GW - 040

USEPA “LEE ACRES” SUPERFUND SITE 5-Yr. REVIEW

2019

Chavez, Carl J, EMNRD

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Friday, November 22, 2019 8:57 AM
To: Stuart Hyde; l1thomas@blm.gov
Cc: Devin Hencmann; McCartney, Gregory J.; Chavez, Carl J, EMNRD; Ashley Ager
Subject: [EXT] RE: Lee Acres 5-Year Review - Western Comments Regarding Upgradient Water-Quality Results

Mr. Hyde,

Thanks again for your letter.

As part of the Five-Year Review for Lee Acres landfill, I am planning to review your letter and data submitted by the Refinery. I have also previously asked BLM to review the data submitted for wells upgradient of the Giant Bloomfield Refinery site.

We will let you know the results of our review hopefully soon.

Thank you,

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

From: Stuart Hyde <shyde@ltenv.com>
Sent: Monday, November 18, 2019 1:31 PM
To: Smith, Nelly <Smith.Nelly@epa.gov>; l1thomas@blm.gov
Cc: Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Ashley Ager <aager@ltenv.com>
Subject: Lee Acres 5-Year Review - Western Comments Regarding Upgradient Water-Quality Results

Nelly and Whitney,

Per our recent conversations, LT Environmental and Western Refining Southwest have reviewed existing groundwater-quality data for wells upgradient of the Giant Bloomfield Refinery site (downgradient of the Lee Acres Landfill site). Attached is a letter summarizing our review to be considered in the upcoming EPA Five-Year Review for the Lee Acres Landfill Superfund site.

Please let me know if you have any questions. Thanks.

LT Environmental, Inc.
Advancing Opportunity

Stuart Hyde, LG
Project Geologist
970.385.1096 *office*
970.903.1607 *cell*
848 East Second Avenue Durango, CO 81301
www.ltenv.com

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Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, November 19, 2019 9:02 AM
To: Griswold, Jim, EMNRD; Powell, Brandon, EMNRD
Cc: 'Stuart Hyde'
Subject: FW: Lee Acres 5-Year Review - Western Comments Regarding Upgradient Water-Quality Results (GW-40) UPDATE
Attachments: 2019-11-18_LTE-Western Response to EPA.pdf

FYI:

LTE's letter to EPA and BLM based on the EPA 5-Yr. Review environmental information exchange. LTE makes a recommendation that EPA and BLM review Western's (Marathon) date regarding Cl, SO4, Cr, Fe and TDS in MWs located upgradient from the GW-40 Facility.

EPA 5-Yr. Review Lee Acres Landfill Superfund Site Upgradient of GW-40. I informed LTE (Consultant for Marathon) that based on the WQCC Regulations for "natural background" the onus is on Marathon to prove contaminants are migrating from the N onto the facility. I recommended when sampling occurs, field monitoring for pH, ORP, DO, etc. be conducted in the upgradient MWs to demonstrate contaminant migration from the Superfund Site is occurring on the GW-40 Site. Also, Marathon has some clean wells, it should develop a natural GW database if it is attempting to show "natural background" exists under the WQCC Regs. The natural background conditions may also support Marathon's case that contaminants are migrating onto the site from the N. Also, OCD clarified to LTE that in the WQCC Regs. pertaining to "background" Marathon is responsible for proving contamination in GW is not from the GW-40 Facility.

EPA indicated to LTE based on the Record of Decision (ROD) for the Superfund Site, Manganese is the only elevated concentration parameter it is responsible for and is working to identify the source. EPA believes there may be naturally occurring elevated Fe, Mn, etc. in GW.

Thank you.

From: Stuart Hyde <shyde@ltenv.com>
Sent: Monday, November 18, 2019 12:31 PM
To: Smith, Nelly <Smith.Nelly@epa.gov>; l1thomas@blm.gov
Cc: Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Ashley Ager <aager@ltenv.com>
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Chavez, Carl J, EMNRD

To: Griswold, Jim, EMNRD; Powell, Brandon, EMNRD
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Attachments: 2019-11-18_LTE-Western Response to EPA.pdf

From: Stuart Hyde <shyde@ltenv.com>
Sent: Monday, November 18, 2019 12:31 PM
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Please let me know if you have any questions. Thanks.

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

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LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
970.385.1096

November 18, 2019

Nelly Smith, Remedial Project Manager
Lee Acres Landfill Superfund Site
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency – Region 6
1445 Ross Avenue, Suite 1200, Dallas, TX 75202

RE: Lee Acres Landfill Superfund Site 5-Year Review
Upgradient Water Quality Results for the Giant Bloomfield Refinery
Western Refining Southwest, Inc. (Marathon Petroleum Company, LP)
Bloomfield, New Mexico

Dear Ms. Smith:

On behalf of Western Refining Southwest, Inc. (Western; owned by Marathon Petroleum Company, LP), LT Environmental, Inc. (LTE) presents this letter to the United States Environmental Protection Agency (EPA) in response to the five-year review of the Lee Acres Landfill Superfund site located in Bloomfield, New Mexico. Western is responsible for remediation of petroleum hydrocarbon impacts to groundwater at the former Giant Bloomfield Refinery (GBR) located directly south and hydrologically downgradient of the Lee Acres Landfill. As part of that remediation effort, Western monitors groundwater on a regular basis.

Groundwater monitoring results were provided by LTE to the EPA in a letter dated October 4, 2019. Specifically, a table was prepared with information regarding monitoring well construction (diameter, total depth, and screen intervals) and measured groundwater elevations. The table also presented laboratory analytical results for selected constituents from annual sampling events conducted at the GBR site between 2010 and 2018. The monitoring results indicate concentrations of chloride, sulfate, chromium, iron, manganese, and total dissolved solids exceeding New Mexico Water Quality Control Commission (NMWQCC) standards are present in wells on and upgradient of the GBR property. As part of the five-year review for the Lee Acres Superfund site, LTE requests that the EPA review Western's data regarding chloride, sulfate, chromium, iron, and total dissolved solids concentrations present in wells located upgradient from the GBR site.

Sincerely,

LT ENVIRONMENTAL, INC.

Devin Hencmann
Project Geologist

Stuart Hyde, LG
Project Geologist

cc: Greg McCartney, Marathon Petroleum Company, LP
Carl Chavez, NMOCD

Chavez, Carl J, EMNRD

From: Stuart Hyde <shyde@ltenv.com>
Sent: Thursday, November 7, 2019 12:14 PM
To: l1thomas@blm.gov; jtafoya@blm.gov
Cc: Devin Hencmann; McCartney, Gregory J.; Chavez, Carl J, EMNRD
Subject: [EXT] RE: Lee Acres/Western Refinery
Attachments: 029518010_GIANT_FIG05_JAN_2018.pdf; 029518010_GIANT_FIG06_OCT_2018.pdf

Whitney,

We do not have any additional manganese data compiled, but all of the annual reports are on NMOCDs website if you would like to review earlier data. I have attached our groundwater flow figures from 2018 for your review. Let me know if you need additional information. Thanks.

Stuart Hyde, LG
Project Geologist
970.385.1096 *direct*
970.903.1607 *cell*

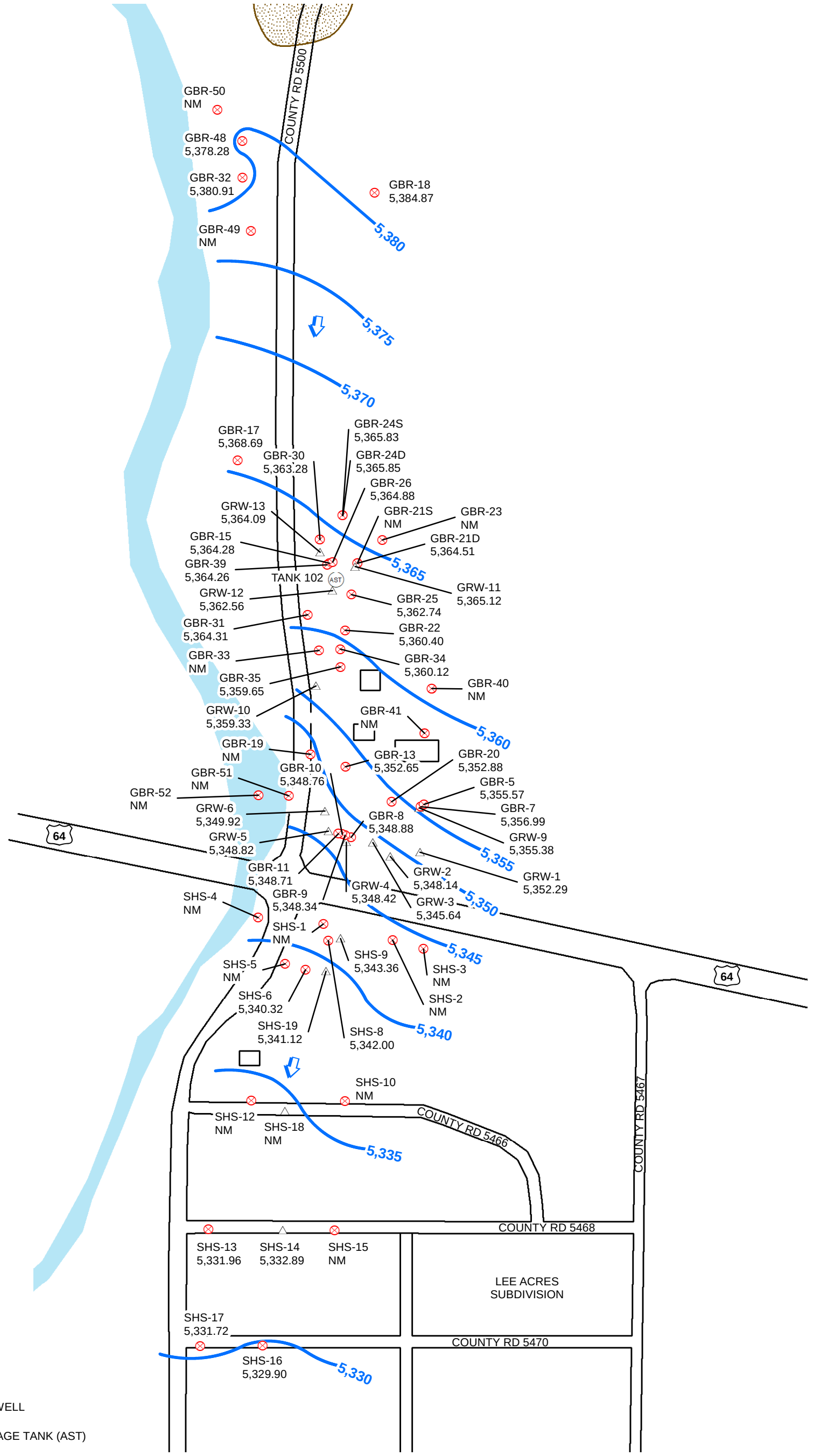
From: Thomas, Leigh <l1thomas@blm.gov>
Sent: Thursday, November 7, 2019 11:46 AM
To: Devin Hencmann <dhencmann@ltenv.com>
Cc: Jeffrey Tafoya <jtafoya@blm.gov>
Subject: Lee Acres/Western Refinery

Hello Devin,

I am contacting you regarding the groundwater monitoring data that you submitted to the EPA. Do you have additional information pertaining to water flow and manganese contaminant levels.

Thank you and let me know if you have any questions.

Whitney Thomas
Physical Scientist
Farmington Field Office
6251 North College Boulevard
Suite A
Farmington, NM 87402
Office: 505-564-7680
Cell: 505-635-9796
email: l1thomas@blm.gov



LEGEND

NM: NOT MEASURED

PO: PAVED OVER

- MONITORING WELL
- INACTIVE RECOVERY WELL
- ABOVEGROUND STORAGE TANK (AST)
- GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 5 FEET
  GROUNDWATER ELEVATION MEASURED IN FEET
  ABOVE MEAN SEA LEVEL IN JANUARY, 2018
- ARROYO
- FORMER LEE ACRES LANDFILL
- ESTIMATED GROUNDWATER FLOW DIRECTION

FIGURE 5
GROUNDWATER POTENTIOMETRIC SURFACE MAP (JANUARY 2018)
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

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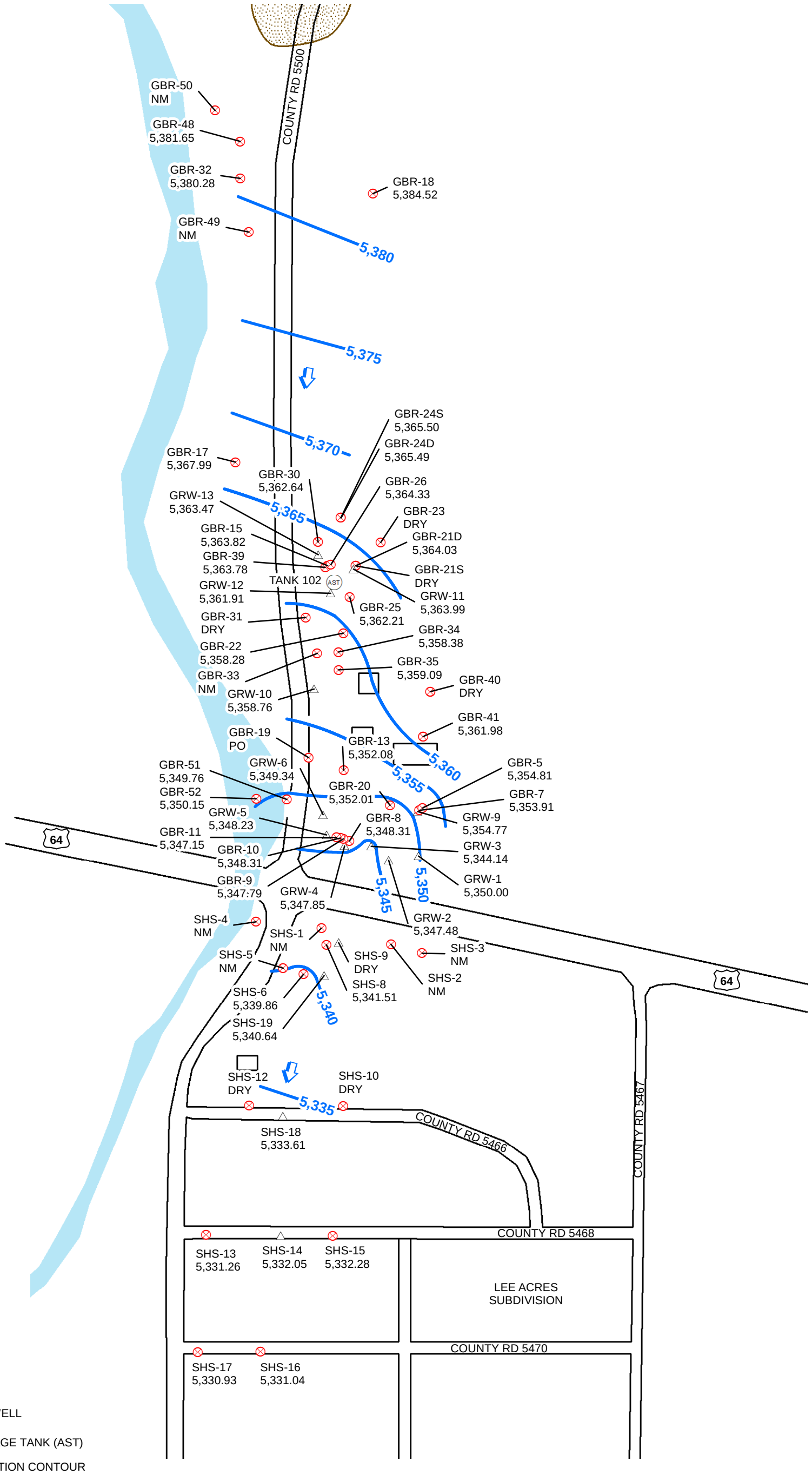

LEGEND

NM: NOT MEASURED

PO: PAVED OVER

- MONITORING WELL
- INACTIVE RECOVERY WELL
- ABOVEGROUND STORAGE TANK (AST)
- GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 5 FEET
  GROUNDWATER ELEVATION MEASURED IN FEET
  ABOVE MEAN SEA LEVEL IN OCTOBER, 2018
- ARROYO
- FORMER LEE ACRES LANDFILL
- ESTIMATED GROUNDWATER FLOW DIRECTION

FIGURE 6
GROUNDWATER POTENTIOMETRIC SURFACE MAP (OCTOBER 2018)
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

P:\Western Refining\GIS\MXD\029518010_GBR\029518010_GIANT_FIG06_OCT_2018.mxd

Chavez, Carl J, EMNRD

From: Stuart Hyde <shyde@ltenv.com>
Sent: Monday, October 28, 2019 11:47 AM
To: Chavez, Carl J, EMNRD
Cc: Devin Hencmann; Ashley Ager
Subject: [EXT] FW: Background Concentrations for COCs at GBR
Attachments: Upgradient_Results for statistical analysis.pdf; Background Stats Table_Updated.pdf; LangP 2018.pdf; 2019_Requested Analytical Results for GBR.pdf

Carl,

Have you had a chance to further review the background data for the Giant Bloomfield Refinery (GBR) site (see email below and attachments). We will be conducting the annual groundwater sampling in the next couple weeks and would like to be able to compare the results to the calculated "background" concentrations for chloride, sulfate, chromium, iron, manganese, and TDS.

In addition, I discovered that there were some missing data from the table we created for EPA's review for the above mentioned constituents (for 2015 and 2016 annual events). I have attached the updated table for your records and will also send this updated table to Nelly to review.

Thanks and please let us know if you have any further questions/concerns regarding the background data.

Stuart Hyde, LG
Project Geologist
970.385.1096 *direct*
970.903.1607 *cell*

From: Devin Hencmann
Sent: Monday, June 10, 2019 3:13 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>
Subject: Background Concentrations for COCs at GBR

Carl,

Attached are the tables you had requested in your email dated 5/9/2019 for establishing background concentrations for constituents of concern at the former Giant Bloomfield Refinery. Statistics have been rerun replacing all Non-Detects with the PQLs. We presented results from the various statistical runs in one table to make comparing the different results easier. Explanations are also presented in the table.
I have also attached a table containing the historical data that was used in the stats, and the bio of the LTE data analyst that ran the statistics. Paloma Lang can be reached at **plang.ltenv.com** if you have any questions. Please cc myself on any correspondence so I can follow through and sure you receive an answer in a timely manner.

Thank you,
Devin

Devin Hencmann
Project Geologist
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PROPOSED FACILITY-SPECIFIC BACKGROUND THRESHOLD VALUES FOR INORGANICS IN GROUNDWATER
FORMER GIANT BLOOMFIELD REFINERY
BLOOMFIELD, NEW MEXICO

												Original Reported UTL	NDs replaced with PQL - Analyzed as Detections (per Agency's request)				Original Dataset with NDs (Statistic based on Gamma distribution for previously lognormal cases)					
Analyte	**Units**	**Number of Samples**	**Percent ND**	**Non-Detects**	**Detections**	**ND EM**	**Distribution**	**Min**	**Max**	**Mean**	**Std Deviation**	**95%UTL 95% Coverage**	**CV**	**ND EM**	**Distribution**	**95%UTL 95% Coverage**	**CV**	**ND EM**	**Distribution**	**95%UTL 95% Coverage**	**Proposed Background Threshold Values (BTVs)**	**Comments**
Chloride	mg/L	40	0	0	40	NA	Non-Parametric\Max	44	560	232.3	153.4	560									560	No Change. Dataset do not follow a discernible distribution, use Max value as UTL
Chromium	mg/L	32	3.125	1	31	ROS	Lognormal	0.006	1.4	0.318	0.379	4.46	1.19	PQL	Gamma-WH	1.59	0.145	KM	Gamma-WH	1.553	1.553	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 1.4 due to highly variable sample data, recommend using UTL based on Gamma distribution with WH approximation
Iron	mg/L	33	6	2	31	ROS	Lognormal	0.1	170	16.62	33.37	261.7	2.008	PQL	Gamma-HW	100.1	1168	KM	Gamma-HW	97.06	97.06	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 170 due to highly variable sample data, recommend using UTL based on Gamma distribution with HW approximation
Manganese	mg/L	24	0	0	24	NA	Lognormal	0.041	6.4	0.765	1.578	10.63					1.226	NA	Gamma-HW	6.42	6.42	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 6.4 due to highly variable sample data, recommend using UTL based on Gamma distribution with HW approximation
Sulfate	mg/L	40	0	0	40	NA	Normal	698	2800	1801	351.9	2546									2546	Low coefficient of variation, use UTL based on normal distribution
Total Dissolved Solids	mg/L	40	0	0	40	NA	Normal	1460	4320	3234	629	4566									4566	Low coefficient of variation, use UTL based on normal distribution

Notes:
CV - Coefficient of Variation
HW - Hawkins–Wixley approximation
KM - Kaplan-Meier method
NA - Not Applicable
ND - Non-detect
ND EM - Non-detect estimation method
ROS - Regression on order statistics
WH - Wilson-Hilferty approximation

PALOMA LANG

GIS / DATABASE MANAGEMENT

EXPERTISE

Database Design and Maintenance

Data Quality Control

Data Analysis and Reporting

ENVIRONMENTAL EXPERIENCE

22 years / 8 years LTE

EDUCATION

B.S. Chemistry, University of Colorado

REGISTRATIONS / CERTIFICATIONS

Information Systems Programming Advanced Training, 2001, Denver Technical College

SharePoint 2013 Administrator, 2014, Mission Critical Training

SharePoint 2013 Designer, 2014, Mission Critical Training

PROJECT EXPERIENCE

Ms. Lang is a chemist and database management specialist who has experience in the environmental consulting field, including data analysis and validation, groundwater monitoring statistics, quality assurance/quality control (QA/QC), database management using Intelex Asset & Compliance Tracking System (ACTS) and Microsoft's SQL, Access, and SharePoint applications, and designing and implementing tools and reports in support of groundwater monitoring, remediation engineering, and greenhouse gas management projects and Spill Prevention, Control, and Countermeasure (SPCC) inspections.

Designed and implemented a SharePoint hosted Access Web Application for reporting analytical data and managing documents.

Designed and maintained a database application to test for outliers, normality, and inter-well/intra-well descriptive statistics, and trends in groundwater samples.

Designed and maintained a database application for managing and reporting water treatment systems. Functionality included Supervisory Control and Data Acquisition data imports, system status, and compliance reports.

Designed and maintained a database for calculating greenhouse gas emissions and aggregate inventories and for managing asbestos clean-up projects.

Wrote code and Implemented statistical analyses such as normality, outlier, trends, prediction and tolerance limits, box plots, and control charts using Microsoft's SQL and S-Plus platforms in support of large groundwater monitoring projects.

Ms. Lang provides data management support for multiple groundwater monitoring, baseline water quality, air permitting, and stormwater programs overseeing data quality from field collection to client and agency reporting.

Designed and implemented tools for the automated production of discharge monitoring reports submitted to Colorado Department of Public Health and Environment, Texas Natural Resource Conservation Commission Form 312, and New Jersey Department of Environmental Protection Electronic Data Deliverables system.

Ms. Lang has effectively integrated M.S. Excel, M.S. Access, M.S. Word, TapForms, GoCanvas, and FormMaker, on iPads, tablets, and laptops to support large field data collection projects such as equipment inventories, tank registrations, and environmental, health and safety and leak detection and repair inspections. She also provides training and technical support to internal and external end-users.

Ms. Lang also has experience providing technical support for non-database tasks such as air permit renewals, Dispersion Models, SPCC reports, and water well management programs.

Ms. Lang is a certified administrator and developer for ACTS and Microsoft SharePoint and has expertise in using ProUCL and ChemStat software.

2008-2018 GROUNDWATER LABORATORY ANALYTICAL RESULTS
FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, INC.

Analyte	NMWQCC Standard	Unit	GBR-32											GBR-48										
			Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018	Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018
USEPA Method 300.0: Anions																								
chloride	250	mg/L	104	**530**	-	**420**	**500**	**400**	**380**	**370**	**320**	**290**	200	144	**560**	-	**390**	200	230	**420**	**370**	**340**	**350**	**300**
sulfate	600	mg/L	**1,750**	**2,100**	-	**2,300**	**2,800**	**2,200**	**1,900**	**2,000**	**2,000**	**1,600**	**1,700**	**698**	**1,300**	-	**2,200**	**1,700**	**2,200**	**2,100**	**2,100**	**2,000**	**1,900**	**1,800**
iron	1	mg/L	-	<0.1	-	-	0.88	**1.2**	**5.9**	0.26	**11**	**2.3**	**2.7**	-	<0.10	-	**9.3**	**15**	**17**	**52**	**170**	**89**	**40**	**18**
total dissolved solids	1,000	mg/L	**4,270**	**4,100**	-	**4,010**	**4,290**	**4,320**	**3,800**	**3,830**	**3,500**	**3,210**	**3,110**	**1,460**	**2,700**	-	**3,510**	**2,940**	**4,020**	**4,030**	**3,730**	**3,360**	**3,690**	**3,580**
chromium	0.05	mg/L	**0.189**	-	-	**0.13**	0.030	**0.098**	**1.4**	**0.20**	**0.33**	**0.13**	-	**1.32**	-	-	**0.71**	**0.63**	**0.52**	**0.92**	**0.95**	**0.42**	**0.13**	-
manganese	0.2	mg/L	-	-	-	-	**0.50**	**0.40**	**0.70**	**0.56**	**1.2**	**1.2**	-	-	-	-	-	**0.83**	**0.94**	**2.0**	**6.4**	**4.8**	**1.7**	-

Analyte	NMWQCC Standard	Unit	GBR-49											GBR-50										
			Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018	Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018
USEPA Method 300.0: Anions																								
chloride	250	mg/L	99.7	**280**	-	**310**	**260**	240	63	180	210	150	180	46.5	44	-	46	49	49	52	44	59	54	59
sulfate	600	mg/L	**1,720**	**2,100**	-	**2,000**	**2,000**	**1,600**	**1,400**	**1,500**	**1,900**	**1,300**	**1,800**	**1,380**	**1,700**	-	**1,800**	**1,800**	**1,600**	**1,700**	**1,700**	**1,500**	**1,500**	**1,700**
iron	1	mg/L	-	**1.4**	-	-	0.23	**4.6**	**41**	**7.1**	**11**	0.44	**23**	-	0.41	-	-	0.72	**1.3**	**3.6**	**2.2**	**6.8**	**5.8**	**4**
total dissolved solids	1,000	mg/L	**3,460**	**3,300**	-	**3,390**	**3,470**	**3,290**	**2,340**	**2,840**	**3,160**	**2,720**	**3,010**	**2,830**	**2,400**	-	**2,640**	**2,730**	**2,830**	**2,800**	**2,760**	**2,580**	**2,590**	**2,770**
chromium	0.05	mg/L	**0.217**	-	-	**0.48**	0.018	0.041	**0.060**	**0.38**	**0.20**	0.018	-	0.011	-	-	0.023	0.0069	<0.0060	0.013	**0.073**	**0.36**	**0.16**	-
manganese	0.2	mg/L	-	-	-	-	**0.34**	**1.3**	**3.9**	**0.54**	**1.1**	**0.30**	-	-	-	-	-	0.041	0.12	**0.22**	**0.19**	**1.3**	**0.32**	-

Notes:
BOLD - indicates concentration exceeds the NMWQCC standard
mg/L - milligrams per liter
- - not tested
ND - not detected
NMWQCC - New Mexico Water Quality Control Commission
µg/L - micrograms per liter
USEPA - United States Environmental Protection Agency

TABLE 1
2010 to 2018 - ANNUAL COMPLIANCE GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Lee Acres Sampling, 1992 RI Report (5)												
Lee Acres Site 1, Subarea 2, OU 2 - Alluvial Aquifer							**8.8 - 730**	**195 - 4,370**	**0.0108 - 0.124**	**0.118 - 1.71**	**0.0161 - 8.62**	**943 - 6,560**
Lee Acres Site 1, Subarea 3, OU 2 - Southern Area - Alluvial Aquifer							**19 - 2,110**	**830 - 2,610**	**0.0145 - 0.0406**	**0.148 - 23.9**	**0.0214 - 4.23**	**622 - 5,300**
Lee Acres Site 2, Subarea 4 - Alluvial Aquifer							**3.5 - 604**	**310 - 3,220**	**0.043 - 0.110**	**0.0749 - 64.1**	**0.0131 - 3.4**	**616 - 6,370**
GBR Sampling, Upgradient Wells (6)												
GBR-32	5,414.86	45	25 - 40	2	Oct 2018	33.95	200	1,700	0.074	2.7	1.9	3,110
					Dec 2017		290	1,600	0.13	2.3	1.2	3,210
					Jan 2017		320	2,000	0.33	11	1.2	3,500
					Aug 2015		370	2,000	0.02	0.26	0.56	3,830
					Nov 2014		380	1,900	1.4	5.9	0.70	3,800
					Jan 2013		400	2,200	0.098	1.2	0.40	4,320
					Jan 2012		500	**2,800**	0.030	0.88	0.50	4,290
					Jan 2011		420	2,300	0.13	NT	NT	4,010
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-48	5,413.90	43.6	28.4 - 38.4	2	Oct 2018	35.62	300	1,800	0.036	18	0.49	3,580
					Dec 2017		350	1,900	0.13	40	1.7	3,690
					Jan 2017		340	2,000	0.42	89	4.8	3,360
					Aug 2015		370	2,100	0.95	170	6.4	3,730
					Nov 2014		420	2,100	0.92	52	2.0	4,030
					Jan 2013		230	2,200	0.52	17	0.94	4,020
					Jan 2012		200	1,700	0.63	15	0.83	2,940
					Jan 2011		390	2,200	0.71	9.3	NT	3,510
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-49	*	38.5	25.9 - 36.3	2	Oct 2018	32.06	180	1,800	1.2	23	0.98	3,010
					Dec 2017		150	1,300	0.018	0.44	0.30	2,720
					Jan 2017		210	1,900	0.2	11	1.1	3,160
					Aug 2015		180	1,500	0.38	7.1	0.54	2,840
					Nov 2014		63	1,400	0.060	41	3.9	2,340
					Jan 2013		240	1,600	0.041	4.6	1.3	3,290
					Jan 2012		260	2,000	0.018	0.23	0.34	3,470
					Jan 2011		310	2,000	0.48	NT	NT	3,390
					Jan 2010		NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GBR-50	*	42.5	26.91 - 37.26		Oct 2018	31.26	59	1,700	0.044	4.0	0.13	2,770
					Dec 2017		54	1,500	0.16	5.8	0.32	2,590
					Jan 2017		59	1,500	0.36	6.8	1.3	2,580
					Aug 2015		44	1,700	0.073	2.2	0.19	2,760
					Nov 2014		52	1,700	0.013	3.6	0.22	2,800
					Jan 2013		49	1,600	<0.0060	1.3	0.12	2,830
					Jan 2012		49	1,800	0.0069	0.72	0.041	2,730
					Jan 2011		46	1,800	0.023	NT	NT	2,640
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR Sampling, Source-Area Wells												
GRW-3/GBR-29 or 43	5,388.77	58.3	34.5 - 50.2	6	Oct 2018	43.13	99	640	NT	18	0.80	2,190
					Dec 2017		74	1,400	NT	54	1.9	2,920
					Jan 2017		74	1,200	NT	150	2.9	2,730
					Aug 2015		38	1,900	NT	0.89	0.69	3,320
					Nov 2014		26	2,200	NT	0.86	0.44	3,680
					Jan 2013		59	1,300	NT	2.8	0.54	2,620
					Jan 2012		54	1,300	NT	2.8	0.67	2,660
					Jan 2011		95	480	NT	NT	NT	1,810
					Jan 2010		NT	NT	NT	NT	NT	NT
GRW-6/GBR-44	5,390.81	58.6	32.6 - 48.3	6	Oct 2018	40.89	100	1,300	NT	**890**	**45**	2,390
					Dec 2017		120	1,200	NT	40	**9.1**	2,570
					Jan 2017		89	1,500	NT	11	**17**	2,580
					Aug 2015		88	1,400	NT	15	**18**	3,220
					Nov 2014		86	1,600	NT	35	**8.5**	3,170
					Jan 2013		100	1,500	NT	2.4	1.2	2,760
					Apr 2012		80	1,900	NT	0.47	1.0	2,740
					Jan 2011		110	1,400	NT	NT	NT	2,490
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-17	5,402.69	51	31 - 51	2	Oct 2018	34.00	49	1,200	NT	**100**	3.0	2,180
					Dec 2017		50	1,000	NT	9.3	0.25	2,110
					Jan 2017		46	1,100	NT	15	0.35	1,890
					Aug 2015		43	1,100	NT	3.6	<0.00200	1,960
					Nov 2014		44	1,200	NT	3.7	0.13	1,980
					Jan 2013		47	1,300	NT	1.2	0.045	2,700
					Jan 2012		46	1,400	NT	3.9	0.15	2,150
					Jan 2011		47	1,300	NT	NT	NT	2,140
					Jan 2010		NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GBR-24D	5,396.77	46.3	33 - 43	2	Oct 2018	30.92	130	2,300	NT	9.1	1.8	3,780
					Dec 2017		140	1,800	NT	11	1.8	3,560
					Jan 2017		130	1,900	NT	14	1.8	3,390
					Aug 2015		160	2,100	NT	11	1.8	3,380
					Nov 2014		210	1,800	NT	12	1.7	3,410
					Jan 2013		200	1,700	NT	3.6	1.8	3,430
					Jan 2012		200	2,000	NT	2.4	1.7	3,320
					Jan 2011		170	2,400	NT	NT	NT	3,410
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-30	5,395.59	45	25 - 40	2	Oct 2018	32.31	250	1,500	NT	28	0.76	3,000
					Dec 2017		220	1,300	NT	38	1.4	2,770
					Jan 2017		220	1,400	NT	64	2.3	2,580
					Aug 2015		310	1,600	NT	7.6	0.5	3,020
					Nov 2014		270	1,400	NT	88	2.2	2,520
					Jan 2013		310	1,500	NT	**130**	6.1	3,340
					Jan 2012		390	1,700	NT	2.9	0.29	3,240
					Jan 2011		320	1,600	NT	NT	NT	3,340
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-31	5,396.58	45	24.6 - 39.6	2	Oct 2018	32.27	220	1,400	NT	13	3.1	2,660
					Dec 2017		93	1,700	NT	21	4.2	2,940
					Jan 2017		84	1,700	NT	1.9	0.18	2,970
					Aug 2015		250	1,700	NT	2.4	0.45	3,170
					Nov 2014		230	1,500	NT	12	1.6	3,100
					Jan 2013		79	1,600	NT	15	0.77	2,720
					Jan 2012		74	1,700	NT	3.8	0.27	2,760
					Jan 2011		97	1,800	NT	NT	NT	2,740
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-51	5,389.68	59.5	38.5 - 54.25	6	Oct 2018	NM	54	1,300	NT	0.059	<0.0020	2,330
					Dec 2017		51	1,200	NT	0.080	<0.020	2,250
					Jan 2017		45	990	NT	9.1	0.47	2,080
					Aug 2015		54	1,600	NT	17	0.42	2,430
					Nov 2014		54	1,400	NT	16	0.47	2,320
					Jan 2013		56	1,500	NT	9.7	0.88	2,540
					Jan 2012		53	1,600	NT	3.1	0.16	2,440
					Jan 2011		53	1,600	NT	NT	NT	2,380
					Jan 2010		NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GBR-52	5,387.74	50.78	30.08 - 45.75	6	Oct 2018	NM	54	1,500	NT	0.12	0.0028	2,580
					Dec 2017		54	1,500	NT	0.048	<0.0020	2,640
					Jan 2017		58	1,400	NT	18	0.46	2,540
					Aug 2015		65	1,400	NT	8.2	0.15	2,840
					Nov 2014		65	1,700	NT	12	0.25	2,540
					Jan 2013		63	1,700	NT	2.3	0.036	2,770
					Jan 2012		60	1,800	NT	2.2	0.032	2,720
					Jan 2011		62	1,900	NT	NT	NT	2,700
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR Sampling, Downgradient Wells												
SHS-1	5,383.54	50.97	35.67 - 45.67	4	June 2017	P&A	100	1,300	NT	NT	NT	2,400
					Jan 2011		NT	NT	NT	NT	NT	NT
SHS-2	5,381.66	41.28	30.98 - 40.98	4	June 2017	P&A	310	2,200	NT	NT	NT	4,100
					Jan 2011		NT	NT	NT	NT	NT	NT
SHS-4	5,383.62	55	37 - 47	2	June 2017	P&A	59	1,600	NT	NT	NT	2,270
SHS-5	5,378.36	53.33	37.62 - 48.0	4	June 2017	P&A	50	1,200	NT	NT	NT	2,030
					Jan 2011		NT	NT	NT	NT	NT	NT
SHS-6	5,378.17	47.88	32.48 - 42.85	4	Jan 2018	37.85	NT	NT	NT	NT	NT	NT
SHS-8	5,380.25	52.5	30.83 - 46.60	4	Oct 2018	38.25	130	890	NT	50	3.1	2,730
SHS-8					Dec 2017		110	1,200	NT	10	3.6	2,730
SHS-8					Jan 2017		100	720	NT	66	3.0	2,210
SHS-8					Aug 2015		120	47	NT	8.6	0.41	1,300
SHS-8					Nov 2014		110	350	NT	**260**	5.0	1,400
SHS-8					Jan 2013		120	770	0.099	**100**	4.7	1,800
SHS-8					Jan 2012		170	430	NT	15	2.3	2,040
SHS-8					Jan 2011		150	150	0.0063	NT	NT	1,440
SHS-8					Jan 2010		NT	NT	NT	NT	NT	NT
SHS-9	5,380.79	49.88	34.46 - 44.46	4	Jan 2018	37.43	NT	NT	NT	NT	NT	NT
SHS-13	5,367.81	47.4	27 - 42	4	Jan 2018	35.85	NT	NT	NT	NT	NT	NT
SHS-14	5,367.07	54	28.70 - 48.70	4	Jan 2018	34.18	NT	NT	NT	NT	NT	NT
SHS-15	5,366.21	47.8	27.40 - 42.40	4	Jan 2018	33.00	NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SHS-16	5,362.58	42.6	22.2 - 37.2	4	Jan 2018	32.68	NT	NT	NT	NT	NT	NT
SHS-17	5,364.35	46.21	35.67 - 45.67	4	Jan 2018	32.63	NT	NT	NT	NT	NT	NT
SHS-18	5,373.64	47.36	37.36 - 47.36	4	Jan 2018	39.24	NT	NT	NT	NT	NT	NT
SHS-19	5,378.89	52.4	32.40 - 52.40	4	Jan 2018	37.77	NT	NT	NT	NT	NT	NT

Notes

(1) Background Concentrations Proposed for the Giant Bloomfield Refinery Site. Based on Statistical Analysis Prepared by LT Environmental and Submitted to New Mexico Oil Conservation District in an Email Dated June 10, 2019.
(2) Regional Background Concentrations Established in Document Titled *Hydrogeology and Water Resources of San Juan Basin, New Mexico,* Stone et al., dated 1983
(3) "Background" Concentration Proposed in Lee Acres DRAFT *Remedial Investigation Report* Prepared for the US Bureau of Land Management (dated February 1992)
(4) Contaminant Concentrations Established as the "Remedial Goals" or "Background" Concentrations for the Lee Acres Superfund Site. Based on the Lee Acres DRAFT *Remedial Investigation Report* and *Record of Decision* (dated May 2004).
(5) The Lee Acres *Remedial Investigation Report* Presents Analytical Data for Areas of the Site and Not Data for Individual Wells
(6) Well Location Used for Statistical Analysis of Background Concentrations
* Top-of-Casing Elevation is Unknown
NM Not Measured
P&A Plugged and Abandoned
µg/L micrograms per liter
BOLD Indicates Concentration Exceeds the Greater Value of the NMWQCC Water-Quality Standards or Background Threshold Values Proposed for the Giant Bloomfield Refinery
mg/L milligrams per liter
NMWQCC New Mexico Water Quality Control Commission
NT Not Tested
USEPA United States Environmental Protection Agency

Chavez, Carl J, EMNRD

From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Monday, June 10, 2019 3:13 PM
To: Chavez, Carl J, EMNRD
Cc: McCartney, Gregory J.
Subject: [EXT] Background Concentrations for COCs at GBR
Attachments: Upgradient_Results for statistical analysis.pdf; Background Stats Table_Updated.pdf; LangP 2018.pdf

Carl,

Attached are the tables you had requested in your email dated 5/9/2019 for establishing background concentrations for constituents of concern at the former Giant Bloomfield Refinery. Statistics have been rerun replacing all Non-Detects with the PQLs. We presented results from the various statistical runs in one table to make comparing the different results easier. Explanations are also presented in the table.
I have also attached a table containing the historical data that was used in the stats, and the bio of the LTE data analyst that ran the statistics. Paloma Lang can be reached at **plang.ltenv.com** if you have any questions. Please cc myself on any correspondence so I can follow through and sure you receive an answer in a timely manner.

Thank you,
Devin

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

Devin Hencmann
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PALOMA LANG

GIS / DATABASE MANAGEMENT

EXPERTISE

Database Design and Maintenance

Data Quality Control

Data Analysis and Reporting

ENVIRONMENTAL EXPERIENCE

22 years / 8 years LTE

EDUCATION

B.S. Chemistry, University of Colorado

REGISTRATIONS / CERTIFICATIONS

Information Systems Programming Advanced Training, 2001, Denver Technical College

SharePoint 2013 Administrator, 2014, Mission Critical Training

SharePoint 2013 Designer, 2014, Mission Critical Training

PROJECT EXPERIENCE

Ms. Lang is a chemist and database management specialist who has experience in the environmental consulting field, including data analysis and validation, groundwater monitoring statistics, quality assurance/quality control (QA/QC), database management using Intelex Asset & Compliance Tracking System (ACTS) and Microsoft's SQL, Access, and SharePoint applications, and designing and implementing tools and reports in support of groundwater monitoring, remediation engineering, and greenhouse gas management projects and Spill Prevention, Control, and Countermeasure (SPCC) inspections.

Designed and implemented a SharePoint hosted Access Web Application for reporting analytical data and managing documents.

Designed and maintained a database application to test for outliers, normality, and inter-well/intra-well descriptive statistics, and trends in groundwater samples.

Designed and maintained a database application for managing and reporting water treatment systems. Functionality included Supervisory Control and Data Acquisition data imports, system status, and compliance reports.

Designed and maintained a database for calculating greenhouse gas emissions and aggregate inventories and for managing asbestos clean-up projects.

Wrote code and Implemented statistical analyses such as normality, outlier, trends, prediction and tolerance limits, box plots, and control charts using Microsoft's SQL and S-Plus platforms in support of large groundwater monitoring projects.

Ms. Lang provides data management support for multiple groundwater monitoring, baseline water quality, air permitting, and stormwater programs overseeing data quality from field collection to client and agency reporting.

Designed and implemented tools for the automated production of discharge monitoring reports submitted to Colorado Department of Public Health and Environment, Texas Natural Resource Conservation Commission Form 312, and New Jersey Department of Environmental Protection Electronic Data Deliverables system.

Ms. Lang has effectively integrated M.S. Excel, M.S. Access, M.S. Word, TapForms, GoCanvas, and FormMaker, on iPads, tablets, and laptops to support large field data collection projects such as equipment inventories, tank registrations, and environmental, health and safety and leak detection and repair inspections. She also provides training and technical support to internal and external end-users.

Ms. Lang also has experience providing technical support for non-database tasks such as air permit renewals, Dispersion Models, SPCC reports, and water well management programs.

Ms. Lang is a certified administrator and developer for ACTS and Microsoft SharePoint and has expertise in using ProUCL and ChemStat software.

PROPOSED FACILITY-SPECIFIC BACKGROUND THRESHOLD VALUES FOR INORGANICS IN GROUNDWATER
FORMER GIANT BLOOMFIELD REFINERY
BLOOMFIELD, NEW MEXICO

												Original Reported UTL	NDs replaced with PQL - Analyzed as Detections (per Agency's request)				Original Dataset with NDs (Statistic based on Gamma distribution for previously lognormal cases)					
Analyte	**Units**	**Number of Samples**	**Percent ND**	**Non-Detects**	**Detections**	**ND EM**	**Distribution**	**Min**	**Max**	**Mean**	**Std Deviation**	**95%UTL 95% Coverage**	**CV**	**ND EM**	**Distribution**	**95%UTL 95% Coverage**	**CV**	**ND EM**	**Distribution**	**95%UTL 95% Coverage**	**Proposed Background Threshold Values (BTVs)**	**Comments**
Chloride	mg/L	40	0	0	40	NA	Non-Parametric\Max	44	560	232.3	153.4	560									560	No Change. Dataset do not follow a discernible distribution, use Max value as UTL
Chromium	mg/L	32	3.125	1	31	ROS	Lognormal	0.006	1.4	0.318	0.379	4.46	1.19	PQL	Gamma-WH	1.59	0.145	KM	Gamma-WH	1.553	1.553	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 1.4 due to highly variable sample data, recommend using UTL based on Gamma distribution with WH approximation
Iron	mg/L	33	6	2	31	ROS	Lognormal	0.1	170	16.62	33.37	261.7	2.008	PQL	Gamma-HW	100.1	1168	KM	Gamma-HW	97.06	97.06	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 170 due to highly variable sample data, recommend using UTL based on Gamma distribution with HW approximation
Manganese	mg/L	24	0	0	24	NA	Lognormal	0.041	6.4	0.765	1.578	10.63					1.226	NA	Gamma-HW	6.42	6.42	Calculated UTL based on lognormal distribution is disproportionately high when compared to maximum detection= 6.4 due to highly variable sample data, recommend using UTL based on Gamma distribution with HW approximation
Sulfate	mg/L	40	0	0	40	NA	Normal	698	2800	1801	351.9	2546									2546	Low coefficient of variation, use UTL based on normal distribution
Total Dissolved Solids	mg/L	40	0	0	40	NA	Normal	1460	4320	3234	629	4566									4566	Low coefficient of variation, use UTL based on normal distribution

Notes:
CV - Coefficient of Variation
HW - Hawkins–Wixley approximation
KM - Kaplan-Meier method
NA - Not Applicable
ND - Non-detect
ND EM - Non-detect estimation method
ROS - Regression on order statistics
WH - Wilson-Hilferty approximation

2008-2018 GROUNDWATER LABORATORY ANALYTICAL RESULTS
FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, INC.

Analyte	NMWQCC Standard	Unit	GBR-32											GBR-48										
			Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018	Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018
USEPA Method 300.0: Anions																								
chloride	250	mg/L	104	**530**	-	**420**	**500**	**400**	**380**	**370**	**320**	**290**	200	144	**560**	-	**390**	200	230	**420**	**370**	**340**	**350**	**300**
sulfate	600	mg/L	**1,750**	**2,100**	-	**2,300**	**2,800**	**2,200**	**1,900**	**2,000**	**2,000**	**1,600**	**1,700**	**698**	**1,300**	-	**2,200**	**1,700**	**2,200**	**2,100**	**2,100**	**2,000**	**1,900**	**1,800**
iron	1	mg/L	-	<0.1	-	-	0.88	**1.2**	**5.9**	0.26	**11**	**2.3**	**2.7**	-	<0.10	-	**9.3**	**15**	**17**	**52**	**170**	**89**	**40**	**18**
total dissolved solids	1,000	mg/L	**4,270**	**4,100**	-	**4,010**	**4,290**	**4,320**	**3,800**	**3,830**	**3,500**	**3,210**	**3,110**	**1,460**	**2,700**	-	**3,510**	**2,940**	**4,020**	**4,030**	**3,730**	**3,360**	**3,690**	**3,580**
chromium	0.05	mg/L	**0.189**	-	-	**0.13**	0.030	**0.098**	**1.4**	**0.20**	**0.33**	**0.13**	-	**1.32**	-	-	**0.71**	**0.63**	**0.52**	**0.92**	**0.95**	**0.42**	**0.13**	-
manganese	0.2	mg/L	-	-	-	-	**0.50**	**0.40**	**0.70**	**0.56**	**1.2**	**1.2**	-	-	-	-	-	**0.83**	**0.94**	**2.0**	**6.4**	**4.8**	**1.7**	-

Analyte	NMWQCC Standard	Unit	GBR-49											GBR-50										
			Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018	Jan 2008	Jan 2009	Jan 2010	Jan 2011	Jan 2012	Jan 2013	Jan 2014	Jan 2015	Jan 2016	Jan 2017	Jan 2018
USEPA Method 300.0: Anions																								
chloride	250	mg/L	99.7	**280**	-	**310**	**260**	240	63	180	210	150	180	46.5	44	-	46	49	49	52	44	59	54	59
sulfate	600	mg/L	**1,720**	**2,100**	-	**2,000**	**2,000**	**1,600**	**1,400**	**1,500**	**1,900**	**1,300**	**1,800**	**1,380**	**1,700**	-	**1,800**	**1,800**	**1,600**	**1,700**	**1,700**	**1,500**	**1,500**	**1,700**
iron	1	mg/L	-	**1.4**	-	-	0.23	**4.6**	**41**	**7.1**	**11**	0.44	**23**	-	0.41	-	-	0.72	**1.3**	**3.6**	**2.2**	**6.8**	**5.8**	**4**
total dissolved solids	1,000	mg/L	**3,460**	**3,300**	-	**3,390**	**3,470**	**3,290**	**2,340**	**2,840**	**3,160**	**2,720**	**3,010**	**2,830**	**2,400**	-	**2,640**	**2,730**	**2,830**	**2,800**	**2,760**	**2,580**	**2,590**	**2,770**
chromium	0.05	mg/L	**0.217**	-	-	**0.48**	0.018	0.041	**0.060**	**0.38**	**0.20**	0.018	-	0.011	-	-	0.023	0.0069	<0.0060	0.013	**0.073**	**0.36**	**0.16**	-
manganese	0.2	mg/L	-	-	-	-	**0.34**	**1.3**	**3.9**	**0.54**	**1.1**	**0.30**	-	-	-	-	-	0.041	0.12	**0.22**	**0.19**	**1.3**	**0.32**	-

Notes:
BOLD - indicates concentration exceeds the NMWQCC standard
mg/L - milligrams per liter
- - not tested
ND - not detected
NMWQCC - New Mexico Water Quality Control Commission
µg/L - micrograms per liter
USEPA - United States Environmental Protection Agency

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, May 9, 2019 3:21 PM
To: Devin Hencmann
Cc: gjmccartney@marathonpetroleum.com; Ashley Ager; Griswold, Jim, EMNRD
Subject: RE: [EXT] Correspondence Letter For GW-040 Partial Remediation System Closure Request Meeting
Attachments: 20.006.0002New Final.pdf

Mr. Hencmann:

The New Mexico Oil Conservation Division (OCD) hereby concurs with the "Partial Remediation System Closure Request" of 3/22/2019 below.

To address the intent to establish "background" concentrations for constituents of concern, OCD requires additional supporting statistical documentation for Table 1 Constituents of Concern background groundwater values. In addition, OCD requires that another similar statistical evaluation be performed and submitted with supporting statistical documentation with "ND" values defaulting to the "Quantitation Limit" instead of the Table 1 values for comparison and further evaluation of background levels.

Please submit the above to OCD within 30 days of receipt of this message or by COB on 6/10/19. I have attached the WQCC Regulations containing the 20.6.2.3103 NMAC water quality standards.

Please contact me if you have questions. Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Friday, March 22, 2019 4:42 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: gjmccartney@marathonpetroleum.com; Ashley Ager <aager@ltenv.com>
Subject: [EXT] Correspondence Letter For GW-040 Partial Remediation System Closure Request Meeting

Carl,

The attached letter is being submitted in response to our meeting on February 26, 2019 discussing the Giant Former Refinery (GW-040) Partial Remediation System Closure Request.
Please let me know if you have any questions.

Thank you,
Devin

Devin Hencmann
Project Geologist
(970) 385-1096 office
(970) 403-6023 cell
848 East 2nd Avenue, Durango CO 81301
www.ltenv.com

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LT Environmental, Inc.
848 East 2nd Avenue
Durango, Colorado 81301
970.385.1096

March 22, 2019

Mr. Carl Chavez
Environmental Engineer, New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: GW-040 Partial Remediation System Closure Request Meeting Correspondence

Dear Mr. Chavez:

This correspondence is in response to the meeting held on February 26, 2019, attended by Ashley Ager (LT Environmental), Devin Hencmann (LT Environmental), Greg McCartney (Marathon Petroleum and Western Refining Southwest, Inc.) via telephone, and Carl Chavez (New Mexico Oil Conservation Division), regarding the Partial Remediation System Closure Request dated November 27, 2018 and submitted to the New Mexico Oil Conservation Division (NMOCD) on February 15, 2019 for discharge permit GW-040 associated with the Giant former Bloomfield Refinery. In the partial closure request, Western Refining Southwest, Inc. (Western) requested permission to remove all infrastructure associated with a portion of the remediation system located south of United States (US) Highway 64, and to plug and abandon monitoring wells SHS-6, SHS-8, SHS-9, SHS-10, SHS-12, SHS-13, SHS-14, SHS-15, SHS-16, SHS-17, SHS-18, and SHS-19. NMOCD was in general agreement with the proposed actions, including decommissioning of the remediation infrastructure and plugging and abandoning most of the monitoring wells. NMOCD requested that Western leave two monitoring points in place and consider a statistical analysis of background conditions to propose analytical parameters for future monitoring.

During the meeting, the NMOCD expressed concern about constituents exceeding New Mexico Water Quality Control Commission (NMWQCC) standards in historical groundwater samples. Constituents that exceeded NMWQCC standards included chloride, sulfate, iron, manganese, chromium, and total dissolved solids. These constituents are observed in excess of NMWQCC standards in upgradient monitoring wells GBR-32, GBR-48, GBR-49, and GBR-50 (Figure 1). LTE conducted a statistical analysis of laboratory analytical results from ten years of groundwater monitoring in the upgradient wells for the following analytes: chloride, iron, sulfate, total dissolved solids, chromium, and manganese. ProUCL, a software developed by the Environmental Protection Agency (EPA) for use with nondetect data samples, was applied to calculate statistical limits of the historical data and establish a background concentration value.

The data were evaluated for fit to normal, lognormal, or non-parametric (if neither normal or lognormal) distributions. That information was then used to calculate the Upper Tolerance Limit at 95% Confidence Level (95% UTL), based on distribution and presence of non-detects, to be used as not-to-exceed background concentrations for each of the six analytes. Results of the statistical analysis and proposed background concentrations are presented in Table 1. No detected concentrations in historical samples collected from SHS wells exceeded the background 95% UTL for the six analytes.

The NMOCD also noted detections of total petroleum hydrocarbons (TPH) observed in groundwater samples collected from monitoring wells SHS-8, SHS-9, and SHS-13 on January 23, 2018. Based on those detections, maintaining at least two monitoring points was recommended. In response, LTE proposes leaving SHS-9 and SHS-13 in place and sampling groundwater from each well on a semi-annual basis. SHS-8 contains obstructions in the well which prevent accurate data collection. SHS-9 is located in close proximity to SHS-8 (Figure 1) and will serve as an adequate monitoring point for the area immediately south of Highway 64. Monitoring of SHS-9 and SHS-13 will allow for the detection of any residual groundwater impact. Since there is no NMWQCC regulatory standard for TPH and all other parameters that have historically exceeded NMWQCC standards are below the statistically derived background concentrations, LTE proposes analyzing those groundwater samples for volatiles according to EPA method 8260B.

Upon approval of the revisions proposed above, all SHS monitoring wells except SHS-9 and SHS-13 will be plugged in accordance with 19.27.4.30 NMAC. All remediation infrastructure will be abandoned and removed as detailed in the Partial Remediation Closure Request dated November 27th, 2019.

If you have any questions or comments regarding this correspondence, do not hesitate to contact me at (970) 385-1096 or via email at dhencmann@ltenv.com

Sincerely,

LT ENVIRONMENTAL, INC.

Devin Hencmann
Project Geologist

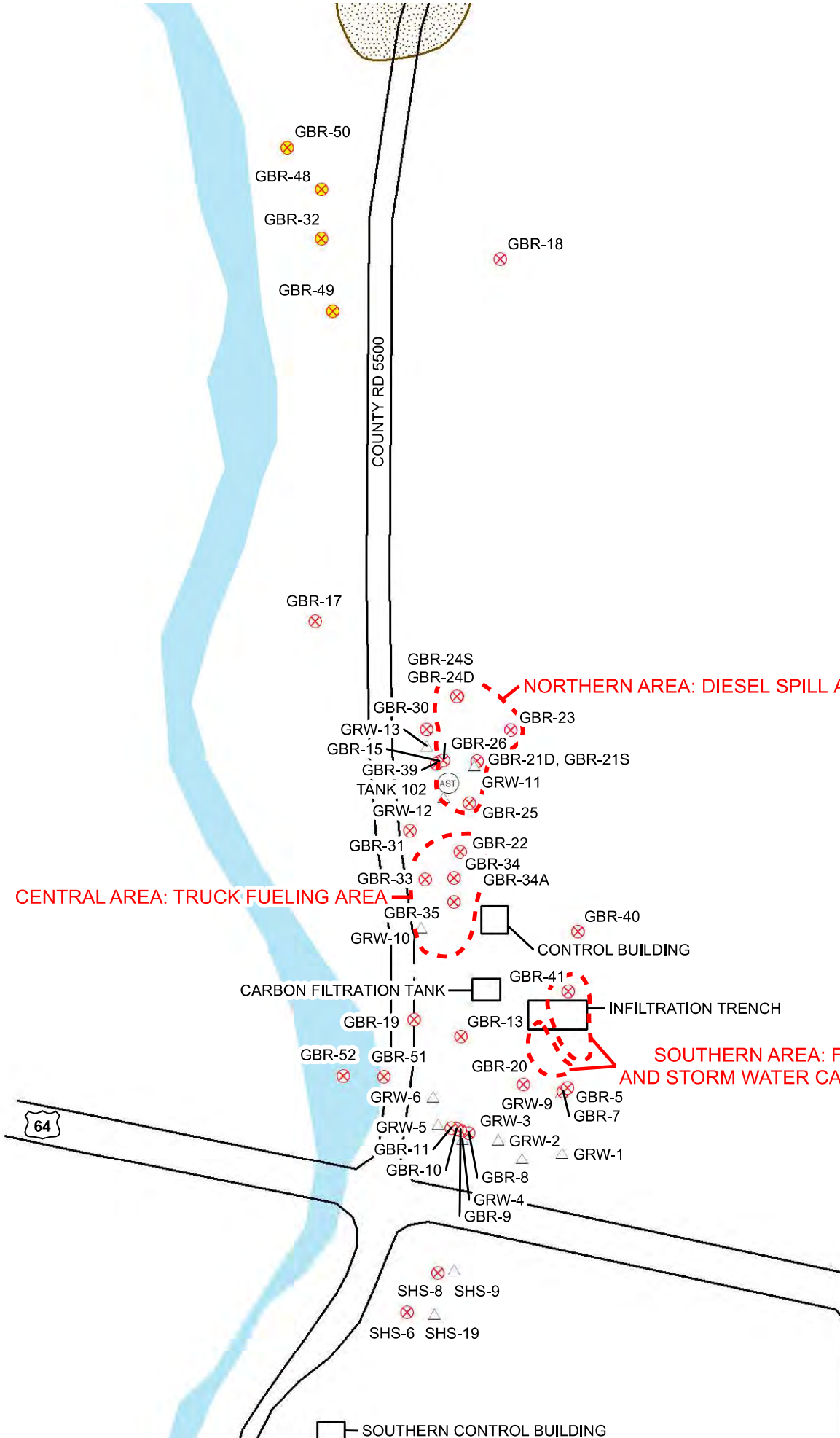
GBR-50
GBR-48
GBR-32
GBR-18
GBR-49
COUNTY RD 5500
GBR-17
GBR-24S
GBR-24D
NORTHERN AREA: DIESEL SPILL A
GBR-30
GBR-23
GRW-13
GBR-15
GBR-26
GBR-21D, GBR-21S
GBR-39
TANK 102
AST
GRW-11
GRW-12
GBR-25
GBR-31
GBR-22
GBR-34
GBR-33
GBR-34A
CENTRAL AREA: TRUCK FUELING AREA
GBR-35
GBR-40
GRW-10
CONTROL BUILDING
GBR-41
CARBON FILTRATION TANK
INFILTRATION TRENCH
GBR-19
GBR-13
GBR-52
GBR-51
SOUTHERN AREA: F
AND STORM WATER CA
GBR-20
GRW-6
GRW-9
GBR-5
GBR-7
64
GRW-5
GRW-3
GRW-2
GRW-1
GBR-11
GBR-10
GBR-8
GRW-4
GBR-9
SHS-8
SHS-9
SHS-6
SHS-19
SOUTHERN CONTROL BUILDING

TABLE 1
BACKGROUND THRESHOLD VALUES FOR ANALYTES OBSERVED IN UPGRADIENT WELLS

GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

Analyte	Units	N	% ND	Non-Detects	Detections	ND EM	Distribution	Mean	Std Deviaion	95% UTL
Chloride	mg/L	40	0	0	40	NA	Non-Parametric\Max	232.3	153.4	560
Chromium	mg/L	32	3	1	31	ROS	Lognormal	0.318	0.379	4.46
Iron	mg/L	33	6	2	31	ROS	Lognormal	16.62	33.37	261.7
Manganese	mg/L	24	0	0	24	NA	Lognormal	0.765	1.578	10.63
Sulfate	mg/L	40	0	0	40	NA	Normal	1,801	351.9	2,546
Total Dissolved Solids	mg/L	40	0	0	40	NA	Normal	3,234	629	4,566

% - percent
mg/L - miligram per litre
ND - Non-detect
ND EM - Non-detect estimation method
N - total number of observations
ROS - Regression on order statistics
UTL - Upper Tolerance Limit

Chavez, Carl J, EMNRD

From: Stuart Hyde <shyde@ltenv.com>
Sent: Wednesday, October 23, 2019 2:59 PM
To: Chavez, Carl J, EMNRD
Cc: Smith, Nelly
Subject: [EXT] FW: part 4 of 4 FW: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data
Attachments: 1993 2004 GW sampling.pdf

Stuart Hyde, LG
Project Geologist
970.385.1096 *direct*
970.903.1607 *cell*

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Wednesday, October 23, 2019 2:35 PM
To: Stuart Hyde <shyde@ltenv.com>; Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; Ashley Ager <aager@ltenv.com>
Subject: RE: part 4 of 4 FW: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

---

From: Smith, Nelly
Sent: Wednesday, October 23, 2019 3:27 PM
To: 'Stuart Hyde' <shyde@ltenv.com>; 'Devin Hencmann' <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; 'aager@ltenv.com' <aager@ltenv.com>
Subject: part 3 of 4 FW: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

---

From: Smith, Nelly
Sent: Wednesday, October 23, 2019 3:02 PM
To: 'Chavez, Carl J, EMNRD' <CarlJ.Chavez@state.nm.us>; Stuart Hyde <shyde@ltenv.com>
Cc: Ogden, Sarah, NMENV <sarah.ogden@state.nm.us>; Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; Ashley Ager <aager@ltenv.com>
Subject: RE: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

Carl,

I apologize I missed Mr. Hyde's question. I have attached the following reports that provide a summary of samples collected at the site since 1993.

- Final First Five Year Review Report: it summaries data from 1999 to 2009
- 2nd FYR (or Second Five year Review Report): It summaries data before 2014
- Excel file: summaries data from 2013 – 2017

- 1993 – 2004 GW sampling: The document provided analytical data, groundwater-elevation information and information on wells.
- ROD (Record of Decision): data before 2004

Please note that our final remedial decision document (2004 Record of Decision) only identified the following constituents of concern, remedial objectives were driven to address those pollutants. Therefore you will only find groundwater data for those constituents. I have also attached the 1995 Remedial Investigation where EPA analyzed other pollutants in more detailed.

- Manganese
- Nickel
- 1-2 Cis-Dichloroethene
- 1,2 Trans Dichloroethene
- Trichloroethene
- Vinyl Chloride

I am reaching out to BLM, may be they maintain a database for groundwater data for the site.

Please feel free to contact NMED (Ms. Ogden) to see if they have additional records. They just sampled groundwater during spring 2019.

Thanks again,

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

From: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Sent: Wednesday, October 23, 2019 1:06 PM
To: Smith, Nelly <Smith.Nelly@epa.gov>; Stuart Hyde <shyde@ltenv.com>
Cc: Ogden, Sarah, NMENV <sarah.ogden@state.nm.us>; Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; Ashley Ager <aager@ltenv.com>
Subject: RE: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

Nelly:

Good afternoon!

I notice Mr. Hyde asked the question below, "According to Ms. Ogden at the NMED, annual samples are collected at the Lee Acres site. Would you be able to provide annual reports for this sampling to LTE? We would be interested to see the data and the groundwater-elevation information collected during your sampling."

Can the annual reports requested by Mr. Hyde be sent or does LTE need to contact Ms. Sarah Ogden (E-mail: Sarah.Ogden@state.nm.us) with the NMED to request the reports directly?

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division

Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Wednesday, October 23, 2019 8:26 AM
To: Stuart Hyde <shyde@ltenv.com>
Cc: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>; Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Ashley Ager <aager@ltenv.com>
Subject: [EXT] RE: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

Thanks,

We will review the data accordingly.

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

From: Stuart Hyde <shyde@ltenv.com>
Sent: Tuesday, October 22, 2019 12:21 PM
To: Smith, Nelly <Smith.Nelly@epa.gov>
Cc: Ogden, Sarah, NMENV <sarah.ogden@state.nm.us>; Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; carlj.chavez@state.nm.us; Ashley Ager <aager@ltenv.com>
Subject: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

Ms. Smith,

Please find attached a letter and table summarizing requested data from the Giant Bloomfield Refinery (GBR) site (also known as "GW-040" site). The table summarizes the information that you had requested from Mr. Carl Chavez in your September 13, 2019 email. Specifically, the table includes data for chloride, sulfate, chromium, iron, manganese, and total dissolved solid concentrations collected between 2010 and 2018. In addition, the table includes information regarding wellhead elevations, well depths, screened intervals, and depth to water (for the latest sampling event in 2018). Also attached is the *2018 Annual Report* summarizing all analytical results from last year's annual monitoring.

According to Ms. Ogden at the NMED, annual samples are collected at the Lee Acres site. Would you be able to provide annual reports for this sampling to LTE? We would be interested to see the data and the groundwater-elevation information collected during your sampling. Thanks and please let us know if you have any questions regarding the provided information.

Stuart Hyde, LG
Project Geologist
970.385.1096 *office*
970.903.1607 *cell*
848 East Second Avenue Durango, CO 81301
www.ltenv.com

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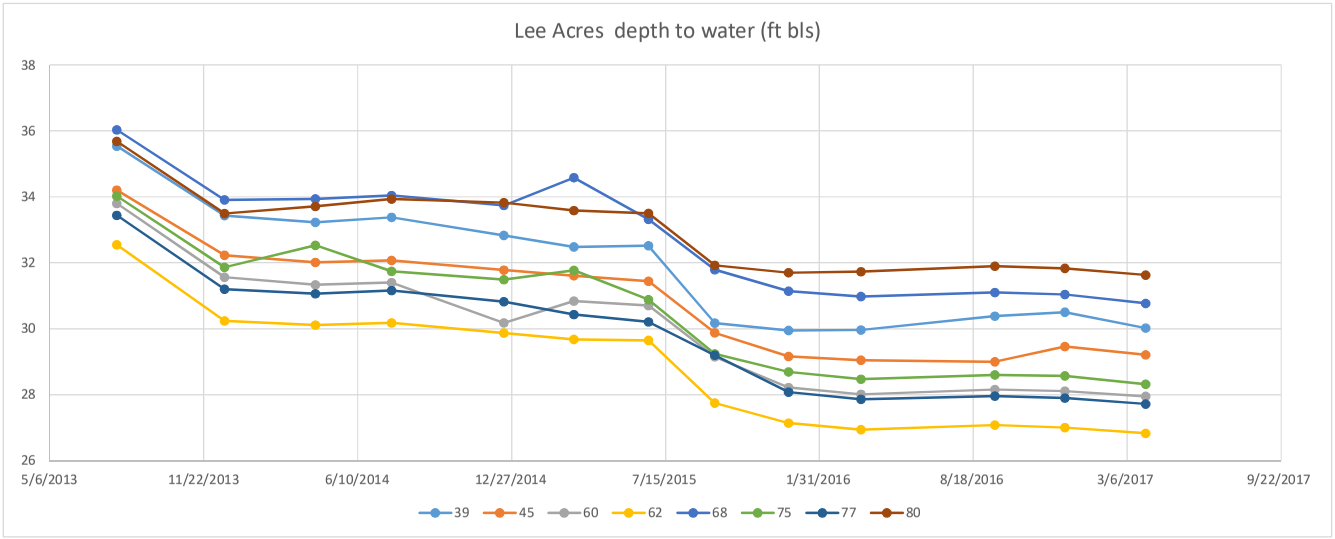
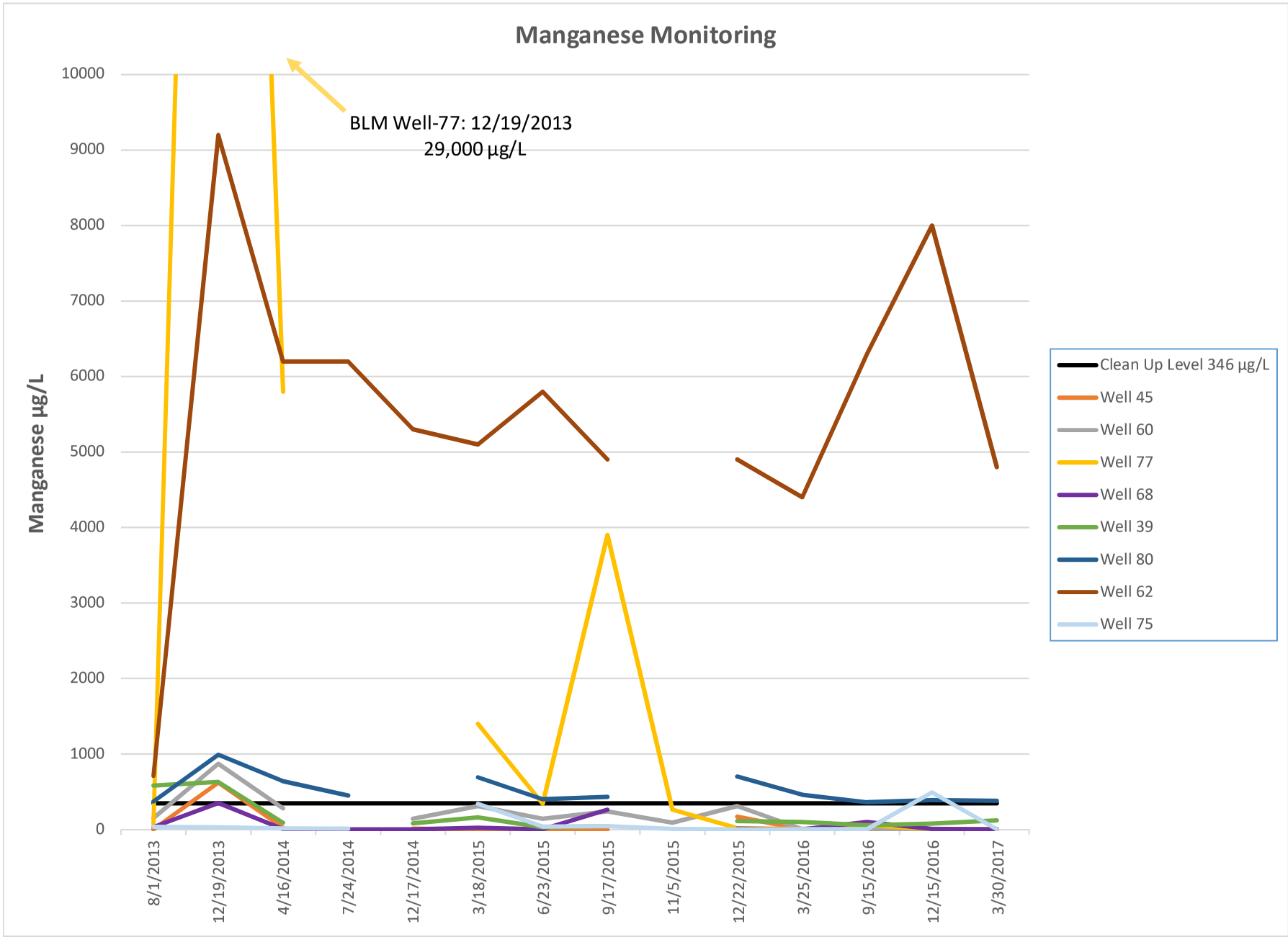
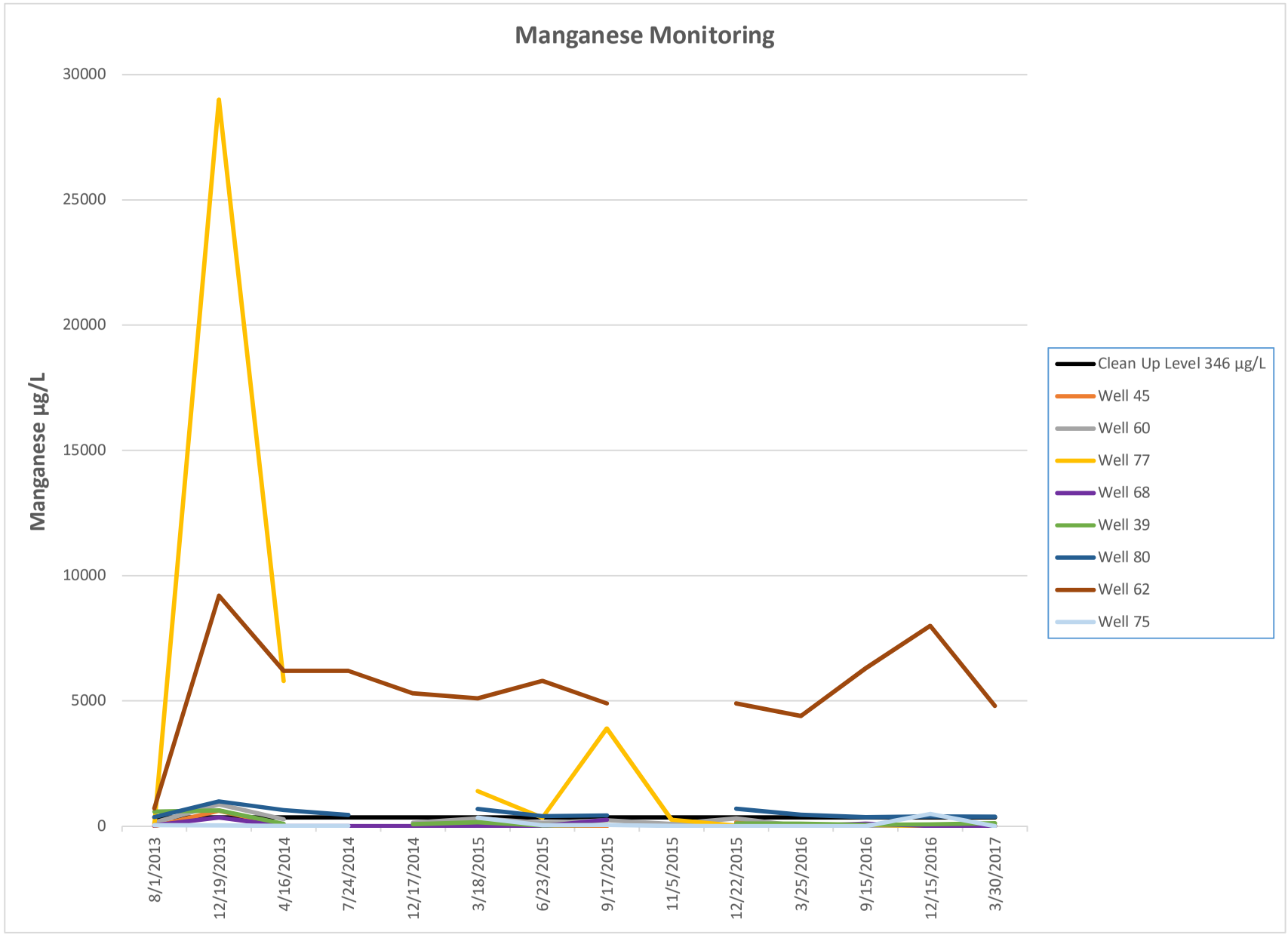
		39	45	60	62	68	75	77	80
20130731	8/1/2013	35.54	34.2	33.8	32.55	36.03	34.02	33.44	35.68
20131219	12/19/2013	33.43	32.23	31.56	30.24	33.91	31.86	31.2	33.49
20140416	4/16/2014	33.23	32.01	31.33	30.11	33.94	32.53	31.06	33.71
20140724	7/24/2014	33.38	32.07	31.4	30.18	34.04	31.74	31.16	33.93
20141217	12/17/2014	32.83	31.78	30.18	29.87	33.74	31.49	30.82	33.82
20150319	3/18/2015	32.48	31.61	30.84	29.68	34.58	31.77	30.43	33.58
20150623	6/23/2015	32.52	31.44	30.7	29.65	33.32	30.88	30.21	33.5
20150917	9/17/2015	30.17	29.88	29.15	27.75	31.79	29.24	29.2	31.92
20151222	12/22/2015	29.95	29.16	28.22	27.14	31.14	28.69	28.08	31.7
20160325	3/25/2016	29.96	29.05	28.01	26.94	30.98	28.47	27.86	31.73
20160914	9/15/2016	30.38	29	28.16	27.08	31.1	28.6	27.96	31.9
20161214	12/15/2016	30.5	29.46	28.11	27	31.04	28.57	27.9	31.83
20170330	3/30/2017	30.02	29.21	27.95	26.83	30.77	28.32	27.72	31.63



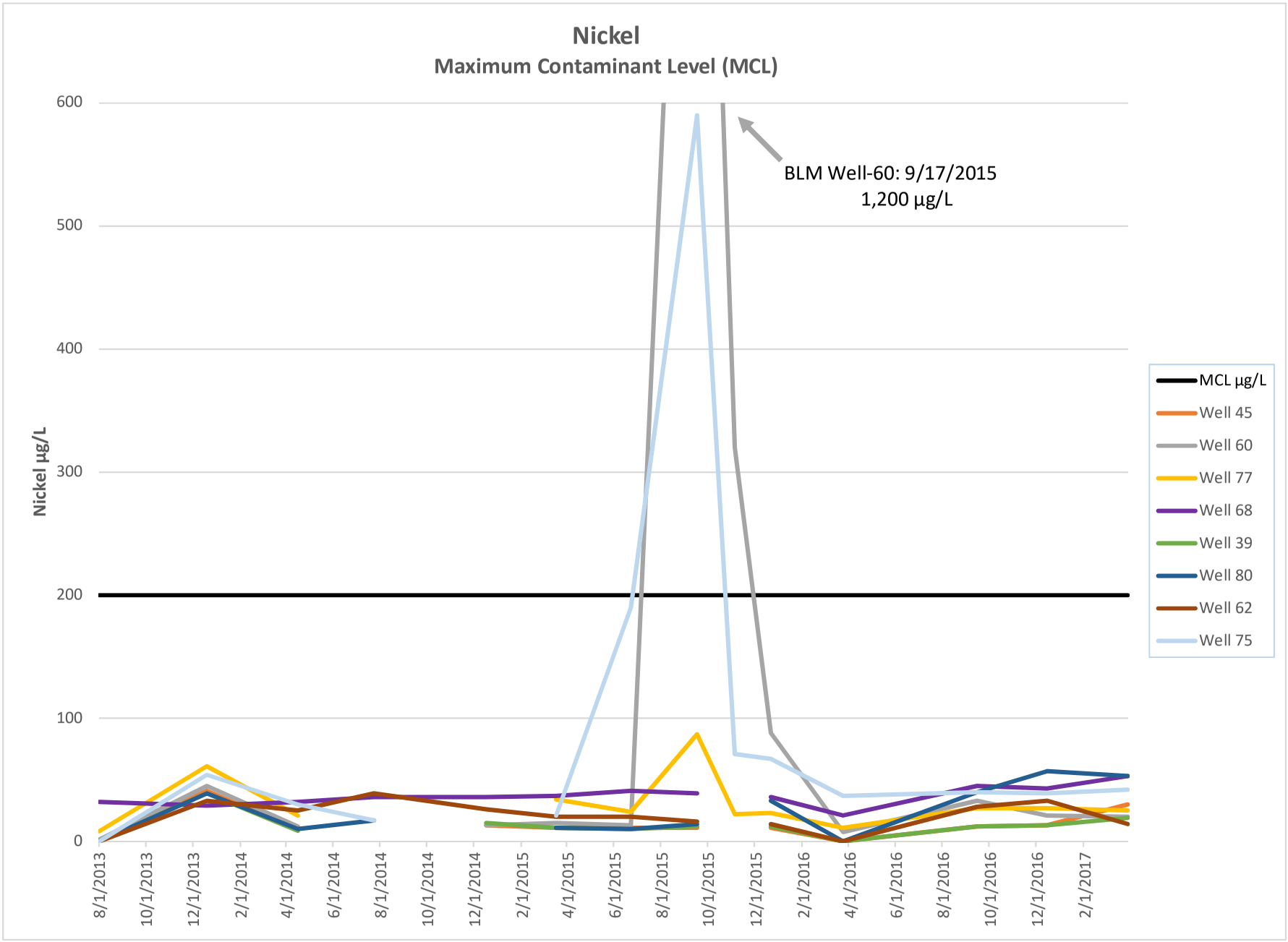
SAMPLED_DATE		MN_ug/L_BLM_45	MN_ug/L_BLM_60	MN_ug/L_BLM_77	MN_ug/L_BLM_68	MN_ug/L_BLM_39	MN_ug/L_BLM_80	MN_ug/L_BLM_62	MN_ug/L_BLM_75
	Clean Up Level 346 µg/L	Well 45	Well 60	Well 77	Well 68	Well 39	Well 80	Well 62	Well 75
8/1/2013	346	0.44	150.00	75.00	32.00	580.00	370.00	710.00	35.00
12/19/2013	346	620.00	870.00	29000.00	350.00	630.00	990.00	9200.00	27.00
4/16/2014	346	23.00	280.00	5800.00	2.90	91.00	640.00	6200.00	13.00
7/24/2014	346				0.98		450.00	6200.00	11.00
12/17/2014	346	11.00	140.00		0.78	80.00		5300.00	
3/18/2015	346	0.72	310.00	1400.00	21.00	160.00	690.00	5100.00	340.00
6/23/2015	346	3.60	140.00	340.00	1.10	28.00	400.00	5800.00	39.00
9/17/2015	346	2.00	240.00	3900.00	260.00	43.00	430.00	4900.00	43.00
11/5/2015	346		89.00	260.00					6.30
12/22/2015	346	170.00	310.00	17.00	9.80	110.00	700.00	4900.00	2.00
3/25/2016	346	0.55	4.00	7.90	0.39	100.00	460.00	4400.00	2.90
9/15/2016	346	1.70	1.20	57.00	100.00	57.00	360.00	6300.00	2.90
12/15/2016	346	4.10	0.86	4.80	7.50	78.00	390.00	8000.00	490.00
3/30/2017	346	1.00	6.00	1.80	0.62	120.00	380.00	4800.00	1.80


Manganese Monitoring
BLM Well-77: 12/19/2013
29,000 µg/L
Manganese µg/L
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
8/1/2013
12/19/2013
4/16/2014
7/24/2014
12/17/2014
3/18/2015
6/23/2015
9/17/2015
11/5/2015
12/22/2015
3/25/2016
9/15/2016
12/15/2016
3/30/2017
Clean Up Level 346 µg/L
Well 45
Well 60
Well 77
Well 68
Well 39
Well 80
Well 62
Well 75


Manganese Monitoring
Manganese µg/L
30000
25000
20000
15000
10000
5000
0
8/1/2013
12/19/2013
4/16/2014
7/24/2014
12/17/2014
3/18/2015
6/23/2015
9/17/2015
11/5/2015
12/22/2015
3/25/2016
9/15/2016
12/15/2016
3/30/2017
Clean Up Level 346 µg/L
Well 45
Well 60
Well 77
Well 68
Well 39
Well 80
Well 62
Well 75

SAMPLED_DATE		NI_ug/L_BLM_45	NI_ug/L_BLM_60	NI_ug/L_BLM_77	NI_ug/L_BLM_68	NI_ug/L_BLM_39	NI_ug/L_BLM_80	NI_ug/L_BLM_62	NI_ug/L_BLM_75
	MCL µg/L	Well 45	Well 60	Well 77	Well 68	Well 39	Well 80	Well 62	Well 75
8/1/2013	200	0	1	8	32	0	0	0	0
12/19/2013	200	41	45	61	29	39	39	33	54
4/16/2014	200	9	12	21	32	9	10	25	30
7/24/2014	200				36		17	39	17
12/17/2014	200	13	13		36	15		26	
3/18/2015	200	11	15	34	37	11	11	20	21
6/23/2015	200	11	13	24	41	10	10	20	190
9/17/2015	200	11	1200	87	39	12	14	16	590
11/5/2015	200		320	22					71
12/22/2015	200	11	88	23	36	12	33	14	67
3/25/2016	200	0	8	11	21	0	0	0	37
9/15/2016	200	12	33	27	45	12	40	28	40
12/15/2016	200	13	21	27	43	13	57	33	39
3/30/2017	200	30	20	25	53	19	53	14	42

3/31/2017: Wells 68, 80, 62, 75


Nickel
Maximum Contaminant Level (MCL)
Nickel µg/L
600
500
400
300
200
100
0
BLM Well-60: 9/17/2015
1,200 µg/L
MCL µg/L
Well 45
Well 60
Well 77
Well 68
Well 39
Well 80
Well 62
Well 75
8/1/2013
10/1/2013
12/1/2013
2/1/2014
4/1/2014
6/1/2014
8/1/2014
10/1/2014
12/1/2014
2/1/2015
4/1/2015
6/1/2015
8/1/2015
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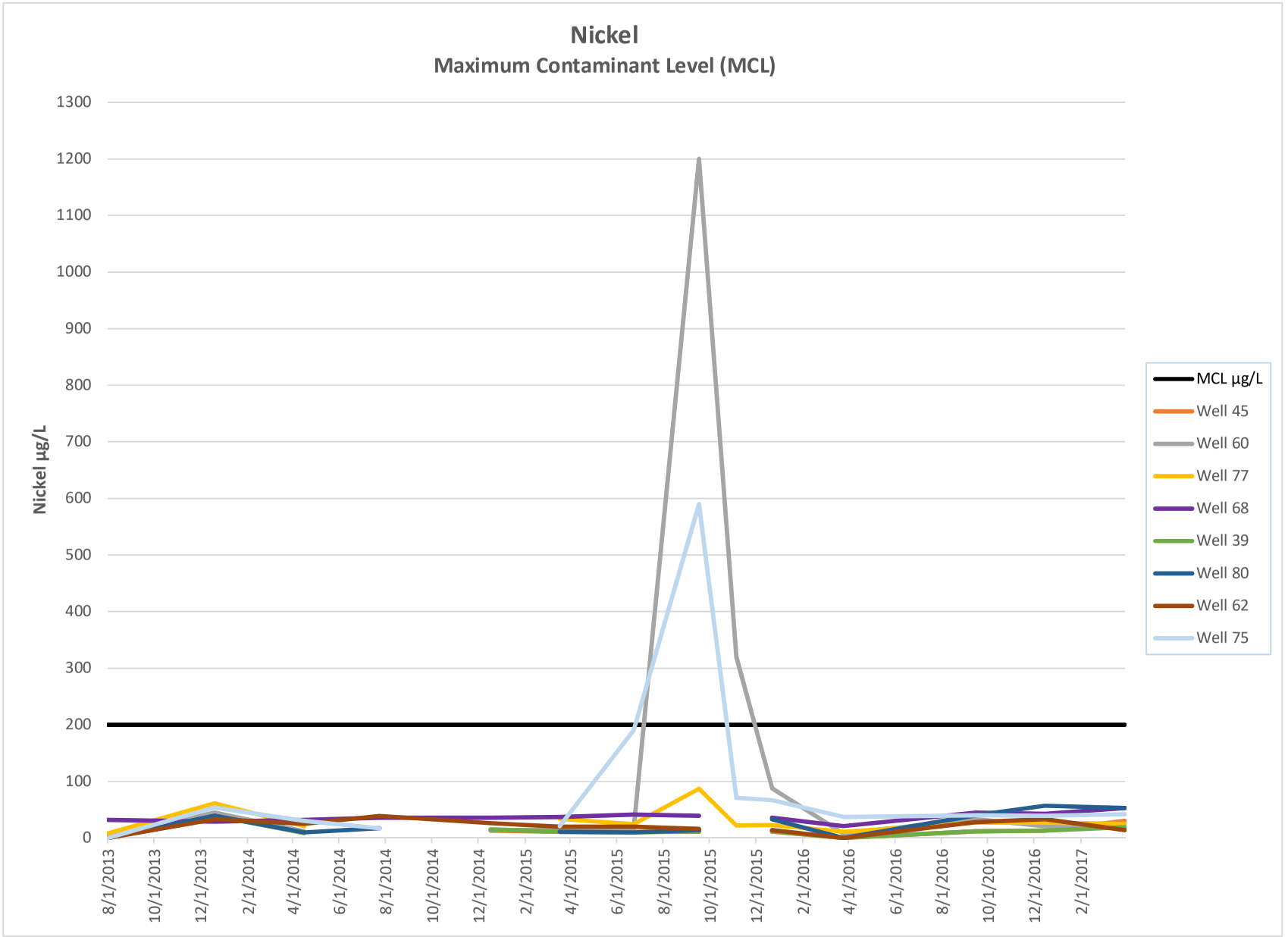
12/1/2016
2/1/2017


Nickel
Maximum Contaminant Level (MCL)
Nickel µg/L
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
8/1/2013
10/1/2013
12/1/2013
2/1/2014
4/1/2014
6/1/2014
8/1/2014
10/1/2014
12/1/2014
2/1/2015
4/1/2015
6/1/2015
8/1/2015
10/1/2015
12/1/2015
2/1/2016
4/1/2016
6/1/2016
8/1/2016
10/1/2016
12/1/2016
2/1/2017
MCL µg/L
Well 45
Well 60
Well 77
Well 68
Well 39
Well 80
Well 62
Well 75

Chavez, Carl J, EMNRD

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Wednesday, October 23, 2019 2:21 PM
To: Chavez, Carl J, EMNRD
Subject: [EXT] FW: Your message couldn't be delivered

I received this message, did you receive my message with attachments?

Thanks,

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

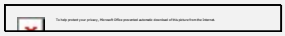
From: Domain postMaster address <postmaster@state.nm.us>
Sent: Wednesday, October 23, 2019 3:15 PM
To: Smith, Nelly <Smith.Nelly@epa.gov>
Subject: Your message couldn't be delivered

Your message couldn't be delivered

The message you sent to carlj.chavez@state.nm.us couldn't be delivered due to: Recipient email server rejected the message.

Further information
5.3.4 Message size exceeds fixed maximum message size

If you sent this message to multiple addresses, you'll receive a notification like this for every one that didn't arrive.



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Chavez, Carl J, EMNRD

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Wednesday, October 23, 2019 8:26 AM
To: Stuart Hyde
Cc: Ogden, Sarah, NMENV; Devin Hencmann; McCartney, Gregory J.; Chavez, Carl J, EMNRD; Ashley Ager
Subject: [EXT] RE: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

Thanks,

We will review the data accordingly.

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

From: Stuart Hyde <shyde@ltenv.com>
Sent: Tuesday, October 22, 2019 12:21 PM
To: Smith, Nelly <Smith.Nelly@epa.gov>
Cc: Ogden, Sarah, NMENV <sarah.ogden@state.nm.us>; Devin Hencmann <dhencmann@ltenv.com>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>; carlj.chavez@state.nm.us; Ashley Ager <aager@ltenv.com>
Subject: Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data

Ms. Smith,

Please find attached a letter and table summarizing requested data from the Giant Bloomfield Refinery (GBR) site (also known as “GW-040” site). The table summarizes the information that you had requested from Mr. Carl Chavez in your September 13, 2019 email. Specifically, the table includes data for chloride, sulfate, chromium, iron, manganese, and total dissolved solid concentrations collected between 2010 and 2018. In addition, the table includes information regarding wellhead elevations, well depths, screened intervals, and depth to water (for the latest sampling event in 2018). Also attached is the *2018 Annual Report* summarizing all analytical results from last year’s annual monitoring.

According to Ms. Ogden at the NMED, annual samples are collected at the Lee Acres site. Would you be able to provide annual reports for this sampling to LTE? We would be interested to see the data and the groundwater-elevation information collected during your sampling. Thanks and please let us know if you have any questions regarding the provided information.

Stuart Hyde, LG
Project Geologist
970.385.1096 *office*
970.903.1607 *cell*
848 East Second Avenue Durango, CO 81301
www.ltenv.com

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Second
Five-Year Review

Lee Acres Landfill
Farmington New Mexico

Prepared By
Farmington BLM

October 2014

713618

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Acronyms

ARARs.....Applicable or Relevant and Appropriate Requirements
BH.....Borehole
BLM.....Bureau of Land Management
BTEX.....Benzene, Toluene, Ethyl benzene, Xylene
CERCLA .....Comprehensive Environmental Response, Compensation, and Liability Act
COC.....Contaminants of Concern
COPC.....Contaminants of Potential Concern
DCE.....Dichloroethene
DOI.....Department of the Interior
EPA..... Environmental Protection Agency
ES.....Executive Summary
FML.....Flexible Membrane Liner
FS .....Feasibility Study
GBR.....Giant Bloomfield Refinery
FFO.....Farmington Field Office
FLPMA..... Federal Land Policy and Management Act
MCL.....Maximum Contaminant Level
MDL.....Minimum Detection Level
mg/l.....Milligrams per liter (parts per million)
MOU..... Memorandum of Understanding
NCP.....National Contingency Plan
NMAC.....New Mexico Administrative Code
NMED..... New Mexico Environment Department
NMED GWQB.....New Mexico Environment Department Ground Water Quality Bureau
NMEID.....New Mexico Environmental Improvement Division
NMOCD.....New Mexico Oil Conservation Division
NMWQCC.....New Mexico Water Quality Control Commission
NPL.....National Priorities List
O & M.....Operation and Maintenance
PCE.....Perchoroethylene (Tetrachloroethylene)
PRG.....Preliminary Remediation Goals
RAO.....Remedial Action Objectives
RI..... Remedial Investigation
RIR.....Remedial Investigation Report
RMP.....Resource Management Plan
RSL.....Regional Screening Level
SARA.....Superfund Amendments and Reauthorization Act
SDWA.....Safe Drinking Water Act
SJC.....San Juan County
TBC .....To Be Considered
TCE ..... Trichloroethylene
SVOC .....Semi-volatile Organic Compounds
TMV.....Toxicity, Mobility, and Volume
µg/l.....micrograms per liter (parts per billions)
VOC.....Volatile Organic Compounds

Executive Summary

The second five-year review of the Lee Acres Landfill Superfund Site located in San Juan County, New Mexico, was completed in October 2014. This site is on the National Priorities List (NPL – EPA ID# NMD980750020). The remedy actions selected in the June 2004, Record of Decision (ROD) included the construction of a landfill cover, water run-on and run-off controls, institutional controls, and monitored natural attenuation of ground water. The remedy actions resulted in landfill contaminants remaining onsite above levels that would allow for unlimited use and unrestricted exposure. CERCLA requires a statutory review no later than five years following the signature date of the previous Five-Year Review report. The results of this second five-year review indicate that the remedy actions completed at the site are protective of human health and the environment. The initial construction of the landfill cap and follow-up actions performed appear to be functioning as designed. The site has been maintained sufficiently to protect the landfill cover that has been constructed over the remaining waste. No deficiencies were noted that currently impact the protectiveness of the remedial actions.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name Lee Acres Landfill		
EPA ID: NMD980750020		
Region: EPA Region 6	**State:** New Mexico	**City/County:** Farmington/San Juan
SITE STATUS		
NPL status: ☐ X Final __ Deleted __ Other (specify)		
Remediation status (choose all that apply): __ Under Construction __ Operating ☐ X Complete		
Multiple OUs?* __ YES X NO	**Construction completion date:** 9 / 14 / 2005	
Has site been put into reuse? __ YES X NO		
REVIEW STATUS		
Lead agency: ☐ _ EPA _ State _ Tribe X Other Federal Agency: Bureau of Land Management (BLM)		
Author name: Barney Wegener		
Author title: President Wegener Services LLC	**Author affiliation:** Contractor	
Review period: 10 / 25 / 2009 to 10 / 25 / 2014		
Date(s) of site inspection: 2 / 19 / 2014		
Type of review: Statutory		
Review number: ☐ 1 (first) X 2 (second) __ 3 (third) __ Other (specify)		
Triggering action: Actual Remedial Action Start		
Triggering action date: October 25, 2004		
Due date ***(five years after triggering action date)***: October 25, 2014		
Issues: Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision documents for all COCs except manganese.		

Recommendations and Follow-Up Actions:

1. The monitoring schedule in the Record of Decision (ROD) and Remedial Action Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required 5 year monitoring period was completed in the fall of 2010. BLM recommends that the landfill cover continues be monitored semi-annually through completion of the existing monitoring contract in 2015, and then annually.

2. The groundwater monitoring schedule in the Work Plan requires the semi-annual monitoring of eight specified wells for a period five years after completion of construction. This five year monitoring period was completed in the fall of 2010. BLM has continued to monitor ground water semi-annually.

3. The Work Plan also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of 8 consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. All six contaminates of concern regulated by the Safe Drinking Water Act (SDWA) have been below the cleanup levels established in the ROD since 2000. Manganese is the seventh contaminate of concern identified in the ROD. The New Mexico Water Quality Control Commission established a domestic water supply standard of manganese, and the ROD established a cleanup level for manganese. Over the years, groundwater monitoring results for manganese have been erratic. The manganese levels appear to be influenced by upgradient background levels and unrelated to the site. BLM plans to submit documentation to the EPS and NMED to consider amending the cleanup standard established in the ROD.

Due to the documentation that all six contaminants of concern regulated by the SDWA have been below cleanup levels since 2000 and attainment of the manganese cleanup level is not likely, BLM recommends that quarterly monitoring for a total of eight quarters be initiated in 2015. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if continued monitoring of the six contaminants of concern regulated by the SDWA is warranted.

4. After completion of groundwater quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if an appropriate regulatory process for amending the manganese cleanup level for the site should be pursued (Appendix #5).

Protectiveness Statement:

The remedial actions performed at the site are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The 23_{rd} monitoring inspection of the landfill cover was completed on July 2, 2014. The summary paragraph of the July 2 report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern regulated by SDWA listed in the ROD, satisfy the Maximum Contaminant Levels (MCL) set under the SDWA Act. The data also shows that manganese is the only contaminant of concern listed in the ROD that failed to comply with the enforceable limits established in the ROD.

* ["OU" refers to operable unit.]

Lee Acres Landfill Superfund Site
Farmington New Mexico
Second Five-Year Review Report

Introduction

The Farmington Field Office (FFO) of the Bureau of Land Management (BLM) has conducted a statutory Second Five-Year review of the remedial actions implemented at the Lee Acres Landfill Superfund Site during the period of October 2009 through October 2014. The purpose of the Five-Year Review is to determine whether the remedy at the site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five -Year review reports identify issues found during the review, if any, and identify recommendations to address them.

BLM has prepared the Second Five-Year Review report pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), §121 and the National Contingency Plan (NCP). NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above level that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The remedy selected for Lee Acres Landfill in the Record of Decision (ROD) resulted in hazardous substances, pollutants, or contaminants remaining on-site above levels that would not allow for unlimited use and unrestricted exposure. The triggering action for this statutory review is the signature date of the first Five – Year Review on October 23, 2009.

2.0 Site Chronology

Date	Event
May 1, 1962	Lee Acres officially opened
Apr. 25, 1980	San Juan County Development Plan for landfill includes provisions for combined sludge and dead animal pit.
Nov. 10, 1980	NMEID found refuse pit almost full and not compacted or covered at required frequency. Suggested either additional land for expansion or new location.
Aug. 24, 1981	NMEID submits to EPA Potential Hazardous Waste Site Inspection Report, reporting surface impoundment with liquids, sludge, oily wastes, drilling fluids and drilling muds.

Sept. 9, 1981	NMEID reported noncompliance regarding required 2 feet of final cover over original landfill area.
Apr. 18, 1985	Lagoon breach and vapor release incident occurred. Eleven people treated for hydrogen sulfide poisoning.
May 8, 1985	BLM compliance exam reported sludge pit was fenced and a "No Dumping" sign posted.
Jan. 14, 1986	NMEID inspection reported the liquid waste lagoon was 96 to 97% evaporated
Apr. 24, 1986	NMEID inspection reported the liquid waste lagoon was completely covered with soil.
Apr. 25, 1986	Lee Acres Landfill officially closed by BLM suspending leases, except for a 5 acre transfer station.
Oct. 21, 1986	NMEID Administrative Order issued for BLM to provide water to residents, and prepare plans to investigate, cleanup, and monitor ground water.
Nov. 5, 1986	BLM begins bottled water delivery to 13 identified residents.
Dec. 1986	BLM fenced landfill to prevent direct contact.
Dec. 24, 1986	BLM and Lee Acres Water Users Assoc. enter agreement to permanently hook up Lee Acres residents to the community supply system.
1987	Lee Acres residents hooked up to community water system.
March 1989	BLM conducts preliminary investigation.
Dec. 19, 1989	Clean Water Act Sec. 404 nationwide permit received for arroyo erosion control construction.
Aug. 28, 1990	Lee Acres Landfill placed on the National Priorities List by EPA.
Sept. 13, 1991	CERCLA 107 letters issued by EPA to BLM, San Juan County and Giant Bloomfield Refinery.
Jan. 1993	BLM, EPA and NMED enter into a technical MOU for completion of the Remedial Investigation.
Sept. 1993	Final Remedial Investigation Report.
May 19, 1995	EPA and NMED approve Remedial Investigation.
May 8, 1996	EPA and NMED approve Feasibility Study.
Sept. 1996	EPA and NMED approve Proposed Plan
Nov. 16, 1996	Public review and comment period completed.
July 23, 2004	ROD signed by EPA & DOI
July 23, 2004	Inter Agency Agreement (IAG) between EPA and DOI signed.

Sept. 27, 2004	Remedial Design approval by EPA & NMED
Oct. 21, 2004	Design specification change from 9-inch to 15-inch layers for soil cover lifts approved by EPA & NMED.
October 25, 2004	Site preparation of site roadway and landfill site.
October 26, 2004	Gradation tests for gravel admixture and capillary barrier approved by BLM contract Consultant.
November 1, 2004	Removal of pilot cap and area leveled.
November 17, 2004	County Road 5569 right-of-way work begins
December 8, 2004	Southeast (small) cap work started.
December 15, 2004	Southeast (small) cap work completed.
Dec.20, 2004 – Jan. 25, 2005	Inclement weather delays significant work progress at Lee Acres.
February 2, 2005	Main cap work began with capillary gravel break
February 3, 2005	Lysimeters installed over northern & southern lagoons
February 7, 2005	Site visit by BLM contract consultant.
February 9, 2005	Site visit by EPA.
February 10, 2005	Placement of separator Geotextile started.
February 15, 2005	Site visit by NMED
March 1, 2005	Design specification change from 15-inch to 30-inch layers for soil cover lifts approved by EPA & NMED.
March 10, 2005	30-inch soil cover competed.
March 14, 2005	Rock Armoring of sides slopes begins.
March 23, 2005	Preparation of 30-inch soil lifts for erosion resistant layer.
March 24, 2005	Site visit by BLM contract consultant.
March 28, 2005	Placement of erosion resistant layer (50/50 blend) begins.
April 1, 2005	Erosion resistant layer (50/50 blend) completed.
April 6, 2005	Topsoil application to side slopes of road right-of-way.
April 14, 2005	Culvert drainage work completed.
April 26, 2005	Site visit by EPA
May 2, 2005	County Road 350 ready for road base and paving.
July 21, 2005	Site visit by NMED
August 25, 2005	New Monitoring well drilled and completed
September 1, 2005	CR 350 road completed and open to traffic
September 14, 2005	Lee Acres reseeding completed.
February 19, 2009	Initiate First Five-Year Review
October 23, 2009	Complete First-Five Year Review
February 19, 2014	Initiate Second Five-Year Review

Lee Acres Area Map

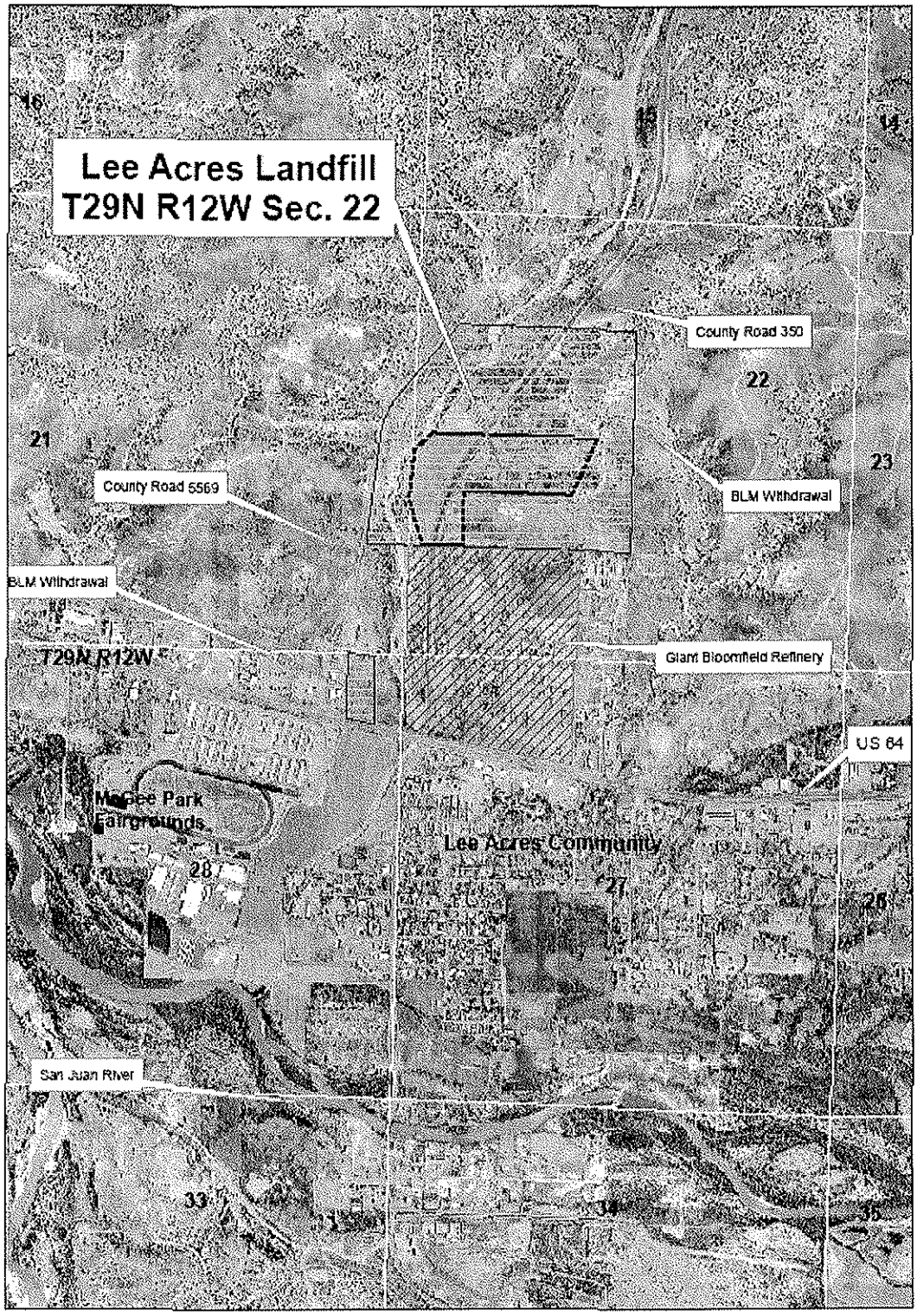


Figure 1

3.0 Background

The Lee Acres Landfill is approximately 4.5 miles east of Farmington, New Mexico, consisting of nearly 60 acres of federal land located in San Juan County. San Juan County is located in the San Juan Basin, an asymmetrical syncline consisting of Quaternary to Cretaceous aged alluvium, sandstone, siltstone, shale, limestone, and coal. The climate of the area is classified as arid continental, characterized by cool, dry winters and warm dry summers. The large distance from any source of oceanic moisture creates a climate of abundant sunshine and large diurnal variations in temperature. The soils are mainly sandy loam and loamy sands derived from sandstone and shale parent materials.

The landfill originally consisted of 20 leased acres issued in 1962 for the operation of a municipal solid waste landfill by San Juan County. An additional 40 acres was leased in 1980 expanding the land fill to its present size of 60 acres (Figure 1).

After acquiring the additional acreage, San Juan County, with the knowledge of the New Mexico Environmental Improvement Division (NMEID) and BLM, expanded the use of the landfill to allow the disposal of liquid waste. Containment berms were built and lagoons were established and referred to as the northern and southern lagoons.

In 1985, during routine maintenance activities the berm of the northern lagoon was breached, causing a release of the liquid contents and hydrogen sulfide gas. A resident along with responding emergency personnel were overcome by the hydrogen sulfide gas and subsequently hospitalized, and later, released. The lagoon was aerated and treated chemically to neutralize the hydrogen sulfide and stabilize other chemicals by NMEID, the predecessor to the NMED. The landfill was immediately closed to liquid waste disposal and later closed to solid waste disposal in 1986. The site was stabilized and covered with clean soil up to a depth of 4 to 15 feet. The BLM conducted a Preliminary Investigation in 1988. In 1990, the Environmental Protection Agency (EPA) placed the Lee Acres Landfill on the National Priorities List (NPL) as EPA ID# NMD980750020.

3.1 Physical Characterisitics

The Lee Acres Landfill is in the eastern portion of San Juan County, a dissected high plateau within the Navajo Section of the Colorado Plateau physiographic province. This high plateau is dissected by the San Juan and Animas Rivers that originate in the San Juan Mountains of southern Colorado, coalesce near Farmington, and flow west to the Colorado River. The landfill is located in the southern drainage basin of the interfluvial ridge between the two rivers. The intermittent surficial waters from the area drain through an unnamed arroyo system that joins the San Juan River south of the Lee Acres subdivision.

The 60-acre landfill can be divided into two portions. The eastern 40 acres is sublain by tertiary Nacimiento Formation claystone/siltstone facies interfingered with Nacimiento sandstone facies that forms the low permeable barrier to bedrock aquifers. This portion of the landfill was generally used for solid waste disposal and dead animal pits. The western 20 acres of the landfill is underlain by quaternary alluvium classified as unconsolidated silty sand to sandy gravel. The thickness of the alluvium, from ground surface to bedrock, is up to 60 feet near the center of the

channel and the depth to water is 34 to 47 feet. Alluvial ground water is present beneath approximately 8 acres along the western edge of the landfill, but not the eastern portion of the landfill.

3.2 Hydrology

Quaternary alluvium forms an unconfined aquifer. It is poorly to moderately sorted, fine-grained to coarse-grained sands, with some gravels and cobbles. Unconsolidated silt and clay lenses are common south of U.S. 64 , where the unnamed arroyo channel alluvium mixes with San Juan River deposits. The unconfined aquifer was defined during the RI because it is bounded on the east by bedrock and the saturated zone ends with no confining feature on the west or above the ground water. This type of configuration is, by geologic definition, an unconfined aquifer. There are no known beneficial uses of this aquifer; however, it is a potential drinking water source. Pursuant to Section 7.28 of the Rules and Regulations Governing Drilling of Wells and Appropriation and Use of Ground Water in New Mexico, the unconfined alluvial aquifer is part of the San Juan Underground Water Basin. The New Mexico Water Quality Control Commission Regulations 3101 (A) classify all ground water with an existing total dissolved solids concentration less than 10,000 milligrams per liter as protected.

The western edge of the landfill is underlain by an unconfined alluvial aquifer. The aquifer is bound on both sides by the margins of an incised bedrock channel which is approximately 600 feet wide in the area near the landfill. Ground water in the alluvial aquifer moves southward at a rate of approximately 0.17 feet per day (62 feet/year), based on the hydraulic data collected in 1993. Farther south, the saturated alluvium interfingers with the San Juan River deposits and is not bound by the bedrock channel. The alluvium is comprised of poor to moderately sorted, fine to medium sands with some gravel and cobbles. Unconsolidated silt and clay lenses are common. The underlying regional bedrock aquifer is unaffected by the contamination from the Lee Acres Landfill site.

Ground water in the unnamed arroyo alluvial aquifer flows from north to south toward the San Juan River within a paleochannel in the bedrock. South of U.S. 64, ground water is no longer contained within the incised unnamed arroyo bedrock channel where the alluvium interfingers with San Juan River terrace and flood plain deposits. In this area, ground water from the unnamed arroyo alluvium discharges and mixes with the ground water of the San Juan River Valley. Most of the domestic, municipal, and agricultural water in the San Juan Basin comes from wells completed in the Quaternary surficial valley deposits or underlying sandstones. Recharge is derived from upstream alluvial aquifer flow and infiltration from meteoric precipitation. Infiltration from the fire water storage ponds southeast of the landfill and the landfill liquid waste lagoons contributed to alluvial aquifer recharge in the past. These sources were later drained, and no longer impact the alluvial aquifer.

Horizontal gradients in the alluvial aquifer range from 0.004 feet per foot (feet/ft) to 0.014 feet/ft. The gradients are steeper in the northern portion of the study area and generally decrease toward the south, the direction of the ground water movement as shown in Figure 2.

Saturated Alluvium Extent and Potentiometric Surface Map

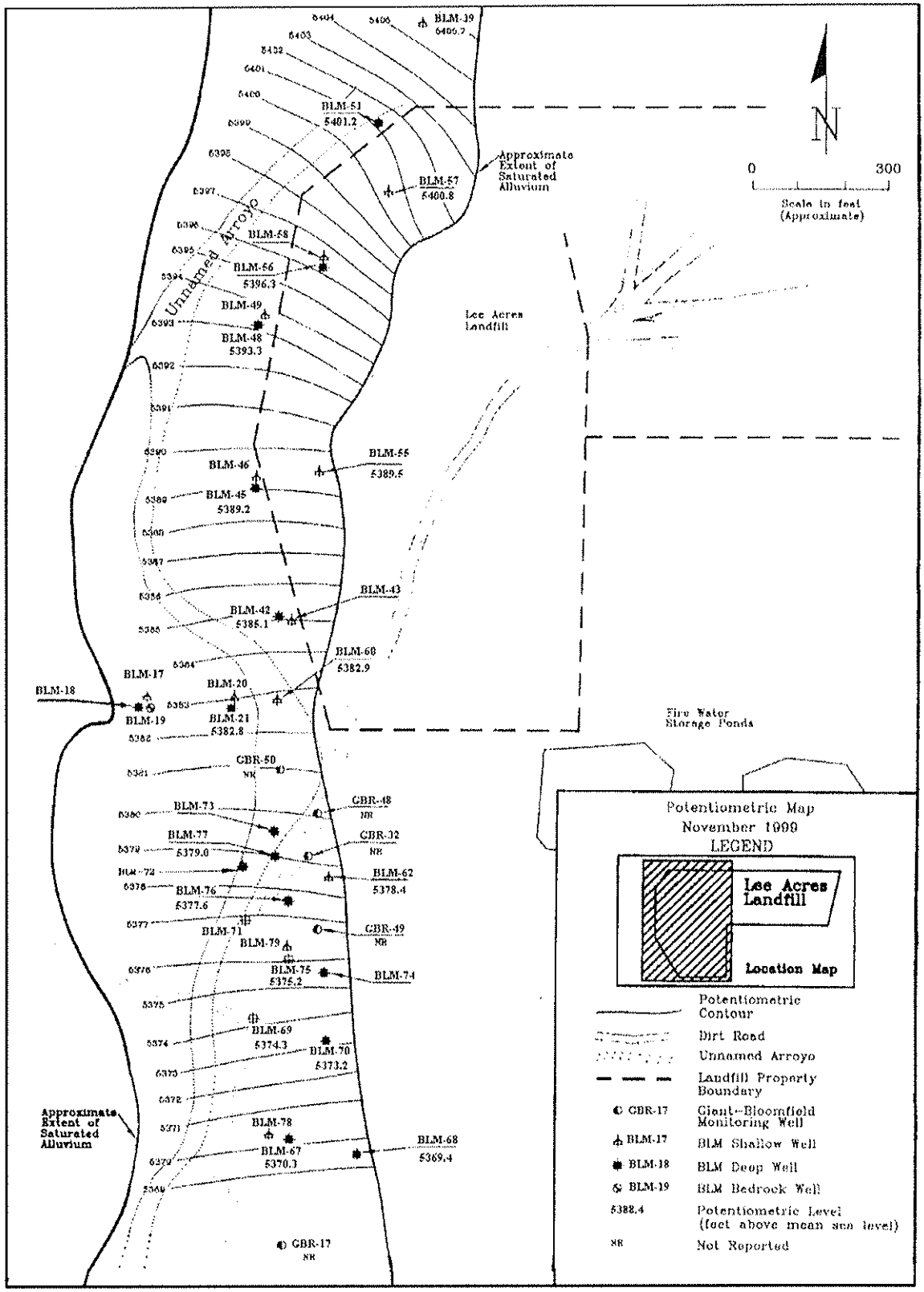


Figure 2

3.3 Land and Resource Use

In this part of San Juan County, much of the land is publicly owned, open rangeland. Several governmental agencies, industries, developers, and private citizens own or lease land within the original study area for the site. The original study area (circa 1986) was significantly larger than the site is now. It was re-defined in 1993 for the RI. No Indian reservations, tribal lands, or railroad land grants are within the study area. Residential, commercial, and industrial developments are concentrated in the incorporated municipalities of Aztec, Bloomfield, and Farmington, and adjacent to the transportation corridors between these towns. The major vehicular transportation route in the vicinity of the former landfill is U.S. Highway 64, also known as the Bloomfield Highway. The highway is located approximately ½ mile south of the landfill boundary.

The land in the region of the study area is used predominantly as open rangeland for livestock and wildlife. It is also used for: 1) industrial purposes by the Giant-Bloomfield Refinery (GBR), and by the El Paso Natural Gas Substation, which is north of the study area; 2) residential purposes south of the study area and north of the San Juan River; and 3) public recreational purposes at the San Juan County Fairgrounds southwest of the study area.

The rangeland vegetation in the area is not well suited to supporting large numbers of livestock; approximately 12 acres are required to feed one mature cow and calf for one month (one animal-unit-month). Oil and natural gas wells are present near the landfill. A north to south trending natural gas pipeline is located approximately 500 feet west of the landfill site. No public schools, prisons, or hospitals are within three miles of the site. The nearest educational facility is a private school operated by the Mennonite community approximately one mile north of the landfill. Future use of this area is expected to remain much the same as it is now, with the exception of a possible county road expansion.

The landfill is surrounded on the north, east and west by undeveloped property. GBR is located south of the landfill, and the GBR property is bounded on the south by Highway 64. South of Highway 64, there is a residential area, the Lee Acres Subdivision, which extends to the San Juan River. The San Juan River is about one mile south of the Lee Acres Landfill.

3.4 History of Contamination

Based on historical records and field sampling, soil investigations at the landfill identified four major areas that are either known or potential contaminant source areas that pose a threat to ground water. The former northern and southern liquid waste lagoons have been identified as known contaminant source areas. Two other potential contaminate sources were identified in the southern portion of the landfill, and may have been solid waste disposal areas.

Soil samples were collected from both the vadose and saturated zones during the initial stage of the RI. Details of the soil sampling programs are found in the RI. The landfill is estimated to contain approximately 800,000 cubic yards of contaminated soil and waste. Waste types encountered within the landfill consist of common household waste and various types of construction debris. Typical types of household and industrial wastes that contain many of the chemicals listed below include paint thinners, grease and oil strippers and cleaners, pesticides,

general cleaning chemicals, dry cleaning chemicals, carburetor cleaners, used oil from automotive and heavy equipment, kitchen and restaurant cleaners and grease, oil field wastes, spent copier and toner cartridges, and many other types of materials. It is probable that many of these products or their containers were placed in both lagoons, as well as other parts of the landfill during the period from 1974 through 1986.

The following methods for soil testing at the Lee Acres Landfill were used during the RI in 1993 and earlier. Samples were collected during borehole installation and from well installation. Soil samples from boreholes BH 01 through BH 39 and wells BLM 39 through BLM 66 were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/PCBs and metals using EPA methods 8010, 8020, 8270, 8080 and TCLP. Soil samples from boreholes BH 40 through BH 53 and well bores BLM 67 through BLM 79 were analyzed for VOCs, metals, chloride, and sulfate.

Soil samples collected for the RI in 1990 identified chlorinated and non-chlorinated VOCs, SVOCs, and pesticides in the subsurface above the method detection limits (MDLs). Chlorinated VOCs, common in solvents, were found in soil samples including 1,2-*trans*-dichloroethene (1,2-*trans*-DCE), tetrachloroethene (PCE), trichloroethene (TCE), trichloromethane, dichloromethane, and other constituents in very low concentrations. During the 1990 sampling event, 1,2-*trans*-DCE was detected in one soil sample collected in the landfill and in two samples collected off-site. Other VOC contaminants detected in vadose zone soils on and south of the landfill included TCE, PCE, and petroleum, gasoline, and oil field wastes such as benzene, toluene, ethylene and xylene (BTEX) compounds. On the site, the highest concentrations of BTEX were found in the region of the former northern liquid waste lagoon and east of the northern lagoon. The majority of the VOC compounds are indicative of solvent and stripper well wastes, while the BTEX compounds are related to petroleum hydrocarbon wastes. Chlorinated VOCs were found in relatively low concentrations less than 10 micrograms per kilogram (µg/kg) in the landfill. The highest concentration (252,600µg/kg) was found in the northern lagoon. Areas outside the lagoon, but adjacent to it ranged in concentration from 30 to 51 µg/kg.

Pesticide concentrations ranged from 5.7 µg/kg to 405 µg/kg. These sites were very localized in the borehole grid, predominantly in the southwestern portion of the landfill. SVOCs, predominantly *bis*(2-ethylhexyl)phthalate and dichlorobenzene were detected in landfill soils in concentrations at or near the minimum detection level (MDLs). The highest concentrations of SVOCs in the soils were found just inside the south landfill entrance, near the former southern liquid waste lagoon, and in the eastern 40-acre portion of the landfill. The highest concentrations of pesticides were at or near MDLs. They were located in soil samples from the eastern and southern portions of the landfill.

3.5 Initial Response

On April 18, 1985, the Farmington field office of the NMEID received information that a disposal pit at the Lee Acres Landfill had breached. The incident extended from April 18 to May 3, 1985. The NMEID incident report is not specific as to which lagoon breached, but the description suggests that it was the north lagoon. The area was sealed off, the breach was

repaired, and sampling activities were performed. Eleven people were treated and released for symptoms of hydrogen sulfide poisoning. The NMEID Emergency Response staff from the NMEID Hazardous Waste section responded to the incident: coordinated the onsite activities with assistance from the NMEID Farmington field office. Additional agencies also responded to the incident. The Occupational Health and Safety Bureau provided monitoring support; the Office of Epidemiology evaluated health effects; the Scientific Laboratories Division performed laboratory analyses; and the San Juan County Road and Fire Departments assisted with security, sampling, and heavy equipment.

The lagoon was aerated and treated chemically to neutralize the hydrogen sulfide and stabilize other chemicals by the New Mexico Environmental Improvement Division. The landfill was immediately closed to liquid waste disposal and later closed to solid waste disposal in 1986 and the site was covered with clean soil up to a depth of 4 to15 feet.

3.6 Basis for Taking Action

In 1986, VOCs were found at concentrations greater than the associated MCLs in samples collected from three domestic water supply wells in the Lee Acres subdivision located down-gradient from the landfill and the Giant Bloomfield Refinery. Even though the source of the contamination was not linked to the Lee Acres Landfill, and BLM did not assume responsibility for the contaminants, the BLM agreed to connect 13 residents in the subdivision, who were using private drinking water wells, to a municipal water supply. During the construction of the connections, BLM provided those residents with at least 8,700 gallons of bottled water. The hookups were completed in 1987.

In January 1993, BLM developed a technical working group to complete the RI, the Feasibility Study (FS), and the Proposed Plan (PP). The RI was approved by EPA in May 1995, and the FS was approved in May 1996. Subsequently, the PP was approved by the EPA in September 1996. The public review and response period was completed in November 1996 with no comments received. Information from the RI was used to identify seven contaminants of concern (COC) within the ROD (Table 1). The basis for taking remedial action is to prevent further contamination of ground water from leaching of contaminants that may exist in the landfill soils, and to eliminate all possibility of human and ecological exposure to contaminated soils and ground water.

4.0 Remedial Actions

The Record of Decision identified four components of selected remedy:

- Landfill cover (capillary barrier cover) with lysimeters
- Surface water run-on and run-off controls
- Monitored natural attenuation of ground water
- Institutional controls, in the form of withdrawal of site by BLM

4.1 Landfill Cover and Surface Water Controls

The 1996 Proposed Plan required the development of a pilot project to test the effectiveness of the proposed capillary barrier cap (landfill cover). If the test was successful the landfill cover was to be the selected remedy for the Lee Acres Landfill. The pilot study began in August 1997 and was completed in March 1999. After more than three years of monitoring and evaluation, the landfill cover was declared to be a success. Based on the successful test, the landfill cover was a selected remedy for the site.

The landfill cover is designed to prevent future leaching of contaminants by minimizing percolation of surface moisture into the ground water through the contaminated trash layers and the lagoon sediments that are still in place in the landfill.

The landfill cover construction consisted of two inter-related actions:

1) Closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory and,
2). Realignment of County Road 5569 to create County Road CR 350, which incorporated surface water run-on and run-off controls to prevent storm water run-on from reaching the landfill cover (figure 3).

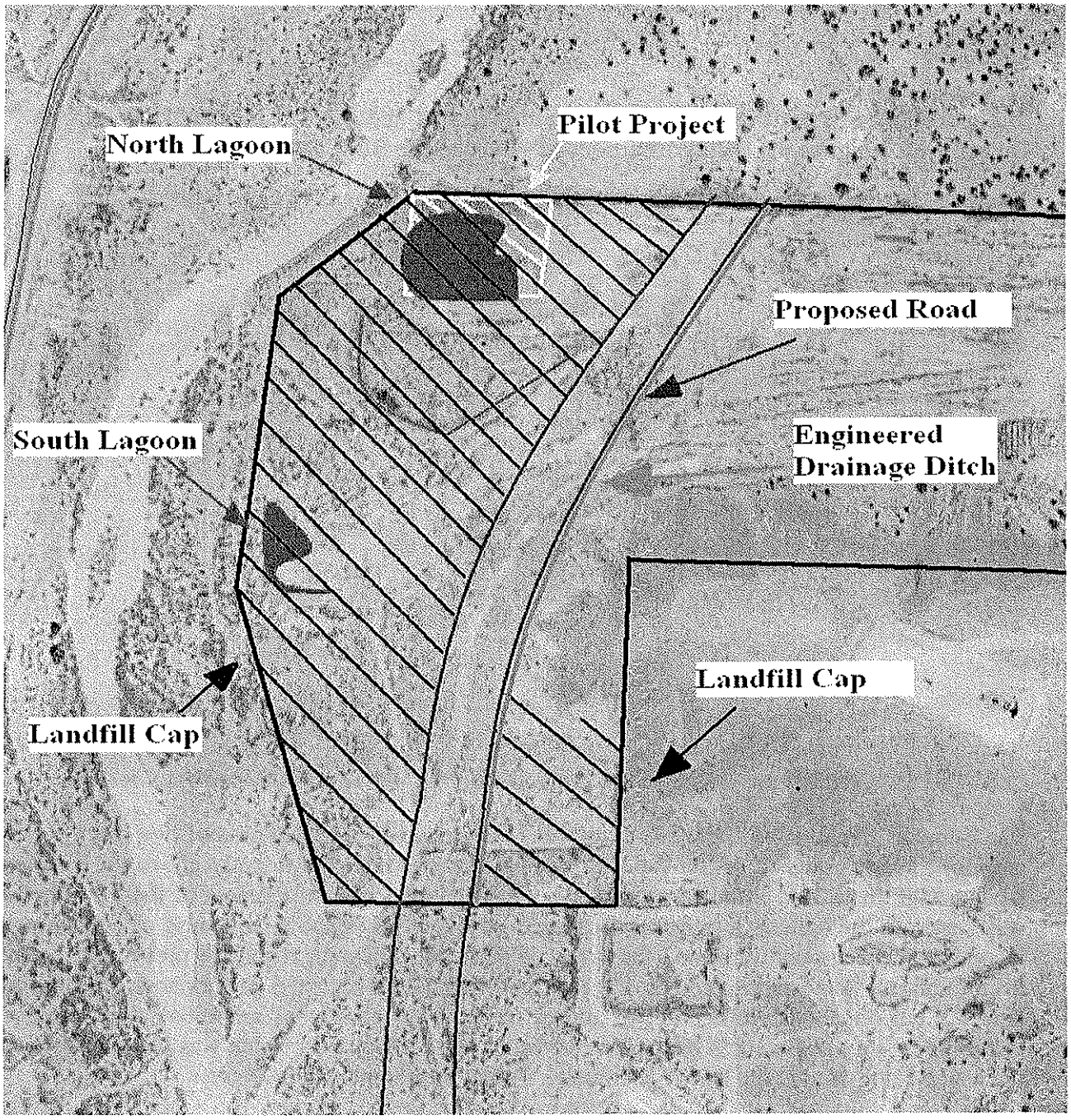
4.1.1 Construction

Construction of the Capillary Barrier began with general site construction requirements performed by the San Juan County Public Works Department (SJC). These consisted of temporary environmental controls for erosion and sediment control, dust abatement, and spill prevention. Site clearing followed next with the grubbing trees, brush and herbaceous vegetation from the area.

The original Pilot Cap was removed and the area leveled and compacted with a smooth roller compactor. Removal of the Pilot Cap was deemed necessary over concerns that area where the Pilot Cap and new cap join could have the potential to create pathways for moisture to infiltrate downward. Removing the Pilot Cap and constructing a new capillary barrier over the entire western portion of the landfill would create a smooth, continuous and homogenous barrier over the entire area. At the completion of this phase, the region received record precipitation amounts that resulted in many construction delays due to unexpected wet conditions. This put construction of the cap behind schedule.

The southeast corner of the landfill was identified as a potential contaminant source area. Based on analytical results, it was believed this area may have been used as a lagoon area or solid waste disposal site. Initially, construction of the capillary barrier was to be completed on the western and southeastern portion of the landfill in one continuous operation. However, the region continued to experience repeated precipitation events delaying the work schedule. During a break in the weather, SJC began and completed construction of the southeastern capillary barrier in the course of a few days. The capillary barrier over the larger western portion of the landfill was constructed from February 2005 through April 2005.

The capillary barrier was constructed in phases. The first phase consisted of the installation of an uncompacted 6 inch gravel bottom layer. The capillary barrier is formed by the contrast in unsaturated hydraulic properties between the course gravel layer and the overlying fine soil layer and is referred to as the capillary break.

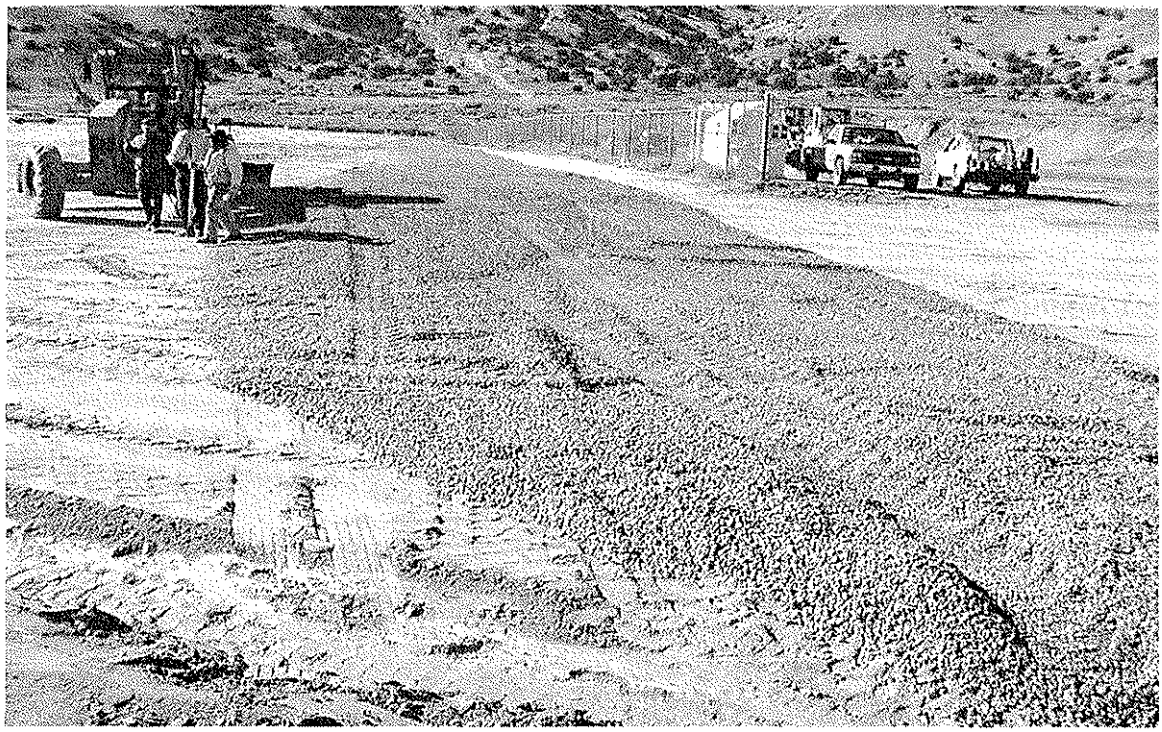


Map of Construction of the Landfill Cover and County Road 350

Figure 3

Soil Fraction	Sieve Size	Specification
Fines	<0.075 mm (#200)	<2%
Sand	<0.425 mm (#4), >0.075 mm	<15%
Gravel	>4.75 (#4), <19 mm (3/4)	>85%
Max Size	<50mm	100%

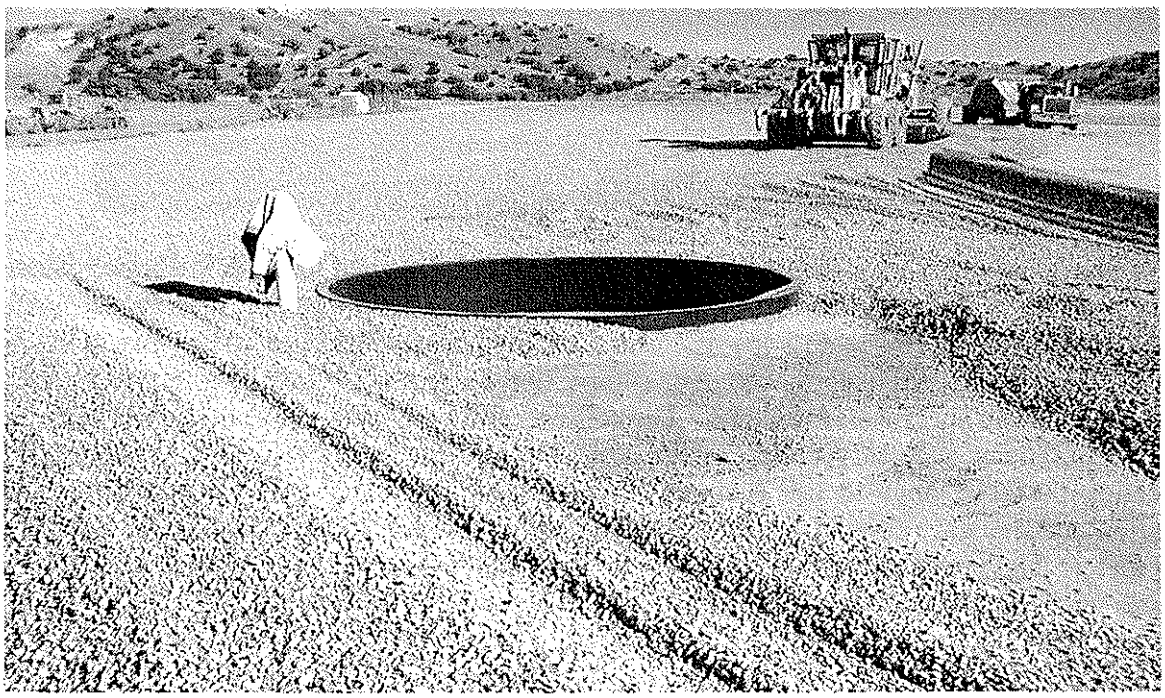
The gradation tests for the course gravel were reviewed and deemed acceptable by Mr. Steve Dwyer, who designed the capillary barrier and served as the BLM contract Consultant.



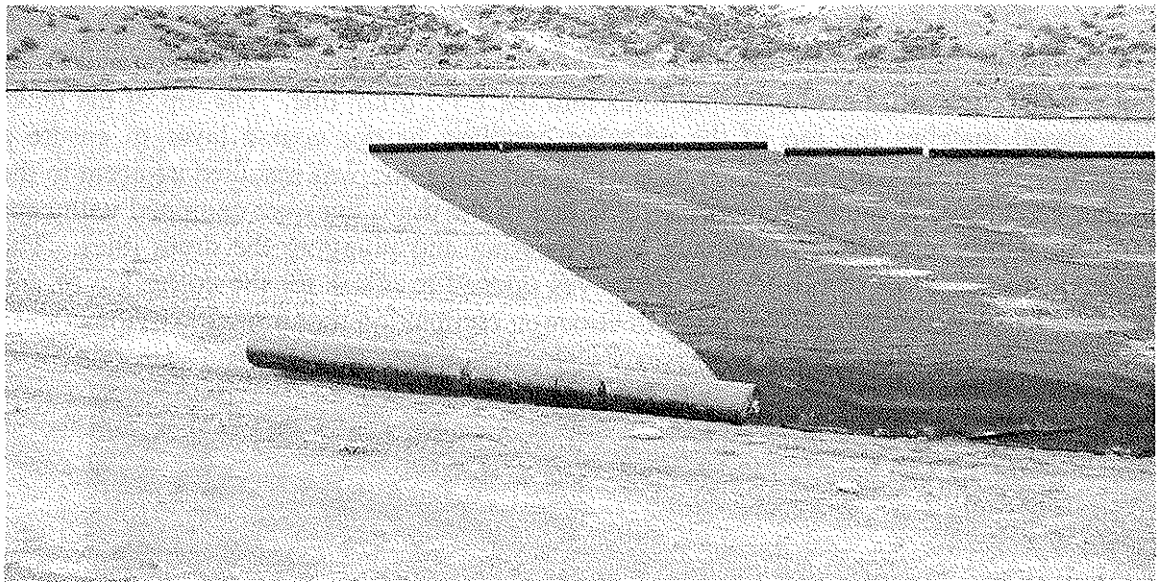
The Remedial Action Work Plan & Remedial Design called for installation of two lysimeters to monitor the performance of the cap. One lysimeter was installed directly above the northern lagoon with the second installed above the southern lagoon. The placement of these lysimeters was based on the assumption the lagoons were presumed to be the direct cause of contaminant increases in the groundwater and the areas of most concern with regard to preventing further infiltration into the existing plumes. At this time there is no accepted performance standard for landfills but an annual influx of 1.3 mm/year has been chosen as an initial alert level for determining the effectiveness of the landfill cap. The 1.3 mm/year value was chosen based on this value being used at the Rocky Mountain Arsenal Superfund site in Denver.

The lysimeters used for this project consisted of double wall, double bottom carbon steel tanks (10 feet in diameter and 2 feet high). The tanks have a single 2-inch outlet in the bottom of the tank adjacent to the sidewall for draining purposes. The tanks were placed on bed material

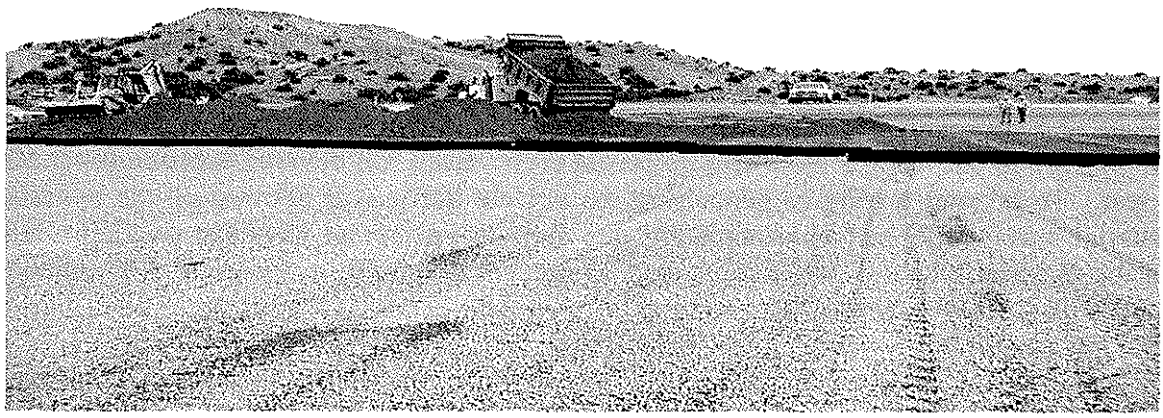
consisting of fine washed sand. The tank and pipe fittings were inspected and tested for water tightness. Following the inspection and site test, the top of the tanks were left open and filled with clean capillary gravel to avoid passing fines into the PVC drain line. The top of the tanks filled with gravel matches the top of the adjacent capillary barrier coarse layer to ensure a continuous capillary break was formed. A gate valve and value box was installed adjacent to the tanks to open and close the 2-inch drain lines. The end of the drain lines are equipped with caps to prevent dirt, debris and foreign materials from entering and plugging the drain lines. The lysimeter drain line caps are removed and the valves opened to allow for the collection of any water collected in the lysimeters during post-construction completion monitoring activities.



The next phase of work involved the installation of a geotextile filter fabric over the completed gravel layer. The fabric was designed to separate the overlying fine soil from the underlying gravel. This fabric also serves as an additional capillary barrier break. The geotextile was supplied in 12.5 foot wide rolls approximately 360 feet long with a thickness of 50 mm. The material was rolled out using a work release prison crew. Each roll covered approximately 500 square feet. To prevent tearing or puncturing, no vehicle traffic was allowed on the material. The material was overlapped approximately one foot to ensure an adequate overlap. SJC covered the material with soil within five days to prevent long term exposure to UV radiation from sunlight and ambient exposure.

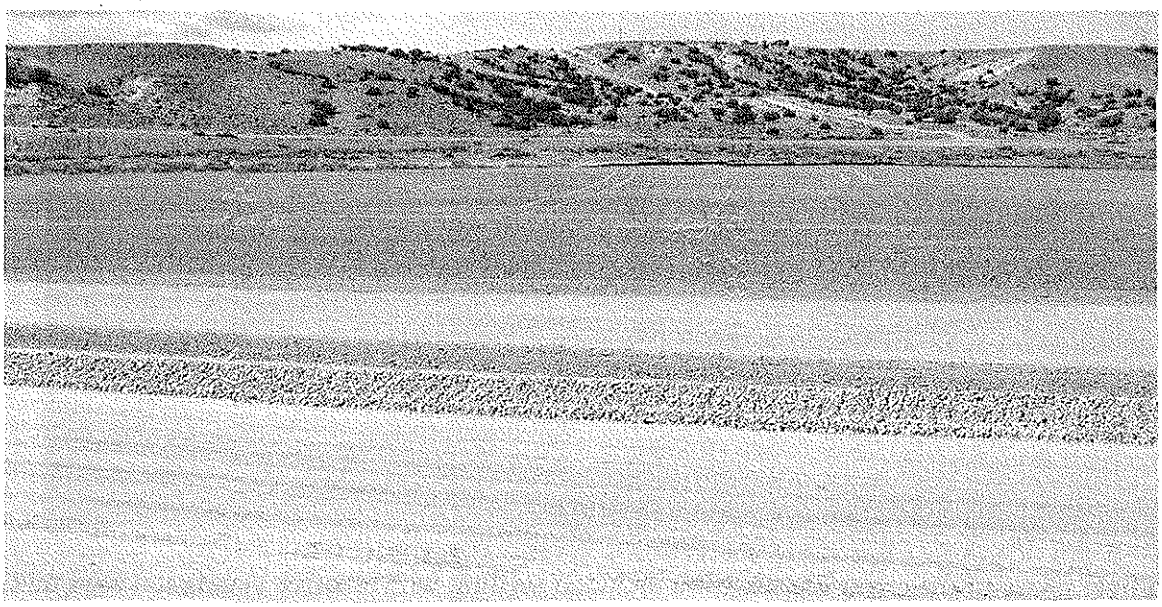


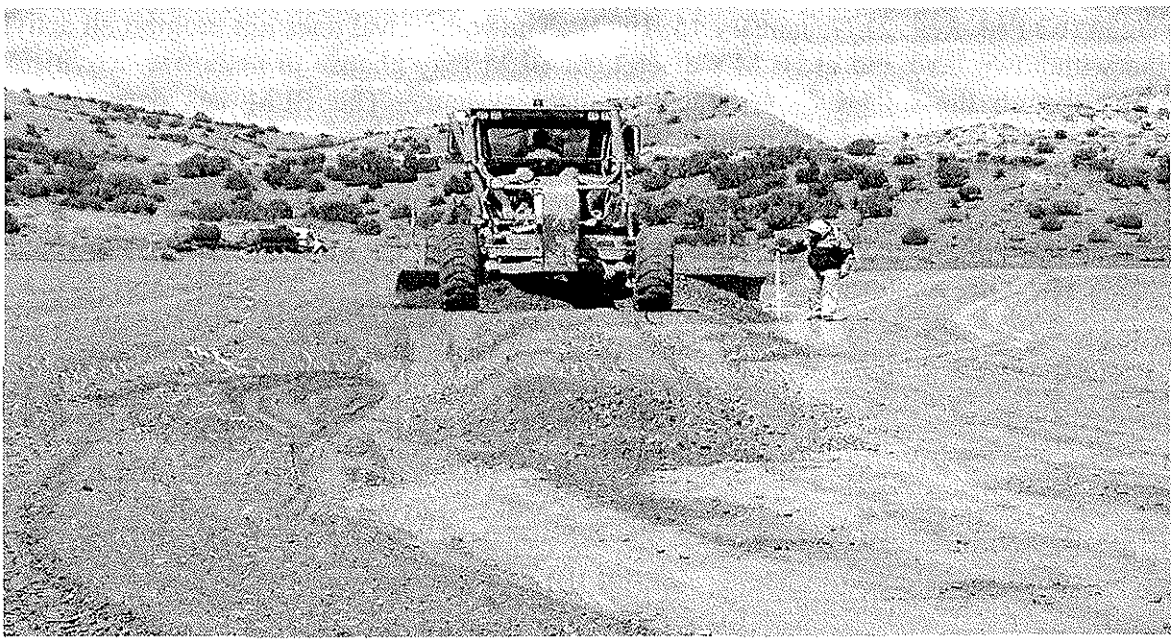
The next phase consisted of placement of the fine soil layer designed to store infiltrated water. SJC hauled in the soil from a nearby borrow site. Initially, the construction plan called for 9-inch lifts compacted to 100 to 112 lbs/ft^3. The total thickness of the soil cover was to be 30 inches. However, SJC still experienced over compaction using the 15-inch lifts approved in the October 2004 design specification change. The soil was still becoming over compacted from the weight of equipment necessary to spread the soil. Geomat Inc. on behalf of SJC requested a specification design change to use a single 30-inch layer instead of two 15-inch lifts. The compaction and moisture content of the soil in the bottom 15 inches were checked by a nuclear density meter. The proposed modification was reviewed and approved by both Remedial Project Managers with the Environmental Protection Agency (EPA) and New Mexico Environmental Department (NMED).



The next phase after completion of the 30-inch fine soil layer involved placement of a 6-inch thick erosion layer. The erosion layer was a blend of the native soil used in the 30-inch soil cover and gravel. This application is also referred to as the 50/50 blend. The intent of this layer

was to minimize erosion of the cover. The gradation test for the gravel was reviewed by Mr. Steve Dwyer and was found to be marginally acceptable for this task. Before this stage could be started the design specification called for the soil cover to be scarified. Scarification is essential to insure a good bond between the soil cover and the erosion barrier. The mixture was spread evenly in one lift to a thickness of 6-inches.





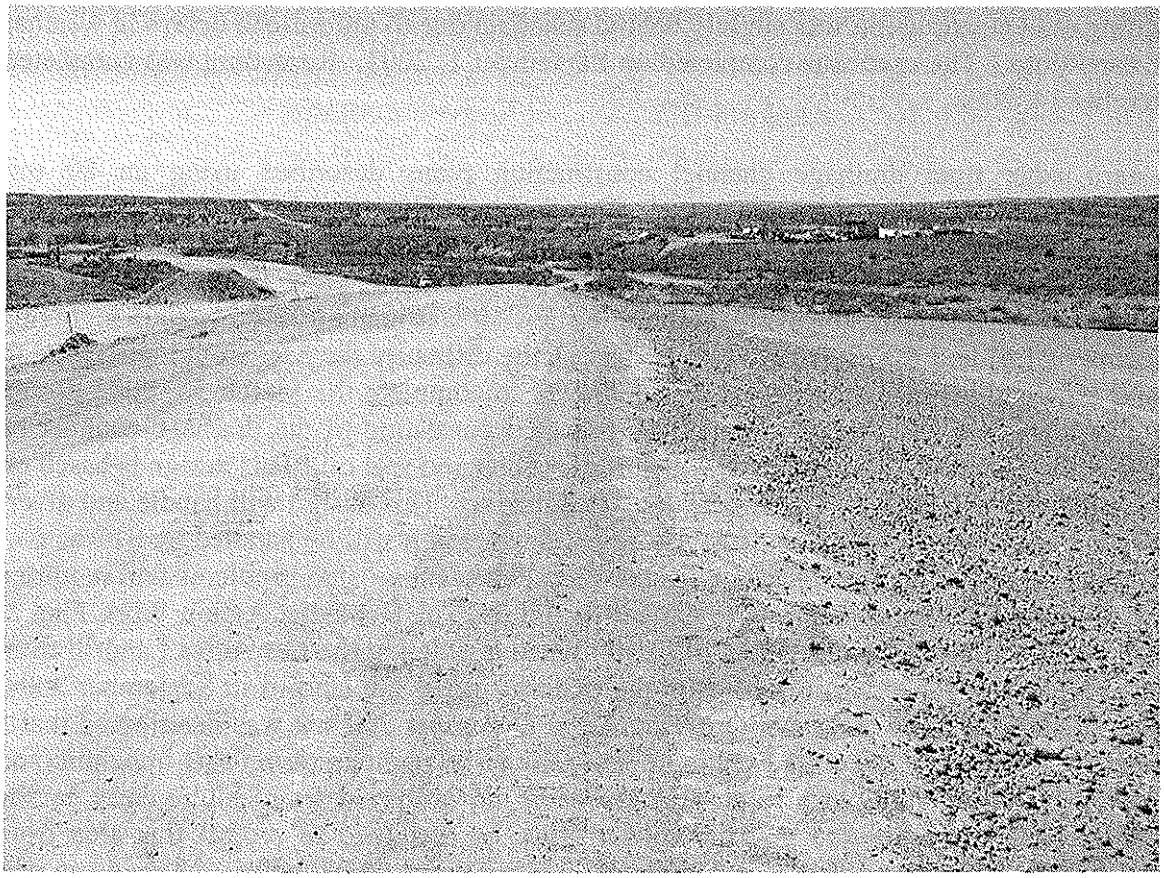
Coble (four to five inches in diameter) was placed around the northern, western and southern perimeter of the capillary barrier to serve as a rip rap armament layer to protect against erosion.

The rip rap was placed on outer slopes of the cap at a slope not to exceed a 6:1 ratio. Each rip rap installation was underlain by a geotextile separation material. At the eastern edge of the cap a v-drainage ditch was constructed where the cap adjoins the slope base of County Road 350. The drainage ditch captures runoff from the road slope and diverts it offsite.

The final phase of the cover construction included seeding with a native vegetation seed mix.

In January 1997, the BLM withdrew 134.68 acres of public land (see fig.1) surrounding and including the landfill from settlement, sale, location and entry as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). The withdrawal does not prohibit all activities on the withdrawn land and at BLM's discretion; BLM may choose to authorize activities that will not disturb the integrity of the containment system. The BLM has determined that realignment of County Road 350 and placement of fence barriers isolating the road from the Lee Acres landfill and capillary barrier would not jeopardize the integrity of the remedial design.

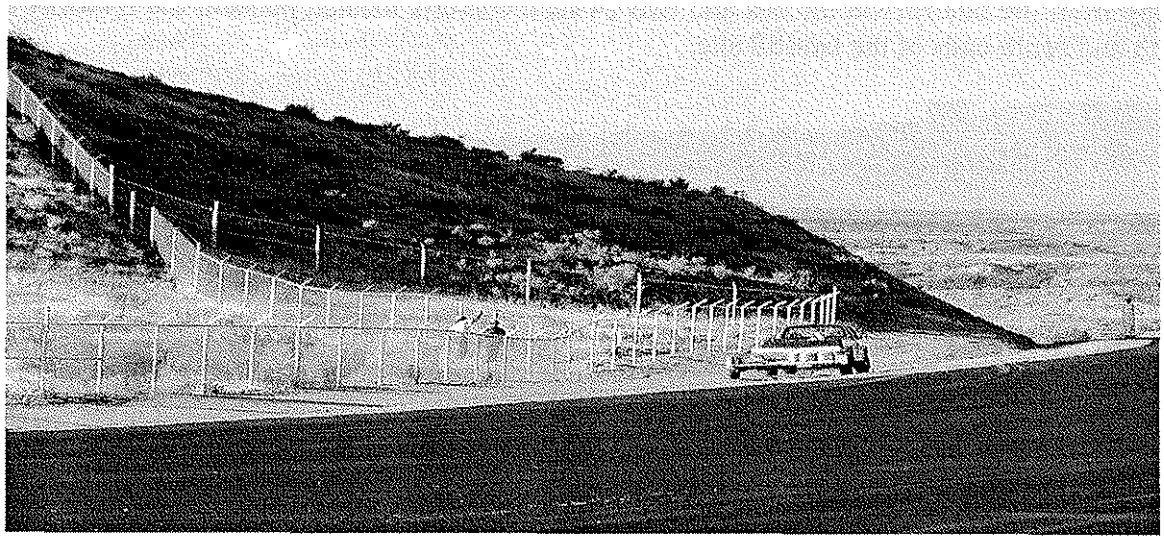
The realignment of County Road 350 was being designed so the location of the road would not adversely affect the capillary barrier cap.



The placement of the road actually serves to intercept runoff from the east and divert it around and away from the landfill via ditches and two 24-inch culverts located beneath the roadway at the north and south ends of the landfill site.

The ongoing road construction was slightly behind schedule due to unforeseen delays in weather and site conditions. The road was completed on September 1, 2005. Reseeding was completed on September 14, 2005.

The eastern edge road drainage channel construction plans described using an 80 mil geomembrane over laid with 4-inch pea gravel. This design is illustrated in the Remedial Design construction drawing Sheet 5 of 7, Detail B. SJC requested a change in design which was discussed at the Lee Acres Landfill site on March 24, 2005 with Mr. Steve Dwyer, Geomat Inc., representing SJC, and BLM. However, another job site visit was held on July 21, 2005 involving SJC, Geomat, BLM and Mr. Steve Dwyer, to discuss the difficulty the SJC would encounter to safely and efficiently operate the necessary equipment to complete the March 30, 2005 design change. As a result a new design change was prepared consisting of the drainage channel be under laid with geotextile, followed by 2½-inches of asphalt and seal oil. This design is based on runoff calculation conducted by Cheney-Walters-Echols, Inc. This design will handle and divert runoff around and away from the landfill. However, any erosion will be handled by SJC as part of its ongoing operation and maintenance for the site. Persistent erosion problems will require a re-design and construction appropriate to correct the issue. The Remedial Action Work Plan & Remedial Design required the placement of barrier fencing isolating the Lee Acres Landfill from the road. The barrier fence was installed on the eastern side of the landfill in September 2004. During a site visit by BLM and NMED personnel, in December 2004, it was determined that a portion of the eastern fence required realignment. Old aerial photograph reveals trenching and other landfill activities took place in an area currently not protected from public entry by the barrier fence. NMED requested that the barrier fence be realigned to protect this area from public entry. The fence correction was completed in late August, 2005, before the roadway was open to public traffic.



4.1.2 Landfill Cover Monitoring

The Remedial Action Work Plan established the monitoring requirements for the landfill cover. The monitoring was to be performed quarterly for the first two years after installation, and then semi-annually for three more years. BLM continues to monitor the cover semi-annually.

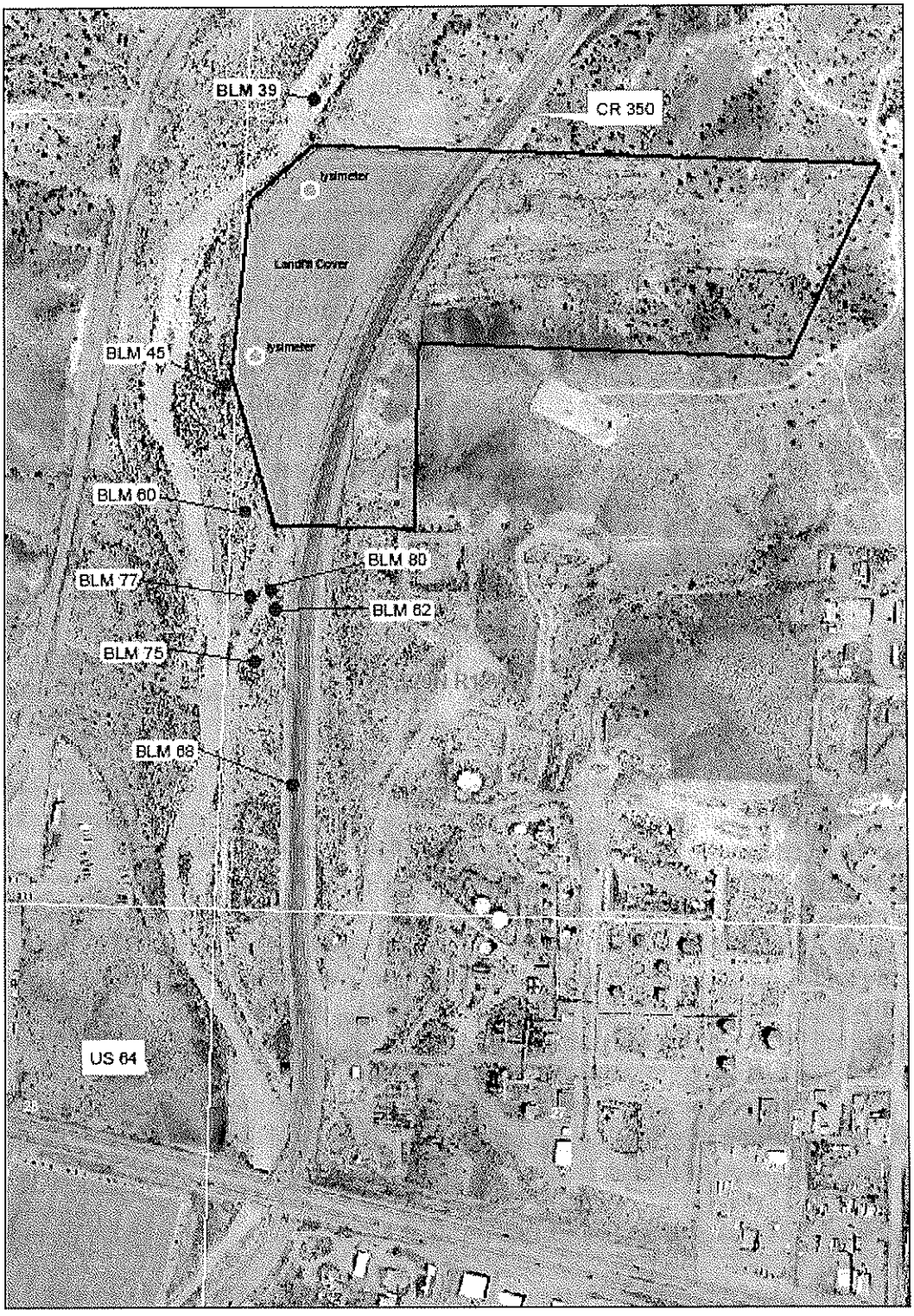
An important feature of the landfill cover monitoring was the inclusion of lysimeters installed under the cover profile. There were two lysimeters installed. One was installed directly above the northern lagoon while the second above the southern lagoon. The lagoons are presumed to be the direct cause of contaminant increases in the groundwater and consequently are the points of most concern with regard to preventing further surface water infiltration into the existing plumes. Initially, an annual flux of 1.3 mm/year within each lysimeter was used as the initial alert level for determining the effectiveness of the cover system. There was no universally accepted performance standard for landfills at the time the Work Plan was approved. Studies at the Rocky Mountain Arsenal Superfund site in Denver, Colorado were using 1.3 mm/year as an acceptable flux for the cover systems installed there, and the same standard was adopted for Lee Acres.

Personnel responsible for performing monitoring and maintenance duties on a CERCLA site generally must have extensive experience and expertise in the area of concern. It was recommended that personnel performing monitoring on the landfill cover system and lysimeters have a minimum of 10 years of landfill cover experience and be a registered professional engineer. Dr. Stephen Dwyer was retained to monitor the Lee Acres landfill cover.

Mr. Dwyer completed the 23_{rd} monitoring inspection on July 2, 2014. The summary of the July 2, 2014, report stated the cover is in excellent condition. The cover soils, embankments, and drainage trenches were all in good condition and performing as designed. The vegetation at the site continues to mature and improve. The vegetation now appears to be approaching a climax community similar to the surrounding vegetation in undisturbed areas. Erosion at the site is minimal. Percolation measurements were made with no flux measured in the north or south lysimeter. Since the landfill cover was completed, all measurements to date have been significantly below the agreed upon alarm level except for two measurements in the north lysimeter during 2010. The rolling annual flux rate for the north lysimeter in 2010 was 10.73 mm/year, and was attributed to an exceptionally cold and wet winter. Since August of 2010, all measurements have been significantly below the alarm level providing confidence the cover system is working very well to minimize flux. The complete July 2, 2014, monitoring report can be found in Attachment 1.

4.2 Monitored Natural Attenuation of Ground Water.

The ROD identified seven contaminates of concern (COC) and established Cleanup Levels (Table 1). The Remedial Action Work Plan established requirements for groundwater monitoring. The Work plan identified seven existing groundwater wells (BLM#s 39, 45, 60, 62, 68, 77, and 75) to monitor, and required that a new well (BLM # 80) be constructed in the area of highest contaminations levels (Figure 4). The new well BLM 80 was completed in



Map of BLM Monitoring Wells, Landfill Cover, and Lysimeters
Figure 4

2005 and was first monitored on December 20, 2005. The Work Plan states: BLM wells 39, 45, 60, 62, 68, 75, 77, and 80 were selected based on their ability to provide adequate monitoring coverage of possible contamination flow off the remediation site. The selected wells are scheduled to be monitored semi-annually for the first five years after completion of the landfill cover. BLM continues to monitor the wells semi-annually.

The Work Plan also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of 8 consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. All six contaminates of concern regulated by the SDWA have been below the cleanup levels established in the ROD since 2000. Manganese is the seventh contaminate of concern identified in the ROD. The New Mexico Water Quality Control Commission established a domestic water supply standard of manganese, and the ROD established a cleanup level for manganese. Over the years, groundwater monitoring results for manganese have been erratic. The manganese levels appear to be influenced by upgradient background levels and unrelated to the site. BLM plans to submit documentation to the EPA and NMED to consider amending the cleanup standard established in the ROD.

Due to the documentation that all six contaminates of concern regulated by the SDWA have been below cleanup levels since 2000 and attainment of the manganese cleanup level is not likely, BLM recommends that quarterly monitoring for a total of eight quarters be initiated in 2015. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if continued monitoring of the six COCs regulated by the SDWA is warranted, and if an appropriate regulatory process should be pursued to amend the manganese cleanup level (Appendix #5)

4.3 Institutional Controls

An area of 135.6 acres of public land, which includes the Lee Aces Landfill site and a buffer area around the site, was withdrawn by BLM from settlement, sale, location, or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234) to protect public health, welfare and the environment from hazardous materials that may remain onsite. At the end of the 50 year period of the withdrawal, if hazardous substances remain at the Lee Acres Landfill above levels that prevent unlimited use and unrestricted exposure, the withdrawal will be extended, or other controls will be implemented. The institutional controls component of the selected remedy will not be modified unless it has been reviewed and approved by EPA.

The area withdrawn is described as follows (Figure 1):

New Mexico Principal Meridian
T. 29N. , R. 12W., Sec. 21 lots 6 and 7 (everything southeast of County Road No. 5569);
Sec. 22, lot 5 (everything southeast of County Road No. 5569);
lot 6 W\1/2\, lot 11 W\1/2\, and lot 12;
Sec. 28 lot 2.

The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could disturb the integrity of the landfill cover, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill site.

Discretionary restrictions on the use of the land at the Lee Acres Landfill Site that are in compliance with the current withdrawal will be implemented in accordance with BLM's current Resource Management Plan (RMP). The RMP enable BLM to manage public lands and resources in a balanced manner, as directed by the Federal Land Policy and Management Act (FLPMA) of 1976. The RMP also allows BLM to analyze impacts to public lands, as prescribed under the National Environmental Policy Act (NEPA) of 1969.

All future proposals for Lee Acres Landfill Site will have to be in accordance with the current withdrawal as well as the current resource management plan. Any person or entity proposing an activity within the Lee Acres Landfill site would do so through an application to the FFO. This application would be reviewed for conformance with the withdrawal and the current resource management plan. Only those applications that are in conformance with the provisions of these documents will be subject to further NEPA review and analysis. Final determination on any future proposed actions at the Lee Acres Landfill Site will be made by the FFO, following a proposal-specific NEPA analysis that will include consultation with the appropriate governmental entities.

BLM is responsible for implementing, maintaining, and monitoring of the surface and institutional controls for the duration of the remedies selected in the ROD and for as long as hazardous substances remain on site above levels that prevent unlimited use and unrestricted exposure. BLM will submit to EPA a monitoring report on the status of the surface and institutional controls at least annually. The report, at a minimum, will contain an evaluation of whether all of the surface and institutional controls requirements of the ROD are being met, including the results of a visual field inspection of all areas subject to surface and institutional controls, and a description of any deficiencies in the surface and institutional controls and measures that have been or will be taken to correct the deficiencies. BLM will notify EPA in writing within 72 hours of discovery of any activity that is inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least 45 days in advance of any proposals for major land use changes inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least six months prior to any transfer, sale, or lease of any property subject to surface or institutional controls and consult with EPA on specific wording for property transfer or lease documents. BLM will notify EPA of any activities that violate the restrictions in the land use plan described above, the effect of the activities on the protectiveness of the remedy, and any proposed actions to address the violation of the restrictions. BLM also will consult with EPA prior to proposing

any changes in the restrictions in the land use plan described above.

4.4 Operations and Maintenance

San Juan County constructed the landfill cover, a chain link fence, and realigned County Road (CR) 5569 through the landfill site to complete CR 350 (Figure 4). The County is responsible to maintain these improvements. Maintenance activities performed by the County to date include re-seeding the landfill cover, repairing damage to the fence along CR 350 caused by a minor traffic accident, and removing loose trash and tumble weeds from the landfill cover and fence line, and maintain gabion basket flood prevention structures (Table 2). Per the ROD, BLM as the lead Agency responsible for implementation of the selected remedy is responsible for ensuring that all operations and maintenance activities are properly conducted under the selected remedy. BLM is responsible to maintain the monitoring wells; no maintenance has been required on the monitoring wells since the completion of the landfill cap.

Table #2: Maintenance Performed by San Juan County

Year	Labor Materials Vehicles $	Description of Work
2006	2,429.99	Re-seed landfill cover
2007	2,706.30	Re-seed landfill cover, remove weeds, fence maintenance
2008	214.00	Clean landfill cover and fence line
2009	629.00	Clean landfill cover and fence line
2010	260.00	Treat weeds, clean landfill cover and fence line
2011	235.00	Treat weeds, clean landfill cover and fence line
2012	310.00	Treat weeds, clean landfill cover and fence line, inspect after storms
2013	415.00	Treat weeds, clean landfill cover and fence line, inspect after storms
2014	1,740.00	Treat weeds, clean landfill cover and fence line, inspect after storms, maintain gabion baskets
Total	$8,939.29	

Table 2

5.0 Progress Since the Last Five Year Review

The site continues to be maintained and monitored. All contaminants of concern regulated by the SDWA remain under cleanup levels. Manganese continues to be erratic in the site as well as the in the background well located up gradient of the site.

6.0 Five-Year Review Process

This second five-year review for the Lee Acres Landfill has been conducted in accordance with EPA's Comprehensive Five-Year Review Guidance dated June 2001. Interviews were conducted with relevant parties, a site inspection was conducted, and applicable data and documentation covering the period of the review were evaluated. The activities conducted as part of this review are described in the following sections.

6.1 Administrative Components

The second five-year review for this site was initiated by BLM. The review team was led by the BLM Remedial Project Manager (RPM) for this site, Dale Wirth/BLM Farmington Field Office with Barney Wegner from Wegener Services LLC, and included members from San Juan County NM, the BLM National Operations Center staff with expertise in hydrology and risk assessment, USGS, Mr. Stephan Dwyer (consultant), and NMED. The components of the review include community involvement, document review, data review, a site inspection, and interviews, and development of this Second Five-Year Review Report.

6.2 Community Involvement

A public notice announcing the initiation of the five-year review was published in the Farmington, New Mexico **Daily Times** on February 16, February 19, and March 17, 2014. Joni Kelsey, Public Relations Manager for San Juan County, served as the community involvement coordinator until she was replaced by T.J. Richards due to an ailment. An article appeared in the **Daily Times** on Sunday, March 2 that outlined the Lee Acres second five-year process. No comments were received from the public during the five-year review process. Upon signature, the five-year review report will be placed in the information repositories for the site, including the Farmington BLM public room, the Farmington Public Library, and the EPA Region 6 office in Dallas, Texas. A public notice will be published in the **Daily Times** to summarize the findings of the review and announce the availability of the report at the information repositories. Copies of the public notices are provided in Attachment 2 to this report.

6.3 Document Review

The five-year review for the Lee Acres Landfill included a review of relevant documents including the Record of Decision, the Remedial Action Work Plan, the Remedial Investigation, Landfill Cover Monitoring reports, and Ground Water Monitoring reports.

6.4 Data Review

Groundwater monitoring data collected by the USGS at the Lee Acres Landfill site since 1993 was reviewed. Cover monitoring data submitted by Dr. Stephen Dwyer since 2005 was reviewed.

6.4.1 Lee Acres Landfill Groundwater Monitoring Data Review

The USGS, Water Resources Division, entered into an agreement with BLM to perform ground water sampling and analysis at and around the Lee Acres Landfill site. USGS submits semiannual reports to BLM that includes: Summary of Concentrations of Analytes, Analytical Results, and Laboratory Quality Assurance/ Quality Control Results. Charts of contaminants of concern show the cumulative results of ground water monitoring (Charts 1 – 9). All of the COC regulated by the SDWA have been below MCLs since 2000..

Manganese is not regulated by the SDWA, but the New Mexico Water Quality Control Commission (NMWQCC) has established a human health standard of 200 parts per billion (ppb) for manganese in domestic water supply. The method for determining the background manganese concentrations at the Lee Acres Landfill site was developed and agreed upon by EPA, NMED, and BLM. A background concentration of 346 ppb was determined by averaging data collected during the Remedial Investigation from three wells (BLM 14, 15, 39) that were located up-gradient of the landfill and were determined to be unaffected by activities at the landfill. The NMWQCC regulations section 4101 (B) state that if background levels exceed state standards, then the cleanup level shall be the background concentration. The enforceable cleanup level for manganese established in the ROD is 346 ppb.

All contaminants of concern listed in the ROD are enforceable by EPA according to the limits set in the ROD. All contaminants of concern listed in the ROD are below MCLs established under the SDWA. Manganese is classified as a secondary maximum contaminant level (SMCL) under the SDWA which is not enforced by EPA. Note however, EPA can and has set risk-based concentration limits and/or state-based limits for manganese, which have been included in RODs. In this case, the ROD includes an enforceable limit (i.e., 346 ppb) for manganese based upon the NMWQCC regulation (Part 3-101.2) requiring cleanups to attain the background concentration level. Ground water sampling for manganese shows that manganese has not attained the cleanup levels required under the ROD. Of the three up gradient wells used in establishing the average background level for manganese (346 ppb), well 39 was identified in the Work Plan as the only up gradient (background) well to continue to be monitored. Manganese has averaged 609 ppb in well 39 and has been erratic with no observable trend since 1993 (Chart 1). The RI states that the reason for the increase in manganese in well 39 is unknown (RI page 5-75).

Manganese in the ground water down gradient from the landfill is attributed to either past disposal of liquid in the former liquid waste lagoons, or the interaction between the native soils and reducing agents in the former lagoons (ROD page 31). Also, where petroleum hydrocarbons undergo natural biodegradation in contact with groundwater, dissolved manganese may be found at relatively high concentrations in groundwater (Deutsch, 1997); however, oxidizing conditions

reverse this reaction and cause manganese to precipitate back to the aquifer sediments (Klinchuch and Delfino, 2000). This process may be occurring at the Lee Acres Landfill site.

Table 1
Groundwater Cleanup Levels for Chemicals of Concern at Lee Acres Superfund Site

Contaminants of Concern (COC)	Site Historic Maximum Concentration (ug/l)	EPA 2014 Regional Screening Levels (ug/l)	SDWA MCL (ug/l)	NMWQCC Human Health Standards (ug/l)	ROD Site Background Mean[a]	Cleanup Levels (ug/l)
Manganese	29,000	430	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-cis-Dichloroethene	77	36	70	NA	NA	70
1,2-trans-Dichloroethene	120	360	100	NA	NA	100
Perchloroethylene (Tetrachloroethylene) (PCE)	10	11	5	20	NA	5
Trichloroethylene (TCE)	11	0.49	5	100	NA	5
Vinyl Chloride	3.1	0.019	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL) based on discoloration, staining, and taste issues.
c Standard for domestic supply.
d NMWQCC Regulation Part 3-101.2 does not require cleanup below site background level.
e Highest value of 12,500 ug/l occurred during May 1993 and was determined to be a statistical anomaly; the next highest value is specified.
f Standard for irrigation use.

Table 1

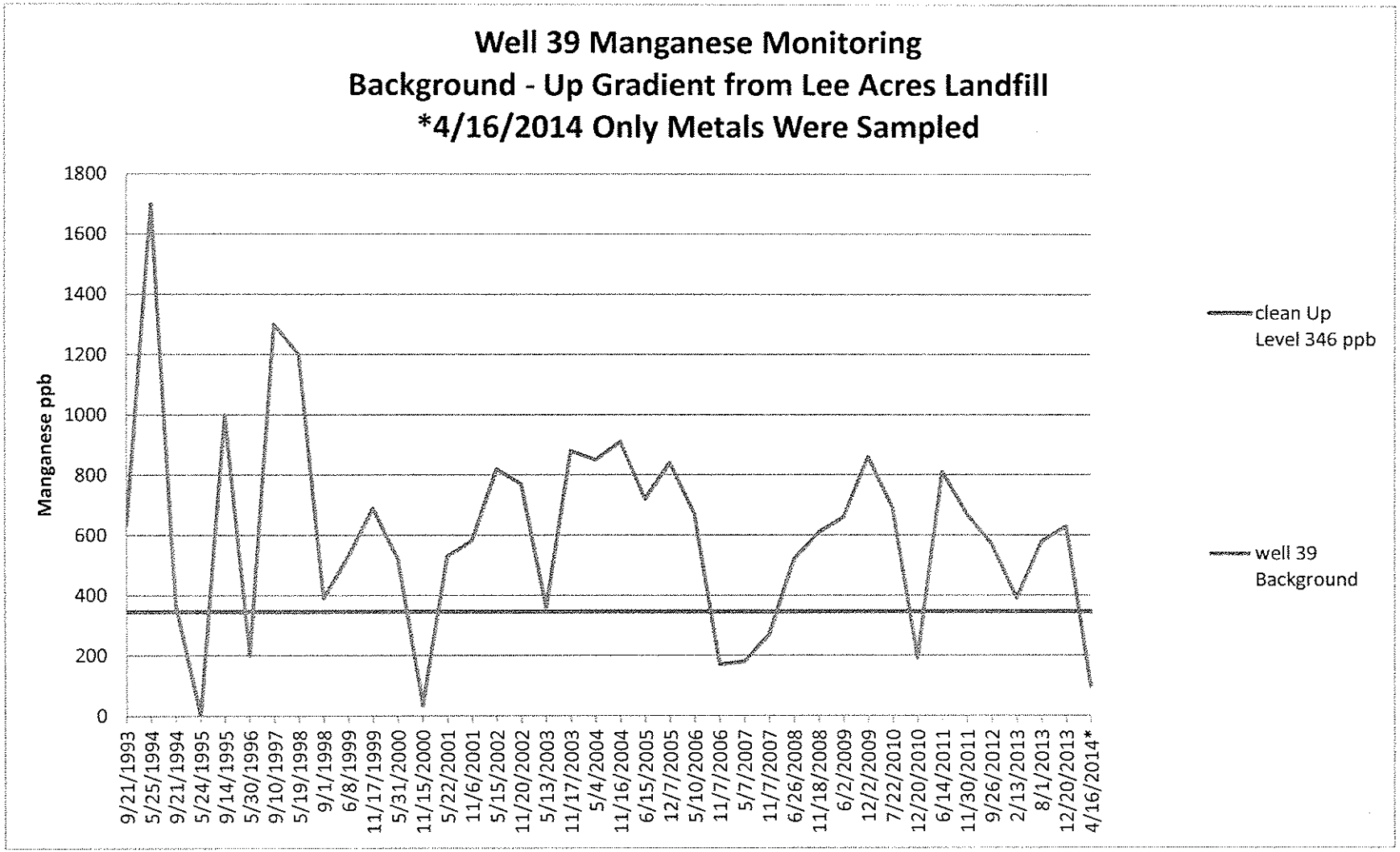

Well 39 Manganese Monitoring
Background - Up Gradient from Lee Acres Landfill
*4/16/2014 Only Metals Were Sampled
Manganese ppb
1800
1600
1400
1200
1000
800
600
400
200
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
11/30/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
4/16/2014*
clean Up Level 346 ppb
well 39 Background

Chart #1

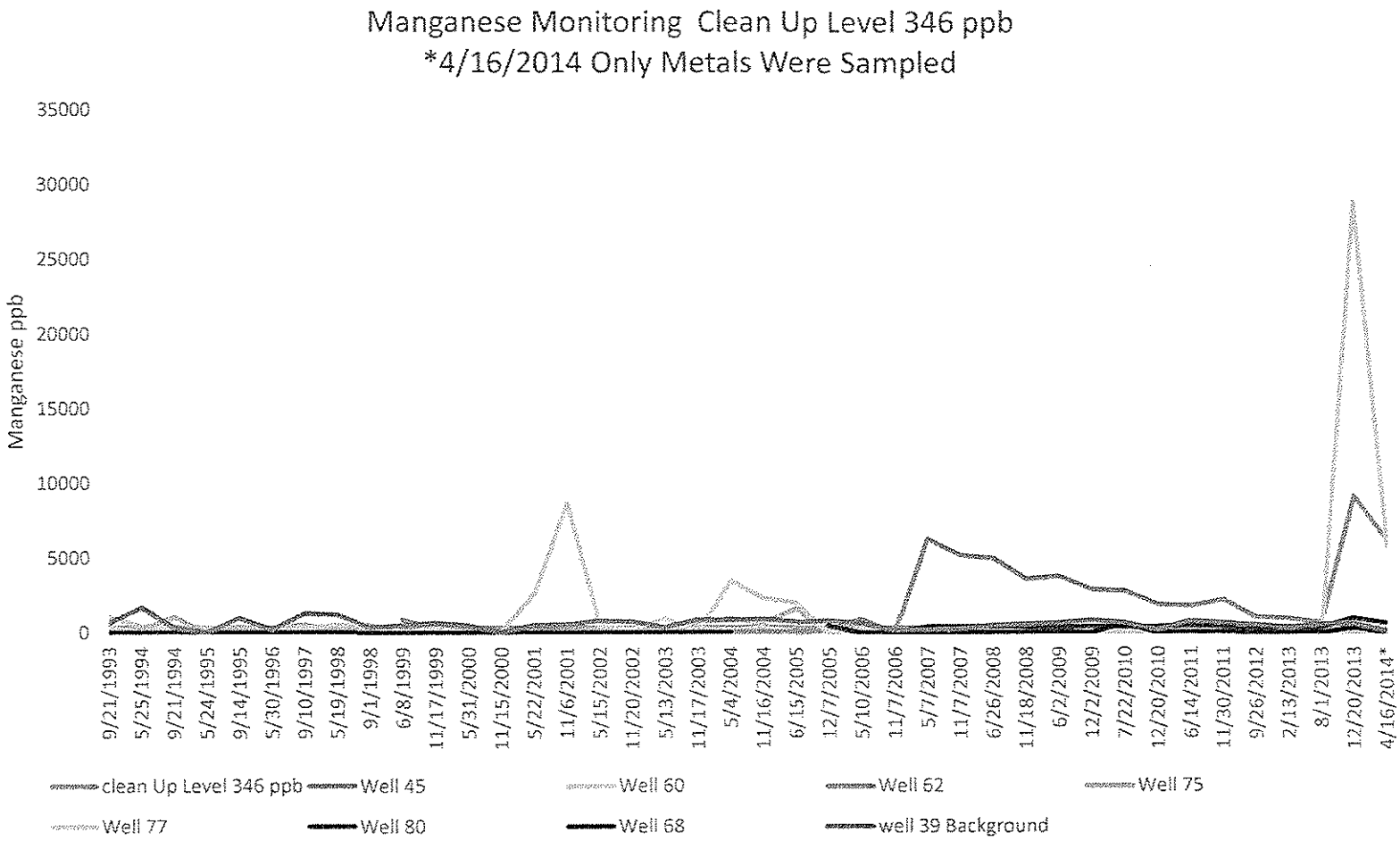

Manganese Monitoring Clean Up Level 346 ppb
*4/16/2014 Only Metals Were Sampled
Manganese ppb
35000
30000
25000
20000
15000
10000
5000
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
11/30/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
4/16/2014*
clean Up Level 346 ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 68
well 39 Background

Chart #2

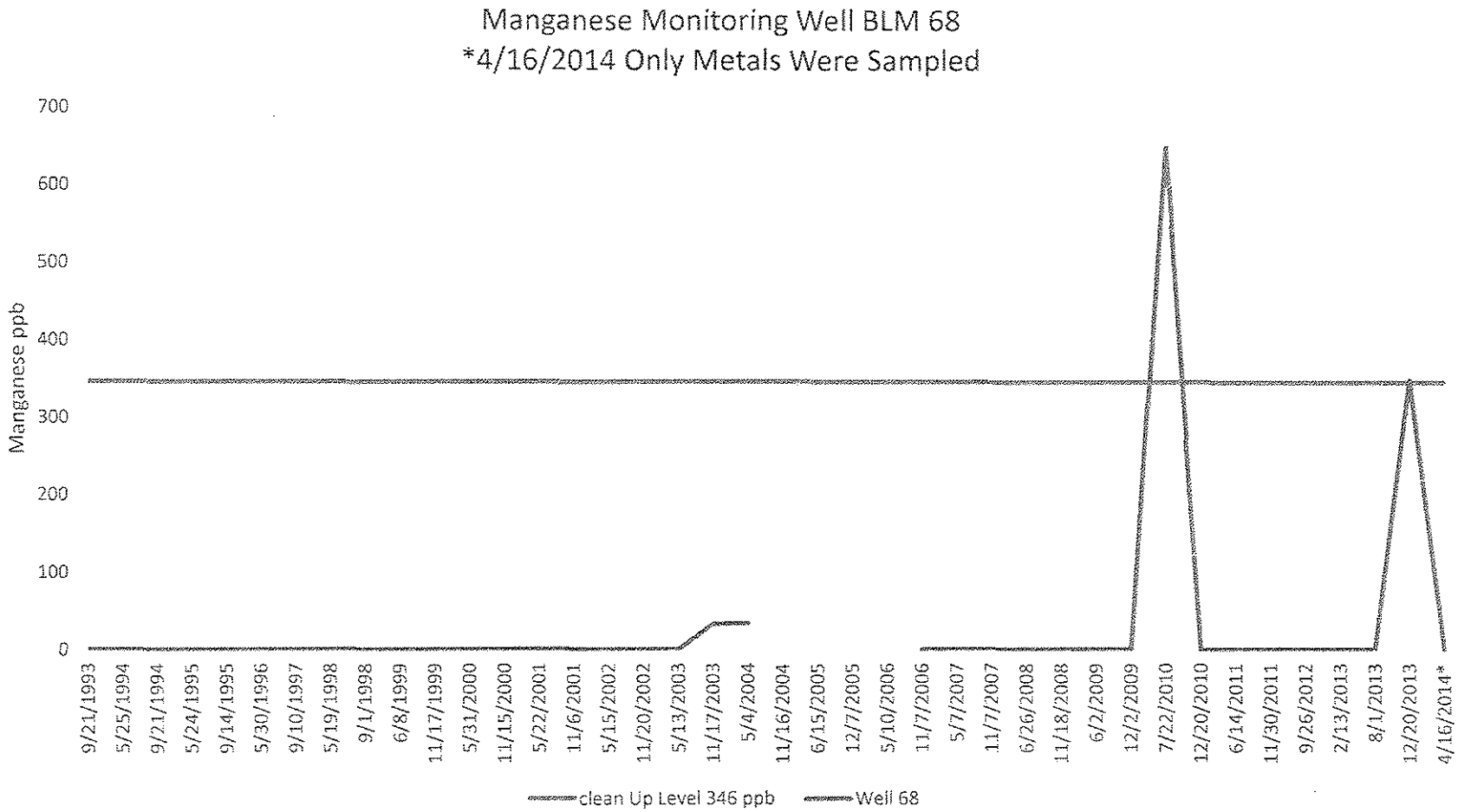

Manganese Monitoring Well BLM 68
*4/16/2014 Only Metals Were Sampled
Manganese ppb
700
600
500
400
300
200
100
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
11/30/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
4/16/2014*
clean Up Level 346 ppb
Well 68

Chart #3

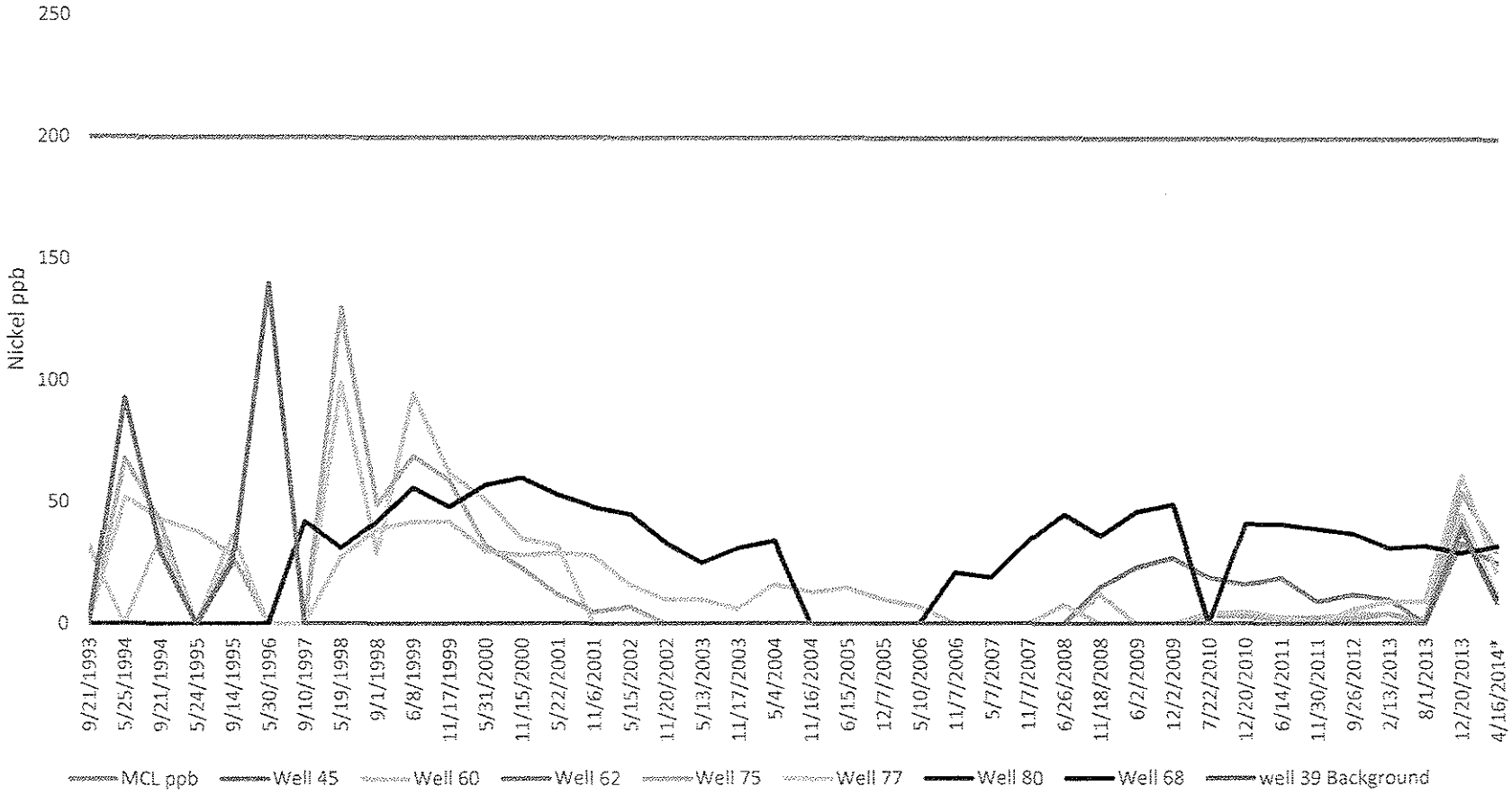

Nickel
Maximum Contaminat Level (MCL) - Clean up Level = 200 ppb
*4/16/2014 Only Metals Were Sampled
Nickel ppb
250
200
150
100
50
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
11/30/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
4/16/2014*
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 68
well 39 Background

Chart #4

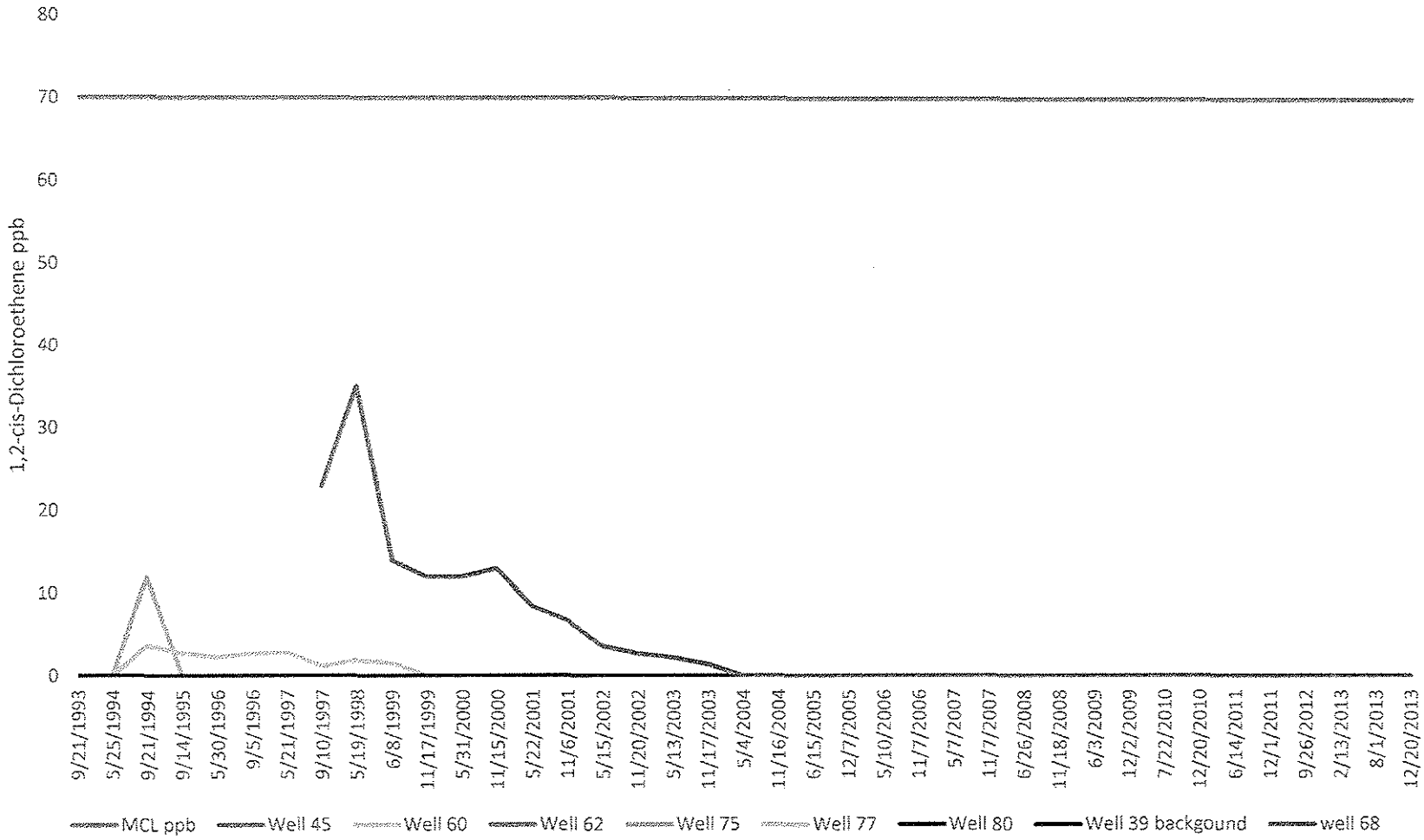

1,2-cis-Dichloroethene
Maximum Contaminat Level (MCL) - Clean up Level = 70 ppb
1,2-cis-Dichloroethene ppb
80
70
60
50
40
30
20
10
0
9/21/1993
5/25/1994
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/3/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
12/1/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart #5

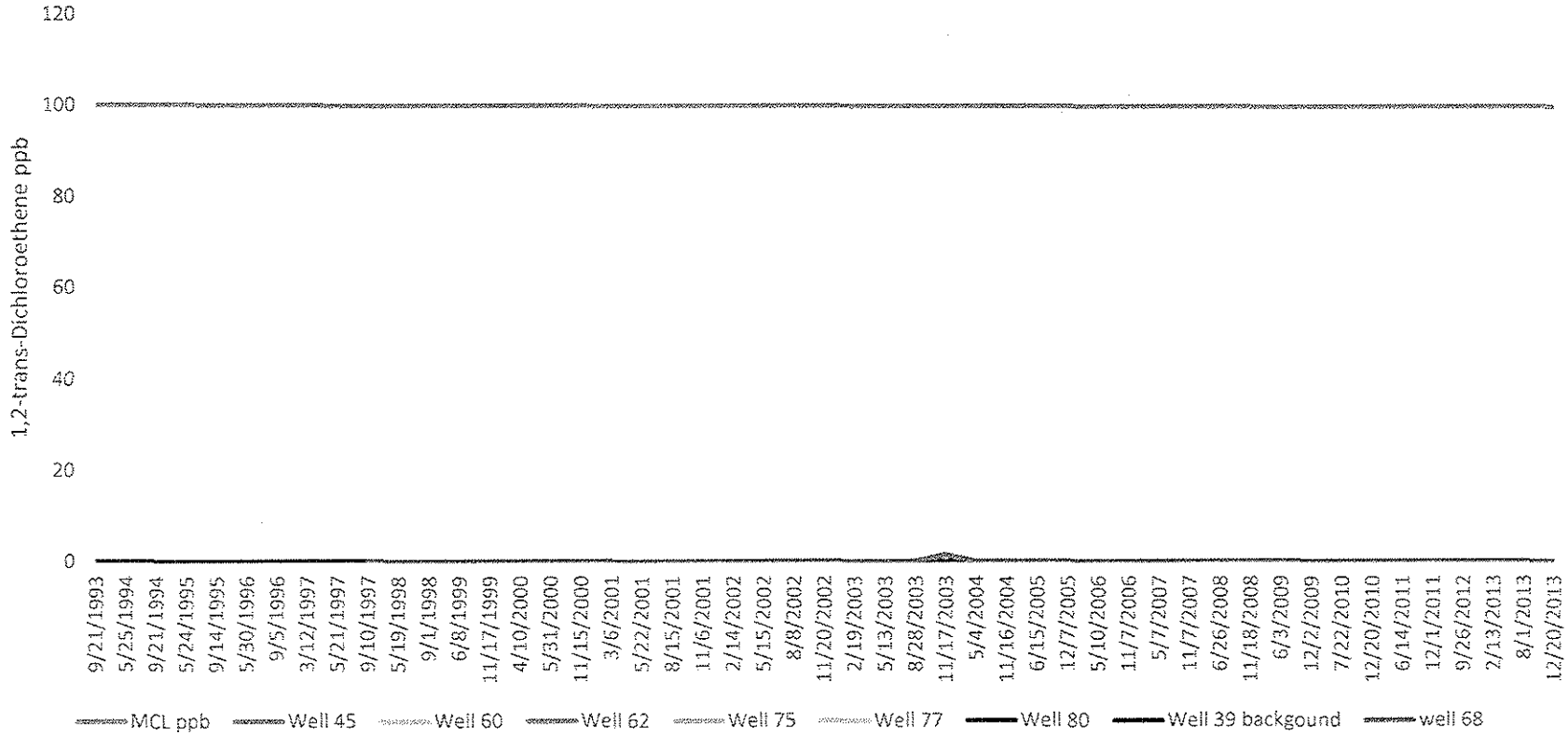

1,2-trans-Dichloroethene
Maximum Contaminat Level (MCL) - Clean up Level = 100 ppb
1,2-trans-Dichloroethene ppb
120
100
80
60
40
20
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
4/10/2000
5/31/2000
11/15/2000
3/6/2001
5/22/2001
8/15/2001
11/6/2001
2/14/2002
5/15/2002
8/8/2002
11/20/2002
2/19/2003
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/3/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
12/1/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart #6

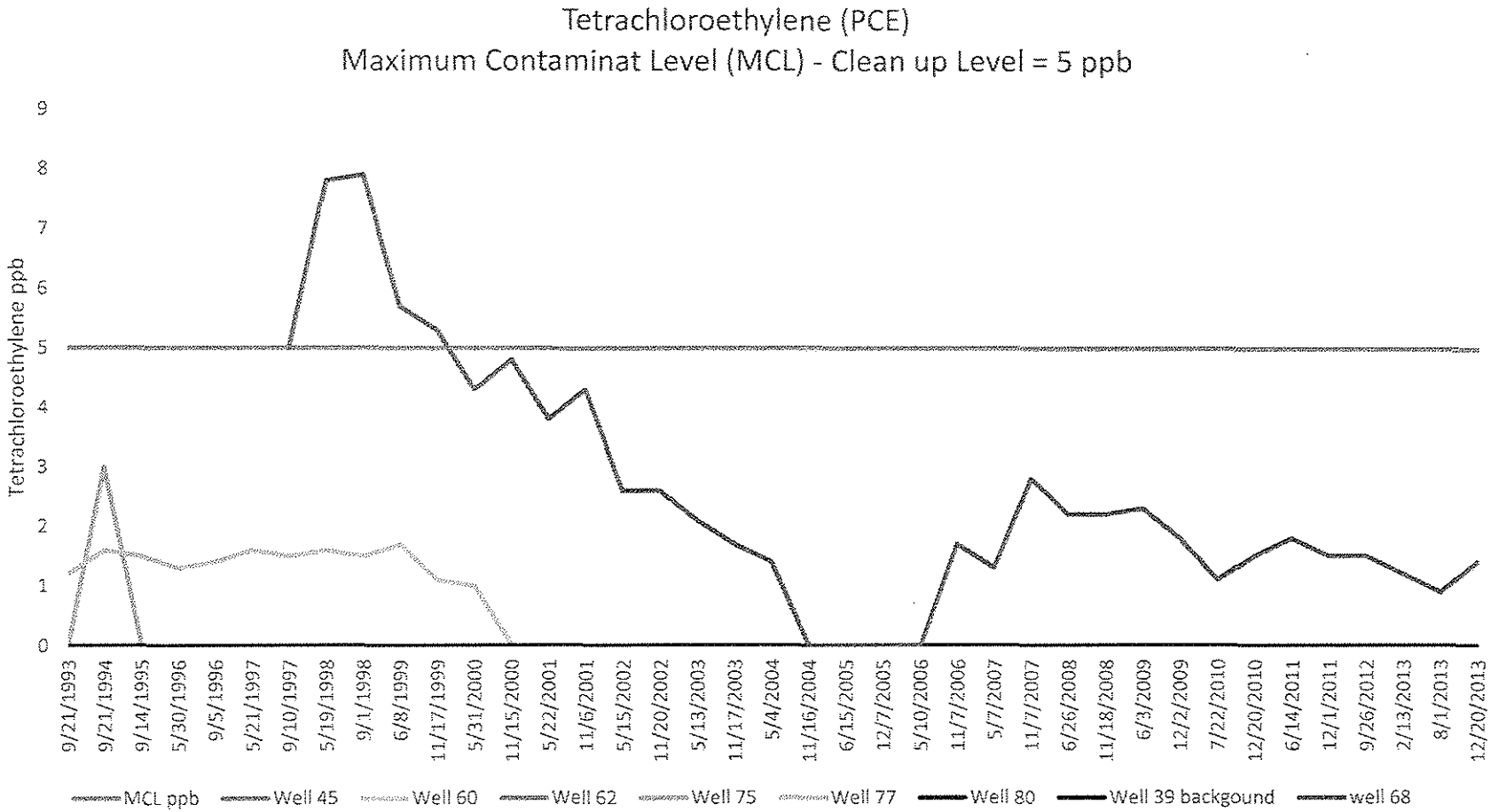

Tetrachloroethylene (PCE)
Maximum Contaminat Level (MCL) - Clean up Level = 5 ppb
Tetrachloroethylene ppb
0
1
2
3
4
5
6
7
8
9
9/21/1993
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/3/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
12/1/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart #7

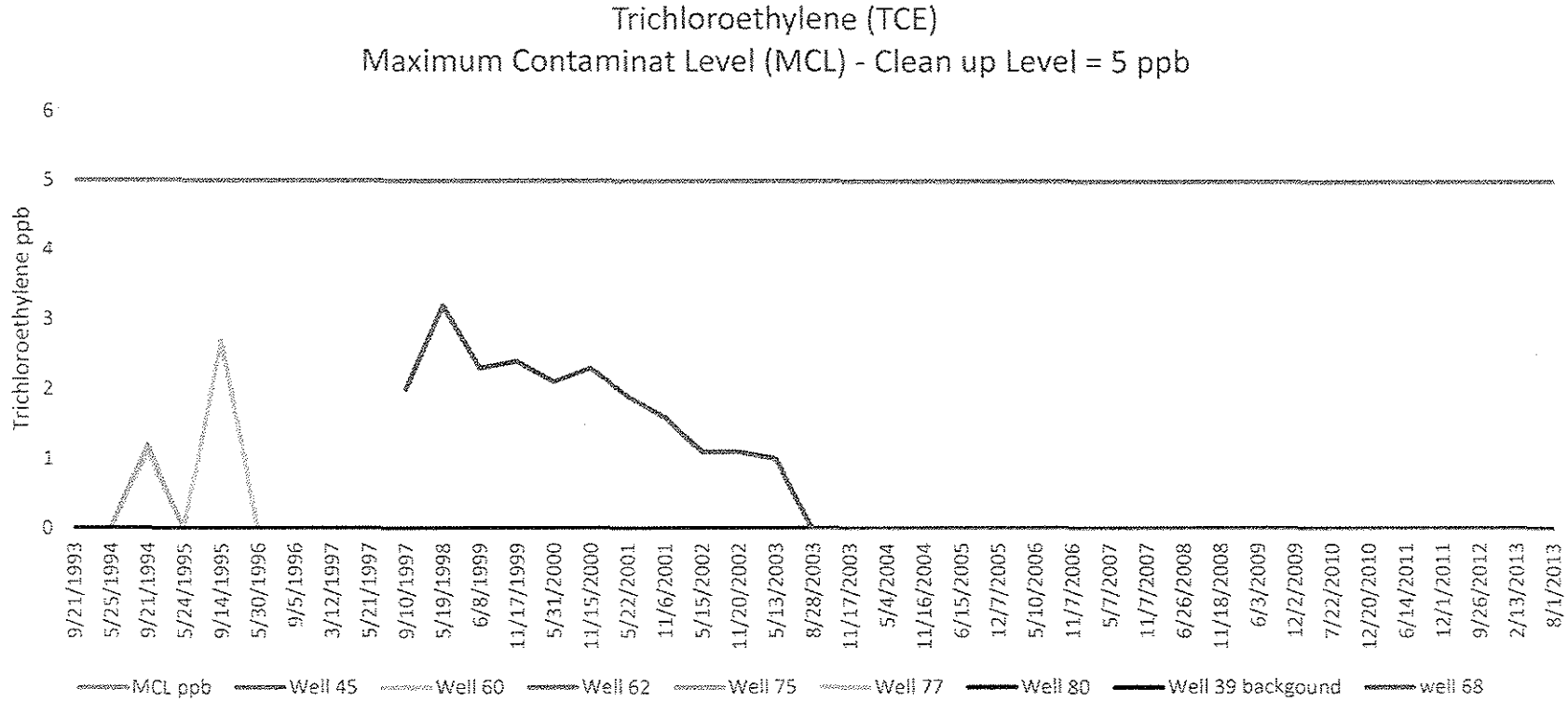

Trichloroethylene (TCE)
Maximum Contaminat Level (MCL) - Clean up Level = 5 ppb
Trichloroethylene ppb
0
1
2
3
4
5
6
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/3/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
12/1/2011
9/26/2012
2/13/2013
8/1/2013
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart #8

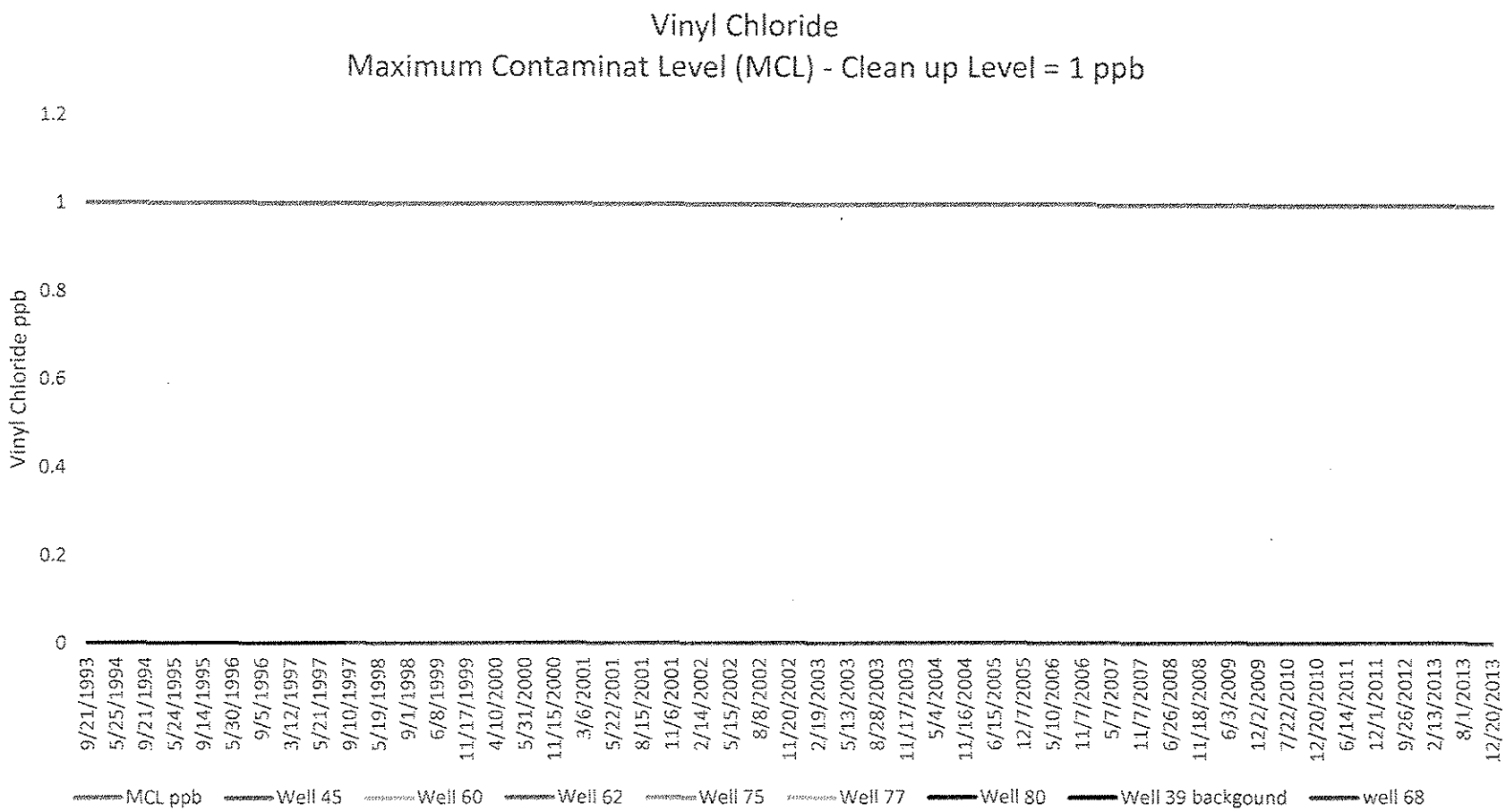

Vinyl Chloride
Maximum Contaminat Level (MCL) - Clean up Level = 1 ppb
Vinyl Chloride ppb
1.2
1
0.8
0.6
0.4
0.2
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
4/10/2000
5/31/2000
11/15/2000
3/6/2001
5/22/2001
8/15/2001
11/6/2001
2/14/2002
5/15/2002
8/8/2002
11/20/2002
2/19/2003
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/3/2009
12/2/2009
7/22/2010
12/20/2010
6/14/2011
12/1/2011
9/26/2012
2/13/2013
8/1/2013
12/20/2013
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart #9

6.5 Interviews

Interviews were conducted with: Dave Keck/San Juan County Public Works Administrator, Fredrick Gebhardt/USGS Water Science Center Hydrologic Technician, Allan Pasteris/Geoscientist - New Mexico Environmental Department – Superfund Oversite, Stephen Dwyer/Contract Engineer, T.J. Richards/San Juan County Compliance Specialist and Public Involvement Coordinator, and Kelly Robinson/Western Refining (GBR) Environmental Engineer with Randy Schmaltz and Allen Hains. Copies of the Interview Record Forms are provided in Attachment 3.

Mr. Dave Keck participated in the interview as the Public Works Administrator for San Juan County. He stated: "As Public Works Administrator, I was responsible for initial construction of the test cap, the main cap, and I am responsible for maintenance and oversight for the entire site including the cap, County Road 350, and the road apron utilized for water run on and run off control. I initiated the idea of building a road (County Road 350) through the site to improve traffic in the county, and to use the road construction to control water run-off and run-on to protect the cap. I was the administrative advisor of the cap construction and attended coordination meetings and site inspections". Mr. Keck said that he had received no calls and no questions from the community concerning the landfill site, and that he felt the landfill cover has performed very well. Mr. Keck thought to project has been highly successful and was proud to have been a part of it.

Mr. Fredrick Gebhardt participated in the interview as a hydrologic technician for the USGS Water Science Center. He began sampling the ground water at Lee Acres in 1993, and became the Lee Acres Sampling Project Manager in 2000. He is responsible for the USGS sampling program at Lee Acres. Mr. Gebhardt said that he thought capillary barrier and the other remedial actions completed at the site have been successful. He also noted that a September 2013 thunder storm event resulted in an increase in groundwater elevation at the site of about two feet, and it appeared that the elevated groundwater may have caused some spikes in manganese levels, but did not result in any other contaminates of concern exceeding cleanup levels. He thought the results of the long term groundwater sampling that he has conducted indicates that the site is ready for closure.

Mr. Allan Pasteris participated in the interview as a geoscientist for the New Mexico Environmental Department – Ground Water Quality Bureau – Superfund Oversight Section. He has been assigned to Lee Acres for 6 months. The Superfund Oversight Section (SOS) assists the U.S. Environmental Protection Agency (EPA) in characterization of inactive hazardous waste sites, and provides management assistance to EPA at Superfund sites listed on the National Priorities List. He reviews the Lee Acres site and associated documents for consistency under the Superfund rules so that actions initiated at Lee Acres are consistent with State of New Mexico rules to ensure protection of human health and the environment.

Mr. Pasteris's major impression was that BLM has continued to fulfill its commitments as established in the ROD, and the actions at the site have made great strides toward achieving the cleanup goals. He was impressed at the level of cooperation between BLM and San Juan County

as they have worked together to insure the betterment of the project. He also thought the implementation of the cap has produced good results in respect to groundwater quality.

Mr. Steven Dwyer participated in the interview as a contract engineer. He helped to conceptualize the use of an engineered capillary barrier (cap) as a remedy to the Lee Acres Landfill, and participated in cap research and development at Sandia National Laboratories. He has attended meetings with the EPA, BLM, and NMED to discuss the appropriateness of the cap, and how it would promote natural attenuation of contaminants that were present within the land fill. He designed the small test cap and had oversight in its construction and monitored the test cap after construction. He assisted the firm of Cheney-Walters-Echols INC to engineer the main cap, reviewed the final plan, and provided construction oversight as construction engineer as the cap was being built. He has been monitoring the cap for the 9 years after the cap was completed.

Mr. Dwyer thought the capillary barrier worked well and has met everyone's expectations, and the desert pavement (gravel and soil composite) has done a good job of stabilizing the surface of the cap. He also stated that the planted native vegetation has grown well on the desert pavement and is now more robust on the cap then on the surrounding areas. He noted that the amount of flux (water flow) through the cap has been lower than the alarm level identified in the ROD and said the cap is working well

Ms. T.J. Richards participated in the interview as the Compliance Specialist and Community Involvement Coordinator for San Juan County. She has been involved with San Juan County administration since 1993, and moved to engineering technician in 1999. She worked with BLM staff and the Engineering Firm of Cheney - Walters – Echols INC to develop the remedial design work plan for the cap and Road 350. Since the cap has been completed, she is responsible for the project compliance and maintenance. She thought the effects to the community have been minimal. The only issue she has noticed is a temporary traffic impediment while USGS (Fred Gebhardt) is monitoring BLM well 68 along the side of County Road 350. USGS monitors the well semi-annually, and sets traffic cones to close the west lane of traffic while a water sample is taken. She drives by the site about 8 to 10 times per month to look at the fence lines, check to see if the erosion controls are working, and look for trash. She is responsible for scheduling any maintenance that may be needed. In the past year, she has scheduled crews to clean up trash and maintain gabion baskets.

T.J. Richards also participated in the interview as the Community Involvement Coordinator. Ms. Richards was assigned the duties of the Community Involvement Coordinator after the original coordinator (Joni Kelsey) came down with a medical emergency. T.J. explained that Joni placed two public notices in the Farmington Daily Times and she placed the third notice after she was assigned Community Involvement Coordinator duties. No public comments were received by Joni Kelsey or T.J. during the Second Five-Year Review process.

Ms. Kelly Robinson participated in the interview as an environmental engineer for Western Refining who now owns the Giant Bloomfield Refining site, and Randy Schmaltz (Health, Safety, Environment and Regulatory Director) and Allen Hains (Manager Remediation Projects) also participated. Robinson, Schmaltz, and Hains are the management team responsible to conduct the remediation program at he closed Giant Bloomfield Refinery which

is located along the southern boundary of the Lee Acres Landfill site. They thought that the Lee Acres site had been well maintained and the capillary barrier and the realignment of County Highway 350 have had a positive impact on the community. They stated that Western Refining has cooperated with the BLM, USGS, NMED Water Quality Bureau, and San Juan County to facilitate the required monitoring activities on the Lee Acres site, and they want to continue to cooperate.

6.6 Site Inspection

BLM coordinated a site inspection of the Lee Acres Landfill on February 19, 2014. The site inspection was attended by representatives from EPA Region 6, NMED, San Juan County, USGS, BLM, Western Refining, and Dr. Stephan Dwyer - a private contractor. Attendees walked the perimeter of the landfill cover and along the water drainage channels constructed down the sides of County Road 350. The purpose of the site inspection was to assess the condition of the landfill cover, the fence surrounding the site, and the water run-on and run-off controls that were engineered into the design of County Road 350. The landfill cover was found to be in excellent condition. The cover soils, embankments, and drainage channels were all in good condition and performing as designed. The vegetation has matured since the First Five-Year review completed in 2009. The quality of the vegetation on the cover is now as good as, or better than the surrounding undisturbed vegetation. There were severe thunderstorms near the site during September 2013. Storm water runoff in the adjacent arroyo had deposited debris around some of the monitoring wells and along the gabion baskets that protect the cover. None of the monitoring wells were damaged and San Juan County maintained the gabion baskets. No excessive erosion was found on the cover during the inspection. Biointrusion activity by native animals and insects was found to be minimal. Burrowing animal intrusion was limited to just a couple of small rodent holes, and there were some ant hills noticed. The fence surrounding the site was in good condition and the gate was locked. The groundwater monitoring wells around the perimeter of the landfill cover were in good condition and the well casings were covered and locked. There was no evidence of the site being vandalized or disturbed by the public. No issues concerning the condition of the landfill cover, water run-on and run-off controls, County Road 350, or the fence were identified. Institutional controls consisting of BLM withdrawal of the Lee Acres Landfill site and buffer area around the site from settlement, sale, location, or entry remains in force, and is effective until 2047. The Site Inspection Check List is presented in Attachment 4.

7.0 Technical Assessment

The five-year review is intended to evaluate whether the remedy at the site is still protective of human health and the environment. The EPA guidance describes three questions used to provide a framework for organizing and evaluating data and information and to ensure all relevant issues are considered when determining the protectiveness of a remedy. These questions are assessed for the Lee Acres Landfill site in the following paragraphs. A conclusion of the technical assessment is presented at the end of the section.

Question A: Is the remedy functioning as intended by the decision documents?

Review of recent groundwater monitoring data, site access restrictions, and cap integrity indicate

that the remedy is functioning as intended. Groundwater monitoring has shown that concentrations of the COC identified in the ROD have remained below all MCLs in the groundwater monitoring well network. Manganese, a COC at this site, does not have a primary health-based MCL but instead has a non-enforceable aesthetic-based secondary maximum contaminant level (SMCL; 50 ppb) under the SDWA. The EPA has developed a risk-based concentration for manganese of 430 ppb (Table 1), which has been included in other RODs as a health-based remedial goal. The Lee Acres ROD includes an enforceable limit (i.e., 346 ppb) for manganese based upon the NMWQCC regulation (Part 3-101.2) requiring cleanups to attain the background concentration level. Ground water sampling for manganese shows that manganese has not attained the cleanup levels required under the ROD in all monitoring wells. Manganese levels have been erratic in some monitoring wells; including background well 39 which is upgradient of the landfill. Manganese has averaged 609 ppb in well 39 since 1993, and monitoring results for manganese in well 39 have been erratic with no observable trend. The remedy intended by the decision document is functioning for all contaminants except manganese. Manganese levels appear to be influenced by non-site related sources. BLM will consult with EPA and NMED to determine if an appropriate regulatory process should be pursued to amend the manganese cleanup level (Appendix #5).

San Juan County constructed the landfill cover, a chain link fence, and realigned County Road (CR) 5569 through the landfill site to complete County Road 350 (Figure 4). The County is responsible for maintaining these improvements. Maintenance activities performed by the County to date include re-seeding the landfill cover, repairing damage to the fence along CR 350 caused by a minor traffic accident, removing loose trash and tumble weeds from the landfill cover and fence line, and maintain erosion control gabion baskets located along wash (Table 2). Per the ROD, BLM as the lead Agency responsible for implementation of the selected remedy is responsible for ensuring that all operations and maintenance activities are properly conducted. BLM and San Juan County have closely cooperated during all aspects of operation and maintenance activities since the completion of construction. The average cost of operations and maintenance since construction completion has been approximately $993.25 per year. Future costs for operations and maintenance are expected to be within a range of $200 to $3,000 per year. BLM is responsible for maintaining the monitoring wells; no maintenance has been required on monitoring wells since the completion of the landfill cap.

A review of the semi-annual cap inspections, including the most recent inspection on July 2, 2014 show that the cap is functioning as designed. ***The answer to Question A is yes – the remedy is functioning as intended.***

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

Land Use and Exposure Assessment:

1. Has land use or expected land use on or near the site changed (*e.g.*, industrial to residential, commercial to residential)? Land use at the Site remains the same as projected in the ROD and the previous Five Year Review. There is no routine human activity at the site other than occasional site monitoring and cap inspection; access restrictions remain in place. The Site is fenced and the cap is inspected semi-annually and is in good operating condition. The Site was

capped with 5 feet of soil as part of the original remedy, leaving no contaminants of concern on the ground surface. County road (CR 350) was constructed adjacent to the cap of the Landfill, however there is no access from the road to the cap due to fencing. The addition of CR 350 does not alter the exposure scenarios used in assessing the protectiveness of the remedy.

2. Have any human health or ecological routes of exposure or receptors changed or been newly identified (*e.g.*, dermal contact where none previously existed, new populations or species identified on site or near the site)? There has been no change in the exposure status for human or ecological receptors at the site. The exposure pathways for current and hypothetical receptors presented in the 1995 RI, Chapter 8, Human Baseline Risk Assessment included: ingestion of groundwater, inhalation of volatile chemicals while showering, inhalation of volatile chemicals associated with groundwater within the house, dermal absorption of chemicals while showering, and inhalation of chemicals in outdoor air. In the risk assessment, a future resident was assumed to reside in a downgradient area directly adjacent to the former landfill and that the resident's water supply comes from either the bedrock aquifer or the shallow/deep alluvial aquifer (RI page 8-30). These exposure pathways are still considered possible (although unlikely); BLM has withdrawn the Lee Acres Landfill site from settlement, sale, location, or entry (Fed. Reg. Jan 15, 1997), effective until 2047. Because of the five feet of soil cover and improving groundwater conditions due to natural attenuation, risk to future onsite trespassers or offsite receptors is deemed insignificant.

3. Are there newly identified contaminants or contaminant sources? There are no newly identified contaminants or sources at the site. The land downgradient of the site and north of U.S. Highway 64 is owned by Giant Bloomfield Refinery and has had groundwater contamination associated with releases from the Refinery. GBR is currently undergoing post-remediation groundwater monitoring under the direction of the State of New Mexico Oil Conservation Division.

4. Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents (*e.g.*, byproducts not evaluated at the time of remedy selection)?
No unanticipated toxic byproducts of the remedy have been identified.

ARARs, Toxicity and Cleanup Levels
The Five-Year Guidance contains the following questions:

1. Are there changes in the standards identified as ARARs in the ROD that bear on the protectiveness of the remedy? Table 3 shows the important chemical-specific ARARs for the site as published in the ROD, the 2009 Five-Year Review, and the current Five-Year Review. Are there newly promulgated standards that might apply or be relevant and appropriate to the site and that bear on the protectiveness of the remedy? The ARARs were reviewed and no newly promulgated standards were identified as ARARs.

2. Are there changes in to-be-considered standards (TBCs) identified in the ROD that bear on the protectiveness of the remedy? No TBCs were identified in the ROD. The basis for each cleanup level identified in the ROD is shown in Table 1. The EPA has replaced the risk-based preliminary remediation goals (PRGs) shown in Table 1 with risk-based regional screening

levels (RSLs; EPA, 2014).The RSLs for most of the COCs have changed (some higher, some lower) since the original ROD and the previous Five Year Review, as shown in Table 1.

Have there been changes to the basis of the cleanup levels? There have been no changes to site groundwater cleanup levels.. The Ssite cleanup levels (Table 1) are a combination of NMWQCC Standards, EPA Primary MCLs, and the background concentration of manganese. The selected remedy remains protective of human health and the environment. The statutory determination in the ROD states the goal that the selected remedy for the groundwater pathway will attain ARARs within a reasonable time frame not to exceed the groundwater monitoring period of 30 years. In fact, the remedy has attained all ARARs (except manganese in some wells) since the ROD was signed in 2004.

3. Have physical site conditions changed such that protectiveness may be affected (*e.g.*, changes in anticipated direction or rate of groundwater flow)? Has understanding of physical site conditions changed (*e.g.*, identification of a new groundwater divide)? No new information has come to light on physical site conditions or the direction of groundwater flow. There are no anticipated impacts to the effectiveness of the Site remedy based on changes in physical conditions or groundwater flow.

4. Have toxicity factors for contaminants of concern at the site changed? Yes; EPA has updated the toxicity values for a number of COCs since the ROD and the previous Five Year Review were published. Updated chemical-specific toxicity values are presented in Table 4. However, the changes in toxicity factors and their corresponding RSLs (Table 1) have not impacted the risk assessment conclusions, since all groundwater exposure pathways are incomplete. There have been no changes to the cleanup levels presented in the ROD.

5. Have other contaminant characteristics changed? No changes have been identified.

6. Have ecological toxicity reference values and/or ecological "no observed adverse effect levels/lowest observed adverse effect" (NOAELs/LOAELs) levels changed? The exposure potential for most ecological receptors is considered minimal to nonexistent. The site has been capped with coarse material to discourage burrowing; native vegetation has been planted on the surface to help maintain the cap integrity. Recent inspection does not show any animals larger than insects, small lizards, or small rodents burrowing into the cap. The cap is fenced to minimize large animal activity. Because ecological receptors have no direct exposure to any site groundwater COCs, there are no ecological toxicity or exposure values that need to be updated.

For Lee Acres, the changes in toxicity criteria and EPA's risk-based screening levels do not constitute a change in any of the formal standards, site risks, or cleanup levels. None of the MCLs, New Mexico water quality standards, or project cleanup levels has changed since the last Five Year Review.

This Five Year Review confirms that the basis for selection of exposure and toxicity for site COCs has not changed appreciably since the ROD and the remedy remains protective for human health and ecological receptors. With the exception of the updated RSLs in Table 1 and toxicity values in Table 4, there are no changes in the risk assessment for the site.

Remedial Action Objectives (RAOs):
As part of the five-year review, the EPA Guidance (2001) requires an evaluation of the RAOs stated in the ROD to determine whether the remedy is meeting RAOs.

The RAOs for the potential soil pathway are:

- Reduce or eliminate the potential for future leaching of contaminants from the landfill to ground water by preventing moisture infiltration.
- Reduce or eliminate the potential for future direct exposure to contaminated soil and waste.
- Reduce or eliminate the potential for future migration of contaminants through storm water run-off or erosion.

The RAOs for ground water are:

- Elimination or significant reduction of the risk posed by elevated manganese levels in ground water by eliminating access to the ground water.
- Reduction of levels of manganese, nickel, 1,2-DCE, PCE, TCE, and VC to comply with ARARs.

Based on groundwater monitoring results and landfill cap inspections, the remedy is meeting the RAOs for all COCs with the exception of manganese.

Question B asked whether the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection are still valid. ***Since the manganese levels have not attained the cleanup level of 346ppb established in the ROD, and due to the level of manganese in the upgradient background well #39 has averaged 609ppb since 1993, the cleanup levels determined in the ROD for manganese does not appear to be valid. The answer to Question B is no. All other exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection remain valid.***

Table 3: Primary ARARs for Groundwater at Lee Acres

Contaminant	ROD Cleanup Level (µg/L) and Basis	Source	EPA MCL[a] (µg/L)	NMWQCC[b] (µg/L)
Manganese[a]	346 (background)	ROD	50	200
		2009 5YR	50	200
		2014 5YR	**50**	**200**
Nickel[a]	200 (NMWQCC)	ROD	NA	200
		2009 5YR	NA	200
		2014 5YR	**NA**	**200**
1,2 –cis-Dichloroethene	70 (MCL)	ROD	70	part 101z
		2009 5YR	70	700
		2014 5YR	**70**	**NA**
1,2-trans-Dichloroethene	100 (MCL)	ROD	100	part 101z
		2009 5YR	100	25
		2014 5YR	**100**	**NA**
Tetrachloroethene	5 (MCL)	ROD	5	20
		2009 5YR	5	6.9
		2014 5YR	**5**	**20**
Trichloroethene	5 (MCL)	ROD	5	100
		2009 5YR	5	25
		2014 5YR	**5**	**100**
Vinyl Chloride	1 (NMWQCC)	ROD	2	1
		2009 5YR	2	20
		2014 5YR	**2**	**1**

NA: not available

[a]EPA 2014: Regional Screening Levels (RSL) Table; May.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/master_sl_table_run_MAY2014.pdf

[b]New Mexico Water Quality Control Criteria, Human Health Standards 2014: June.
http://www.nmcpr.state.nm.us/nmac/parts/title20/20.006.0002.htm

[c]Secondary MCL, based on aesthetics, not health protection

Table #3

Table 4: Changes in Chemical-Specific Toxicity Standards

Contaminant	ROD Cleanup Level (µg/L) and Basis	Source	Noncancer Reference Dose (RfD), mg/kg-day	Oral Cancer Slope Factor, CSFo, $(mg/kg\text{-}day)^{-1}$	Citation
Manganese	346 (background)	ROD	5.0E-03	NA	2009 5YR
		2009 5YR	1.4E-01	NA	2009 5YR
		2014 5YR	**1.4E-01**	**NA**	EPA 2014
Nickel[a]	200 (NMWQCC)	ROD	2.0E-02	NA	2009 5YR
		2009 5YR	2.0E-02	NA	2009 5YR
		2014 5YR	**2.0E-02**	**NA**	EPA 2014
1,2 –cis-Dichloroethene	70 (MCL)	ROD	1.0E-02	NA	2009 5YR
		2009 5YR	withdrawn	NA	2009 5YR
		2014 5YR	**2.0E-03**	**NA**	EPA 2014
1,2-trans-Dichloroethene	100 (MCL)	ROD	2.0E-02	NA	2009 5YR
		2009 5YR	withdrawn	NA	2009 5YR
		2014 5YR	**2.0E-02**	**NA**	EPA 2014
Tetrachloroethene	5 (MCL)	ROD	1.0E-01	5.2E-02	2009 5YR
		2009 5YR	1.0E-02	withdrawn	2009 5YR
		2014 5YR	**6.0E-03**	**2.1E-03**	EPA 2014
Trichloroethene	5 (MCL)	ROD	1.0E-02	1.1E-02	2009 5YR
		2009 5YR	withdrawn	withdrawn	2009 5YR
		2014 5YR	**5.0E-04**	**4.6E-02**	EPA 2014
Vinyl Chloride	1 (NMWQCC)	ROD	not listed	not listed	2009 5YR
		2009 5YR	3.0E-03	1.0E-01	2009 5YR
		2014 5YR	**3.0E-03**	**7.2E-01**	EPA 2014

NA: not applicable, not a carcinogen by the oral exposure route

[a]Evaluated as nickel soluble salts; value not available for elemental nickel

EPA 2014: Regional Screening Levels (RSL) Table; May.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/master_sl_table_run_MAY2014.pdf

Table #4

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

EPA's Five-Year Review Guidance (2001) requires consideration of any other information that comes to light that could call into question the protectiveness of the remedy, such as ecological risks, flood boundaries and land use changes that are being considered by local officials. No information of this type has been identified.

Conclusion:

Based on the responses to Questions A, B and C, there have been no changes to exposure pathways, toxicity factors, ARARs, chemicals of concern, land use, RAOs that require a new risk assessment. Inspections of the cap and the groundwater monitoring show the remedy is protective and is working. The remedy is considered protective in the short-term because institutional controls are in place, and therefore, there is no current or potential exposure. Follow-up actions are necessary to address long-term protectiveness to ensure RAOs continue to be met. Because the remedial actions at the Lee Acres Landfill are protective, the site is protective of human health and the environment. The remedy is working as intended and is effective at providing long-term protectiveness for human health and the environment.

8.0 Issues

Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision documents for all COCs except manganese.

9.0 Recommendations and Follow-Up Actions

1. The monitoring schedule in the ROD and Remedial Action Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. The first required five year monitoring period was completed in the fall of 2010. BLM has continued semi-annual monitoring since the completion of the First Five-Year Review. BLM recommends that the landfill cover continues be monitored semi-annually through completion of an existing monitoring contract in 2015, and then annually until other monitoring requirements may be established in conjunction with site deletion from NPL.

2. The groundwater monitoring schedule in the Work Plan requires the semi-annual monitoring of eight specified wells for a period of five years after completion of construction. This five year monitoring period was completed in the fall of 2010. BLM continues to monitor groundwater semi-annually. BLM recommends that quarterly monitoring for a total of eight quarters be initiated in 2015 to comply with regulations found at NMAC 20.6.2.4103 D. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if continued monitoring of the six contaminates of concern regulated by the SDWA is warranted. Over the years, groundwater monitoring results for manganese have been erratic. The Manganese levels appear to be influenced by upgradient background levels and unrelated to the site. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if

an appropriate regulatory process should be pursued to amend the manganese cleanup level (Appendix #5).

10.0 Protectiveness Statement

The remedial actions performed at the site were evaluated for this Five-Year Review and are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes and reduced the potential mobility of contaminant sources that may remain on the Site. The 23_{rd} monitoring inspection of the cover was completed on July 2, 2014. The summary of the July 2, 2014 report stated the cover is in excellent condition. Groundwater data collected from eight monitoring wells indicate that all COCs are below their respective MCLs and limits specified in the ROD except for manganese.

11.0 Next Review

A third five-year review will be completed in October 2019 if the contamination at the Site remains above levels that prevent unlimited use and unrestricted exposure as specified in 40 C.F.R. § 300.430(f)(4)(ii).

12.0 References

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U.S. Environmental Protection Agency (EPA). 2004. Record of Decision for the Lee Acres Landfill Superfund Site, Farmington, New Mexico. May.

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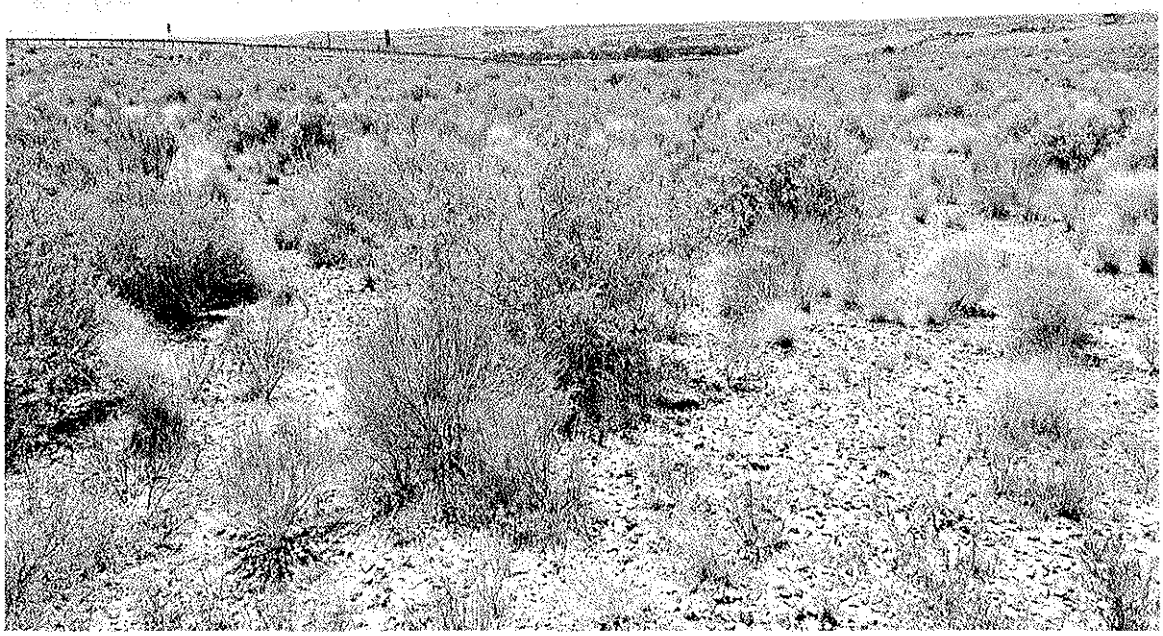
ATTACHMENT 1

Landfill Cover Monitoring Report July 2, 2014

Lee Acres CERCLA Cover System, Farmington, NM

Post-Construction Monitoring Report



Inspection date: July 2, 2014

Submitted to: *Dale Wirth*
US Department of Interior
Bureau of Land Management, Farmington Field Office
1235 La Plata Highway
Farmington, NM 87401

Submitted by: *Stephen F Dwyer, PhD, PE*
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Summary:

This report summarizes the monitoring inspection performed on July 2, 2014 of the Lee Acres Superfund Closure cover system (EPA ID# NMD980750020). The surface of the cover is in excellent condition. The cover soils, embankments, and drainage trenches were all in good condition. The vegetation at the site was in excellent condition nearing a mature state.

The flux measured during this inspection for both the north and south lysimeters was zero. The rolling annual flux rate for both lysimeters is zero. Refer to Table 1 for details of percolation measurements obtained to date. The Lee Acres Landfill Remedial Action Work Plan and Remedial Design prepared by the Department of Interior, Bureau of Land Management stated in appendix E that the alarm level for the measurement of flux via the installed lysimeters is 1.3 mm/year.

Site Name: **Lee Acres Landfill**	Date of Inspection: **July 2, 2014**
City: **Farmington**	Weather: **Warm, sunny**
State: **New Mexico**	Temperature: **90s**
EPA Region: **6**	Site Map: **Figure 1**
Inspector: **Stephen F Dwyer, PhD, PE**	ID#: **NMD9870750020**
Prior Monitoring Performed: See Table 1 @ end of report	

ITEM	REMARKS
COVER SYSTEM (Capillary Barrier)	
1. SETTLEMENT (LOW SPOTS) Yes ( ) No (**X**) Areal Extent: none Depth: none	No settlement or evidence of ponding in cover noted.
2. CRACKS Yes ( ) No (**X**) Length: none Width: none Depth: none	No significant surface cracking seen on cover.
3. EROSION Yes (...) No (**X**) Areal Extent: no new erosion noted Depth: NA	There is no new significant erosion noted on the site. The gravel admixture surface layer of the cover was designed for this purpose – to allow for minimal erosion of the uppermost fine material leaving behind the gravel on the surface, thus forming a surface armor referred to as a 'desert pavement' (Picture 2). The steeper side slope along the eastern perimeter of the cover adjacent to Highway 350 had some silt erosion that was deposited in the drainage trench (Picture 9) at its base (Picture 10). The silt deposits are within tolerable limits

ITEM	REMARKS
4. BIOINTRUSION Yes (X) No ( ) Areal Extent: minimal Depth: shallow Suspected Cause: Small Animal and Insect	There is minimal biointrusion activity (ants and small animals) found on the cover. There were minimal burrow holes found during this inspection by small mammals (Picture 8).
5. VEGETATIVE COVER Yes (X) No ( ) Grass: Yes (X) No ( ) Shrubs Yes (X) No ( ) Weeds: Yes (X) No ( ) – some tumbleweeds Other: Yes (X) No ( ) – wildflowers, yucca and cacti Condition: excellent Size: Approaching mature state.	The cover's vegetation appears mature (Pictures 1, 3, 5, 6, 7, and 13). The seeded vegetation is in excellent condition. Non-seeded local native vegetation is beginning to establish on the site such as cacti.
6. GRAVEL/SOIL ADMIXTURE COVER SURFACE Yes (X) No ( ) Material Type: soil mixed with gravel Condition: Excellent	The gravel/soil surface admixture is in good shape and performing as designed with evidence of a stable 'desert pavement' formation (Picture 2).
7. WET AREAS Yes ( ) No (X) Ponding: Yes ( ) No (X) Areal Extent: NA Estimated Flow Rate: none Soft Subgrade: Yes ( ) No (X) Areal Extent: none	The cover surface soil was very dry. No evidence of ponding was seen on the cover surface.
9. SLOPE INSTABILITY Yes ( ) No (X) Slides: Yes ( ) No (X) Areal Extent: none Probable Slide Interface: none Suspected Cause: NA Exposed Cover Components: none	Slopes along the roadway appear in good shape with no signs of instability (Picture 10). These slopes were compacted to high densities for strength in road construction. Gentler slopes along the perimeter of the cover system are in good shape (Picture 4). These slopes were covered with a gravel mulch to minimize erosion along the perimeter of the cover.
10. GEOTEXTILE EXPOSED Yes ( ) No (X) Type: geotextile filter fabric Areal Extent: none	none

ITEM	REMARKS
11. SOUTHEAST CLOSURE SECTION – EAST OF ROAD Condition: Excellent	This cover is surrounded by a fence with locked gate. This cover section is in excellent condition (Picture 13). Vegetation is well established with no signs of significant erosion, excessive biointrusion or stability issues.
FLUX MEASURMENTS FROM LYSIMETERS	
1. LYSIMETER FUNCITONING PROPERLY Yes (**X**) No ( ) Description of problem: none	There was no percolation produced from either lysimeter during this inspection. There was no visual evidence of damage to either lysimeter. Both lysimeter drainage valves worked properly.
1a. NORTH LYSIMETER Yes (**X**) No ( ) Description of problem: none	
1b. SOUTH LYSIMETER Yes (**X**) No ( ) Description of problem: none	
DRAINAGE CHANNELS	
1. SETTLEMENT Yes ( ) No (**X**) Areal Extent: none Depth: none	All drainage channels are in good shape. Acceptable levels of silt are found in the interior drainage trenches (Picture *9*).
2. MATERIAL DEGRADATION Yes ( ) No (**X**) Material Type: Areal Extent: none Degree of Degradation: none	
3. EROSION Yes ( ) No (**X**) Areal Extent: minimal, no new erosion noted Depth: minimal	
4. UNDERCUTTING Yes ( ) No (**X**) Areal Extent: none Depth: none	
5. OBSTRUCTIONS Yes ( ) No (**X**) Type: none Areal Extent: none Size:	
6. SLOPE INSTABILITY Yes ( ) No (**X**) Type: none Areal Extent: none	

ITEM	REMARKS
COVER PENETRATIONS	
1. LYSIMETER ACCESS VALVE Yes (**X**) No ( ) Functioning: Yes (**X**) No ( ) Condition: Good	There are 2 valve access ports that penetrate the cover profile; one for each lysimeter. These ports allow access to the cutoff valves for the 2 lysimeters installed to monitor the flux through the cover. They are made of PVC pipe and are in excellent condition at this time. These cover penetrations are in good shape and do not appear to be allowing preferential flow through the cover.
PERIMETER DITCHES/OFF-SITE DISCHARGE	
1. SILTATION Yes ( ) No (**X**) Areal Extent: minimal, *no new* siltation noted Depth: minimal	The perimeter ditches and off-site drainage trenches appear to be working properly. There was some silt remaining in the perimeter ditch along the eastern edge of the cover (Picture 9).
2. VEGETATION GROWTH Yes (**X**) No ( ) Areal Extent: full coverage Type: Shrub, grasses and forbs with minimal weeds.	Vegetation has matured. The surface vegetation appears to be a success at this time.
3. EROSION Yes ( ) No (**X**) Areal Extent: minimal, *no new* erosion noted Depth: minimal	No significant erosion noted on site.
4. DISCHARGE STRUCTURE Yes (X) No ( ) Functioning: Yes (X) No ( ) Condition: Good	The culverts located in cross drainage trenches above and below the Lee Acres cover site appeared to be working properly.
5. CULVERT Yes (**X**) No ( ) Material Type: Corrugated metal culverts direct drainage from the east side of the road to the arroyo located west of the landfill site. There are two culverts: one located north of the site and one located south of the site.	The culverts located in cross drainage trenches above and below the Lee Acres cover site appeared to be working properly.
FENCING	

ITEM	REMARKS
1. FENCING DAMAGE Yes ( ) No (**X**) Description of damage: none	The chain link fence around the perimeter of the site is in excellent condition (Pictures 11, 12 and 13).
ROADS	
1. ROAD DAMAGE Yes ( ) No (**X**) Location: Bisects landfill (figure 1) Description of damage: none Impact to Closure: Yes ( ) No (**X**) Description of Impact: Helps by redirecting up-gradient surface runoff away from landfill source locations.	The road (County Highway 350) is generally in good condition (Pictures 11 and 14). There is evidence of settlement noted in the roadway that corresponds with buried debris the road was constructed over (Picture 14). This settlement appears to create a low spot in the roadway. The San Juan County Manager verbally informed me at the site closure's 5-year CERCLA review in April 2014 the roadway will be repaired to eliminate the low spot.
SITE ACCESS	
1. ACCESS RESTRICTIONS Yes (**X**) No ( ) Description: Chain link fence and locked gate.	The site is currently secured with chain link fencing (Picture 11, 12, and 13). Access is limited by a locked gate. All are in excellent condition.
GENERAL	
1. VANDALISM Yes ( ) No (**X**) Description of damage: none	none
2. CHANGED SITE CONDITION Yes ( ) No (**X**)	No degradation noted. Vegetation has improved.
3. LAND USE CHANGE Yes ( ) No (**X**) Description: none	none
3. Other Yes ( ) No (**X**) Description:	.
INTERVIEWS	
1. INTERVIEW ON-SITE WORKERS Yes ( ) No (**X**) Problems: none Suggestions: none Attach report: NA	none

ITEM	REMARKS
2. INTERVIEW NEIGHBORS Yes ( ) No (**X**) Problems: none Suggestions: none Attach report: none	none
3. INTERVIEW LOCAL OFFICIALS Yes ( ) No (**X**) Problems: none Suggestions: none Attach report: none	NA.

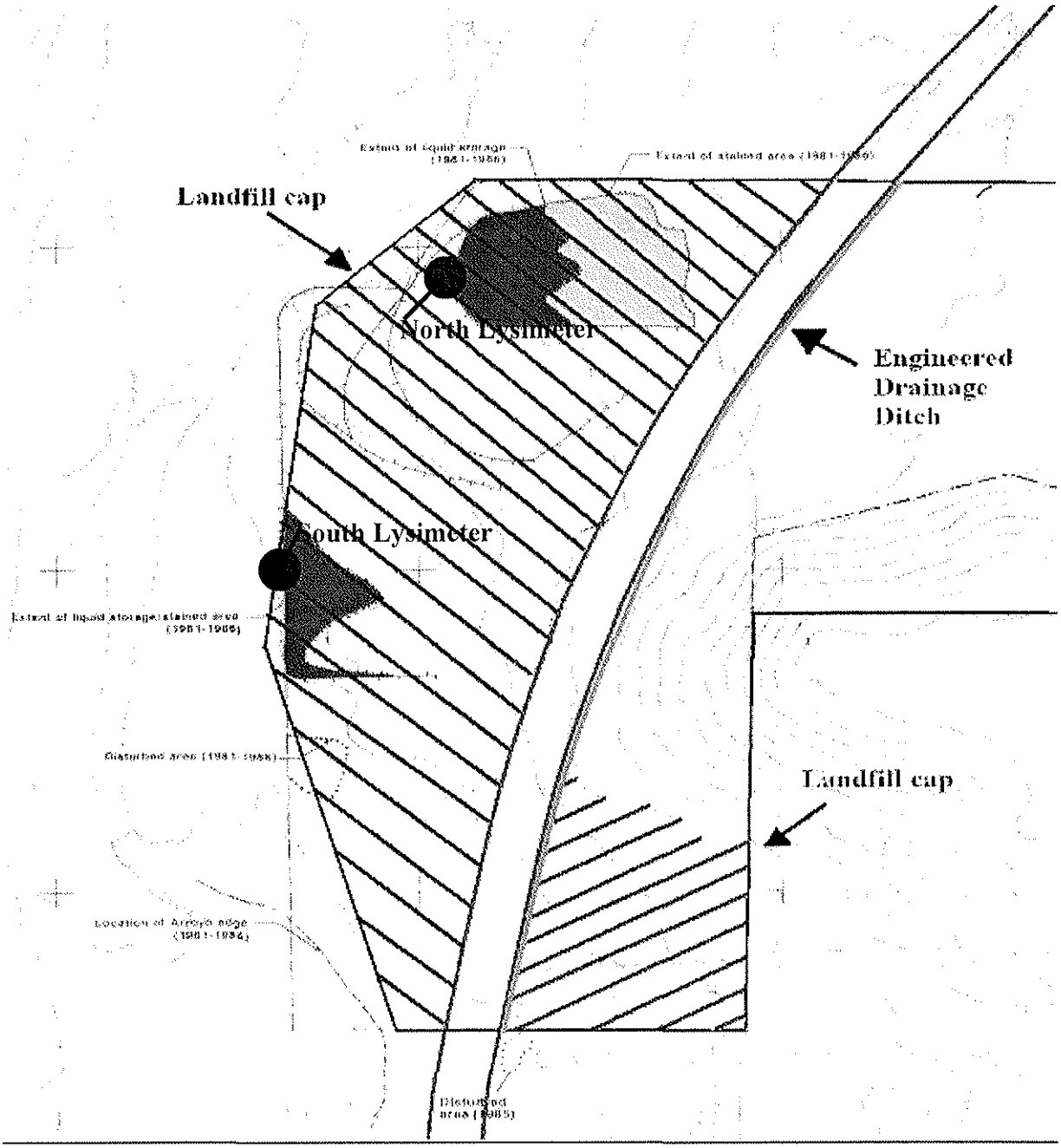
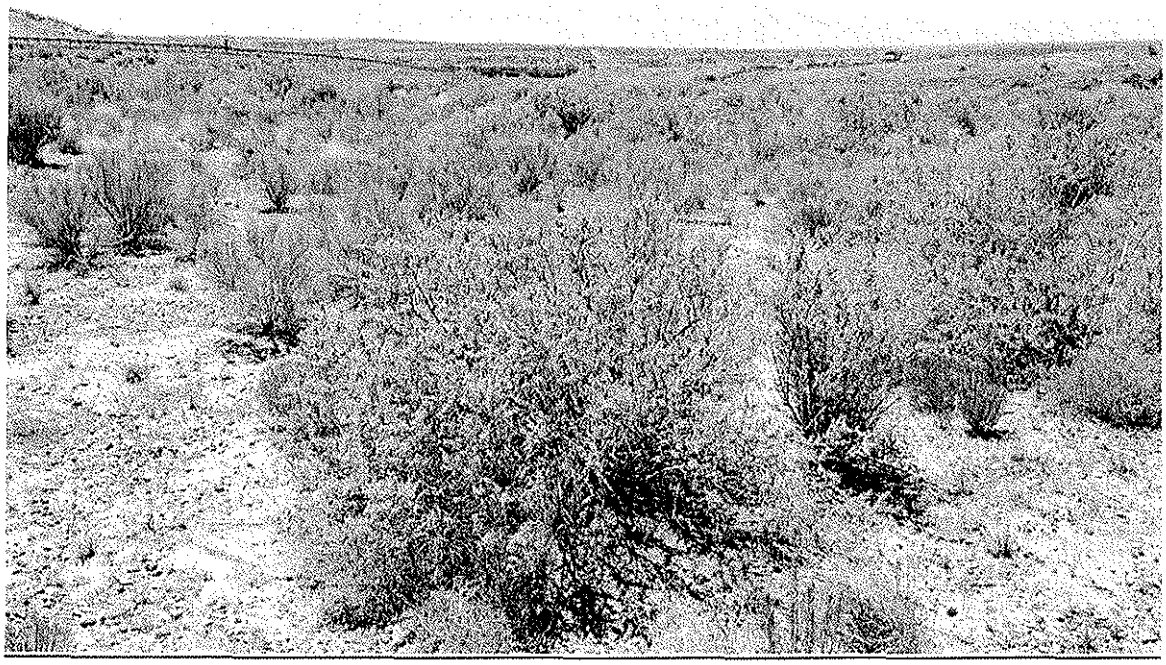
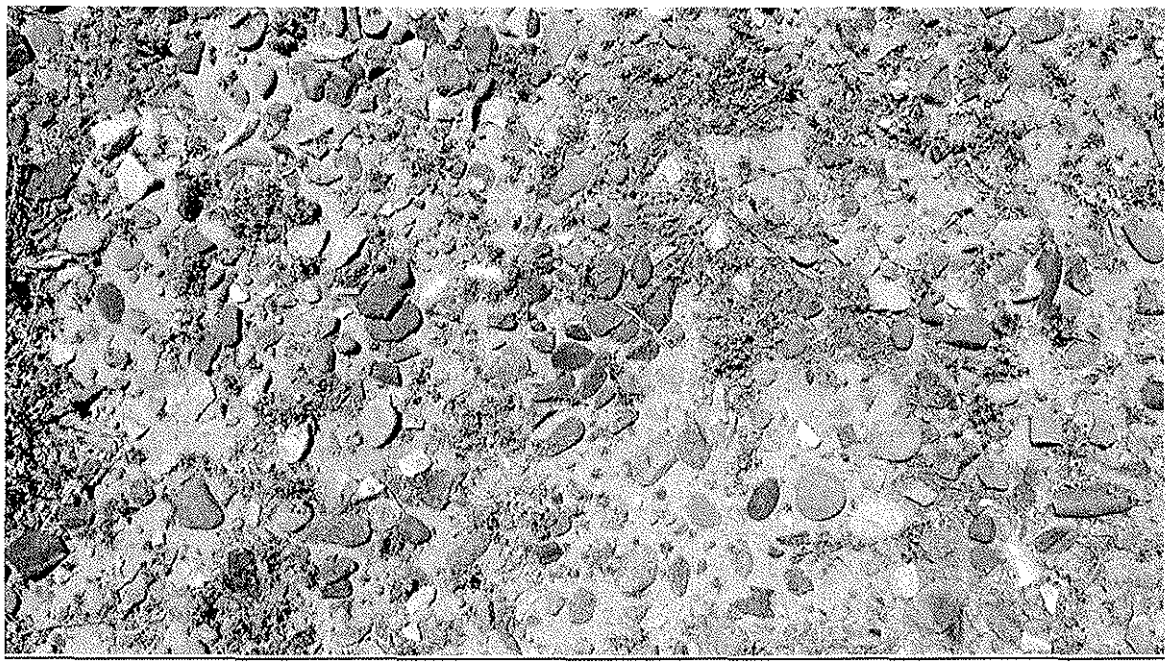


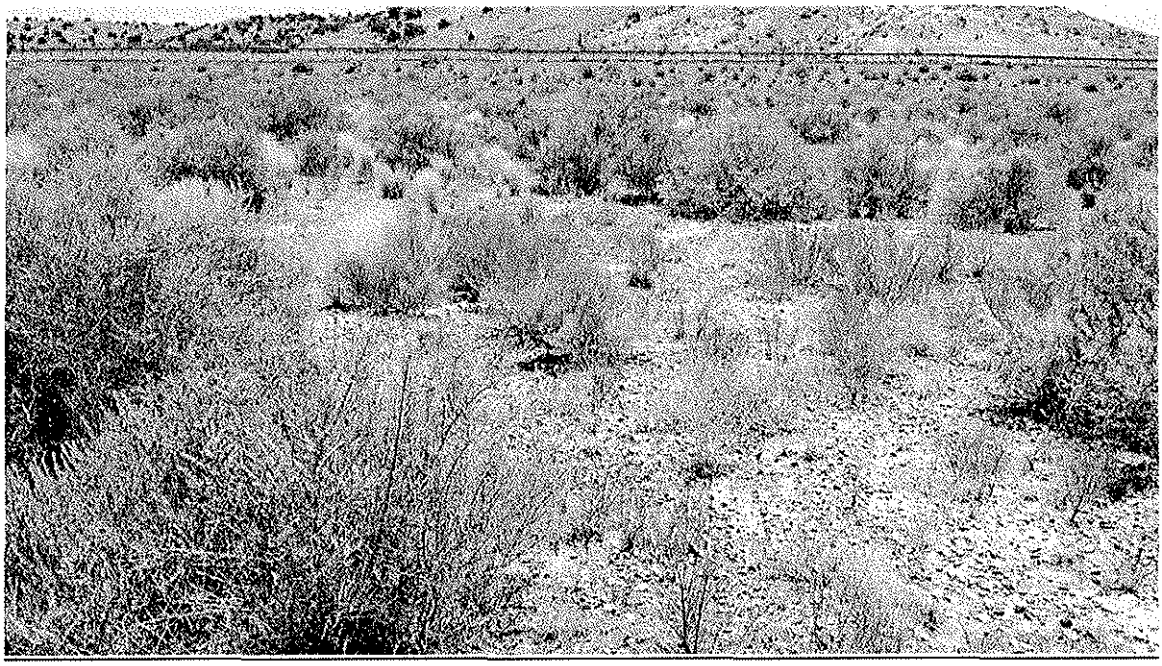
Figure 1. Lee Acres Landfill Site with Lysimeter Locations



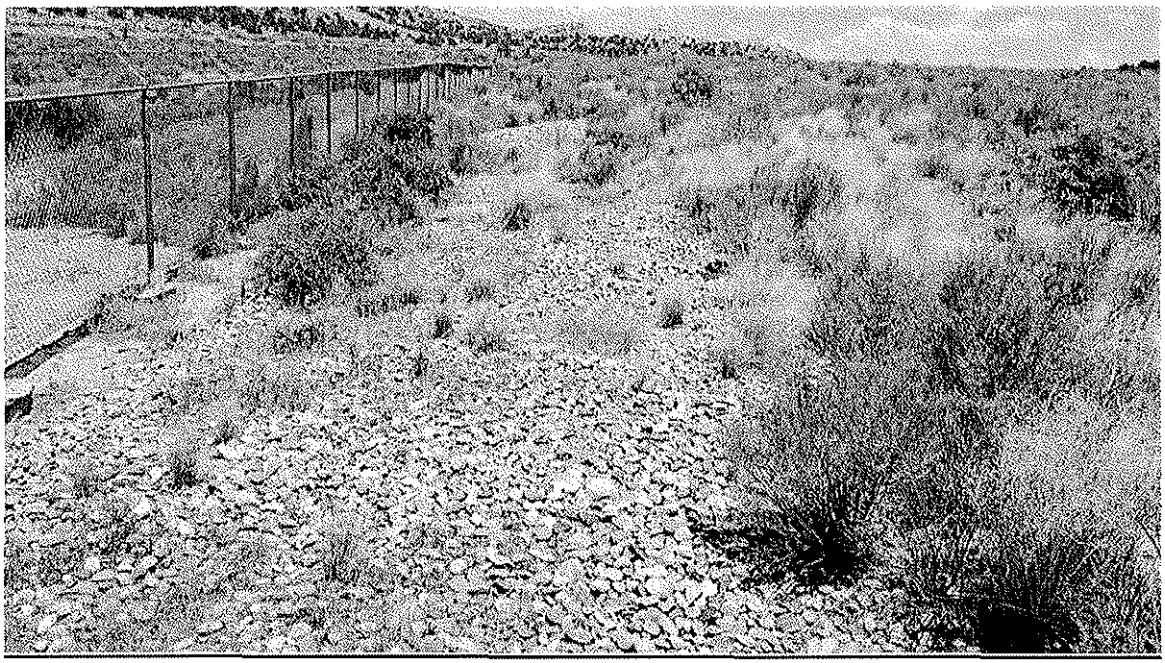
Picture 1. Lee Acres Cover, South View



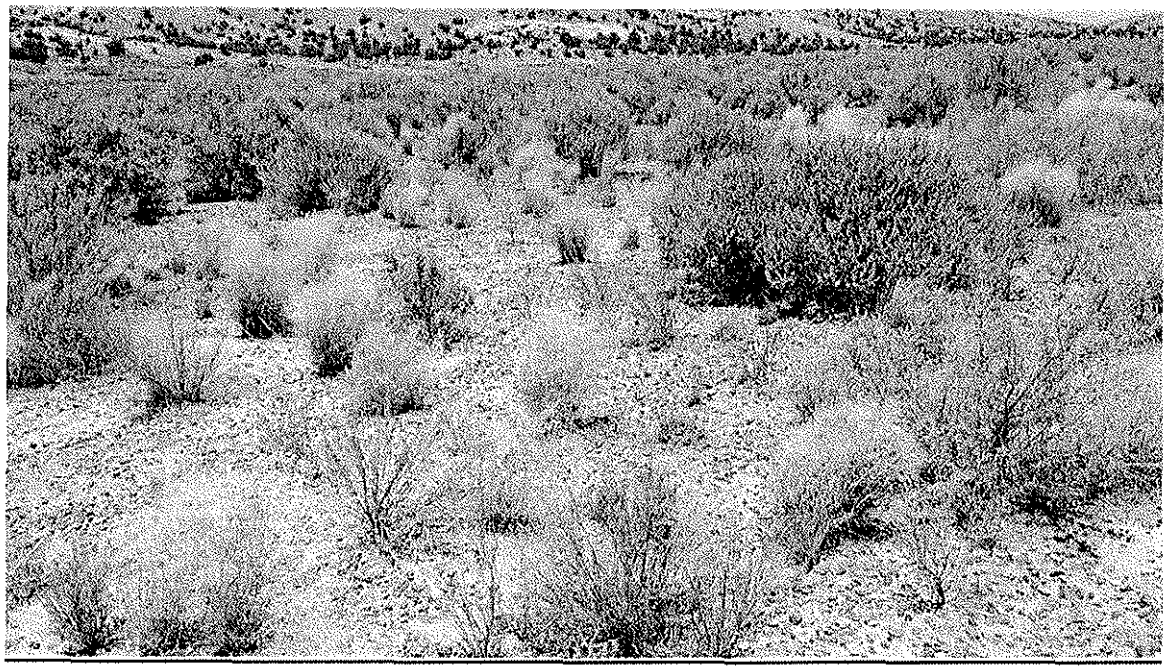
Picture 2. 'Desert Pavement' on Cover Surface



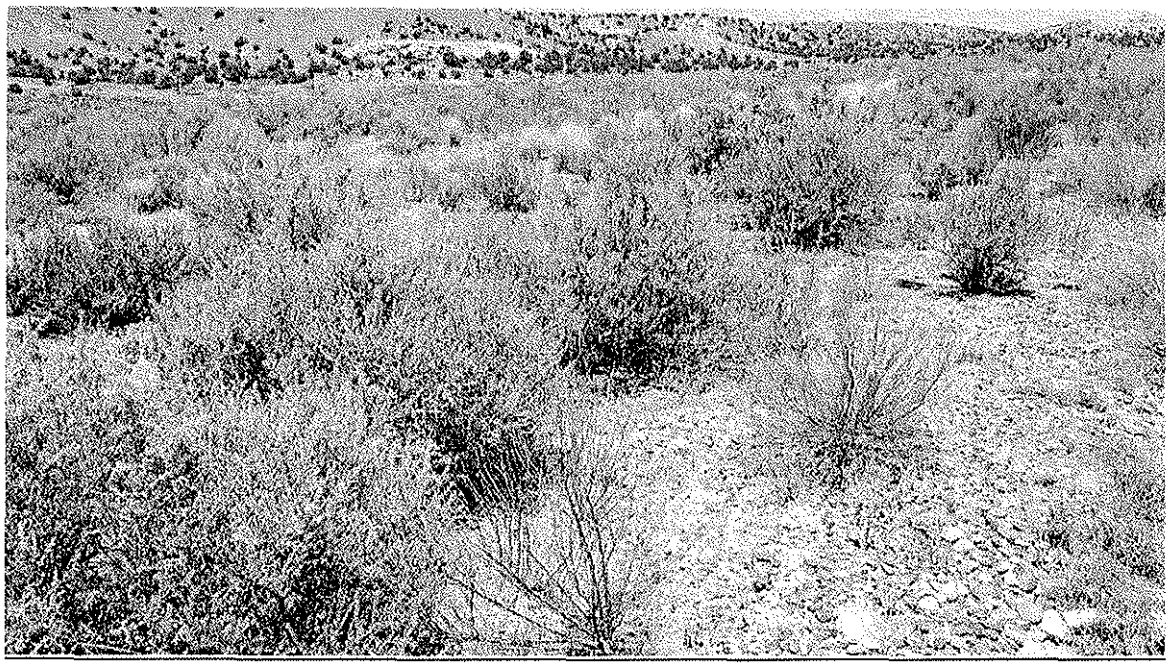
Picture 3. Cover, East View



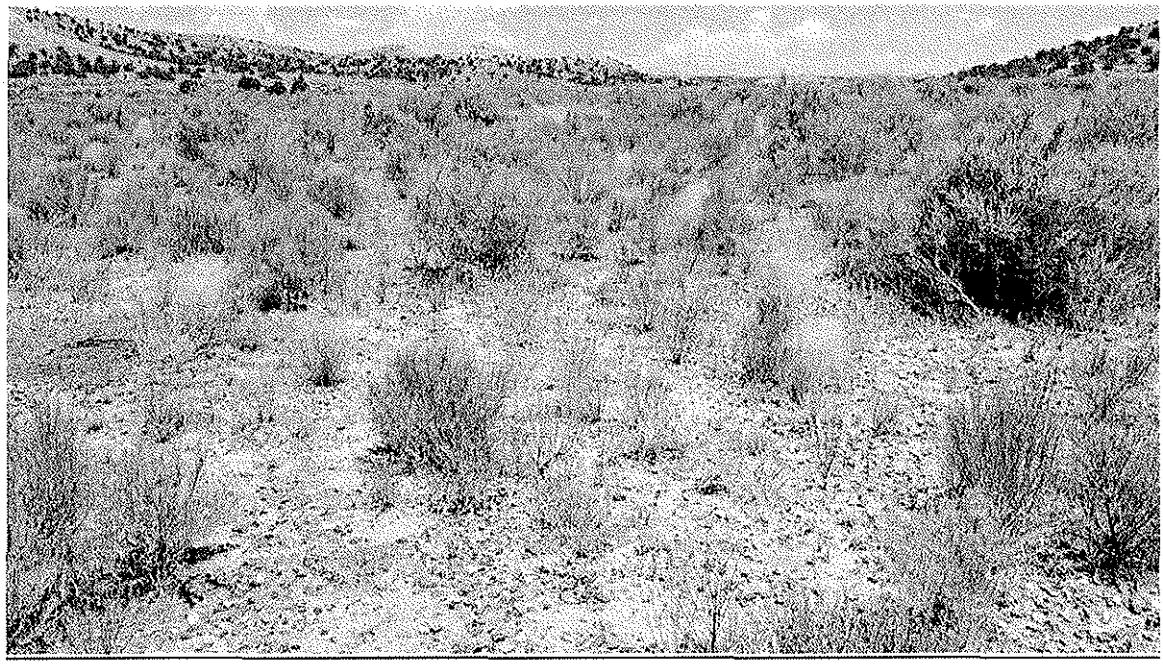
Picture 4. Cover Perimeter with Rock Erosion Protection



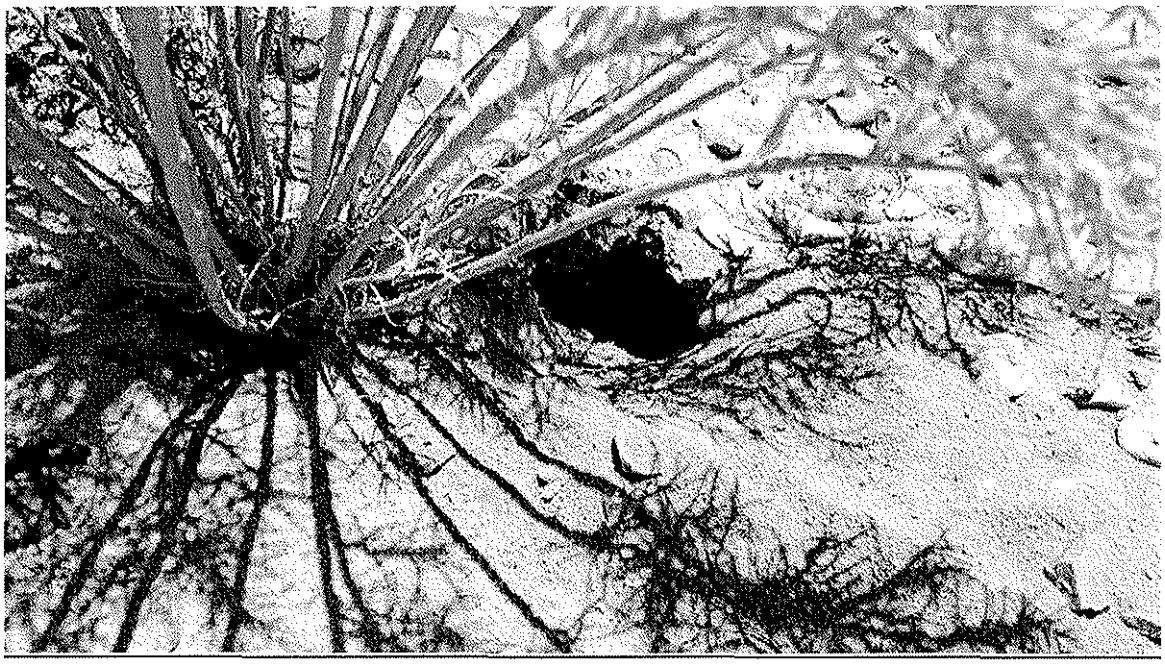
Picture 5. Cover, North View



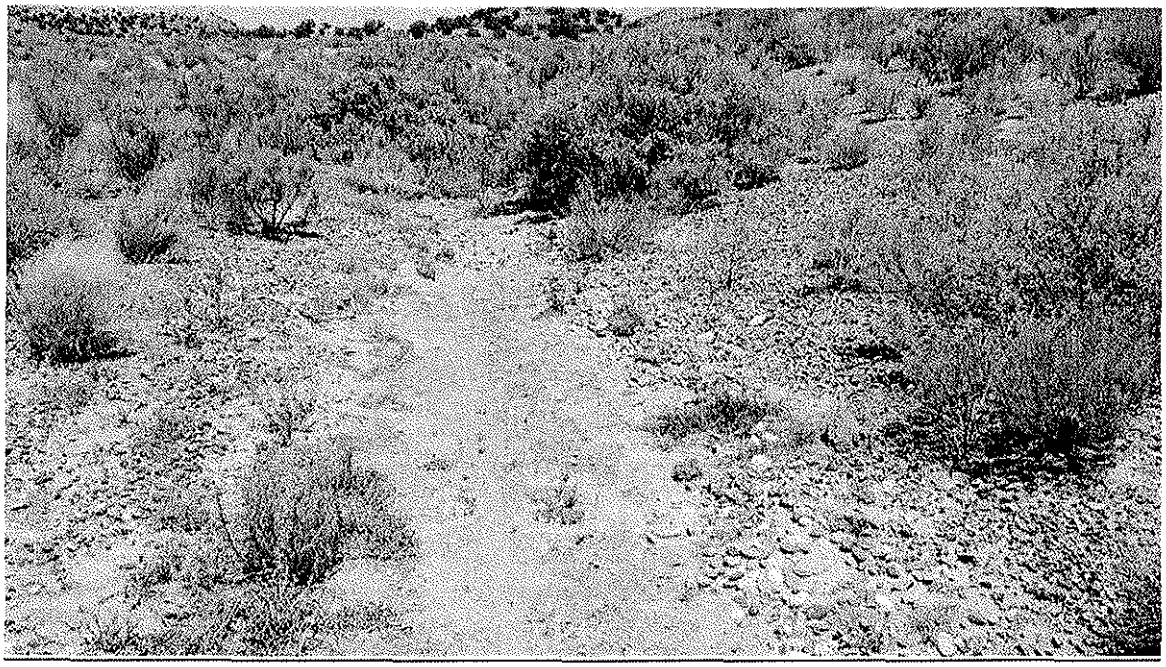
Picture 6. Cover, West View



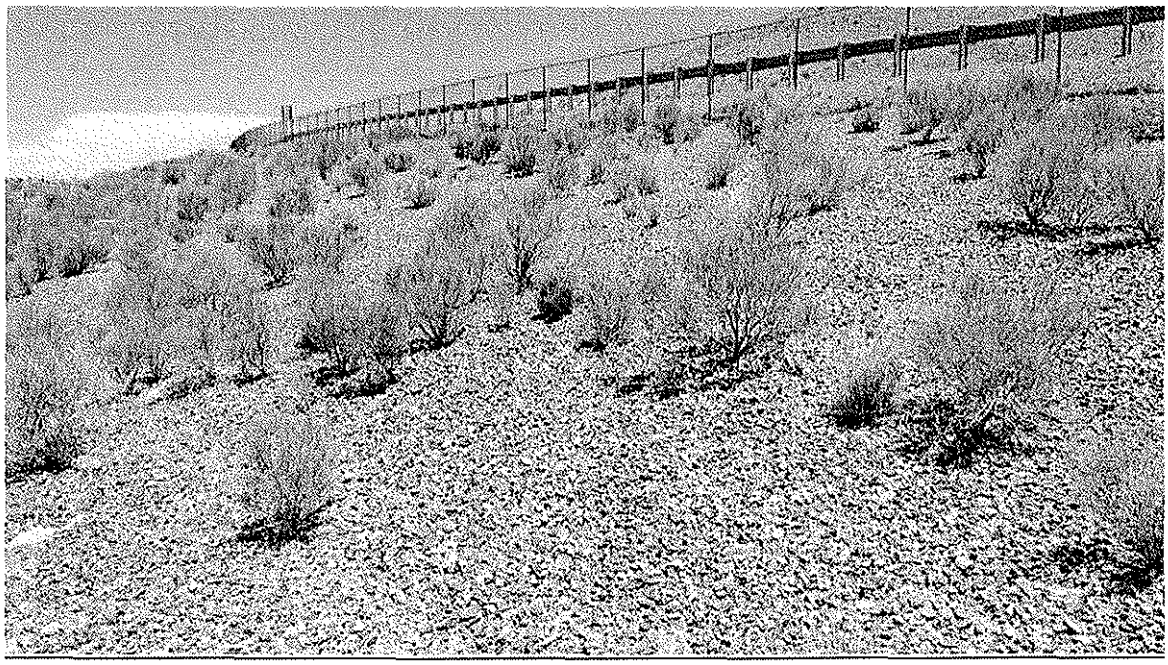
Picture 7. Cover, North View



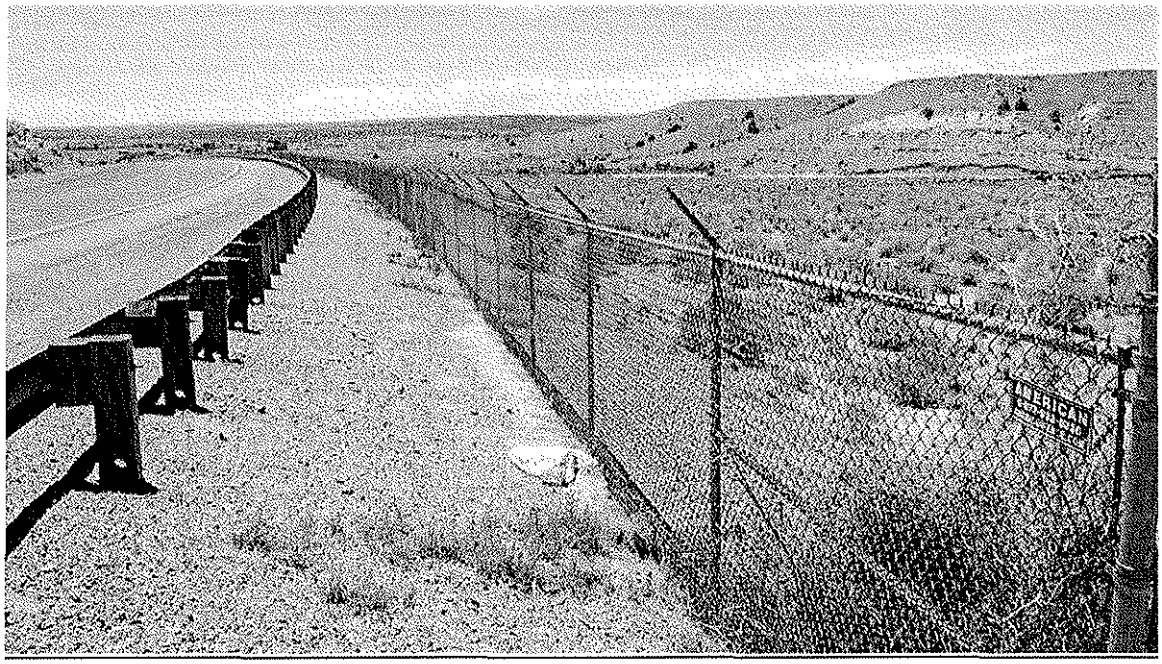
Picture 8. Small Animal Burrow Hole on Cover



Picture 9. Sediment in Drainage Channel @ Base of Eastern Slope

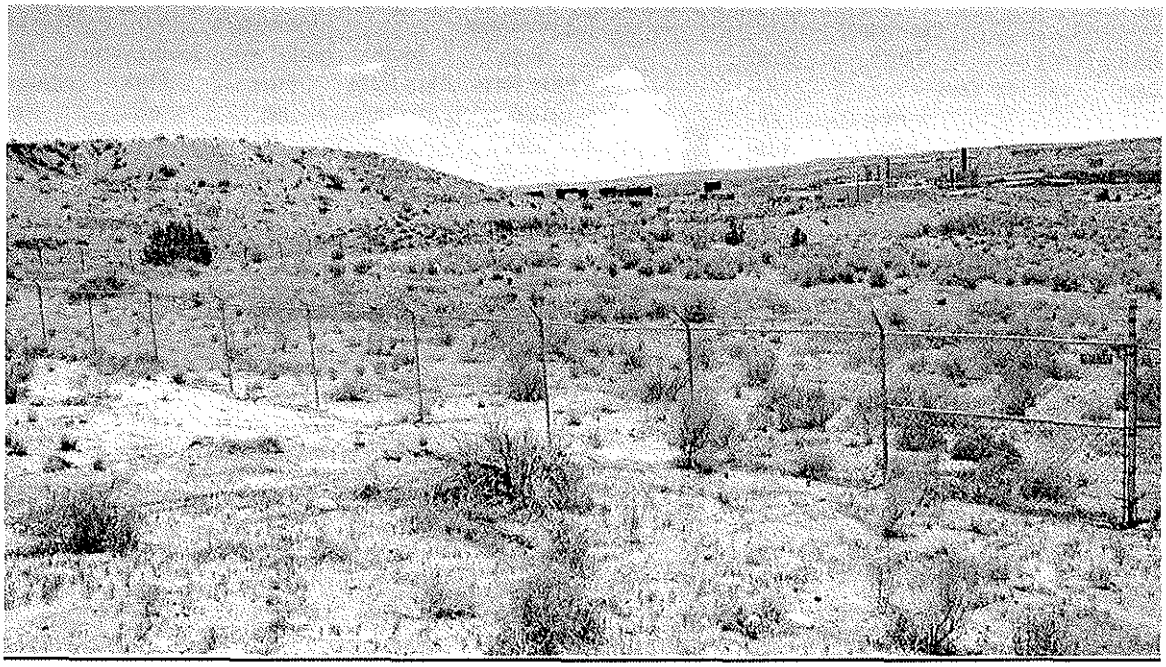


Picture 10. Highway Slope East of Cover

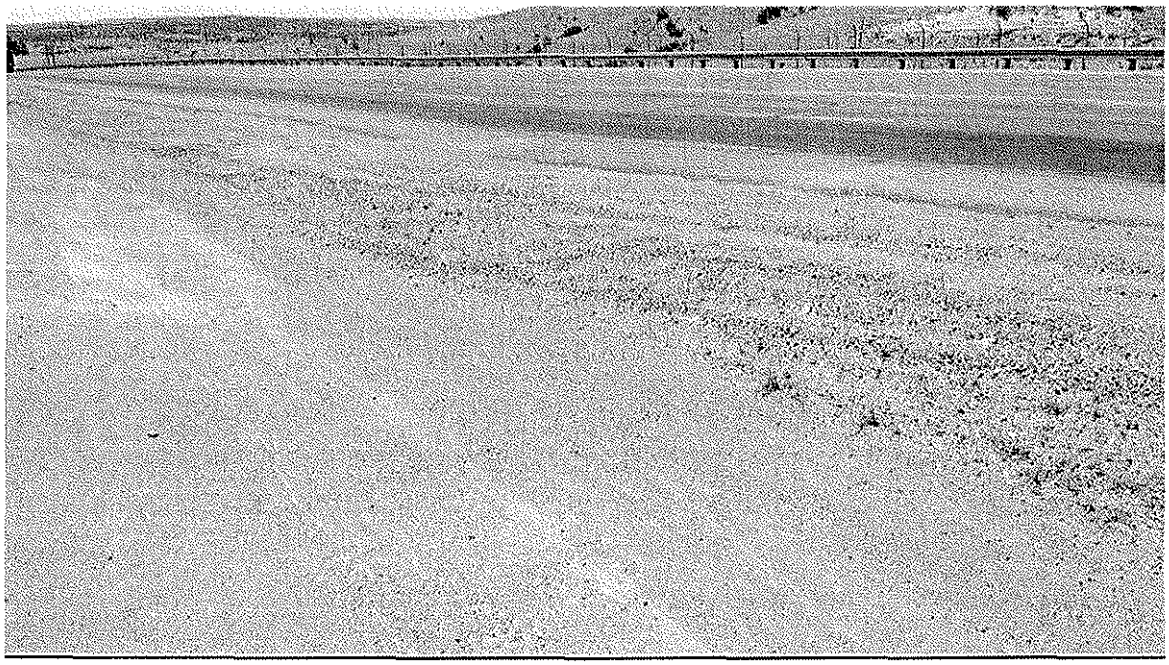


Picture 11. Perimeter Fence and Adjacent Highway

Picture 12. Locked Fence around Site



Picture 13. Smaller Cover East of Roadway



Picture 14. Settlement in Roadway

Monitoring Period Date	calendar days	Lysimeters North	South		Lysimeters North Flux Rate	South Flux Rate	Lysimeters North Lysime Flux	South Lysime Flux	Lysimeters North Annualized Flux	South Annualized
		ml	ml		cm/sec	cm/sec	mm	mm	mm/yr	mm/yr
7/21/2005	start	initial	initial		0	0	-	-	0	0
10/27/2005	98	5600	5100		9.1E-09	8.3E-09	0.8	0.7	2.9	2.6
2/10/2006	106	910	790		1.4E-09	1.2E-09	0.1	0.1	0.4	0.4
5/18/2006	97	221	0		3.6E-10	0.0E+00	0.0	0.0	0.1	0.0
8/9/2006	83	6740	0		1.3E-08	0.0E+00	0.9	0.0	4.1	0.0
11/17/2006	100	850	0		1.3E-09	0.0E+00	0.1	0.0	0.4	0.0
2/16/2007	91	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
5/3/2007	76	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
8/16/2007	105	3608	0		5.5E-09	0.0E+00	0.5	0.0	1.7	0.0
2/29/2008	197	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
9/12/2008	196	650	0		5.3E-10	0.0E+00	0.1	0.0	0.2	0.0
2/20/2009	161	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
9/30/2009	222	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
3/19/2010	170	16277	0		1.5E-08	0.0E+00	2.2	0.0	4.8	0.0
8/27/2010	161	61981	0		6.1E-08	0.0E+00	8.5	0.0	19.3	0.0
3/2/2011	187	340	0		2.9E-10	0.0E+00	0.0	0.0	0.1	0.0
9/29/2011	211	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
4/24/2012	208	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
10/12/2012	171	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
4/24/2013	194	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
10/21/2013	180	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
7/2/2014	254	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
TOTAL	**3268**	**97177**	**5890**	**AVERAGE**	**4.9E-09**	**4.3E-10**	**6.3E-01**	**3.8E-02**	**1.5**	**0.1**

Table 1. Percolation Results

Note: Rolling annual flux refers to the cumulative flux for the prior year (i.e. the prior 2 semi-annual measurements or the prior 4 quarterly measurements)

ATTACHMENT 2

Public Notices

PUBLIC NOTICE

BLM AND EPA BEGINS SECOND FIVE-YEAR REVIEW of the SUPERFUND CLEAN UP at the LEE ACRES LANDFILL SITE

The Bureau of Land Management (BLM) and the U.S. Environmental Protection Agency (EPA) is in the process of completing a **Second Five-Year Review** of the **Lee Acres Landfill Superfund Site**, located approximately 3/8 mile north of the intersection of U.S. Highway 64 and San Juan County road 5500 near McGee Park. BLM welcomes comments and/or questions prior to and following the review's expected completion date of November 2014.

What is a Five-Year Review?
It is a review required by law or policy to make sure that the BLM – EPA cleanup is protective of human health and the environment. The review includes inspecting the site and cleanup technologies and examining monitoring data, operating data, and maintenance records. This entire process is repeated every five years. The First Five-Year Review was completed in October 2009.

Why is a Second Five-Year Review being done for this site?
The Five-Year Review will evaluate the effectiveness of the Lee Acres Landfill Remedial Action Work Plan components:

- Closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory.
- Realignment of County Road 350, including storm water run-on and run-off controls constructed to divert run-on, and maximize run-off.
- Monitor natural attenuation of ground water contaminants.

To Review Second Five-Year Report:
When complete, the Second Five-Year Review will be available on the internet at the New Mexico BLM external website, the Farmington Public Library, and at the BLM public room at 6251 College Blvd., Farmington NM.

PLEASE NOTE: For more information or to report concerns about the Site which may be helpful to the Second Five-Year Review process, contact:

T.J. Ricahards
San Juan County
305 South Oliver Drive
Aztec NM 87410
505-334-4574

Barney Wegener
Farmington BLM
6251 College Blvd. Suite A.
Farmington NM 87402
505-564-7695

Sample of Public Notice Published in Farmington Daily Times on 2/16/2014, 2/19/2014, and 3/17/2014

AFFIDAVIT OF PUBLICATION

Ad No. 70050

STATE OF NEW MEXICO
County of San Juan:

JOHN ELCHERT, being duly sworn says: That HE is the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Monday, March 17, 2014

And the cost of the publication is $112.55

ON 3/17/14 JOHN ELCHERT appeared before me, whom I know personally to be the person who signed the above document.

OFFICIAL SEAL
CHRISTINE SELLERS
Notary Public
State of New Mexico
My Comm. Expires 11/05/15

COPY OF PUBLICATION

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San Juan County
305 South Oliver Drive
Aztec, NM 87410
Office: 505-334-4574

Barney Wegener
Farmington BLM
6251 College Blvd. Suite A.
Farmington NM 87402
505-564-7695

Legal No. 70050 published in The Daily Times on March 17, 2014.

For Publication in the Farmington Daily Times upon Completion of the Lee Acres Second Five-Year Review:

BLM AND EPA Completes the SECOND FIVE-YEAR REVIEW of the SUPERFUND CLEAN UP at the LEE ACRES LANDFILL SITE

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- Realignment of County Road 350, including storm water run-on and run-off controls constructed to divert run-on, and maximize run-off.
- Monitor natural attenuation of ground water contaminants.

Results of the Second Five-Year Report:
The results of the Second Five-Year Review indicate that the remedy is protective of human health and the environment. The results of the Second Five-Year Review will be available on the internet at the New Mexico BLM external website, the Farmington Public Library, and at the BLM public room at 6251 College Blvd., Farmington NM.

PLEASE NOTE: For more information or to report concerns about the site contact:

T.J. Richards
San Juan County
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505-334-4574

Barney Wegener
Farmington BLM
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Farmington NM 87402
505-564-7695

ATTACHMENT 3

Interviews

INTERVIEW RECORD

Site Name: Lee Acres Landfill	EPA ID No.: NMD980750020	
Subject: Second Five-Year Review	Time: 1300	Date: 4-21-2014
Type: Visit Location of Visit: San Juan County Public Works Office	Incoming 1300	Outgoing 1400

Contact Made By:

Name: Barney Wegener	Title: Consultant	Organization: Wegener Services LLC

Individual Contacted:

Name: Dave Keck	Title: San Juan County Public Works Administrator	Organization: San Juan County
Telephone No: 505-334-4520 Fax No: 505-334-3645 E-Mail Address: dkeck@sjcounty.net	Street Address: 305 South Oliver Dr. City, State, Zip: Aztec NM 87410	

Purpose of the Five-Year Review

The Purpose of the second five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (CAP), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I am the Public Works Administrator for San Juan County. As the Public Works Administrator, I was directly involved with the construction of the following selected remedies: the capillary barrier, the water run-on and run-off controls and the construction of Highway 350, and the construction of the institutional controls consisting of the fencing around the site. I supervised all San Juan County crews involved with the construction of the remedies. I also supervise T.J. Richards who is the San Juan County operations and maintenance officer for the Lee Acres site.

Interview Questions
QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009? **I am pleased with the outcome of the remedial action remedies that San Juan County constructed. Highway 350 has improved the traffic flow within the county. It is my opinion that San Juan County is very pleased with the project as a whole.**
QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community? **I think the capillary barrier and the remedy actions as a whole have given the citizens of the area peace of mind that there is no longer a threat of water contamination.**
QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site? **No.**
QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results. **I supervise T.J. Richards who has been assigned as the operations and maintenance officer for San Juan County. T.J. is responsible for site monitoring and maintenance.**

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?

No

Summary Of Conversation

I think the entire project has been highly successful and I am proud to have been a part of it.

Site Name: Lee Acres Landfill		EPA ID No.: NMD980750020	
Subject: Second Five-Year Review		Time: 0930	Date: 4-22-2014
Type: Telephone Location of Visit:		Incoming 0930	Outgoing 1015
Contact Made By:			
Name: Barney Wegener	Title: Consultant	Organization: Wegener Services LLC	
Individual Contacted:			
Name: Stephen Dwyer PhD, PE	Title: Contract Engineer	Organization: Dwyer Engineering LLC	
Telephone No: 505-844-0595 Fax No: 505-271-0741 E-Mail Address: dwyerengineering@yahoo.com		Street Address: 1813 Stagecoach Rd. SE City, State, Zip: Albuquerque, nm 87123	

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The Purpose of the second five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (CAP), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I helped to conceptualize the use of an engineered capillary barrier (cap) as a remedy to the Lee Acres Landfill. I participated in cap research and development at Sandia National Laboratories. I attended meetings with the EPA, BLM, and NMED to discuss the appropriateness of the cap, and how it would promote natural attenuation of contaminants that were present within the land fill. I assisted the firm of Cheney-Walters-Echols INC to engineer the main cap, and I reviewed the final plan. I provided construction oversight as construction engineer as the cap was being built. I have been monitoring the capillary barrier since it was completed in 2005.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009?

In my opinion, the capillary barrier worked well and has met everyone's expectations. The desert pavement (gravel and soil composite) has done a good job of stabilizing the surface of the cap and has prevented erosion. The planted native vegetation has grown well on the desert pavement, and now the plant community has matured and is more robust on the cap then on the surrounding areas. The amount of flux (water flow) through the cap has been lower than the alarm level identified in the Record of Decision of 1.3 mm/year. The cap is working well.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

I think the cap and the other remedies have had a major positive impact for the area. San Juan County was able to straighten Highway 350 through the site, and that resulted in a much safer road. The cap has stopped recharge of water into the old landfill and that has enhanced the natural attenuation of contaminates that were in the landfill. The remedies has resulted in an effective cleanup of the site.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

Yes. I have monitored the cap since it was completed in 2005. I monitor the amount of flux that is captured in the lysimeters and I evaluate the surface of the cap for vegetation development, bio intrusions, and erosion. When I have discovered bio intrusions, usually due to rodents, I have notified BLM and the problems have been resolved in a timely manner. I also recommended vegetation reseeding shortly after the cap was completed, but now the vegetation community has reached climax.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?

No

Summary Of Conversation

In my opinion, the cap and the other remedial actions have been successful. The remedies included the unique situation of allowing a highway to be constructed through the site that not only provided a much safer road for the area, but also complemented the design of the cap and controls the amount of storm water runoff that can reach the cap. The capillary barrier works well and the desert pavement is effective at controlling erosion and limiting rodent intrusions.

Site Name: Lee Acres Landfill		EPA ID No.: NMD980750020	
Subject: Second Five-Year Review		Time: 0800	Date: 4-16-2014
Type: Visit Location of Visit: San Juan County Public Works Office		Incoming 0800	Outgoing 0900
Contact Made By:			
Name: Barney Wegener	Title: Consultant	Organization: Wegener Services LLC	
Individual Contacted:			
Name: T.J. Richards	Title: Compliance Specialist & Community Involvement Coordinator	Organization: San Juan County	
Telephone No: 505-334-4574 Fax No: 505-334-3645 E-Mail Address: tjrichards@sjcounty.net		Street Address: 305 South Oliver Dr. City, State, Zip: Aztec NM 87410	

Purpose of the Five-Year Review

The Purpose of the second five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (CAP), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I have two assigned duties connected to the Lee Acres Landfill site as an employee of San Juan County. I am the operations manager for the site and have been since the construction of the Capillary Barrier. I was also assigned the duties of Community Involvement Coordinator after the original coordinator (Joni Kelsey) came down with a medical emergency.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review completed in October 2009?

The site has been well maintained. There have been minimal incidents due to weather events and those incidents have been corrected in a timely manner. There have been no complaints from the public concerning the Lee Acres site.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

I do not think there has been any impact to the community in the past 5 years. I have not received any comments from the community or from the public concerning Lee Acres.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No. Joni Kelsey was the Community Involvement Coordinator and she place two legal notices in the Farmington Daily Times in February to announce the start of the Second Five-Year Review Process, and I placed a 3rd legal notice in the Farmington Daily Times on March 17th. No public comments were received after the public notices were published. I have not received any comments from anyone, nor did Joni Kelsey receive any comments before her medical emergency.

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I do inspections and monitor the site, including the fenced capillary barrier and other areas east of Highway 350. I inspect quarterly and also after weather events. I go out even on weekends after weather events to insure any damage to the site is identified and quickly as possible. When maintenance is needed, I notify the proper San Juan County crew to perform the maintenance. After the maintenance work is completed, I inspect the work. I keep a copy of the Daily Reports to track maintenance costs.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No

Summary Of Conversation

In my opinion, I do not think the Lee Acres Landfill site should be considered a Super Fund Site anymore. The capillary barrier has performed as designed and I do not think Lee Acres poses any threat to the downstream community or the groundwater.

Site Name: Lee Acres Landfill		EPA ID No.: NMD980750020	
Subject: Second Five-Year Review		Time: 0800	Date: 5-7-2014
Type: Visit Location of Visit: Western Refining Bloomfield NM Office		Incoming 0800	Outgoing 1200
Contact Made By:			
Name: Barney Wegener	Title: Consultant	Organization: Wegener Services LLC	
Individuals Contacted:			
Name: Kelly Robinson Randy Schmaltz Allen Hains	Title: Environmental Supervisor Health, Safety, Environment and Regulatory Director Manager Remediation Projects	Organization: Western Refining	
Telephone No: (Kelly Robinson) 505-632-4166 Fax No: 505-632-4021 E-Mail Address: kelly.robinson@wnr.com		Street Address: 111 County Road 4990 City, State, Zip: Bloomfield NM 87413	

Purpose of the Five-Year Review

The Purpose of the second five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (CAP), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

We (Kelly Robinson, Randy Schmaltz, and Allen Hains) are the management team responsible to conduct the remediation program at the closed Giant Bloomfield Refinery which is located along the southern boundary of the Lee Acres Landfill site. Western Refining acquired the Giant Bloomfield Refinery and is responsible to remediate the Giant Bloomfield Refinery site as regulated by the New Mexico Oil Conservation Division (OCD).

Interview Questions
QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009. **It appears to us that the Lee Acres site has been well maintained.**
QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community? **We think the capillary barrier (CAP) and the realignment of County Highway 350 have had a positive impact on the community.**
QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site? **No**
QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results. **We do not monitor the Lee Acres Site.**

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?

No

Summary of Conversation

INTERVIEW RECORD

We have cooperated with the BLM, USGS, NMED Water Quality Bureau, and San Juan County to facilitate the required monitoring activities on the Lee Acres site, and we want to continue to cooperate.

Site Name: Lee Acres Landfill		EPA ID No.: NMD980750020	
Subject: Second Five-Year Review		Time: 0930	Date: 6-12-2014
Type: Visit Location of Visit: Harold Runnels Bldg. Santa Fe (NMED office)		Incoming 0930	Outgoing 1115
Contact Made By:			
Name: Barney Wegener	Title: Consultant	Organization: Wegener Services LLC	
Individual Contacted:			
Name: Allan Pasteris	Title: Geoscientist	Organization: New Mexico Environment Department, Ground Water Quality Bureau	
Telephone No: 505 872-0039 Fax No: 505-827-2965 E-Mail Address: allan.pasteris@state.nm.us		Street Address: 1190 St. Francis Dr. P.O. Box 5469 City, State, Zip: Santa Fe, NM 87502-5469	

Purpose of the Five-Year Review

The Purpose of the second five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (CAP), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I am a staff member of the New Mexico Environment Department – Ground Water Quality Bureau – Superfund Oversight Section. I have been assigned to Lee Acres for 6 months. The Superfund Oversight Section (SOS) assists the U.S. Environmental Protection Agency (EPA) in characterization of inactive hazardous waste sites, and provides management assistance to EPS at Superfund sites listed on the National Priorities List. I review the Lee Acres site and associated documents for consistency under the Superfund rules so that actions initiated at LEE Acres are consistent with State of New Mexico rules to ensure protection of human health and the environment.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009?

My major impression is that BLM continues to fulfill its commitments as established in the ROD. The actions at the site have made great strides toward achieving the cleanup goals. I am impressed at the level of cooperation between BLM and San Juan County as they have worked together to insure the betterment of the project.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

The reclamation of the landfill has enhanced the landscape of the community.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I was at the site in 2009 and I attended the BLM coordination meeting that initiated the Second Five-Year review on February 19th, 2014. I also assisted Phyllis Bustamante in 2009 to sample ground water in the Lee Acres Community. No human health issues were identified as a result of the 2009 Lee Acres community groundwater sampling.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?

No. The fence and the site were in good shape during the February 19th 2014 site inspection.

Summary Of Conversation

I am impressed with the condition of the cap and the quality of the vegetation. It appears that the implementation of the cap has produced good results in respect to groundwater quality.

Site Name: Lee Acres Landfill		EPA ID No.: NMD980750020	
Subject: Second Five-Year Review		Time: 1015	Date: 6-2-2014
Type: Telephone Location of Visit:		Incoming 1015	Outgoing 1115
Contact Made By:			
Name: Barney Wegener	Title: Consultant	Organization: Wegener Services LLC	
Individual Contacted:			
Name: Fredrick Gebhardt	Title: Hydrologic Technician	Organization: USGS Water Science Center	
Telephone No: 505-830-7978 Fax No: 505-830-7998 E-Mail Address: gebhardt@usgs.gov		Street Address: 5338 Montgomery Blvd. NE Suite 400 City, State, Zip: Albuquerque NM 87109	

Purpose of the Five-Year Review

The Purpose of the second five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (CAP), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I am with the USGS Water Science Center in Albuquerque. I am the project manager for the groundwater sampling contract between BLM and USGS. I have conducted groundwater sampling at the Lee Acres site for many years and I am responsible for collecting samples, maintaining quality control, and sending the samples to a qualified laboratory. I also analyze data results from the laboratory and prepare sampling reports that are submitted to BLM as outlined in the contract.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009?

It appears to me that the capillary barrier and the other remedial actions completed at the site have been successful.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

The completion of the capillary barrier and the realignment of San Juan County road 350 ten years ago resulted in the site blending into the local topography and I do not think anyone notices that the site exists. I think the remedial actions completed at the site have been beneficial to the area.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

As I noted in question #1, I routinely sample the groundwater monitoring wells at the site per the groundwater monitoring contract between USGS and BLM.

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?

No

Summary Of Conversation

Last September there were some storm events in the Lee Acres area, and some high water runoff passed down through the arroyo that is adjacent to the capillary barrier. The storm events resulted in an increase of the groundwater elevation at the site of about 2 feet. The elevated groundwater may have caused some spikes in manganese levels, but did not result in any other contaminates of concern that I am contracted to sample exceeding cleanup levels. Manganese has always been erratic and has not been well understood in the system. I think the results of the long term groundwater sampling that I have conducted indicates that the site is ready for closure.

ATTACHMENT 4

Site Inspection Check List and Photos

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Lee Acres Landfill	**Date of inspection: 2-19-2014**
Location and Region: Farmington NM Region 6	**EPA ID: NMD980750020**
Agency, office, or company leading the five-year review: Farmington BLM (DOI)	**Weather/temperature: Sunny and 50 degrees F.**

Remedy Includes: (Check all that apply)

- **X** Landfill cover/containment
- **X** Access controls
- **X** Institutional controls
- G Groundwater pump and treatment
- G Surface water collection and treatment
- G Other _____

- **X** Monitored natural attenuation
- G Groundwater containment
- G Vertical barrier walls

Attachments: **X** Inspection team roster attached **X** Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Dave Keck (Name) Public Works Administrator (Title) 4-21-2013 (Date)
   Interviewed **X** at site G at office G by phone Phone no. **505-334-4520**
   Problems, suggestions; **X** Report attached _____

2. **O&M staff** T. J. Richards (Name) Compliance Specialist (Title) 4-16-2013 (Date)
   Interviewed G at site **X** at office G by phone Phone no. 505-334-4574
   Problems, suggestions; **X** Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency San Juan County
Contact TJ Richards Community Involvement Coordinator 4-16-2013 505-334-4574
Name Title Date Phone no.
Problems; suggestions; X Report attached

Agency USGS
Contact Fredrick Gebhardt Hydrologic Technician 6-2-2013 505-830-7978
Name Title Date Phone no.
Problems; suggestions; **X** Report attached

Agency New Mexico Environmental Department (NMED)
Contact Allan Pasteris NMED Superfund Oversite 6-12-2013 505-827-0039
Name Title Date Phone no.
Problems; suggestions; **X** Report attached

Agency
Contact
Name Title Date Phone no.
Problems; suggestions; G Report attached

4. **Other interviews** (optional) **X** Report attached.

Stephen Dwyer PhD, PE Dwyer Engineering, LLC Landfill Cover Monitoring 505-844-0595

Kelly Robinson Environmental Engineer Western Refining (Giant Bloomfield Refinery) 505-632-4166

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	G O&M manual	X Readily available	G Up to date	G N/A
	G As-built drawings	G Readily available	G Up to date	X N/A
	G Maintenance logs	X Readily available	G Up to date	G N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	X Readily available	G Up to date	G N/A
	G Contingency plan/emergency response plan	X Readily available	G Up to date	G N/A
	Remarks			
3.	**O&M and OSHA Training Records**	**X** Readily available	G Up to date	G N/A
	Remarks Tail Gate Meetings			
4.	**Permits and Service Agreements**			
	G Air discharge permit	G Readily available	G Up to date	X N/A
	G Effluent discharge	G Readily available	G Up to date	X N/A
	G Waste disposal, POTW	G Readily available	G Up to date	X N/A
	G Other permits	G Readily available	G Up to date	X N/A
	Remarks No Permits Required			
5.	**Gas Generation Records**	G Readily available	G Up to date	X N/A
	Remarks			
6.	**Settlement Monument Records**	G Readily available	G Up to date	X N/A
	Remarks			
7.	**Groundwater Monitoring Records**	**X** Readily available	X Up to date	G N/A
	Remarks			
8.	**Leachate Extraction Records**	G Readily available	G Up to date	X N/A
	Remarks			
9.	**Discharge Compliance Records**			
	G Air	G Readily available	G Up to date	X N/A
	G Water (effluent)	G Readily available	G Up to date	X N/A
	Remarks			
10.	**Daily Access/Security Logs**	G Readily available	G Up to date	X N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**

G State in-house G Contractor for State
G PRP in-house G Contractor for PRP
G Federal Facility in-house G Contractor for Federal Facility
X Other San Juan County In-House

2. **O&M Cost Records**

X Readily available X Up to date
G Funding mechanism/agreement in place
Original O&M cost estimate $1,109,299.03 G Breakdown attached

Total annual cost by year for review period if available

From	Jan 2010 (Date)	To	Jan. 2011 (Date)	$260.00 (Total cost)	G Breakdown attached
From	Jan. 2011 (Date)	To	Jan. 2012 (Date)	$235.00 (Total cost)	G Breakdown attached
From	Jan. 2012 (Date)	To	Jan 2013 (Date)	$310.00 (Total cost)	G Breakdown attached
From	Jan. 2013 (Date)	To	Jan 2014 (Date)	$415.00 (Total cost)	G Breakdown attached
From	Jan. 14 (Date)	To	Present (Date)	$1,740 (Total cost)	G Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons:
None

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable G N/A

A. Fencing

1. **Fencing damaged** G Location shown on site map G Gates secured G N/A

Remarks A citizen crashed his vehicle through the fence near the small cap in 2005. The San Juan County Sheriff's Office responded to the accident and determined the driver was impaired by alcohol. No injuries were reported and the fence was repaired by the County the next day.

B. Other Access Restrictions

1. **Signs and other security measures** G Location shown on site map G N/A

Remarks All gates are locked and checked regularly by the County

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented — G Yes X No G N/A
Site conditions imply ICs not being fully enforced — G Yes X No G N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Drive By
Frequency 8 – 10 times per month
Responsible party/agency San Juan County
Contact T. J. Richards (Name) Compliance Specialist (Title) _____ (Date) 505-334-4574 (Phone no.)

Reporting is up-to-date — X Yes G No G N/A
Reports are verified by the lead agency — X Yes G No G N/A

Specific requirements in deed or decision documents have been met — X Yes G No G N/A
Violations have been reported — G Yes G No X N/A
Other problems or suggestions: G Report attached

2. **Adequacy** X ICs are adequate G ICs are inadequate G N/A

Remarks BLM has withdrawn 134.68 acres of public land, within which the landfill is located, from settlement, sale, location, and entry, as described in Public Land Order No., 7234 (62 Fed. Reg. 2177, January 15, 1997).

D. General

1. **Vandalism/trespassing** G Location shown on site map X No vandalism evident

Remarks None

2. **Land use changes on site** G N/A

Remarks None

3. **Land use changes off site** G N/A

Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads G Applicable G N/A

1. **Roads damaged** G Location shown on site map X Roads adequate G N/A

Remarks None

B. Other Site Conditions

Remarks Site is in good condition

VII. LANDFILL COVERS X Applicable G N/A

A. Landfill Surface

1. **Settlement** (Low spots) G Location shown on site map X Settlement not evident
   Areal extent _____ Depth _____
   Remarks No Settlement

2. **Cracks** G Location shown on site map X Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks No Cracks

3. **Erosion** G Location shown on site map G Erosion not evident
   Areal extent _____ Depth _____
   Remarks Steve Dwyer noted that there was minor silt deposits seen in the gravel in storm water run-off trenches, but the silt was minimal and within tolerances. No action needed.

4. **Holes** G Location shown on site map X Holes not evident
   Areal extent _____ Depth _____
   Remarks Steve Dwyer noted that there are some scattered ant hills and evidence of some burrowing animals (probably lizards), but nothing significant and no penetrations. One gopher was found on site in 2006, but was removed immediately.

5. **Vegetative Cover** G Grass X Cover properly established G No signs of stress
   G Trees/Shrubs (indicate size and locations on a diagram)
   Remarks The grass and shrub community established by two seedings is similar to the undisturbed vegetation surrounding the site, but is not yet mature.

6. **Alternative Cover (armored rock, concrete, etc.)** G N/A
   Remarks There is rock armor 12 feet wide around the perimeter of the cover. All of the rock armor is in good condition and side slopes and drainage trenches are in good shape.

7. **Bulges** G Location shown on site map X Bulges not evident
   Areal extent _____ Height _____
   Remarks None

8.	**Wet Areas/Water Damage**	**X** Wet areas/water damage not evident
	G Wet areas	G Location shown on site map Areal extent_____
	G Ponding	G Location shown on site map Areal extent_____
	G Seeps	G Location shown on site map Areal extent_____
	G Soft subgrade	G Location shown on site map Areal extent_____
	Remarks None	
9.	**Slope Instability** G Slides	G Location shown on site map X No evidence of slope instability
	Areal extent_____	
	Remarks None	
B. Benches	G Applicable X N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)	
1.	**Flows Bypass Bench**	G Location shown on site map X N/A or okay
	Remarks	
2.	**Bench Breached**	G Location shown on site map X N/A or okay
	Remarks	
3.	**Bench Overtopped**	G Location shown on site map X N/A or okay
	Remarks	
C. Letdown Channels	G Applicable X N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)	
1.	**Settlement**	G Location shown on site map G No evidence of settlement
	Areal extent_____ Depth_____	
	Remarks	
2.	**Material Degradation**	G Location shown on site map G No evidence of degradation
	Material type_____ Areal extent_____	
	Remarks	
3.	**Erosion**	G Location shown on site map G No evidence of erosion
	Areal extent_____ Depth_____	
	Remarks	

4. **Undercutting** G Location shown on site map G No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ G No obstructions
G Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
G No evidence of excessive growth
G Vegetation in channels does not obstruct flow
G Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations X Applicable G N/A

1. **Gas Vents** G Active G Passive
G Properly secured/locked G Functioning G Routinely sampled G Good condition
G Evidence of leakage at penetration G Needs Maintenance
G N/A
Remarks_____

2. **Gas Monitoring Probes**
G Properly secured/locked G Functioning G Routinely sampled G Good condition
G Evidence of leakage at penetration G Needs Maintenance G N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
G Properly secured/locked X Functioning X Routinely sampled X Good condition
G Evidence of leakage at penetration G Needs Maintenance G N/A
Remarks There are two lysimeters within the surface of the landfill site. The lysimeters are in good condition, and monitored regularly.

4. **Leachate Extraction Wells**
G Properly secured/locked G Functioning G Routinely sampled G Good condition
G Evidence of leakage at penetration G Needs Maintenance G N/A
Remarks_____

5. **Settlement Monuments** G Located G Routinely surveyed G N/A
Remarks_____

E. Gas Collection and Treatment G Applicable X N/A

1. **Gas Treatment Facilities**
   G Flaring G Thermal destruction G Collection for reuse
   G Good condition G Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   G Good condition G Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   G Good condition G Needs Maintenance G N/A
   Remarks_____

F. Cover Drainage Layer G Applicable X N/A

1. **Outlet Pipes Inspected** G Functioning G N/A
   Remarks_____

2. **Outlet Rock Inspected** G Functioning G N/A
   Remarks_____

G. Detention/Sedimentation Ponds G Applicable X N/A

1. **Siltation** Areal extent_____ Depth_____ G N/A
   G Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   G Erosion not evident
   Remarks_____

3. **Outlet Works** G Functioning G N/A
   Remarks_____

4. **Dam** G Functioning G N/A
   Remarks_____

H. Retaining Walls G Applicable X N/A

1. **Deformations** G Location shown on site map G Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** G Location shown on site map G Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge X Applicable G N/A

1. **Siltation** G Location shown on site map X Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** G Location shown on site map G N/A
   X Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** G Location shown on site map X Erosion not evident
   Areal extent_____ Depth_____
   Remarks No erosion in trenches._____

4. **Discharge Structure** G Functioning G N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS G Applicable X N/A

1. **Settlement** G Location shown on site map G Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   G Performance not monitored
   Frequency_____ G Evidence of breaching
   Head differential_____
   Remarks_____

C. Treatment System G Applicable X N/A

1. **Treatment Train** (Check components that apply)
   G Metals removal G Oil/water separation G Bioremediation
   G Air stripping G Carbon adsorbers
   G Filters_____
   G Additive (*e.g.*, chelation agent, flocculent)_____
   G Others_____
   G Good condition G Needs Maintenance
   G Sampling ports properly marked and functional
   G Sampling/maintenance log displayed and up to date
   G Equipment properly identified
   G Quantity of groundwater treated annually_____
   G Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   G N/A G Good condition G Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   G N/A G Good condition G Proper secondary containment G Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   G N/A G Good condition G Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   G N/A G Good condition (esp. roof and doorways) G Needs repair
   G Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   G Properly secured/locked G Functioning G Routinely sampled G Good condition
   G All required wells located G Needs Maintenance G N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   X Is routinely submitted on time X Is of acceptable quality

2. Monitoring data suggests:
   X Groundwater plume is effectively contained X Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

X Properly secured/locked X Functioning X Routinely sampled X Good condition
X All required wells located G Needs Maintenance G N/A
Remarks Wells monitored by USGS

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

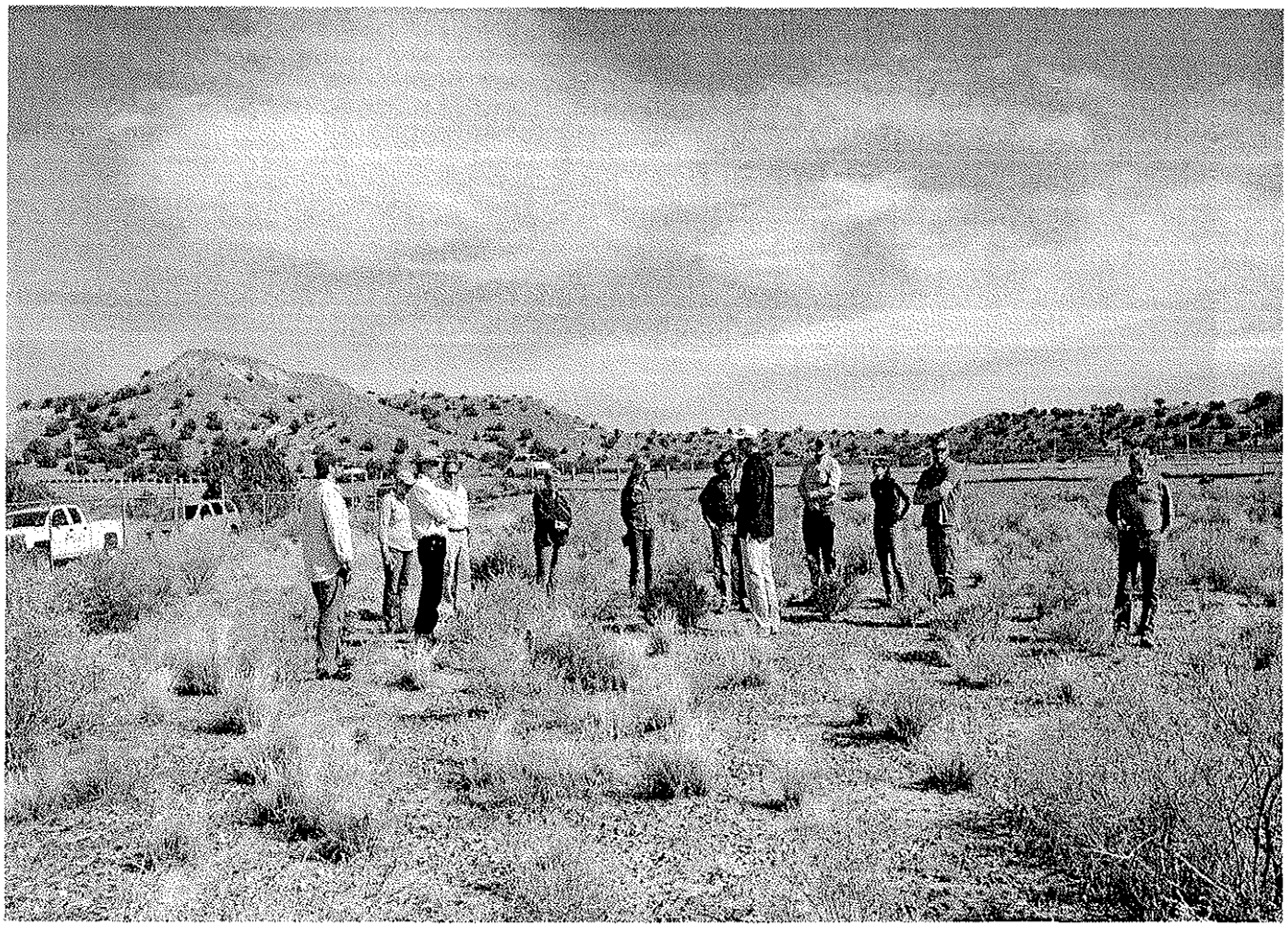
Remedy is functioning as designed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

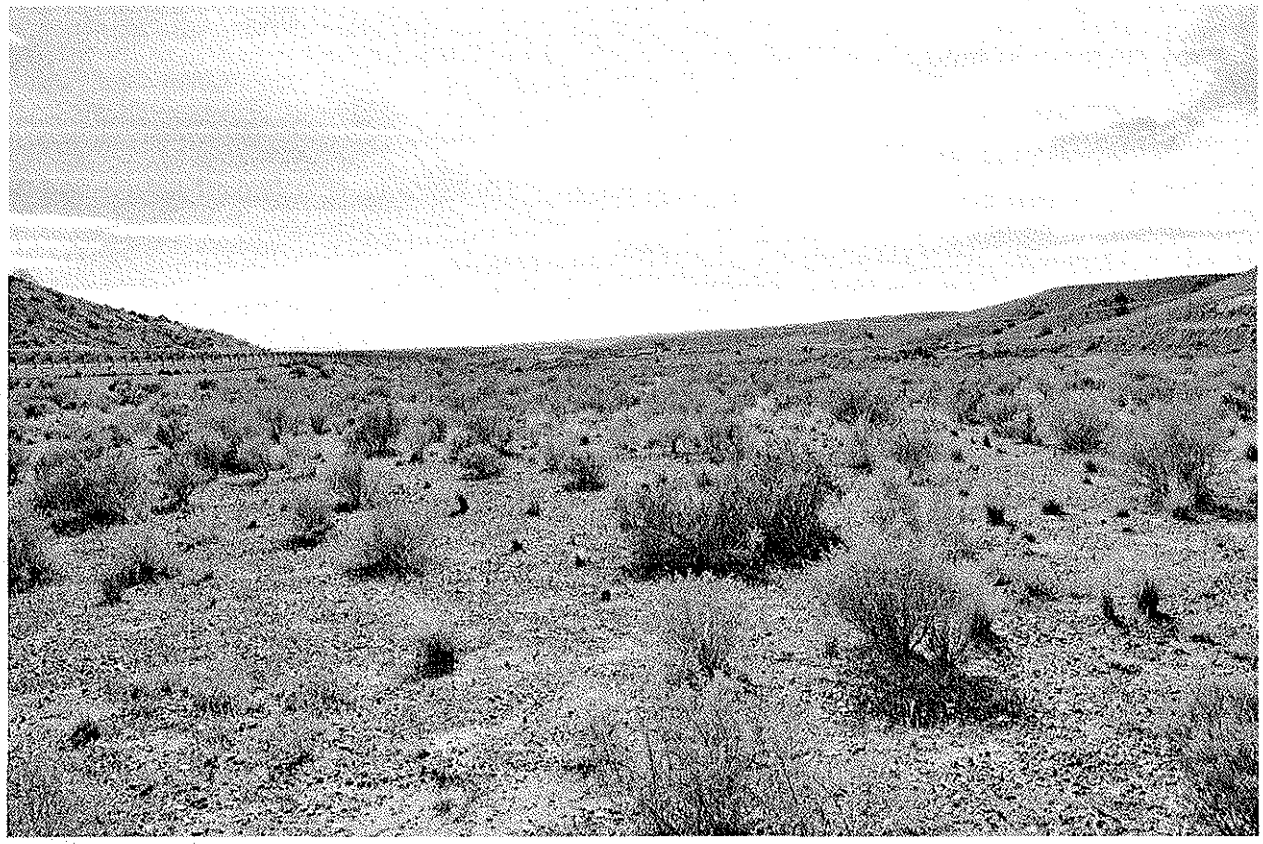
The landfill cover is properly maintained and all facilities are in good condition.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. No issues
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. No issues



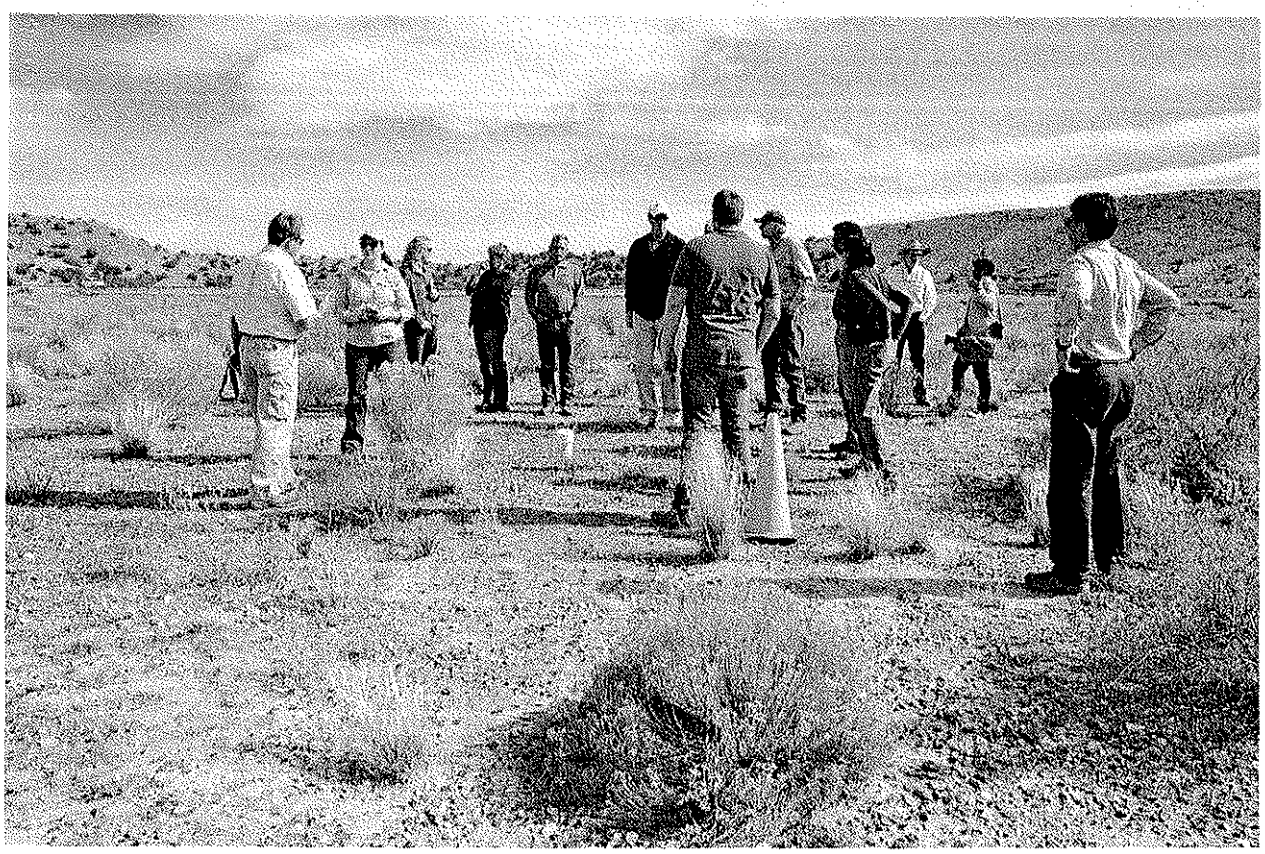
Lee Acres Landfill Site Inspection February 19, 2014

View is from the north portion of the landfill cover looking east.



Lee Acres Landfill Site Inspection February 19, 2014

View is from the center of the cover looking south

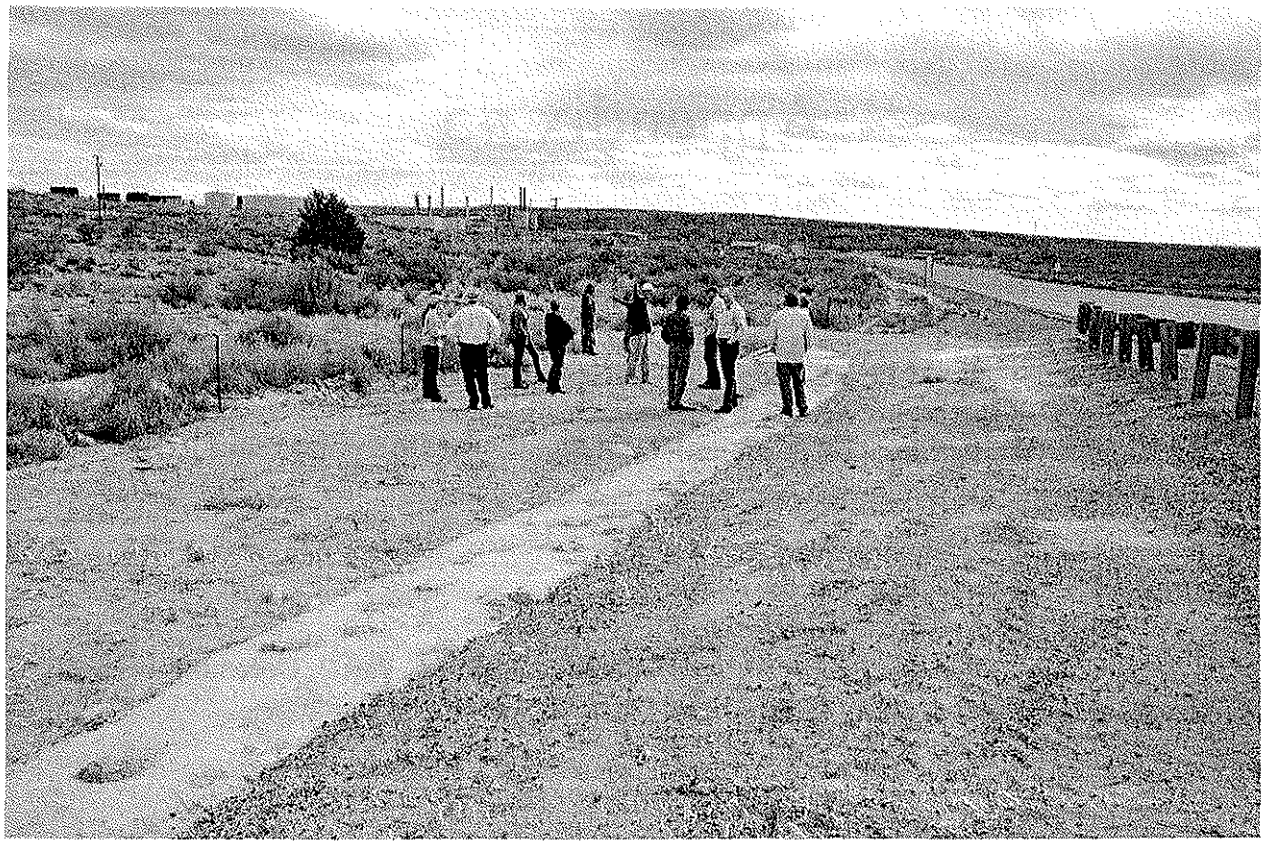


Lee Acres Landfill Site Inspection February 19, 2014

View is from the northwest corner of cover and cone marks the location of the north lysimeter.

Lee Acres Landfill Site Inspection February 19, 2014

View is from the southern portion of the cover looking at the stability of the cover surface and vegetation.



Lee Acres Landfill Site Inspection February 19, 2014

View looking south along storm water run-off channel that was constructed along County Road 350.

Appendix #5

Potential Regulations to amend the manganese cleanup level

EPA 540-R-98-031 July 1999: **A Guide to Preparing Superfund Proposed Plans Records of Decision, and Other Remedy Selection Decision Documents:** Section 7: **Documenting Post-ROD Changes: Minor Changes, Explanations of Significant Differences, and ROD Amendments.**

EPA Technical Impracticability Waiver
OSWER Directive 9200.4-14, January 19, 1995

New Mexico Administrative Code (NMAC) Title 20, Chapter 6, Part 2, December 1, 1995: **Environmental Water Quality Ground and 'surface Water Protection:**

20.6.2.1.4101(B) NMAC
20.6.2.3101(A) NMAC
20.6.2.4130 NMAC

First Five-Year Review Memorandum

Lee Acres Landfill Superfund Site
EPA ID# NMD980750020
Farmington, San Juan County, New Mexico

This U.S. Environmental Protection Agency (EPA) memorandum documents the performance, determinations and approval of the Lee Acres Landfill Superfund Site First Five-Year Review, including the attached First Five-Year Review Report prepared by the Bureau of Land Management (BLM).

The first Five-Year Review is required by Section 121(c) of the Comprehensive Environmental Response, Compensation & Liability Act (CERCLA), 42 U.S.C. §9621(c), which requires that a periodic review be conducted no less often than every five years after the initiation of remedial action at sites where hazardous substances, pollutants or contaminants will remain onsite above levels that allow for unlimited use and unrestricted exposure. The triggering action for this statutory first five-year review is the initiation of the remedial action on October 25, 2004. BLM led the five-year review effort and completed it in close cooperation with EPA.

Summary of Five-Year Review Findings

The five-year review for this site indicates that the four remedy actions set forth in the Record of Decision (ROD) and the Remedial Action Work Plan (Work Plan) have been implemented as planned:

1. Construction of landfill cover (capillary barrier cover) with lysimeters. Construction of the landfill cover was completed on September 14, 2005 and has been maintained and monitored according to schedule. The February 2009 monitoring report found the cover is in excellent condition, and all flux measurements from lysimeters to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well.

2. Surface water run-on and run-off controls. The realignment of San Juan County Road 350 was incorporated into the remedial action design. The road provides the surface water run-on and run-off controls by channeling up gradient surface water along an impervious road apron downhill to a culvert that discharges the water off the landfill site.

3. Monitored natural attenuation of ground water. The Remedial Action Work Plan identified seven existing wells to be monitored, and required an additional well to be drilled. The additional well was completed in July 2005. These eight wells were selected based on their ability to provide adequate monitoring coverage of possible contamination flow off of the remediation site. The eight monitoring wells are sampled by the U.S. Geologic Survey. The ROD identified seven

contaminants of concern (COC). Six of the COCs have been below cleanup levels established in the ROD and below maximum contaminate levels (MCL) established by the Safe Drinking Water Act (SDWA) in all wells since 2000. Manganese is the seventh COC listed in the ROD. Manganese has sporadically been detected above the established background level (clean up level) in all monitoring wells except well #68.

4. Institutional controls. In January 1997, BLM withdrew 134.6 acres of public land surrounding and including the landfill from settlement, sale, location or entry as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). This withdrawal remains in effect for 50 years (until 2047).

Actions Needed

Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision document. No issues concerning the remedy implementation were identified.

The monitoring schedule in the Work Plan requires the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required five year monitoring period will be completed in the fall of 2010. After the fall of 2010, EPA will evaluate BLM's recommendation for annual monitoring until such time the site is deleted from the National Priority List (NPL).

Currently all contaminants of concern at the site with the exception of manganese is below clean up standards. Manganese levels in six of eight monitoring wells are at or below the clean up standard. Manganese is regulated by EPA at the Site based upon the enforceable limit specified in the ROD. BLM needs to continue to monitor for manganese until they meet the clean up standard. If all contaminants of concern are below clean up standards including manganese the monitoring frequency will increase to quarterly for a period of eight consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D.

Protectiveness Statement

The remedial actions performed at the site are considered to be protective of human health and the environment in the short-term. Long-term protectiveness will be achieved when manganese values begin to decrease and meet the clean up standard established in the ROD. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the landfill cover was completed on February 20, 2009. The summary paragraph of the Feb. 20, report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern listed in the ROD, satisfy the maximum contaminant levels (MCL) set under the SDWA Act. The

data also shows that manganese is the only contaminant of concern listed in the ROD that failed to comply with the enforceable limits established in the ROD.

Determinations

I have determined that the actions performed for the Lee Acres Landfill Superfund Site are protective of human health and the environment.

Approved By: _____ FOR

Samuel Coleman, P.E.
Director, Superfund Division
U.S. Environmental Protection Agency
Region 6

Date: 10-23-9

CONCURRENCES

First Five-Year Review

For the

Lee Acres Landfill Superfund Site

By: _____ Date: 10/6/09
Sairam S. Appaji, Remedial Project Manager
Superfund Remedial Branch

By: _____ Date: 10/13/09
Henry Parr, Chief
LA/OK/NM Remedial Section

By: _____ Date: 10/20/09
Charles Faultry, Associate Director
Superfund Remedial Branch

By: _____ Date: 10/13/09
Donald H. Williams, Deputy Associate Director
Superfund Remedial Branch

By: _____ Date: 10/23/09
George Malone, Assistant Regional Counsel
Superfund Division, Office of Regional Counsel

By: _____ Date: 10/23/09
Mark Peycke, Chief
Superfund Branch, Office of Regional Counsel

By: _____ FOR Date: 10-23-9
Sam Coleman, Director
Superfund Division

Five-Year Review

Lee Acres Landfill
Farmington New Mexico

Prepared By
Farmington BLM

October 2009

First Five-Year Review

Lee Acres Landfill Superfund Site
EPA ID# NMD980750020
Site ID: 0600911
Farmington, NM

This memorandum documents the United States Department of Interior (DOI) performance, determinations, and approval of the first five-year review for the Lee Acres Landfill Superfund Site performed under Section 121(c) of the Comprehensive Environmental Response, Compensation & Liability Act (CERCLA), 42 United States Code (USC) 9621 (c), as described in the attached Five-Year Review Report.

Summary of Five-Year Review Findings

The five-year review for this site indicates that the four remedy actions set forth in the Record of Decision (ROD) and the Remedial Action Work Plan (Work Plan) have been implemented as planned:

1. Construction of landfill cover (capillary barrier cover) with lysimeters. Construction of the landfill cover was completed on September 14, 2005 and has been maintained and monitored according to schedule. The February 2009 monitoring report found the cover is in excellent condition, and all flux measurements from lysimeters to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well.

2. Surface water run-on and run-off controls. The realignment of San Juan County Road 350 was incorporated into the remedial action design. The road provides the surface water run-on and run-off controls by channeling up gradient surface water along an impervious road apron downhill to a culvert that discharges the water off the landfill site.

3. Monitored natural attenuation of ground water. The Remedial Action Work Plan identified seven existing wells to be monitored, and required an additional well to be drilled. The additional well was completed in July 2005. These eight wells were selected based on their ability to provide adequate monitoring coverage of possible contamination flow off of the remediation site. The eight monitoring wells are sampled by the U.S. Geologic Survey. The ROD identified seven contaminants of concern (COC). Six of the COCs have been below cleanup levels established in the ROD and below maximum contaminate levels (MCL) established by the Safe Drinking Water Act (SDWA) in all wells since 2000. Manganese is the seventh COC listed in the ROD. Manganese has sporadically been detected above the established background level (clean up level) in all monitoring wells except well #68.

4. Institutional controls. In January 1997, BLM withdrew 134.6 acres of public land surrounding and including the landfill from settlement, sale, location or entry as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). This withdrawal remains in effect for 50 years (until 2047).

Actions Needed

Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision documents. No issues concerning the remedy implementation were identified.

The monitoring schedule in the Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required five year monitoring period will be completed in the fall of 2010. After the fall of 2010, BLM recommends monitoring the cover annually until site deletion from the EPA National Priority List (NPL).

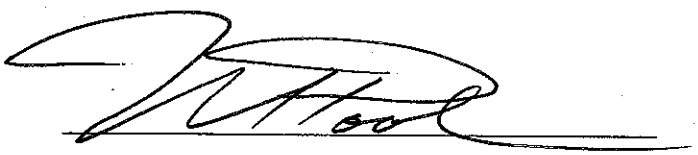
The groundwater monitoring schedule in the Work Plan requires semi-annual monitoring for a period five years after completion of construction. The five year period will be completed in the fall of 2010. The ROD also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of eight consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. Monitoring will continue as scheduled in the Work Plan. Currently all contaminants of concern except manganese are under established clean up levels. Manganese levels in six of eight monitoring wells are at or below clean up levels. Manganese is regulated by EPA at the Site based upon the enforceable limit specified in the ROD.

Protectiveness Statement

The remedial actions performed at the site are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the landfill cover was completed on February 20, 2009. The summary paragraph of the Feb. 20, report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern listed in the ROD, satisfy the maximum contaminant levels (MCL) set under the SDWA Act. The data also shows that manganese is the only contaminant of concern listed in the ROD that failed to comply with the enforceable limits established in the ROD.

Determinations

I have determined that the actions performed for the Lee Acres Landfill Superfund Site are protective of human health and the environment.



10/2/09

Mike Pool
Acting Deputy Director, Bureau of Land Management

Date

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Acronyms

ARARS.....Applicable or Relevant and Appropriate Requirements
BH.....Borehole
BLM..... .....Bureau of Land Management
BTEX.....Benzene, Toluene, Ethyl benzene, Xylene
CERCLA .....Comprehensive Environmental Response, Compensation, and Liability Act
COC.....Contaminants of Concern
COPC.....Contaminants of Potential Concern
DCE.....Dichloroethene
DOI.....Department of the Interior
EPA..... Environmental Protection Agency
ES.....Executive Summary
FML.....Flexible Membrane Liner
FS .....Feasibility Study
GBR.....Giant Bloomfield Refinery
MCL.....Maximum Contaminant Level
MDL.....Minimum Detection Level
mg/l.....Milligrams per liter (parts per million)
MOU..... Memorandum of Understanding
NCP.....National Contingency Plan
NMED..... New Mexico Environment Department
NMEID.....New Mexico Environmental Improvement Division
NMOCD.....New Mexico Oil Conservation Division
NMWQCC.....New Mexico Water Quality Control Commission
NPL.....National Priorities List
O & M.....Operation and Maintenance
PCE.....Tetrachloroethene
PRG.....Preliminary Remediation Goals
RAO.....Remedial Action Objectives
RI..... Remedial Investigation
RIR.....Remedial Investigation Report
SARA.....Superfund Amendments and Reauthorization Act
SDWA.....Safe Drinking Water Act
TBC …….To Be Considered
TCE …… Trichloroethylene
SVOC .....Semi-volatile Organic Compounds
TMV.....Toxicity, Mobility, and Volume
µg/l.....micrograms per liter (parts per billions)
VOC.....Volatile Organic Compounds

Executive Summary

The first five-year review of the Lee Acres Landfill Superfund Site located in San Juan County, New Mexico, was completed in June of 2009. This site is on the National Priorities List (NPL – EPA ID# NMD980750020). The remedy actions selected in the June 2004, Record of Decision (ROD) included the construction of a landfill cover, water run-on and run-off controls, institutional controls, and monitored natural attenuation of ground water. The remedy actions resulted in landfill contaminants remaining onsite above levels that would allow for unlimited use and unrestricted exposure. The ROD required a statutory review no less often than each five years after the initiation of the remedial action as defined in the Work Plan to ensure that the remedy is, or will be, protective of human health and the environment. The results of this first five-year review indicate that the remedy actions completed at the site are protective of human health and the environment. The initial construction of the landfill cap and follow-up actions performed appear to be functioning as designed. The site has been maintained sufficiently to protect the landfill cover that has been constructed over the remaining waste. No deficiencies were noted that currently impact the protectiveness of the remedial actions.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name Lee Acres Landfill		
EPA ID: NMD980750020		
Region: EPA Region 6	**State:** New Mexico	**City/County:** Farmington/San Juan
SITE STATUS		
NPL status: □ X Final __ Deleted __ Other (specify)		
Remediation status (choose all that apply): __ Under Construction __ Operating. X Complete		
Multiple OUs?* __ YES X NO	**Construction completion date:** 9 / 14 / 2005	
Has site been put into reuse? __ YES X NO		
REVIEW STATUS		
Lead agency: □ _ EPA _ State _ Tribe X Other Federal Agency: Bureau of Land Management (BLM)		
Author name: Barney Wegener		
Author title: Remedial Project Manager	**Author affiliation:** BLM	
Review period: 10 / 25 / 2004 to 10 / 25 / 2009		
Date(s) of site inspection: 2 / 19 / 2009		
Type of review: Statutory		
Review number: □ X 1 (first) __ 2 (second) __ 3 (third) __ Other (specify)		
Triggering action: Actual Remedial Action Start		
Triggering action date: October 25, 2004		
Due date *(five years after triggering action date)*: October 25, 2009		
Issues: Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision documents. No issues concerning the remedy implementation were identified.		

Recommendations and Follow-Up Actions:

1. The monitoring schedule in the Record of Decision (ROD) and Remedial Action Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required 5 year monitoring period will be completed in the fall of 2010. BLM recommends that the landfill cover be monitored semi-annually through 2010, and then annually until other monitoring requirements may be established in conjunction with site deletion from NPL.

2. The groundwater monitoring schedule in the Work Plan requires the semi-annual monitoring of eight specified wells for a period five years after completion of construction. This five year monitoring period will be completed in the fall of 2010. BLM recommends continued groundwater monitoring through 2010, and then consulting with EPA to establish monitoring requirements to facilitate removal of the site from the National Priorities List.

3. The Work Plan also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of 8 consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. BLM recommends that after the contaminant levels attain the enforceable limits set in the ROD, and the ground water monitoring requirements in the ROD are completed in 2010, a review of the NMAC 20.6.2.4103 D regulations will be completed. Upon completion of the review, BLM will either initiate quarterly monitoring, or notify NMED of BLM's review findings and BLM's intent to consult with EPA to establish monitoring requirements to facilitate removal of the site from the National Priorities List.

Protectiveness Statement:

The remedial actions performed at the site are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the landfill cover was completed on February 20, 2009. The summary paragraph of the Feb. 20, report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern listed in the ROD, satisfy the maximum contaminant levels (MCL) set under the SDWA Act. The data also shows that manganese is the only contaminant of concern listed in the ROD that failed to comply with the enforceable limits established in the ROD.

* ["OU" refers to operable unit.]

Lee Acres Landfill Superfund Site
Farmington New Mexico
First Five-Year Review Report

Introduction

The Farmington Field Office of the Bureau of Land Management (BLM) has conducted a statutory First Five-Year review of the remedial actions implemented at the Lee Acres Landfill Superfund Site during the period of October 2005 through October 2009. The purpose of the Five-Year Review is to determine whether the remedy at the site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year review reports identify issues found during the review, if any, and identify recommendations to address them.

BLM is preparing the Five-Year Review report pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), §121 and the National Contingency Plan (NCP). NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above level that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The remedy selected for Lee Acres Landfill in the ROD resulted in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. The triggering action for this statutory review is the initiation of the remedial action on October 25, 2004.

2.0 Site Chronology

Date	Event
May 1, 1962	Lee Acres officially opened
Apr. 25, 1980	San Juan County Development Plan for landfill includes provisions for combined sludge and dead animal pit.
Nov. 10, 1980	NMEID found refuse pit almost full and not compacted or covered at required frequency. Suggested either additional land for expansion or new location.
Aug. 24, 1981	NMEID submits to EPA Potential Hazardous Waste Site Inspection Report, reporting surface impoundment with liquids, sludge, oily wastes, drilling fluids and drilling muds.

Sept. 9, 1981	NMEID reported noncompliance regarding required 2 feet of final cover over original landfill area.
Apr. 18, 1985	Lagoon breach and vapor release incident occurred. Eleven people treated for hydrogen sulfide poisoning.
May 8, 1985	BLM compliance exam reported sludge pit was fenced and a "No Dumping" sign posted.
Jan. 14, 1986	NMEID inspection reported the liquid waste lagoon was 96 to 97% evaporated
Apr. 24, 1986	NMEID inspection reported the liquid waste lagoon was completely covered with soil.
Apr. 25, 1986	Lee Acres Landfill officially closed by BLM suspending leases, except for a 5 acre transfer station.
Oct. 21, 1986	NMEID Administrative Order issued for BLM to provide water to residents, and prepare plans to investigate, cleanup, and monitor ground water.
Nov. 5, 1986	BLM begins bottled water delivery to 13 identified residents.
Dec. 1986	BLM fenced landfill to prevent direct contact.
Dec. 24, 1986	BLM and Lee Acres Water Users Assoc. enter agreement to permanently hook up Lee Acres residents to the community supply system.
1987	Lee Acres residents hooked up to community water system.
March 1989	BLM conducts preliminary investigation.
Dec. 19, 1989	Clean Water Act Sec. 404 nationwide permit received for arroyo erosion control construction.
Aug. 28, 1990	Lee Acres Landfill placed on the National Priorities List by EPA.
Sept. 13, 1991	CERCLA 107 letters issued by EPA to BLM, San Juan County and Giant Bloomfield Refinery.
Jan. 1993	BLM, EPA and NMED enter into a technical MOU for completion of the Remedial Investigation.
Sept. 1993	Final Remedial Investigation Report.
May 19, 1995	EPA and NMED approve Remedial Investigation.
May 8, 1996	EPA and NMED approve Feasibility Study.
Sept. 1996	EPA and NMED approve Proposed Plan

Nov. 16, 1996	Public review and comment period completed.
July 23, 2004	ROD signed by EPA & DOI
July 23, 2004	Inter Agency Agreement (IAG) between EPA and DOI signed.
Sept. 27, 2004	Remedial Design approval by EPA & NMED
Oct. 21, 2004	Design specification change from 9-inch to 15-inch layers for soil cover lifts approved by EPA & NMED.
October 25, 2004	Site preparation of site roadway and landfill site.
October 26, 2004	Gradation tests for gravel admixture and capillary barrier approved by BLM contract Consultant.
November 1, 2004	Removal of pilot cap and area leveled.
November 17, 2004	County Road 5569 right-of-way work begins
December 8, 2004	Southeast (small) cap work started.
December 15, 2004	Southeast (small) cap work completed.
Dec.20, 2004 – Jan. 25, 2005	Inclement weather delays significant work progress at Lee Acres.
February 2, 2005	Main cap work began with capillary gravel break
February 3, 2005	Lysimeters installed over northern & southern lagoons
February 7, 2005	Site visit by BLM contract consultant.
February 9, 2005	Site visit by EPA.
February 10, 2005	Placement of separator Geotextile started.
February 15, 2005	Site visit by NMED
March 1, 2005	Design specification change from 15-inch to 30-inch layers for soil cover lifts approved by EPA & NMED.
March 10, 2005	30-inch soil cover competed.
March 14, 2005	Rock Armoring of sides slopes begins.
March 23, 2005	Preparation of 30-inch soil lifts for erosion resistant layer.
March 24, 2005	Site visit by BLM contract consultant.
March 28, 2005	Placement of erosion resistant layer (50/50 blend) begins.
April 1, 2005	Erosion resistant layer (50/50 blend) completed.
April 6, 2005	Topsoil application to side slopes of road right-of-way.
April 14, 2005	Culvert drainage work completed.
April 26, 2005	Site visit by EPA
May 2, 2005	County Road 350 ready for road base and paving.
July 21, 2005	Site visit by NMED
August 25, 2005	New Monitoring well drilled and completed
September 1, 2005	CR 350 road completed and open to traffic
September 14, 2005	Lee Acres reseeding completed.

Lee Acres Area Map

Figure 1

3.0 Background

The Lee Acres Landfill is approximately 4.5 miles east of Farmington, New Mexico, consisting of nearly 60 acres of federal land located in San Juan County. San Juan County is located in the San Juan Basin, an asymmetrical syncline consisting of Quaternary to Cretaceous aged alluvium, sandstone, siltstone, shale, limestone, and coal. The climate of the area is classified as arid continental, characterized by cool, dry winters and warm dry summers. The large distance from any source of oceanic moisture creates a climate of abundant sunshine and large diurnal variations in temperature. The soils are mainly sandy loam and loamy sands derived from sandstone and shale parent materials.

The landfill originally consisted of 20 leased acres issued in 1962 for the operation of a municipal solid waste landfill by San Juan County. An additional 40 acres was leased in 1980 expanding the land fill to it present size of 60 acres (Figure 1).

After acquiring the additional acreage, San Juan County, with the knowledge of the New Mexico Environmental Improvement Division (NMEID) and Bureau of Land Management (BLM), expanded the use of the landfill to allow the disposal of liquid waste. Containment berms were built and lagoons were established and referred to as the northern and southern lagoons.

In 1985, during routine maintenance activities the berm of the northern lagoon was breached, causing a release of the liquid contents and hydrogen sulfide gas. A resident along with responding emergency personnel were overcome by the hydrogen sulfide gas and subsequently hospitalized, and later, released. The lagoon was aerated and treated chemically to neutralize the hydrogen sulfide and stabilize other chemicals by the New Mexico Environmental Improvement Division (NMEID), the predecessor to the NMED. The landfill was immediately closed to liquid waste disposal and later closed to solid waste disposal in 1986. The site was stabilized and covered with clean soil up to a depth of 4 to 15 feet. The BLM conducted a Preliminary Investigation in 1988. In 1990, the Environmental Protection Agency (EPA) placed the Lee Acres Landfill on the National Priorities List (NPL) as EPA ID# NMD980750020.

3.1 Physical Characterisitics

The Lee Acres Landfill is in the eastern portion of San Juan County, a dissected high plateau within the Navajo Section of the Colorado Plateau physiographic province. This high plateau is dissected by the San Juan and Animas Rivers that originate in the San Juan Mountains of southern Colorado, coalesce near Farmington, and flow west to the Colorado River. The landfill is located in the southern drainage basin of the interfluvial ridge between the two rivers. The intermittent surficial waters from the area drain through an unnamed arroyo system that joins the San Juan River south of the Lee Acres subdivision.

The 60-acre landfill can be divided into two portions. The eastern 40 acres is sublain by tertiary Nacimiento Formation claystone/siltstone facies interfingered with Nacimiento sandstone facies that forms the low permeable barrier to bedrock aquifers. This portion of the landfill was generally used for solid waste disposal and dead animal pits. The western 20 acres of the landfill is underlain by quaternary alluvium classified as unconsolidated silty sand to sandy gravel. The

thickness of the alluvium, from ground surface to bedrock, is up to 60 feet near the center of the channel and the depth to water is 34 to 47 feet. Alluvial ground water is present beneath approximately 8 acres along the western edge of the landfill, but not the eastern portion of the landfill.

3.2 Hydrology

Quaternary alluvium forms an unconfined aquifer. It is poorly to moderately sorted, fine-grained to coarse-grained sands, with some gravels and cobbles. Unconsolidated silt and clay lenses are common south of U.S. 64 , where the unnamed arroyo channel alluvium mixes with San Juan River deposits. The unconfined aquifer was defined during the RI because it is bounded on the east by bedrock and the saturated zone ends with no confining feature on the west or above the ground water. This type of configuration is, by geologic definition, an unconfined aquifer. There are no known beneficial uses of this aquifer; however, it is a potential drinking water source. Pursuant to Section 7.28 of the Rules and Regulations Governing Drilling of Wells and Appropriation and Use of Ground Water in New Mexico, the unconfined alluvial aquifer is part of the San Juan Underground Water Basin. The New Mexico Water Quality Control Commission Regulations 3101 (A) classify all ground water with an existing total dissolved solids concentration less than 10,000 milligrams per liter as protected.

The western edge of the landfill is underlain by an unconfined alluvial aquifer. The aquifer is bound on both sides by the margins of an incised bedrock channel which is approximately 600 feet wide in the area near the landfill. Ground water in the alluvial aquifer moves southward at a rate of approximately 0.17 feet per day (62 feet/year), based on the hydraulic data collected in 1993. Farther south, the saturated alluvium interfingers with the San Juan River deposits and is not bound by the bedrock channel. The alluvium is comprised of poor to moderately sorted, fine to medium sands with some gravel and cobbles. Unconsolidated silt and clay lenses are common. The underlying regional bedrock aquifer is unaffected by the contamination from the Lee Acres Landfill site.

Ground water in the unnamed arroyo alluvial aquifer flows from north to south toward the San Juan River within a paleochannel in the bedrock. South of U.S. 64, ground water is no longer contained within the incised unnamed arroyo bedrock channel where the alluvium interfingers with San Juan River terrace and flood plain deposits. In this area, ground water from the unnamed arroyo alluvium discharges and mixes with the ground water of the San Juan River Valley. Most of the domestic, municipal, and agricultural water in the San Juan Basin comes from wells completed in the Quaternary surficial valley deposits or underlying sandstones. Recharge is derived from upstream alluvial aquifer flow and infiltration from meteoric precipitation. Infiltration from the fire water storage ponds southeast of the landfill and the landfill liquid waste lagoons contributed to alluvial aquifer recharge in the past. These sources were later drained, and no longer impact the alluvial aquifer.

Horizontal gradients in the alluvial aquifer range from 0.004 feet per foot (feet/ft) to 0.014 feet/ft. The gradients are steeper in the northern portion of the study area and generally decrease toward the south, the direction of the ground water movement as shown in Figure 2.

Saturated Alluvium Extent and Potentiometric Surface Map

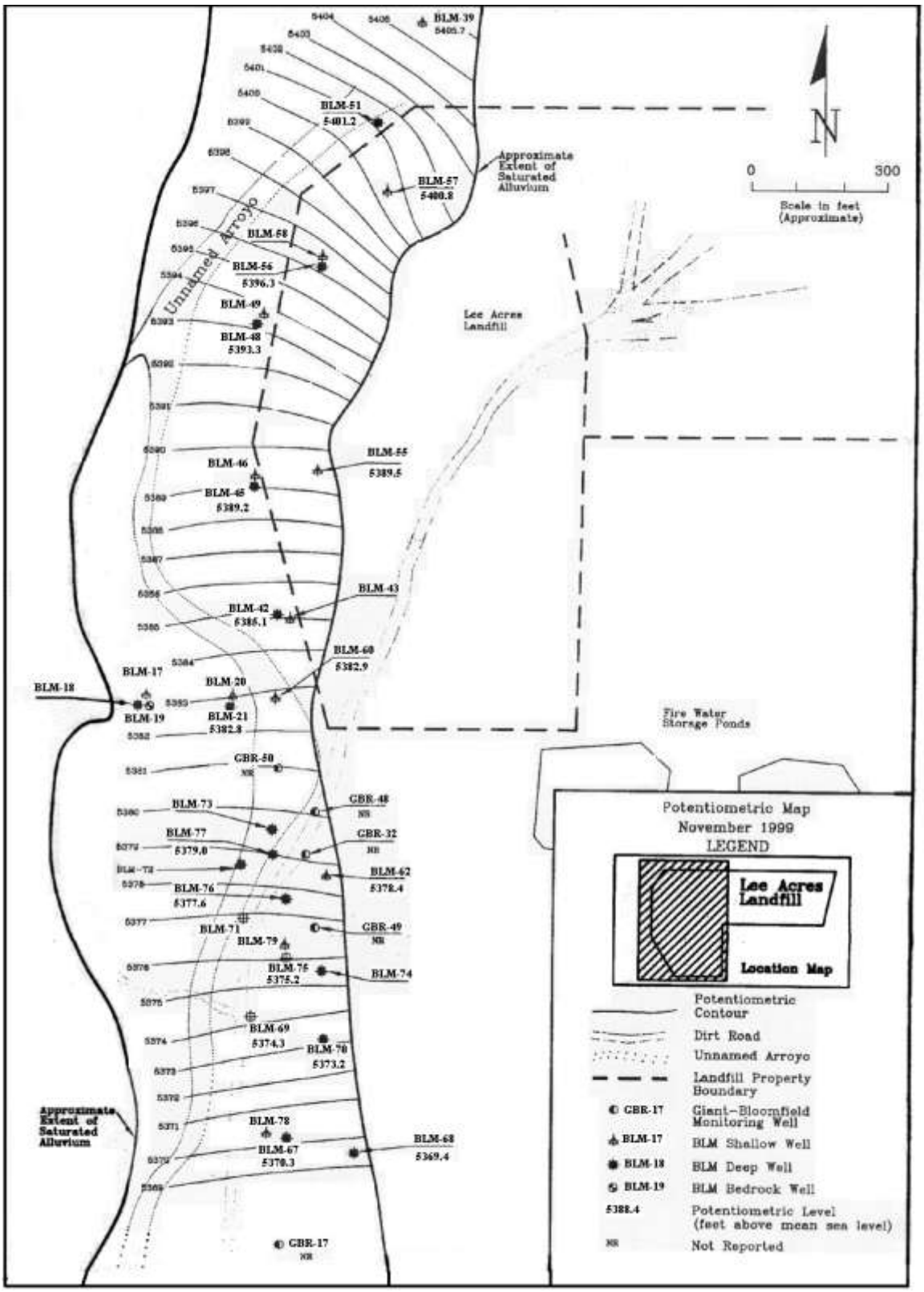


Figure 2

3.3 Land and Resource Use

In this part of San Juan County, much of the land is publicly owned, open rangeland. Several governmental agencies, industries, developers, and private citizens own or lease land within the original study area for the site. The original study area (circa 1986) was significantly larger than the site is now. It was re-defined in 1993 for the RI. No Indian reservations, tribal lands, or railroad land grants are within the study area. Residential, commercial, and industrial developments are concentrated in the incorporated municipalities of Aztec, Bloomfield, and Farmington, and adjacent to the transportation corridors between these towns. The major vehicular transportation route in the vicinity of the former landfill is U.S. Highway 64, also known as the Bloomfield Highway. The highway is located approximately ½ mile south of the landfill boundary.

The land in the region of the study area is used predominantly as open rangeland for livestock and wildlife. It is also used for: 1) industrial purposes by the Giant-Bloomfield Refinery (GBR), and by the El Paso Natural Gas Substation, which is north of the study area; 2) residential purposes south of the study area and north of the San Juan River; and 3) public recreational purposes at the San Juan County Fairgrounds southwest of the study area.

The rangeland vegetation in the area is not well suited to supporting large numbers of livestock; approximately 12 acres are required to feed one mature cow and calf for one month (one animal-unit-month). Oil and natural gas wells are present near the landfill. A north to south trending natural gas pipeline is located approximately 500 feet west of the landfill site. No public schools, prisons, or hospitals are within three miles of the site. The nearest educational facility is a private school operated by the Mennonite community approximately one mile north of the landfill. Future use of this area is expected to remain much the same as it is now, with the exception of a possible county road expansion.

The landfill is surrounded on the north, east and west by undeveloped property. GBR is located south of the landfill, and the GBR property is bounded on the south by Highway 64. South of Highway 64, there is a residential area, the Lee Acres Subdivision, which extends to the San Juan River. The San Juan River is about one mile south of the Lee Acres Landfill.

3.4 History of Contamination

Based on historical records and field sampling, soil investigations at the landfill identified four major areas that are either known or potential contaminant source areas that pose a threat to ground water. The former northern and southern liquid waste lagoons have been identified as known contaminant source areas. Two other potential contaminate sources were identified in the southern portion of the landfill, and may have been solid waste disposal areas.

Soil samples were collected from both the vadose and saturated zones during the initial stage of the RI. Details of the soil sampling programs are found in the RI. The landfill is estimated to contain approximately 800,000 cubic yards of contaminated soil and waste. Waste types encountered within the landfill consist of common household waste and various types of construction debris. Typical types of household and industrial wastes that contain many of the

chemicals listed below include paint thinners, grease and oil strippers and cleaners, pesticides, general cleaning chemicals, dry cleaning chemicals, carburetor cleaners, used oil from automotive and heavy equipment, kitchen and restaurant cleaners and grease, oil field wastes, spent copier and toner cartridges, and many other types of materials. It is probable that many of these products or their containers were placed in both lagoons, as well as other parts of the landfill during the period from 1974 through 1986.

The following methods for soil testing at the Lee Acres Landfill were used during the RI in 1993 and earlier. Samples were collected during borehole installation and from well installation. Soil samples from boreholes BH 01 through BH 39 and wells BLM 39 through BLM 66 were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/PCBs and metals using EPA methods 8010, 8020, 8270, 8080 and TCLP. Soil samples from boreholes BH 40 through BH 53 and well bores BLM 67 through BLM 79 were analyzed for VOCs, metals, chloride, and sulfate.

Soil samples collected for the RI in 1990 identified chlorinated and non-chlorinated VOCs, SVOCs, and pesticides in the subsurface above the method detection limits (MDLs). Chlorinated VOCs, common in solvents, were found in soil samples including 1,2-*trans*-dichloroethene (1,2-*trans*-DCE), tetrachloroethane (PCE), trichloroethene (TCE), trichloromethane, dichloromethane, and other constituents in very low concentrations. During the 1990 sampling event, 1,2-*trans*-DCE was detected in one soil sample collected in the landfill and in two samples collected off-site. Other VOC contaminants detected in vadose zone soils on and south of the landfill included TCE, PCE, and petroleum, gasoline, and oil field wastes such as benzene, toluene, ethylene and xylene (BTEX) compounds. On the site, the highest concentrations of BTEX were found in the region of the former northern liquid waste lagoon and east of the northern lagoon. The majority of the VOC compounds are indicative of solvent and stripper well wastes, while the BTEX compounds are related to petroleum hydrocarbon wastes. Chlorinated VOCs were found in relatively low concentrations less than 10 micrograms per kilogram (µg/kg) in the landfill. The highest concentration (252,600µg/kg) was found in the northern lagoon. Areas outside the lagoon, but adjacent to it ranged in concentration from 30 to 51 µg/kg.

Pesticide concentrations ranged from 5.7 µg/kg to 405 µg/kg. These sites were very localized in the borehole grid, predominantly in the southwestern portion of the landfill. SVOCs, predominantly *bis*(2-ethylhexyl)phthalate and dichlorobenzene were detected in landfill soils in concentrations at or near the minimum detection level (MDLs). The highest concentrations of SVOCs in the soils were found just inside the south landfill entrance, near the former southern liquid waste lagoon, and in the eastern 40-acre portion of the landfill. The highest concentrations of pesticides were at or near MDLs. They were located in soil samples from the eastern and southern portions of the landfill.

3.5 Initial Response

On April 18, 1985, the Farmington field office of the NMEID received information that a disposal pit at the Lee Acres Landfill had breached. The incident extended from April 18 to May 3, 1985. The NMEID incident report is not specific as to which lagoon breached, but the

description suggests that it was the north lagoon. The area was sealed off, the breach was repaired, and sampling activities were performed. Eleven people were treated and released for symptoms of hydrogen sulfide poisoning. The NMEID Emergency Response staff from the NMEID Hazardous Waste section responded to the incident: coordinated the onsite activities with assistance from the NMEID Farmington field office. Additional agencies also responded to the incident. The Occupational Health and Safety Bureau provided monitoring support; the Office of Epidemiology evaluated health effects; the Scientific Laboratories Division performed laboratory analyses; and the San Juan County Road and Fire Departments assisted with security, sampling, and heavy equipment.

The lagoon was aerated and treated chemically to neutralize the hydrogen sulfide and stabilize other chemicals by the New Mexico Environmental Improvement Division. The landfill was immediately closed to liquid waste disposal and later closed to solid waste disposal in 1986 and the site was covered with clean soil up to a depth of 4 to15 feet.

3.6 Basis for Taking Action

In 1986, volatile organic compounds (VOCs) were found at concentrations greater than the associated maximum contaminant levels (MCLs) in samples collected from three domestic water supply wells in the Lee Acres subdivision located down-gradient from the landfill and the Giant Bloomfield Refinery. Even though the source of the contamination was not linked to the Lee Acres Landfill, and BLM did not assume responsibility for the contaminants, the BLM agreed to connect 13 residents in the subdivision, who were using private drinking water wells, to a municipal water supply. During the construction of the connections, BLM provided those residents with at least 8,700 gallons of bottled water. The hookups were completed in 1987.

In January 1993, BLM developed a technical working group to complete the Remedial Investigation (RI), the Feasibility Study (FS), and the Proposed Plan (PP). The RI was approved by EPA in May 1995, and the FS was approved in May 1996. Subsequently, the PP was approved by the EPA in September 1996. The public review and response period was completed in November 1996 with no comments received. Information from the RI was used to identify seven contaminants of concern (COC) within the ROD (Table 1). The basis for taking remedial action is to prevent further contamination of ground water from leaching of contaminants that may exist in the landfill soils, and to eliminate all possibility of human and ecological exposure to contaminated soils and ground water.

4.0 Remedial Actions

The Record of Decision identified four components of selected remedy:

- Landfill cover (capillary barrier cover) with lysimeters
- Surface water run-on and run-off controls
- Monitored natural attenuation of ground water
- Institutional controls, in the form of withdrawal of site by BLM

4.1 Landfill Cover and Surface Water Controls

The 1996 Proposed Plan required the development of a pilot project to test the effectiveness of the proposed capillary barrier cap (landfill cover). If the test was successful the landfill cover was to be the selected remediation for the Lee Acres Landfill. The pilot study began in August 1997 and was completed in March 1999. After more than three years of monitoring and evaluation, the landfill cover was declared to be a success. Based on the successful test, the landfill cover was a selected remedy for the site.

The landfill cover is designed to prevent future leaching of contaminants by minimizing percolation of surface moisture into the ground water through the contaminated trash layers and the lagoon sediments that are still in place in the landfill.

The landfill cover construction consisted of two inter-related actions:

1) Closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory and,
2). Realignment of County Road 5569 to create County Road CR 350, which incorporated surface water run-on and run-off controls to prevent storm water run-on from reaching the landfill cover (figure 3).

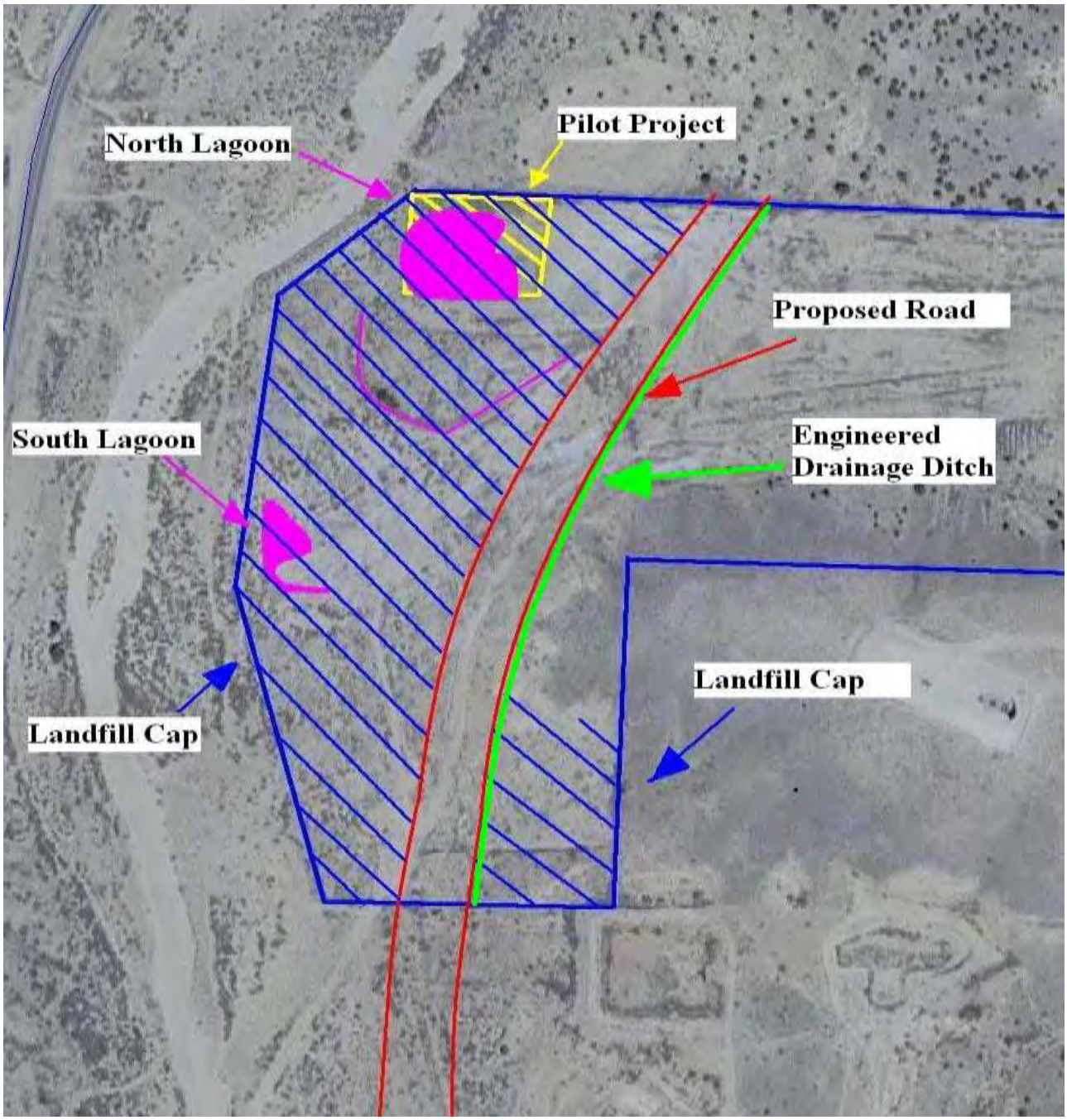
4.1.1 Construction

Construction of the Capillary Barrier began with general site construction requirements performed by the San Juan County Public Works Department (SJC). These consisted of temporary environmental controls for erosion and sediment control, dust abatement, and spill prevention. Site clearing followed next with the grubbing trees, brush and herbaceous vegetation from the area.

The original Pilot Cap was removed and the area leveled and compacted with a smooth roller compactor. Removal of the Pilot Cap was deemed necessary over concerns that area where the Pilot Cap and new cap join could have the potential to create pathways for moisture to infiltrate downward. Removing the Pilot Cap and constructing a new capillary barrier over the entire western portion of the landfill would create a smooth, continuous and homogenous barrier over the entire area. At the completion of this phase, the region received record precipitation amounts that resulted in many construction delays due to unexpected wet conditions. This put construction of the cap behind schedule.

The southeast corner of the landfill was identified as a potential contaminant source area. Based on analytical results, it was believed this area may have been used as a lagoon area or solid waste disposal site. Initially, construction of the capillary barrier was to be completed on the western and southeastern portion of the landfill in one continuous operation. However, the region continued to experience repeated precipitation events delaying the work schedule. During a break in the weather, SJC began and completed construction of the southeastern capillary barrier in the course of a few days. The capillary barrier over the larger western portion of the landfill was constructed from February 2005 through April 2005.

The capillary barrier was constructed in phases. The first phase consisted of the installation of an uncompacted 6 inch gravel bottom layer. The capillary barrier is formed by the contrast in unsaturated hydraulic properties between the course gravel layer and the overlying fine soil layer and is referred to as the capillary break.



Map of Construction of the Landfill Cover and County Road 350

Figure 3

Soil Fraction	Sieve Size	Specification
Fines	<0.075 mm (#200)	<2%
Sand	<0.425 mm (#4), >0.075 mm	<15%
Gravel	>4.75 (#4), <19 mm (3/4)	>85%
Max Size	<50mm	100%

The gradation tests for the course gravel were reviewed and deemed acceptable by Mr. Steve Dwyer, who designed the capillary barrier and served as the BLM contract Consultant.

The Remedial Action Work Plan & Remedial Design called for installation of two lysimeters to monitor the performance of the cap. One lysimeter was installed directly above the northern lagoon with the second installed above the southern lagoon. The placement of these lysimeters was based on the assumption the lagoons were presumed to be the direct cause of contaminant increases in the groundwater and the areas of most concern with regard to preventing further infiltration into the existing plumes. At this time there is no accepted performance standard for landfills but an annual influx of 1.3 mm/year has been chosen as an initial alert level for determining the effectiveness of the landfill cap. The 1.3 mm/year value was chosen based on this value being used at the Rocky Mountain Arsenal Superfund site in Denver.

The lysimeters used for this project consisted of double wall, double bottom carbon steel tanks (10 feet in diameter and 2 feet high). The tanks have a single 2-inch outlet in the bottom of the tank adjacent to the sidewall for draining purposes. The tanks were placed on bed material

consisting of fine washed sand. The tank and pipe fittings were inspected and tested for water tightness. Following the inspection and site test, the top of the tanks were left open and filled with clean capillary gravel to avoid passing fines into the PVC drain line. The top of the tanks filled with gravel matches the top of the adjacent capillary barrier coarse layer to ensure a continuous capillary break was formed. A gate valve and value box was installed adjacent to the tanks to open and close the 2-inch drain lines. The end of the drain lines are equipped with caps to prevent dirt, debris and foreign materials from entering and plugging the drain lines. The lysimeter drain line caps are removed and the valves opened to allow for the collection of any water collected in the lysimeters during post-construction completion monitoring activities.

The next phase of work involved the installation of a geotextile filter fabric over the completed gravel layer. The fabric was designed to separate the overlying fine soil from the underlying gravel. This fabric also serves as an additional capillary barrier break. The geotextile was supplied in 12.5 foot wide rolls approximately 360 feet long with a thickness of 50 mm. The material was rolled out using a work release prison crew. Each roll covered approximately 500 square feet. To prevent tearing or puncturing, no vehicle traffic was allowed on the material. The material was overlapped approximately one foot to ensure an adequate overlap. SJC covered the material with soil within five days to prevent long term exposure to UV radiation from sunlight and ambient exposure.

The next phase consisted of placement of the fine soil layer designed to store infiltrated water. SJC hauled in the soil from a nearby borrow site. Initially, the construction plan called for 9-inch lifts compacted to 100 to 112 lbs/ft^3. The total thickness of the soil cover was to be 30 inches. However, SJC still experienced over compaction using the 15-inch lifts approved in the October 2004 design specification change. The soil was still becoming over compacted from the weight of equipment necessary to spread the soil. Geomat Inc. on behalf of SJC requested a specification design change to use a single 30-inch layer instead of two 15-inch lifts. The compaction and moisture content of the soil in the bottom 15 inches were checked by a nuclear density meter. The proposed modification was reviewed and approved by both Remedial Project Managers with the Environmental Protection Agency (EPA) and New Mexico Environmental Department (NMED).

The next phase after completion of the 30-inch fine soil layer involved placement of a 6-inch thick erosion layer. The erosion layer was a blend of the native soil used in the 30-inch soil cover and gravel. This application is also referred to as the 50/50 blend. The intent of this layer

was to minimize erosion of the cover. The gradation test for the gravel was reviewed by Mr. Steve Dwyer and was found to be marginally acceptable for this task. Before this stage could be started the design specification called for the soil cover to be scarified. Scarification is essential to insure a good bond between the soil cover and the erosion barrier. The mixture was spread evenly in one lift to a thickness of 6-inches.

Coble (four to five inches in diameter) was placed around the northern, western and southern perimeter of the capillary barrier to serve as a rip rap armament layer to protect against erosion.

The rip rap was placed on outer slopes of the cap at a slope not to exceed a 6:1 ratio. Each rip rap installation was underlain by a geotextile separation material. At the eastern edge of the cap a v-drainage ditch was constructed where the cap adjoins the slope base of County Road 350. The drainage ditch captures runoff from the road slope and diverts it offsite.

The final phase of the cover construction included seeding with a native vegetation seed mix. .

In January 1997, the BLM withdrew 134.68 acres of public land (see fig.1) surrounding and including the landfill from settlement, sale, location and entry as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). The withdrawal does not prohibit all activities on the withdrawn land and at BLM's discretion; BLM may choose to authorize activities that will not disturb the integrity of the containment system. The BLM has determined that realignment of County Road 350 and placement of fence barriers isolating the road from the Lee Acres landfill and capillary barrier would not jeopardize the integrity of the remedial design.

The realignment of County Road 350 was being designed so the location of the road would not adversely affect the capillary barrier cap.

The placement of the road actually serves to intercept runoff from the east and divert it around and away from the landfill via ditches and two 24-inch culverts located beneath the roadway at the north and south ends of the landfill site.

The ongoing road construction was slightly behind schedule due to unforeseen delays in weather and site conditions. The road was completed on September 1, 2005. Reseeding was completed on September 14, 2005.

The eastern edge road drainage channel construction plans described using an 80 mil geomembrane over laid with 4-inch pea gravel. This design is illustrated in the Remedial Design construction drawing Sheet 5 of 7, Detail B. SJC requested a change in design which was discussed at the Lee Acres Landfill site on March 24, 2005 with Mr. Steve Dwyer, Geomat Inc., representing SJC, and BLM. However, another job site visit was held on July 21, 2005 involving SJC, Geomat, BLM and Mr. Steve Dwyer, to discuss the difficulty the SJC would encounter to safely and efficiently operate the necessary equipment to complete the March 30, 2005 design change. As a result a new design change was prepared consisting of the drainage channel be under laid with geotextile, followed by 2½-inches of asphalt and seal oil. This design is based on runoff calculation conducted by Cheney-Walters-Echols, Inc. This design will handle and divert runoff around and away from the landfill. However, any erosion will be handled by SJC as part of its ongoing operation and maintenance for the site. Persistent erosion problems will require a re-design and construction appropriate to correct the issue. The Remedial Action Work Plan & Remedial Design required the placement of barrier fencing isolating the Lee Acres Landfill from the road. The barrier fence was installed on the eastern side of the landfill in September 2004. During a site visit by BLM and NMED personnel, in December 2004, it was determined that a portion of the eastern fence required realignment. Old aerial photograph reveals trenching and other landfill activities took place in an area currently not protected from public entry by the barrier fence. NMED requested that the barrier fence be realigned to protect this area from public entry. The fence correction was completed in late August, 2005, before the roadway was open to public traffic.

4.1.2 Landfill Cover Monitoring

The Remedial Action Work Plan established the monitoring requirements for the landfill cover. The monitoring was to be performed quarterly for the first two years after installation, and then semi-annually for three more years. After the five-year monitoring period has been completed in the fall of 2010, the BLM may request that EPA, in its discretion, negotiate a reduction in the type and frequency of monitoring.

An important feature of the landfill cover monitoring was the inclusion of lysimeters installed under the cover profile. There were two lysimeters installed. One was installed directly above the northern lagoon while the second above the southern lagoon. The lagoons are presumed to be the direct cause of contaminant increases in the groundwater and consequently are the points of most concern with regard to preventing further surface water infiltration into the existing plumes. Initially, an annual flux of 1.3 mm/year within each lysimeter was used as the initial alert level for determining the effectiveness of the cover system. There was no universally accepted performance standard for landfills at the time the Work Plan was approved. Studies at the Rocky Mountain Arsenal Superfund site in Denver, Colorado were using 1.3 mm/year as an acceptable flux for the cover systems installed there, and the same standard was adopted for Lee Acres.

Personnel responsible for performing monitoring and maintenance duties on a CERCLA site generally must have extensive experience and expertise in the area of concern. It was recommended that personnel performing monitoring on the landfill cover system and lysimeters have a minimum of 10 years of landfill cover experience and be a registered professional engineer. Dr. Stephen Dwyer was retained to monitor the Lee Acres landfill cover.

Dr. Dwyer completed the eleventh monitoring inspection on February 20, 2009. The summary of the February 20, 2009, report stated the cover is in excellent condition. The cover soils, embankments, and drainage trenches were all in good condition and performing as designed. The vegetation at the site continues to mature and improve. The vegetation now appears to be approaching a climax community similar to the surrounding vegetation in undisturbed areas. Erosion at the site is minimal. Percolation measurements were made with no flux measured in the north or south lysimeter. Since the landfill cover was completed, all measurements to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well to minimize flux. The complete February 20, 2009, monitoring report can be found in Attachment A.

4.2 Monitored Natural Attenuation of Ground Water.

The ROD identified seven chemicals of concern (COC) and established Cleanup Levels (Table 1). The Remedial Action Work Plan established requirements for groundwater monitoring. The Work plan identified seven existing groundwater wells (BLM#s 39, 45, 60, 62, 68, 77, and 75) to monitor, and required that a new well (BLM # 80) be constructed in the area of highest contaminations levels (Figure 4). The new well BLM 80 was completed in

Map of BLM Monitoring Wells, Landfill Cover, and Lysimeters

Figure 4

2005 and was first monitored on December 20, 2005. The Work Plan states: BLM wells 39, 45, 60, 62, 68, 75, 77, and 80 were selected based on their ability to provide adequate monitoring coverage of possible contamination flow off the remediation site. The selected wells are scheduled to be monitored semi-annually for the first five years after completion of the landfill cover. The first five year monitoring period will be completed in the fall of 2010. If at the end of the five-year post-construction period the contamination levels have dropped below New Mexico State Standards, the Work Plan states that the monitoring will increase to quarterly for a period of eight consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D.

4.3 Institutional Controls

An area of 135.6 acres of public land, which includes the Lee Aces Landfill site and a buffer area around the site, was withdrawn by BLM from settlement, sale, location, or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234) to protect public health, welfare and the environment from hazardous materials that may remain onsite. At the end of the 50 year period of the withdrawal, if hazardous substances remain at the Lee Acres Landfill above levels that prevent unlimited use and unrestricted exposure, the withdrawal will be extended, or other controls will be implemented. The institutional controls component of the selected remedy will not be modified unless it has been reviewed and approved by EPA.

The area withdrawn is described as follows (Figure 1):

New Mexico Principal Meridian
T. 29N. , R. 12W., Sec. 21 lots 6 and 7 (everything southeast of County Road No. 5569);
Sec. 22, lot 5 (everything southeast of County Road No. 5569);
lot 6 W\1/2\, lot 11 W\1/2\, and lot 12;
Sec. 28 lot 2.

The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could disturb the integrity of the landfill cover, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill site.

Discretionary restrictions on the use of the land at the Lee Acres Landfill Site that are in compliance with the current withdrawal will be implemented in accordance with BLM's current Resource Management Plan (RMP). The RMP enable BLM to manage public lands and resources in a balanced manner, as directed by the Federal Land Policy and Management Act (FLPMA) of 1976. The RMP also allows BLM to analyze impacts to public lands, as prescribed under the National Environmental Policy Act (NEPA) of 1969.

All future proposals for Lee Acres Landfill Site will have to be in accordance with the current

withdrawal as well as the current resource management plan. Any person or entity proposing an activity within the Lee Acres Landfill site would do so through an application to the Farmington Field Office. This application would be reviewed for conformance with the withdrawal and the current resource management plan. Only those applications that are in conformance with the provisions of these documents will be subject to further NEPA review and analysis. Final determination on any future proposed actions at the Lee Acres Landfill Site will be made by the Farmington Field Office, following a proposal-specific NEPA analysis that will include consultation with the appropriate governmental entities.

BLM is responsible for implementing, maintaining, and monitoring of the surface and institutional controls for the duration of the remedies selected in the ROD and for as long as hazardous substances remain on site above levels that prevent unlimited use and unrestricted exposure. BLM will submit to EPA a monitoring report on the status of the surface and institutional controls at least annually. The report, at a minimum, will contain an evaluation of whether all of the surface and institutional controls requirements of the ROD are being met, including the results of a visual field inspection of all areas subject to surface and institutional controls, and a description of any deficiencies in the surface and institutional controls and measures that have been or will be taken to correct the deficiencies. BLM will notify EPA in writing within 72 hours of discovery of any activity that is inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least 45 days in advance of any proposals for major land use changes inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least six months prior to any transfer, sale, or lease of any property subject to surface or institutional controls and consult with EPA on specific wording for property transfer or lease documents. BLM will notify EPA of any activities that violate the restrictions in the land use plan described above, the effect of the activities on the protectiveness of the remedy, and any proposed actions to address the violation of the restrictions. BLM also will consult with EPA prior to proposing any changes in the restrictions in the land use plan described above.

4.4 Operations and Maintenance

San Juan County constructed the landfill cover, a chain link fence, and realigned County Road (CR) 5569 through the landfill site to complete CR 350 (Figure 4). The County is responsible to maintain these improvements. Maintenance activities performed by the County to date include re-seeding the landfill cover, repairing damage to the fence along CR 350 caused by a minor traffic accident, and removing loose trash and tumble weeds from the landfill cover and fence line (Table 2). Per the ROD, BLM as the lead Agency responsible for implementation of the selected remedy is responsible for ensuring that all operations and maintenance activities are properly conducted under the selected remedy. BLM is responsible to maintain the monitoring wells; no maintenance has been required on monitoring wells since the completion of the landfill cap.

Maintenance Performed by San Juan County

Year	Labor $	Vehicle $	Material $	Total $	Description of Work
2006	220.00	42.60	2,167.39	2,429.99	Re-seed Landfill Cover
2007	2,520.00	162.30	24	2,706.30	Re-seed Landfill Cover, Remove Weeds, Fence Maintenance
2008	120.00	94.00	0	214.00	Clean Landfill Cover and Fence Line
2009	160.00	84.00	0	244.00	Clean Landfill Cover and Fence Line
Total	3,020.00	382.90	2,191.39	**5,594.29**	

Table 2

5.0 Progress Since the Last Five Year Review

This is the first five-year review for this site.

6.0 Five-Year Review Process

This five-year review for the Lee Acres Landfill has been conducted in accordance with EPA's Comprehensive Five-Year Review Guidance dated June 2001. Interviews were conducted with relevant parties, a site inspection was conducted, and applicable data and documentation covering the period of the review were evaluated. The activities conducted as part of this review are described in the following sections.

6.1 Administrative Components

The five-year review for this site was initiated by BLM. The review team was led by the BLM Remedial Project Manager (RPM) for this site, Barney Wegener/BLM Farmington Field Office, and included members from San Juan County NM, the BLM National Operations Center staff with expertise in hydrology and risk assessment, and NMED. The components of the review include community involvement, document review, data review, a site inspection, and interviews, and development of this Five-Year Review Report.

6.2 Community Involvement

A public notice announcing the initiation of the five-year review was published in the Farmington, New Mexico **The Daily Times** on February 11, March 7, and March 14, 2009. Beth Utley, Public Relations Manager for San Juan County, served as the community involvement coordinator and received no comments from the public during the five-year review process. Upon signature, the five-year review report will be placed in the information repositories for the site, including the Farmington BLM public room, the Farmington Public Library, and the EPA Region 6 office in Dallas, Texas. A public notice will be published in The Daily Times to summarize the findings of the review and announce the availability of the report at the information repositories. Copies of the public notices are provided in Attachment 2 to this report.

6.3 Document Review

The five-year review for the Lee Acres Landfill included a review of relevant documents including the Record of Decision, the Remedial Action Work Plan, the Remedial Investigation, Landfill Cover Monitoring reports, and Ground Water Monitoring reports.

6.4 Data Review

Groundwater monitoring has been conducted by USGS at the Lee Acres Landfill site since 1993. In addition, the property south of, and adjacent to the Lee Acres Landfill was owned and operated by Giant Bloomfield Refinery (GBR). Groundwater monitoring wells were installed and sampled by GBR and are included in this data review.

6.4.1 Lee Acres Landfill Groundwater Monitoring Data Review

The U.S. Geological Survey (USGS), Water Resources Division, entered into an agreement with BLM to perform ground water sampling and analysis at and around the Lee Acres Landfill site. USGS submits semiannual reports to BLM that includes: Summary of Concentrations of Analytes, Analytical Results, and Laboratory Quality Assurance/ Quality Control Results. Charts of contaminants of concern show the cumulative results of ground water monitoring (Charts 1 – 9). All of the COC regulated by the Safe Drinking Water Act (SDWA) have been below Maximum Contaminate Levels (MCL) since 2000 and nickel has been below the clean up level established in the ROD since 1993.

Manganese is not regulated by the SWDA, but the New Mexico Water Quality Control Commission (NMWQCC) has established a human health standard of 200 parts per billion (ppb) for manganese in domestic water supply. The method for determining the background manganese concentrations at the Lee Acres Landfill site was developed and agreed upon by EPA, NMED, and BLM. A background concentration of 346 ppb was determined by averaging data collected during the Remedial Investigation from three wells (BLM 14, 15, 39) that were located up-gradient of the landfill and were determined to be unaffected by activities at the landfill. The NMWQCC regulations section 4101 (B) state that if background

levels exceed state standards, then the cleanup level shall be the background concentration. The enforceable cleanup level for manganese provided in the ROD is 346 ppb.

All contaminants of concern listed in the ROD are enforceable by EPA according to the limits set in the ROD. All contaminants of concern listed in the ROD are below MCLs established under the SDWA. Manganese is classified as a secondary maximum contaminant level (SMCL) under the SDWA which is not enforced by EPA. Note however, EPA can and has set risk-based concentration limits and/or state-based limits for manganese, which have been included in RODs. In this case, the ROD includes an enforceable limit (i.e., 346 ppb) for manganese based upon the NMWQCC regulation (Part 3-101.2) requiring cleanups to attain the background concentration level. Ground water sampling for manganese shows that manganese has not attained the cleanup levels required under the ROD. Of the three upgradient wells used in establishing the average background level for manganese (346 ppb), well 39 was identified in the Work Plan as the only upgradient well to continue to be monitored. Manganese has averaged 717 ppb in well 39 since 1993 (Chart 1). The RI states that the reason for the increase in manganese in well 39 is unknown.

In the ROD, manganese in the ground water downgradient from the landfill is attributed to either past disposal of liquid in the former liquid waste lagoons, or the interaction between the native soils and reducing agents in the former lagoons. Also, where petroleum hydrocarbons undergo natural biodegradation in contact with groundwater, dissolved manganese may be found at relatively high concentrations in groundwater (Deutsch, 1997); however, oxidizing conditions reverse this reaction and cause manganese to precipitate back to the aquifer sediments (Klinchuch and Delfino 2000). This process may be occurring at the Lee Acres Landfill site. Well 68 is the most down-gradient monitoring well and is considered to be the point of compliance. All COC levels at well 68, including manganese, have been below cleanup levels since 2000; indicating that contaminants of concern are not migrating off site at concentrations above cleanup levels.

Table 1

Constituent	Site Historic Maximum Concentration (µg/L)	Risk-Based Preliminary Remediation Goal (µg/L)	SDWA MCL (µg/L)	NMWQCC Standards (µg/L)	Site Background Mean[a] (µg/L)	Cleanup Levels (µg/L)
Manganese	6,335	176	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-*cis*-Dichloroethene	77	NA	70	per part 101z.z[g]	NA	70
1,2-*trans*-Dichloroethene	120	NA	100	per part 101z.z[g]	NA	100
Tetrachloroethylene (PCE)	10	NA	5	20	NA	5
Trichloroethylene (TCE)	11	NA	5	100	NA	5
Vinyl Chloride	3.1	NA	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL)
c Standard for domestic supply.
d NMWQCC regulation Part 3-101.2 does not require cleanup level below site background level.
e Highest value of 12,500 µg/L occurred during the May 1993 sampling period and was determined to be a statistical anomaly for the purposes of this table, the next highest value is specified.
f Standard for irrigation use.
g No NMWQCC specific to 1,2-DCE exists, therefore Part 101.z.z. is referenced for State ARAR
NA - not applicable.
NOTE: Dichloromethene was detected once in 95 samples at a concentration level of 27 µg/L; however, this concentration was considered a statistical anomaly and is not presented

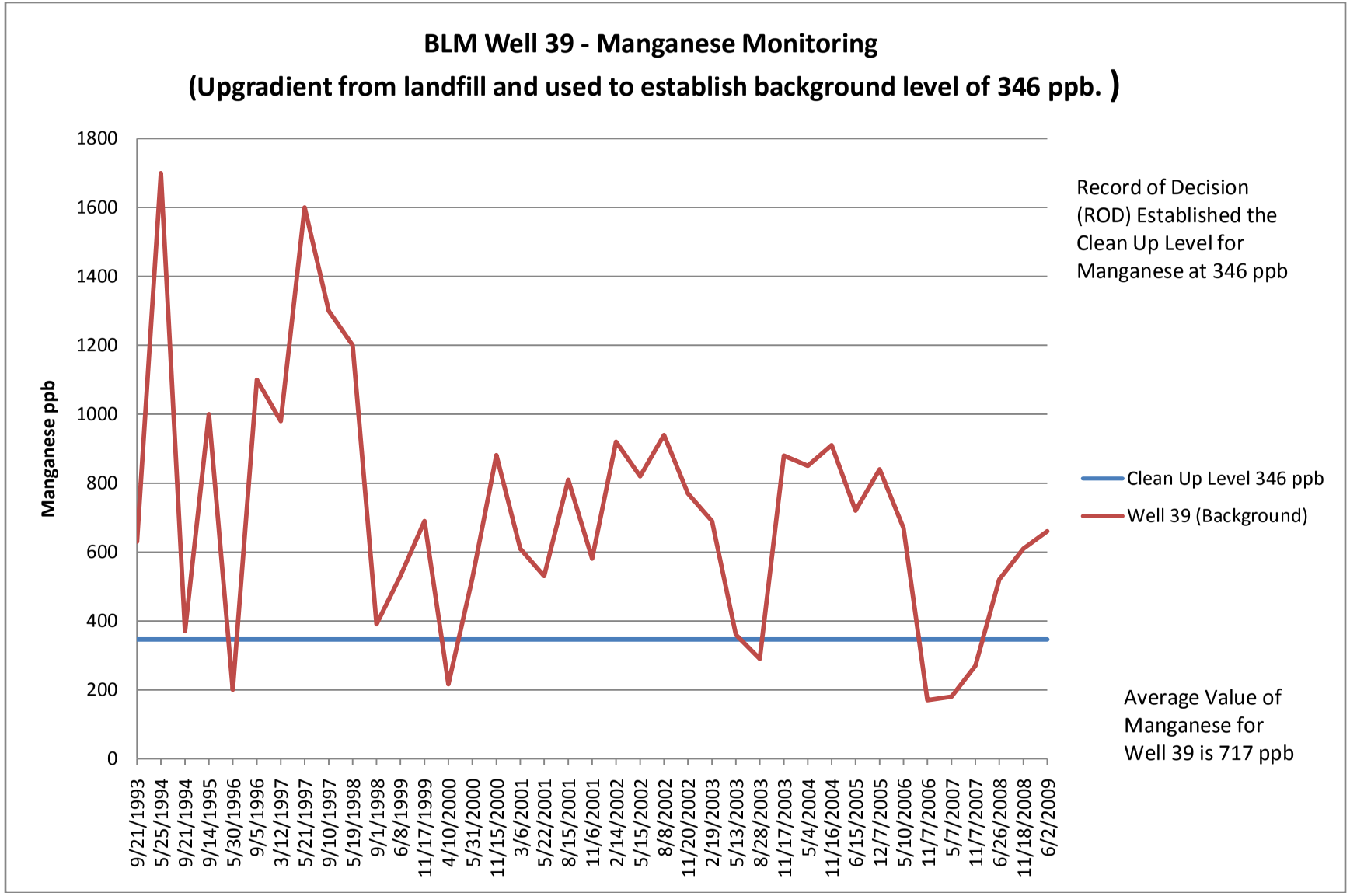

BLM Well 39 - Manganese Monitoring
(Upgradient from landfill and used to establish background level of 346 ppb.)
Manganese ppb
1800
1600
1400
1200
1000
800
600
400
200
0
9/21/1993
5/25/1994
9/21/1994
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
4/10/2000
5/31/2000
11/15/2000
3/6/2001
5/22/2001
8/15/2001
11/6/2001
2/14/2002
5/15/2002
8/8/2002
11/20/2002
2/19/2003
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
Record of Decision (ROD) Established the Clean Up Level for Manganese at 346 ppb
Clean Up Level 346 ppb
Well 39 (Background)
Average Value of Manganese for Well 39 is 717 ppb

Chart 1

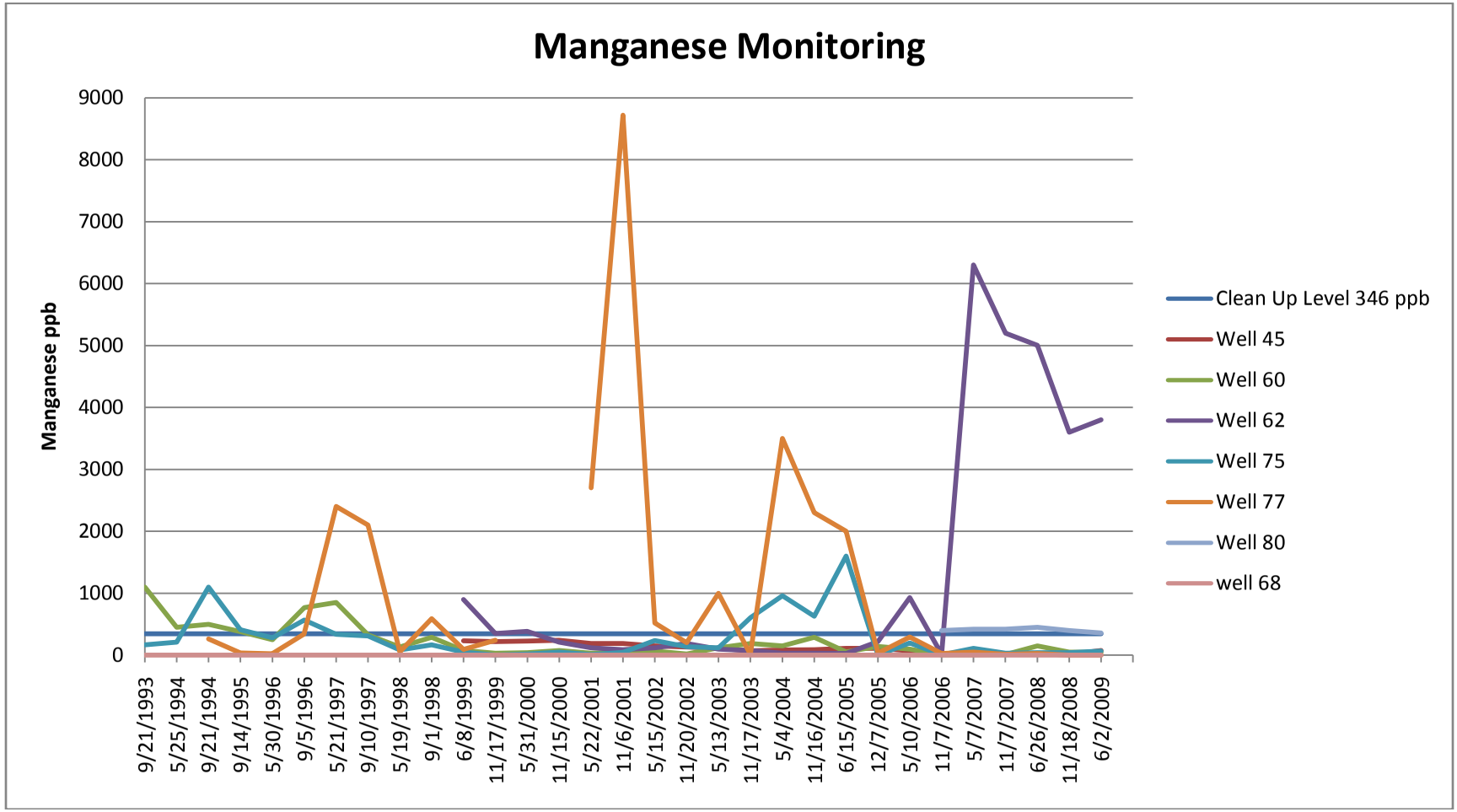

Manganese Monitoring
Manganese ppb
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
9/21/1993
5/25/1994
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
Clean Up Level 346 ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
well 68

Chart 2

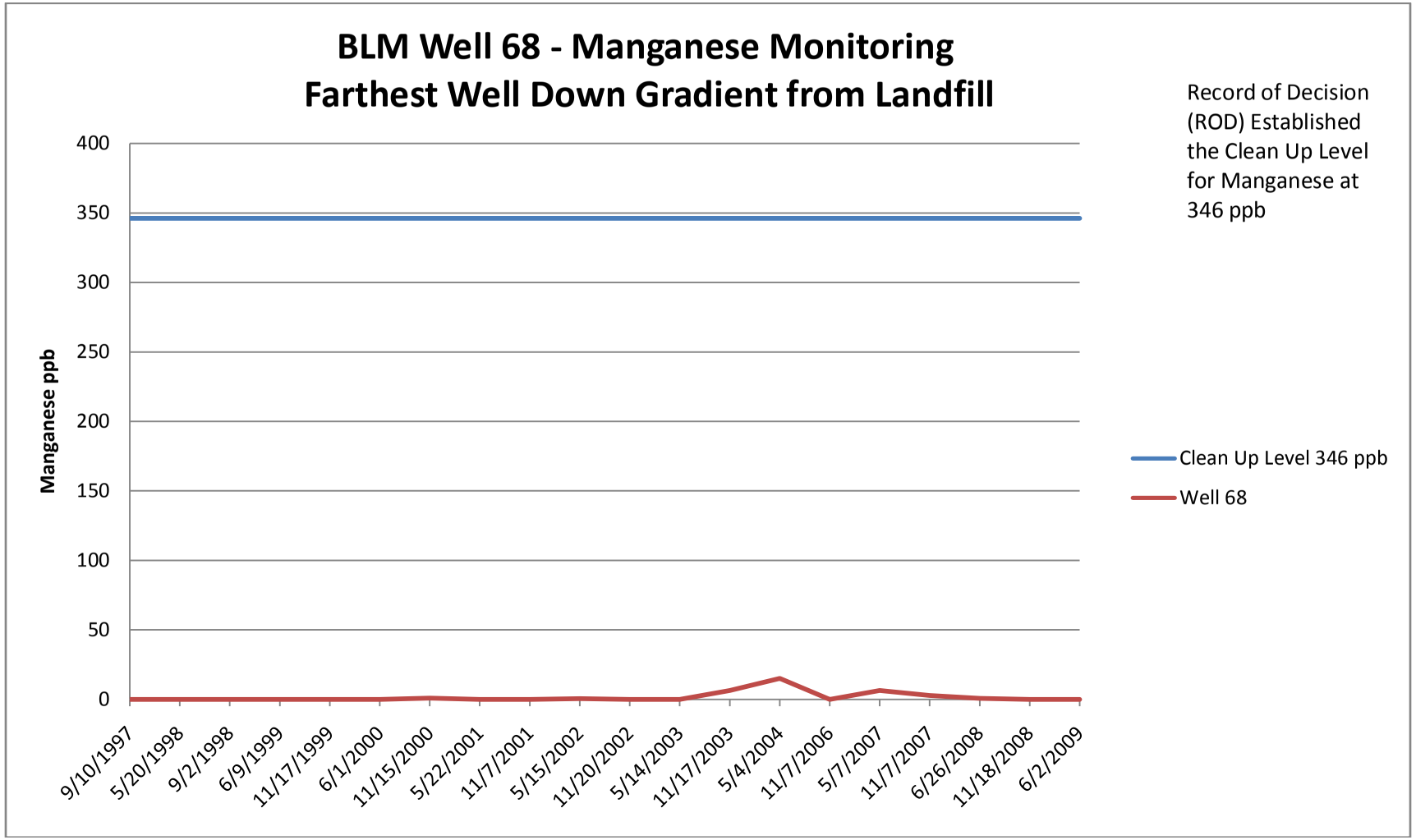

BLM Well 68 - Manganese Monitoring
Farthest Well Down Gradient from Landfill
Manganese ppb
400
350
300
250
200
150
100
50
0
9/10/1997
5/20/1998
9/2/1998
6/9/1999
11/17/1999
6/1/2000
11/15/2000
5/22/2001
11/7/2001
5/15/2002
11/20/2002
5/14/2003
11/17/2003
5/4/2004
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
Record of Decision (ROD) Established the Clean Up Level for Manganese at 346 ppb
Clean Up Level 346 ppb
Well 68

Chart 3

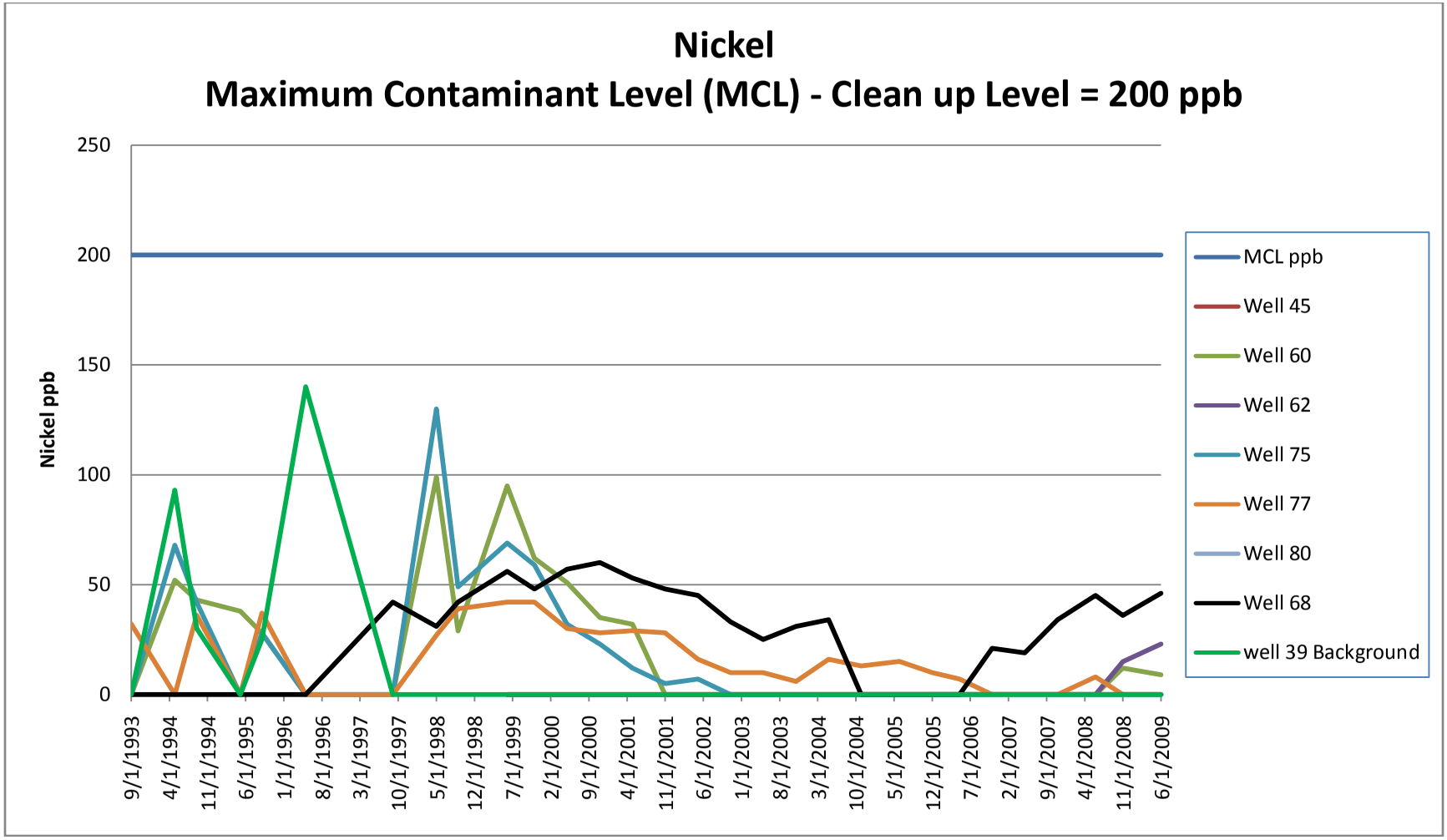

Nickel
Maximum Contaminant Level (MCL) - Clean up Level = 200 ppb
Nickel ppb
250
200
150
100
50
0
9/1/1993
4/1/1994
11/1/1994
6/1/1995
1/1/1996
8/1/1996
3/1/1997
10/1/1997
5/1/1998
12/1/1998
7/1/1999
2/1/2000
9/1/2000
4/1/2001
11/1/2001
6/1/2002
1/1/2003
8/1/2003
3/1/2004
10/1/2004
5/1/2005
12/1/2005
7/1/2006
2/1/2007
9/1/2007
4/1/2008
11/1/2008
6/1/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 68
well 39 Background

Chart 4

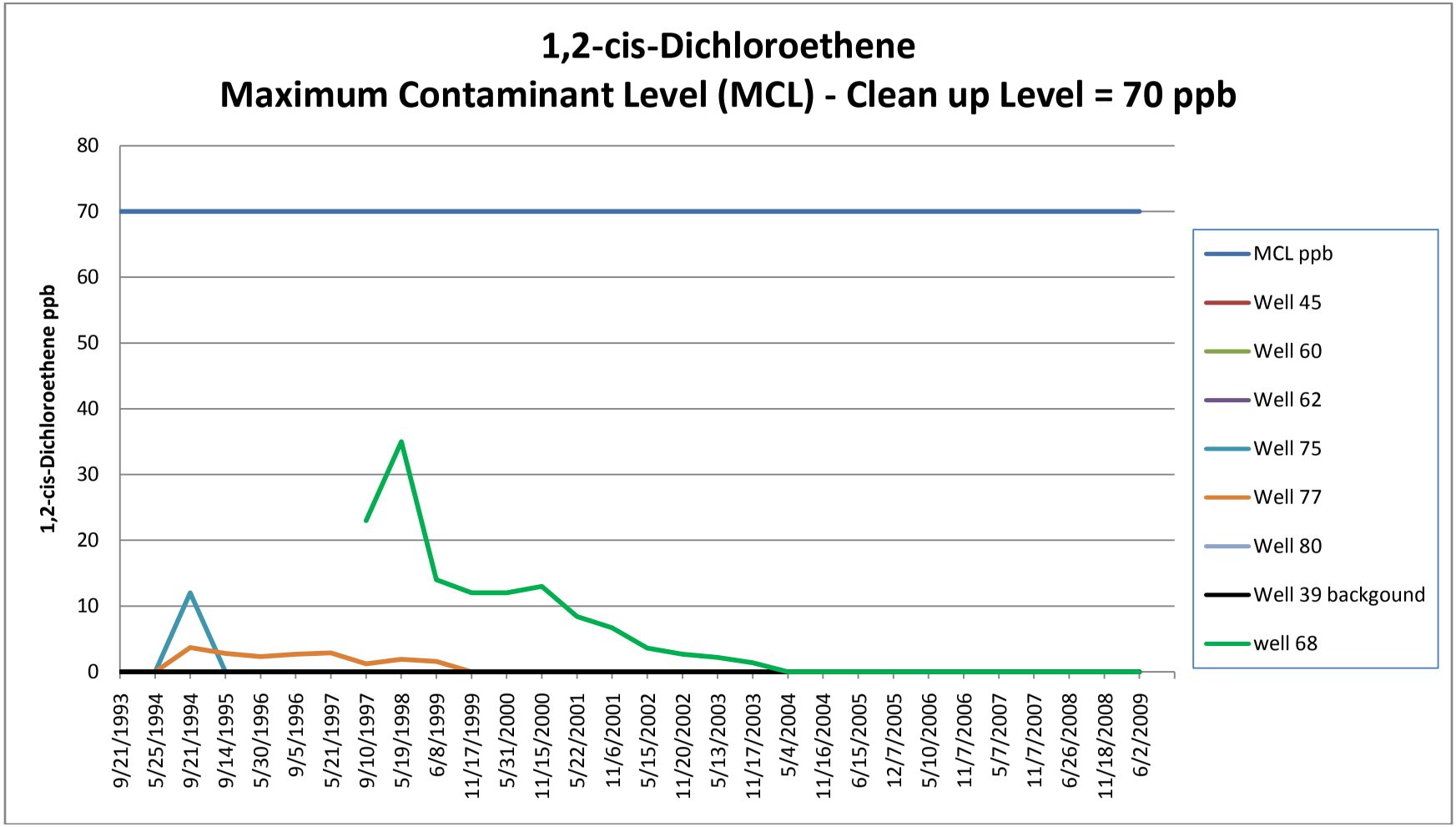

1,2-cis-Dichloroethene
Maximum Contaminant Level (MCL) - Clean up Level = 70 ppb
1,2-cis-Dichloroethene ppb
80
70
60
50
40
30
20
10
0
9/21/1993
5/25/1994
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 5

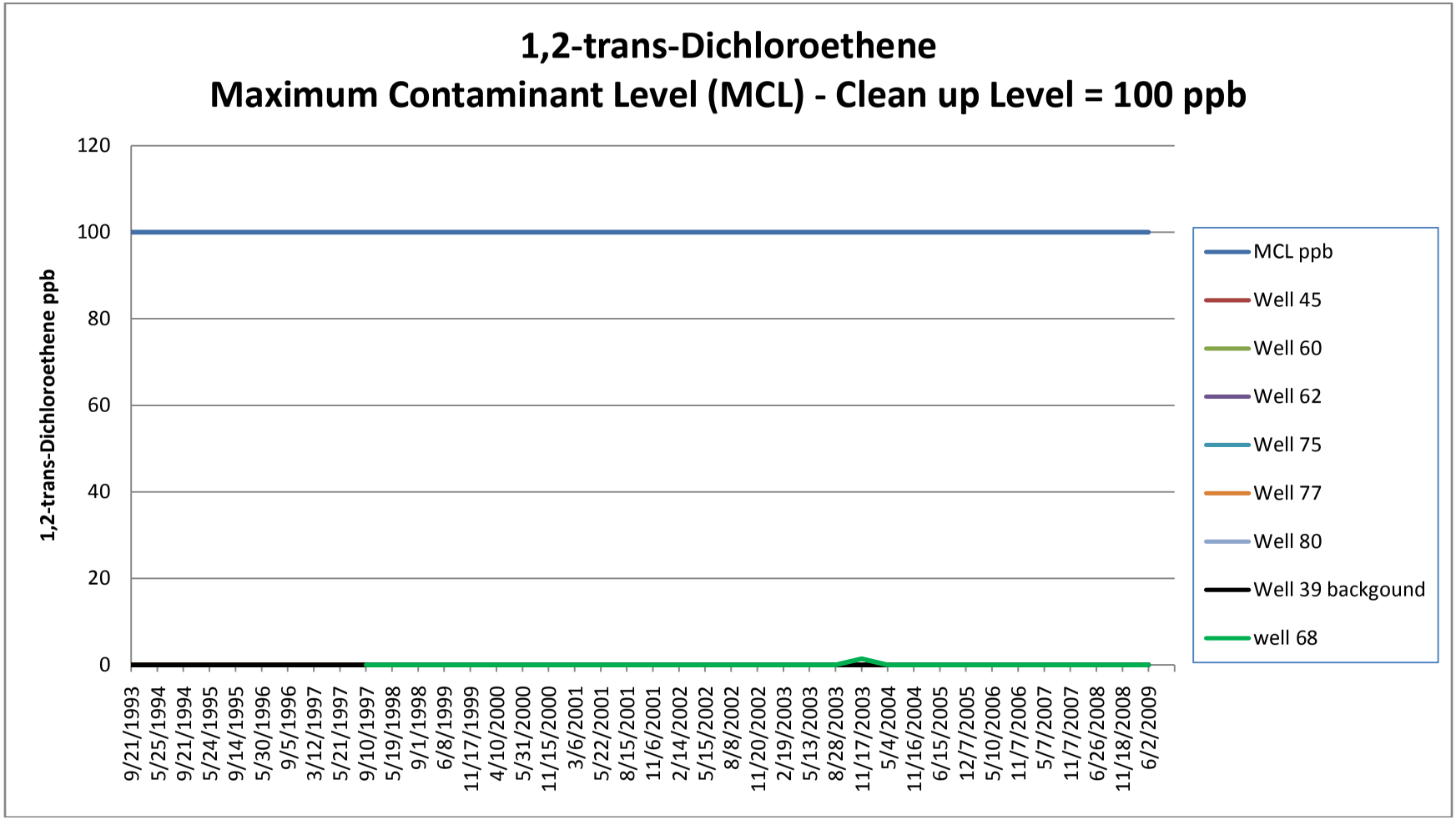

1,2-trans-Dichloroethene
Maximum Contaminant Level (MCL) - Clean up Level = 100 ppb
1,2-trans-Dichloroethene ppb
120
100
80
60
40
20
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
4/10/2000
5/31/2000
11/15/2000
3/6/2001
5/22/2001
8/15/2001
11/6/2001
2/14/2002
5/15/2002
8/8/2002
11/20/2002
2/19/2003
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 6

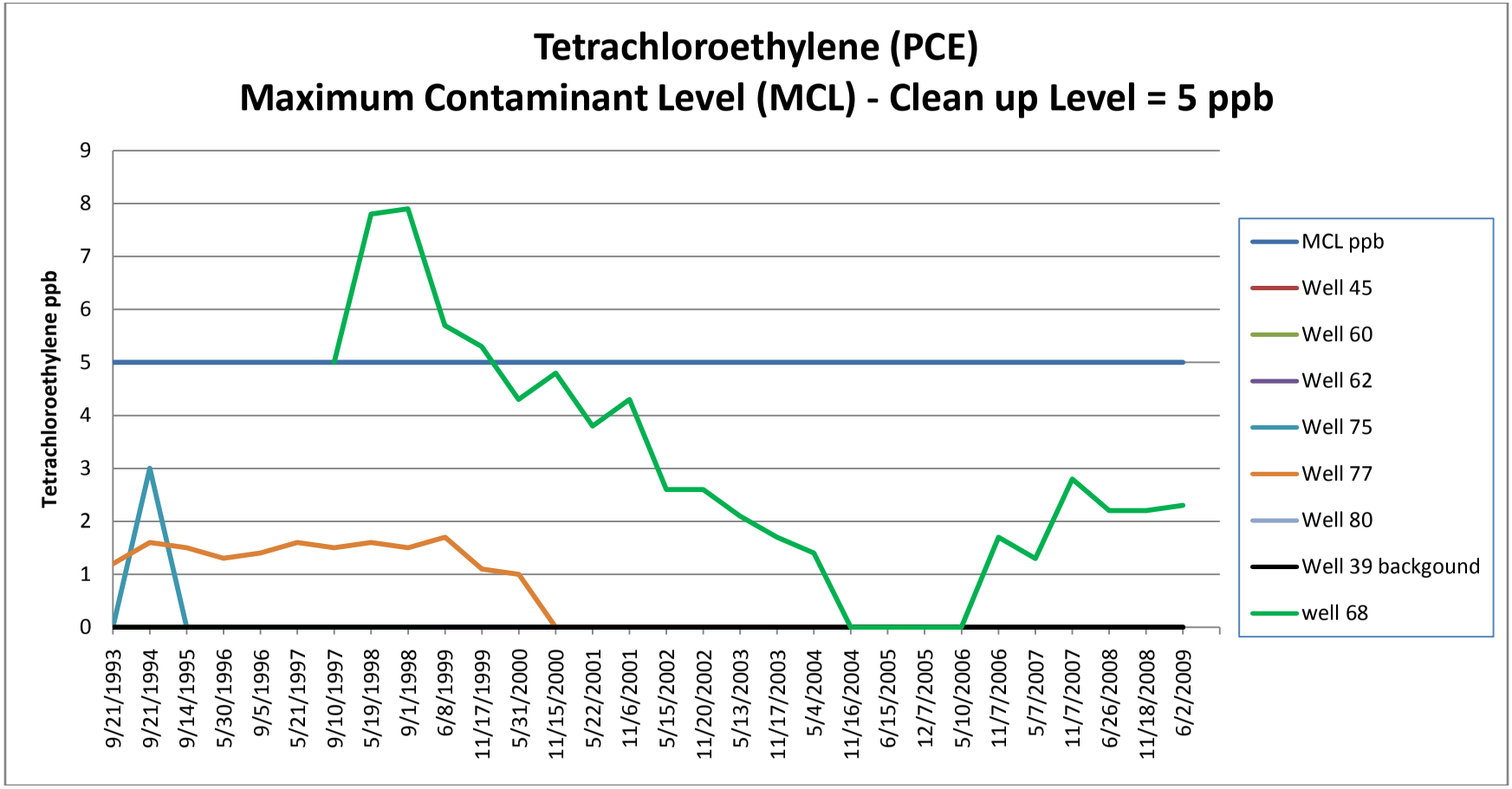

Tetrachloroethylene (PCE)
Maximum Contaminant Level (MCL) - Clean up Level = 5 ppb
Tetrachloroethylene ppb
0
1
2
3
4
5
6
7
8
9
9/21/1993
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 7

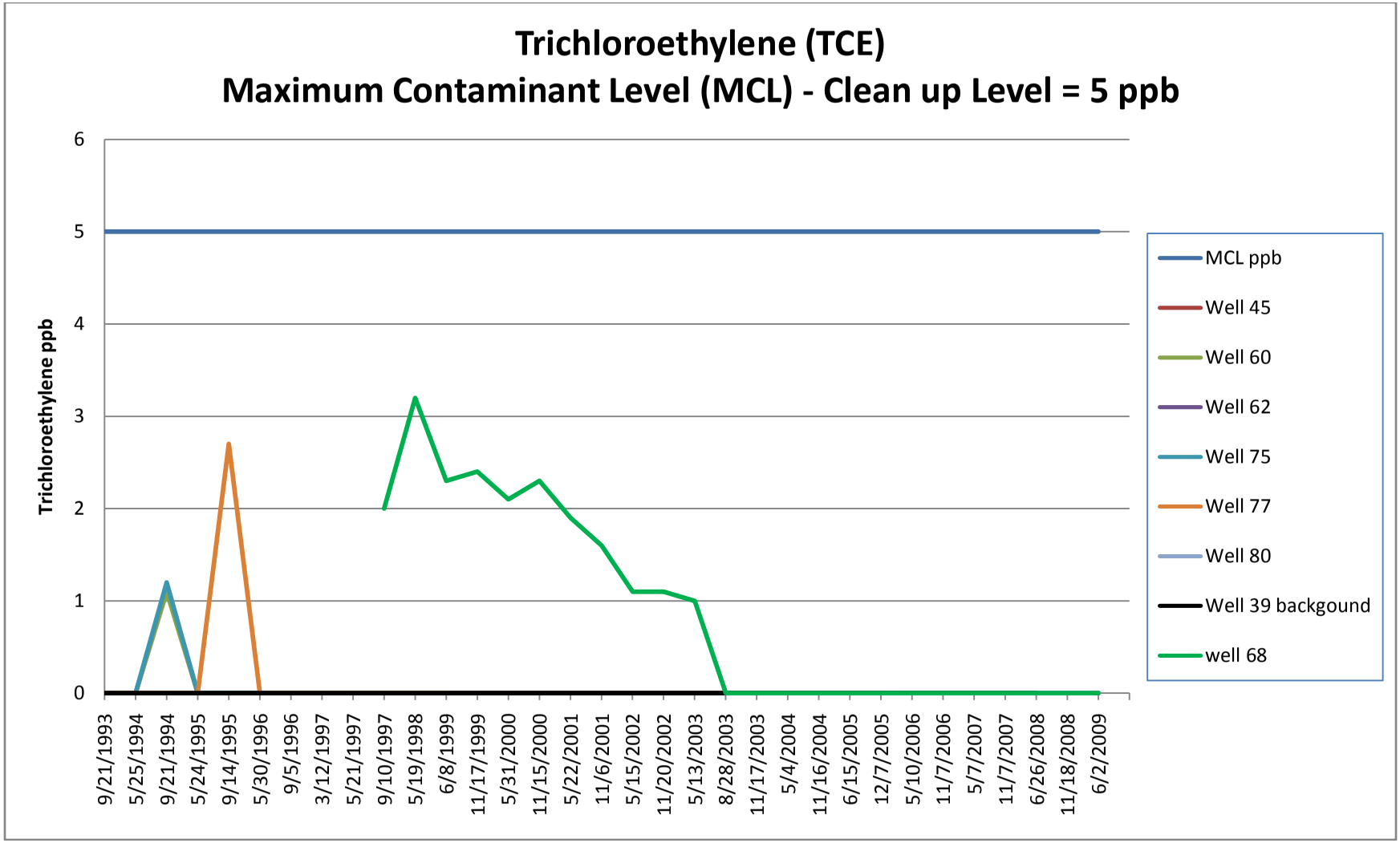

Trichloroethylene (TCE)
Maximum Contaminant Level (MCL) - Clean up Level = 5 ppb
Trichloroethylene ppb
0
1
2
3
4
5
6
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 8

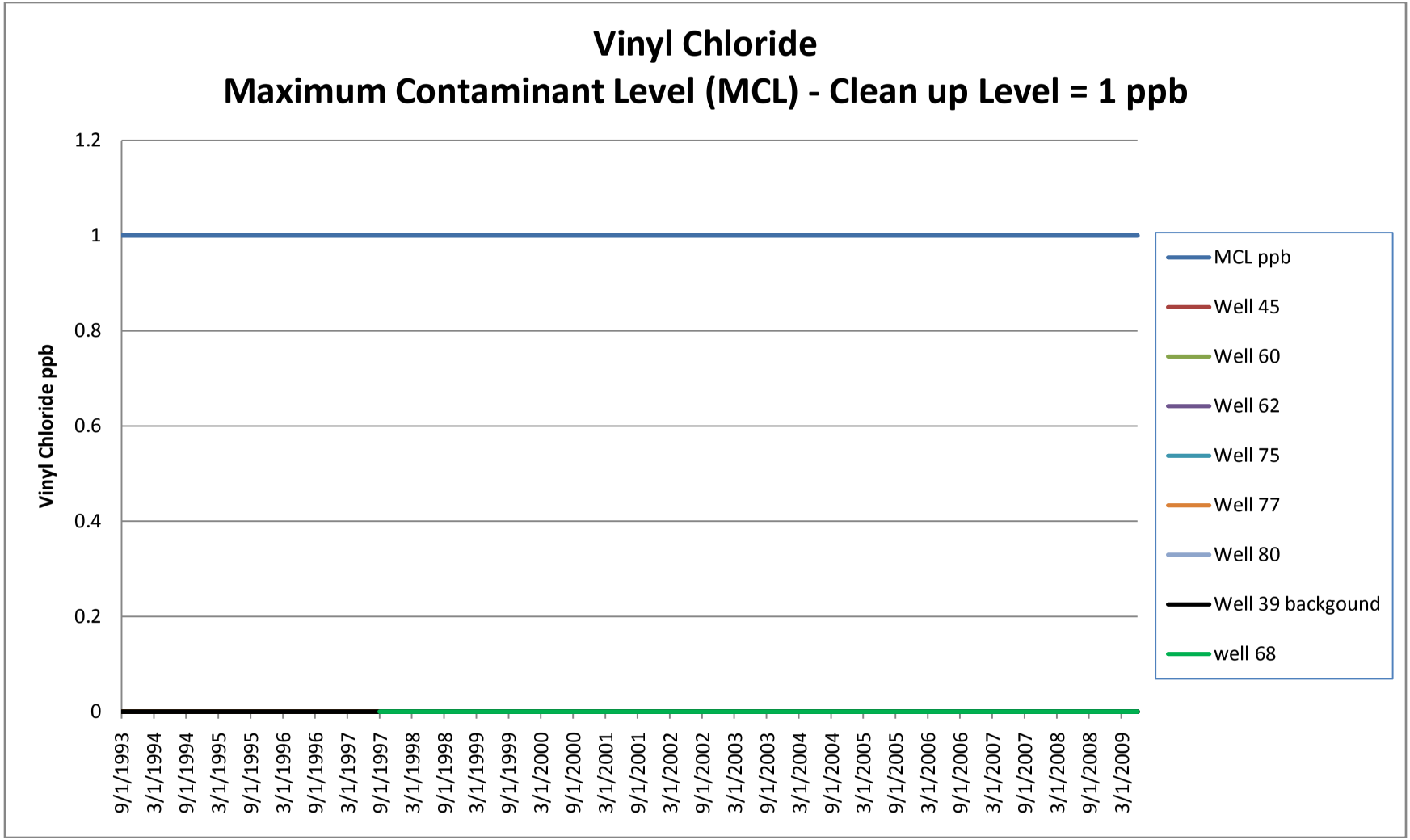

Vinyl Chloride
Maximum Contaminant Level (MCL) - Clean up Level = 1 ppb
Vinyl Chloride ppb
1.2
1
0.8
0.6
0.4
0.2
0
9/1/1993
3/1/1994
9/1/1994
3/1/1995
9/1/1995
3/1/1996
9/1/1996
3/1/1997
9/1/1997
3/1/1998
9/1/1998
3/1/1999
9/1/1999
3/1/2000
9/1/2000
3/1/2001
9/1/2001
3/1/2002
9/1/2002
3/1/2003
9/1/2003
3/1/2004
9/1/2004
3/1/2005
9/1/2005
3/1/2006
9/1/2006
3/1/2007
9/1/2007
3/1/2008
9/1/2008
3/1/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 9

6.4.2 Giant Bloomfield Refinery Ground Water Monitoring

During the period of operation of the landfill, the Giant-Bloomfield Refinery (GBR), located immediately south of the landfill, was also in full operation, refining mainly diesel and unleaded gasoline. It was discovered that the refinery lost approximately 45,000 barrels of refined product into the soils and ground water from about 1975 to 1984. In their efforts to recover the product and remediate the contaminated ground water, GBR installed numerous groundwater monitoring wells downgradient of the Lee Acres Landfill. The GRB cleanup effort and groundwater monitoring are conducted under the regulatory authority of New Mexico Oil and Gas Division (NMOCD). Not all of the GBR wells are relevant to the five-year review; however, GBR well 17 (immediately downgradient of BLM 68) and eight wells within the Lee Acres community are reviewed to present additional evidence that EPA regulated contaminants of concern have not migrated since Lee Acres Landfill ROD was signed in 2004 (See Map Figure 5).

GBR well 17 was monitored by USGS from 1993 to 2003 for the contaminants of concern listed in the Lee Acres Landfill ROD. From 1993 to 1996, manganese ranged from 29 to 110 ppb; below the established cleanup level. From 1997 to 2003, manganese was below the reporting limit of 10 ppb. Nickel was recorded above the clean up level of 200 ppb from 1993 to 1996, but dropped below the reporting limit of 40 ppb from 1997 to 2003. USGS discontinued monitoring GBR well 17 after 2003. The well was not monitored in 2004. Giant Bloomfield Refinery started monitoring GBR well 17 in 2005 and continues to the present. Analytes monitored by GBR included four COC listed in the Lee Acres ROD: 1,2-*trans*-Dichloroethene, Tetrachloroethylene (PCE), Trichloroethylene (TCE), and Vinyl Chloride. Since 2005, all results for these analytes have been non-detect (ND). A typical analytical report for well 17 is presented in Figure 6 and 6A to illustrate the scope of the GBR monitoring for this well.

Giant Bloomfield Refinery established eight monitoring wells (SHS 4, 6, 10, 12, 13, 15, 16, and 17) under the direction and authority of the NMOCD. GBR started monitoring these wells in 1995, and analytes monitored included four COC listed in the Lee Acres ROD: 1,2-*trans*-Dichloroethene, Tetrachloroethylene (PCE), Trichloroethylene (TCE), and Vinyl Chloride. Since the Lee Acres Landfill ROD was signed in 2004, all eight wells have been ND for the four COC listed in the Lee Acres ROD. A typical analytical report for SHS wells (SHS 4) is presented in Figure 7 and 7A to illustrate the scope of the GBR monitoring for the SHS wells in the Lee Acres community. Giant Bloomfield Refinery submitted a revised sample schedule to NMOCD in discharge Plan GW040 in 2005 to remove the eight SHS wells listed above from the sampling matrix based on the number of previous clean reporting periods (8 quarters). These wells have not been sampled since October of 2006.

Refinery Map of the reviewed GBR and SHS wells monitored by Bloomfield Giant

Figure 5

	JAN 2007	APR 2007	JUL 2007	OCT 2007	NOV 2007	DEC 2006
1,2-Dichlorobenzene	nd					
1,3-Dichlorobenzene	nd					
1,4-Dichlorobenzene	nd					
Ethylbenzene	nd					
Methyl-t-Butyl Ether	nd					
Toluene	nd					
Total Xylenes	nd					
PAH						
1-Methylnapthalene	nd					
2-Methylnapthalene	nd					
Benzo(a)pyrene	nd					
Napthalene	nd					
GBR-17						
Lab pH						7.0
Lab Conductivity@25C						2500
Total Dissolved Solids (Calc)						2000
Total Alkalinity as CaCO3						164
Total Hardness as CaCO3						696
Bicarbonate as HCO3						163
Carbonate as CO3						nd
Hydroxide						nd
Chloride						48
Sulfate						1400
Calcium						273
Magnesium						22.6
Potassium						7.27
Sodium						222
HALOCARBONS						
Bromodichloromethane						nd
Bromoform						nd
Bromomethane						nd
Carbon Tetrachloride						nd
Chloroethane						nd
Chloroform						nd
Chloromethane						nd
Dibromochloromethane						nd
1,2-Dibromomethane (EDB)						nd
1,2-Dichlorobenzene						nd

Figure 6

	JAN 2007	APR 2007	JUL 2007	OCT 2007	NOV 2007	DEC 2006
1,3-Dichlorobenzene						nd
1,4-Dichlorobenzene						nd
1,1-Dichloroethane						nd
1,2-Dichloroethane (EDC)						nd
1,1-Dichoroethene						nd
trans-1,2-Dichloroethene						nd
1,2-Dichloropropane						nd
cis-1,-Dichloropropene						nd
trans-1,2-Dichloropropene						nd
Methylene Chloride						nd
1,1,2,2-Tetrachloroethane						nd
Tetrachloroethane						nd
1,1,1-Trichloroethane						nd
1,1,2-Trichloroethane						nd
Trichloroethene						nd
Trichlorofluoromethane						nd
Vinyl Chloride						nd
AROMATICS						
Benzene						nd
Chlorobenzene						nd
1,2-Dichlorobenzene						nd
1,3-Dichlorobenzene						nd
1,4-Dichlorobenzene						nd
Ethylbenzene						nd
Methyl-t-Butyl Ether						nd
Toluene						nd
Total Xylenes						nd
GBR-24D						
Lab pH	8					
Lab Conductivity@25C	4500					
Total Dissolved Solids (Calc)	3490					
Total Alkalinity as CaCO3	213					
Total Hardness as CaCO3	1220					
Bicarbonate as HCO3	213					
Carbonate as CO3	nd					
Hydroxide	nd					
Chloride	190					
Sulfate	2000					
Calcium	421					

Figure 6A

TABLE 2.1 GIANT INDUSTRIES, INC. ONSITE REMEDIATION PROJECT 2005 ANNUAL ANALYTICAL DATA SUMMARY					
	JAN	APR	JUL	OCT	DEC
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				
1,4-Dichlorobenzene	nd				
Ethylbenzene	nd				
Methyl-t-Butyl Ether	nd				
Toluene	nd				
Total Xylenes	nd				
SHS-4					
Lab pH	7.3				
Lab Conductivity@25C	3200				
Total Dissolved Solids (Calc)	2700				
Total Alkalinity as CaCO3	210				
Total Hardness as CaCO3	1400				
Bicarbonate as HCO3	210				
Carbonate as CO3	1.0				
Hydroxide	nd				
Chloride	63				
Sulfate	1600				
Calcium	490				
Magnesium	39				
Potassium	5.1				
Sodium	320				
HALOCARBONS					
Bromodichloromethane	nd				
Bromoform	nd				
Bromomethane	nd				
Carbon Tetrachloride	nd				
Chloroethane	nd				
Chloroform	nd				
Chloromethane	nd				
Dibromochloromethane	nd				
1,2-Dibromomethane (EDB)	nd				
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				
1,4-Dichlorobenzene	nd				
1,1-Dichloroethane	nd				
1,2-Dichloroethane (EDC)	nd				
1,1-Dichoroethene	nd				
trans-1,2-Dichloroethene	nd				
1,2-Dichloropropane	nd				
cis-1,-Dichloropropene	nd				
trans-1,2-Dichloropropene	nd				
Methylene Chloride	nd				
1,1,2,2-Tetrachloroethane	nd				

Figure 7

TABLE 2.1 GIANT INDUSTRIES, INC. ONSITE REMEDIATION PROJECT 2005 ANNUAL ANALYTICAL DATA SUMMARY					
	JAN	APR	JUL	OCT	DEC
Tetrachloroethane	nd				
1,1,1-Trichloroethane	nd				
1,1,2-Trichloroethane	nd				
Trichloroethene	nd				
Trichlorofluoromethane	nd				
Vinyl Chloride	nd				
AROMATICS					
Benzene	nd				
Chlorobenzene	nd				
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				
1,4-Dichlorobenzene	nd				
Ethylbenzene	nd				
Methyl-t-Butyl Ether	nd				
Toluene	nd				
Total Xylenes	nd				
SHS-6					
Lab pH	7.2				
Lab Conductivity@25C	2900				
Total Dissolved Solids (Calc)	2300				
Total Alkalinity as CaCO3	230				
Total Hardness as CaCO3	1100				
Bicarbonate as HCO3	230				
Carbonate as CO3	nd				
Hydroxide	nd				
Chloride	61				
Sulfate	1300				
Calcium	390				
Magnesium	32				
Potassium	3.1				
Sodium	300				
HALOCARBONS					
Bromodichloromethane	nd				
Bromoform	nd				
Bromomethane	nd				
Carbon Tetrachloride	nd				
Chloroethane	nd				
Chloroform	nd				
Chloromethane	nd				
Dibromochloromethane	nd				
1,2-Dibromomethane (EDB)	nd				
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				

Figure 7A

6.5 Interviews

Interviews were conducted with Beth Utley/San Juan County Public Relations Manager; Bruce Cauthen/Western Refining (GBR) Environmental Engineer: Dave Keck/San Juan County Public Works Administrator; Fredrick Gebhardt/USGS Water Science Center Hydrologic Technician; Phyllis Bustamante/Geoscientist - New Mexico Environmental Department – Superfund Over Site; Stephen Dwyer/Contract Engineer; and T.J. Richards/San Juan County Compliance Specialist. Copies of the Interview Record Forms are provided in Attachment 3.

Ms. Beth Utley participated in the interview as the Community Involvement Coordinator for the five-year review. She is employed by San Juan County Public and holds the title of Public Relations Manager. Ms. Utley explained that she posted 3 Public Notices in the Farmington Daily Times on Feb. 11, March 7, and March 14 (Attachment 2), but did not receive any responses from the public. Since 2004 when she took over the position of Public Relations Manager, she has not received any negative responses from the public concerning Lee Acres. San Juan County received an award from the National Association of Counties for cooperating with federal agencies and the State of New Mexico to develop remedial actions for the Lee Acres site and the construction of the cap (capillary barrier cover, or landfill cover) and Road 350. The Farmington Daily Times reported on the award, and she did receive some positive comments from the public in response the report in the paper.

Mr. Bruce Cauthen participated in the interview as an environmental engineer for Western Refining who now owns the Giant Bloomfield Refining site. He was familiar with the Lee Acres Landfill site and worked for Bloomfield Giant Refinery in 1981 as part of the shut down crew. He is in charge of analyzing groundwater monitoring reports and coordinating with NMOCD on the GBR and SHS monitoring wells. He was not aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site, and that after looking through his ground water monitoring charts, he said “it looks like the contaminants of concern are below cleanup levels and that is good for the community”.

Mr. Dave Keck participated in the interview as the Public Works Administrator for San Juan County. He stated: “As Public Works Administrator, I was responsible for initial construction of the test cap, the main cap, and I am responsible for maintenance and oversight for the entire site including the cap, County Road 350, and the road apron utilized for water run on and run off control. I initiated the idea of building a road (County Road 350) through the site to improve traffic in the county, and to use the road construction to control water run-off and run-on to protect the cap. I was the administrative advisor of the cap construction and attended coordination meetings and site inspections”. Mr. Keck said that he had received no calls and no questions from the community concerning the landfill site, and that he felt the landfill cover has performed very well. There are very few issues other than reseeding the cover after the initial seeding effort failed. He was very pleased with the remediation project.

Mr. Fredrick Gebhardt participated in the interview as a hydrologic technician for the USGS Water Science Center. He began sampling the ground water at Lee Acres in 1993, and became the Lee Acres Sampling Project Manager in 2000. He is responsible for the USGS sampling program at Lee Acres. He was not aware of any community concerns and believes the BLM and EPA remediation plan is moving in the right direction. He said "I think they are on track to start the closure process".

Ms. Phyllis Bustamante participated in the interview as a geoscientist for the New Mexico Environmental Department – Ground Water Quality Bureau – Superfund Oversight Section. She has been assigned to Lee Acres for 2 years. The Superfund Oversight Section (SOS) assists the U.S. Environmental Protection Agency (EPA) in characterization of inactive hazardous waste sites, and provides management assistance to EPA at Superfund sites listed on the National Priorities List. She reviews the Lee Acres site and associated documents for consistency under the Superfund rules so that actions initiated at Lee Acres are consistent with State of New Mexico rules to ensure protection of human health and the environment. Her impression was that BLM has met commitments outlined in the Record of Decision (ROD) by constructing the landfill cover and monitoring ground water. She thought the monitoring information indicates that things are going well. Early indications of the cap monitoring show the cap may be preventing migration of contaminants to, or through the ground water. She said "In terms of reviewing the documents, I have concerns and I am hoping that we are not missing any contamination movement or migration. Analytical results do not clearly show that PCE has gone through the degradation process. I am not seeing all secondary by products that should be produced during the breakdown of PCE to TCE to DCE to VC. I wonder; could some of the contamination migrated without being detected with the current monitoring system? Analytical review and down gradient wells monitoring does not indicate that much migration is taking place, but no monitoring system is perfect. I wonder if a path of migration may not have been detected"?

Mr. Steven Dwyer participated in the interview as a contract engineer. He helped to conceptualize the use of an engineered capillary barrier (cap) as a remedy to the Lee Acres Landfill, and participated in cap research and development at Sandia National Laboratories. He attended meetings with the EPA, BLM, and NMED to discuss the appropriateness of the cap, and how it would promote natural attenuation of contaminants that were present within the land fill. He designed the small test cap and had oversight in its construction and monitored the test cap after construction. He assisted the firm of Cheney-Walters-Echols INC to engineer the main cap, reviewed the final plan, and provided construction oversight as construction engineer as the cap was being built. He has been monitoring the cap for the 4 years after the cap was completed, and thinks the cap looks very good. He said "The cover is working very well. Any issues that have arisen have been taken care of between BLM and San Juan County. Data is showing the cap is working and is allowing natural attenuation to do its thing. There is generally a window of time between 3 to 7 years after construction that if there is going to be a problem with a cap, it will show up within this window. We have reduced the monitoring of the cap from quarterly to semiannual. I would recommend continuing the monitoring

semiannually until we get out of the 3 to 7 year window. If no problems arise after that time, monitoring may be reduced to annually".

Ms. T.J. Richards participated in the interview as the Compliance Specialist for San Juan County. She has been involved with San Juan County administration since 1993, and moved to engineering technician in 1999. She worked with BLM staff and the Engineering Firm of Cheney - Walters – Echols INC to develop the remedial design work plan for the cap and Road 350. Since the cap has been completed, she is responsible for the project compliance and maintenance. She thought the effects to the community have been minimal. The only issue she has noticed is a temporary traffic impediment while USGS (Fred Gebhardt) is monitoring BLM well 68 along the side of County Road 350. USGS monitors the well semi-annually, and sets traffic cones to close the west lane of traffic while a water sample is taken. She drives by the site about 8 to 10 times per month to look at the fence lines, check to see if the erosion controls are working, and look for trash. The only incident that she was aware of was when a citizen crashed his vehicle through the fence along County Road 350. The San Juan County Sheriff's Office responded to the accident; no injuries were reported and the fence was repaired by the County the next day. She knew of no other incidents.

6.6 Site Inspection

BLM coordinated a site inspection of the Lee Acres Landfill on February 19, 2009. The site inspection was attended by representatives from EPA Region 6, NMED, San Juan County, USGS, BLM, and a private contractor. Attendees walked the perimeter of the landfill cover and along the water drainage channels constructed down the sides of County Road 350. The purpose of the site inspection was to assess the condition of the landfill cover, the fence surrounding the site, and the water run-on and run-off controls that were engineered into the design of County Road 350. The landfill cover was found to be in excellent condition. The cover soils, embankments, and drainage channels were all in good condition and performing as designed. The vegetation at the site appeared to be sparse, but was similar to the surrounding vegetation in undisturbed areas adjacent to the landfill. No excessive erosion was found during the inspection. Biointrusion activity by native animals and insects was found to be minimal. Burrowing animal intrusion was limited to just a couple of small rodent holes, and there were some ant hills noticed. The fence surrounding the site was in good condition and the gate was locked. The groundwater monitoring wells around the perimeter of the landfill cover were in good condition and the well casings were covered and locked. There was no evidence of the site being vandalized or disturbed by the public. No issues concerning the condition of the landfill cover, water run-on and run-off controls, County Road 350, or the fence were identified. Institutional controls consisting of BLM withdrawal of the Lee Acres Landfill site and buffer area around the site from settlement, sale, location, or entry remains in force, and is effective until 2047. The Site Inspection Check List is presented in Attachment 4.

7.0 Technical Assessment

The five-year review must determine whether the remedy at the site is protective of human health and the environment. The EPA guidance describes three questions used to provide a framework for organizing and evaluating data and information and to ensure all relevant issues are considered when determining the protectiveness of a remedy. These questions are assessed for the Lee Acres Landfill site in the following paragraphs. A conclusion of the technical assessment is presented at the end of the section.

Question A: Is the remedy functioning as intended by the decision documents?
Groundwater monitoring has shown that concentrations of the ROD listed contaminants of concern (COC) regulated by EPA have declined and all maximum contaminant levels (MCLs) are being met in the ROD selected groundwater monitoring well network. Concentrations have declined, especially at the most downgradient monitoring well (BLM-68), and all wells are meeting MCLs. Manganese is classified as a secondary maximum contaminant level (SMCL) under the SDWA which is not enforced by EPA. Note however, EPA can and has set risk-based concentration limits and/or state-based limits for manganese, which have been included in RODs. In this case, the ROD includes an enforceable limit (i.e., 346 ppb) for manganese based upon the NMWQCC regulation (Part 3-101.2) requiring cleanups to attain the background concentration level. Ground water sampling for manganese shows that manganese has not attained the cleanup levels required under the ROD. Manganese levels have been erratic in some monitoring wells; including well 39 which is upgradient of the landfill. However, manganese levels in well 68 have been below the cleanup level since 1997 indicating that manganese is not migrating off site.

San Juan County constructed the landfill cover, a chain link fence, and realigned County Road (CR) 5569 through the landfill site to complete County Road 350 (Figure 4). The County is responsible to maintain these improvements. Maintenance activities performed by the County to date include re-seeding the landfill cover, repairing damage to the fence along CR 350 caused by a minor traffic accident, and removing loose trash and tumble weeds from the landfill cover and fence line (Table 2). Per the ROD, BLM as the lead Agency responsible for implementation of the selected remedy is responsible for ensuring that all operations and maintenance activities are properly conducted under the selected remedy. BLM and San Juan County have closely cooperated during all aspects of operation and maintenance activities since the completion of construction. The average cost of operations and maintenance since construction completion has been approximately $1,400 per year. Future costs for operations and maintenance are expected to be within a range of $200 to $3,000 per year. BLM is responsible to maintain the monitoring wells; no maintenance has been required on monitoring wells since the completion of the landfill cap.

A review of the semi-annual cap inspections, including the most recent inspection on February 19, 2009, show that the cap is functioning as designed. The answer to this question is yes.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

Land Use and Exposure Assessment:
1. Has land use or expected land use on or near the site changed (*e.g.*, industrial to residential, commercial to residential)? A County road (CR 350) has been constructed across the cap of the Landfill, however this change does not alter the exposure scenarios used in assessing the protectiveness of the remedy. Because the site is capped with 5 feet of soil, there are no contaminants of concern on the ground surface. The site is fenced and the cap is inspected semi-annually and is in good operating condition.

2. Have any human health or ecological routes of exposure or receptors changed or been newly identified (*e.g.*, dermal contact where none previously existed, new populations or species identified on site or near the site)? The exposure pathways presented in the 1995 Remedial Investigation (RI), Chapter 8, Human Baseline Risk Assessment included: ingestion of groundwater, inhalation of volatile chemicals while showering, inhalation of volatile chemicals associated with groundwater within the house, dermal absorption of chemicals while showering, and inhalation of chemicals in outdoor air. In the risk assessment, the future resident was assumed to reside in a downgradient area directly adjacent to the former landfill and that the resident's water supply comes from either the bedrock aquifer or the shallow/deep alluvial aquifer (RI page 8-30). These exposure pathways are still considered possible; however, BLM has withdrawn the Lee Acres Landfill site from settlement, sale, location, or entry (Fed. Reg. Jan 15, 1997), effective until 2047. Groundwater monitoring documents that all COC are below their respective MCLs and limits specified in the ROD except for manganese. There is no MCL for manganese, but the ROD sets the limit at 346 ppb consistent with NMQCC regulation (part 3-101.2). Because of the five feet of cover soil and improving groundwater conditions by natural attenuation, risk to future onsite trespasser or offsite receptors is deemed insignificant.

3. Are there newly identified contaminants or contaminant sources? There are no newly identified sources at the site. Nor would the land downgradient of the site and north of the highway likely be developed as this is land owned by Giant Bloomfield Refinery and has had groundwater contamination associated with the Refinery. GBR is currently undergoing post-remediation groundwater monitoring with the State of New Mexico Oil Conservation Division.

4. Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents (*e.g.*, byproducts not evaluated at the time of remedy selection)? No.

ARARs, Toxicity and Cleanup Levels
The Five-Year Guidance contains the following questions:

1. Are there changes in the standards identified as ARARs in the ROD that bear on the protectiveness of the remedy? Table 3 shows the important chemical specific ARARs for the site as published in the ROD and currently in 2009. Are there newly promulgated standards that might apply or be relevant and appropriate to the site and that bear on the protectiveness of the remedy? ARARs were reviewed and there are no changes in ARARs that would increase risk, in fact, the toxicity factor for manganese has been adjusted upward, indicating less toxicity.

2. Are there changes in to-be-considered standards (TBCs) identified in the ROD that bear on the protectiveness of the remedy? No TBCs were identified in the ROD. The basis for each cleanup level identified in the ROD is shown in Table 1. Have there been changes to the basis of the cleanup levels? None. The selected remedy is protective of human health and the environment. The selected remedy for the soil pathway attains State and Federal ARARs. The statutory determination in the ROD states the goal that the selected remedy for the ground-water pathway will attain ARARs within a reasonable time frame not to exceed the ground-water monitoring period of 30 years. In fact, the remedy has attained all ARARs (except manganese in some wells) since the ROD was signed in 2004.

3. Have physical site conditions changed such that protectiveness may be affected (*e.g.*, changes in anticipated direction or rate of groundwater flow)? Has understanding of physical site conditions changed (*e.g.*, identification of a new groundwater divide)? No new information has come to light on the direction of groundwater flow.

4. Have toxicity factors for contaminants of concern at the site changed? Some slight changes have occurred. Table 1 presents the ROD cleanup levels, ARARs and toxicity factors from EPA's Integrated Risk Information System (IRIS). These changes indicate either less toxicity or the toxicity factor in IRIS was withdrawn pending further study by EPA.

5. Have other contaminant characteristics changed? No.

6. Have ecological toxicity reference values and/or ecological "no observed adverse effect levels/lowest observed adverse effect" (NOAELs/LOAELs) levels changed? There are no standardized ecological toxicity factors. Because the site has been capped and converted into a County road, ecological receptors are considered minimal to nonexistent. Recent inspection does not show any animals larger than insects, small lizards, or small rodents burrowing into the cap. The cap has a gravel cover that was designed to discourage animal burrowing.

The EPA Guidance Appendix G-2 shows a decision flow sheet for any changes in standards. However, the changes are minimal and do not increase risk nor do they have lower (more restrictive) standards compared to the ROD.

For these reasons, it is therefore unnecessary to revise or expand the previous risk assessment as part of the five-year review.

Remedial Action Objectives (RAOs):
As part of the five-year review, the EPA Guidance requires an evaluation of the RAOs stated in the ROD to determine whether the remedy is meeting RAOs. The RAOs for the potential soil pathway are:

- Reduce or eliminate the potential for future leaching of contaminants from the landfill to ground water by preventing moisture infiltration.
- Reduce or eliminate the potential for future direct exposure to contaminated soil and waste.
- Reduce or eliminate the potential for future migration of contaminants through storm water run-off or erosion.

The RAOs for ground water are:

- Elimination or significant reduction of the risk posed by elevated manganese levels in ground water by eliminating access to the ground water.
- Reduction of levels of manganese, nickel, 1,2-DCE, PCE, TCE, and VC to comply with ARARs.

Based on the favorable groundwater monitoring results and cap inspections, the remedy is meeting all RAOs stated in the ROD, is within EPA's acceptable risk range, and the remedy is considered protective.

In summary, the answer to question B, are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid? The answer to this question is yes, these components are still valid.

Table 3. Lee Acres Landfill ARARs and Toxicity Factors

	ROD Cleanup		ROD	2009	2004	2009	1995- RI Tox Factor		2009 IRIS Tox Factor	
	Levels	Basis	MCL	MCL	NMWQCC[b]	NMWQCC[b]	RfD	SFO	RfD	SFO
Manganese	346	Background	50[a]	50[a]	200	200	5.00E-03	NA	1.40E-01	NA
Nickel	200	NMWQCC	NA	NA	200	200	2.00E-02	NA	2.00E-02	NA
1,2-cis-Dichloroethene	70	MCL	70	70	part 101z	700	1.00E-02	NA	withdrawn	NA
1,2-trans-Dichloroethene	100	MCL	100	100	part 101z	25	2.00E-02	NA	withdrawn	NA
Tetrachloroethene	5	MCL	5	5	20	6.9	1.00E-01	5.20E-02	1.00E-02	withdrawn
Trichloroethene	5	MCL	5	5	100	25	1.00E-02	1.10E-02	withdrawn	withdrawn
Vinyl Chloride	1	NMWQCC	2	2	1	20	not listed	not listed	3.00E-03	1.00E-01

a - Secondary Maximum Contaminant Level (MCL) – not based on health
b - Standard for domestic supply NM 20.6.4.900. NM MCLs are same as EPA

Question C: Other information and protectiveness of the remedy:
The Guidance requires consideration of any other information that comes to light that could call into question the protectiveness of the remedy, such as ecological risks, flood boundaries and land use changes that are being considered by local officials. No information of this type has come to light.

Conclusion:
Based on the responses to Questions A, B and C, there have been no changes to exposure pathways, toxicity factors, ARARs, chemicals of concern, land use, RAOs that require a new risk assessment. Inspections of the cap and the groundwater monitoring show the remedy is protective and is working. The remedy is considered protective in the short-term because institutional controls are in place, and therefore, there is no current or potential exposure. Follow-up actions are necessary to address long-term protectiveness to ensure RAOs continue to be met. Because the remedial actions at the Lee Acres Landfill are protective, the site is protective of human health and the environment. At this point in time, there is no apparent reason to think the remedy is incapable of achieving long-term protection of human health and the environment.

8.0 Issues

No issues concerning the construction, maintenance, monitoring, or protectiveness of remedies completed as required in the Lee Acres Landfill Record of Decision were identified.

9.0 Recommendations and Follow-Up Actions

1. The monitoring schedule in the Record of Decision (ROD) and Remedial Action Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required 5 year monitoring period will be completed in the fall of 2010. BLM recommends that the landfill cover be monitored semi-annually through 2010, and then annually until other monitoring requirements may be established in conjunction with site deletion from NPL.

2. The groundwater monitoring schedule in the Work Plan requires the semi-annual monitoring of eight specified wells for a period five years after completion of construction. This five year monitoring period will be completed in the fall of 2010. BLM recommends continued groundwater monitoring semi-annually through 2010, and then consulting with EPA to establish monitoring requirements to facilitate removal of the site from the National Priorities List.

3. The Work Plan also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of 8 consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. After the groundwater monitoring requirements in the ROD are complete in 2010, BLM will review the NMAC regulations and coordinate with NMED to discuss future monitoring regimen for the site.

4. BLM recommends the Lee Acres Landfill be placed on the EPA Superfund Post Construction Completion list.

10.0 Protectiveness Statement

The remedial actions performed at the site are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the cover was completed on February 20, 2009. The summary of the Feb. 20, report stated the cover is in excellent condition. Groundwater data collected from eight monitoring wells indicate that all COCs are below their respective MCLs and limits specified in the ROD except for manganese. There is no MCL for manganese, but the ROD sets the limit at 346 ppb consistent with MNQCC regulation (part 3-101.2).

11.0 Next Review

A second five-year review will be completed in October 2014 if the contamination at the Site remains above levels that prevent unlimited use and unrestricted exposure as specified in 40 C.F.R. § 300.430(f)(4)(ii).

12.0 References

Deutsch, W. J. (1997). *Groundwater geochemistry – Fundamentals and applications to contamination.* New York: Lewis Publishers.

Klinchuch, Leslie A. and Delfino, Thomas A. (2000). "Reductive Dissolution and Precipitation of Manganese Associated with Biodegradation of Petroleum Hydrocarbons." Environmental Geosciences, Volume 7, Number 2, (2000): 69-79.

ATTACHMENT 1

Landfill Cover Monitoring Report Feb 20, 2009

Lee Acres Landfill

Post-Construction Monitoring

Inspection date: **February 20, 2009**

Submitted to:

Mr. Barney Wegener US Department of Interior Bureau of Land Management, Farmington Field Office 1235 La Plata Highway Farmington, NM 87401

Submitted by:

DWYER ENGINEERING, LLC
Stephen F Dwyer, PhD, PE
1813 Stagecoach Rd. SE
Albuquerque, NM 87123

Summary:

This report summarizes the eleventh monitoring inspection performed of the Lee Acres Superfund Closure cover system (EPA ID# NMD980750020). This is the third monitoring inspection performed on a semi-annual interval. The Work Plan identified the first 2 post-construction years required quarterly monitoring on the progress of the cover system, while the final 3 years of the initial 5-year monitoring period required monitoring on a semi-annual basis.

The cover is in excellent condition. The cover soils, embankments, and drainage trenches were all in good condition and performing as designed (Picture 1). The vegetation at the site continues to mature and improve. The vegetation now appears to be approaching a climax community similar to the surrounding vegetation in undisturbed areas. Erosion at the site is minimal. Percolation measurements were made with no flux measured in the north or south lysimeter.

The Lee Acres Landfill Remedial Action Work Plan and Remedial Design prepared by the Department of Interior, Bureau of Land Management stated in appendix E that the alarm level for the measurement of flux via the installed lysimeters is 1.3 mm/year. All measurements to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well to minimize flux.

Site Name: Lee Acres Landfill	**Date of Inspection: February 20, 2009**
City: Farmington	**Weather: Sunny and warm.**
State: New Mexico	**Temperature: high 50s**
EPA Region: 6	**Site Map: Figure 1**
Inspector: Stephen F Dwyer, PhD, PE	**ID#: NMD9870750020**
Prior Monitoring Performed: Initial Monitoring Report (7-21-05); 1st Quarter Monitoring Report (10-27-05); 2nd Quarter Monitoring (2-11-06); 3rd Quarter (5-20-06); 4th Quarter (8-9-06); 5th Quarter (11-17-06); 6th Quarter (2-16-07); 7th Quarter (5-3-07); 8th Quarter (8-16-07); 9th Semi-Annual (2-29-08); 10th Semi-Annual (9-12-08).	
ITEM	**REMARKS**
COVER SYSTEM (Capillary Barrier)	
1. SETTLEMENT (LOW SPOTS) Yes ( ) No (**X**) Areal Extent: none Depth: none	No settlement or evidence of ponding noted.
2. CRACKS Yes ( ) No (**X**) Length: none Width: none Depth: none	No significant surface cracking seen on cover.
3. EROSION Yes (X) No ( ) Areal Extent: minimal Depth: minimal	There is no significant erosion noted on the site (Picture 1). Desert pavement has reached equilibrium on the main cover surface allowing no significant visible erosion. The gravel admixture surface layer was designed for this purpose – to allow for minimal erosion of the uppermost fine material leaving behind the gravel, thus forming a surface armorment referred to as a 'desert pavement' (Picture 2). The steeper side slopes along the roadway now produce minimal erosion (Picture 3).
4. BIOINTRUSION Yes (X) No ( )	There is minimal biointrusion activity

Areal Extent: minimal Depth: shallow Suspected Cause (Rodent or Other): rodent and ant	(isolated insect / mammal holes and ant piles) found on the cover (Pictures 4) The burrowing animal intrusion had decreased to only a couple of holes on the entire site. The number of ant hills had decreased from the last visit. These were inactive at the time of the site visit – winter hibernation.
5. VEGETATIVE COVER Yes ( ) No (**X**) Grass: Yes (X) No ( ) Shrubs Yes (X) No ( ) Weeds: Yes (**X**) No ( ) – minimal Other: Yes (X) No ( ) - wildflowers Condition: vegetation was in excellent condition. Size: Approaching mature state.	The cover's vegetation has continued to improve (Picture 1). Native shrubs and forbs are expanding their surface coverage (Picture 5). More native grasses are visible on the site. Minimal invasive species were noted other than some dried up tumbleweeds.
6. GRAVEL/SOIL ADMIXTURE COVER SURFACE Yes (**X**) No ( ) Material Type: soil mixed with gravel Condition: Excellent	The gravel/soil surface admixture is in good shape and performing as designed with evidence of a 'desert pavement' formation (Pictures 2 and 3).
7. WET AREAS Yes ( ) No (**X**) Ponding: Yes ( ) No (**X**) Areal Extent: none Estimated Flow Rate: none Soft Subgrade: Yes ( ) No (**X**) Areal Extent: none	None noted during this visit.
9. SLOPE INSTABILITY Yes ( ) No (**X**) Slides: Yes ( ) No (**X**) Areal Extent: none Probable Slide Interface: none Suspected Cause: NA Exposed Cover Components: none	Slopes along the roadway appear in good shape with no signs of instability (Picture 3). These slopes were compacted to high densities for strength in road construction. The slopes have produced minimal silt erosion while the desert pavement has approached equilibrium.
10. GEOTEXTILE EXPOSED Yes ( ) No (**X**) Type: geotextile filter fabric Areal Extent: none	none
11. SOUTHEAST CLOSURE SECTION – EAST OF ROAD Condition: Excellent	This cover section is in excellent condition (Picture 6).
FLUX MEASURMENTS FROM LYSIMETERS	
1. LYSIMETER FUNCITONING PROPERLY Yes (**X**) No ( )	Neither lysimeter produced any flux (Figure 1, Pictures 7 and 8). Both lysimeters appeared to be functioning

Description of problem: none	properly. Both valves were in good shape.
1a. NORTH LYSIMETER Yes (**X**) No ( ) Description of problem: none	
1b. SOUTH LYSIMETER Yes (**X**) No ( ) Description of problem: none	
DRAINAGE CHANNELS	
1. SETTLEMENT Yes ( ) No (**X**) Areal Extent: none Depth: none	All drainage channels are in good shape. Acceptable levels of silt are found in the interior drainage trenches (Pictures 9 and 10).
2. MATERIAL DEGRADATION Yes ( ) No (**X**) Material Type: Areal Extent: none Degree of Degradation: none	
3. EROSION Yes ( ) No (**X**) Areal Extent: minimal Depth: minimal	
4. UNDERCUTTING Yes ( ) No (**X**) Areal Extent: none Depth: none	
5. OBSTRUCTIONS Yes ( ) No (**X**) Type: none Areal Extent: none Size:	
6. SLOPE INSTABILITY Yes ( ) No (**X**) Type: none Areal Extent: none	
COVER PENETRATIONS	
1. LYSIMETER ACCESS VALVE Yes (**X**) No ( ) Functioning: Yes (**X**) No ( ) Condition: Good	There are 2 valve access ports that penetrate the cover profile; one for each lysimeter (Picture 7). These ports allow access to the cutoff valves for the 2 lysimeters installed to monitor the flux through the cover. They are made of PVC pipe and are in excellent condition at this time. These cover penetrations are in good shape and do not appear to be allowing preferential flow through the cover.

PERIMETER DITCHES/OFF-SITE DISCHARGE	
1. SILTATION Yes ( ) No (**X**) Areal Extent: minimal Depth: minimal	The perimeter ditches and off-site drainage appear to be working properly. (Picture 9 and 10).
2. VEGETATION GROWTH Yes (**X**) No ( ) Areal Extent: full coverage Type: Shrub, grasses and forbs with some weeds.	Vegetation continues to improve. The surface vegetation appears to be a success at this time (Pictures 1, 5, and 6).
3. EROSION Yes ( ) No (**X**) Areal Extent: minimal Depth: minimal	No new erosion noted on site.
4. DISCHARGE STRUCTURE Yes (X) No ( ) Functioning: Yes (X) No ( ) Condition: Good	The culverts located in cross drainage trenches above and below the Lee Acres cover site appeared to be working properly (Picture 11).
5. CULVERT Yes (**X**) No ( ) Material Type: Corrugated metal culverts direct drainage from the east side of the road to the arroyo located west of the landfill site. There are two culverts: one located north of the site and one located south of the site.	The culverts located in cross drainage trenches above and below the Lee Acres cover site appeared to be working properly (Picture 11).
FENCING	
1. FENCING DAMAGE Yes ( ) No (**X**) Description of damage: none	The chain link fence around the perimeter of the site is in excellent condition (Picture 12).
ROADS	
1. ROAD DAMAGE Yes ( ) No (**X**) Location: Bisects landfill (figure 1) Description of damage: none Impact to Closure: Yes ( ) No (**X**) Description of Impact: Helps by redirecting up-gradient surface runoff away from landfill source locations.	The road (County Highway 350) is still in new condition.
SITE ACCESS	
1. ACCESS RESTRICTIONS Yes (**X**) No ( ) Description: Chain link fence and locked gate.	The site is currently secured with chain link fencing. Access is limited by a locked gate. All are in excellent condition (Picture 12).

GENERAL	
1. VANDALISM Yes ( ) No (**X**) Description of damage: none	none
2. CHANGED SITE CONDITION Yes ( ) No (**X**)	No degradation noted. Vegetation has improved.
3. LAND USE CHANGE Yes ( ) No (**X**) Description: none	none
INTERVIEWS	
1. INTERVIEW ON-SITE WORKERS Yes ( ) No (**X**) Problems: none Suggestions: none Attach report: NA	none
2. INTERVIEW NEIGHBORS Yes ( ) No (**X**) Problems: none Suggestions: none Attach report: none	none
3. INTERVIEW LOCAL OFFICIALS Yes (X) No ( ) Problems: none Suggestions: none Attach report: none	None. 5-year CERCLA review was held the prior day that included a site visit by all attendees.

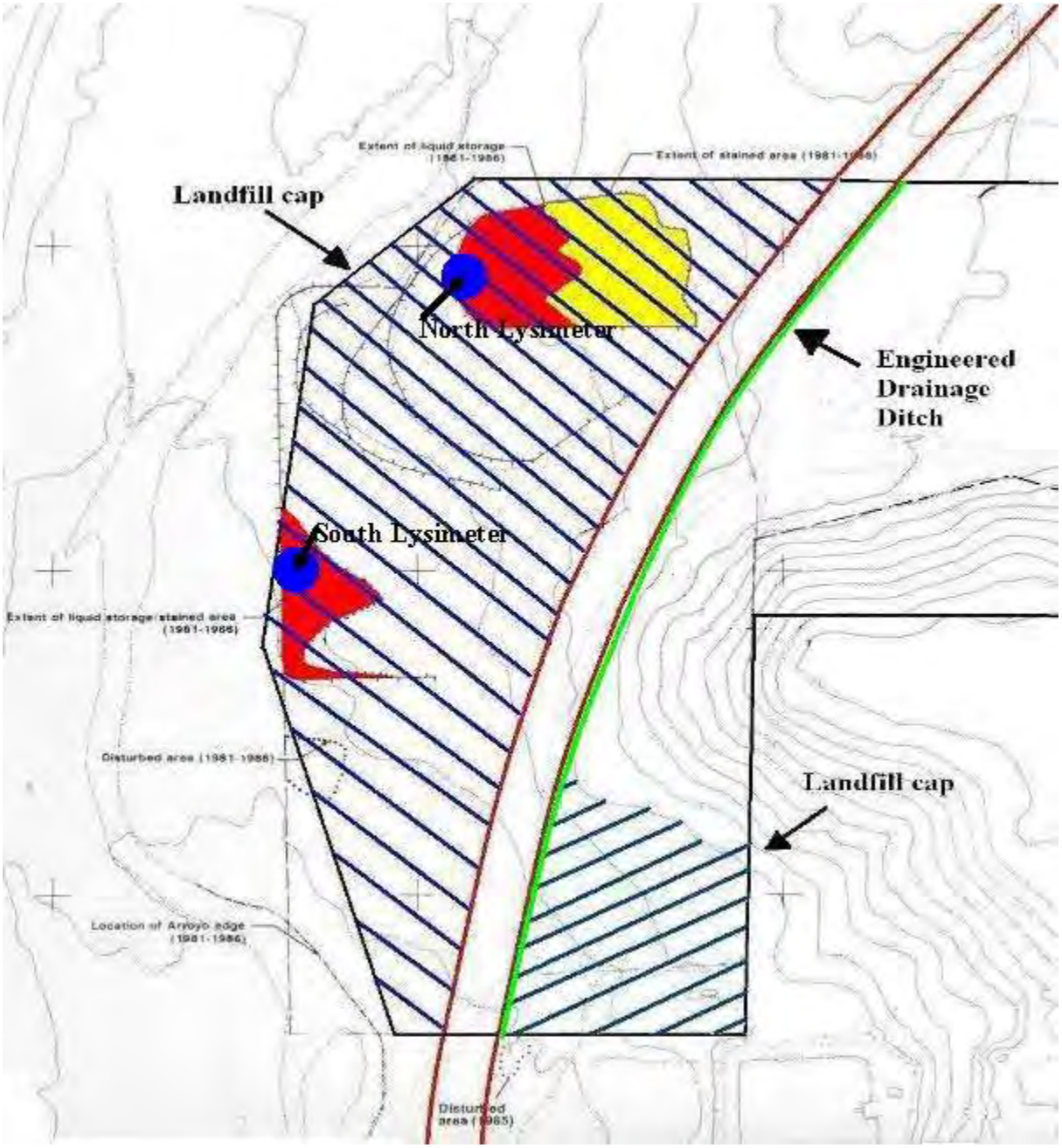


Figure 1. Lee Acres Landfill Site with Lysimeter Locations

Picture 1. Lee Acres Cover, dated 2-20-09

Picture 2. Desert Pavement on Cover Surface

Picture 3. Roadway Western Slope

Picture 4. Ant Hill on Cover – Inactive due to Winter Hibernation

Picture 5. Vegetation Present on Cover

Picture 6. Southeast Cover System

Picture 7. North Lysimeter Valve Access

Picture 8. North Lysimeter Collection Point

Picture 9. Exterior Drainage Ditch East of Roadway

Picture 10. Drainage Ditch on East Side of Cover Adjacent to Roadway

Picture 11. Culvert South of Site

Picture 12. Site Gate

ATTACHMENT 2

Public Notices

PUBLIC NOTICE

BLM AND EPA BEGINS FIVE-YEAR REVIEW of the SUPERFUND CLEAN UP at the LEE ACRES LANDFILL SITE

The Bureau of Land Management (BLM) and the U.S. Environmental Protection Agency (EPA) is in the process of completing a **Five-Year Review** of the **Lee Acres Landfill Superfund Site**, located approximately 3/8 mile north of the intersection of U.S. Highway 64 and San Juan County road 5500 near McGee Park. BLM welcomes comments and/or questions prior to and following the review's expected completion date of November 2009.

What is a Five-Year Review?
It is a review required by law or policy to make sure that the BLM – EPA cleanup is protective of human health and the environment. The review includes inspecting the site and cleanup technologies and examining monitoring data, operating data, and maintenance records. This entire process is repeated every five years.

Why is a Five-Year Review being done for this site?
The Five-Year Review will evaluate the effectiveness of the Lee Acres Landfill Remedial Action Work Plan components:

- Closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory.
- Realignment of County Road 350, including storm water run-on and run-off controls constructed to divert run-on, and maximize run-off.
- Monitor natural attenuation of ground water contaminants.

To Review Five-Year Report:
When complete, the Five-Year Review will be available on the internet at the New Mexico BLM external website, and at the BLM public room at 1235 La Plata Highway, Farmington NM.

PLEASE NOTE: For more information or to report concerns about the Site which may be helpful to the Five-Year Review process, contact:

Beth Utley
San Juan County
100 South Oliver Drive
Aztec NM 87410
505-334-4581

Barney Wegener
Farmington BLM
1235 La Plata Highway
Farmington NM 87401
505-599-6346

Confirmed Publication in Farmington Daily Times: Feb. 11, March 7, and March 14, 2009.

PUBLIC NOTICE

BLM AND EPA COMPLETES FIVE-YEAR REVIEW of the SUPERFUND CLEAN UP at the LEE ACRES LANDFILL SITE

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- Realignment of County Road 350, including storm water run-on and run-off controls constructed to divert run-on, and maximize run-off.
- Monitor natural attenuation of ground water contaminants.

Results of the Five-Year Review:
The results of the Five-Year Review indicate that the remedy is protective of human health and the environment. The results of the Five-Year Review are available on the internet at the New Mexico BLM external website, the Farmington Public Library, and at the BLM public room at 1235 La Plata Highway, Farmington NM.

PLEASE NOTE: For more information or to report concerns about the Site, contact:

Beth Utley
San Juan County
100 South Oliver Drive
Aztec NM 87410
505-334-4581

Barney Wegener
Farmington BLM
1235 La Plata Highway
Farmington NM 87401
505-599-6346

For Publication in Farmington Daily Times for publication upon completion of Five-Year Review

ATTACHMENT 3

Interviews

INTERVIEW RECORD

Site Name: Lee Acres Landfill	**EPA ID No.: NMD980750020**	
Subject: Five-Year Review	**Time: 0830**	**Date: 3-25-2009**
Type: Telephone **Visit** Other **Location of Visit: San Juan County Administration Building**	Incoming 0830	Outgoing 0900

Contact Made By:

Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**

Individual Contacted:

Name: Beth Utley	**Title: San Juan County Public Relations Manager**	**Organization: San Juan County**
Telephone No: 505-334-4581 **Fax No: 505-334-4226** **E-Mail Address: bethutley@sjcounty.net**	**Street Address: 100 South Oliver Drive** **City, State, Zip: Aztec NM 87410**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I have worked for San Juan County since 2000, and have been the County Public Relations Manager since 2004. I am also serving as the Community Involvement Coordinator for the Lee Acres five-year review process.

Interview Questions
QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004? I feel that proper procedures have been in place to insure the safety of the public, and to make sure the cap maintains its integrity.
QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community? No effects at all on the surrounding community. Most people do not know the landfill site is there.
QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site? No.
QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results. I do not conduct site visits or inspection. Other County employees do visit the site, and then I get their reports.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

The only incident that I am aware of is the vehicle accident that required fence repair.

Summary Of Conversation

I asked Beth to summarize her thoughts about Lee Acres and she responded with the following:

The San Juan County Legal Department posted 3 Public Notices in the Farmington Daily Times. The notices ran in the paper at 3 different times: February 11, March 7, and March 14. The notice explained the five-year review process and directed the public to notify me of any questions or concerns. I did not receive any responses. Since 2004 when I took over the position of Public Relations Manager, I have not received any negative responses from the public concerning Lee Acres. San Juan County received an award from the National Association of Counties for cooperating with federal agencies and the State of New Mexico to develop remedial actions for the Lee Acres site and the construction of the cap and Road 350. The Farmington Daily Times reported on the award, and I did receive some positive comments from the public in response the report in the paper.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1330** **Date: 3-26-09**
Type: Telephone **Visit** Other **Location of Visit: Western Refining Office - Bloomfield**		Incoming 1330 Outgoing 1520
Contact Made By:		
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Bruce Cauthen	**Title: Environmental Engineer**	**Organization: Western Refining**
Telephone No: 505-632-8006 **Fax No: 505-632-4021** **E-Mail Address: bruce.cauthen@wnr.com**	**Street Address: 111 County road 4990** **City, State, Zip: Bloomfield, NM 87413**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

Western Refining owns property south of the Landfill, and I have been an environmental engineer for Western Refining for about a year. I am familiar with the site. I worked at Giant Bloomfield Refinery in 1981 and was part of the shut down crew. I am now in charge of analyzing groundwater monitoring reports and coordinating with OCD on Giant Bloomfield Refinery monitoring wells. Some of these ground water monitoring wells are located on BLM surface just south of the landfill.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

I was aware of the earth moving project on the site that you call the cap. But I was not working for Western Refining at that time. From an environmental stand point; the overall clean up and project seems to be moving the right direction.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

After looking through the ground water monitoring charts, it looks like the contaminants of concern are below cleanup levels and that is good for the community.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I do not monitor the old landfill site. The monitoring that I am involved with concerns Western Refining in cooperation with the New Mexico Oil Conservation District.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No.

Summary Of Conversation

Bruce asked me how the cap was constructed and how it works. I replied that I would send him a copy of the Interim Remedial Action Report for the Lee Acres Landfill from September 2005. This report includes details about the cap.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1000** **Date: 3-18-2009**
Type: Telephone **Visit** Other **Location of Visit:San Juan County Public Works Office**		Incoming 1000 Outgoing 1200
Contact Made By:		
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Dave Keck	**Title: Public Works Administrator**	**Organization: San Juan County**
Telephone No: 505-334-4520 **Fax No: 505-334-3645** **E-Mail Address: dkeck@sjcounty.net**	**Street Address: 305 South Oliver Dr.** **City, State, Zip: Aztec NM 87410**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

As Public Works Administrator, I was responsible for initial construction of the test cap, the main cap, and I am responsible for maintenance and oversight for the entire site including the cap, County Road 350, and the road apron utilized for water run on and run off control. I initiated the idea of building a road (County Road 350) through the site to improve traffic in the county, and to use the road construction to control water run off and run on to protect the cap. I was the administrative advisor of the cap construction and attended coordination meetings and site inspections.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

The cap has performed very well. There are very few issues other than reseeding the cap after the initial seeding effort failed. I am very pleased with the cap project.

QUESTION #3 From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

None; people do not realize they are driving over the old landfill.

QUESTION #4 Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No; I have had no calls and no questions from the community.

Question #5 Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I have done visual drive through inspections, and I have coordinated with BLM. I look at the asphalt lined drainage swale that controls water run on and run off from the cap. The asphalt drainage along the east side of 350 was sealed and is working fine other than a few low places that hold a puddle of water for a short time after a rain.

INTERVIEW RECORD

Question #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

A citizen crashed his vehicle through the fence near the small cap in 2005. The San Juan County Sheriff's Office responded to the accident and determined the driver was impaired by alcohol. No injuries were reported and the fence was repaired by the County the next day. I know of no other incidences.

Summary Of Conversation

Dave's summary was: the cap and remediation project in cooperation with EPA and BLM has been a huge success.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**	
Subject: Five-Year Review		**Time: 0900**	**Date: 3-30-09**
Type: Telephone Visit Other **Location of Visit:**		Incoming 0900 Outgoing 1000	
Contact Made By:			
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**	
Individual Contacted:			
Name: Fredrick Gebhardt	**Title: Hydrologic Technician**	**Organization: USGS Water Science Center**	
Telephone No: 505-830-7978 **Fax No: 505-830-7998** **E-Mail Address: gebhardt@usgs.gov**		**Street Address: 5338 Montgomery Blvd. NE Suite 400** **City, State, Zip: Albuquerque NM 87109**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I began sampling the ground water at Lee Acres in 1993, and became the Lee Acres Sampling Project Manager in 2000. I am responsible for the USGS sampling program at Lee Acres.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

I believe the BLM and EPA remediation plan is moving in the right direction. I think they are on track to start the closure process.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

From the prospective of the ground water monitoring program, there is no indication of any effects to the down gradient residences of the Lee Acres community.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No.

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I am contracted by BLM to monitor the ground water monitoring wells twice a year. I am in constant communication with BLM regarding the monitoring results. I think the next phase in this project is closure.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No.

Summary Of Conversation

I truly feel the project is moving in the right way, and will benefit BLM and the community by closing out the site.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1000** **Date: 4-16-2009**
Type: Telephone **Visit** Other **Location of Visit:**		Incoming 1000 Outgoing 1200
Contact Made By:		
Name: Barney Wegener **Dale Wirth**	**Title: Natural Resource Specialist** **Branch Chief – Rng & Mult Resources**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Phyllis Bustamante	**Title: Geoscientist – New Mexico Environmental Department (NMED) Superfund Over Site**	**Organization: NMED**
Telephone No: 505-827-2434 **Fax No: 505-827-2965** **E-Mail Address: phyllis.bustamante@state.nm.us**	**Street Address: Harold Runnels Building Rm. N2250** **1190 St. Francis Drive P.O. Box 5469** **City, State, Zip: Santa Fe, NM 87502-5469**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I am a staff member of the New Mexico Environmental Department – Ground Water Quality Bureau – Superfund Oversight Section. I have been assigned to Lee Acres for 2 years. The Superfund Oversight Section (SOS) assists the U.S. Environmental Protection Agency (EPA) in characterization of inactive hazardous waste sites, and provides management assistance to EPA at Superfund sites listed on the National Priorities List. I review the Lee Acres site and associated documents for consistency under the Superfund rules so that actions initiated at Lee Acres are consistent with State of New Mexico rules to ensure protection of human health and the environment.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

My impression is that BLM has met commitments outlined in the Record of Decision (ROD) by constructing the cap and monitoring ground water. The monitoring information indicates that things are going well.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

The cap has eliminated any odors and blowing trash that may have come from the landfill. Early indications of the cap monitoring show the cap may be preventing migration of contaminants to, or through the ground water.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No. I have not heard any community concerns.

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I did a site visit on August 16, 2007 and was introduced to the site by Dale Wirth and Steve Dwyer. I attended the 5 year coordination meeting and follow up site visit on February 19, 2009. On March 24 and April 7, NMED staff members including myself, hand delivered post cards to the Lee Acres subdivision residents with a questionnaire to identify private wells, and the current use of the wells. NMED wants to sample these wells in May 2009, if given permission by the land owner. NMED is initiating this study to see if there are any new targets or contaminants in the ground water under the Lee Acres community. NMED will split samples at the Lee Acres landfill site during the next sampling event conducted by USGS.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No.

Summary Of Conversation

In terms of reviewing the documents, I have concerns and I am hoping that we are not missing any contamination movement or migration. Analytical results do not clearly show that PCE has gone through the degradation process. I am not seeing all secondary by products that should be produced during the breakdown of PCE to TCE to DCE to VC. I wonder; could some of the contamination migrated without being detected with the current monitoring system? Analytical review and down gradient wells monitoring does not indicate that much migration is taking place, but no monitoring system is perfect. I Wonder if a path of migration may not have been detected?

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1020** **Date: 3-27-2009**
Type: Telephone Visit Other **Location of Visit:**		Incoming Outgoing
Contact Made By:		
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Stephen Dwyer PhD, PE	**Title: Contract Engineer**	**Organization: Dwyer Engineering, LLC**
Telephone No: 505-844-0595 **Fax No: 505-271-0741** **E-Mail Address: dwyerengineering@yahoo.com**		**Street Address: 1813 Stagecoach Rd. SE** **City, State, Zip: Albuquerque, NM 87123**

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I helped to conceptualize the use of an engineered capillary barrier (cap) as a remedy to the Lee Acres Landfill. I participated in cap research and development at Sandia National Laboratories. I attended meetings with the EPA, BLM, and NMED to discuss the appropriateness of the cap, and how it would promote natural attenuation of contaminants that were present within the land fill. I designed the small test cap and had oversight in its construction and monitored the test cap after construction. I assisted the firm of Cheney-Walters-Echols INC to engineer the main cap, and I reviewed the final plan. I provided construction oversight as construction engineer as the cap was being built. I have been monitoring the cap for the 4 years after the cap was completed. The cap looks very good.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

Very favorable. The cover is working very well. Any issues that have arisen have been taken care of between BLM and San Juan County. Data is showing he cap is working and is allowing natural attenuation to do its thing. There is generally a window of time between 3 to 7 years after construction that if there is going to be a problem with a cap, it will show up within this window. We have reduced the monitoring of the cap from quarterly to semiannual. I would recommend continuing the monitoring semiannually until we get out of the 3 to 7 year window. If no problems arise after that time, monitoring may be reduced to annually. Monitoring ground water and the cap go hand in hand.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

I think they are positive. San Juan County pushed the remediation to include the realignment of Road 350. The road eliminated the need for a stop light on Highway 64, and straightened the alignment of 350; eliminating dangerous curves. The community benefits from the safer alignment of road 350. The cover has also stopped water from pounding on the site, reducing surface water issues.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No.

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

Yes. I am responsible for monitoring the cap. I am currently monitoring semiannually, and submit my reports to BLM. The cap is performing as designed and you can review my reports in your office.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No. Nothing other than a car accident that damaged a fence. The fence was repaired right away. I have found no vandalism during my monitoring visits.

Summary Of Conversation

I am very positive; this is an excellent closure.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**	
Subject: Five-Year Review		**Time:1000**	**Date: 3-18-2009**
Type: Telephone **Visit** Other **Location of Visit:**		Incoming 1000 Outgoing 1200	
Contact Made By:			
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**	
Individual Contacted:			
Name: T.J. Richards	**Title: Compliance Specialist**	**Organization: San Juan County**	
Telephone No: 505-334-4574 **Fax No: 505-334-3645** **E-Mail Address: tjrichards@sjcounty.net**		**Street Address: 305 South Oliver Dr.** **City, State, Zip: Aztec NM 87410**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I have been involved with San Juan County administration since 1993. I moved to engineering technician in 1999. I worked with BLM staff and the Engineering Firm of Cheney - Walters – Echols INC to develop the remedial design work plan for the cap and Road 350. Since the cap has been completed, I am responsible for the project compliance and maintenance.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

The cap has performed very well. I am very pleased with the cap project. I visually inspect the project area every time she passes by – about 8 to 10 times per month

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

The effects have been minimal. The only community issue I have noticed is a temporary traffic impediment while USGS (Fred Gephardt) is monitoring well #68 along the side of the highway (County Road 350).

(USGS monitors well 68 biannually, and sets cones to close the west lane of traffic while he takes a water sample).

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I drive by the site about 8 to 10 times per month and look at the fence lines, check to see if the erosion controls are working, and look for trash.

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

The only incident that I am aware of is the traffic accident that Dave Keck mentioned. The fence was damaged by the accident, but the County repaired the fence the next day.

Summary Of Conversation

T.J. said that different government agencies including local, federal, and state cooperated to develop and construct the remedy (cap and Road 350). I think it was a great showing of government agencies working together.

ATTACHMENT 4

Site Inspection Check List and Photos

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Lee Acres Landfill	**Date of inspection: 2-19-2009**
Location and Region: Farmington NM Region 6	**EPA ID: NMD980750020**
Agency, office, or company leading the five-year review: Farmington BLM (DOI)	**Weather/temperature: Sunny and 50 degrees F.**

Remedy Includes: (Check all that apply)

- **X** Landfill cover/containment
- **X** Access controls
- **X** Institutional controls
- ■ Groundwater pump and treatment
- ■ Surface water collection and treatment
- ■ Other_____

- **X** Monitored natural attenuation
- ■ Groundwater containment
- ■ Vertical barrier walls

Attachments: **X** Inspection team roster attached **X** Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** __Dave Keck_____ ___Public Works Administrator ___2-19-2009
   Name Title Date
   Interviewed **X** at site ■ at office ■ by phone Phone no. _**505-334-4520**_____
   Problems, suggestions; **X** Report attached _____

2. **O&M staff** __T. J. Richards_____ ___ Compliance Specialist ___ _3-18-2009_____
   Name Title Date
   Interviewed ■ at site **X** at office ■ by phone Phone no. ___505-334-4574_____
   Problems, suggestions; **X** Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency __San Juan County_____
Contact _____Beth Utley__ Community Involvement Coordinator_ 3-25-2009_ 505-334-4581_
Name Title Date Phone no.
Problems; suggestions; **X** Report attached _____
_____

Agency _USGS_ __
Contact Fredrick Gebhardt ___ Hydrologic Technician _3-30-09 _505-830-7978
Name Title Date Phone no.
Problems; suggestions; **X** Report attached _____
_____

Agency New Mexico Environmental Department__(NMED)___
Contact Phyllis Bustamante __ __NMED Superfund Oversite _4-16-2009 505-827-2434
Name Title Date Phone no.
Problems; suggestions; **X** Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ■ Report attached _____
_____

4. **Other interviews** (optional) **X** Report attached.

Stephen Dwyer PhD, PE Dwyer Engineering, LLC Landfill Cover Monitoring 505-844-0595

Bruce Cauthen Environmental Engineer Western Refining (Giant Bloomfield Refinery) 505-632-8006

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ■ O&M manual — X Readily available — ■ Up to date — ■ N/A
   - ■ As-built drawings — ■ Readily available — ■ Up to date — X N/A
   - ■ Maintenance logs — X Readily available — ■ Up to date — ■ N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — X Readily available — ■ Up to date — ■ N/A
   - ■ Contingency plan/emergency response plan — X Readily available — ■ Up to date — ■ N/A

   Remarks_____

3. **O&M and OSHA Training Records** — **X** Readily available — ■ Up to date — ■ N/A

   Remarks Tail Gate Meetings_____

4. **Permits and Service Agreements**
   - ■ Air discharge permit — ■ Readily available — ■ Up to date — X N/A
   - ■ Effluent discharge — ■ Readily available — ■ Up to date — X N/A
   - ■ Waste disposal, POTW — ■ Readily available — ■ Up to date — X N/A
   - ■ Other permits _____ — ■ Readily available — ■ Up to date — X N/A

   Remarks _____No Permits Required___

5. **Gas Generation Records** — ■ Readily available — ■ Up to date — X N/A

   Remarks_____

6. **Settlement Monument Records** — ■ Readily available — ■ Up to date — X N/A

   Remarks_____

7. **Groundwater Monitoring Records** — **X** Readily available — X Up to date — ■ N/A

   Remarks_____

8. **Leachate Extraction Records** — ■ Readily available — ■ Up to date — X N/A

   Remarks_____

9. **Discharge Compliance Records**
   - ■ Air — ■ Readily available — ■ Up to date — X N/A
   - ■ Water (effluent) — ■ Readily available — ■ Up to date — X N/A

   Remarks_____

10. **Daily Access/Security Logs** — ■ Readily available — ■ Up to date — X N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**
   ■ State in-house ■ Contractor for State
   ■ PRP in-house ■ Contractor for PRP
   ■ Federal Facility in-house ■ Contractor for Federal Facility
   X Other ____San Juan County In-House__

2. **O&M Cost Records**
   X Readily available X Up to date
   ■ Funding mechanism/agreement in place
   Original O&M cost estimate $1,109,299.03__ ■ Breakdown attached

   Total annual cost by year for review period if available

From__ Oct 2004_	To _Jan. 2006_	$711,925.34____	■ Breakdown attached
Date	Date	Total cost	
From__ Jan. 2006_	To _Jan. 2007_	___$2,429.99_____	■ Breakdown attached
Date	Date	Total cost	
From__ Jan. 2007	To_ Jan 2008 -	___$2,706.30_____	■ Breakdown attached
Date	Date	Total cost	
From__ Jan. 2008_	To_ Jan 2009_	____$214.00_____	■ Breakdown attached
Date	Date	Total cost	
From_ Jan. 09 _	To Present __	_____$244.00_____	■ Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons:
   _____None_____

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ■ N/A

A. Fencing

1. **Fencing damaged** ■ Location shown on site map ■ Gates secured ■ N/A
   Remarks_ A citizen crashed his vehicle through the fence near the small cap in 2005. The San Juan County Sheriff's Office responded to the accident and determined the driver was impaired by alcohol. No injuries were reported and the fence was repaired by the County the next day.___

B. Other Access Restrictions

1. **Signs and other security measures** ■ Location shown on site map ■ N/A
   Remarks___All gates are locked and checked regularly by the County

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ■ Yes X No ■ N/A
Site conditions imply ICs not being fully enforced ■ Yes X No ■ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) ____Drive By_____
Frequency ____8 – 10 times per month_____
Responsible party/agency ___San Juan County_____
Contact ___T. J. Richards_____ __Compliance Specialist __ _____ _505-334-4574__
Name Title Date Phone no.

Reporting is up-to-date X Yes ■ No ■ N/A
Reports are verified by the lead agency X Yes ■ No ■ N/A

Specific requirements in deed or decision documents have been met X Yes ■ No ■ N/A
Violations have been reported ■ Yes ■ No X N/A
Other problems or suggestions: ■ Report attached

2. **Adequacy** X ICs are adequate ■ ICs are inadequate ■ N/A
Remarks _BLM has withdrawn 134.68 acres of public land, within which the landfill is located, from settlement, sale, location, and entry, as described in Public Land Order No., 7234 (62 Fed. Reg. 2177, January 15, 1997).____

D. General

1. **Vandalism/trespassing** ■ Location shown on site map X No vandalism evident
Remarks_____None_____

2. **Land use changes on site** ■ N/A
Remarks_____None_____

3. **Land use changes off site** ■ N/A
Remarks_____None_____

VI. GENERAL SITE CONDITIONS

A. Roads ■ Applicable ■ N/A

1. **Roads damaged** ■ Location shown on site map X Roads adequate ■ N/A
Remarks_____None_____

B. Other Site Conditions

Remarks __Site is in good condition_____

_____

_____

_____

_____

_____

VII. LANDFILL COVERS X Applicable ■N/A

A. Landfill Surface

1. **Settlement** (Low spots) ■Location shown on site map X Settlement not evident
Areal extent_____ Depth_____
Remarks _____No Settlement_____
_____

2. **Cracks** ■Location shown on site map X Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks _____No Cracks_____
_____

3. **Erosion** ■Location shown on site map ■Erosion not evident
Areal extent_____ Depth_____
Remarks ___Steve Dwyer noted that there was minor silt deposits seen in the gravel in storm water run-off trenches, but the silt was minimal and within tolerances. No action needed.____
_____

4. **Holes** ■Location shown on site map X Holes not evident
Areal extent_____ Depth_____
Remarks ___Steve Dwyer noted that there are some scattered ant hills and evidence of some burrowing animals (probably lizards), but nothing significant and no penetrations. One gopher was found on site in 2006, but was removed immediately.____
_____

5. **Vegetative Cover** ■Grass X Cover properly established ■No signs of stress
■Trees/Shrubs (indicate size and locations on a diagram)
Remarks ___The grass and shrub community established by two seedings is similar to the undisturbed vegetation surrounding the site, but is not yet mature.____
_____

6. **Alternative Cover (armored rock, concrete, etc.)** ■N/A
Remarks __There is rock armor 12 feet wide around the perimeter of the cover. All of the rock armor is in good condition and side slopes and drainage trenches are in good shape.____
_____

7. **Bulges** ■Location shown on site map X Bulges not evident
Areal extent_____ Height_____
Remarks_____None_____
_____

8. **Wet Areas/Water Damage** **X** Wet areas/water damage not evident
- ■ Wet areas ■ Location shown on site map Areal extent_____
- ■ Ponding ■ Location shown on site map Areal extent_____
- ■ Seeps ■ Location shown on site map Areal extent_____
- ■ Soft subgrade ■ Location shown on site map Areal extent_____

Remarks_____None_____

9. **Slope Instability** ■ Slides ■ Location shown on site map X No evidence of slope instability
Areal extent_____
Remarks_____None_____

B. Benches ■ Applicable X N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ■ Location shown on site map X N/A or okay
Remarks_____

2. **Bench Breached** ■ Location shown on site map X N/A or okay
Remarks_____

3. **Bench Overtopped** ■ Location shown on site map X N/A or okay
Remarks_____

C. Letdown Channels ■ Applicable X N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ■ Location shown on site map ■ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ■ Location shown on site map ■ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ■ Location shown on site map ■ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ■ Location shown on site map ■ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____
_____

5. **Obstructions** Type_____ ■ No obstructions
■ Location shown on site map Areal extent_____
Size_____
Remarks_____
_____

6. **Excessive Vegetative Growth** Type_____
■ No evidence of excessive growth
■ Vegetation in channels does not obstruct flow
■ Location shown on site map Areal extent_____
Remarks_____
_____

D. Cover Penetrations X Applicable ■ N/A

1. **Gas Vents** ■ Active ■ Passive
■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
■ Evidence of leakage at penetration ■ Needs Maintenance
■ N/A
Remarks_____
_____

2. **Gas Monitoring Probes**
■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
■ Evidence of leakage at penetration ■ Needs Maintenance ■ N/A
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
■ Properly secured/locked X Functioning X Routinely sampled X Good condition
■ Evidence of leakage at penetration ■ Needs Maintenance ■ N/A
Remarks There are two lysimeters within the surface of the landfill site. The lysimeters are in good condition, and monitored regularly.____
_____

4. **Leachate Extraction Wells**
■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
■ Evidence of leakage at penetration ■ Needs Maintenance ■ N/A
Remarks_____
_____

5. **Settlement Monuments** ■ Located ■ Routinely surveyed ■ N/A
Remarks_____
_____

E. Gas Collection and Treatment ■ Applicable X N/A

1. **Gas Treatment Facilities**
   ■ Flaring ■ Thermal destruction ■ Collection for reuse
   ■ Good condition ■ Needs Maintenance
   Remarks_____
   _____

2. **Gas Collection Wells, Manifolds and Piping**
   ■ Good condition ■ Needs Maintenance
   Remarks_____
   _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ■ Good condition ■ Needs Maintenance ■ N/A
   Remarks_____
   _____

F. Cover Drainage Layer ■ Applicable X N/A

1. **Outlet Pipes Inspected** ■ Functioning ■ N/A
   Remarks_____
   _____

2. **Outlet Rock Inspected** ■ Functioning ■ N/A
   Remarks_____
   _____

G. Detention/Sedimentation Ponds ■ Applicable X N/A

1. **Siltation** Areal extent_____ Depth_____ ■ N/A
   ■ Siltation not evident
   Remarks_____
   _____

2. **Erosion** Areal extent_____ Depth_____
   ■ Erosion not evident
   Remarks_____
   _____

3. **Outlet Works** ■ Functioning ■ N/A
   Remarks_____
   _____

4. **Dam** ■ Functioning ■ N/A
   Remarks_____
   _____

H. Retaining Walls ■ Applicable X N/A

1. **Deformations** ■ Location shown on site map ■ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____
   _____

2. **Degradation** ■ Location shown on site map ■ Degradation not evident
   Remarks_____
   _____

I. Perimeter Ditches/Off-Site Discharge X Applicable ■ N/A

1. **Siltation** ■ Location shown on site map X Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** ■ Location shown on site map ■ N/A
   X Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____
   _____

3. **Erosion** ■ Location shown on site map X Erosion not evident
   Areal extent_____ Depth_____
   Remarks ___No erosion in trenches._____
   _____

4. **Discharge Structure** ■ Functioning ■ N/A
   Remarks_____
   _____

VIII. VERTICAL BARRIER WALLS ■ Applicable X N/A

1. **Settlement** ■ Location shown on site map ■ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Performance Monitoring** Type of monitoring_____
   ■ Performance not monitored
   Frequency_____ ■ Evidence of breaching
   Head differential_____
   Remarks_____
   _____

C. Treatment System ■ Applicable X N/A

1. **Treatment Train** (Check components that apply)
   ■ Metals removal ■ Oil/water separation ■ Bioremediation
   ■ Air stripping ■ Carbon adsorbers
   ■ Filters_____
   ■ Additive (*e.g.*, chelation agent, flocculent)_____
   ■ Others_____
   ■ Good condition ■ Needs Maintenance
   ■ Sampling ports properly marked and functional
   ■ Sampling/maintenance log displayed and up to date
   ■ Equipment properly identified
   ■ Quantity of groundwater treated annually_____
   ■ Quantity of surface water treated annually_____
   Remarks_____
   _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ■ N/A ■ Good condition ■ Needs Maintenance
   Remarks_____
   _____

3. **Tanks, Vaults, Storage Vessels**
   ■ N/A ■ Good condition ■ Proper secondary containment ■ Needs Maintenance
   Remarks_____
   _____

4. **Discharge Structure and Appurtenances**
   ■ N/A ■ Good condition ■ Needs Maintenance
   Remarks_____
   _____

5. **Treatment Building(s)**
   ■ N/A ■ Good condition (esp. roof and doorways) ■ Needs repair
   ■ Chemicals and equipment properly stored
   Remarks_____
   _____

6. **Monitoring Wells** (pump and treatment remedy)
   ■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
   ■ All required wells located ■ Needs Maintenance ■ N/A
   Remarks_____
   _____

D. Monitoring Data

1. Monitoring Data
   X Is routinely submitted on time X Is of acceptable quality

2. Monitoring data suggests:
   X Groundwater plume is effectively contained X Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

X Properly secured/locked X Functioning X Routinely sampled X Good condition
X All required wells located ■ Needs Maintenance ■ N/A
Remarks __Wells monitored by USGS_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Remedy is functioning as designed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The landfill cover is properly maintained and all facilities are in good condition.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. No issues
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. No issues

Lee Acres Landfill Site Inspection February 19, 2009

View is from the north portion of the landfill cover looking south.

Lee Acres Landfill Site Inspection February 19, 2009

View is from the southwest portion of the landfill cover looking to the northeast; note truck on County Road 350.

Lee Acres Landfill Site Inspection February 19, 2009

View is from the northwest corner of cover and cone marks the location of the north lysimeter.

Lee Acres Landfill Site Inspection February 19, 2009

View is from the southern portion of the cover looking south; note County Road 350 on the left, water drain channel in the center, and the southern portion of the cover on the right.

Lee Acres Landfill Site Inspection February 19, 2009

View looking south along storm water run-off channel that was constructed along County Road 350.

United States Bureau of Land Management

CERCLA Ground-Water Monitoring at the Lee Acres Landfill, National Priority Site, near Farmington, New Mexico

Analytical Results for Samples Collected November 16-18, 2004

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Prepared for

U.S. Bureau of Land Management

April 2005

United States Bureau of Land Management

CERCLA Ground-Water Monitoring at the Lee Acres Landfill, National Priority Site, near Farmington, New Mexico

Analytical Results for Samples Collected November 16-18, 2004

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April 2005

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APPENDIX I

Analytical Results from Severn Trent Services Laboratory for Ground-Water Samples Collected November 16-18, 2004

Severn Trent Reports Lot # D4170331, D4K1800279, and D4K190267, (Wells BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 75, 76, 77 and GBR-17, 32, 48, 50)	I-1
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APPENDIX I—Continued

Analytical Results from Severn Trent Services Laboratory for Ground-Water Samples Collected November 16-18, 2004

Page

Severn Trent Sample Receiving Checklist I-247

APPENDIX II

USGS Laboratory Quality Assurance/Quality Control Results

USGS Laboratory Data Validation for Reports Lot # D4K170331, D4K180279, and D4K190267 ..... II-1

USGS DODEC Laboratory Data Review Worksheet for Reports Lot # D4K170331, D4K180279, and D4190267 ..... II-9

APPENDIX III

Field Data

Sample Container and Preservation Requirements III-1

Field Notes III-2

EXECUTIVE SUMMARY

The U.S. Geological Survey (USGS), Water Resources Division, entered into an agreement with the U.S. Bureau of Land Management (BLM) to perform ground-water sampling and analysis at and around the Lee Acres Landfill site. The Lee Acres Landfill site is located in northwestern New Mexico approximately 6 miles east of Farmington (figure 1). The landfill was operational from May 1962 through April 1986. The BLM conducted a remedial investigation at the former Lee Acres Landfill, beginning in 1989, according to the Comprehensive Environmental Restoration, Compensation, and Liability Act (CERCLA); the Superfund Amendments and Reauthorization Act (SARA); and the National Contingency Plan in anticipation of the site's placement on the National Priorities List (NPL). In August 1990, the former Lee Acres Landfill was placed on the NPL by the U.s. Environmental Protection Agency (EPA). In 1986, Geoscience Consultants, Ltd., completed a preliminary ground-water investigation of the adjacent refinery. In 1987, the USGS conducted a hydrogeologic characteristics study of the landfill. The remedial investigation (RI) study was conducted by Roy F. Weston, Inc.; in 1991. The objective of the present agreement is to sample existing wells on and around the landfill site according to protocols outlines in the Sampling and Analysis Plan (SAP). This ground-water monitoring effort is mandatory for CERCLA compliance.

This report presents water-quality data for samples collected from wells at and around the Lee Acres Landfill (Figure 2). This report will consist of water-quality data collected from seventeen BLM and four Giant-Bloomfield Refinery (GBR) monitoring wells during November 16-18, 2004. Normally there are a total of nineteen BLM and five GBR wells sampled. However, wells BLM-68, 70, and GBR-49 were not sampled because the quantity of water in the wells was not of a sufficient amount to allow a sample to be collected. Monitoring wells BLM-15 and 39 are upgradient from the landfill and serve as the background wells. Monitoring wells BLM-55, 56, and 57 are within the landfill. Monitoring wells BLM-21, 42, 45, 48, 51, and 60 are adjacent to and west of the landfill. Monitoring wells BLM-62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50 are located downgradient from the landfill. The altitudes of water levels measured on November 15, 2004 at and around Lee Acres Landfill site is shown in figure 3. Records of water-level measurements for the 24 wells at and around Lee Acres Landfill sire are presented in table 1. A summary of historical concentrations of analytes in ground water from monitoring wells at he Lee Acres Landfill site is presented in table 2. Ground-water samples were analyzed for the following: volatile organic compounds (VOC's) by method SW8260A; general chemistry (chloride, fluoride, nitrate, orthophosphate, and sulfate) by method MCAWW300.0A; nitrate plus nitrite by method MCAWW353.2; total dissolved solids (TDS) by method MCAWW160.1; and dissolved metals by method SW6010B.

Concentrations of the analytes detected are presented in the Executive summaries of the appendices, pages I-7 through I-17. Only those concentrations detected above the reporting limit are discussed in this summary. The volatile organic compound chloroform was detected in the water sample from well GBR-48 at a concentration of 1.1 µg/L. The compound cis-1,2-dichloroethene was detected in water samples from wells GBR-32 and 48 at concentrations of 1.1 and 1.7 µg/L, respectively. The compound tetrachloroethene was detected in the water sample from well GBR-48 at a concentration of 1.6 µg/L.

Dissolved manganese was detected in water samples from all wells except BLM-15, 51, 69, and GBR-17 and 49. The concentrations of dissolved manganese ranged from 10.0 µg/L (BLM-48) to 4900 µg/L (BLM-57). Dissolved nickel was detected in water samples from wells BLM-55, GBR-32 and 48, at concentrations ranging from 71.0 µg/L (BLM-55) to 2500 µg/L (GBR-48). Nitrate plus nitrite was detected in water samples from all wells except BLM-57, 62, 76, and 77, the concentrations of nitrate plus nitrite ranged from 0.93 mg/L (BLM-21) to 11.0 mg/L (BLM-48). Use of discretion while reviewing nitrate plus nitrite data results. Some results had elevated reporting limits, due to high analyte levels.

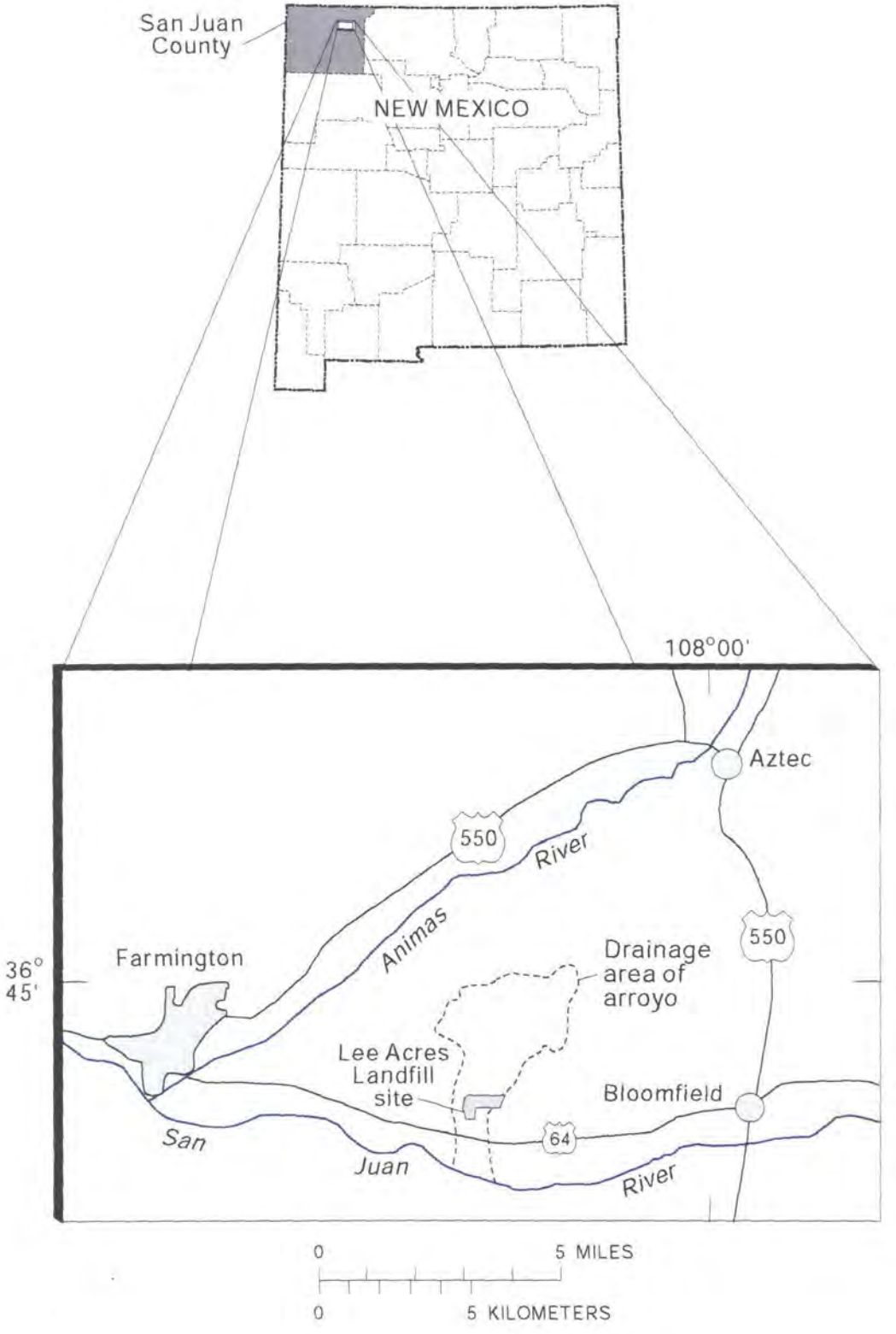

Figure 1. Location of the Lee Acres Landfill site, northwestern New Mexico.

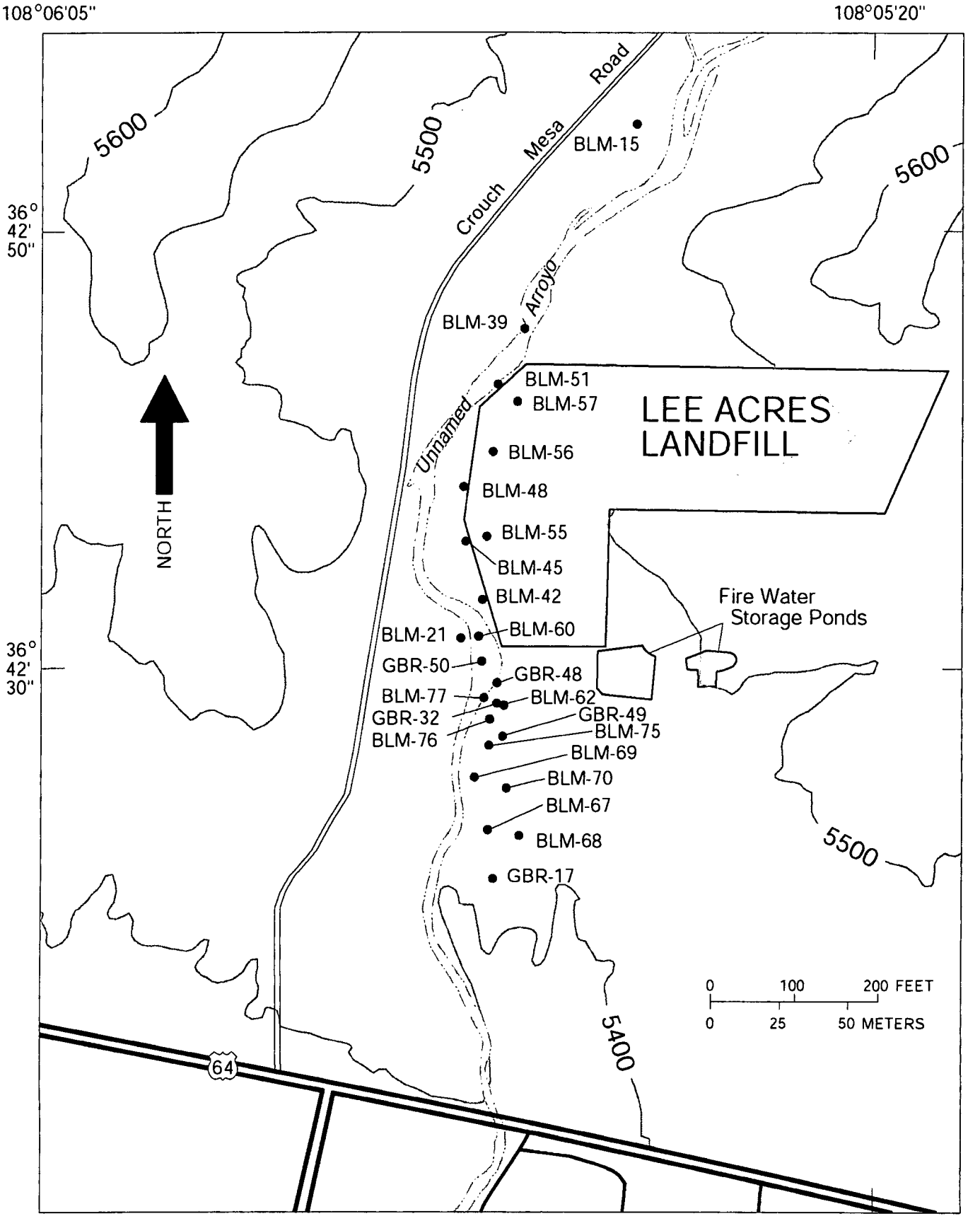

Figure 2. Location of wells sampled by the U.S. Geological Survey at and around the Lee Acres Landfill site.

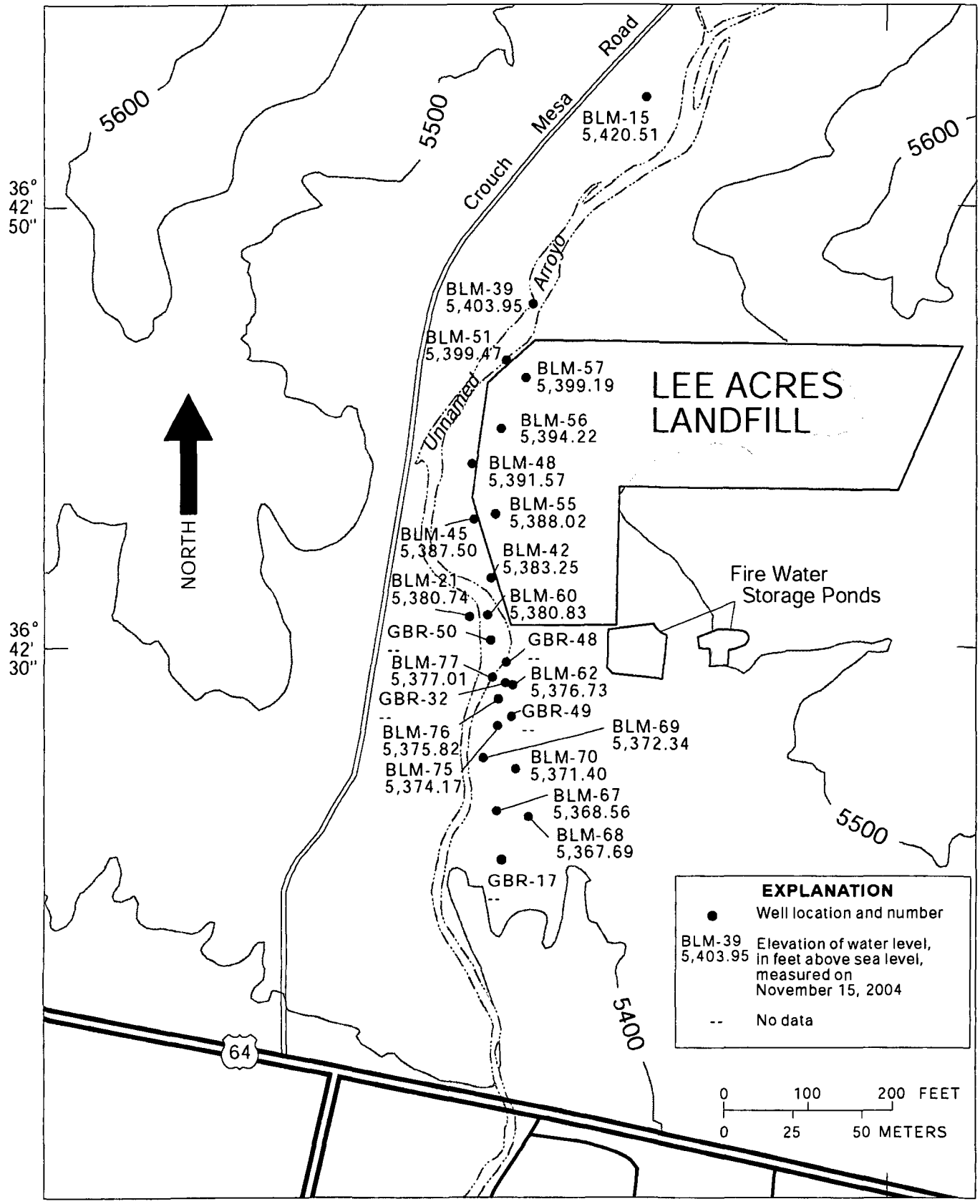

Figure 3. Altitude of water levels measured on November 15, 2004 at and around the Lee Acres Landfill site.

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-15	09/21/1993	41.25	5,420.42
2 inches	05/22/1994	40.92	5,420.75
62.88 feet	09/18/1994	41.29	5,420.38
	05/22/1995	41.34	5,420.33
	09/11/1995	41.46	5,420.21
	05/28/1996	41.69	5,419.98
	09/03/1996	41.87	5,419.80
	03/11/1997	41.97	5,419.70
	05/20/1997	42.03	5,419.64
	09/08/1997	40.94	5,420.73
	05/19/1998	40.46	5,421.21
	08/31/1998	40.81	5,420.86
	06/07/1999	39.65	5,422.02
	11/17/1999	39.40	5,422.27
	05/31/2000	39.72	5,421.95
	11/14/2000	40.25	5,421.42
	05/21/2001	40.24	5,421.43
	11/06/2001	40.65	5,421.02
	05/14/2002	40.79	5,420.88
	11/19/2002	40.85	5,420.82
	02/19/2003	40.62	5,421.05
	05/13/2003	40.58	5,421.09
	11/17/2003	41.02	5,420.65
	05/03/2004	40.91	5,420.76
	11/15/2004	41.16	5,420.51

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-21	09/26/1993	36.60	5,382.25
2 inches	05/22/1994	Not sampled	--
45.45 feet	09/18/1994	36.91	5,381.94
	05/22/1995	Not sampled	--
	09/11/1995	Not sampled	--
	05/28/1996	37.40	5,381.45
	09/03/1996	37.68	5,381.17
	05/20/1997	37.98	5,380.87
	09/08/1997	37.23	5,381.62
	05/19/1998	36.93	5,381.92
	08/31/1998	37.36	5,381.49
	06/07/1999	36.27	5,382.58
	11/17/1999	36.05	5,382.80
	05/31/2000	36.09	5,382.76
	11/14/2000	36.58	5,382.27
	05/21/2001	36.58	5,382.27
	11/06/2001	37.08	5,381.77
	05/14/2002	37.22	5,381.63
	11/19/2002	37.49	5,381.36
	05/13/2003	37.42	5,381.43
	11/18/2003	37.85	5,381.00
	05/03/2004	37.81	5,381.04
	11/15/2004	38.11	5,380.74

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-39	09/21/1993	40.05*	5,404.19
2 inches	05/22/1994	39.78*	5,404.46
51.58 feet	09/18/1994	40.10*	5,404.14
	05/22/1995	40.12*	5,404.12
	09/11/1995	40.22*	5,404.02
	05/28/1996	39.86*	5,404.38
	09/03/1996	40.00*	5,404.24
	03/11/1997	40.12*	5,404.12
	05/20/1997	40.17*	5,404.07
	09/08/1997	39.95*	5,404.29
	05/19/1998	39.47*	5,404.77
	08/31/1998	39.76*	5,404.48
	06/07/1999	38.20*	5,406.04
	11/17/1999	37.97*	5,406.26
	04/10/2000	37.98*	5,406.25
	05/30/2000	39.66*	5,404.58
	08/15/2000	39.53*	5,404.71
	11/14/2000	39.07*	5,405.17
	03/06/2001	39.03*	5,405.21
	05/21/2001	39.16*	5,405.08
	08/15/2001	39.40*	5,404.84
	11/06/2001	39.58*	5,404.66
	02/14/2002	39.65*	5,404.59
	05/14/2002	39.73*	5,404.51
	08/08/2002	39.95*	5,404.29
	11/19/2002	39.88*	5,404.36
	02/19/2003	39.75*	5,404.49
	05/13/2003	39.72*	5,404.46
	08/28/2003	40.02*	5,404.16
	11/17/2003	40.05*	5,404.13
	05/03/2004	40.00*	5,404.18
	11/15/2004	40.23*	5,403.95

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-42	09/22/1993	38.45	5,384.28
2 inches	05/22/1994	38.31	5,384.42
49.83 feet	09/18/1994	38.66	5,384.07
	05/22/1995	Not sampled	--
	09/11/1995	Not sampled	--
	05/28/1996	39.06	5,383.67
	09/03/1996	39.27	5,383.46
	05/20/1997	39.43	5,383.30
	09/08/1997	38.83	5,383.90
	05/19/1998	38.42	5,384.31
	08/31/1998	38.82	5,383.91
	06/07/1999	37.77	5,384.96
	11/17/1999	37.61	5,385.12
	05/30/2000	37.61	5,385.12
	11/14/2000	38.13	5,384.60
	05/21/2001	38.10	5,384.63
	11/06/2001	38.61	5,384.12
	05/14/2002	38.74	5,383.99
	11/19/2002	39.02	5,383.71
	05/13/2003	38.91	5,383.82
	11/18/2003	39.28	5,383.45
	05/03/2004	39.21	5,383.52
	11/15/2004	39.48	5,383.25

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-45	09/22/1993	36.70	5,388.02
2 inches	05/22/1994	Not sampled	--
45.08 feet	09/18/1994	36.85	5,387.87
	05/22/1995	36.90	5,387.82
	09/11/1995	36.93	5,387.79
	05/28/1996	37.00	5,387.72
	09/03/1996	37.18	5,387.54
	05/20/1997	37.30	5,387.42
	09/08/1997	36.83	5,387.89
	05/19/1998	36.28	5,388.44
	08/31/1998	36.67	5,388.05
	06/07/1999	35.69	5,389.03
	11/17/1999	35.55	5,389.17
	05/30/2000	35.59	5,389.13
	11/14/2000	36.05	5,388.67
	05/21/2001	36.19	5,388.53
	11/06/2001	36.49	5,388.23
	05/14/2002	36.60	5,388.12
	11/19/2002	36.95	5,387.77
	05/13/2003	36.68	5,388.04
	11/17/2003	37.04	5,387.68
	05/03/2004	36.95	5,387.77
	11/15/2004	37.22	5,387.50

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-48	09/22/1993	Not Sampled	--
2 inches	05/22/1994	41.20	5,392.26
47.92 feet	09/18/1994	41.47	5,391.99
	05/22/1995	Not sampled	--
	09/11/1995	Not sampled	--
	05/28/1996	41.77	5,391.69
	09/03/1996	41.91	5,391.55
	05/20/1997	42.07	5,391.39
	09/08/1997	41.36	5,392.10
	05/19/1998	41.00	5,392.46
	08/31/1998	41.32	5,392.14
	06/07/1999	40.38	5,393.08
	11/17/1999	40.21	5,393.25
	05/30/2000	40.26	5,393.20
	11/14/2000	40.73	5,392.73
	05/21/2001	40.74	5,392.72
	11/06/2001	41.18	5,392.28
	05/14/2002	41.30	5,392.16
	11/19/2002	41.48	5,391.98
	05/13/2003	41.37	5,392.09
	11/17/2003	41.71	5,391.75
	05/03/2004	41.63	5,391.83
	11/15/2004	41.89	5,391.57

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-51	09/21/1993	Not Sampled	--
2 inches	05/22/1994	45.25*	--
63.16 feet	09/18/1994	45.53*	--
	05/22/1995	Not sampled	--
	09/11/1995	Not sampled	--
	05/28/1996	45.77*	--
	09/03/1996	45.89*	--
	05/20/1997	46.05*	--
	09/08/1997	45.31*	--
	05/19/1998	44.95*	--
	08/31/1998	45.22*	--
	06/07/1999	44.32*	5,401.04
	11/17/1999	44.14*	5,401.22
	05/30/2000	44.25*	5,401.13
	11/14/2000	44.66*	5,400.70
	05/21/2001	44.73*	5,400.63
	11/06/2001	45.13*	5,400.23
	05/14/2002	45.25*	5,400.11
	11/19/2002	45.39*	5,399.97
	05/13/2003	45.26*	5,399.96
	11/17/2003	45.60*	5,399.62
	05/03/2004	45.51*	5,399.71
	11/15/2004	45.75*	5,399.47

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-55	09/22/1993	42.80	5,388.53
2 inches	05/22/1994	42.67	5,388.66
44.73 feet	09/18/1994	42.92	5,388.41
	05/22/1995	42.95	5,388.38
	09/11/1995	53.05	5,378.28
	05/28/1996	43.17	5,388.16
	09/03/1996	43.30	5,388.03
	03/12/1997	43.38	5,387.95
	05/20/1997	43.41	5,387.92
	09/08/1997	42.83	5,388.50
	05/19/1998	42.52	5,388.81
	08/31/1998	42.84	5,388.49
	06/07/1999	41.98	5,389.35
	11/17/1999	41.86	5,389.47
	05/30/2000	41.90	5,389.43
	11/14/2000	42.35	5,388.98
	05/21/2001	42.23	5,389.10
	11/06/2001	42.29	5,389.04
	05/14/2002	42.82	5,388.51
	11/19/2002	42.98	5,388.35
	05/13/2003	42.87	5,388.46
	11/19/2003	43.19	5,388.14
	05/03/2004	43.11	5,388.22
	11/15/2004	43.31	5,388.02

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-56	09/22/1993	42.70	5,394.90
2 inches	05/22/1994	42.36	5,395.24
49.83 feet	09/18/1994	42.62	5,394.98
	05/22/1995	42.78	5,394.82
	09/11/1995	42.74	5,394.86
	05/28/1996	42.90	5,394.70
	09/03/1996	43.02	5,394.58
	03/12/1997	43.16	5,394.44
	05/20/1997	43.19	5,394.41
	09/08/1997	42.50	5,395.10
	05/19/1998	42.14	5,395.46
	08/31/1998	42.42	5,395.18
	06/07/1999	41.52	5,396.08
	11/17/1999	41.35	5,396.25
	04/10/2000	41.35	5,396.25
	05/30/2000	41.41	5,396.19
	08/15/2000	41.71	5,395.89
	11/14/2000	41.89	5,395.71
	03/06/2001	41.76	5,395.84
	05/21/2001	41.90	5,395.70
	08/15/2001	42.11	5,395.49
	11/08/2001	42.31	5,395.29
	02/14/2002	42.37	5,395.23
	05/14/2002	42.43	5,395.17
	08/08/2002	42.65	5,394.95
	11/19/2002	42.61	5,394.99
	02/19/2003	42.51	5,395.09
	05/13/2003	42.49	5,395.11
	08/28/2003	42.75	5,394.85
	11/19/2003	42.82	5,394.78
	05/03/2004	42.75	5,394.85
	11/15/2004	42.98	5,394.22

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-57	09/23/1993	46.76	5,399.48
2 inches	05/22/1994	46.55	5,399.69
51.57 feet	09/18/1994	46.82	5,399.42
	05/22/1995	46.87	5,399.37
	09/11/1995	46.94	5,399.30
	05/28/1996	47.09	5,399.15
	09/03/1996	47.20	5,399.04
	03/12/1997	47.33	5,398.91
	05/20/1997	47.33	5,398.91
	09/08/1997	46.65	5,399.59
	05/19/1998	46.26	5,399.98
	08/31/1998	46.53	5,399.71
	06/07/1999	45.67	5,400.57
	11/17/1999	45.49	5,400.75
	04/10/2000	45.51	5,400.73
	05/30/2000	45.61	5,400.63
	08/15/2000	45.90	5,400.34
	11/14/2000	46.03	5,400.21
	03/06/2001	45.95	5,400.29
	05/21/2001	46.08	5,400.16
	08/15/2001	46.27	5,399.97
	11/08/2001	46.46	5,399.78
	02/14/2002	46.52	5,399.72
	05/14/2002	46.58	5,399.66
	08/08/2002	46.76	5,399.48
	11/19/2002	46.70	5,399.54
	02/19/2002	46.61	5,399.63
	05/13/2003	46.58	5,399.66
	08/28/2003	46.84	5,399.40
	11/19/2003	46.90	5,399.34
	05/03/2004	46.81	5,399.43
	11/15/2004	47.05	5,399.19

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-60	09/22/1993	37.90	5,382.24
2 inches	05/22/1994	37.72	5,382.42
42.76 feet	09/18/1994	38.23	5,381.91
	05/22/1995	38.29	5,381.85
	09/11/1995	38.46	5,381.68
	05/28/1996	38.62	5,381.52
	09/03/1996	38.88	5,381.26
	05/20/1997	39.16	5,380.98
	09/08/1997	38.46	5,381.68
	05/19/1998	38.12	5,382.02
	08/31/1998	38.54	5,381.60
	06/07/1999	37.45	5,382.69
	11/17/1999	37.25	5,382.89
	05/30/2000	37.26	5,382.88
	11/14/2000	37.78	5,382.36
	05/21/2001	37.75	5,382.39
	11/06/2001	38.27	5,381.87
	05/14/2002	38.41	5,381.73
	11/19/2002	38.71	5,381.40
	05/13/2003	38.63	5,381.48
	11/18/2003	39.04	5,381.07
	05/03/2004	38.97	5,381.14
	11/15/2004	39.28	5,380.83

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-62	09/25/1993	34.10	5,378.57
2 inches	05/22/1994	Not sampled	--
36.47 feet	09/18/1994	34.57	5,378.10
	05/22/1995	Not sampled	--
	09/11/1995	34.92	5,377.75
	05/28/1996	35.09	5,377.58
	09/03/1996	35.43	5,377.24
	05/20/1997	35.75	5,376.92
	09/08/1997	35.10	5,377.57
	05/19/1998	34.90	5,377.77
	08/31/1998	35.35	5,377.32
	06/07/1999	34.45	5,378.22
	11/17/1999	34.25	5,378.42
	05/30/2000	34.18	5,378.49
	11/14/2000	34.66	5,378.01
	05/21/2001	34.66	5,378.01
	11/07/2001	35.10	5,377.57
	05/14/2002	35.22	5,377.45
	11/19/2002	35.48	5,377.19
	05/13/2003	35.38	5,377.29
	11/19/2003	35.83	5,376.84
	05/03/2004	35.72	5,376.93
	11/15/2004	35.92	5,376.73

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-67	09/23/1993	35.53	5,370.88
2 inches	05/22/1994	35.05	5,371.36
45.01 feet	09/18/1994	35.90	5,370.51
	05/22/1995	36.13	5,370.28
	09/11/1995	36.06	5,370.35
	05/28/1996	35.96	5,370.45
	09/03/1996	36.72	5,369.69
	05/20/1997	37.17	5,369.24
	09/08/1997	36.48	5,369.93
	05/19/1998	36.51	5,369.90
	08/31/1998	37.02	5,369.39
	06/07/1999	36.26	5,370.15
	11/17/1999	36.10	5,370.31
	05/30/2000	36.18	5,370.23
	11/14/2000	36.77	5,369.64
	05/21/2001	36.81	5,369.60
	11/07/2001	37.02	5,369.39
	05/14/2002	37.11	5,369.30
	11/19/2002	37.49	5,368.92
	05/13/2003	37.24	5,369.17
	11/19/2003	37.59	5,368.82
	05/03/2004	37.58	5,368.83
	11/15/2004	37.85	5,368.56

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-68	09/23/1993	38.29	5,370.35
2 inches	05/22/1994	37.71	5,370.93
40.91 feet	09/18/1994	Not sampled	--
	05/22/1995	38.90	5,369.74
	09/11/1995	39.07	5,369.57
	05/28/1996	38.93	5,369.71
	09/03/1996	39.78	5,368.86
	05/20/1997	40.19	5,368.45
	09/08/1997	39.52	5,369.12
	05/19/1998	39.61	5,369.03
	08/31/1998	40.11	5,368.53
	06/07/1999	39.40	5,369.24
	11/17/1999	39.27	5,369.37
	05/30/2000	39.32	5,369.32
	11/14/2000	39.70	5,368.94
	05/21/2001	39.72	5,368.92
	11/07/2001	40.13	5,368.51
	05/14/2002	40.23	5,368.41
	11/19/2002	40.38	5,368.26
	05/13/2003	40.32	5,368.32
	11/19/2003	40.70	5,367.94
	05/03/2004	40.69	5,367.95
	11/15/2004	40.95	5,367.69

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-69	09/23/1993	36.00	5,374.52
2 inches	05/22/1994	35.64	5,374.88
41.22 feet	09/18/1994	36.46	5,374.06
	05/22/1995	Not sampled	--
	09/11/1995	36.69	5,373.83
	05/28/1996	36.74	5,373.78
	09/03/1996	37.23	5,373.29
	05/20/1997	37.66	5,372.86
	09/08/1997	36.92	5,373.60
	05/19/1998	36.87	5,373.65
	08/31/1998	37.36	5,373.16
	06/07/1999	36.42	5,374.10
	11/17/1999	36.25	5,374.27
	05/30/2000	36.34	5,374.18
	11/14/2000	36.75	5,373.77
	05/21/2001	36.83	5,373.69
	11/07/2001	37.26	5,373.26
	05/14/2002	37.37	5,373.15
	11/19/2002	37.60	5,372.92
	05/13/2003	37.50	5,373.02
	11/18/2003	37.90	5,372.62
	05/03/2004	37.90	5,372.62
	11/15/2004	38.18	5,372.34

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-70	09/23/1993	37.80	5,373.60
2 inches	05/22/1994	37.43	5,373.97
40.30 feet	09/18/1994	38.32	5,373.08
	05/22/1995	38.38	5,373.02
	09/11/1995	38.50	5,372.90
	05/28/1996	38.55	5,372.85
	09/03/1996	39.11	5,372.29
	05/20/1997	39.60	5,371.80
	09/08/1997	38.83	5,372.57
	05/19/1998	38.80	5,372.60
	08/31/1998	39.31	5,372.09
	06/07/1999	38.43	5,372.97
	11/17/1999	38.25	5,373.15
	05/30/2000	38.33	5,373.07
	11/14/2000	38.74	5,372.66
	05/21/2001	38.75	5,372.65
	11/07/2001	39.22	5,372.18
	05/14/2002	39.33	5,372.07
	11/19/2002	39.52	5,371.98
	05/13/2003	39.48	5,372.02
	11/18/2003	39.87	5,371.63
	05/03/2004	39.86	5,371.64
	11/15/2004	40.10	5,371.40

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-75	09/23/1993	34.74	5,375.76
5 inches	05/22/1994	33.97	5,376.53
41.60 feet	09/18/1994	34.66	5,375.84
	05/22/1995	35.37	5,375.13
	09/11/1995	34.95	5,375.55
	05/28/1996	35.04	5,375.46
	09/03/1996	35.43	5,375.07
	05/20/1997	35.85	5,374.65
	09/08/1997	35.11	5,375.39
	05/19/1998	35.00	5,375.50
	08/31/1998	35.49	5,375.01
	06/07/1999	34.54	5,375.96
	11/17/1999	34.32	5,376.18
	05/30/2000	34.42	5,376.08
	11/14/2000	34.91	5,375.59
	05/21/2001	35.42	5,375.08
	11/07/2001	35.34	5,375.16
	05/14/2002	35.45	5,375.05
	11/19/2002	36.20	5,374.30
	05/13/2003	35.60	5,374.90
	11/19/2003	35.99	5,374.51
	05/03/2004	35.99	5,374.51
	11/15/2004	36.33	5,374.17

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-76	09/23/1993	36.89*	--
5 inches	05/22/1994	36.73*	--
41.93 feet	09/18/1994	37.33*	--
	05/22/1995	37.46*	--
	09/11/1995	37.32*	--
	05/28/1996	37.43*	--
	09/03/1996	37.76*	--
	05/20/1997	38.15*	--
	09/08/1997	37.41*	--
	05/19/1998	37.27*	--
	08/31/1998	37.72*	--
	06/07/1999	36.76	5,377.57
	11/17/1999	36.54	5,377.79
	05/30/2000	36.61	5,377.72
	11/14/2000	37.39	5,376.94
	05/21/2001	37.08	5,377.25
	11/07/2001	Not Sampled	--
	05/14/2002	37.67	5,376.66
	11/19/2002	38.20	5,376.13
	05/13/2003	37.82	5,376.51
	11/18/2003	38.23	5,376.10
	05/03/2004	38.22	5,376.11
	11/15/2004	38.51	5,375.82

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
BLM-77	09/23/1993	35.50	5,378.83
5 inches	05/22/1994	Not sampled	--
38.43 feet	09/18/1994	35.86	5,378.47
	05/22/1995	36.05	5,378.28
	09/11/1995	36.20	5,378.13
	05/28/1996	36.32	5,378.01
	09/03/1996	36.63	5,377.70
	05/20/1997	37.05	5,377.28
	09/08/1997	36.24	5,378.09
	05/19/1998	36.08	5,378.25
	08/31/1998	36.52	5,377.81
	06/07/1999	35.53	5,378.80
	11/17/1999	35.31	5,379.02
	05/30/2000	35.38	5,378.95
	11/14/2000	35.85	5,378.48
	05/21/2001	35.85	5,378.48
	11/07/2001	36.31	5,378.02
	05/14/2002	36.43	5,377.90
	11/19/2002	36.65	5,377.68
	05/13/2003	36.59	5,377.74
	11/18/2003	37.03	5,377.30
	05/03/2004	36.98	5,377.35
	11/15/2004	37.32	5,377.01

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
GBR-17	09/24/1993	35.40	--
2 inches	05/24/1994	34.92	--
52.25 feet	09/21/1994	36.15	--
	05/22/1995	35.99	--
	09/11/1995	36.16	--
	05/31/1996	Not Sampled	--
	09/05/1996	36.95	--
	05/21/1997	Not Sampled	--
	09/08/1997	36.75	--
	05/19/1998	36.96	--
	08/31/1998	37.50	--
	06/07/1999	36.81	--
	11/17/1999	36.72	--
	05/30/2000	Not Sampled	--
	11/14/2000	Not Sampled	--
	05/22/2001	37.39	--
	11/07/2001	37.84	--
	05/14/2002	38.00	--
	11/19/2002	38.10	--
	05/14/2003	38.12	--
	11/19/2003	Not Sampled	--
	05/05/2004	38.54	--
	11/15/2004	38.92	--

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
GBR-32	09/23/1993	38.60	--
2 inches	05/24/1994	38.47	--
47.66 feet	09/21/1994	39.01	--
	05/22/1995	39.17	--
	09/11/1995	39.31	--
	05/28/1996	39.46	--
	09/04/1996	39.78	--
	05/21/1997	Not Sampled	--
	09/08/1997	39.40	--
	05/19/1998	39.24	--
	08/31/1998	39.67	--
	06/07/1999	38.70	--
	11/17/1999	38.49	--
	05/30/2000	Not Sampled	--
	11/14/2000	Not Sampled	--
	05/22/2001	39.00	--
	11/07/2001	39.48	--
	05/14/2002	Not Sampled	--
	11/21/2002	39.84	--
	05/14/2003	39.75	--
	11/19/2003	Not Sampled	--
	05/05/2004	40.18	--
	11/15/2004	40.52	--

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
GBR-48	09/24/1993	40.30*	--
2 inches	05/24/1994	40.22*	--
43.40* feet	09/21/1994	40.69*	--
	05/22/1995	40.87*	--
	09/11/1995	41.04*	--
	05/28/1996	41.21*	--
	09/05/1996	41.51*	--
	05/22/1997	Not Sampled	--
	09/08/1997	41.07*	--
	05/19/1998	38.50*	--
	08/31/1998	41.31*	--
	06/07/1999	40.23*	--
	11/17/1999	40.04*	--
	05/30/2000	Not Sampled	--
	11/14/2000	Not Sampled	--
	05/22/2001	40.54*	--
	11/07/2001	41.09*	--
	05/14/2002	Not Sampled	--
	11/19/2002	41.48*	--
	05/14/2003	41.40	--
	11/19/2003	Not Sampled	--
	05/05/2004	41.79	--
	11/15/2004	42.10	--

Table 1.--Records of water-level measurements for 24 wells (BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 68, 69, 70, 75, 76, 77, and GBR-17, 32, 48, 49, and 50) at and around Lee Acres Landfill site, near Farmington, New Mexico

[TOC, top of casing; BLM, U.S. Bureau of Land Management; --, no data; *, measured below protective cover; GBR, Giant-Bloomfield Refinery]

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
GBR-49	09/23/1993	36.32	--
2 inches	05/24/1994	36.14	--
40.14 feet	09/21/1994	36.75	--
	05/22/1995	36.88	--
	09/11/1995	37.03	--
	05/28/1996	37.13	--
	09/04/1996	37.50	--
	05/21/1997	Not Sampled	--
	09/08/1997	37.19	--
	05/19/1998	37.08	--
	08/31/1998	37.52	--
	06/07/1999	36.59	--
	11/17/1999	36.39	--
	05/30/2000	Not Sampled	--
	11/14/2000	Not Sampled	--
	05/22/2001	36.88	--
	11/07/2001	37.37	--
	05/14/2002	Not Sampled	--
	11/19/2002	37.38	--
	05/14/2003	37.61	--
	11/19/2003	Not Sampled	--
	05/05/2004	38.00	--
	11/15/2004	38.31	--

Well number, diameter, and depth below TOC	Date	Water level (feet below TOC)	Altitude of water level (feet above sea level)
GBR-50	09/26/1993	36.10	--
2 inches	05/22/1994	Not sampled	--
43.85 feet	09/21/1994	36.45	--
	05/22/1995	36.59	--
	09/11/1995	36.79	--
	05/28/1996	36.93	--
	09/04/1996	37.19	--
	05/21/1997	Not Sampled	--
	09/08/1997	36.78	--
	05/19/1998	36.52	--
	08/31/1998	36.96	--
	06/07/1999	35.91	--
	11/17/1999	35.75	--
	05/30/2000	Not Sampled	--
	11/14/2000	Not Sampled	--
	05/22/2001	36.20	--
	11/07/2001	36.70	--
	05/14/2002	Not Sampled	--
	11/19/2002	37.10	--
	05/14/2003	37.02	--
	11/19/2003	Not Sampled	--
	05/05/2004	37.40	--
	11/15/2004	37.73	--

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-15 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Toluene µg/L	09/21/1993	0.84 J	1.0
Antimony mg/L		0.006	0.01
Barium mg/L		0.011	0.002
Calcium mg/L		362	0.5
Chloride mg/L		43.7	0.02
Chromium mg/L		0.012	0.002
Fluoride mg/L		2.0	0.002
Iron mg/L		0.026	0.004
Magnesium mg/L		29.8	0.01
Molybdenum mg/L		0.0028	0.02
Nitrate as N mg/L		3.3	0.25
Nitrate plus Nitrite mg/L		3.3	0.5
Selenium mg/L		0.0092	0.002
Sodium mg/L		286	5.0
Sulfate mg/L		1380	0.002
TDS mg/L		2230	0.02
Zinc mg/L		0.14	--
Hexane µg/L	05/24/1994	0.84 J	1.0
Antimony mg/L		0.0049	0.001
Calcium mg/L		356	0.2
Chloride mg/L		43.1	0.5
Chromium mg/L		0.021	0.01
Fluoride mg/L		2.6	2.5
Magnesium mg/L		27.8	0.2
Molybdenum mg/L		0.0021	0.001
Nickel mg/L		0.062	0.01
Nitrate as N mg/L		3.1	0.5
Nitrate plus Nitrite mg/L		3.0	0.25
Selenium mg/L		0.011	0.001
Sodium mg/L		281	5.0
Sulfate mg/L		1350	5.0
TDS mg/L		2270	10.0
Antimony mg/L	09/12/1994	0.006	0.002
Calcium mg/L		312	5.0
Chloride mg/L		63.6	0.5

Analyte and unit	Date sampled	Result	RL
Chromium mg/L	09/12/1994	0.026	0.02
Fluoride mg/L	-continued	2.4	0.1
Magnesium mg/L		33.8	5.0
Molybdenum mg/L		0.0024	0.002
Nickel mg/L		0.022	0.02
Nitrate as N mg/L		4.6	0.1
Nitrate plus Nitrite mg/L		4.7	0.25
Selenium mg/L		0.0092	0.002
Sodium mg/L		219	5.0
Sulfate mg/L		1180	5.0
TDS mg/L		1920	20.0
2-Butanone (MEK) µg/L	05/23/1995	9.6 J	10.0
Methylene chloride µg/L		1.0	1.0
Toluene µg/L		0.84 J	1.0
Antimony mg/L		0.011	0.002
Cadmium mg/L		0.0017	0.002
Calcium mg/L		338	0.01
Chloride mg/L		43.7	0.5
Chromium mg/L		0.021	0.02
Cobalt mg/L		0.0013	0.001
Magnesium mg/L		28.5	0.2
Manganese mg/L		0.013	0.01
Molybdenum mg/L		0.0026	0.001
Nickel mg/L		0.032	0.001
Nitrate as N mg/L		3.3	0.1
Nitrate plus Nitrite mg/L		3.3	0.25
Selenium mg/L		0.0061	0.001
Sodium mg/L		286	5.0
Sulfate mg/L		1380	5.0
TDS mg/L		2230	20.0
Zinc mg/L		0.065	0.02
Barium mg/L	09/13/1995	0.0077	0.002
Calcium mg/L		353	0.2
Chloride mg/L		47.9	1.0
Chromium mg/L		0.02	0.001

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-15 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Copper mg/L	09/13/1995	0.0051	0.002
Fluoride mg/L	-continued	3.0	1.0
Magnesium mg/L		30.2	0.2
Molybdenum mg/L		0.0032	0.0002
Nickel mg/L		0.024	0.0002
Nitrate as N mg/L		3.6	0.5
Nitrate plus Nitrite mg/L		4.3	0.5
Potassium mg/L		1.4	5.0
Sodium mg/L		299	5.0
Sulfate mg/L		1340	5.0
TDS mg/L		2250	50.0
Methylene chloride µg/L	05/30/1996	0.30 J	1.0
Chloride mg/L		50.5	1.0
Fluoride mg/L		2.8	1.0
Nitrate as N mg/L		4.5	0.5
Nitrate plus Nitrite mg/L		4.2	0.5
Sulfate mg/L		1420	5.0
TDS mg/L		2330	50.0
Chloride mg/L	09/05/1996	52.9	1.0
Nitrate as N mg/L		4.4	0.5
Nitrate plus Nitrite mg/L		4.6	0.5
Sulfate mg/L		1350	5.0
TDS mg/L		2300	50.0
Chloride mg/L	03/12/1997	52.3	1.0
Nitrate as N mg/L		4.4	0.5
Nitrate plus Nitrite mg/L		4.3	0.5
Sulfate mg/L		1400	5.0
TDS mg/L		2340	50.0
Chloride mg/L	05/21/1997	52.2	1.0
Nitrate as N mg/L		4.4	0.5
Nitrate plus Nitrite mg/L		4.7	0.5
Sulfate mg/L		1430	5.0
TDS mg/L		2290	50.0

Analyte and unit	Date sampled	Result	RL
Methylene chloride µg/L	09/10/1997	0.24 J	1.0
Chloride mg/L		49.2	1.0
Nitrate as N mg/L		4.2	0.5
Nitrate plus Nitrite mg/L		0.5	0.5
Sulfate mg/L		1430	5.0
TDS mg/L		2310	50.0
Chloride mg/L	05/19/1998	47.2 G	2.0
Fluoride mg/L		1.0 JG	2.0
Nitrate as N mg/L		5.2	0.5
Nitrate plus Nitrite mg/L		5.1 Q	1.0
Phosphate as P, Ortho mg/L		0.12 J	0.5
Sulfate mg/L		1390 Q	125
TDS mg/L		2320	10.0
Chloroform µg/L	09/01/1998	0.18 J	1.0
1,1-Dichloroethane µg/L		0.13 J	1.0
1,2-Dichloroethene TOTAL µg/L		3.2	1.0
Tetrachloroethene µg/L		2.2	1.0
Trichloroethene µg/L		0.74 J	1.0
Chloride mg/L		116 Q	30.0
Fluoride mg/L		1.1 BJ	2.0
Manganese mg/L		0.38	0.01
Nickel mg/L		0.051	0.04
Nitrate as N mg/L		3.4 J	1.0
Nitrate plus Nitrite mg/L		4.2 Q	0.2
Sulfate mg/L		1580 Q	250
TDS mg/L		2890 Q	10.0
Methylene chloride µg/L	06/08/1999	0.43JB	1.0
Chloride mg/L		49.7 Q	15.0
Fluoride mg/L		1.0	1.0
Nitrate mg/L		4.9	0.50
Nitrate plus Nitrite mg/L		5.4	0.10
Sulfate mg/L		1280 Q	250
TDS mg/L		2180	10.0
Chloride mg/L	11/17/1999	48.4 Q	15.0
Fluoride mg/L		0.59 B	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-15 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	11/17/1999	5.2	0.50
Nitrate plus Nitrite mg/L	-continued	0.011 B	0.10
Sulfate mg/L		1350 Q	250
TDS mg/L		2350	10.0
Calcium µg/L	05/31/2000	385000	200
Potassium µg/L		1870 B	3000
Magnesium µg/L		33600	200
Manganese µg/L		1.5 B	10.0
Sodium µg/L		290000	5000
Nitrate plus Nitrite mg/L		5.4	0.10
Chloride mg/L		47.4 Q	15.0
Sulfate mg/L		1360 Q	250
Fluoride mg/L		0.79 B	1.0
Nitrate mg/L		5.3	0.50
Phosphate as P, Ortho mg/L		1.8 B	2.5
Acetone µg/L	11/15/2000	1.2 J	10.0
Calcium mg/L		380	0.20
Potassium mg/L		1.4 B	3.0
Magnesium mg/L		34.0	0.20
Sodium mg/L		295	5.0
Nitrate plus Nitrite mg/L		6.4	0.10
Chloride mg/L		46.7 Q	15.0
Sulfate mg/L		1270 Q	250
Nitrate mg/L		5.5	0.50
TDS mg/L		2350	10.0
Acetone µg/L	05/22/2001	59	10.0
Bromoform µg/L		0.47 J	1.0
Calcium mg/L		362	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		31.6	0.20
Sodium mg/L		280	5.0
Nitrate plus Nitrite mg/L		5.5	0.10
Chloride mg/L		44.8 Q	15.0
Sulfate mg/L		1310 Q	250
Nitrate mg/L		5.9	0.50

Analyte and unit	Date sampled	Result	RL
Fluoride mg/L	05/22/2001	0.67 B	1.0
TDS mg/L	-continued	2420	10.0
Chloromethane µg/L	11/06/2001	0.57 J	2.0
Calcium mg/L		374	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		33.3	0.20
Sodium mg/L		288	5.0
Nitrate plus Nitrite mg/L		6.5	0.10
Chloride mg/L		46.4 Q	15.0
Sulfate mg/L		1300 Q	250
Nitrate mg/L		6.1	0.50
Fluoride mg/L		0.51 B	1.0
TDS mg/L		2310	10.0
Calcium mg/L	05/15/2002	385	0.20
Potassium mg/L		2.6 B	3.0
Magnesium mg/L		34.9	0.20
Sodium mg/L		294	5.0
Nitrate plus Nitrite mg/L		6.8	0.10
Chloride mg/L		46.3 Q	15.0
Sulfate mg/L		1320 Q	250
Nitrate mg/L		5.7	0.50
Fluoride mg/L		0.71 B	1.0
TDS mg/L		2200	10.0
Chromium µg/L	11/20/2002	5.1 B	10
Calcium mg/L		380	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		270	5.0
Nitrate plus Nitrite mg/L		5.3	0.10
Chloride mg/L		50.0 Q	15.0
Sulfate mg/L		1400 Q	250
Nitrate mg/L		6.4	0.50
Fluoride mg/L		1.0	1.0
TDS mg/L		2300	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-15 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	05/13/2003	3.5 J	10.0
Methylene chloride µg/L		0.72 J	1.0
Calcium mg/L		360	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		34.0	0.20
Sodium mg/L		290	5.0
Nitrate plus Nitrite mg/L		6.2	0.10
Chloride mg/L		47.0	15.0
Sulfate mg/L		1400 Q	250
Nitrate mg/L		6.3	0.50
TDS mg/L		2300	10.0
Calcium mg/L	11/17/2003	370	0.20
Potassium mg/L		2.4 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		280	5.0
Nitrate plus Nitrite mg/L		5.8	0.10
Chloride mg/L		48.0	15.0
Sulfate mg/L		1400 Q	250
Nitrate mg/L		6.8	0.50
Fluoride mg/L		1.1	1.0
TDS mg/L		1200	10.0
Methylene chloride µg/L	05/04/2004	0.70 J,B	5.0
Chromium µg/L		4.7 B	10.0
Manganese µg/L		1.1 B	10.0
Calcium mg/L		370	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		290	5.0
Nitrate plus Nitrite mg/L		6.3	0.10
Chloride mg/L		45.0	3.0
Sulfate mg/L		1100 Q	250
Nitrate mg/L		6.1	0.50
TDS mg/L		2300	10.0
Acetone µg/L	11/16/2004	3.3 J	10.0
Chromium µg/L		4.7 B	10.0
Manganese µg/L	11/16/2004	7.6 B	10.0
Calcium mg/L	-continued	390	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		280	5.0
Nitrate plus Nitrite mg/L		5.6	0.10
Chloride mg/L		45.0 J	3.0
Sulfate mg/L		1600 Q	250
Nitrate mg/L		6.4	0.50
Fluoride mg/L		0.68 B	1.0
TDS mg/L		2400	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-21 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	06/08/1999	3.5 J	10.0
Chloride mg/L		32.0 G	6.0
Fluoride mg/L		1.3 B,G	2.0
Manganese mg/L		0.59	0.010
Nitrate mg/L		1.8 G	1.0
Nitrate plus Nitrite mg/L		2.5	0.10
Sulfate mg/L		1900 Q	250
TDS mg/L		2950	10.0
Chloride mg/L	11/18/1999	32.8	3.0
Fluoride mg/L		1.1	1.0
Manganese mg/L		0.30	0.015
Nitrate mg/L		1.3	0.50
Nitrate plus Nitrite mg/L		3.7	0.10
Sulfate mg/L		1690 Q	250
TDS mg/L		2790	10.0
Manganese µg/L	05/31/2000	157	10.0
Calcium mg/L		422	0.20
Potassium mg/L		5.3	3.0
Magnesium mg/L		32.8	0.20
Sodium mg/L		392	5.0
Nitrate plus Nitrite mg/L		2.6	0.10
Chloride mg/L		40.4	3.0
Fluoride mg/L		0.70 B	1.0
Sulfate mg/L		1750	250
Nitrate mg/L		2.3	0.50
TDS mg/L		2820	10.0
Acetone µg/L	11/15/2000	1.6 J	10.0
Manganese µg/L		196	10.0
Calcium mg/L		387	0.20
Potassium mg/L		4.2	3.0
Magnesium mg/L		30.5	0.20
Sodium mg/L		373	5.0
Nitrate plus Nitrite mg/L		2.3	0.10
Chloride mg/L		34.2 G	15.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	11/15/2000	1730 Q	250
Nitrate mg/L	-continued	1.9	0.50
TDS mg/L		2940	10.0
Acetone µg/L	05/22/2001	7.6 J	1.0
Bromoform µg/L		0.39 J	1.0
Methylene chloride µg/L		1.5	1.0
Manganese µg/L		10.0	10.0
Calcium mg/L		335	0.20
Potassium mg/L		2.2 J	3.0
Magnesium mg/L		25.6	0.20
Sodium mg/L		301	5.0
Nitrate plus Nitrite mg/L		4.4	0.10
Chloride mg/L		48.1	15.0
Sulfate mg/L		1220 Q	250
Fluoride mg/L		0.52 B	1.0
Nitrate mg/L		4.1	0.50
TDS mg/L		2260	10.0
Manganese µg/L	11/06/2001	225	10.0
Calcium mg/L		440	0.20
Potassium mg/L		5.2	3.0
Magnesium mg/L		33.6	0.20
Sodium mg/L		406	5.0
Nitrate plus Nitrite mg/L		2.5	15.0
Chloride mg/L		38.9	3.0
Sulfate mg/L		1760 Q	250
Fluoride mg/L		0.54 B	1.0
Nitrate mg/L		2.2	0.50
TDS mg/L		2940	10.0
Manganese µg/L	05/15/2002	320	10.0
Nickel µg/L		6.7 B	40.0
Calcium mg/L		462	0.20
Potassium mg/L		6.5	3.0
Magnesium mg/L		36.8	0.20
Sodium mg/L		439	5.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-21 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	05/15/2002	2.9	0.10
Chloride mg/L	-continued	36.4	3.0
Sulfate mg/L		1840 Q	250
Fluoride mg/L		0.73 B	1.0
Nitrate mg/L		1.8	0.50
TDS mg/L		3000	10.0
Manganese µg/L	11/19/2002	550	10.0
Calcium mg/L		410 J	0.20
Potassium mg/L		5.7	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		390	5.0
Nitrate plus Nitrite mg/L		0.87	0.10
Chloride mg/L		31.0	3.0
Sulfate mg/L		2100 Q	500
Fluoride mg/L		1.2	1.0
Nitrate mg/L		0.80	0.50
TDS mg/L		3200	10.0
Acetone µg/L	05/13/2003	2.9 J	1.0
Methylene chloride µg/L		0.66 J	5.0
Manganese µg/L		210	10.0
Calcium mg/L		420	0.20
Potassium mg/L		5.8	3.0
Magnesium mg/L		35.0	0.20
Sodium mg/L		420	5.0
Nitrate plus Nitrite mg/L		2.8	0.10
Chloride mg/L		40.0	15.0
Sulfate mg/L		1900 Q	250
Nitrate mg/L		2.5	0.50
TDS mg/L		2900	10.0
Methylene chloride µg/L	11/18/2003	0.58 J,B	5.0
Manganese µg/L		47.0	10.0
Calcium mg/L		340	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		290	5.0
Nitrate plus Nitrite mg/L		5.4	0.10

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	11/18/2003	47.0 Q	3.0
Sulfate mg/L	-continued	1500 Q	500
Fluoride mg/L		0.93 B	1.0
Nitrate mg/L		6.0	0.50
TDS mg/L		2300	10.0
Acetone µg/L	05/04/2004	3.9 J	1.0
Methylene chloride µg/L		0.53 J,B	5.0
Chromium µg/L		2.8 B	10.0
Manganese µg/L		220	10.0
Calcium mg/L		460	0.20
Potassium mg/L		7.0	3.0
Magnesium mg/L		36.0	0.20
Sodium mg/L		450	5.0
Nitrate plus Nitrite mg/L		5.1	0.10
Chloride mg/L		34.0	15.0
Sulfate mg/L		1900 Q	250
Nitrate mg/L		1.4	0.50
TDS mg/L		3200	10.0
Manganese µg/L	11/17/2004	360	10.0
Nickel µg/L		3.3 B	40.0
Calcium mg/L		520	0.20
Potassium mg/L		7.4	3.0
Magnesium mg/L		39.0	0.20
Sodium mg/L		490	5.0
Nitrate plus Nitrite mg/L		0.93	0.10
Chloride mg/L		35.0	15.0
Sulfate mg/L		2100 Q	250
Fluoride mg/L		0.62 B	1.0
Nitrate mg/L		0.65	0.50
TDS mg/L		3400	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-39 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Toluene µg/L	09/21/1993	0.38 J	1.0
Antimony mg/L		0.0061	0.001
Barium mg/L		0.017	0.01
Calcium mg/L		311	0.01
Fluoride mg/L		3.2	0.5
Magnesium mg/L		24.8	0.2
Manganese mg/L		0.63	0.01
Molybdenum mg/L		0.0028	0.001
Nitrate as N mg/L		2.5	0.5
Nitrate plus Nitrite mg/L		3.0	0.1
Sodium mg/L		297	5.0
Sulfate mg/L		1,600	5.0
TDS mg/L		2,610	10.0
Carbon disulfide µg/L	05/25/1994	0.77 J	1.0
Antimony mg/L		0.0038	0.001
Barium mg/L		0.018	0.01
Calcium mg/L		446	0.2
Chloride mg/L		33.1	0.5
Chromium mg/L		0.011	0.01
Copper mg/L		0.012	0.01
Iron mg/L		2.2	0.1
Magnesium mg/L		30.9	0.2
Manganese mg/L		1.7	0.01
Molybdenum mg/L		0.0018	0.001
Nickel mg/L		0.093	0.01
Nitrate as N mg/L		1.5	0.5
Nitrate plus Nitrite mg/L		1.2	0.05
Selenium mg/L		0.0049	0.001
Sodium mg/L		435	5.0
Sulfate mg/L		1,960	5.0
TDS mg/L		3,090	10.0
Methylene chloride µg/L	09/21/1994	0.3 J	1.0
Toluene µg/L		0.2 J	1.0
Antimony mg/L		0.0067	0.002
Calcium mg/L		347	0.01
Chloride mg/L	-continued	48.0	0.5
Chromium mg/L		0.018	0.01
Cobalt mg/L		0.0017	0.001
Iron mg/L		0.3	0.1
Magnesium mg/L		26.6	0.2
Manganese mg/L		0.37	0.01
Molybdenum mg/L		0.0026	0.001
Nickel mg/L		0.03	0.001
Nitrate as N mg/L		3.0	0.5
Nitrate plus Nitrite mg/L		2.9	0.1
Selenium mg/L		0.0062	0.001
Sodium mg/L		315	5.0
TDS mg/L		2,320	10.0
Zinc mg/L		0.05	0.02
Barium mg/L	09/14/1995	0.011	0.002
Calcium mg/L		421	0.2
Chloride mg/L		40.2	1.0
Chromium mg/L		0.0092	0.001
Cobalt mg/L		0.0027	0.0005
Copper mg/L		0.0059	0.002
Fluoride mg/L		3.6	1.0
Iron mg/L		1.1	0.1
Magnesium mg/L		31.7	0.2
Manganese mg/L		1.0	0.01
Molybdenum mg/L		0.0016	0.0002
Nickel mg/L		0.025	0.0002
Nitrate as N mg/L		2.2	0.5
Nitrate plus Nitrite mg/L		1.4	0.5
Potassium mg/L		4.2	5.0
Sodium mg/L		427	5.0
Sulfate mg/L		1,720	5.0
TDS mg/L		2,540	50.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-39 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Methylene chloride µg/L	05/30/1996	0.23 J	1.0
Chloride mg/L		49.9	1.0
Fluoride mg/L		2.8	1.0
Manganese mg/L		0.2	0.01
Nickel mg/L		0.14	0.04
Nitrate as N mg/L		3.2	0.5
Nitrate plus Nitrite mg/L		2.0	0.5
Sulfate mg/L		1,560	5.0
TDS mg/L		2,520	50.0
Carbon disulfide µg/L	09/05/1996	0.2 J	1.0
Chloride mg/L		34.8	1.0
Manganese mg/L		1.1	0.01
Nitrate as N mg/L		1.6	0.5
Nitrate plus Nitrite mg/L		2.0	0.5
Sulfate mg/L		1,940	5.0
TDS mg/L		3,150	50.0
Chloride mg/L	03/12/1997	52.9	1.0
Manganese mg/L		0.98	0.01
Nitrate as N mg/L		2.9	0.5
Nitrate plus Nitrite mg/L		2.7	0.5
Sulfate mg/L		892	5.0
TDS mg/L		2,770	50.0
Chloride mg/L	05/21/1997	26.9	1.0
Manganese mg/L		1.6	0.01
Nitrate plus Nitrite mg/L		0.09	0.5
Sulfate mg/L		2,200	5.0
TDS mg/L		3,380	50.0
Methylene chloride µg/L	09/10/1997	0.24 J	1.0
Chloride mg/L		37.8	1.0
Manganese mg/L		1.3	0.01
Nitrate as N mg/L		1.9	0.5
Nitrate plus Nitrite mg/L		2.1	0.5
Sulfate mg/L		1,910	5.0

Analyte and unit	Date sampled	Result	RL
Carbon disulfide µg/L	05/19/1998	1.2	0.01
Chloride mg/L		38.5 G	6.0
Fluoride mg/L		1.7 JG	2.0
Manganese mg/L		1.2	0.01
Nitrate as N mg/L		2.7	0.5
Nitrate plus Nitrite mg/L		3.6 Q	0.2
Sulfate mg/L		1,810 Q	125
TDS mg/L		2,820 Q	10.0
Carbon disulfide µg/L	09/01/1998	0.67 J	1.0
Methylene chloride µg/L		0.15 JB	1.0
Chloride mg/L		49.8 Q	15.0
Fluoride mg/L		1.2	1.0
Manganese mg/L		0.39	0.01
Nitrate as N mg/L		4.4	0.5
Nitrate plus Nitrite mg/L		4.9 Q	0.2
Sulfate mg/L		1,420 Q	250
TDS mg/L		2,500	10.0
Methylene chloride µg/L	06/08/1999	0.37 JB	1.0
Manganese mg/L		0.53	0.010
Chloride mg/L		19.0 G	6.0
Fluoride mg/L		0.44 JG	1.0
Nitrate mg/L		1.4 G	1.0
Nitrate plus Nitrite mg/L		3.2	0.10
Sulfate mg/L		1,780 Q	250
TDS mg/L		2,520	10.0
Chloride mg/L	11/17/1999	47.9 Q	15.0
Fluoride mg/L		0.53 B	1.0
Manganese mg/L		0.69	0.015
Nitrate mg/L		4.6	0.50
Nitrate plus Nitrite mg/L		0.012 B	0.10
Sulfate mg/L		1450 Q	250
TDS mg/L		2480	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-39 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Manganese µg/L	04/10/2000	216	10.0
Nitrate-Nitrite µg/L		3.4	0.10
Chloride mg/L		56.1	15.0
Sulfate mg/L		1550 Q	250
Flouride mg/L		2.0	1.0
Nitrate mg/L		5.8	0.50
Calcium µg/L	05/31/2000	449000	200
Potassium µg/L		3770	3000
Magnesium µg/L		34200	200
Manganese µg/L		522	10.0
Sodium µg/L		414000	5000
Nitrate plus Nitrite mg/L		3.0	0.10
Chloride mg/L		42.8	3.0
Sulfate mg/L		1810 Q	250
Fluoride mg/L		0.69	1.0
Nitrate mg/L		2.8	0.50
Manganese µg/L	11/15/2000	881	10.0
Calcium mg/L		439	0.20
Potassium mg/L		3.7	3.0
Magnesium mg/L		34.1	0.20
Sodium mg/L		426	5.0
Nitrate plus Nitrite mg/L		2.5	0.10
Chloride mg/L		39.6 G	15.0
Sulfate mg/L		1680 Q	250
Phosphate as P, ortho mg/L		1.3 B, G	2.5
Nitrate mg/L		3.0	0.50
Manganese µg/L	03/06/2001	610	10.0
Calcium mg/L		406	0.20
Potassium mg/L		4.0	3.0
Magnesium mg/L		31.7	0.20
Sodium mg/L		382	5.0
Nitrate plus Nitrite mg/L		5.0	0.10
Chloride mg/L		46.0	15.0
Sulfate mg/L		1460 Q	250
Fluoride mg/L		0.39 B	1.0

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	03/06/2001	3.9	0.50
TDS mg/L	-continued	2810	10.0
Acetone µg/L	05/22/2001	21	10
Bromoform µg/L		0.48 J	1.0
Manganese µg/L		530	10.0
Calcium mg/L		389	0.20
Potassium mg/L		3.0	3.0
Magnesium mg/L		29.9	0.20
Sodium mg/L		348	5.0
Nitrate plus Nitrite mg/L		4.6	0.10
Chloride mg/L		44.8 Q	15.0
Sulfate mg/L		1440 Q	250
Fluoride mg/L		0.64 B	1.0
Nitrate mg/L		5.0	0.50
TDS mg/L		2620	10.0
Manganese µg/L	08/15/2001	810	10.0
Calcium mg/L		417	0.20
Potassium mg/L		4.0	3.0
Magnesium mg/L		31.5	0.20
Sodium mg/L		417	5.0
Nitrate plus Nitrite mg/L		2.8	0.10
Chloride mg/L		35.6 G	15.0
Sulfate mg/L		1870 Q	250
Fluoride mg/L		1.1 B, G	1.0
Nitrate mg/L		2.5 G	0.50
TDS mg/L		3210	10.0
Manganese µg/L	11/06/2001	581	10.0
Calcium mg/L		406	0.20
Potassium mg/L		3.8	3.0
Magnesium mg/L		31.1	0.20
Sodium mg/L		379	5.0
Nitrate plus Nitrite mg/L		5.4	0.10
Chloride mg/L		50.0 Q	6.0
Sulfate mg/L		1450 Q	250
Fluoride mg/L		0.49 B, G	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-39 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	11/06/2001	5.4	0.50
TDS mg/L	-continued	2480	10.0
Manganese µg/L	02/14/2002	920	10.0
Calcium mg/L		398	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		31.1	0.20
Sodium mg/L		373	5.0
Nitrate plus Nitrite mg/L		3.9	0.10
Chloride mg/L		44.2	3.0
Sulfate mg/L		1430 Q	500
Fluoride mg/L		0.66 B,	1.0
Nitrate mg/L		4.1	0.50
TDS mg/L		2480	10.0
Manganese µg/L	05/15/2002	820	10.0
Calcium mg/L		452	0.20
Potassium mg/L		5.3	3.0
Magnesium mg/L		34.8	0.20
Sodium mg/L		455	5.0
Nitrate plus Nitrite mg/L		2.2	0.10
Chloride mg/L		32.7	3.0
Sulfate mg/L		1780 Q	500
Fluoride mg/L		0.79 B,	1.0
Nitrate mg/L		2.3	0.50
TDS mg/L		2970	10.0
Manganese µg/L	08/08/2002	940	10.0
Calcium mg/L		430 J	0.20
Potassium mg/L		4.7	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		470	5.0
Nitrate plus Nitrite mg/L		2.0	0.10
Chloride mg/L		32 J,B	3.0
Sulfate mg/L		2100 Q	500
Fluoride mg/L		1.1 B,G	1.0
Nitrate mg/L		2.3 G	0.50

Analyte and unit	Date sampled	Result	RL
Phosphate as P, ortho mg/L	08/08/2002	0.73 B, G	2.5
TDS mg/L	-continued	3100	10.0
Manganese µg/L	11/20/2002	770	10.0
Calcium mg/L		430 J	0.20
Potassium mg/L		4.2	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		410	5.0
Nitrate plus Nitrite mg/L		0.88	0.10
Chloride mg/L		25 J,B	6.0
Sulfate mg/L		2400 Q	250
Fluoride mg/L		1.4 B,G	2.0
Nitrate mg/L		0.72 B,G	1.0
TDS mg/L		3400	10.0
Manganese µg/L	02/19/2003	690 J	10.0
Calcium mg/L		410	0.20
Potassium mg/L		4.5	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		400 J	5.0
Nitrate plus Nitrite mg/L		0.73	0.10
Chloride mg/L		22.0 G	6.0
Sulfate mg/L		2400 J	250
Fluoride mg/L		1.5 B,G	2.0
Nitrate mg/L		0.57 B,G	1.0
TDS mg/L		3500	10.0
Methylene chloride µg/L	05/13/2003	0.75 J	1.0
Manganese µg/L		360	10.0
Calcium mg/L		390	0.20
Potassium mg/L		2.9	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		350	5.0
Nitrate plus Nitrite mg/L		5.1	0.10
Chloride mg/L		44.0	3.0
Sulfate mg/L		2600 Q	250
Nitrate mg/L		5.3	0.50
TDS mg/L		2600	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-39 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chromium µg/L	08/28/2003	2.3 B	10.0
Manganese µg/L		290 J	10.0
Calcium mg/L		400 J	0.20
Potassium mg/L		2.2	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		320	5.0
Nitrate plus Nitrite mg/L		4.7	0.10
Chloride mg/L		37.0 G	6.0
Sulfate mg/L		1800 Q	250
Fluoride mg/L		1.4 B,G	2.0
Nitrate mg/L		4.0 G	1.0
TDS mg/L		2800	20.0
Carbon disulfide µg/L	11/17/2003	0.29 J	10.0
Manganese µg/L		880 J	10.0
Calcium mg/L		460 J	0.20
Potassium mg/L		5.8	3.0
Magnesium mg/L		34.0	0.20
Sodium mg/L		490	5.0
Nitrate plus Nitrite mg/L		1.7	0.10
Chloride mg/L		29.0 G	6.0
Sulfate mg/L		2200 Q	250
Fluoride mg/L		1.4 B,G	2.0
Nitrate mg/L		1.7 G	1.0
Phosphate as P, ortho mg/L		0.91 B, G	2.5
TDS mg/L		1600	20.0
Acetone µg/L	05/04/2004	2.6 J	10.0
Methylene chloride µg/L		0.72 J,B	5.0
Manganese µg/L		850	10.0
Calcium mg/L		440	0.20
Potassium mg/L		4.6	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		470	5.0
Nitrate plus Nitrite mg/L		3.1	0.10
Chloride mg/L		32.0 G	6.0
Sulfate mg/L		1700 Q	250

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	05/04/2004	2.5 G	1.0
TDS mg/L	-continued	3100	10.0
Manganese µg/L	11/16/2004	910	10.0
Calcium mg/L		490 J	0.20
Potassium mg/L		5.3	3.0
Magnesium mg/L		35.0	0.20
Sodium mg/L		520	5.0
Nitrate plus Nitrite mg/L		1.2	0.10
Chloride mg/L		32.0 J	6.0
Sulfate mg/L		2500 Q	250
Fluoride mg/L		0.77 B	2.0
Nitrate mg/L		2.1	1.0
TDS mg/L		3300	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-42 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	06/08/1999	97.8 Q	30.0
Fluoride mg/L		0.91 B,G	2.0
Manganese mg/L		0.32	0.010
Nickel mg/L		0.041	0.040
Nitrate mg/L		6.1 G	1.0
Nitrate plus Nitrite mg/L		7.1	0.10
Sulfate mg/L		1530	250
TDS mg/L		2820	10.0
Tetrachloroethene µg/L	11/17/1999	0.18 J	1.0
Chloride mg/L		53.3 Q	15.0
Fluoride mg/L		0.42 B	1.0
Manganese mg/L		0.28	0.015
Nickel mg/L		0.014 B	0.040
Nitrate mg/L		3.7	0.50
Nitrate plus Nitrite mg/L		0.014 B	0.10
Sulfate mg/L		1470	250
TDS mg/L		2560	10.0
Calcium µg/L	05/31/2000	363000	200
Potassium µg/L		2030	3000
Magnesium µg/L		27500	200
Manganese µg/L		222	10.0
Sodium µg/L		375000	5000
Nickel µg/L		13.0 B	40.0
Nitrate plus Nitrite mg/L		3.9	0.10
Chloride mg/L		48.3 Q	15.0
Sulfate mg/L		1470 Q	250
Fluoride mg/L		0.60	1.0
Nitrate mg/L		3.6	0.50
TDS mg/L		2600	10.0
Tetrachloroethene µg/L	11/16/2000	0.21 J	1.0
Acetone µg/L		0.86 J, B	10.0
Manganese µg/L		220	10.0
Nickel µg/L		11.0 B	40.0
Calcium mg/L		340	0.20

Analyte and unit	Date sampled	Result	RL
Potassium mg/L	11/16/2000	1.9 B	3.0
Magnesium mg/L	-continued	26.4	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		4.2	0.10
Chloride mg/L		50.0	3.0
Fluoride mg/L		0.33 B	1.0
Sulfate mg/L		1380 Q	250
Nitrate mg/L		3.4	0.50
TDS mg/L		2510	10.0
Acetone µg/L	05/22/2001	18	10
Bromoform µg/L		0.62 J	1.0
Manganese µg/L		180	10.0
Nickel µg/L		4.1	40.0
Calcium mg/L		323	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		23.9	0.20
Sodium mg/L		339	5.0
Nitrate plus Nitrite mg/L		3.8 Q	0.10
Chloride mg/L		43.8 Q	15.0
Sulfate mg/L		1470 Q	250
Fluoride mg/L		0.58 B	1.0
Nitrate mg/L		3.7	0.50
TDS mg/L		2580	10.0
Manganese µg/L	11/06/2001	182	10.0
Calcium mg/L		347	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		26.0	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		3.9 Q	0.10
Chloride mg/L		47.0	3.0
Sulfate mg/L		1440 Q	250
Fluoride mg/L		0.51 B	1.0
Nitrate mg/L		3.6	0.50
TDS mg/L		2460	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-42 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Manganese µg/L	05/15/2002	180	10.0
Nickel µg/L		11.0 B	40.0
Calcium mg/L		370	0.20
Potassium mg/L		2.4 B	3.0
Magnesium mg/L		28.5	0.20
Sodium mg/L		373	5.0
Nitrate plus Nitrite mg/L		4.2	0.10
Chloride mg/L		42.2	3.0
Sulfate mg/L		1470 Q	250
Fluoride mg/L		0.57 B	1.0
Nitrate mg/L		3.5	0.50
TDS mg/L		2340	10.0
Acetone µg/L	11/19/2002	25	10.0
Chromium µg/L		0.81 B	10.0
Manganese µg/L		220	10.0
Calcium mg/L		380 J	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		27	0.20
Sodium mg/L		340	5.0
Nitrate plus Nitrite mg/L		3.1	0.10
Chloride mg/L		44	3.0
Sulfate mg/L		1440 Q	250
Fluoride mg/L		0.87 B	1.0
Nitrate mg/L		3.4	0.50
TDS mg/L		2300	10.0
Methylene chloride µg/L	05/13/2003	0.73 J	5.0
Manganese µg/L		220	10.0
Calcium mg/L		380	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		380	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		45.0	3.0
Sulfate mg/L		1600 Q	250
Nitrate mg/L		3.8	0.50
TDS mg/L		2600	10.0

Analyte and unit	Date sampled	Result	RL
Methylene chloride µg/L	11/18/2003	0.47 J,B	5.0
Manganese µg/L		200	10.0
Calcium mg/L		350	0.20
Potassium mg/L		2.1 B	3.0
Magnesium mg/L		26.0	0.20
Sodium mg/L		340	5.0
Nitrate plus Nitrite mg/L		3.2	0.10
Chloride mg/L		44.0	3.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		0.97 B	1.0
Nitrate mg/L		3.5	0.50
TDS mg/L		2500 Q	10.0
Methylene chloride µg/L	05/04/2004	0.55 J,B	5.0
Chromium µg/L		2.5 B	10.0
Manganese µg/L		210	10.0
Calcium mg/L		410	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		390	5.0
Nitrate plus Nitrite mg/L		3.7	0.10
Chloride mg/L		43.0	3.0
Sulfate mg/L		1400 Q	250
Nitrate mg/L		3.4	0.50
TDS mg/L		2600 Q	10.0
Chromium µg/L	11/16/2004	1.4 B	10.0
Manganese µg/L		180	10.0
Nickel µg/L		3.2 B	40.0
Calcium mg/L		400	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		3.0	0.10
Chloride mg/L		42.0 J	3.0
Sulfate mg/L		1900 Q	250
Fluoride mg/L		0.65 B	1.0
Nitrate mg/L		3.4	0.50

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-42 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
TDS mg/L	11/16/2004	2700	10.0
Phosphate as P, Ortho mg/L	-continued	0.17 B,J	0.50

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-45 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	06/08/1999	48.2	3.0
Fluoride mg/L		0.95 B	1.0
Manganese mg/L		0.23	0.010
Nitrate mg/L		3.5	0.50
Nitrate plus Nitrite mg/L		4.1	0.10
Sulfate mg/L		1540 Q	250
TDS mg/L		2500	10.0
Chloride mg/L	11/17/1999	47.6	3.0
Fluoride mg/L		0.50 B	1.0
Manganese mg/L		0.22	0.015
Nitrate mg/L		3.7	0.50
Nitrate plus Nitrite mg/L		0.013B	0.10
Sulfate mg/L		1430 Q	250
TDS mg/L		2460	10.0
Calcium µg/L	05/31/2000	374000	200
Potassium µg/L		1970 B	3000
Magnesium µg/L		29400	200
Manganese µg/L		226	10.0
Sodium µg/L		334000	5000
Nickel µg/L		4.0 B	40.0
Nitrate plus Nitrite mg/L		4.1	0.10
Chloride mg/L		45.5 Q	15.0
Sulfate mg/L		1440 Q	250
Fluoride mg/L		0.66	1.0
Nitrate mg/L		3.9	0.50
Acetone µg/L	11/16/2000	0.72 J, B	10.0
Manganese µg/L		240	10.0
Nickel µg/L		5.7 J	40.0
Calcium mg/L		365	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		29.5	0.20
Sodium mg/L		338	5.0
Nitrate plus Nitrite mg/L		4.2	0.10

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	11/16/2000	41.8	15.0
Sulfate mg/L	-continued	1460 Q	250
Fluoride mg/L		.31 B	1.0
Nitrate mg/L		3.5	0.50
TDS mg/L		2540	10.0
Acetone µg/L	05/22/2001	12	10.0
Bromoform µg/L		0.90 J	1.0
Dibromochloromethane µg/L		0.39 J	1.0
Manganese µg/L		190	10.0
Calcium mg/L		351	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		27.3	0.20
Sodium mg/L		322	5.0
Nitrate plus Nitrite mg/L		4.1	0.10
Chloride mg/L		50.0	15.0
Sulfate mg/L		1360 Q	250
Fluoride mg/L		0.58 B	1.0
Nitrate mg/L		4.3	0.50
TDS mg/L		2520	10.0
Manganese µg/L	11/06/2001	188	10.0
Calcium mg/L		372	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		29.3	0.20
Sodium mg/L		342	5.0
Nitrate plus Nitrite mg/L		4.4	0.10
Chloride mg/L		42.8	3.0
Sulfate mg/L		1450 Q	250
Fluoride mg/L		0.50 B	1.0
Nitrate mg/L		4.0	0.50
TDS mg/L		2510	10.0
Acetone µg/L	05/15/2002	3.6 J	10.0
Manganese µg/L		150	10.0
Calcium mg/L		385	0.20

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-45 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Potassium mg/L	05/15/2002	2.4 B	3.0
Magnesium mg/L	-continued	31.2	0.20
Sodium mg/L		352	5.0
Nitrate plus Nitrite mg/L		4.9	0.10
Chloride mg/L		42.9	3.0
Sulfate mg/L		1440 Q	250
Fluoride mg/L		0.61 B	1.0
Nitrate mg/L		4.2	0.50
TDS mg/L		2420	10.0
Chromium µg/L	11/20/2002	3.3 B	10.0
Manganese µg/L		130	10.0
Nickel µg/L		2.7 B	40.0
Calcium mg/L		380 J	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		340	5.0
Nitrate plus Nitrite mg/L		4.0	0.10
Chloride mg/L		43.0 J,B	6.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		0.87 B,G	2.0
Nitrate mg/L		4.0	1.0
TDS mg/L		2500	10.0
Methylene chloride µg/L	05/13/2003	7.2 J	5.0
Manganese µg/L		110	10.0
Calcium mg/L		370	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		370	5.0
Nitrate plus Nitrite mg/L		4.6	0.10
Chloride mg/L		44.0	3.0
Sulfate mg/L		1500 Q	250
Nitrate mg/L		4.6	0.5
TDS mg/L		2500	10.0
Manganese µg/L	11/17/2003	72.0 J	10.0
Calcium mg/L		390	0.20
Potassium mg/L		2.5 B	3.0
Magnesium mg/L	-continued	30.0	0.20
Sodium mg/L		350	5.0
Nitrate plus Nitrite mg/L		4.0	0.10
Chloride mg/L		45.0 J,B	6.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		0.93 B	2.0
Nitrate mg/L		4.4	1.0
TDS mg/L		2300	10.0
Methylene chloride µg/L	05/04/2004	0.50 J,B	5.0
Chromium µg/L		4.2 B	10.0
Manganese µg/L		83.0	10.0
Calcium mg/L		390	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		380	5.0
Nitrate plus Nitrite mg/L		4.5	0.10
Chloride mg/L		43.0	3.0
Sulfate mg/L		1300 Q	250
Nitrate mg/L		4.3	0.5
TDS mg/L		2600	10.0
Acetone µg/L	11/16/2004	3.4 J	10.0
Chromium µg/L		5.3 B	10.0
Manganese µg/L		88.0	10.0
Nickel µg/L		3.7 B	40.0
Calcium mg/L		400 J	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		350	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		44.0 J	6.0
Sulfate mg/L		1800 Q	250
Fluoride mg/L		0.64 B	2.0
Nitrate mg/L		4.8	1.0
TDS mg/L		2600	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-48 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	06/08/1999	1.8 J	10.0
Chloride mg/L		48.5	3.0
Fluoride mg/L		0.88 B	1.0
Manganese mg/L		0.0085B	0.010
Nickel mg/L		0.014 B	0.040
Nitrate mg/L		5.0	0.50
Nitrate plus Nitrite mg/L		5.4	0.10
Sulfate mg/L		1250 Q	250
TDS mg/L		2200	10.0
Chloride mg/L	11/17/1999	47.6	3.0
Fluoride mg/L		0.50 B	1.0
Manganese mg/L		0.023	0.015
Nitrate mg/L		4.4	0.50
Nitrate plus Nitrite mg/L		0.013	0.10
Sulfate mg/L		1240 Q	250
TDS mg/L		2230	10.0
Calcium µg/L	05/31/2000	341000	200
Potassium µg/L		1580 B	3000
Magnesium µg/L		27200	200
Manganese µg/L		25.6	10.0
Sodium µg/L		292000	200
Nickel µg/L		4.1 B	40.0
Nitrate plus Nitrite mg/L		5.0	0.10
Chloride mg/L		48.7	3.0
Sulfate mg/L		1280 Q	250
Fluoride mg/L		0.66 B	1.0
Nitrate mg/L		4.8	0.50
TDS mg/L		2230	10.0
Acetone µg/L	11/16/2000	0.78 J	10.0
Calcium mg/L		339	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		27.8	0.20
Manganese µg/L		29.0	10.0

Analyte and unit	Date sampled	Result	RL
Sodium mg/L	11/16/2000	292	5.0
Nickel µg/L	-continued	7.7 B	40.0
Nitrate plus Nitrite mg/L		5.6	0.10
Chloride mg/L		48.0	3.0
Sulfate mg/L		1200 Q	250
Fluoride mg/L		0.34 B	1.0
Nitrate mg/L		4.6	0.50
TDS mg/L		2260	10.0
Acetone µg/L	05/22/2001	39	10
Bromoform µg/L		0.58 J	1.0
Manganese µg/L		17.0	10.0
Calcium mg/L		341	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		26.9	0.20
Sodium mg/L		283	5.0
Nitrate plus Nitrite mg/L		5.1	0.10
Chloride mg/L		45.4 Q	15.0
Sulfate mg/L		1270 Q	250
Fluoride mg/L		0.55 B	1.0
Nitrate mg/L		5.4	0.50
TDS mg/L		2360	10.0
Manganese µg/L	11/06/2001	15.8	10.0
Calcium mg/L		339	0.20
Potassium mg/L		0.54 B	3.0
Magnesium mg/L		27.1	0.20
Sodium mg/L		282	5.0
Nitrate plus Nitrite mg/L		5.6	0.10
Chloride mg/L		49.2	3.0
Sulfate mg/L		1270 Q	250
Fluoride mg/L		0.46 B	1.0
Nitrate mg/L		5.5	0.50
TDS mg/L		2270	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-48 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interfcrence]

Analyte and unit	Date sampled	Result	RL
Manganese µg/L	05/15/2002	21.0	10.0
Calcium mg/L		368	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		30.2	0.20
Sodium mg/L		301	5.0
Nitrate plus Nitrite mg/L		6.5	0.10
Chloride mg/L		49.0	3.0
Sulfate mg/L		1260 Q	250
Fluoride mg/L		0.56 B	1.0
Nitrate mg/L		5.6	0.50
TDS mg/L		2190	10.0
Chromium µg/L	11/20/2002	9.6 B	10.0
Manganese µg/L		15.0	10.0
Nickel µg/L		1.9 B	40.0
Calcium mg/L		350 J	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		270	5.0
Nitrate plus Nitrite mg/L		5.5	0.10
Chloride mg/L		48.0 J	15.0
Sulfate mg/L		1300 Q	250
Fluoride mg/L		0.88 B	1.0
Nitrate mg/L		6.2	0.50
TDS mg/L		2200	10.0
Acetone µg/L	05/13/2003	3.5 J	10.0
Methylene chloride µg/L		0.72 J	1.0
Chromium µg/L		7.7 B,J	10.0
Manganese µg/L		13.0	10.0
Calcium mg/L		350	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		290	5.0
Nitrate plus Nitrite mg/L		6.4	0.10
Chloride mg/L		48.0 Q	15.0
Sulfate mg/L		1300 Q	250

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	05/13/2003	6.6	0.50
TDS mg/L	-continued	2300	10.0
Carbon disulfide µg/L	11/17/2003	0.30 J	1.0
Manganese µg/L		14.0 J	10.0
Nickel µg/L		6.8 B	40.0
Calcium mg/L		350	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		28.0	0.20
Sodium mg/L		280	5.0
Nitrate plus Nitrite mg/L		5.8	0.10
Chloride mg/L		44.0 Q	15.0
Sulfate mg/L		1300 Q	250
Fluoride mg/L		0.87 B	1.0
Nitrate mg/L		6.8	0.50
TDS mg/L		1900	10.0
Methylene chloride µg/L	05/04/2004	0.57 J,B	1.0
Chromium µg/L		9.5 B	10.0
Manganese µg/L		13.0	10.0
Calcium mg/L		370	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		300	5.0
Nitrate plus Nitrite mg/L		6.7	0.10
Chloride mg/L		49.0 Q	3.0
Sulfate mg/L		1100 Q	250
Fluoride mg/L		2.9	1.0
Nitrate mg/L		6.6	0.50
TDS mg/L		2200	10.0
Chromium µg/L	11/16/2004	9.4 B	10.0
Manganese µg/L		10.0	10.0
Calcium mg/L		380	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		280	5.0
Nitrate plus Nitrite mg/L		5.8	0.10

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-48 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	11/16/2004	49.0 J	15.0
Sulfate mg/L	-continued	1500 Q	250
Fluoride mg/L		0.59 B	1.0
Nitrate mg/L		6.9	0.50
TDS mg/L		2300	10.0

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-51 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Methylene chloride µg/L	06/08/1999	0.22J,B	1.0
Chloride mg/L		52.7 Q	15.0
Fluoride mg/L		0.59 B	1.0
Nitrate mg/L		5.2	0.50
Nitrate plus Nitrite mg/L		5.1	0.10
Sulfate mg/L		1400 Q	250
TDS mg/L		2390	10.0
Chloride mg/L	11/17/1999	50.0	15.0
Fluoride mg/L		0.50	1.0
Nitrate mg/L		5.1	0.50
Nitrate plus Nitrite mg/L		0.010	0.10
Sulfate mg/L		1370 Q	250
TDS mg/L		2390	10.0
Calcium mg/L	05/31/2000	387	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		30.7	0.20
Sodium mg/L		320	5.0
Nitrate plus Nitrite mg/L		5.6	0.10
Chloride mg/L		51.6 Q	15.0
Sulfate mg/L		1420 Q	250
Fluoride mg/L		0.67 B	1.0
Nitrate mg/L		5.5	0.50
Acetone µg/L	11/16/2000	0.78J,B	10.0
Nickel µg/L		7.90 B	40.0
Calcium mg/L		339	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		30.6	0.20
Sodium mg/L		316	5.0
Nitrate plus Nitrite mg/L		6.4	0.10
Chloride mg/L		47.8 Q	15.0
Sulfate mg/L		1350 Q	250
Fluoride mg/L		0.33 B	1.0

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	11/16/2000	5.4	0.50
TDS mg/L	-continued	2490	10.0
Acetone µg/L	05/22/2001	120	10
Bromoform µg/L		0.66 J	1.0
Calcium mg/L		364	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		28.9	0.20
Sodium mg/L		302	5.0
Nitrate plus Nitrite mg/L		5.5	0.10
Chloride mg/L		51.0 Q	15.0
Sulfate mg/L		1400 Q	250
Fluoride mg/L		0.59 B	1.0
Nitrate mg/L		6.0	0.50
TDS mg/L		2560	10.0
Acetone µg/L	11/06/2001	2.9 J	10
Calcium mg/L		372	0.20
Potassium mg/L		1.3 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		310	5.0
Nitrate plus Nitrite mg/L		6.1	0.10
Chloride mg/L		51.2 Q	15.0
Sulfate mg/L		1380 Q	250
Fluoride mg/L		0.43 B	1.0
Nitrate mg/L		5.9	0.50
TDS mg/L		2440	10.0
Nickel µg/L	05/15/2002	4.2 B	40.0
Calcium mg/L		371	0.20
Potassium mg/L		2.8 B	3.0
Magnesium mg/L		30.5	0.20
Sodium mg/L		308	5.0
Nitrate plus Nitrite mg/L		6.9	0.10
Chloride mg/L		49.6 Q	15.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-51 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/15/2002	1340 Q	250
Fluoride mg/L	-continued	0.61 B	1.0
Nitrate mg/L		6.1	0.50
TDS mg/L		2360	10.0
Chromium µg/L	11/20/2002	4.4 B	10.0
Calcium mg/L		390 J	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		300	5.0
Nitrate plus Nitrite mg/L		6.3	0.10
Chloride mg/L		53.0 J,Q	15.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.90 B	1.0
Nitrate mg/L		6.8	0.50
TDS mg/L		2400	10.0
Methylene chloride µg/L	05/13/2003	0.72 J	1.0
Calcium mg/L		370	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		320	5.0
Nitrate plus Nitrite mg/L		6.8	0.10
Chloride mg/L		53.0 Q	15.0
Sulfate mg/L		1400 Q	250
Nitrate mg/L		7.1	0.50
TDS mg/L		2400	10.0
Manganese µg/L	11/17/2003	1.4 B,J	10.0
Calcium mg/L		390	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		310	5.0
Nitrate plus Nitrite mg/L		6.6	0.10
Chloride mg/L		52.0 Q	15.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.91 B	1.0
Nitrate mg/L		7.5	0.50
Phosphate as P, Ortho mg/L	11/17/2003	0.10 B	0.50
TDS mg/L	-continued	1200	10.0
Methylene chloride µg/L	05/04/2004	0.59 J,B	1.0
Calcium mg/L		370	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		300	5.0
Nitrate plus Nitrite mg/L		7.4	0.10
Chloride mg/L		51.0 Q	15.0
Sulfate mg/L		1200 Q	250
Fluoride mg/L		2.8	1.0
Nitrate mg/L		7.2	0.50
TDS mg/L		2400	10.0
Chromium µg/L	11/16/2004	3.7 B	10.0
Calcium mg/L		410	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		320	5.0
Nitrate plus Nitrite mg/L		7.7	0.10
Chloride mg/L		50.0 J,Q	15.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		0.62 B	1.0
Nitrate mg/L		7.7	0.50
TDS mg/L		2500	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-55 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; t, sample diluted due to the concentration of target compounds; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
cis-1,2-Dichloroethene µg/L	09/09/1997	1.2	0.50
Methylene chloride µg/L		0.25 J	1.0
Tetrachloroethene µg/L		0.63	1.0
Manganese mg/L		2.0	0.014
Nickel mg/L		0.16	0.040
Chloride mg/L		51.4	0.50
Nitrate as N mg/L		1.4	0.50
Nitrate plus Nitrite mg/L		1.7	0.10
Sulfate mg/L		1690	10.0
TDS mg/L		2750	10.0
cis-1,2-Dichloroethene µg/L	05/19/1998	1.1	0.50
Methylene chloride µg/L		0.38 J	1.0
Tetrachloroethene µg/L		0.80 J	1.0
Trichloroethene µg/L		0.16 J	1.0
Manganese mg/L		1.3	0.010
Nickel mg/L		0.040	0.040
Chloride mg/L		38.6 G	4.0
Fluoride mg/L		1.9 J,G	2.0
Nitrate mg/L		1.1	0.50
Nitrate plus Nitrite mg/L		1.1	0.10
Sulfate mg/L		1230 Q	250
TDS mg/L		2720	50.0
1,2-Dichloroethene total µg/L	09/01/1998	0.73 J	1.0
Methylene chloride µg/L		0.15 J	1.0
Tetrachloroethene µg/L		0.59 J	1.0
Trichloroethene µg/L		0.16 J	1.0
Manganese mg/L		1.2	0.010
Nickel mg/L		0.03 J	0.040
Chloride mg/L		47.9	3.0
Fluoride mg/L		1.3	1.0
Nitrate mg/L		0.94	0.50
Nitrate plus Nitrite mg/L		1.4	0.10
Sulfate mg/L		1790 J,Q	250
TDS mg/L		2830	10.0

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	06/08/1999	4.0 J	10
cis-1,2-Dichloroethene µg/L		0.61 J	1.0
1,2-Dichloroethene total µg/L		0.61 J	1.0
Tetrachloroethene µg/L		0.34 J	1.0
Manganese mg/L		1.3	0.010
Nickel mg/L		0.042	0.040
Chloride mg/L		38.6	3.0
Fluoride mg/L		0.82 J	1.0
Nitrate mg/L		0.93	0.50
Nitrate plus Nitrite mg/L		1.0	0.10
Sulfate mg/L		1650 Q	250
TDS mg/L		2690	10.0
cis-1,2-Dichloroethene µg/L	11/18/1999	0.57 J	1.0
1,2-Dichloroethene total µg/L		0.57 J	1.0
Tetrachloroethene µg/L		0.59 J	1.0
Trichloroethene µg/L		0.15 J	1.0
Chloride mg/L		35.8	3.0
Fluoride mg/L		0.96 B	1.0
Nickel mg/L		0.017 B	0.040
Nitrate mg/L		1.1	0.50
Nitrate plus Nitrite mg/L		1.2	0.10
Sulfate mg/L		1610 Q	250
TDS mg/L		2670	10.0
Manganese µg/L	06/01/2000	1590	10.0
Nickel µg/L		19.3 B	40.0
Calcium mg/L		372	0.20
Potassium mg/L		2.7 B	3.0
Magnesium mg/L		29.9	0.20
Sodium mg/L		401	5.0
Nitrate plus Nitrite mg/L		1.3	0.10
Chloride mg/L		34.5	3.0
Sulfate mg/L		1620 Q	250
Fluoride mg/L		0.72 B	1.0
Nitrate mg/L		1.2	0.50

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-55 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; t, sample diluted due to the concentration of target compounds; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
TDS mg/L	06/01/2000	2620	10.0
	-continued		
cis-1,2-Dichlorothene µg/L	11/16/2000	0.19 J	0.50
Tetrachlorothene µg/L		0.53 J	1.0
Manganese µg/L		1200	10.0
Nickel µg/L		7.6 J	40.0
Calcium mg/L		349	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		28.3	0.20
Sodium mg/L		388	5.0
Nitrate plus Nitrite mg/L		1.2	0.10
Chloride mg/L		31.6	3.0
Sulfate mg/L		1490 Q	250
Fluoride mg/L		0.34 B	1.0
Nitrate mg/L		1.1	0.50
TDS mg/L		2600	10.0
Acetone µg/L	05/22/2001	12	10.0
Bromoform µg/L		1.1	1.0
Dibromochloromethane µg/L		0.44 J	1.0
Manganese µg/L		1500	10.0
Nickel µg/L		10.0 B	40.0
Calcium mg/L		333	0.20
Potassium mg/L		2.1 B	3.0
Magnesium mg/L		25.9	0.20
Sodium mg/L		365	5.0
Nitrate plus Nitrite mg/L		1.5	0.10
Chloride mg/L		33.1	3.0
Sulfate mg/L		1480 Q	250
Fluoride mg/L		0.47 B	1.0
Nitrate mg/L		1.6	0.50
TDS mg/L		2570	10.0
Manganese µg/L	11/08/2001	817	10.0
Nickel µg/L		5.9 B	40.0
Calcium mg/L		334	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		26.1	0.20
Sodium mg/L		363	5.0
Nitrate plus Nitrite mg/L	-continued	1.6	0.10
Chloride mg/L		35.6 J	3.0
Sulfate mg/L		1580 Q	250
Fluoride mg/L		0.63 B	1.0
Nitrate mg/L		1.5	0.50
TDS mg/L		2460	10.0
Manganese µg/L	05/16/2002	1200	10.0
Calcium mg/L		363	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		28.5	0.20
Sodium mg/L		391	5.0
Nitrate plus Nitrite mg/L		2.5	0.10
Chloride mg/L		35.5	3.0
Sulfate mg/L		1480 Q	250
Fluoride mg/L		0.70 B	1.0
Nitrate mg/L		1.8	0.50
TDS mg/L		2510	10.0
Tetrachloroethene µg/L	11/21/2002	0.33 J	1.0
Manganese µg/L		680	10.0
Nickel µg/L		2.9 B	40.0
Calcium mg/L		340	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		25.0	0.20
Sodium mg/L		340	5.0
Nitrate plus Nitrite mg/L		1.8	0.10
Chloride mg/L		42.0 J	3.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		1.1	1.0
Nitrate mg/L		1.9	0.50
TDS mg/L		2500	10.0
Tetrachloroethene µg/L	05/15/2003	0.28 J	1.0
Manganese µg/L		810	10.0
Nickel µg/L		6.2 B	40.0
Calcium mg/L		400	0.20

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-55 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; t, sample diluted due to the concentration of target compounds; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Potassium mg/L	05/15/2003	3.4	3.0
Magnesium mg/L	-continued	29.0	0.20
Sodium mg/L		390	5.0
Nitrate plus Nitrite mg/L		2.3	0.10
Chloride mg/L		41.0	3.0
Sulfate mg/L		1600 Q	250
Nitrate mg/L		2.2	0.50
TDS mg/L		2600	10.0
Methylene chloride µg/L	11/19/2004	0.53 J,B	5.0
Tetrachloroethene µg/L		0.27 J	1.0
Manganese µg/L		380	10.0
Nickel µg/L		4.6 B	40.0
Calcium mg/L		380	0.20
Potassium mg/L		2.1 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		390	5.0
Nitrate plus Nitrite mg/L		2.0	0.10
Chloride mg/L		45.0	3.0
Sulfate mg/L		1800 Q	250
Fluoride mg/L		3.1	1.0
Nitrate mg/L		2.2	0.50
TDS mg/L		2700	10.0
Methylene chloride µg/L	05/05/2004	0.45 J,B	5.0
Manganese µg/L		970	10.0
Nickel µg/L		20.0 B	40.0
Calcium mg/L		410	0.20
Potassium mg/L		2.5 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		410	5.0
Nitrate plus Nitrite mg/L		2.3	0.10
Chloride mg/L		43.0	3.0
Sulfate mg/L		1900 Q	250
Fluoride mg/L		0.77 B	1.0
Nitrate mg/L		2.2	0.50
TDS mg/L		2700	10.0

Analyte and unit	Date sampled	Result	RL
Tetrachloroethene µg/L	11/16/2004	0.34 J	1.0
Chromium µg/L		5.0 B	10.0
Manganese µg/L		1200	10.0
Nickel µg/L		71.0	40.0
Calcium mg/L		430	0.20
Potassium mg/L		2.9 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		400	5.0
Nitrate plus Nitrite mg/L		1.8	0.10
Chloride mg/L		47.0 J	3.0
Sulfate mg/L		2000 Q	250
Fluoride mg/L		0.63 B	1.0
Nitrate mg/L		2.0	0.50
TDS mg/L		2800	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-56 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Carbon disulfide µg/L	09/21/1993	0.38 J	1.0
Ethylbenzene µg/L		0.37 J	1.0
Methylene chloride µg/L		0.32 J	1.0
Toluene µg/L		1.0	1.0
Xylenes (total) µg/L		1.1	1.0
Antimony mg/L		0.008	0.001
Barium mg/L		0.012	0.01
Calcium mg/L		347	0.01
Chloride mg/L		45.3	0.5
Chromium mg/L		0.018	0.01
Fluoride mg/L		2.9	0.5
Iron mg/L		0.26	0.1
Magnesium mg/L		25.1	0.2
Manganese mg/L		0.085	0.01
Molybdenum mg/L		0.0052	0.001
Nitrate as N mg/L		2.7	0.5
Nitrate plus Nitrite mg/L		2.5	0.1
Sodium mg/L		320	5.0
Sulfate mg/L		1,490	5.0
TDS mg/L		2,360	10.0
Zinc mg/L		0.23	0.02
Methylene chloride µg/L	05/25/1994	0.5	1.0
Antimony mg/L		0.0024	0.001
Barium mg/L		0.012	0.01
Calcium mg/L		346	0.2
Chloride mg/L		40.5	0.5
Chromium mg/L		0.024	0.01
Copper mg/L		0.01	0.01
Magnesium mg/L		25.3	0.2
Manganese mg/L		0.028	0.01
Molybdenum mg/L		0.0031	0.001
Nickel mg/L		0.076	0.01
Nitrate as N mg/L		2.4	0.5
Nitrate plus Nitrite mg/L		2.8	0.1
Selenium mg/L		0.0096	0.001
Sodium mg/L		323	5.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/25/1994	1,480	5.0
TDS mg/L	-continued	2,470	10.0
Methylene chloride µg/L	09/12/1994	0.48	1.0
Antimony mg/L		0.0087	0.002
Calcium mg/L		362	5.0
Chloride mg/L		43.6	0.5
Cobalt mg/L		0.0035	0.002
Fluoride mg/L		2.8	1.0
Magnesium mg/L		27.8	5.0
Manganese mg/L		0.042	0.01
Molybdenum mg/L		0.0032	0.002
Nickel mg/L		0.032	0.02
Nitrate as N mg/L		2.2	0.1
Nitrate plus Nitrite mg/L		2.3	0.1
Selenium mg/L		0.006	0.002
Sodium mg/L		374	5.0
Sulfate mg/L		1,560	5.0
TDS mg/L		2,480	50.0
2-Butanone (MEK) µg/L	05/24/1995	12.0	10.0
Methylene chloride µg/L		0.60 J	1.0
Antimony mg/L		0.0062	0.001
Calcium mg/L		392	0.01
Chloride mg/L		42.7	0.5
Chromium mg/L		0.022	0.01
Cobalt mg/L		0.0039	0.001
Magnesium mg/L		29.6	0.2
Manganese mg/L		0.046	0.01
Molybdenum mg/L		0.0037	0.001
Nickel mg/L		0.032	0.001
Nitrate as N mg/L		2.2	0.5
Nitrate plus Nitrite mg/L		2.5	0.1
Selenium mg/L		0.0054	0.001
Sodium mg/L		399	5.0
Sulfate mg/L		1,480	--
TDS mg/L		2,510	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-56 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Barium mg/L	09/13/1995	0.011	0.002
Cadmium mg/L		0.00078	0.0006
Calcium mg/L		375	0.2
Chloride mg/L		40.0	1.0
Chromium mg/L		0.021	0.001
Cobalt mg/L		0.0039	0.0005
Copper mg/L		0.0078	0.002
Fluoride mg/L		3.1	1.0
Iron mg/L		0.12	0.1
Magnesium mg/L		27.6	0.2
Manganese mg/L		0.042	0.01
Molybdenum mg/L		0.0034	0.0002
Nickel mg/L		0.034	0.0002
Nitrate as N mg/L		2.3	0.5
Nitrate plus Nitrite mg/L		2.2	0.5
Potassium mg/L		2.0	5.0
Sodium mg/L		369	5.0
Sulfate mg/L		1,510	5.0
TDS mg/L		2,410	50.0
Acetone µg/L	05/31/1996	1.5	10.0
Methylene chloride µg/L		0.31 J	1.0
Tetrachloroethene µg/L		0.28 J	1.0
Chloride mg/L		44.1	1.0
Fluoride mg/L		2.6	1.0
Manganese mg/L		0.02	0.01
Nitrate as N mg/L		2.5	0.5
Nitrate plus Nitrite mg/L		2.7	0.5
Sulfate mg/L		1,570	5.0
TDS mg/L		2,500	50.0
Chloride mg/L	09/05/1996	41.9	1.0
Manganese mg/L		0.021	0.01
Nitrate as N mg/L		2.6	0.5
Nitrate plus Nitrite mg/L		2.8	0.5
Sulfate mg/L		1,630	5.0
TDS mg/L		2,390	50.0

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	03/12/1997	43.6	1.0
Manganese mg/L		0.036	0.01
Nitrate as N mg/L		2.6	0.5
Nitrate plus Nitrite mg/L		2.9	0.5
Sulfate mg/L		1,520	5.0
TDS mg/L		2,600	50.0
Chloride mg/L	05/22/1997	42.5	1.0
Manganese mg/L		0.039	0.01
Nitrate as N mg/L		2.7	0.5
Nitrate plus Nitrite mg/L		3.0	0.5
Sulfate mg/L		1,510	5.0
TDS mg/L		2,460	50.0
Methylene chloride µg/L	09/10/1997	0.24 J	1.0
Tetrachloroethene µg/L		0.23 J	1.0
Chloride mg/L		47.7	1.0
Manganese mg/L		0.012	0.01
Nitrate as N mg/L		3.2	0.5
Nitrate plus Nitrite mg/L		3.4	0.5
Sulfate mg/L		1,440	5.0
TDS mg/L		2,410	50.0
Methylene chloride µg/	05/19/1998	0.29 J	1.0
Tetrachloroethene µg/L		0.26 J	1.0
Chloride mg/L		42.1 G	6.0
Fluoride mg/L		1.2 JG	2.0
Manganese mg/L		0.024	0.01
Nitrate as N mg/L		3.0	0.5
Nitrate plus Nitrite mg/L		2.7	0.1
Sulfate mg/L		1,530 Q	125
TDS mg/L		2,440	10.0
Methylene chloride µg/	09/01/1998	0.1 J	1.0
Tetrachloroethene µg/L		0.17 J	1.0
Chloride mg/L		46.3	3.0
Fluoride mg/L		1.1	1.0
Manganese mg/L		0.04	0.01
Nitrate as N mg/L		2.7	0.5

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-56 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	09/01/1998	1.6	0.1
Sulfate mg/L	-continued	1560 Q	250
TDS mg/L		2610	10.0
Manganese mg/L	06/08/1999	0.0099J	0.01
Chloride mg/L		38.7	3.0
Fluoride mg/L		0.71 J	1.0
Nitrate mg/L		3.2	0.5
Nitrate plus Nitrite mg/L		3.8	0.10
Sulfate mg/L		1290 Q	250
TDS mg/L		2200	10.0
Chloride mg/L	11/17/1999	40.1	3.0
Fluoride mg/L		0.48 B	1.0
Manganese mg/L		0.024	0.5
Nitrate mg/L		3.1	0.10
Nitrate plus Nitrite mg/L		0.012 B	250
Sulfate mg/L		1340 Q	10.0
TDS mg/L		1970	
Manganese µg/L	04/10/2000	88.8	10.0
Nickel µg/L		47.1	40.0
Chloride mg/L		41.0	3.0
Fluoride mg/L		1.9	1.0
Nitrate mg/L		3.2	0.5
Nitrate plus Nitrite mg/L		3.1	0.10
Sulfate mg/L		1540 Q	250
TDS mg/L		2380	10.0
Manganese µg/L	06/01/2000	30.2	10.0
Nickel µg/L		13.4	40.0
Calcium mg/L		357	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		28.1	0.20
Sodium mg/L		321	5.0
Nitrate mg/L		3.4	0.5
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		42.2	15.0
Sulfate mg/L		1390 Q	250

Analyte and unit	Date sampled	Result	RL
Fluoride mg/L	06/01/2000	0.64	1.0
Phosphate as P, Ortho mg/L	-continued	1.2 B, G	0.50
TDS mg/L		2440	10.0
Manganese µg/L	08/15/2000	24.4	10.0
Nickel µg/L		4.8 B	40.0
Calcium mg/L		325	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		28.1	0.20
Sodium mg/L		314	5.0
Nitrate plus Nitrite mg/L		3.6	0.10
Chloride mg/L		42.9	3.0
Sulfate mg/L		1230 Q	250
Floride mg/L		0.59 B	1.0
Nitrate mg/L		3.2	0.50
Phosphate as P, Ortho mg/L		0.57	0.50
TDS mg/L		2490	10.0
Manganese µg/L	11/16/2000	36.0	10.0
Nickel µg/L		8.2 B	40.0
Calcium mg/L		359	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		28.3	0.20
Sodium mg/L		336	5.0
Nitrate plus Nitrite mg/L		3.7	0.10
Chloride mg/L		39.2	3.0
Sulfate mg/L		1360 Q	250
Fluoride mg/L		0.32	1.0
Nitrate mg/L		3.2	0.50
TDS mg/L		2490	10.0
Manganese µg/L	03/06/2001	24.0	10.0
Nickel µg/L		4.8 B	40.0
Calcium mg/L		362	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		28.3	0.20
Sodium mg/L		326	5.0
Nitrate plus Nitrite mg/L		4.3	0.10
Chloride mg/L		42.9	3.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-56 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	03/06/2001	1310 Q	250
Floride mg/L	-continued	0.33 B	1.0
Nitrate mg/L		3.4	0.50
TDS mg/L		2510	10.0
Acetone µg/L	05/23/2001	16	10
Bromoform µg/L		0.62 J	1.0
Manganese µg/L		24.0	10.0
Nickel µg/L		12.0 B	40.0
Calcium mg/L		353	0.20
Potassium mg/L		1.3 B	3.0
Magnesium mg/L		26.8	0.20
Sodium mg/L		311	5.0
Nitrate plus Nitrite mg/L		3.7	0.10
Chloride mg/L		45.0	15.0
Sulfate mg/L		1270 Q	250
Fluoride mg/L		0.75 B	1.0
Nitrate mg/L		4.1	0.50
TDS mg/L		2440	10.0
Manganese µg/L	11/08/2001	17.6	10.0
Calcium mg/L		351	0.20
Potassium mg/L		1.0 B	3.0
Magnesium mg/L		26.8	0.20
Sodium mg/L		302	5.0
Nitrate plus Nitrite mg/L		4.3	0.10
Chloride mg/L		43.2 J	3.0
Sulfate mg/L		1450 Q	250
Fluoride mg/L		0.48 B	1.0
Nitrate mg/L		4.0	0.50
TDS mg/L		2360	10.0
Manganese µg/L	02/14/2002	25.0	10.0
Calcium mg/L		398	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		31.1	0.20
Sodium mg/L		373	5.0
Nitrate plus Nitrite mg/L		3.9	0.10
Chloride mg/L		44.2 J	3.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	02/14/2002	1430 Q	250
Fluoride mg/L	-continued	0.66 B	1.0
Nitrate mg/L		4.1	0.50
TDS mg/L		2480	10.0
Manganese µg/L	05/16/2002	22.0	10.0
Calcium mg/L		393	0.20
Potassium mg/L		1.4 B	3.0
Magnesium mg/L		31.1	0.20
Sodium mg/L		353	5.0
Nitrate plus Nitrite mg/L		4.5	0.10
Chloride mg/L		42.4	3.0
Sulfate mg/L		1450 Q	250
Fluoride mg/L		0.60 B	1.0
Nitrate mg/L		3.9	0.50
TDS mg/L		2480	10.0
Manganese µg/L	08/08/2002	15.0	10.0
Calcium mg/L		370	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		330	5.0
Nitrate plus Nitrite mg/L		4.3	0.10
Chloride mg/L		45.0	3.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.69 B	1.0
Nitrate mg/L		4.4	0.50
TDS mg/L		2400	10.0
Chromium µg/L	11/21/2002	3.6 B	10.0
Manganese µg/L		20.0	10.0
Calcium mg/L		370	0.20
Potassium mg/L		1.4 B	3.0
Magnesium mg/L		28.0	0.20
Sodium mg/L		310	5.0
Nitrate plus Nitrite mg/L		3.9	0.10
Chloride mg/L		45.0 J	3.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.97 B	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-56 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	11/21/2002	4.4	0.50
TDS mg/L	-continued	2400	10.0
Tetrachloroethene µg/L	02/19/2003	0.27 J	1.0
Chromium µg/L		4.2 B	10.0
Manganese µg/L		24.0	10.0
Nickel µg/L		4.8 B	40.0
Calcium mg/L		380	0.20
Potassium mg/L		2.1 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		350	5.0
Nitrate plus Nitrite mg/L		4.5	0.10
Chloride mg/L		43.0 J	3.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		1.0	1.0
Nitrate mg/L		4.3	0.50
Phosphate as P, Ortho mg/L		0.13 B	0.50
TDS mg/L		2500	10.0
Chromium µg/L	05/15/2003	3.2 B	10.0
Manganese µg/L		16.0	10.0
Calcium mg/L		410	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		330	5.0
Nitrate plus Nitrite mg/L		4.8	0.10
Chloride mg/L		44.0 J	3.0
Sulfate mg/L		1400 Q	250
Nitrate mg/L		4.8	0.50
TDS mg/L		2400	10.0
Chromium µg/L	08/28/2003	2.2 B	10.0
Manganese µg/L		9.8 B,J	10.0
Calcium mg/L		380	0.20
Potassium mg/L		1.2 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		330	5.0
Nitrate plus Nitrite mg/L		4.3	0.10
Chloride mg/L		43.0 J	3.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	08/28/2003	1600 Q	250
Fluoride mg/L	-continued	0.99 B	1.0
Nitrate mg/L		4.3	0.50
TDS mg/L		2600	10.0
Methtlene chloride µg/L	11/19/2003	0.50 J,B	5.0
Manganese µg/L		20.0	10.0
Calcium mg/L		380	0.20
Potassium mg/L		1.0 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		340	5.0
Nitrate plus Nitrite mg/L		4.0	0.10
Chloride mg/L		43.0	3.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		3.0	1.0
Nitrate mg/L		4.6	0.50
TDS mg/L		2500	10.0
Methtlene chloride µg/L	05/05/2004	0.58 J,B	5.0
Chromium µg/L		3.9 B	10.0
Manganese µg/L		14.0	10.0
Calcium mg/L		390	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		340	5.0
Nitrate plus Nitrite mg/L		4.0	0.10
Chloride mg/L		41.0	3.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		0.54 B	1.0
Nitrate mg/L		4.4	0.50
TDS mg/L		2500	10.0
Chromium µg/L	11/15/2004	4.2 B	10.0
Manganese µg/L		20.0	10.0
Nickel µg/L		5.1 B	40.0
Calcium mg/L		420	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		370	5.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-56 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	11/16/2004	3.7	0.10
Chloride mg/L	-continued	43.0 J	3.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		0.67 B	1.0
Nitrate mg/L		4.3	0.50
TDS mg/L		2700	10.0

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-57 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	09/21/1993	6.8	25.0
Benzene µg/L		0.75 J	2.5
1,2-Dichloroethene µg/L		1.2 J	2.5
Methylene chloride µg/L		0.52 J	2.5
Aluminum mg/L		0.12	0.1
Antimony mg/L		0.0032	0.002
Calcium mg/L		324	0.02
Chloride mg/L		84.2	0.5
Fluoride mg/L		3.6	0.5
Iron mg/L		1.5	0.2
Magnesium mg/L		31.2	0.4
Manganese mg/L		6.0	0.02
Molybdenum mg/L		0.013	0.002
Nickel mg/L		0.075	0.002
Sodium mg/L		651	10.0
Sulfate mg/L		2,000	50.0
TDS mg/L		3,500	50.0
Zinc mg/L		1.0	0.04
Carbon disulfide µg/L	05/12/1994	0.22 J	1.0
1,1-Dichloroethane µg/L		1.4	1.0
1,2-Dichloroethene µg/L		0.31 J	1.0
Methylene chloride µg/L		0.54 J	1.0
Antimony mg/L		0.0051	0.001
Barium mg/L		0.013	0.01
Calcium mg/L		327	0.2
Chloride mg/L		80.6	0.5
Chromium mg/L		0.015	0.01
Cobalt mg/L		0.022	0.01
Copper mg/L		0.016	0.01
Magnesium mg/L		30.1	0.2
Manganese mg/L		5.7	0.01
Molybdenum mg/L		0.01	0.001
Nickel mg/L		0.11	0.01
Selenium mg/L		0.0033	0.001
Sodium mg/L		604	5.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/12/1994	1,960	10.0
TDS mg/L	-continued	3,280	50.0
1,1-Dichloroethane µg/L	09/12/1994	1.7	1.0
Methylene chloride µg/L		0.34	1.0
Trichloroethene µg/L		0.22	1.0
1,2-Dichloroethene(cis)µg/L		0.47	1.0
Antimony mg/L		0.0067	0.002
Calcium mg/L		308	5.0
Chloride mg/L		79.2	0.5
Cobalt mg/L		0.03	0.002
Iron mg/L		0.1	0.04
Magnesium mg/L		30.1	5.0
Manganese mg/L		5.6	0.01
Molybdenum mg/L		0.014	0.002
Nickel mg/L		0.1	0.02
Selenium mg/L		0.0043	0.002
Sodium mg/L		715	5.0
Sulfate mg/L		2,220	10.0
TDS mg/L		3,100	50.0
Zinc mg/L		0.11	0.04
2-Butanone (MEK) µg/L	05/23/1995	7.5 J	10.0
1,1-Dichloroethane µg/L		2.4	1.0
1,2-Dichloroethene(cis)µg/L		0.86 J	1.0
Methylene chloride µg/L		0.71 J	1.0
Antimony mg/L		0.0077	0.001
Barium mg/L		0.011	0.01
Calcium mg/L		306	0.01
Chloride mg/L		63.2	0.5
Chromium mg/L		0.02	0.01
Cobalt mg/L		0.025	0.001
Copper mg/L		0.013	0.01
Magnesium mg/L		30.1	0.2
Manganese mg/L		6.0	0.01
Molybdenum mg/L		0.015	0.001

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-57 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nickel mg/L	05/23/1995	0.0023	0.001
Selenium mg/L		0.0054	0.001
Sodium mg/L		737	5.0
Sulfate mg/L		2,000	--
TDS mg/L		2,370	10.0
1,2-Dichloroethane µg/L	09/13/1995	2.3	1.0
Barium mg/L		0.012	0.002
Cadmium mg/L		0.00076	0.006
Chloride mg/L		70.1	1.0
Chromium mg/L		0.013	0.001
Cobalt mg/L		0.027	0.0005
Copper mg/L		0.0062	0.002
Fluoride mg/L		3.9	1.0
Iron mg/L		0.14	0.1
Magnesium mg/L		29.7	0.2
Manganese mg/L		5.3	0.01
Molybdenum mg/L		0.014	0.0002
Nickel mg/L		0.093	0.0002
Potassium mg/L		2.7	5.0
Sodium mg/L		732	5.0
Sulfate mg/L		2,030	5.0
TDS mg/L		3,370	50.0
Acetone µg/L	05/30/1996	1.8 J	10.0
1,1-Dichloroethane µg/L		2.1	1.0
1,2cis-Dichloroethene µg/L		0.65 J	1.0
Methylene chloride µg/L		0.22 J	1.0
Trichloroethene µg/L		0.21 J	1.0
Chloride mg/L		71.7	1.0
Manganese mg/L		5.6	0.01
Nickel mg/L		0.077	0.04
Sulfate mg/L		1,960	5.0
TDS mg/L		3,260	50.0
1,1-Dichloroethane µg/L	09/05/1996	2.8	1.0
1,2cis-Dichloroethene µg/L		0.92 J	1.0
Methylene chloride µg/L		0.31 J	1.0
Tetrachloroethene µg/L		0.25 J	1.0
Chloride mg/L	09/05/1996	82.1	1.0
Manganese mg/L	-continued	5.2	0.01
Nickel mg/L		0.086	0.04
Sulfate mg/L		1,850	5.0
TDS mg/L		3,260	50.0
1,1-Dichloroethane µg/L	03/12/1997	2.1	1.0
1,2cis-Dichloroethene µg/L		0.68 J	1.0
Chloride mg/L		72.7	1.0
Manganese mg/L		4.5	0.01
Nickel mg/L		0.057	0.04
Nitrate as N mg/L		4.4	0.5
Nitrate plus Nitrite mg/L		4.3	0.5
Sulfate mg/L		1,890	5.0
TDS mg/L		3,220	50.0
1,1-Dichloroethane µg/L	05/21/1997	1.9	1.0
1,2cis-Dichloroethene µg/L		0.71 J	1.0
Chloride mg/L		70.5	1.0
Manganese mg/L		5.0	0.01
Nickel mg/L		0.057	0.04
Nitrate plus Nitrite mg/L		0.19	0.5
Sulfate mg/L		1,970	5.0
TDS mg/L		3,150	50.0
Acetone µg/L	09/10/1997	0.098 J	10.0
1,1-Dichloroethene µg/L		2.4 J	1.0
cis-1,3-Dichloropropene µg/L		0.83 J	1.0
Trichloroethene µg/L		0.22 J	1.0
Chloride mg/L		96.9	1.0
Manganese mg/L		6.2	0.01
Nickel mg/L		0.081	0.04
Nitrate as N mg/L		4.4	0.5
Nitrate plus Nitrite mg/L		4.7	0.5
Sulfate mg/L		1,910	5.0
TDS mg/L		3,190	50.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-57 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
1,1-Dichloroethane µg/L	05/19/1998	2.8	1.0
cis-1,2-Dichloroethene µg/L		4.7	0.5
Methylene chloride µg/L		0.27 J	1.0
Tetrachloroethene µg/L		0.15 J	1.0
Trichloroethene µg/L		1.1	1.0
Vinyl chloride µg/L		1.3 J	2.0
Chloride mg/L		197 Q	6.0
Fluoride mg/L		1.3 J	5.0
Manganese mg/L		4.7	0.01
Nickel mg/L		0.055	0.04
Sulfate mg/L		1,740 Q	125
TDS mg/L		2,880 Q	50.0
Benzene µg/L	09/01/1998	0.31 J	1.0
Chloroethane µg/L		0.14 J	2.0
1,1-Dichloroethane µg/L		3.0	1.0
1,2-Dichloroethene TOTAL µg/L		9.1	1.0
Methylene chloride µg/L		0.64 J	1.0
Trichloroethene µg/L		2.7	1.0
Vinyl chloride µg/L		3.0	2.0
Chloride mg/L		368 Q	30.0
Fluoride mg/L		1.3 JG	2.0
Manganese mg/L		6.4	0.01
Nickel mg/L		0.055	0.04
Sulfate mg/L		1,820 Q	250
TDS mg/L		2,820	10.0
Benzene µg/L	06/08/1999	0.53 J	1.0
1,1-Dichloroethane µg/L		2.7	1.0
cis-1,2-Dichloroethene µg/L		14	1.0
1,2-Dichloroethene µg/L		14	1.0
Methylene chloride µg/L		0.60 JB	1.0
Tetrachloroethene µg/L		0.26 J	1.0
Trichloroethene µg/L		4.6	1.0
Vinyl chloride µg/L		3.1	2.0
Manganese mg/L		7.2	0.01
Nickel mg/L		0.084	0.04
Chloride mg/L		487 Q	150
Fluoride mg/L		0.61 JG	2.0

Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	06/08/1999	0.014 J	0.10
Sulfate mg/L	-continued	1,830 Q	250
TDS mg/L		3,670	10.0
Benzene µg/L	11/17/1999	0.37 J	1.0
1,1-Dichloroethane µg/L		2.7	1.0
cis-1,2-Dichloroethene µg/L		11	1.0
1,2-Dichloroethene totalµg/L		11	1.0
Methylene chloride µg/L		0.41 J	1.0
Tetrachloroethene µg/L		0.18 J	1.0
Trichloroethene µg/L		3.4	1.0
Vinyl chloride µg/L		2.6	2.0
Chloride mg/L		482 Q	150
Fluoride mg/L		0.49 B,G	2.0
Manganese mg/L		7.1	0.015
Nickel mg/L		0.068	0.040
Nitrate plus Nitrite mg/L		0.013 B	0.10
Sulfate mg/L		1860 Q	250
TDS mg/L		2040	10.0
Benzene µg/L	04/10/2000	0.28	1.0
1,1-Dichloroethane µg/L		2.1	1.0
cis-1,2-Dichloroethene µg/L		7.1	1.0
Trichloroethene µg/L		2.4	1.0
Vinyl chloride µg/L		2.3	1.0
Manganese µg/L		5320	10.0
Nickel µg/L		91.2	40.0
Chloride mg/L		362 Q	30.0
Sulfate mg/L		1850	50
TDS mg/L		3470	10.0
Benzene µg/L	06/01/2000	0.30 J	1.0
1,1-Dichloroethane µg/L		2.5	1.0
cis-1,2-Dichloroethene µg/L		8.1	1.0
Trichloroethene µg/L		2.6	1.0
Vinyl chloride µg/L		2.4	1.0
Manganese µg/L		7140	10.0
Nickel µg/L		74.2	40.0
Calcium mg/L		387	0.20

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-57 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Potassium mg/L	06/01/2000	3.2	3.0
Magnesium mg/L	-continued	45.3	0.20
Sodium mg/L		722	5.0
Nitrate plus Nitrite mg/L		0.092 B	0.10
Chloride mg/L		416 Q	30.0
Fluoride mg/L		0.73 B,G	2.0
Sulfate mg/L		1880 Q	250
TDS mg/L		3620	10.0
Benzene µg/L	08/15/2000	0.24	1.0
1,1-Dichloroethane µg/L		2.0	1.0
cis-1,2-Dichloroethene µg/L		6.1	1.0
Trichloroethene µg/L		2.2	1.0
Vinyl chloride µg/L		1.6	1.0
Manganese µg/L		6160	10.0
Nickel µg/L		61.1	40.0
Calcium mg/L		346	0.02
Magnesium mg/L		40.6	0.20
Sodium mg/L		654	5.0
Nitrate plus Nitrite mg/L		ND	0.10
Chloride mg/L		318 Q	30.0
Fluoride mg/L		0.55 B	1.0
Sulfate mg/L		1470 Q	250
Phosphate as P, Ortho mg/L		1.7 B,G	2.5
TDS mg/L		3490	10.0
Benzene µg/L	11/16/2000	0.27 J	1.0
1,1-Dichloroethane µg/L		2.4	1.0
cis-1,2-Dichloroethene µg/L		5.9	1.0
Methylene chloride µg/L		0.20 J	1.0
Trichloroethene µg/L		1.9	1.0
Vinyl chloride µg/L		1.9 J	1.0
Manganese µg/L		6400	10.0
Nickel µg/L		61.0	40.0
Calcium mg/L		349	0.20
Potassium mg/L		3.1	3.0
Magnesium mg/L		40.4	0.20
Sodium mg/L		647	5.0
Nitrate plus Nitrite mg/L		0.11	0.10

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	11/16/2000	288 Q	30.0
Fluoride mg/L	-continued	0.41 B,G	2.0
Sulfate mg/L		1700 Q	250
TDS mg/L		3460	10.0
1,1-Dichloroethane µg/L	03/06/2001	1.7	1.0
cis-1,2-Dichloroethene µg/L		3.3	1.0
Trichloroethene µg/L		1.0	1.0
Vinyl chloride µg/L		0.77 J	1.0
Manganese µg/L		5200	10.0
Nickel µg/L		47.0	40.0
Calcium mg/L		353	0.20
Potassium mg/L		3.0	3.0
Magnesium mg/L		38.8	0.20
Sodium mg/L		641	5.0
Chloride mg/L		235 Q	60.0
Fluoride mg/L		0.25 B	1.0
Sulfate mg/L		1640 Q	250
TDS mg/L		3350	10.0
Acetone µg/L	05/23/2001	26.0	10.0
Bromoform µg/L		0.44 J	1.0
1,1-Dichloroethane µg/L		1.5	1.0
cis-1,2-Dichloroethene µg/L		2.5	1.0
Trichloroethene µg/L		0.87 J	1.0
Vinyl chloride µg/L		0.67 J	1.0
Manganese µg/L		5800	10.0
Nickel µg/L		52.0	40.0
Calcium mg/L		323	0.20
Potassium mg/L		2.8 B	3.0
Magnesium mg/L		621	0.20
Sodium mg/L		621	5.0
Nitrate plus Nitrite mg/L		0.038 B	0.10
Chloride mg/L		212 Q	60.0
Fluoride mg/L		0.44 B, G	1.0
Sulfate mg/L		1620 Q	250
TDS mg/L		3220	10.0

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Analyte and unit	Date sampled	Result	RL
1,1-Dichloroethane µg/L	08/15/2001	1.9	1.0
1,2-Dichloroethene µg/L		0.26 J	1.0
cis-1,2-Dichloroethene µg/L		2.4	1.0
Trichloroethene µg/L		0.75 J	1.0
Vinyl chloride µg/L		0.67 J	1.0
Manganese µg/L		5900	10.0
Calcium mg/L		311	0.20
Potassium mg/L		2.8 B	3.0
Magnesium mg/L		36.7	0.20
Sodium mg/L		648	5.0
Chloride mg/L		266 Q	60.0
Fluoride mg/L		0.97 B, G	1.0
Sulfate mg/L		1890 Q	250
TDS mg/L		3350	10.0
1,1-Dichloroethane µg/L	11/08/2001	1.0	1.0
1,2-Dichloroethene µg/L		1.2	1.0
cis-1,2-Dichloroethene µg/L		1.2	1.0
Trichloroethene µg/L		0.36 J	1.0
Vinyl chloride µg/L		0.43 J	1.0
Manganese µg/L		4850	10.0
Nickel µg/L		39.7 B	40.0
Calcium mg/L		301	0.20
Potassium mg/L		2.4 B	3.0
Magnesium mg/L		31.7	0.20
Sodium mg/L		541	5.0
Chloride mg/L		150 J, Q	30.0
Fluoride mg/L		0.51 B	1.0
Sulfate mg/L		1680 Q	250
TDS mg/L		3980	10.0
Manganese µg/L	02/14/2002	4900	10.0
Nickel µg/L		38.0 B	40.0
Calcium mg/L		316	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		32.7	0.20
Sodium mg/L		564	5.0
Chloride mg/L		165 Q	30.0
Fluoride mg/L		0.79 B	1.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	02/14/2002	1650 Q	250
TDS mg/L	-continued	3040	10.0
1,1-Dichloroethane µg/L	05/16/2002	1.2	1.0
cis-1,2-Dichloroethene µg/L		1.0	1.0
Trichloroethene µg/L		0.31 J	1.0
Manganese µg/L		5700	10.0
Nickel µg/L		39.0 B	40.0
Calcium mg/L		321	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		37.2	0.20
Sodium mg/L		643	5.0
Nitrate plus Nitrite mg/L		0.037 B	0.10
Chloride mg/L		90.8 Q	30.0
Fluoride mg/L		0.85 B, G	1.0
Sulfate mg/L		1570 Q	250
TDS mg/L		2740	10.0
1,1-Dichloroethane µg/L	08/08/2002	0.77 J	1.0
cis-1,2-Dichloroethene µg/L		0.67 J	1.0
Manganese µg/L		4900	10.0
Nickel µg/L		41.0	40.0
Calcium mg/L		290	0.20
Potassium mg/L		3.2 B	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		560	5.0
Chloride mg/L		130 Q	30.0
Fluoride mg/L		0.85 B, G	1.0
Sulfate mg/L		1600 Q	250
TDS mg/L		2900	10.0
1,1-Dichloroethane µg/L	11/21/2002	1.7	1.0
cis-1,2-Dichloroethene µg/L		1.2	1.0
Trichloroethene µg/L		0.33 J	1.0
Manganese µg/L		5100	10.0
Nickel µg/L		37.0 B	40.0
Calcium mg/L		300	0.20
Potassium mg/L		2.6 B	3.0
Magnesium mg/L		32.0	0.20

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-57 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Sodium mg/L	11/21/2002	550	5.0
Chloride mg/L	-continued	170 J, Q	30.0
Fluoride mg/L		1.0 B,G	2.0
Sulfate mg/L		1700 Q	250
TDS mg/L		3000	10.0
1,1-Dichloroethane µg/L	02/19/2003	1.3	1.0
cis-1,2-Dichloroethene µg/L		0.72 J	1.0
Trichloroethene µg/L		0.21 J	1.0
Chromium µg/L		1.2 B	10.0
Manganese µg/L		5200	10.0
Nickel µg/L		39.0 B	40.0
Calcium mg/L		310	0.20
Potassium mg/L		3.1 B	3.0
Magnesium mg/L		35.0	0.20
Sodium mg/L		600	5.0
Chloride mg/L		150 Q	30.0
Fluoride mg/L		1.2 B,G	1.0
Sulfate mg/L		1700 Q	250
TDS mg/L		3000	10.0
1,1-Dichloroethane µg/L	05/15/2003	1.3	1.0
cis-1,2-Dichloroethene µg/L		0.77 J	1.0
Trichloroethene µg/L		0.20 J	1.0
Manganese µg/L		4900	10.0
Nickel µg/L		36.0 B	40.0
Calcium mg/L		320	0.20
Potassium mg/L		2.7 B	3.0
Magnesium mg/L		34.0	0.20
Sodium mg/L		580	5.0
Chloride mg/L		120 Q	30.0
Sulfate mg/L		1700 Q	250
TDS mg/L		2900	10.0
1,1-Dichloroethane µg/L	08/28/2003	0.92 J	1.0
cis-1,2-Dichloroethene µg/L		0.50 J	1.0
Manganese µg/L		4800 J	10.0
Nickel µg/L		81.0	40.0
Calcium mg/L		320	0.20

Analyte and unit	Date sampled	Result	RL
Potassium mg/L	08/28/2003	3.1 B	3.0
Magnesium mg/L	-continued	34.0	0.20
Sodium mg/L		590	5.0
Chloride mg/L		110 Q	30.0
Fluoride mg/L		1.5 B,G	2.0
Sulfate mg/L		1700 Q	250
TDS mg/L		2900 Q	20.0
1,1-Dichloroethane µg/L	11/19/2003	1.2	1.0
cis-1,2-Dichloroethene µg/L		0.66 J	1.0
Methylene chloride µg/L		0.52 J,B	5.0
Manganese µg/L		4300	10.0
Nickel µg/L		32.0 B	40.0
Calcium mg/L		310	0.20
Potassium mg/L		2.7 B	3.0
Magnesium mg/L		34.0	0.20
Sodium mg/L		550	5.0
Chloride mg/L		120 Q	30.0
Fluoride mg/L		1.8 G	1.0
Sulfate mg/L		1800 Q	250
TDS mg/L		2900	10.0
1,1-Dichloroethane µg/L	05/05/2004	1.1	1.0
cis-1,2-Dichloroethene µg/L		0.52 J	1.0
Methylene chloride µg/L		0.61 J,B	5.0
Manganese µg/L		5100	10.0
Nickel µg/L		35.0 B	40.0
Calcium mg/L		330	0.20
Potassium mg/L		2.9 B	3.0
Magnesium mg/L		36.0	0.20
Sodium mg/L		580	5.0
Chloride mg/L		110 Q	30.0
Fluoride mg/L		0.77 B,G	1.0
Sulfate mg/L		1900 Q	250
TDS mg/L		2800	10.0
Acetone µg/L	11/16/2004	2.5 J	10.0
1,1-Dichloroethane µg/L		0.87 J	1.0
cis-1,2-Dichloroethene µg/L		0.39 J	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-57 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chromium µg/L	11/16/2004	1.8 B	10.0
Manganese µg/L	-continued	4900	10.0
Nickel µg/L		36.0 B	40.0
Calcium mg/L		330	0.20
Potassium mg/L		3.0	3.0
Magnesium mg/L		35.0	0.20
Sodium mg/L		550	5.0
Chloride mg/L		100 J,Q	30.0
Fluoride mg/L		0.66 B	1.0
Sulfate mg/L		2000 Q	250
TDS mg/L		3000	10.0

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-60 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	09/21/1993	1.7 J	10.0
1,2-Dichloroethene µg/L		0.29 J	1.0
Ethylbenzene µg/L		0.67 J	1.0
Tetrachloroethene µg/L		0.37 J	1.0
Toluene µg/L		2.2	1.0
Xylenes (total) µg/L		4.3	1.0
Antimony mg/L		0.011	0.001
Calcium mg/L		355	0.01
Chloride mg/L		72.1	0.5
Fluoride mg/L		2.8	0.5
Iron mg/L		0.36	0.1
Magnesium mg/L		24.9	0.2
Manganese mg/L		1.1	0.01
Molybdenum mg/L		0.012	0.001
Nitrate as N mg/L		3.0	0.5
Nitrate plus Nitrite mg/L		2.9	0.1
Selenium mg/L		0.003	0.001
Sodium mg/L		307	5.0
Sulfate mg/L		1290	5.0
TDS mg/L		2320	10.0
Zinc mg/L		0.8	0.02
Acetone µg/L	05/12/1994	20.0	10.0
Tetrachloroethene µg/L		0.78	1.0
Toluene µg/L		1.1	1.0
Trichloroethene µg/L		0.29	1.0
Pentane, 2-methyl- µg/L		22.0	2.0
Pentane, 3-methyl- µg/L		46.0	2.0
Hexane µg/L		150	3.0
Antimony mg/L		0.0064	0.002
Calcium mg/L		349	0.2
Chloride mg/L		76.1	0.5
Chromium mg/L		0.021	0.01
Magnesium mg/L		24.3	0.2
Manganese mg/L		0.45	0.01
Molybdenum mg/L		0.0049	0.001

Analyte and unit	Date sampled	Result	RL
Nickel mg/L	05/12/1994	0.052	0.01
Nitrate as N mg/L	-continued	2.8	0.5
Nitrate plus Nitrite mg/L		2.7	0.1
Selenium mg/L		0.012	0.006
Sodium mg/L		329	5.0
Sulfate mg/L		1290	5.0
TDS mg/L		2280	10.0
Vanadium mg/L		0.01	0.01
1,2-Dichloroethene(cis)µg/L	09/10/1994	0.27	1.0
Tetrachloroethene µg/L		0.44 J	1.0
Trichloroethene µg/L		1.1	1.0
Antimony mg/L		0.0056	0.002
Chloride mg/L		86.3	0.5
Cobalt mg/L		0.0067	0.002
Fluoride mg/L		2.7	1.0
Magnesium mg/L		28.4	5.0
Manganese mg/L		0.5	0.01
Molybdenum mg/L		0.005	0.002
Nickel mg/L		0.043	0.02
Nitrate as N mg/L		2.3	0.1
Nitrate plus Nitrite mg/L		2.7	0.1
Selenium mg/L		0.0063	0.002
Sodium mg/L		340	5.0
Sulfate mg/L		1460	5.0
TDS mg/L		2350	50.0
2-Butanone (MEK) µg/L	05/24/1995	8.6 J	10.0
1,2-Dichloroethene(cis) µg/L		0.50 J	1.0
Methylene chloride µg/L		0.57 J	1.0
Tetrachloroethene µg/L		0.78 J	1.0
Antimony mg/L		0.0083	0.001
Calcium mg/L		379	0.01
Chloride mg/L		74.6	0.5
Chromium mg/L		0.018	0.01
Cobalt mg/L		0.0074	0.001

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-60 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Magnesium mg/L	05/24/1995	29.5	0.2
Manganese mg/L	-continued	0.39	0.01
Molybdenum mg/L		0.0057	0.001
Nickel mg/L		0.038	0.001
Nitrate as N mg/L		2.4	0.5
Nitrate plus Nitrite mg/L		2.5	0.1
Selenium mg/L		0.0061	0.001
Sodium mg/L		357	5.0
Sulfate mg/L		1360	--
TDS mg/L		2410	10.0
2-Butanone (MEK) µg/L	09/14/1995	4.5 J	10.0
1,2cis-Dichloroethene µg/L		0.33 J	1.0
Methylene chloride µg/L		0.31 J	1.0
Tetrachloroethene µg/L		0.65 J	1.0
Barium mg/L		0.0074	0.002
Calcium mg/L		350	0.2
Chloride mg/L		58.6	1.0
Chromium mg/L		0.03	0.001
Cobalt mg/L		0.0076	0.0005
Copper mg/L		0.0062	0.002
Fluoride mg/L		2.9	1.0
Magnesium mg/L		27.6	0.2
Manganese mg/L		0.38	0.01
Molybdenum mg/L		0.0053	0.0002
Nickel mg/L		0.028	0.0002
Nitrate as N mg/L		2.1	0.5
Nitrate plus Nitrite mg/L		2.3	0.5
Potassium mg/L		1.7	5.0
Selenium mg/L		0.0052	0.005
Sodium mg/L		326	5.0
Sulfate mg/L		1380	5.0
TDS mg/L		2480	50.0
Vanadium mg/L		0.0078	0.0005
1,2cis-Dichloroethene µg/L	05/30/1996	0.22 J	1.0
Methylene chloride µg/L		0.34 J	1.0
Tetrachloroethene µg/L		0.59 J	1.0

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	05/30/1996	57.4	1.0
Fluoride mg/L	-continued	3.2	1.0
Manganese mg/L		0.25	0.01
Nitrate as N mg/L		2.2	0.5
Nitrate plus Nitrite mg/L		2.4	0.5
Sulfate mg/L		1540	5.0
TDS mg/L		2510	50.0
Tetrachloroethene µg/L	09/05/1996	0.31 J	1.0
Xylenes (total) µg/L		0.30 J	1.0
Chloride mg/L		44.0	1.0
Manganese mg/L		0.77	0.01
Nitrate as N mg/L		1.9	0.5
Nitrate plus Nitrite mg/L		2.2	0.5
Sulfate mg/L		1640	5.0
TDS mg/L		2620	50.0
Tetrachloroethene µg/L	05/21/1997	0.28 J	1.0
Chloride mg/L		45.3	1.0
Manganese mg/L		0.85	0.01
Nitrate as N mg/L		1.8	0.5
Nitrate plus Nitrite mg/L		2.0	0.5
Sulfate mg/L		1660	5.0
TDS mg/L		2720	50.0
Tetrachloroethene µg/L	09/10/1997	0.41 J	1.0
Chloride mg/L		528	1.0
Manganese mg/L		0.33	0.01
Nitrate as N mg/L		19.6	0.5
Nitrate plus Nitrite mg/L		19.3	0.5
Sulfate mg/L		1390	5.0
TDS mg/L		3160	50.0
Methylene chloride µg/L	05/19/1998	0.24 J	1.0
Tetrachloroethene µg/L		0.4 J	1.0
Chloride mg/L		239 Q	15.0
Fluoride mg/L		1.2BG	5.0
Manganese mg/L		0.13	0.01

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-60 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nickel mg/L	05/19/1998	0.099	0.04
Nitrate as N mg/L	-continued	13.1 Q	2.5
Nitrate plus Nitrite mg/L		13.6 Q	1.0
Sulfate mg/L		1500 Q	125
TDS mg/L		2850 Q	50.0
Tetrachloroethene µg/L	09/02/1998	0.2 J	1.0
Chloride mg/L		78.6 Q	15.0
Fluoride mg/L		0.77 J	1.0
Manganese mg/L		0.29	0.01
Nickel mg/L		0.029 J	0.04
Nitrate as N mg/L		4.5	0.5
Nitrate plus Nitrite mg/L		4.6 Q	0.5
Sulfate mg/L		1640 Q	250
TDS mg/L		2840	10.0
Acetone µg/L	06/08/1999	2.7 J	10
Tetrachloroethene µg/L		0.37 J	1.0
Manganese mg/L		0.075	0.010
Nickel mg/L		0.095	0.040
Chloride mg/L		232 Q	30.0
Fluoride mg/L		0.95JG	2.0
Nitrate mg/L		13.0 Q	1.0
Nitrate plus Nitrite mg/L		14.3	0.50
Sulfate mg/L		1370 Q	250
TDS mg/L		2820	10.0
Tetrachloroethene µg/L	11/18/1999	0.31 J	1.0
Chloride mg/L		158 Q	15.0
Fluoride mg/L		0.90 B	1.0
Manganese mg/L		0.030	0.015
Nickel mg/L		0.062	0.040
Nitrate mg/L		9.1 Q	2.5
Nitrate plus Nitrite mg/L		9.5 Q	0.50
Sulfate mg/L		1260 Q	250
TDS mg/L		2490	10.0

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	05/31/2000	2.5 J	10.0
Manganese µg/L		38.2	10.0
Nickel µg/L		51.5	40.0
Calcium mg/L		344	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		27.7	0.20
Sodium mg/L		367	5.0
Nitrate plus Nitrite mg/L		9.1 Q	0.50
Chloride mg/L		144 Q	15.0
Sulfate mg/L		1210 Q	250
Fluoride mg/L		0.63 B	1.0
Nitrate mg/L		9.5	0.50
TDS mg/L		2400	10.0
Tetrachloroethene µg/L	11/15/2000	0.36 J	1.0
Manganese µg/L		76.8	10.0
Nickel µg/L		35.4 B	40.0
Calcium mg/L		350	0.20
Potassium mg/L		0.94 B	3.0
Magnesium mg/L		28.2	0.20
Sodium mg/L		363	5.0
Nitrate plus Nitrite mg/L		9.8 Q	0.50
Chloride mg/L		94.6 Q	15.0
Sulfate mg/L		1180 Q	250
Nitrate mg/L		6.6	0.50
TDS mg/L		2340	10.0
Acetone µg/L	05/22/2001	25.0	10.0
Methylene chloride µg/L		2.0	1.0
Manganese µg/L		33.0	10.0
Nickel µg/L		32.0 B	40.0
Calcium mg/L		325	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		25.4	0.20
Sodium mg/L		323	5.0
Nitrate plus Nitrite mg/L		6.6	0.10
Chloride mg/L		91.9 Q	3.0
Sulfate mg/L		1230 Q	250

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-60 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/22/2001	1230 Q	250
Fluoride mg/L	-continued	0.57 B	1.0
Nitrate mg/L		6.9	0.50
TDS mg/L		2440	10.0
Manganese µg/L	11/08/2001	47.5	10.0
Nickel µg/L		15.4 B	40.0
Calcium mg/L		346	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		340	5.0
Nitrate plus Nitrite mg/L		65.2	0.10
Chloride mg/L		59.0 Q	15.0
Sulfate mg/L		1370 Q	250
Fluoride mg/L		0.47 B	1.0
Nitrate mg/L		4.8	0.50
TDS mg/L		2380	10.0
Manganese µg/L	05/15/2002	65.0	10.0
Nickel µg/L		9.7 B	40.0
Calcium mg/L		360	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		28.5	0.20
Sodium mg/L		353	5.0
Nitrate plus Nitrite mg/L		5.0	0.10
Chloride mg/L		50.0 Q	3.0
Sulfate mg/L		1440 Q	250
Fluoride mg/L		0.59 B	1.0
Nitrate mg/L		3.8	0.50
TDS mg/L		2450	10.0
Acetone µg/L	11/19/2002	3.0 J	10
Manganese µg/L		16.0	10.0
Calcium mg/L		360 J	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		320	5.0
Nitrate plus Nitrite mg/L		3.4	0.10

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	11/19/2002	49.0 Q	3.0
Sulfate mg/L	-continued	1440 Q	500
Fluoride mg/L		0.88 B	1.0
Nitrate mg/L		3.8	0.50
TDS mg/L		2400	10.0
Acetone µg/L	05/13/2003	2.6 J	10.0
Methylene chloride µg/L		0.70 J	5.0
Manganese µg/L		120	10.0
Calcium mg/L		370	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		4.0	0.10
Chloride mg/L		48.0 Q	3.0
Sulfate mg/L		1500 Q	250
Nitrate mg/L		4.0	0.50
TDS mg/L		2600	10.0
Methylene chloride µg/L	11/18/2003	0.46 J,B	5.0
Manganese µg/L		190	10.0
Calcium mg/L		380	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		3.4	0.10
Chloride mg/L		46.0 Q	3.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		0.94 B	1.0
Nitrate mg/L		3.5	0.50
Phosphate as P, Ortho mg/L		0.28 B	0.50
TDS mg/L		2800	10.0
Methylene chloride µg/L	05/04/2004	0.58 J,B	5.0
Manganese µg/L		150	10.0
Calcium mg/L		380	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		29.0	0.20

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-60 at Lee Acres Landfill site, northwestern. New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Sodium mg/L	05/04/2004	360	5.0
Nitrate plus Nitrite mg/L	-continued	3.7	0.10
Chloride mg/L		45.0 Q	3.0
Sulfate mg/L		1600 Q	250
Nitrate mg/L		3.8	0.50
TDS mg/L		2600	10.0
Manganese µg/L	11/17/2004	290	10.0
Nickel µg/L		4.4 B	40.0
Calcium mg/L		430	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		400	5.0
Nitrate plus Nitrite mg/L		3.3	0.10
Chloride mg/L		46.0 Q	15.0
Sulfate mg/L		1900 Q	250
Fluoride mg/L		0.58 B	1.0
Nitrate mg/L		3.3	0.50
TDS mg/L		2800	10.0

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-62 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
1,1-Dichloroethene µg/L	06/09/1999	0.32 J	1.0
cis-1,2-Dichloroethene µg/L		0.18 J	1.0
Methylene chloride µg/L		6.1 B	1.0
Manganese µg/L		900	10.0
Nickel µg/L		16.0 B	40.0
Nitrate plus Nitrite mg/L		0.028	0.10
Chloride mg/L		60.5	6.0
Fluoride mg/L		1.9 B,G	2.0
Sulfate mg/L		2320 Q	250
Nitrate mg/L		0.52 B,G	1.0
TDS mg/L		3750	10.0
Chloroform µg/L	11/18/1999	0.16 J	1.0
Tetrachloroethene µg/L		0.19 J	1.0
Manganese µg/L		350	15.0
Nickel µg/L		8.9 B	40.0
Nitrate plus Nitrite mg/L		0.023 B	0.10
Chloride mg/L		47.6	3.0
Fluoride mg/L		1.2	1.0
Nitrate plus Nitrite mg/L		0.023 B	0.10
Sulfate mg/L		2330 Q	250
Nitrate mg/L		0.24 B	0.50
TDS mg/L		2130	10.0
Manganese µg/L	05/31/2000	384	10.0
Calcium mg/L		472	0.20
Potassium mg/L		5.4	3.0
Magnesium mg/L		33.2	0.20
Sodium mg/L		651	5.0
Nitrate plus Nitrite mg/L		0.014 B	0.10
Chloride mg/L		23.0 G	6.0
Sulfate mg/L		2380 Q	500
Fluoride mg/L		1.3 B,G	2.0
TDS mg/L		3900	10.0

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	11/16/2000	1.7 J,B	10
2-Butanone (MEK) µg/L		1.4	10
Manganese µg/L		210	10.0
Calcium mg/L		457	0.20
Potassium mg/L		5.2	3.0
Magnesium mg/L		33.2	0.20
Sodium mg/L		633	5.0
Nitrate plus Nitrite mg/L		0.046 B	0.10
Chloride mg/L		23.1 G	6.0
Sulfate mg/L		2460 Q	250
Fluoride mg/L		0.49 B,G	2.0
Nitrate mg/L		0.37 B,G	1.0
TDS mg/L		3820	10.0
Acetone µg/L	05/22/2001	35	10.0
Bromoform µg/L		0.55 J	1.0
Methylene chloride µg/L		1.4	1.0
Manganese µg/L		120	10.0
Nickel µg/L		5.5 B	40.0
Calcium mg/L		439	0.20
Potassium mg/L		4.4	3.0
Magnesium mg/L		30.8	0.20
Sodium mg/L		594	5.0
Nitrate plus Nitrite mg/L		0.23	0.10
Chloride mg/L		36.8 G	3.0
Sulfate mg/L		2430 Q	250
Fluoride mg/L		0.88 B, G	1.0
TDS mg/L		3860	10.0
Methyl tert-butyl ether µg/L	11/07/2001	2.4 J	5.0
Manganese µg/L		87.1	10.0
Calcium mg/L		467	0.20
Potassium mg/L		5.0	3.0
Magnesium mg/L		33.2	0.20
Sodium mg/L		636	5.0
Nitrate plus Nitrite mg/L		0.12	0.10

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-62 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	11/07/2001	32.6 G	3.0
Sulfate mg/L	-continued	2400 Q	250
Fluoride mg/L		0.85 B, G	1.0
TDS mg/L		3800	10.0
Manganese µg/L	05/15/2002	120	10.0
Nickel µg/L		6.9 B	40.0
Calcium mg/L		497	0.20
Potassium mg/L		5.9	3.0
Magnesium mg/L		36.6	0.20
Sodium mg/L		667	5.0
Nitrate plus Nitrite mg/L		0.0069 B	0.10
Chloride mg/L		36.0 G	3.0
Sulfate mg/L		2460 Q	250
Fluoride mg/L		1.1 B, G	1.0
TDS mg/L		3710	10.0
Manganese µg/L	11/20/2002	190	10.0
Calcium mg/L		550	0.20
Potassium mg/L		4.9	3.0
Magnesium mg/L		37.0	0.20
Sodium mg/L		680	5.0
Nitrate plus Nitrite mg/L		0.013 B	0.10
Chloride mg/L		37.0 J,G	6.0
Sulfate mg/L		2900 Q	500
Fluoride mg/L		1.5 B, G	2.0
Phosphate as P, Ortho mg/L		0.47 B, G	1.0
TDS mg/L		4400	10.0
Chloroform µg/L	05/15/2003	0.18 J	1.0
Manganese µg/L		97.0	10.0
Calcium mg/L		540	0.20
Potassium mg/L		4.6	3.0
Magnesium mg/L		36.0	0.20
Sodium mg/L		670	5.0
Nitrate plus Nitrite mg/L		0.021 B	0.10
Chloride mg/L		42.0 G	6.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/15/2003	2500 Q	250
TDS mg/L	-continued	3400	10.0
Methylene chloride µg/L	11/19/2003	0.74 J,B	5.0
Manganese µg/L		76.0	10.0
Calcium mg/L		480	0.20
Potassium mg/L		5.2	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		670	5.0
Chloride mg/L		32.0 G	6.0
Sulfate mg/L		2700 Q	500
Fluoride mg/L		5.6 G	2.0
TDS mg/L		3200 Q	10.0
Chromium µg/L	05/06/2004	2.6 B	10.0
Manganese µg/L		33.0	10.0
Calcium mg/L		500	0.20
Potassium mg/L		5.0	3.0
Magnesium mg/L		37.0	0.20
Sodium mg/L		680	5.0
Nitrate plus Nitrite mg/L		0.0031 B	0.10
Chloride mg/L		29.0 G	6.0
Sulfate mg/L		2800 Q	500
TDS mg/L		4000	10.0
Acetone µg/L	11/17/2004	5.2 B	10.0
Chromium µg/L		2.0 B	10.0
Manganese µg/L		30.0	10.0
Nickel µg/L		2.6 B	40.0
Calcium mg/L		530	0.20
Potassium mg/L		5.1	3.0
Magnesium mg/L		36.0	0.20
Sodium mg/L		690	5.0
Chloride mg/L		19.0	3.0
Sulfate mg/L		2100 Q	250
Fluoride mg/L		0.60 B	1.0
Nitrate mg/L		0.20 B	0.50
TDS mg/L		3000	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-67 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Antimony mg/L	09/21/1993	0.007	0.001
Barium mg/L		0.015	0.01
Cadmium mg/L		0.001	0.001
Calcium mg/L		336	0.01
Chloride mg/L		71.4	0.5
Cobalt mg/L		0.01	0.001
Fluoride mg/L		2.6	0.5
Iron mg/L		0.36	0.1
Magnesium mg/L		23.3	0.2
Manganese mg/L		0.8	0.01
Molybdenum mg/L		0.0074	0.001
Nickel mg/L		0.011	0.001
Nitrate as N mg/L		2.7	0.5
Nitrate plus Nitrite mg/L		3.7	0.1
Potassium mg/L		6.4	5.0
Sodium mg/L		286	5.0
Sulfate mg/L		1240	5.0
TDS mg/L		2140	10.0
Zinc mg/L		1.2	0.02
Methylene chloride µg/L	05/12/1994	0.21	1.0
Antimony mg/L		0.0031	0.002
Calcium mg/L		342	0.2
Chloride mg/L		61.6	0.5
Chromium mg/L		0.023	0.02
Cobalt mg/L		0.011	0.01
Magnesium mg/L		25.8	0.2
Manganese mg/L		0.29	0.01
Molybdenum mg/L		0.0054	0.002
Nickel mg/L		0.048	0.02
Nitrate as N mg/L		2.8	0.5
Nitrate plus Nitrite mg/L		2.7	0.1
Selenium mg/L		0.0058	0.002
Sodium mg/L		320	5.0
Sulfate mg/L		1230	5.0
TDS mg/L		2140	20.0

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	05/24/1995	1.5 J	10.0
2-Butanone (MEK) µg/L		9.6 J	10.0
4-Methyl-2-pentanone (MIBK) µg/L		0.59 J	10.0
Antimony mg/L		0.0047	0.001
Barium mg/L		0.012	0.01
Cadmium mg/L		0.0011	0.001
Calcium mg/L		321	0.01
Chloride mg/L		65.3	0.5
Chromium mg/L		0.022	0.01
Cobalt mg/L		0.0048	0.001
Magnesium mg/L		24.5	0.2
Manganese mg/L		0.1	0.01
Molybdenum mg/L		0.0049	0.001
Nickel mg/L		0.035	0.001
Nitrate as N mg/L		2.8	0.5
Nitrate plus Nitrite mg/L		3.1	0.1
Selenium mg/L		0.0053	0.001
Sodium mg/L		319	5.0
Sulfate mg/L		1250	5.0
TDS mg/L		2260	10.0
Barium mg/L	09/15/1995	0.014	0.002
Cadmium mg/L		0.00072	0.006
Calcium mg/L		336	0.2
Chloride mg/L		55.3	1.0
Chromium mg/L		0.042	0.001
Cobalt mg/L		0.0042	0.0005
Copper mg/L		0.0067	0.002
Fluoride mg/L		2.7	1.0
Magnesium mg/L		25.4	0.2
Manganese mg/L		0.051	0.01
Molybdenum mg/L		0.0045	0.0002
Nickel mg/L		0.031	0.0002
Nitrate as N mg/L		2.7	0.5
Nitrate plus Nitrite mg/L		2.8	0.5

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-67 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Potassium mg/L	09/15/1995	1.1	5.0
Selenium mg/L	-continued	0.0051	0.005
Sodium mg/L		314	5.0
Sulfate mg/L		1360	5.0
TDS mg/L		2310	50.0
Vanadium mg/L		0.00068	0.0005
Acetone µg/L	05/31/1996	2.6	10.0
Chloride mg/L		52.0	1.0
Fluoride mg/L		2.8	1.0
Manganese mg/L		0.81	0.01
Nitrate as N mg/L		2.0	0.5
Nitrate plus Nitrite mg/L		2.1	0.5
Sulfate mg/L		1300	5.0
TDS mg/L		2190	50.0
Chloride mg/L	09/06/1996	57.4	1.0
Manganese mg/L		0.55	0.01
Nitrate as N mg/L		1.9	0.5
Nitrate plus Nitrite mg/L		2.2	0.5
Sulfate mg/L		1320	5.0
TDS mg/L		2200	50.0
Chloride mg/L	05/22/1997	54.7	1.0
Manganese mg/L		0.053	0.01
Nitrate as N mg/L		2.5	0.5
Nitrate plus Nitrite mg/L		2.5	0.5
Sulfate mg/L		1330	5.0
TDS mg/L		2170	50.0
Chloride mg/L	09/10/1997	54.7	1.0
Manganese mg/L		0.036	0.01
Nitrate as N mg/L		3.0	0.5
Nitrate plus Nitrite mg/L		2.9	0.5
Sulfate mg/L		1100	5.0
TDS mg/L		1100	50.0

Analyte and unit	Date sampled	Result	RL
Methylene chloride µg/L	05/20/1998	0.42 J	1.0
Tetrachloroethene µg/L		0.35 J	1.0
Chloride mg/L		49.0 Q	15.0
Manganese mg/L		0.028	0.01
Nitrate as N mg/L		2.8	0.5
Nitrate plus Nitrite mg/L		8.6 Q	0.5
Sulfate mg/L		1320 Q	100
TDS mg/L		3090 Q	50.0
Acetone µg/L	09/02/1998	4.1 J	10.0
Ethylbenzene µg/L		0.11 J	1.0
Methylene chloride µg/L		0.45 J	1.0
Tetrachloroethene µg/L		0.19 J	1.0
Toluene µg/L		0.14 J	1.0
Methyl tert-butyl ether µg/L		0.32 J	5.0
Chloride mg/L		52.3 Q	15.0
Fluoride mg/L		0.83 J	1.0
Manganese mg/L		0.02	0.01
Nickel mg/L		0.014 J	0.04
Nitrate as N mg/L		1.7	0.5
Nitrate plus Nitrite mg/L		1.6 Q	0.5
Sulfate mg/L		1280 Q	250
TDS mg/L		2260	10.0
1,1-Dichloroethene µg/L	06/09/1999	0.41 J	1.0
Methylene chloride µg/L		1.8 B	1.0
Manganese mg/L		0.024	0.010
Chloride mg/L		52.2 Q	15.0
Fluoride mg/L		0.88 B	1.0
Nitrate mg/L		2.6	0.50
Nitrate plus Nitrite mg/L		3.1	0.10
Sulfate mg/L		1160 Q	125
TDS mg/L		2120	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-67 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	11/18/1999	0.15 J	1.0
cis-1,2-Dichloroethene µg/L		0.16	1.0
Tetrachloroethene µg/L		0.28 J	1.0
Chloride mg/L		48.6 Q	15.0
Fluoride mg/L		0.82 B	1.0
Manganese µg/L		13.0 B	15.0
Nitrate mg/L		2.8	0.50
Nitrate plus Nitrite mg/L		3.2	0.10
Sulfate mg/L		1100 Q	250
TDS mg/L		1690	10.0
Manganese µg/L	06/01/2000	6.4 B	10.0
Nickel µg/L		4.8 B	40.0
Calcium mg/L		299	0.20
Potassium mg/L		1.3 B	3.0
Magnesium mg/L		22.7	0.20
Sodium mg/L		304	5.0
Nitrate plus Nitrite mg/L		3.3	0.10
Chloride mg/L		51.6 Q	15.0
Sulfate mg/L		1170 Q	250
Fluoride mg/L		0.66 B	1.0
Nitrate mg/L		3.4	0.50
Phosphate as P, Ortho mg/L		1.2 B,G	2.5
TDS mg/L		2150	10.0
Acetone µg/L	11/15/2000	1.1 J	10.0
Manganese µg/L		6.4 B	10.0
Calcium mg/L		310	0.20
Potassium mg/L		0.81 B	3.0
Magnesium mg/L		24.2	0.20
Sodium mg/L		314	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		52.4 Q	15.0
Sulfate mg/L		1130 Q	250
Nitrate mg/L		3.0	0.50
TDS mg/L		2140	10.0

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	05/23/2001	17	10.0
Bromoform µg/L		1.2	1.0
Manganese µg/L		5.3 B	10.0
Calcium mg/L		233	0.20
Potassium mg/L		0.70 B	3.0
Magnesium mg/L		17.7	0.20
Sodium mg/L		237	5.0
Nitrate plus Nitrite mg/L		3.3	0.10
Chloride mg/L		49.0	15.0
Sulfate mg/L		973 Q	250
Fluoride mg/L		0.65 B	1.0
Nitrate mg/L		3.4	0.50
TDS mg/L		1910	10.0
Manganese µg/L	09/07/2001	13.9	10.0
Nickel µg/L		4.6 B	40.0
Calcium mg/L		306	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		23.2	0.20
Sodium mg/L		313	5.0
Nitrate plus Nitrite mg/L		4.5	0.10
Chloride mg/L		50.0 Q	15.0
Sulfate mg/L		1140 Q	250
Fluoride mg/L		0.50 B	1.0
Nitrate mg/L		4.0	0.50
TDS mg/L		2090	10.0
Manganese µg/L	05/16/2002	7.9 B	10.0
Calcium mg/L		327	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		24.8	0.20
Sodium mg/L		332	5.0
Nitrate plus Nitrite mg/L		4.8	0.10
Chloride mg/L		53.2 Q	6.0
Sulfate mg/L		1220 Q	250
Fluoride mg/L		0.77 B,G	1.0
Nitrate mg/L		3.8	0.50
TDS mg/L		2190	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-67 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chromium µg/L	11/20/2002	9.7 B	10.0
Manganese µg/L		13.0	10.0
Nickel µg/L		11.0 B	40.0
Calcium mg/L		340	0.20
Potassium mg/L		2.1 B	3.0
Magnesium mg/L		24.0	0.20
Sodium mg/L		310	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		52.0 J,Q	15.0
Sulfate mg/L		1300 Q	250
Fluoride mg/L		0.83 B	1.0
Nitrate mg/L		3.8	0.50
TDS mg/L		2200	10.0
Manganese µg/L	05/14/2003	11.0	10.0
Calcium mg/L		330	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		25.0	0.20
Sodium mg/L		300	5.0
Nitrate plus Nitrite mg/L		3.9	0.10
Chloride mg/L		53.0 Q	15.0
Sulfate mg/L		1400 Q	250
Fluoride mg/L		1.0	1.0
Nitrate mg/L		3.8	0.50
TDS mg/L		2300 J	10.0
Methylene chloride µg/L	11/19/2003	0.54 J,B	5.0
Manganese µg/L		12.0	10.0
Calcium mg/L		350	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		26.0	0.20
Sodium mg/L		350	5.0
Nitrate plus Nitrite mg/L		4.1	0.10
Chloride mg/L		55.0 Q	15.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		2.8 B	1.0
Nitrate mg/L		4.3	0.50
TDS mg/L		2400	10.0

Analyte and unit	Date sampled	Result	RL
Methylene chloride µg/L	05/06/2004	0.48 J,B	5.0
Trichloroethene µg/L		1.1	5.0
Chromium µg/L		7.1 B	10.0
Manganese µg/L		20.0	10.0
Nickel µg/L		4.4 B	40.0
Calcium mg/L		350	0.20
Potassium mg/L		1.2 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		320	5.0
Nitrate plus Nitrite mg/L		5.1	0.10
Chloride mg/L		52.0 Q	15.0
Sulfate mg/L		1500 Q	250
Nitrate mg/L		4.6	0.50
TDS mg/L		2300	10.0
Acetone µg/L	11/18/2004	2.8 J,B	10.0
Chromium µg/L		4.9 B	10.0
Manganese µg/L		12.0	10.0
Calcium mg/L		350	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		26.0	0.20
Sodium mg/L		310	5.0
Nitrate plus Nitrite mg/L		4.8	0.10
Chloride mg/L		52.0 Q	15.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		0.66 B	1.0
Nitrate mg/L		4.8	0.50
TDS mg/L		2400	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-68 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	09/10/1997	0.69 J	1.0
1,1-Dichloroethane µg/L		0.65 J	1.0
cis-1,2-Dichloroethene µg/L		23	0.50
Tetrachloroethene µg/L		5.0	1.0
1,1,1-Trichloroethane µg/L		0.31 J	1.0
Trichloroethene µg/L		2.0	1.0
Nickel mg/L		0.042	0.040
Chloride mg/L		168 t	1.0
Nitrate as N mg/L		1.3 G	1.0
Nitrate plus Nitrite mg/L		1.3	0.10
Sulfate mg/L		1420 t	25
TDS mg/L		2970 t	20.0
Chloroform µg/L	05/20/1998	1.5	1.0
1,1-Dichloroethane µg/L		0.65 J	1.0
cis-1,2-Dichloroethene µg/L		35	0.50
Methylene chloride µg/L		0.52 J	1.0
Tetrachloroethene µg/L		7.8	1.0
1,1,1-Trichloroethane µg/L		0.52 J	1.0
Trichloroethene µg/L		3.2	1.0
Nickel mg/L		0.031 J	0.040
Chloride mg/L		199 Q	15.0
Nitrate mg/L		3.3	0.50
Nitrate plus Nitrite mg/L		5.7 Q	0.50
Sulfate mg/L		1500 Q	250
TDS mg/L		3560 Q	50.0
Chloroform µg/L	09/02/1998	1.4	1.0
1,1-Dichloroethane µg/L		0.59 J	1.0
1,2-Dichloroethene total µg/L		25	1.0
Ethylbenzene µg/L		0.10 J	1.0
Methylene chloride µg/L		0.58 J	1.0
Tetrachloroethene µg/L		7.9	1.0
Toluene µg/L		0.13 J	1.0
Trichloroethene µg/L		3.2	1.0
Nickel mg/L		0.042 J	0.040
Chloride mg/L		240 Q	30.0

Analyte and unit	Date sampled	Result	RL
Fluoride mg/L	09/02/1998	0.72 JG	2.0
Nitrate mg/L	-continued	4.3 G	1.0
Nitrate plus Nitrite mg/L		4.7 Q	0.50
Sulfate mg/L		1600 Q	250
TDS mg/L		2060	10.0
Chloroform µg/L	06/09/1999	1.2	1.0
Chloromethane µg/L		0.21 J	2.0
1,1-Dichloroethane µg/L		0.65 J	1.0
1,1-Dichloroethene µg/L		0.52 J	1.0
cis-1,2-Dichloroethene µg/L		14	1.0
1,2-Dichloroethene total µg/L		14	1.0
Methylene chloride µg/L		0.98 JB	1.0
Tetrachloroethene µg/L		5.7	1.0
1,1,1-Trichloroethane µg/L		0.23 J	1.0
Trichloroethene µg/L		2.3	1.0
Nickel mg/L		0.056	0.040
Chloride mg/L		260 Q	30.0
Fluoride mg/L		0.89 JG	2.0
Nitrate mg/L		2.3 G	1.0
Nitrate plus Nitrite mg/L		2.5	0.10
Sulfate mg/L		1580 Q	250
TDS mg/L		3100	10.0
Chloroform µg/L	11/18/1999	0.90 J	1.0
1,1-Dichloroethane µg/L		1.1 J	1.0
cis-1,2-Dichloroethene µg/L		12	0.50
1,2-Dichloroethene total µg/L		12	1.0
Tetrachloroethene µg/L		5.3	1.0
1,1,1-Trichloroethane µg/L		0.17 J	1.0
Trichloroethene µg/L		2.4	1.0
Chloride mg/L		360 Q	30.0
Fluoride mg/L		0.67 B	2.0
Manganese mg/L		0.0026 B	0.015
Nickel mg/L		0.048	0.040
Nitrate mg/L		4.9	0.50
Nitrate plus Nitrite mg/L		5.5	0.10

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-68 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	11/18/1999	1520 Q	250
TDS mg/L	-continued	2480	10.0
Chloroform	06/01/2000	0.80 J	1.0
1,1-Dichloroethane µg/L		1.0	1.0
cis-1,2-Dichloroethene µg/L		12	1.0
Tetrachloroethene µg/L		4.3	1.0
Trichloroethene µg/L		2.1	1.0
Nickel µg/L		57.6	40.0
Calcium mg/L		468	0.20
Potassium mg/L		2.5	3.0
Magnesium mg/L		43.7	0.20
Sodium mg/L		545	5.0
Nitrate plus Nitrite mg/L		4.1	0.10
Chloride mg/L		377	30.0
Fluoride mg/L		0.69 B,G	2.0
Sulfate mg/L		1650 Q	500
TDS mg/L		3640	10.0
Acetone µg/L	11/15/2000	1.2 J	10.0
Chloroform µg/L		0.74 J	1.0
1,1-Dichloroethane µg/L		0.98 J	1.0
cis-1,2-Dichloroethene µg/L		13.0	1.0
Tetrachloroethene µg/L		4.8	1.0
Trichloroethene µg/L		2.3	1.0
Manganese µg/L		0.97 J	10.0
Nickel µg/L		60.0	40.0
Calcium mg/L		477	0.20
Potassium mg/L		2.4 B	3.0
Magnesium mg/L		45.2	0.20
Sodium mg/L		586	5.0
Nitrate plus Nitrite mg/L		3.3	0.10
Chloride mg/L		348 Q	30.0
Sulfate mg/L		1660 Q	250
TDS mg/L		3490	10.0
Acetone µg/L	05/22/2001	8.2 J	10.0
Chloroform µg/L		0.65 J	1.0
1,1-Dichloroethane µg/L		0.88 J	1.0

Analyte and unit	Date sampled	Result	RL
cis-1,2-Dichloroethene µg/L	05/22/2001	8.4	1.0
Methylene chloride µg/L	-continued	1.5	1.0
Tetrachloroethene µg/L		3.8	1.0
Trichloroethene µg/L		1.9	1.0
Nickel µg/L		53.0	40.0
Calcium mg/L		421	0.20
Potassium mg/L		2.8 B	3.0
Magnesium mg/L		38.7	0.20
Sodium mg/L		552	5.0
Nitrate plus Nitrite mg/L		2.5	0.10
Chloride mg/L		326 Q	30.0
Sulfate mg/L		1690 Q	250
Fluoride mg/L		0.51 B, G	2.0
TDS mg/L		3510	10.0
Chloroform µg/L	11/07/2001	0.62 J	1.0
1,1-Dichloroethane µg/L		0.71 J	1.0
cis-1,2-Dichloroethene µg/L		6.7	1.0
Tetrachloroethene µg/L		4.3	1.0
Trichloroethene µg/L		1.6	1.0
Nickel µg/L		48.4	40.0
Calcium mg/L		400	0.20
Potassium mg/L		3.0	3.0
Magnesium mg/L		37.4	0.20
Sodium mg/L		540	5.0
Nitrate plus Nitrite mg/L		2.0	0.10
Chloride mg/L		264 Q	30.0
Sulfate mg/L		1640 Q	250
Fluoride mg/L		0.42 B	2.0
Nitrate mg/L		1.8	0.50
TDS mg/L		3140	10.0
Chloroform µg/L	05/16/2002	0.61 J	1.0
1,1-Dichloroethane µg/L		0.51 J	1.0
cis-1,2-Dichloroethene µg/L		3.6	1.0
Tetrachloroethene µg/L		2.6	1.0
Trichloroethene µg/L		1.1	1.0
Manganese µg/L		0.62 B	10.0
Nickel µg/L		45.0	40.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-68 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Calcium mg/L	05/16/2002	415	0.20
Potassium mg/L	-continued	2.6 B	3.0
Magnesium mg/L		38.9	0.20
Sodium mg/L		553	5.0
Nitrate plus Nitrite mg/L		1.9	0.10
Chloride mg/L		233 Q	30.0
Sulfate mg/L		1590 Q	250
Fluoride mg/L		0.68 B,G	2.0
Nitrate mg/L		1.7 G	1.0
TDS mg/L		3040 J	10.0
Chloroform µg/L	11/20/2002	0.60 J	1.0
1,1-Dichloroethane µg/L		0.40 J	1.0
cis-1,2-Dichloroethene µg/L		2.7	1.0
Tetrachloroethene µg/L		2.6	1.0
Trichloroethene µg/L		1.1	1.0
Nickel µg/L		33.0 B	40.0
Calcium mg/L		370 J	0.20
Potassium mg/L		2.0 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		450	5.0
Nitrate plus Nitrite mg/L		1.1	0.10
Chloride mg/L		180 J, Q	30.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		0.76 B,G	2.0
Nitrate mg/L		1.2 G	1.0
TDS mg/L		2800	10.0
Chloroform µg/L	05/14/2003	0.60 J	1.0
1,1-Dichloroethane µg/L		0.34 J	1.0
cis-1,2-Dichloroethene µg/L		2.2	1.0
Tetrachloroethene µg/L		2.1	1.0
Trichloroethene µg/L		0.92 J	1.0
Nickel µg/L		25.0 B	40.0
Calcium mg/L		360	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		450	5.0
Nitrate plus Nitrite mg/L		0.98	0.10

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	05/14/2003	170 Q	30.0
Sulfate mg/L	-continued	1600 Q	250
Fluoride mg/L		1.0	1.0
Nitrate mg/L		1.0	0.50
TDS mg/L		2800 J	10.0
Chloroform µg/L	11/19/2003	0.47 J	1.0
cis-1,2-Dichloroethene µg/L		1.4	1.0
Methylene chloride µg/L		0.55 J,B	1.0
Tetrachloroethene µg/L		1.7	1.0
Trichloroethene µg/L		0.60 J	1.0
Manganese µg/L		6.3 B	10.0
Nickel µg/L		31.0 B	40.0
Calcium mg/L		360	0.20
Potassium mg/L		2.2 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		460	5.0
Nitrate plus Nitrite mg/L		0.95	0.10
Chloride mg/L		180 Q	30.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		3.2	2.0
Nitrate mg/L		1.0	0.50
TDS mg/L		2900	10.0
Acetone µg/L	05/06/2004	2.9 J	10.0
Chloroform µg/L		0.38 J	1.0
cis-1,2-Dichloroethene µg/L		0.84 J	1.0
Methylene chloride µg/L		0.52 J,B	5.0
Tetrachloroethene µg/L		1.4	1.0
Trichloroethene µg/L		0.48 J	1.0
Chromium µg/L		2.4 B	10.0
Manganese µg/L		15.0	10.0
Nickel µg/L		34.0 B	40.0
Calcium mg/L		380	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		35.0	0.20
Sodium mg/L		480	5.0
Nitrate plus Nitrite mg/L		0.87	0.10
Chloride mg/L		180 Q	30.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-68 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/06/2004	1600 Q	250
Nitrate mg/L	-continued	0.99 B,G	1.0
TDS mg/L		2800	10.0
Not sampled, dry	11/18/2004		

Analyte and unit	Date sampled	Result	RL

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Analyte and unit	Date sampled	Result	RL
Antimony mg/L	09/21/1993	0.014	0.001
Barium mg/L		0.012	0.01
Calcium mg/L		342	0.01
Chloride mg/L		55.0	0.5
Chromium mg/L		0.026	0.01
Fluoride mg/L		2.7	0.5
Iron mg/L		0.26	0.1
Magnesium mg/L		24.7	0.2
Manganese mg/L		0.011	0.01
Molybdenum mg/L		0.0037	0.001
Nitrate as N mg/L		4.0	0.5
Nitrate plus Nitrite mg/L		3.4	0.1
Selenium mg/L		0.0037	0.001
Sodium mg/L		305	5.0
Sulfate mg/L		1230	5.0
TDS mg/L		2190	10.0
Zinc mg/L		0.023	0.02
Methylene chloride µg/L	05/25/1994	0.7 J	1.0
Antimony mg/L		0.0038	0.002
Barium mg/L		0.01	0.01
Calcium mg/L		332	0.2
Chloride mg/L		53.2	0.5
Chromium mg/L		0.028	0.01
Magnesium mg/L		23.7	0.2
Molybdenum mg/L		0.0031	0.001
Nickel mg/L		0.057	0.01
Nitrate as N mg/L		3.8	0.5
Nitrate plus Nitrite mg/L		3.8	0.25
Selenium mg/L		0.0081	0.006
Sodium mg/L		307	5.0
Sulfate mg/L		1270	5.0
TDS mg/L		2200	20.0
1,1-Dichloroethane µg/L	09/21/1994	0.27 J	1.0
1,2-Dichloroethene(cis) µg/L		12.0	1.0
Methylene chloride µg/L		0.29 J	1.0
Tetrachloroethene µg/L		3.4 J	1.0
Trichloroethene µg/L		1.3	1.0
Antimony mg/L	-continued	0.0074	0.002
Chloride mg/L		58.5	0.5
Cobalt mg/L		0.017	0.002
Magnesium mg/L		30.8	5.0
Manganese mg/L		1.7	0.01
Molybdenum mg/L		0.011	0.002
Nickel mg/L		0.039	0.02
Nitrate as N mg/L		1.0	0.5
Nitrate plus Nitrite mg/L		1.2	0.05
Selenium mg/L		0.0044	0.002
Sodium mg/L		409	5.0
Sulfate mg/L		1340	5.0
TDS mg/L		2470	20.0
2-Butanone (MEK) µg/L	09/14/1995	2.6 J	10.0
Methylene chloride µg/L		0.35 J	1.0
Barium mg/L		0.013	0.002
Cadmium mg/L		0.0015	0.006
Calcium mg/L		328	0.2
Chloride mg/L		53.3	1.0
Chromium mg/L		0.03	0.001
Cobalt mg/L		0.0027	0.0005
Copper mg/L		0.0099	0.002
Fluoride mg/L		2.7	1.0
Magnesium mg/L		24.3	0.2
Molybdenum mg/L		0.0036	0.0002
Nickel mg/L		0.04	0.0002
Nitrate as N mg/L		3.6	0.5
Nitrate plus Nitrite mg/L		3.7	0.5
Potassium mg/L		1.1	5.0
Selenium mg/L		0.01	0.005
Sodium mg/L		302	5.0
Sulfate mg/L		1450	5.0
TDS mg/L		2140	50.0
Vanadium mg/L		0.012	0.0005

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Analyte and unit	Date sampled	Result	RL
Acetone µg/L	05/31/1996	2.2 J	10.0
Chloride mg/L		50.7	1.0
Fluoride mg/L		2.8	1.0
Nitrate as N mg/L		3.5	0.5
Nitrate plus Nitrite mg/L		3.5	0.5
Sulfate mg/L		1310	5.0
TDS mg/L		2190	50.0
Chloride mg/L	09/06/1996	52.8	1.0
Nitrate as N mg/L		3.5	0.5
Nitrate plus Nitrite mg/L		4.0	0.5
Sulfate mg/L		1310	5.0
TDS mg/L		2140	50.0
Chloride mg/L	05/22/1997	52.2	1.0
Nitrate as N mg/L		2.8	0.5
Nitrate plus Nitrite mg/L		3.1	0.5
Sulfate mg/L		1270	5.0
TDS mg/L		2070	50.0
Chloride mg/L	09/11/1997	36.6	1.0
Nitrate as N mg/L		7.6	0.5
Nitrate plus Nitrite mg/L		9.3	0.5
Sulfate mg/L		873	5.0
TDS mg/L		1800	50.0
Chloromethane µg/L	05/20/1998	0.8 J	2.0
Methylene chloride µg/L		0.69 J	1.0
Tetrachloroethene µg/L		0.14 J	1.0
Chloride mg/L		44.6 Q	15.0
Manganese µg/L		4.3 J	10.0
Nitrate as N mg/L		3.8	0.5
Nitrate plus Nitrite mg/L		4.2 Q	0.5
Sulfate mg/L		1260 Q	100
TDS mg/L		2680	10.0
Tetrachloroethene µg/L	09/02/1998	0.11 J	1.0
Chloride mg/L		50.2 Q	15.0
Fluoride mg/L		0.74 JG	2.0

Analyte and unit	Date sampled	Result	RL
Manganese µg/L	09/02/1998	7.5 J	10.0
Nitrate as N mg/L	-continued	3.2 G	1.0
Nitrate plus Nitrite mg/L		3.5 Q	0.5
Sulfate mg/L		1250 Q	250
TDS mg/L		2220	10.0
Acetone µg/L	06/09/1999	2.6 J	10
Methylene chloride µg/L		0.30 JB	1.0
Manganese µg/L		3.1 B	10.0
Chloride mg/L		47.9	3.0
Fluoride mg/L		0.78 B	1.0
Nitrate mg/L		3.5	0.50
Nitrate plus Nitrite mg/L		3.9	0.10
Sulfate mg/L		1080 Q	125
TDS mg/L		2040	10.0
Tetrachloroethene µg/L	11/18/1999	0.11	1.0
Chloride mg/L		48.6	3.0
Fluoride mg/L		0.86 B	1.0
Manganese µg/L		4.6 B	15.0
Nitrate mg/L		2.7	0.50
Nitrate plus Nitrite mg/L		3.1	0.10
Sulfate mg/L		1070 Q	250
TDS mg/L		1970	10.0
Manganese µg/L	06/01/2000	2.4 B	10.0
Calcium mg/L		288	0.20
Potassium mg/L		0.91 B	3.0
Magnesium mg/L		22.0	0.20
Sodium mg/L		279	5.0
Nitrate plus Nitrite mg/L		4.5	0.10
Chloride mg/L		48.9	3.0
Fluoride mg/L		0.69 B	1.0
Sulfate mg/L		1120 Q	250
TDS mg/L		2060	10.0
Acetone µg/L	11/15/2000	1.0 J	10.0
Manganese µg/L		3.3 B	10.0
Calcium mg/L		316	0.20

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Analyte and unit	Date sampled	Result	RL
Potassium mg/L	11/15/2000	0.41 B	3.0
Magnesium mg/L	-continued	24.8	0.20
Sodium mg/L		307	5.0
Nitrate plus Nitrite mg/L		4.3	0.10
Chloride mg/L		45.6 G	3.0
Sulfate mg/L		1120 Q	250
Phosphate as P, Ortho mg/L		0.87 B,G	1.2
TDS mg/L		2110	10.0
Acetone µg/L	05/23/2001	36	10.0
Bromoform µg/L		0.53 J	1.0
Manganese µg/L		2.0 B	10.0
Calcium mg/L		286	0.20
Potassium mg/L		0.36 B	3.0
Magnesium mg/L		21.8	0.20
Sodium mg/L		274	5.0
Nitrate plus Nitrite mg/L		3.1	0.10
Chloride mg/L		48.4	3.0
Sulfate mg/L		1090 Q	250
Fluoride mg/L		0.68 B	1.0
Nitrate mg/L		3.2	0.50
TDS mg/L		2130	10.0
Calcium mg/L	11/07/2001	313	0.20
Potassium mg/L		0.86 B	3.0
Magnesium mg/L		24.2	0.20
Sodium mg/L		300	5.0
Nitrate plus Nitrite mg/L		2.7	0.10
Chloride mg/L		51.2	6.0
Sulfate mg/L		1190 Q	250
Fluoride mg/L		0.51 B	1.0
Nitrate mg/L		2.5	0.50
TDS mg/L		2120	10.0
Manganese µg/L	05/16/2002	2.8 B	10.0
Calcium mg/L		346	0.20
Potassium mg/L		1.1 B	3.0
Magnesium mg/L		26.9	0.20
Sodium mg/L		318	5.0

Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	05/16/2002	3.6	0.10
Chloride mg/L	-continued	46.8	15.0
Sulfate mg/L		1180 Q	250
Fluoride mg/L		0.64 B	1.0
Nitrate mg/L		2.9	0.50
TDS mg/L		2130 J	10.0
Chromium µg/L	11/20/2002	2.4 B	10.0
Manganese µg/L		2.6 B	10.0
Calcium mg/L		340 J	0.20
Potassium mg/L		1.3 B	3.0
Magnesium mg/L		25.0	0.20
Sodium mg/L		290	5.0
Nitrate plus Nitrite mg/L		3.5	0.10
Chloride mg/L		51.0 J,Q	15.0
Sulfate mg/L		1300 Q	250
Fluoride mg/L		0.90 B	1.0
Nitrate mg/L		3.7	0.50
TDS mg/L		2100	10.0
Acetone µg/L	05/13/2003	4.4 J	10.0
Methylene chloride µg/L		0.3 J,B	10.0
Manganese µg/L		1.6 B	10.0
Calcium mg/L		330	0.20
Potassium mg/L		0.81 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		310	5.0
Nitrate plus Nitrite mg/L		5.2	0.10
Chloride mg/L		50.0 Q	15.0
Sulfate mg/L		1300 Q	250
Nitrate mg/L		5.2	0.50
TDS mg/L		2200	10.0
Methylene chloride µg/L	11/18/2003	0.43 J,B	1.0
Manganese µg/L		1.9 B	10.0
Calcium mg/L		310	0.20
Potassium mg/L		1.4 B	3.0
Magnesium mg/L		24.0	0.20
Sodium mg/L		270	5.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-69 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	11/18/2003	5.1	0.10
Chloride mg/L	-continued	51.0 Q	6.0
Sulfate mg/L		1400 Q	250
Fluoride mg/L		0.99 B	1.0
Nitrate mg/L		5.6	0.50
TDS mg/L		2200	10.0
Methylene chloride µg/L	05/05/2004	0.50 J,B	1.0
Chromium µg/L		4.2 B	10.0
Manganese µg/L		2.2 B	10.0
Calcium mg/L		330	0.20
Potassium mg/L		1.2 B	3.0
Magnesium mg/L		26.0	0.20
Sodium mg/L		290	5.0
Nitrate plus Nitrite mg/L		5.6	0.10
Chloride mg/L		52.0 Q	3.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.73 B	1.0
Nitrate mg/L		5.5	0.50
TDS mg/L		2200	10.0
Chromium µg/L	11/16/2004	4.2 B	10.0
Manganese µg/L		2.1 B	10.0
Calcium mg/L		360	0.20
Potassium mg/L		1.4 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		300	5.0
Nitrate plus Nitrite mg/L		4.4	0.10
Chloride mg/L		49.0 J,Q	3.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.63 B	1.0
Nitrate mg/L		4.9	0.50
TDS mg/L		2300	10.0

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-70 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B,estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
1,4-Dichlorobenzene µg/L	09/21/1993	0.33 J	0.5
1,2-Dichloroethene TOTAL µg/L		14.0	1.0
Methylene chloride µg/		0.25 J	1.0
Tetrachloroethene µg/L		3.1	1.0
Trichloroethene µg/L		1.4	1.0
Antimony mg/L		0.01	0.001
Barium mg/L		0.01	0.01
Calcium mg/L		328	0.01
Chloride mg/L		58.8	0.5
Cobalt mg/L		0.019	0.001
Fluoride mg/L		2.9	0.5
Iron mg/L		0.33	0.1
Magnesium mg/L		27.6	0.2
Manganese mg/L		1.5	0.01
Molybdenum mg/L		0.014	0.001
Nickel mg/L		0.016	0.001
Nitrate as N mg/L		1.7	0.5
Nitrate plus Nitrite mg/L		1.5	0.1
Sodium mg/L		376	5.0
Sulfate mg/L		1,380	5.0
TDS mg/L		2,490	10.0
Zinc mg/L		0.025	0.02
1,2-Dichloroethene(total)µg/L	05/25/1994	9.4	1.0
Methylene chloride µg/L		0.29 J	1.0
Tetrachloroethene µg/L		2.8	1.0
Trichloroethene µg/L		1.0	1.0
Antimony mg/L		0.0051	0.002
Calcium mg/L		382	0.2
Chloride mg/L		54.5	0.5
Cobalt mg/L		0.02	0.01
Magnesium mg/L		32.7	0.2
Manganese mg/L		1.7	0.01
Molybdenum mg/L		0.01	0.002
Nickel mg/L		0.044	0.02
Nitrate as N mg/L		1.8	0.5
Nitrate plus Nitrite mg/L		2.0	0.05
Selenium mg/L	05/25/1994	0.0035	0.002
Sodium mg/L	-continued	436	5.0
Sulfate mg/L		1,480	5.0
TDS mg/L		2,650	20.0
Aluminum mg/L	09/21/1994	54.3	0.5
Arsenic mg/L		3.6	0.5
Barium mg/L		3.8	0.1
Cadmium mg/L		1,110	5.0
Chloride mg/L		2,130	20.0
Cobalt mg/L		0.005	0.002
Magnesium mg/L		0.035	0.02
Manganese mg/L		0.0023	0.002
Nickel mg/L		0.061	0.04
Nitrate plus Nitrite mg/L		24.3	5.0
Potassium mg/L		0.003	0.002
Selenium mg/L		0.023	0.02
Sulfate mg/L		0.0076	0.002
1,2-Dichloroethene (cis) µg/L	05/25/1995	14.0	1.0
4-Methyl-2-pentanone(MIBK)µg/L		0.87 J	10.0
Tetrachloroethene µg/L		3.4	1.0
Trichloroethene µg/L		1.2	1.0
Antimony mg/L		0.0047	0.001
Barium mg/L		0.012	0.01
Calcium mg/L		399	0.01
Chloride mg/L		58.3	0.5
Chromium mg/L		0.013	0.01
Cobalt mg/L		0.013	0.001
Magnesium mg/L		33.3	0.2
Manganese mg/L		1.5	0.01
Nickel mg/L		0.01	0.001
Nitrate as N mg/L		1.3	0.5
Nitrate plus Nitrite mg/L		1.2	0.1
Selenium mg/L		0.042	0.001
Silver mg/L		0.0034	0.001
Sodium mg/L		437	5.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-70 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B,estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Sodium mg/L	05/25/1995	437	5.0
Sulfate mg/L	-continued	1630	5.0
TDS mg/L		280	10.0
2-Butanone (MEK) µg/L	09/14/1995	3.9 J	10.0
1,4-Dichlorobenzene µg/L		0.22 J	0.5
1,2 cis-Dichloroethene µg/L		0.22 J	0.5
Methylene chloride µg/L		0.40 J	1.0
Tetrachloroethene µg/L		3.2	1.0
Trichloroethene µg/L		1.0	1.0
Barium mg/L		0.011	0.002
Cadmium mg/L		0.0012	0.006
Calcium mg/L		370	0.2
Chloride mg/L		58.4	1.0
Chromium mg/L		0.0076	0.001
Cobalt mg/L		0.013	0.0005
Copper mg/L		0.0086	0.002
Fluoride mg/L		3.3	1.0
Magnesium mg/L		32.1	0.2
Manganese mg/L		1.8	0.01
Molybdenum mg/L		0.004	0.0002
Nickel mg/L		0.048	0.0002
Nitrate as N mg/L		1.2	0.5
Nitrate plus Nitrite mg/L		1.1	0.5
Potassium mg/L		1.8	5.0
Sodium mg/L		414	5.0
Sulfate mg/L		1820	5.0
TDS mg/L		2400	50.0
Vanadium mg/L		0.012	0.0005
Acetone µg/L	05/31/1996	1.9 J	10.0
Chloroform µg/L		0.25 J	0.5
1,1-Dichloroethane µg/L		0.27 J	1.0
1,2 cis-Dichloroethene µg/L		11.0	1.0
Tetrachloroethene µg/L		3.1	1.0
Trichloroethene µg/L		1.3	1.0
Manganese mg/L		0.5	0.01
Nitrate as N mg/L		0.91	0.5
Nitrate plus Nitrite mg/L		0.94	0.5

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/31/1996	1,660	5.0
TDS mg/L	-continued	2,770	50.0
Chloroform µg/L	09/06/1996	0.44 J	0.5
1,2 cis-Dichloroethene µg/L		8.0	1.0
Tetrachloroethene µg/L		1.7	1.0
Trichloroethene µg/L		0.62 J	1.0
Chloride mg/L		73.8	1.0
Manganese mg/L		0.22	0.01
Nitrate as N mg/L		1.0	0.5
Nitrate plus Nitrite mg/L		1.1	0.5
Sulfate mg/L		1620	5.0
TDS mg/L		2720	50.0
Acetone µg/L	05/31/1997	0.86 J	10.0
Chloroform µg/L		0.28 J	0.5
1,1-Dichloroethane µg/L		0.23 J	1.0
1,2 cis-Dichloroethene µg/L		7.2	1.0
Methylene chloride µg/L		0.45 J	1.0
Tetrachloroethene µg/L		2.6	1.0
1,1,1-Trichloroethane µg/L		0.22 J	1.0
Trichloroethene µg/L		0.88 J	1.0
Chloride mg/L		81.3	1.0
Manganese mg/L		0.069	0.01
Nitrate plus Nitrite mg/L		0.83	0.5
Sulfate mg/L		1610	5.0
TDS mg/L		2760	50.0
Chloroform µg/L	09/10/1997	0.22 J	0.5
1,2 cis-Dichloroethene µg/L		5.6	1.0
Tetrachloroethene µg/L		2.3	1.0
Trichloroethene µg/L		0.72 J	1.0
Chloride mg/L		60.1	1.0
Manganese mg/L		0.015	0.01
Nitrate as N mg/L		0.71	0.5
Nitrate plus Nitrite mg/L		0.69	0.5
Sulfate mg/L		1570	5.0
TDS mg/L		2770	50.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-70 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B,estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	05/20/1998	0.33 J	1.0
1,1-Dichloroethane µg/L		0.27 J	1.0
cis-1,2-Dichloroethene µg/L		7.1	0.5
4-Methyl-2-pentanone µg/L		0.18 J	5.0
Tetrachloroethene µg/L		3.0	1.0
1,1,1-Trichloroethane µg/L		0.22 J	1.0
Trichloroethene µg/L		0.99 J	1.0
Chloride mg/L		112 Q	15.0
Nitrate as N mg/L		1.8	0.5
Nitrate plus Nitrite mg/L		1.9 Q	0.2
Sulfate mg/L		1550 Q	250
TDS mg/L		2930 Q	50.0
1,1-Dichloroethane µg/L	09/02/1998	0.3 J	1.0
Tetrachloroethene µg/L		3.1	1.0
Trichloroethene µg/L		0.92 J	1.0
Chloride mg/L		124 Q	30.0
Fluoride mg/L		0.74 J,G	2.0
Manganese µg/L		5.6 J	10.0
Nickel µg/L		30.0 J	40.0
Nitrate as N mg/L		1.2 G	1.0
Nitrate plus Nitrite mg/L		1.0	0.1
Sulfate mg/L		1650 Q	250
TDS mg/L		2820	10.0
Acetone µg/L	06/08/1999	2.0 J,B	10
Chloroform µg/L		0.23 J	1.0
1,1-Dichloroethane µg/L		0.14 J	1.0
cis-1,2-Dichloroethene µg/L		2.4	1.0
1,2-Dichloroethene µg/L		2.4	1.0
Tetrachloroethene µg/L		2.2	1.0
Trichloroethene µg/L		0.62 J	1.0
Manganese µg/L		1.5 B	10.0
Nickel µg/L		21.0 B	40.0
Chloride mg/L		120 Q	30.0
Fluoride mg/L		0.69 B,G	2.0
Nitrate mg/L		2.3 G	1.0
Nitrate plus Nitrite mg/L		2.3	0.10
Sulfate mg/L		1590 Q	250

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	06/08/1999	1590 Q	250
TDS mg/L	-continued	2830	10.0
Chloroform µg/L	11/18/1999	0.34 J	1.0
1,1-Dichloroethane µg/L		0.17 J	1.0
cis-1,2-Dichloroethene µg/L		3.0	1.0
1,2-Dichloroethene µg/L		3.0	1.0
Tetrachloroethene µg/L		1.9	1.0
1,1,1-Trichloroethane µg/L		0.13 J	1.0
Trichloroethene µg/L		0.65 J	1.0
Chloride mg/L		147 Q	15.0
Fluoride mg/L		0.82 B	1.0
Manganese µg/L		2.3 B	15.0
Nickel µg/L		27.0 B	40.0
Nitrate as N mg/L		2.8	0.50
Nitrate plus Nitrite mg/L		3.1	0.10
Sulfate mg/L		1580 Q	250
TDS mg/L		2430	10.0
cis-1,2-Dichloroethene µg/L	06/01/2000	0.95 J	1.0
Tetrachloroethene µg/L		1.5	1.0
Trichloroethene µg/L		0.43	1.0
Nickel µg/L		22.2 J	40.0
Calcium mg/L		408	0.20
Potassium mg/L		2.7 B	3.0
Magnesium mg/L		34.2	0.20
Sodium mg/L		439	5.0
Nitrate plus Nitrite mg/L		2.4	0.10
Chloride mg/L		125 Q	15.0
Fluoride mg/L		0.57	1.0
Sulfate mg/L		1610 Q	250
TDS mg/L		2770	10.0
Acetone µg/L	11/16/2000	0.95 J,B	10.0
Chloroform µg/L		0.15 J	1.0
1,1-Dichloroethane µg/L		0.12 J	1.0
cis-1,2-Dichloroethene µg/L		0.64	1.0
Tetrachloroethene µg/L		1.3	1.0
Trichloroethene µg/L		0.35 J	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-70 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B,estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nickel µg/L	11/16/2000	2.3 B	40.0
Calcium mg/L	-continued	379	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		32.4	0.20
Sodium mg/L		423	5.0
Nitrate plus Nitrite mg/L		2.0	0.10
Chloride mg/L		113 Q	3.0
Fluoride mg/L		0.25 B	1.0
Sulfate mg/L		1500 Q	250
TDS mg/L		2740	10.0
Acetone µg/L	05/23/2001	13	10.0
Bromoform µg/L		0.59 J	1.0
cis-1,2-Dichloroethene µg/L		0.29 J	1.0
Tetrachloroethene µg/L		1.2	1.0
Trichloroethene µg/L		0.32 J	1.0
Nickel µg/L		23.0 B	40.0
Calcium mg/L		371	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		30.7	0.20
Sodium mg/L		411	5.0
Nitrate plus Nitrite mg/L		1.6	0.10
Chloride mg/L		104 Q	3.0
Sulfate mg/L		1480 Q	250
Fluoride mg/L		0.67 B	1.0
Nitrate mg/L		1.8	0.50
TDS mg/L		2800	10.0
Acetone µg/L	11/07/2001	2.3 J	10.0
Tetrachloroethene µg/L		1.2	1.0
Trichloroethene µg/L		0.24 J	1.0
Nickel µg/L		22.3 B	40.0
Calcium mg/L		372	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		419	5.0
Nitrate plus Nitrite mg/L		1.1	0.10
Chloride mg/L		94.7 Q	15.0
Sulfate mg/L		1540 Q	250

Analyte and unit	Date sampled	Result	RL
Fluoride mg/L	11/07/2001	0.46 B	1.0
Nitrate mg/L	-continued	1.1	0.50
TDS mg/L		2710	10.0
Acetone µg/L	05/16/2002	3.0 J	10.0
Tetrachloroethene µg/L		0.99 J	1.0
Manganese mg/L		3.2 B	10.0
Nickel µg/L		20.0 B	40.0
Calcium mg/L		365	0.20
Potassium mg/L		2.8 B	3.0
Magnesium mg/L		31.5	0.20
Sodium mg/L		422	5.0
Nitrate plus Nitrite mg/L		1.1	0.10
Chloride mg/L		95.2 Q	6.0
Sulfate mg/L		1460 Q	250
Fluoride mg/L		0.75 B,G	1.0
Nitrate mg/L		1.2 G	0.50
TDS mg/L		2590	10.0
Tetrachloroethene µg/L	11/20/2002	1.0	1.0
Manganese µg/L		3.1 B	10.0
Nickel µg/L		15.0 B	40.0
Calcium mg/L		350 J	0.20
Potassium mg/L		2.1 B	3.0
Magnesium mg/L		28.0	0.20
Sodium mg/L		390	5.0
Nitrate plus Nitrite mg/L		0.63	0.10
Chloride mg/L		91.0 J,Q	6.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.87 B,G	2.0
Nitrate mg/L		0.83 B,G	1.0
TDS mg/L		2500	10.0
Acetone µg/L	05/14/2003	3.9 J	10.0
cis-1,2-Dichloroethene µg/L		0.21 J	1.0
Tetrachloroethene µg/L		0.89 J	1.0
Trichloroethene µg/L		0.23 J	1.0
Manganese mg/L		3.9 B	10.0
Nickel µg/L		12.0 B	40.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-70 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B,estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Calcium mg/L	05/14/2003	360 J	0.20
Potassium mg/L	-continued	2.0 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		400	5.0
Nitrate plus Nitrite mg/L		0.58	0.10
Chloride mg/L		81.0 Q	6.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		1.1	1.0
Nitrate mg/L		0.74	0.50
TDS mg/L		2500 J	10.0
Not sampled, dry.	11/18/2003	--	--
Not sampled, dry.	05/03/2004	--	--
Not sampled, dry.	11/18/2004	--	--

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-75 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
1,2-Dichloroethene TOTAL µg/L	09/21/1993	0.054 J	1.0
Tetrachloroethene µg/L		0.44 J	1.0
Toluene µg/		0.22 J	1.0
Antimony mg/L		0.0099	0.001
Barium mg/L		0.012	0.01
Calcium mg/L		345	0.01
Chloride mg/L		82.4	0.5
Fluoride mg/L		2.7	0.5
Iron mg/L		0.27	0.1
Magnesium mg/L		28.7	0.2
Manganese mg/L		0.17	0.01
Molybdenum mg/L		0.0061	0.001
Nitrate as N mg/L		3.3	0.5
Nitrate plus Nitrite mg/L		2.1	0.1
Sodium mg/L		303	5.0
Sulfate mg/L		1180	5.0
TDS mg/L		2190	10.0
Zinc mg/L		0.051	0.02
1,2-Dichloroethene TOTAL µg/L	05/25/1994	0.29 J	1.0
Methylene chloride µg/L		0.7 J	1.0
Pentane, 3-methyl- µg/L		24.0	2.0
Hexane µg/L		110	3.0
Cyclobutane, ethyl- µg/L		77.0	2.0
Antimony mg/L		0.0039	0.002
Barium mg/L		0.012	0.01
Calcium mg/L		332	0.2
Chloride mg/L		81.5	0.5
Chromium mg/L		0.014	0.01
Magnesium mg/L		0.21	0.01
Manganese mg/L		0.21	0.01
Molybdenum mg/L		0.0061	0.001
Nickel mg/L		0.068	0.01
Nitrate as N mg/L		2.8	0.5
Nitrate plus Nitrite mg/L		2.8	0.1
Selenium mg/L		0.0093	0.006
Sodium mg/L		307	5.0

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/25/1994	1240	5.0
TDS mg/L	-Continued	2120	20.0
Carbon disulfide µg/L	09/21/1994	0.67 J	1.0
Chloroform µg/L		0.2 J	0.5
1,1-Dichloroethane µg/L		0.23 J	1.0
1,2-Dichloroethene(cis) µg/L		12.0	1.0
Methylene chloride µg/L		0.26 J	1.0
Tetrachloroethene µg/L		3.0	1.0
Trichloroethene µg/L		1.2	1.0
Antimony mg/L		0.0073	0.002
Calcium mg/L		372	5.0
Chloride mg/L		72.7	0.5
Cobalt mg/L		0.015	0.002
Magnesium mg/L		31.7	5.0
Manganese mg/L		1.1	0.01
Molybdenum mg/L		0.008	0.002
Nickel mg/L		0.042	0.02
Nitrate as N mg/L		0.86	0.5
Nitrate plus Nitrite mg/L		0.73	0.05
Selenium mg/L		0.0037	0.002
Sodium mg/L		428	5.0
Sulfate mg/L		1580	5.0
TDS mg/L		2540	20.0
2-Butanone (MEK) µg/L	09/14/1995	1.5 J	10.0
1,2 cis-Dichloroethene µg/L		0.22 J	1.0
Methylene chloride µg/L		0.57 J	1.0
Tetrachloroethene µg/L		0.46 J	1.0
Barium mg/L		0.0079	0.002
Calcium mg/L		382	0.2
Chloride mg/L		68.3	1.0
Chromium mg/L		0.029	0.001
Cobalt mg/L		0.0069	0.0005
Copper mg/L		0.0069	0.002
Fluoride mg/L		2.9	1.0
Magnesium mg/L		30.6	0.2

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-75 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Manganese mg/L	09/14/1995	0.41	0.01
Molybdenum mg/L	-continued	0.0086	0.0002
Nickel mg/L		0.028	0.0002
Nitrate as N mg/L		2.3	0.5
Nitrate plus Nitrite mg/L		2.3	0.5
Potassium mg/L		1.2	5.0
Sodium mg/L		363	5.0
Sulfate mg/L		1440	5.0
TDS mg/L		2410	50.0
Vanadium mg/L		0.0073	0.0005
Acetone µg/L	05/31/1996	1.4 J	10.0
cis-1,3-Dichloropropene µg/L		0.24 J	1.0
Tetrachloroethene µg/L		0.61 J	1.0
Chloride mg/L		44.4	1.0
Fluoride mg/L		3.2	1.0
Manganese mg/L		0.28	0.01
Nitrate as N mg/L		2.1	0.5
Nitrate plus Nitrite mg/L		2.4	0.5
Sulfate mg/L		1490	5.0
TDS mg/L		2480	50.0
1,2 cis-Dichloroethene µg/L	09/06/1996	0.27 J	1.0
Methylene chloride µg/L		0.32 J	1.0
Tetrachloroethene µg/L		0.42 J	1.0
Chloride mg/L		46.9	1.0
Manganese mg/L		0.57	0.01
Nitrate as N mg/L		1.9	0.5
Nitrate plus Nitrite mg/L		2.1	0.5
Sulfate mg/L		1570	5.0
TDS mg/L		2510	50.0
Tetrachloroethene µg/L	05/22/1997	0.38 J	1.0
Chloride mg/L		42.9	1.0
Manganese mg/L		0.34	0.01
Nitrate as N mg/L		1.6	0.5
Nitrate plus Nitrite mg/L		1.4	0.5
Sulfate mg/L		1600	5.0
TDS mg/L		2560	50.0

Analyte and unit	Date sampled	Result	RL
Tetrachloroethene µg/L	09/10/1997	0.34 J	1.0
Chloride mg/L		51.8	1.0
Manganese mg/L		0.31	0.01
Nitrate as N mg/L		2.1	0.5
Nitrate plus Nitrite mg/L		2.4	0.5
Sulfate mg/L		1550	5.0
TDS mg/L		2540	50.0
Tetrachloroethene µg/L	05/19/1998	0.48 J	1.0
Chloride mg/L		305 Q	15.0
Fluoride mg/L		1.2 JG	5.0
Manganese mg/L		0.086	0.01
Nickel mg/L		0.13	0.04
Nitrate as N mg/L		16.4 Q	2.5
Nitrate plus Nitrite mg/L		16.9 Q	1.0
Phosphate as P, Ortho mg/L			
Sulfate mg/L		1530 Q	125
TDS mg/L		2930	50.0
Methylene chloride µg/L	09/01/1998	0.14 JB	1.0
Tetrachloroethene µg/L		0.31 J	1.0
Chloride mg/L		131 Q	30.0
Fluoride mg/L		1.2 JG	2.0
Manganese mg/L		0.17	0.01
Nickel mg/L		0.049	0.04
Nitrate as N mg/L		6.6 G	1.0
Nitrate plus Nitrite mg/L		7.1 Q	1.0
Sulfate mg/L		1620 Q	250
TDS mg/L		3550	10.0
Methylene chloride µg/L	06/09/1999	0.56 JB	1.0
Tetrachloroethene µg/L		0.32 J	1.0
Manganese mg/L		0.050	0.010
Nickel mg/L		0.069	0.040
Chloride mg/L		177 Q	30.0
Fluoride mg/L		0.96 BG	2.0
Nitrate mg/L		9.4 G	1.0
Nitrate plus Nitrite mg/L		11.7	0.40
Phosphate as P, Ortho mg/L		0.49 BG	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-75 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	06/09/1999	1410 Q	250
TDS mg/L	-continued	2720	10.0
Tetrachloroethene µg/L	11/18/1999	0.26 J	1.0
Chloride mg/L		155 Q	15.0
Fluoride mg/L		0.91 B	1.0
Manganese µg/L		2.3 B	15.0
Nickel µg/L		59.0	40.0
Nitrate as N mg/L		8.7	0.50
Nitrate plus Nitrite mg/L		8.3	0.50
Sulfate mg/L		1380	250
TDS mg/L		2610	10.0
Manganese µg/L	06/01/2000	22.6	10.0
Nickel µg/L		31.9 B	40.0
Calcium mg/L		329	0.20
Potassium mg/L		1.2 B	3.0
Magnesium mg/L		25.3	0.20
Sodium mg/L		365	5.0
Nitrate plus Nitrite mg/L		5.4	0.10
Chloride mg/L		98.7	15.0
Fluoride mg/L		0.67 B	1.0
Sulfate mg/L		1360 Q	250
Nitrate mg/L		3.3	0.50
TDS mg/L		2420	10.0
Acetone µg/L	11/15/2000	0.80 J	10.0
Tetrachloroethene µg/L		0.28 J	1.0
Manganese µg/L		49.5	10.0
Nickel µg/L		23.6 B	40.0
Calcium mg/L		347	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		49.5	10.0
Sodium mg/L		386	5.0
Nitrate plus Nitrite mg/L		7.7	0.10
Chloride mg/L		67.6 Q	15.0
Sulfate mg/L		1270 Q	250
Nitrate mg/L		4.0	0.50
TDS mg/L		2420	10.0

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	05/23/2001	20	10.0
Bromoform µg/L		0.98 J	1.0
Chloromethane µg/L		0.48 J	2.0
Manganese µg/L		10.0	10.0
Nickel µg/L		12.0 B	40.0
Calcium mg/L		321	0.20
Potassium mg/L		1.3 B	3.0
Magnesium mg/L		24.7	10.0
Sodium mg/L		344	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		61.5 Q	15.0
Sulfate mg/L		1280 Q	250
Fluoride mg/L		0.85 B	1.0
Nitrate mg/L		4.2	0.50
TDS mg/L		2410	10.0
Manganese µg/L	11/07/2001	48.4	10.0
Nickel µg/L		5.1 B	40.0
Calcium mg/L		335	0.20
Potassium mg/L		0.95 B	3.0
Magnesium mg/L		26.1	10.0
Sodium mg/L		354	5.0
Nitrate plus Nitrite mg/L		3.6	0.10
Chloride mg/L		51.6 Q	15.0
Sulfate mg/L		1360 Q	250
Fluoride mg/L		0.59 B	1.0
Nitrate mg/L		3.3	0.50
TDS mg/L		2380	10.0
Manganese µg/L	05/16/2002	240	10.0
Nickel µg/L		7.2 B	40.0
Calcium mg/L		350	0.20
Potassium mg/L		1.4 B	3.0
Magnesium mg/L		27.4	10.0
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		45.1 Q	15.0
Sulfate mg/L		1360 Q	250
Fluoride mg/L		0.64 B	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-75 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	05/16/2002	3.1	0.50
TDS mg/L	-continued	2300	10.0
Chromium µg/L	11/21/2002	1.4 B	10.0
Manganese µg/L		140	10.0
Nickel µg/L		4.1 B	40.0
Calcium mg/L		340	0.20
Potassium mg/L		1.4 B	3.0
Magnesium mg/L		26.0	0.20
Sodium mg/L		330	5.0
Nitrate plus Nitrite mg/L		2.6	0.10
Chloride mg/L		49.0 J	3.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.99 B	1.0
Nitrate mg/L		2.7	0.50
TDS mg/L		2400	10.0
Manganese µg/L	05/14/2003	120	10.0
Calcium mg/L		370	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		28.0	0.20
Sodium mg/L		350	5.0
Nitrate plus Nitrite mg/L		3.0	0.10
Chloride mg/L		46.0	3.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		1.0	1.0
Nitrate mg/L		2.9	0.50
TDS mg/L		2500 J	10.0
Methylene chloride µg/L	11/19/2003	0.62 J,B	5.0
Manganese µg/L		610	10.0
Calcium mg/L		370	0.20
Potassium mg/L		1.1 B	3.0
Magnesium mg/L		28.0	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		2.8	0.10
Chloride mg/L		46.0	3.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		3.0	1.0

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	11/19/2003	3.0	0.50
TDS mg/L	-continued	2600	10.0
Methylene chloride µg/L	05/06/2004	0.55 J,B	5.0
Chromium µg/L		2.5 B	10.0
Manganese µg/L		960	10.0
Nickel µg/L		5.5 B	40.0
Calcium mg/L		370	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		3.1	0.10
Chloride mg/L		43.0 J	3.0
Sulfate mg/L		1600 Q	250
Nitrate mg/L		2.7	0.50
TDS mg/L		2500	10.0
Manganese µg/L	11/18/2004	630	10.0
Nickel µg/L		2.9 B	40.0
Calcium mg/L		420	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		380	5.0
Nitrate plus Nitrite mg/L		2.3	0.10
Chloride mg/L		46.0 J	3.0
Sulfate mg/L		1800 Q	250
Fluoride mg/L		0.58 B	1.0
Nitrate mg/L		2.4	0.50
TDS mg/L		2700	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-76 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
1,4-Dichlorobenzene µg/L	09/21/1993	0.020 J	0.5
1,2-Dichloroethene TOTAL µg/L		6.8	1.0
Tetrachloroethene µg/L		1.6	1.0
Toluene µg/		0.21 J	1.0
Trichloroethene µg/L		0.63 J	1.0
Antimony mg/L		0.007	0.001
Barium mg/L		0.013	0.01
Cadmium mg/L		0.001	0.001
Calcium mg/L		376	0.01
Chloride mg/L		52.6	0.5
Cobalt mg/L		0.016	0.001
Fluoride mg/L		2.9	0.5
Iron mg/L		0.016	0.1
Magnesium mg/L		29.4	0.2
Manganese mg/L		1.6	0.01
Molybdenum mg/L		0.015	0.001
Nickel mg/L		0.01	0.001
Nitrate as N mg/L		2.1	0.5
Nitrate plus Nitrite mg/L		1.9	0.1
Sodium mg/L		357	5.0
Sulfate mg/L		1540	5.0
TDS mg/L		2260	10.0
1,1-Dichloroethane µg/L	05/25/1994	0.2 J	1.0
1,2-Dichloroethene TOTAL µg/L		3.8	1.0
Methylene chloride µg/L		0.33 J	1.0
Tetrachloroethene µg/L		1.4	1.0
Trichloroethene µg/L		0.57 J	1.0
Antimony mg/L		0.0047	0.001
Barium mg/L		0.013	0.01
Calcium mg/L		344	0.2
Chloride mg/L		51.8	0.5
Chromium mg/L		0.015	0.01
Cobalt mg/L		0.018	0.01
Copper mg/L		0.012	0.01
Magnesium mg/L		28.0	0.2
Manganese mg/L		0.97	0.01

Analyte and unit	Date sampled	Result	RL
Molybdenum mg/L	05/25/1994	0.012	0.001
Nickel mg/L	-Continued	0.085	0.01
Nitrate as N mg/L		1.8	0.5
Nitrate plus Nitrite mg/L		1.9	0.05
Selenium mg/L		0.0071	0.001
Sodium mg/L		371	5.0
Sulfate mg/L		1540	5.0
TDS mg/L		2570	10.0
1,2-Dichloroethene(cis) µg/L	09/21/1994	3.7	1.0
Tetrachloroethene µg/L		1.6	1.0
Trichloroethene µg/L		0.57	1.0
Antimony mg/L		0.0055	0.002
Chloride mg/L		48.7	0.5
Cobalt mg/L		0.012	0.002
Magnesium mg/L		32.1	5.0
Manganese mg/L		0.8	0.01
Molybdenum mg/L		0.011	0.002
Nickel mg/L		0.035	0.02
Nitrate as N mg/L		1.6	0.5
Nitrate plus Nitrite mg/L		1.8	0.05
Selenium mg/L		0.0042	0.002
Sodium mg/L		398	5.0
Sulfate mg/L		1060	5.0
TDS mg/L		2520	10.0
1,2 cis-Dichloroethene µg/L	09/15/1995	5.5	1.0
Tetrachloroethene µg/L		2.3	1.0
Barium mg/L		0.011	0.002
Calcium mg/L		378	0.2
Chloride mg/L		50.2	1.0
Chromium mg/L		0.011	0.001
Cobalt mg/L		0.011	0.0005
Copper mg/L		0.0062	0.002
Fluoride mg/L		3.3	1.0
Magnesium mg/L		33.2	0.2
Manganese mg/L		1.2	0.01

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Analyte and unit	Date sampled	Result	RL
Molybdenum mg/L	09/15/1995	0.013	0.0002
Nickel mg/L	-continued	0.036	0.0002
Nitrate as N mg/L		1.5	0.5
Nitrate plus Nitrite mg/L		1.5	0.5
Potassium mg/L		2.3	5.0
Sodium mg/L		423	5.0
Sulfate mg/L		1580	5.0
TDS mg/L		2270	50.0
Acetone µg/L	05/31/1996	1.7 J	10.0
1,2 cis-Dichloroethene µg/L		5.5	1.0
Tetrachloroethene µg/L		2.1	1.0
Trichloroethene µg/L		0.69 J	1.0
Chloride mg/L		48.0	1.0
Fluoride mg/L		3.4	1.0
Manganese mg/L		1.7	0.01
Nitrate as N mg/L		1.2	0.5
Nitrate plus Nitrite mg/L		1.4	0.5
Sulfate mg/L		1660	5.0
TDS mg/L		2690	50.0
1,2 cis-Dichloroethene µg/L	09/06/1996	4.8	1.0
Methylene chloride µg/L		0.32 J	1.0
Tetrachloroethene µg/L		1.8	1.0
Trichloroethene µg/L		0.54 J	1.0
Chloride mg/L		51.3	1.0
Manganese mg/L		1.5	0.01
Nitrate as N mg/L		1.2	0.5
Nitrate plus Nitrite mg/L		1.4	0.5
Sulfate mg/L		1670	5.0
TDS mg/L		2670	50.0
2-Butanone (MEK) µg/L	05/22/1997	1.7 J	10.0
1,2 cis-Dichloroethene µg/L		5.5	1.0
Tetrachloroethene µg/L		2.3	1.0
Trichloroethene µg/L		0.76 J	1.0
Chloride mg/L		50.8	1.0
Manganese mg/L		1.4	0.01
Nitrate plus Nitrite mg/L		0.91	0.5

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/22/1997	1710	5.0
TDS mg/L	-continued	2780	50.0
1,2 cis-Dichloroethene µg/L	09/11/1997	2.7	1.0
Tetrachloroethene µg/L		1.5	1.0
Trichloroethene µg/L		0.44 J	1.0
Chloride mg/L		48.5	1.0
Manganese mg/L		0.59	0.01
Nitrate as N mg/L		1.1	0.5
Nitrate plus Nitrite mg/L		1.2	0.5
Sulfate mg/L		1490	5.0
TDS mg/L		2710	50.0
Chloroform µg/L	05/19/1998	0.12 J	1.0
1,1-Dichloroethane µg/L		0.13 J	1.0
cis-1,2-Dichloroethene µg/L		3.7	0.5
Tetrachloroethene µg/L		1.9	1.0
Trichloroethene µg/L		0.55 J	1.0
Chloride mg/L		141 Q	6.0
Manganese mg/L		1.7	0.01
Nickel mg/L		0.05	0.04
Nitrate as N mg/L		4.3	0.5
Nitrate plus Nitrite mg/L		4.1 Q	1.0
Sulfate mg/L		1640 Q	125
TDS mg/L		2850 Q	50.0
Chloride mg/L	09/01/1998	48.7 Q	15.0
Fluoride mg/L		1.2	1.0
Nitrate as N mg/L		5.0	0.5
Nitrate plus Nitrite mg/L		5.7 Q	0.2
Sulfate mg/L		1380 Q	250
TDS mg/L		2390	10.0
Acetone µg/L	06/09/1999	1.9 J	10
cis-1,2-Dichloroethene µg/L		1.5	1.0
1,2-Dichloroethene totalµg/L		1.5	1.0
Methylene chloride µg/L		0.77 JB	1.0
Tetrachloroethene µg/L		1.3	1.0
Trichloroethene µg/L		0.36 J	1.0

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Analyte and unit	Date sampled	Result	RL
Manganese µg/L	06/09/1999	80.0	10.0
Nickel µg/L	-continued	43.0	40.0
Nitrate plus Nitrite mg/L		7.4	0.10
Chloride mg/L		172 Q	30.0
Sulfate mg/L		1510 Q	250
Fluoride mg/L		0.89 B,G	2.0
Nitrate mg/L		6.4 G	1.0
TDS mg/L		2900	10.0
1,1-Dichloroethane µg/L	11/18/1999	0.14 J	1.0
cis-1,2-Dichloroethene µg/L		1.0	1.0
1,2-Dichloroethene total µg/L		1.0	1.0
Tetrachloroethene µg/L		0.93 J	1.0
Trichloroethene µg/L		0.31 J	1.0
Manganese µg/L		480	15.0
Nickel µg/L		44.0	40.0
Nitrate plus Nitrite mg/L		5.9	0.10
Chloride mg/L		118 Q	30.0
Sulfate mg/L		1500	250
Fluoride mg/L		0.79 B	1.0
Nitrate mg/L		5.2	0.50
TDS mg/L		2600	10.0
1,1-Dichloroethane µg/L	05/31/2000	0.19 J	1.0
cis-1,2-Dichloroethene µg/L		1.1	1.0
1,2-Dichloroethene total µg/L		1.1	1.0
Tetrachloroethene µg/L		0.99 J	1.0
Trichloroethene µg/L		0.34 J	1.0
Manganese µg/L		54.0	10.0
Nickel µg/L		26.8 B	40.0
Calcium mg/L		384	0.20
Potassium mg/L		2.7 B	3.0
Magnesium mg/L		31.2	0.20
Sodium mg/L		432	5.0
Nitrate plus Nitrite mg/L		4.0	0.10
Chloride mg/L		85.0 Q	15.0
Sulfate mg/L		1610 Q	250
Fluoride mg/L		0.58 B	1.0

Analyte and unit	Date sampled	Result	RL
Nitrate mg/L	05/31/2000	3.9	0.50
TDS mg/L	-continued	2790	10.0
Acetone µg/L	11/16/2000	1.3 J,B	10
1,1-Dichloroethane µg/L		0.13 J	1.0
cis-1,2-Dichloroethene µg/L		0.70	1.0
Tetrachloroethene µg/L		0.86 J	1.0
Trichloroethene µg/L		0.25 J	1.0
Manganese µg/L		50.0	10.0
Nickel µg/L		2.30 B	40.0
Calcium mg/L		370	0.20
Potassium mg/L		2.5 B	3.0
Magnesium mg/L		30.3	0.20
Sodium mg/L		423	5.0
Nitrate plus Nitrite mg/L		4.0	0.10
Chloride mg/L		67.2 Q	6.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.32 B,G	1.0
Nitrate mg/L		3.4	0.50
TDS mg/L		2780	10.0
Acetone µg/L	05/22/2001	100	10
Bromoform µg/L		0.49 J	1.0
cis-1,2-Dichloroethene µg/L		0.41 J	1.0
Methylene chloride µg/L		1.4	1.0
Tetrachloroethene µg/L		0.81 J	1.0
Manganese µg/L		2.2 B	10.0
Nickel µg/L		9.7 B	40.0
Calcium mg/L		350	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		27.6	0.20
Sodium mg/L		398	5.0
Nitrate plus Nitrite mg/L		2.5 B	0.10
Chloride mg/L		56.0 Q	6.0
Sulfate mg/L		1500 Q	250
Fluoride mg/L		0.57 B	1.0
Nitrate mg/L		2.2	0.50
TDS mg/L		2710	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-76 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Not Sampled	11/07/2001	--	--
Tetrachloroethene µg/L	05/16/2002	0.68 J	1.0
Manganese µg/L		72.0	10.0
Nickel µg/L		16.0 B	40.0
Calcium mg/L		361	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		29.4	0.20
Sodium mg/L		410	5.0
Nitrate plus Nitrite mg/L		2.4	0.10
Chloride mg/L		54.5 Q	6.0
Sulfate mg/L		1480 Q	250
Fluoride mg/L		0.73 B,G	1.0
Nitrate mg/L		2.1 G	0.50
TDS mg/L		2570	10.0
Tetrachloroethene µg/L	11/21/2002	0.72 J	1.0
Chromium µg/L		2.0 B	10.0
Manganese µg/L		33.0	10.0
Nickel µg/L		7.7 B	40.0
Calcium mg/L		340	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		370	5.0
Nitrate plus Nitrite mg/L		1.9	0.10
Chloride mg/L		56.0 J,Q	6.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		0.97 B,G	1.0
Nitrate mg/L		1.8 G	0.50
TDS mg/L		2600	10.0
Acetone µg/L	05/14/2003	2.7 J	10.0
Tetrachloroethene µg/L		0.81 J	1.0
Trichloroethene µg/L		0.24 J	1.0
Manganese µg/L		290	10.0
Nickel µg/L		6.7 B	40.0
Calcium mg/L		360	0.20
Potassium mg/L		2.3 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		400	5.0
Nitrate plus Nitrite mg/L	-continued	2.3	0.10
Chloride mg/L		48.0 Q	15.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		1.0	1.0
Nitrate mg/L		2.2	0.50
TDS mg/L		2600 J	10.0
Methylene chloride µg/L	11/18/2003	0.40 J,B	5.0
Tetrachloroethene µg/L		0.61 J	1.0
Manganese µg/L		3.4 B	10.0
Nickel µg/L		5.9 B	40.0
Calcium mg/L		340	0.20
Potassium mg/L		0.97 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		370	5.0
Nitrate plus Nitrite mg/L		1.3 B	0.10
Chloride mg/L		52.0 Q	6.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		0.97 B,G	1.0
Nitrate mg/L		1.7 G	0.50
TDS mg/L		2700	10.0
Methylene chloride µg/L	05/05/2004	0.52 J,B	5.0
Tetrachloroethene µg/L		0.56 J	1.0
Chromium µg/L		2.8 B	10.0
Manganese µg/L		140	10.0
Nickel µg/L		10.0 B	40.0
Calcium mg/L		390	0.20
Potassium mg/L		2.5 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		430	5.0
Nitrate plus Nitrite mg/L		2.4 B	0.10
Chloride mg/L		54.0 Q	15.0
Sulfate mg/L		1800 Q	250
Fluoride mg/L		0.73 B	1.0
Nitrate mg/L		5.5	0.50
TDS mg/L		2600	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well BLM-76 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Tetrachloroethene µg/L	11/17/2004	0.65 J	1.0
Chromium µg/L		1.4 B	10.0
Manganese µg/L		770	10.0
Nickel µg/L		9.3 B	40.0
Calcium mg/L		410	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		420	5.0
Nitrate plus Nitrite mg/L		1.4 B	0.10
Chloride mg/L		55.0 Q	15.0
Sulfate mg/L		1900 Q	250
Fluoride mg/L		0.51 B	1.0
Nitrate mg/L		1.5	0.50
TDS mg/L		2800	10.0

Analyte and unit	Date sampled	Result	RL

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Analyte and unit	Date sampled	Result	RL
1,2-Dichloroethene TOTAL µg/L	09/27/1993	4.4	1.0
Tetrachloroethene µg/L		1.2	1.0
Toluene µg/		0.34 J	1.0
Trichloroethene µg/L		0.45 J	1.0
Antimony mg/L		0.012	0.001
Barium mg/L		0.017	0.01
Cadmium mg/L		0.001	0.001
Calcium mg/L		328	0.01
Chloride mg/L		47.8	0.5
Chromium mg/L		0.01	0.01
Fluoride mg/L		2.7	0.5
Iron mg/L		0.23	0.1
Magnesium mg/L		29.7	0.2
Manganese mg/L		0.4	0.01
Molybdenum mg/L		0.018	0.001
Nickel mg/L		0.032	0.001
Nitrate as N mg/L		1.3	0.5
Nitrate plus Nitrite mg/L		1.2	0.1
Potassium mg/L		6.4	5.0
Selenium mg/L		0.0015	0.001
Sodium mg/L		374	5.0
Sulfate mg/L		1,360	5.0
TDS mg/L		2,430	10.0
1,2-Dichloroethene(cis) µg/L	09/21/1994	3.7	1.0
Tetrachloroethene µg/L		1.6	1.0
Trichloroethene µg/L		0.51	1.0
Antimony mg/L		0.0069	0.002
Calcium mg/L		378	5.0
Chloride mg/L		50.5	0.5
Chromium mg/L		0.03	0.02
Cobalt mg/L		0.0083	0.002
Magnesium mg/L		33.0	5.0
Manganese mg/L		0.26	0.01
Molybdenum mg/L		0.013	0.002
Nickel mg/L		0.036	0.02
Nitrate as N mg/L		1.2	0.5

Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	09/21/1994	0.3	0.05
Selenium mg/L	-Continued	0.0044	0.002
Sodium mg/L		391	5.0
Sulfate mg/L		1,130	5.0
TDS mg/L		2,370	20.0
1,2 cis-Dichloroethene µg/L	09/13/1995	2.8	1.0
Tetrachloroethene µg/L		1.5	1.0
Trichloroethene µg/L		2.7	1.0
Barium mg/L		0.014	0.002
Calcium mg/L		358	0.2
Chloride mg/L		51.6	1.0
Chromium mg/L		0.026	0.001
Cobalt mg/L		0.0071	0.0005
Copper mg/L		0.0054	0.002
Fluoride mg/L		3.3	1.0
Magnesium mg/L		30.5	0.2
Manganese mg/L		0.033	0.01
Molybdenum mg/L		0.012	0.002
Nickel mg/L		0.037	0.002
Nitrate as N mg/L		1.3	0.5
Potassium mg/L		2.3	5.0
Sodium mg/L		391	5.0
Sulfate mg/L		1,580	5.0
TDS mg/L		2,320	50.0
Acetone µg/L	05/31/1996	1.4 J	10.0
1,2 cis-Dichloroethene µg/L		2.3	1.0
Tetrachloroethene µg/L		1.3	1.0
Trichloroethene µg/L		0.38 J	1.0
Chloride mg/L		48.8	1.0
Fluoride mg/L		2.9	1.0
Manganese mg/L		0.02	0.01
Nitrate as N mg/L		1.0	0.5
Nitrate plus Nitrite mg/L		1.0	0.5
Sulfate mg/L		1,580	5.0
TDS mg/L		2,580	50.0

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Analyte and unit	Date sampled	Result	RL
1,2 cis-Dichloroethene µg/L	09/06/1996	2.7	1.0
Tetrachloroethene µg/L		1.4	1.0
Trichloroethene µg/L		0.36 J	1.0
Chloride mg/L		48.9	1.0
Manganese mg/L		0.34	0.01
Nitrate as N mg/L		0.64	0.5
Nitrate plus Nitrite mg/L		0.72	0.5
Sulfate mg/L		1,600	5.0
TDS mg/L		2,520	50.0
1,2 cis-Dichloroethene µg/L	05/22/1997	2.9	1.0
Tetrachloroethene µg/L		1.6	1.0
Trichloroethene µg/L		0.48 J	1.0
Chloride mg/L		49.8	1.0
Manganese mg/L		2.4	0.01
Nitrate plus Nitrite mg/L		0.41	0.5
Sulfate mg/L		1,640	5.0
TDS mg/L		2,680	50.0
1,2 cis-Dichloroethene µg/L	09/10/1997	1.2	1.0
Tetrachloroethene µg/L		1.5	1.0
Trichloroethene µg/L		0.38 J	1.0
Chloride mg/L		49.6	1.0
Manganese mg/L		2.1	0.01
Nitrate plus Nitrite mg/L		0.12	0.5
Sulfate mg/L		1,500	5.0
TDS mg/L		2,660	50.0
Chloroform µg/L	05/19/1998	0.14 J	1.0
cis-1,2-Dichloroethene µg/L		1.9	0.5
Tetrachloroethene µg/L		1.6	1.0
Trichloroethene µg/L		0.40 J	1.0
Chloride mg/L		110 Q	6.0
Fluoride mg/L		1.7 JG	2.0
Manganese mg/L		0.053	0.01
Nickel mg/L		0.027 J	0.04
Nitrate as N mg/L		2.4	0.5
Nitrate plus Nitrite mg/L		2.2	0.1

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/19/1999	1,560 Q	125
TDS mg/L	-continued	2,570	10.0
Chloroform µg/L	09/01/1998	0.11 J	1.0
1,2-Dichloroethene TOTAL µg/L		1.4	1.0
Methylene chloride µg/L		0.13 JB	1.0
Tetrachloroethene µg/L		1.5	1.0
Trichloroethene µg/L		0.46 J	1.0
Chloride mg/L		110 Q	15.0
Fluoride mg/L		1.2	1.0
Manganese mg/L		0.59	0.01
Nickel mg/L		0.039 B	0.04
Nitrate as N mg/L		1.6	0.5
Nitrate plus Nitrite mg/L		2.1	0.1
Sulfate mg/L		1,580 Q	250
TDS mg/L		2,790	10.0
Acetone µg/L	06/08/1999	2.2 JB	10
Chloroform µg/L		0.17 J	1.0
cis-1,2-Dichloroethene µg/L		1.6	1.0
1,2-Dichloroethene TOTAL µg/L		1.6	1.0
Tetrachloroethene µg/L		1.7	1.0
Trichloroethene µg/L		0.43 J	1.0
Manganese mg/L		0.091	0.010
Nickel mg/L		0.042	0.040
Chloride mg/L		119 Q	30.0
Fluoride mg/L		0.76 JG	2.0
Nitrate mg/L		5.1 G	1.0
Nitrate plus Nitrite mg/L		5.8	0.10
Sulfate mg/L		1,580 Q	250.0
TDS mg/L		2,900	10.0
Chloroform µg/L	11/18/1999	0.11 J	1.0
cis-1,2-Dichloroethene µg/L		0.64 J	1.0
1,2-Dichloroethene TOTAL µg/L		0.64 J	1.0
Tetrachloroethene µg/L		1.1	1.0
Trichloroethene µg/L		0.27 J	1.0
Chloride mg/L		146 Q	15.0

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Analyte and unit	Date sampled	Result	RL
Fluoride mg/L	11/18/1999	0.90 B	1.0
Manganese µg/L	-continued	240	10.0
Nickel µg/L		42.0	40.0
Nitrate mg/L		4.7	0.50
Nitrate plus Nitrite mg/L		5.3	0.10
Sulfate mg/L		1600 Q	250
TDS mg/L			
cis-1,2-Dichloroethene µg/L	06/01/2000	0.60 J	1.0
Tetrachloroethene µg/L		0.99 J	1.0
Trichloroethene µg/L		0.23 J	1.0
Nickel µg/L		30.0 B	40.00
Calcium mg/L		374	0.20
Potassium mg/L		1.5 B	3.0
Magnesium mg/L		30.3	0.20
Sodium mg/L		401	5.0
Nitrate plus Nitrite mg/L		3.5	0.10
Chloride mg/L		98.3 Q	15.0
Fluoride mg/L		0.67	1.0
Sulfate mg/L		1570 Q	250
TDS mg/L		2760	10.0
cis-1,2-Dichloroethene µg/L	11/16/2000	0.26 J	1.0
Tetrachloroethene µg/L		0.83 J	1.0
Nickel µg/L		28.0 B	40.00
Calcium mg/L		376	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		31.8	0.20
Sodium mg/L		427	5.0
Nitrate plus Nitrite mg/L		2.8	0.10
Chloride mg/L		85.3 Q	15.0
Fluoride mg/L		0.34 B	1.0
Sulfate mg/L		1500 Q	250
TDS mg/L		2760	10.0
Acetone µg/L	05/22/2001	72	10.0
Bromoform µg/L		0.35 J	1.0
Methylene chloride µg/L		1.9	1.0
Tetrachloroethene µg/L		0.49 J	1.0

Analyte and unit	Date sampled	Result	RL
Manganese µg/L	05/22/2001	2700	10.0
Nickel µg/L	-continued	29.0 B	40.0
Calcium mg/L		343	0.20
Potassium mg/L		1.9 B	3.0
Magnesium mg/L		27.9	0.20
Sodium mg/L		393	5.0
Nitrate plus Nitrite mg/L		1.5	0.10
Chloride mg/L		69.8	15.0
Sulfate mg/L		1490 Q	250
Fluoride mg/L		0.66 B	1.0
Nitrate mg/L		1.7	0.50
TDS mg/L		2720	10.0
Manganese µg/L	11/07/2001	8720	10.0
Nickel µg/L		28.8 B	40.0
Calcium mg/L		349	0.20
Potassium mg/L		1.1 B	3.0
Magnesium mg/L		28.2	0.20
Sodium mg/L		388	5.0
Nitrate plus Nitrite mg/L		0.14	0.10
Chloride mg/L		60.8	15.0
Sulfate mg/L		1520 Q	250
Fluoride mg/L		0.53 B	1.0
Nitrate mg/L		0.32 B	0.50
TDS mg/L		2600	10.0
Tetrachloroethene µg/L	05/16/2002	0.45 J	1.0
Manganese µg/L		520	10.0
Nickel µg/L		16.0 B	40.0
Calcium mg/L		377	0.20
Potassium mg/L		1.2 B	3.0
Magnesium mg/L		31.3	0.20
Sodium mg/L		431	5.0
Nitrate plus Nitrite mg/L		0.53	0.10
Chloride mg/L		54.3 Q	6.0
Sulfate mg/L		1510 Q	250
Fluoride mg/L		0.70 B	1.0
Nitrate mg/L		3.9	0.50
TDS mg/L		2530	10.0

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Analyte and unit	Date sampled	Result	RL
Tetrachloroethene µg/L	11/20/2002	0.44 J	1.0
Chromium µg/L		1.3 B	10.0
Manganese µg/L		200	10.0
Nickel µg/L		10.0 B	40.0
Calcium mg/L		370	0.20
Potassium mg/L		1.2 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		390	5.0
Nitrate plus Nitrite mg/L		0.31	0.10
Chloride mg/L		55.0 J,Q	6.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		1.0 B,G	2.0
Nitrate mg/L		0.72 B,G	1.0
TDS mg/L		2700	10.0
Tetrachloroethene µg/L	05/14/2003	0.44 J	1.0
Manganese µg/L		1000	10.0
Nickel µg/L		10.0 B	40.0
Calcium mg/L		350	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		29.0	0.20
Sodium mg/L		410	5.0
Nitrate plus Nitrite mg/L		0.47	0.10
Chloride mg/L		48.0 Q	15.0
Sulfate mg/L		1700 Q	250
Fluoride mg/L		1.2	1.0
Nitrate mg/L		0.59	0.50
TDS mg/L		2600	10.0
Phosphate as P, Ortho mg/L		0.090 B	0.50
Methylene chloride µg/L	11/18/2003	0.57 J,B	5.0
Tetrachloroethene µg/L		0.27 J	1.0
Manganese µg/L		14.0	10.0
Nickel µg/L		5.7 B	40.0
Calcium mg/L		380	0.20
Potassium mg/L		0.67 B	3.0
Magnesium mg/L		31.0	0.20
Sodium mg/L		420	5.0
Nitrate plus Nitrite mg/L		0.29	0.10
Chloride mg/L	11/18/2003	52.0 Q	15.0
Sulfate mg/L	-continued	1900 Q	250
Fluoride mg/L		1.20	1.0
Nitrate mg/L		0.44	0.50
TDS mg/L		2900	10.0
Methylene chloride µg/L	05/04/2004	0.53 J,B	5.0
Tetrachloroethene µg/L		0.43 J	1.0
Manganese µg/L		3500	10.0
Nickel µg/L		16.0 B	40.0
Calcium mg/L		400	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		33.0	0.20
Sodium mg/L		440	5.0
Nitrate plus Nitrite mg/L		0.029 B	0.10
Chloride mg/L		50.0 Q	6.0
Sulfate mg/L		1400 Q	250
Nitrate mg/L		0.24 B	0.50
TDS mg/L		2600	10.0
Tetrachloroethene µg/L	11/17/2004	0.47 J	1.0
Manganese µg/L		2300	10.0
Nickel µg/L		13.0 B	40.0
Calcium mg/L		410	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		32.0	0.20
Sodium mg/L		420	5.0
Nitrate plus Nitrite mg/L		0.057 B	0.10
Chloride mg/L		52.0 Q	6.0
Sulfate mg/L		1900 Q	250
Nitrate mg/L		0.24 B	0.50
TDS mg/L		2800	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-17 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels]

Analyte and unit	Date sampled	Result	RL
Antimony mg/L	09/25/1993	0.013	0.001
Calcium mg/L		311	0.01
Chloride mg/L		56.6	0.5
Chromium mg/L		0.014	0.01
Fluoride mg/L		2.6	0.5
Iron mg/L		0.18	0.1
Magnesium mg/L		25.9	0.2
Manganese mg/L		0.029	0.01
Molybdenum mg/L		0.0028	0.001
Nickel mg/L		0.088	0.001
Nitrate as N mg/L		3.5	0.5
Nitrate plus Nitrite mg/L		3.5	0.1
Selenium mg/L		0.0027	0.001
Sodium mg/L		300	5.0
Sulfate mg/L		1300	5.0
TDS mg/L		2150	10.0
Zinc mg/L		0.029	0.02
Methylene chloride µg/L	05/14/1994	0.26 J	1.0
Antimony mg/L		0.005	0.002
Calcium mg/L		347	0.2
Chloride mg/L		54.5	0.5
Cobalt mg/L		0.011	0.01
Magnesium mg/L		30.2	0.2
Manganese mg/L		0.092	0.01
Molybdenum mg/L		0.0025	0.002
Nickel mg/L		0.26	0.02
Nitrate as N mg/L		3.2	0.5
Nitrate plus Nitrite mg/L		3.3	0.1
Selenium mg/L		0.0043	0.002
Sodium mg/L		303	5.0
Sulfate mg/L		1230	5.0
TDS mg/L		2210	10.0
Acetone µg/L	06/01/1996	2.2 J	10.0
carbon disulfide µg/L		0.61 J	1.0
Methylene chloride µg/L		0.59 J	1.0

Analyte and unit	Date sampled	Result	RL
Tetrachloroethene µg/L	06/01/1996	0.3 J	1.0
Chloride mg/L	-continued	55.2	1.0
Manganese mg/L		0.11	0.01
Nickel mg/L		0.41	0.04
Nitrate as N mg/L		3.0	0.5
Nitrate plus Nitrite mg/L		2.9	0.5
Sulfate mg/L		1400	5.0
TDS mg/L		2200	50.0
Chloride mg/L	09/06/1996	54.3	1.0
Nitrate as N mg/L		3.1	0.5
Nitrate plus Nitrite mg/L		3.4	0.5
Sulfate mg/L		1260	5.0
TDS mg/L		2170	50.0
Methylene chloride µg/L	05/22/1997	0.39 J	1.0
Chloride mg/L		54.0	1.0
Manganese mg/L		0.14	0.01
Nitrate as N mg/L		3.2	0.5
Nitrate plus Nitrite mg/L		3.6	0.5
Sulfate mg/L		1270	5.0
TDS mg/L		2140	50.0
Chloride mg/L	09/10/1997	54.6	1.0
Nitrate as N mg/L		2.9	0.5
Nitrate plus Nitrite mg/L		2.9	0.5
Sulfate mg/L		1190	5.0
TDS mg/L		2190	50.0
Methylene chloride µg/L	05/20/1998	0.45 J	1.0
Chloride mg/L		46.4 Q	15.0
Manganese µg/L		8.6 J	10.0
Nitrate as N mg/L		4.8	0.5
Nitrate plus Nitrite mg/L		4.9 Q	0.4
Sulfate mg/L		1470 Q	100
TDS mg/L		899	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-17 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels]

Analyte and unit	Date sampled	Result	RL
Methylene chloride µg/L	09/02/1998	0.16 J	1.0
Chloride mg/L		48.8 Q	15.0
Fluoride mg/L		0.81 J	1.0
Manganese µg/L		6.8 J	10.0
Nitrate as N mg/L		3.8	0.5
Nitrate plus Nitrite mg/L		3.6 Q	1.0
Sulfate mg/L		1210 Q	250
TDS mg/L		2150	10.0
Methylene chloride µg/L	06/09/1999	0.26 JB	1.0
Manganese µg/L		5.0 B	10.0
Chloride mg/L		44.6 Q	3.0
Fluoride mg/L		0.73 J	1.0
Nitrate as N mg/L		5.6	0.50
Nitrate plus Nitrite mg/L		6.6	0.10
Sulfate mg/L		980 Q	125
TDS mg/L		1900	10.0
Chloride mg/L	11/18/1999	48.5	3.0
Fluoride mg/L		0.81 B	1.0
Manganese µg/L		5.6 B	15.0
Nickel µg/L		11.0 B	40.0
Nitrate as N mg/L		4.4	0.50
Nitrate plus Nitrite mg/L		5.1	0.10
Sulfate mg/L		1050 Q	250
TDS mg/L		1850	10.0
Not Sampled	06/01/2000	--	--
Not Sampled	11/16/2000	--	--
Acetone µg/L	05/23/2001	55	10.0
Bromoform µg/L		0.67 J	1.0
Manganese µg/L		2.3 B	10.0
Calcium mg/L		278	0.20
Potassium mg/L		1.2 B	3.0
Magnesium mg/L		21.4	0.20
Sodium mg/L		279	5.0
Nitrate plus Nitrite mg/L		4.2	0.10
Chloride mg/L		49.3	15.0
Sulfate mg/L		1040 Q	250
Fluoride mg/L		0.45 B	1.0
Nitrate mg/L		4.8	0.50
TDS mg/L		2080	10.0
Manganese µg/L	11/07/2001	5.1 B	10.0
Calcium mg/L		293	0.20
Potassium mg/L		1.0 B	3.0
Magnesium mg/L		22.7	0.20
Sodium mg/L		292	5.0
Nitrate plus Nitrite mg/L		5.0	0.10
Chloride mg/L		51.3	6.0
Sulfate mg/L		1140 Q	250
Fluoride mg/L		0.49 B	1.0
Nitrate mg/L		4.4	0.50
TDS mg/L		2010	10.0
Manganese µg/L	05/16/2002	5.0 B	10.0
Nickel µg/L		4.5 B	40.0
Calcium mg/L		315	0.20
Potassium mg/L		0.51 B	3.0
Magnesium mg/L		24.8	0.20
Sodium mg/L		309	5.0
Nitrate plus Nitrite mg/L		4.8	0.10
Chloride mg/L		49.2	6.0
Sulfate mg/L		1120 Q	250
Fluoride mg/L		0.72 B,G	1.0
Nitrate mg/L		4.2 G	0.50
TDS mg/L		2030	10.0
Chromium µg/L	11/20/2002	6.4 B	10.0
Manganese µg/L		4.8 B	10.0
Calcium mg/L		320	0.20
Potassium mg/L		0.82 B	3.0
Magnesium mg/L		24.0	0.20
Sodium mg/L		290	5.0
Nitrate plus Nitrite mg/L		3.7	0.10
Chloride mg/L		50.0 J,Q	15.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-17 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels]

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	11/20/2002	1200 Q	250
Fluoride mg/L	-continued	0.88 B	1.0
Nitrate mg/L		4.0	0.50
TDS mg/L		2000	10.0
Calcium mg/L	05/14/2003	310	0.20
Potassium mg/L		0.50 B	3.0
Magnesium mg/L		25.0	0.20
Sodium mg/L		300	5.0
Nitrate plus Nitrite mg/L		4.3	0.10
Chloride mg/L		49.0 Q	15.0
Sulfate mg/L		1200 Q	250
Fluoride mg/L		0.93 B	1.0
Nitrate mg/L		4.3	0.50
TDS mg/L		2000	10.0
Not Sampled	11/18/2003	--	--
Methylene chloride µg/L	05/05/2004	0.54 J,B	1.0
Chromium µg/L		8.0 B	10.0
Manganese µg/L		1.4 B	10.0
Calcium mg/L		350	0.20
Potassium mg/L		0.88 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		320	5.0
Nitrate plus Nitrite mg/L		5.0	0.10
Chloride mg/L		53.0 Q	15.0
Sulfate mg/L		1400 Q	250
Fluoride mg/L		0.71 B	1.0
Nitrate mg/L		5.0	0.50
TDS mg/L		2100	10.0
Chromium µg/L	11/17/2004	6.3 B	10.0
Calcium mg/L		360	0.20
Potassium mg/L		1.1 B	3.0
Magnesium mg/L		27.0	0.20
Sodium mg/L		310	5.0
Nitrate plus Nitrite mg/L		4.1	0.10
Chloride mg/L		49.0 Q	15.0
Sulfate mg/L	11/17/2004	1400 Q	250
Fluoride mg/L	-continued	0.62 B	1.0
Nitrate mg/L		5.0	0.50
TDS mg/L		2200	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-32 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference; I, estimated result and exceeds the calibration range]

Analyte and unit	Date sampled	Result	RL
1,1-Dichloroethane µg/L	09/21/1993	2.3	2.5
1,2-Dichloroethene TOTAL µg/L		120	2.5
Methylene chloride µg/L		1.4 J	2.5
Tetrachloroethene µg/L		4.8	2.5
Trichloroethene µg/L		4.3	2.5
Xylenes (total) µg/L		0.56 J	2.5
Antimony mg/L		0.016	0.001
Calcium mg/L		502	0.01
Chloride mg/L		506	0.5
Cobalt mg/L		0.046	0.001
Fluoride mg/L		3.4	0.5
Iron mg/L		0.7	0.1
Magnesium mg/L		46.5	0.2
Manganese mg/L		4.3	0.01
Molybdenum mg/L		0.02	0.001
Nickel mg/L		0.16	0.001
Nitrate as N mg/L		2.0	0.5
Nitrate plus Nitrite mg/L		2.1	0.1
Potassium mg/L		6.4	5.0
Selenium mg/L		0.011	0.001
Sodium mg/L		696	5.0
Sulfate mg/L		2000	5.0
TDS mg/L		3900	10.0
Zinc mg/L		0.11	0.02
1,2-Dichloroethene TOTAL µg/L	05/25/1994	82.0	5.0
Tetrachloroethene µg/L		8.7	5.0
Toluene µg/L		4.2	5.0
Trichloroethene µg/L		5.9	5.0
Antimony mg/L		0.0046	0.002
Arsenic mg/L		0.007	0.005
Barium mg/L		0.012	0.01
Calcium mg/L		467	0.2
Chloride mg/L		491	5.0
Chromium mg/L		0.019	0.01
Cobalt mg/L		0.03	0.01

Analyte and unit	Date sampled	Result	RL
Copper mg/L	05/25/1994	0.02	0.01
Magnesium mg/L	-Continued	44.0	0.2
Manganese mg/L		3.7	0.01
Molybdenum mg/L		0.0089	0.001
Nickel mg/L		0.2	0.01
Nitrate as N mg/L		2.3	0.5
Nitrate plus Nitrite mg/L		2.4	0.1
Selenium mg/L		0.04	0.006
Sodium mg/L		756	5.0
Sulfate mg/L		1890	5.0
TDS mg/L		3970	10.0
Zinc mg/L		0.02	0.02
1;2 cis-Dichloroethene µg/L	09/15/1995	95.0	1.0
Tetrachloroethene µg/L		10.0	1.0
Trichloroethene µg/L		5.1	1.0
Barium mg/L		0.011	0.002
Calcium mg/L		482	0.2
Chloride mg/L		652	1.0
Chromium mg/L		0.044	0.001
Cobalt mg/L		0.023	0.0005
Copper mg/L		0.012	0.002
Fluoride mg/L		4.9	1.0
Magnesium mg/L		47.1	0.2
Manganese mg/L		2.0	0.01
Molybdenum mg/L		0.00059	0.0002
Nickel mg/L		0.15	0.0002
Nitrate as N mg/L		4.7	0.5
Nitrate plus Nitrite mg/L		4.9	0.5
Potassium mg/L		2.0	5.0
Selenium mg/L		0.042	0.005
Sodium mg/L		699	5.0
Sulfate mg/L		1940	5.0
TDS mg/L		4200	50.0
Vanadium mg/L		0.0038	0.0005
Zinc mg/L		0.096	0.01

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-32 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	05/30/1996	2.7	1.2
1,1-Dichloroethane µg/L		1.3 J	2.5
1,2 cis-Dichloroethene µg/L		69.0	2.5
Methylene chloride µg/L		0.71 J	2.5
Tetrachloroethene µg/L		7.0	2.5
1,1,1-Trichloroethane µg/L		0.81 J	2.5
Trichloroethene µg/L		4.3	2.5
Chloride mg/L		658	1.0
Manganese mg/L		2.0	0.01
Nickel mg/L		0.14	0.04
Nitrate as N mg/L		5.4	0.5
Nitrate plus Nitrite mg/L		5.8	0.5
Sulfate mg/L		1960	5.0
TDS mg/L		4300	50.0
Chloroform µg/L	09/06/1996	2.4	0.5
1,1-Dichloroethane µg/L		1.1	1.0
1,2 cis-Dichloroethene µg/L		48.0	1.0
Methylene chloride µg/L		0.41 J	1.0
Tetrachloroethene µg/L		8.0	1.0
1,1,1-Trichloroethane µg/L		1.2	1.0
Trichloroethene µg/L		4.2	1.0
Chloride mg/L		815	1.0
Manganese mg/L		1.8	0.01
Nickel mg/L		0.1	0.04
Nitrate as N mg/L		6.8	0.5
Nitrate plus Nitrite mg/L		7.9	0.5
Sulfate mg/L		1980	5.0
TDS mg/L		4520	50.0
Benzene µg/L	05/22/1997	0.62 J	1.0
Chloroform µg/L		1.3	0.5
1,1-Dichloroethane µg/L		0.43 J	1.0
1,2 cis-Dichloroethene µg/L		14.0	1.0
Methylene chloride µg/L		0.41 J	1.0
Tetrachloroethene µg/L		1.9	1.0
1,1,1-Trichloroethane µg/L		0.37 J	1.0
Trichloroethene µg/L		1.4	1.0

Analyte and unit	Date sampled	Result	RL
Chloride mg/L		967	1.0
Manganese mg/L		0.66	0.01
Nickel mg/L		0.48	0.04
Nitrate as N mg/L		11.8	0.5
Nitrate plus Nitrite mg/L		12.8	0.5
Sulfate mg/L		1990	5.0
TDS mg/L		4760	50.0
Chloroform µg/L	09/10/1997	1.7	0.5
Dibromochloromethane µg/L		0.55 J	1.0
1,2 cis-Dichloroethene µg/L		14.0	1.0
Tetrachloroethene µg/L		3.3	1.0
1,1,1-Trichloroethane µg/L		0.53 J	1.0
Trichloroethene µg/L		1.9	1.0
Chloride mg/L		737	1.0
Manganese mg/L		0.51	0.01
Nickel mg/L		0.11	0.04
Nitrate as N mg/L		10.1	0.5
Nitrate plus Nitrite mg/L		10.5	0.5
Sulfate mg/L		1670	5.0
TDS mg/L		4090	50.0
Chloroform µg/L	05/20/1998	2.5	1.2
1,1-Dichloroethane µg/L		1.0	1.0
cis-1,2-Dichloroethene µg/L		37.0	0.5
Methylene chloride µg/L		0.44 J	1.0
Tetrachloroethene µg/L		5.5	1.0
1,1,1-Trichloroethane µg/L		0.56 J	1.0
Trichloroethene µg/L		3.7	1.0
Chloride mg/L		735 Q	150
Manganese mg/L		0.53	0.01
Nickel mg/L		0.1	0.04
Nitrate as N mg/L		7.9	0.5
Nitrate plus Nitrite mg/L		7.5 Q	1.0
Sulfate mg/L		1850 Q	250
TDS mg/L		3090 Q	50.0

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Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	09/01/1998	2.4	1.0
1,1-Dichloroethane µg/L		0.9	1.0
1,2-Dichloroethene TOTAL µg/L		24.0	1.0
Methylene chloride µg/L		0.13 J	1.0
Tetrachloroethene µg/L		5.1	1.0
1,1,1-Trichloroethane µg/L		0.44 J	1.0
Trichloroethene µg/L		3.5	1.0
Chloride mg/L		949 Q	300
Fluoride mg/L		1.5 J,G	10.0
Manganese mg/L		0.56	0.01
Nickel mg/L		0.13	0.04
Nitrate as N mg/L		9.0 G	1.0
Nitrate plus Nitrite mg/L		8.8 Q	0.5
Sulfate mg/L		1870 Q	500
TDS mg/L		4810	10.0
Chloroform µg/L	06/08/1999	2.0	1.0
1,1-Dichloroethane µg/L		1.4	1.0
cis-1,2-Dichloroethene µg/L		24	1.0
1,2-Dichloroethene TOTAL µg/L		24	1.0
Tetrachloroethene µg/L		4.8	1.0
1,1,1-Trichloroethane µg/L		0.29 J	1.0
Trichloroethene µg/L		3.1	1.0
Manganese mg/L		0.64	0.010
Nickel mg/L		0.13	0.040
Chloride mg/L		812 Q	300
Nitrate mg/L		8.6 G	1.0
Nitrate plus Nitrite mg/L		9.7	0.20
Sulfate mg/L		1920 Q	500
TDS mg/L		4750	10.0
Carbon disulfide µg/L	11/18/1999	0.40 J	1.0
Chloroform µg/L		1.7	1.0
1,1-Dichloroethane µg/L		1.5	1.0
cis-1,2-Dichloroethene µg/L		17	1.0
1,2-Dichloroethene TOTAL µg/L		17	1.0
Tetrachloroethene µg/L		4.4	1.0
1,1,1-Trichloroethane µg/L		0.22 J	1.0
Trichloroethene µg/L		2.6	1.0
Chloride mg/L	-continued	736 Q	60.0
Fluoride mg/L		0.88 B,G	2.0
Manganese mg/L		0.84	0.015
Nickel mg/L		0.096	0.040
Nitrate mg/L		5.0 G	1.0
Nitrate plus Nitrite mg/L		17.4 Q	0.50
Sulfate mg/L		2040 Q	500
TDS mg/L		4840	10.0
Not Sampled	06/01/2000	--	--
Not Sampled	11/16/2000	--	--
Acetone µg/L	05/23/2001	40	10.0
Chloroform µg/L		0.90 J	1.0
1,1-Dichloroethane µg/L		0.96 J	1.0
cis-1,2-Dichloroethene µg/L		6.8	1.0
Tetrachloroethene µg/L		3.0	1.0
Trichloroethene µg/L		2.1	1.0
Manganese µg/L		260	10.0
Nickel µg/L		86	40.0
Calcium mg/L		503	0.20
Potassium mg/L		4.9	3.0
Magnesium mg/L		48.5	0.20
Sodium mg/L		790	5.0
Nitrate plus Nitrite mg/L		5.8	0.10
Chloride mg/L		545 Q	60.0
Sulfate mg/L		2060 Q	250
Fluoride mg/L		0.33 B,G	2.0
Nitrate mg/L		6.4 G	1.0
TDS mg/L		4550	10.0
Chloroform µg/L	11/08/2001	1.0	1.0
1,1-Dichloroethane µg/L		0.81 J	1.0
cis-1,2-Dichloroethene µg/L		6.9	1.0
Tetrachloroethene µg/L		3.4	1.0
Trichloroethene µg/L		1.7	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-32 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference; I, estimated result and exceeds the calibration range]

Analyte and unit	Date sampled	Result	RL
Manganese µg/L	11/08/2001	395	10.0
Nickel µg/L	-continued	98.5	40.0
Calcium mg/L		518	0.20
Potassium mg/L		4.3	3.0
Magnesium mg/L		52.3	0.20
Sodium mg/L		805	5.0
Nitrate plus Nitrite mg/L		7.5	0.10
Chloride mg/L		621 J, Q	60.0
Sulfate mg/L		2190 Q	250
Fluoride mg/L		0.60 B,G	2.0
Nitrate mg/L		7.3 G	1.0
TDS mg/L		4530	10.0
Not Sampled	05/16/2002	--	--
Benzene µg/L	11/21/2002	0.39 J	1.0
Chloroform µg/L		0.89 J	1.0
1,1-Dichloroethane µg/L		0.40 J	1.0
cis-1,2-Dichloroethene µg/L		2.7	1.0
Tetrachloroethene µg/L		1.4	1.0
Trichloroethene µg/L		0.83 J	1.0
2-Butanone (MEK) µg/L		2.5 J	5.0
Chromium µg/L		1.0 B	10.0
Manganese µg/L		340	10.0
Nickel µg/L		81.0	40.0
Calcium mg/L		490	0.20
Potassium mg/L		4.9	3.0
Magnesium mg/L		46.0	0.20
Sodium mg/L		730	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		460 J,Q	60.0
Sulfate mg/L		2200 Q	250
Fluoride mg/L		1.2 B,G	2.0
Nitrate mg/L		3.4 G	1.0
TDS mg/L		4100	10.0
Acetone µg/L	05/14/2003	2.8 J	10.0
Benzene µg/L		0.65 J	1.0

Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	05/14/2003	1.7	1.0
1,1-Dichloroethane µg/L	-continued	0.59 J	1.0
cis-1,2-Dichloroethene µg/L		4.7	1.0
Tetrachloroethene µg/L		2.7	1.0
Trichloroethene µg/L		1.6	1.0
Manganese µg/L		380	10.0
Nickel µg/L		84.0	40.0
Calcium mg/L		470	0.20
Potassium mg/L		4.5	3.0
Magnesium mg/L		47.0	0.20
Sodium mg/L		780	5.0
Nitrate plus Nitrite mg/L		3.9	0.10
Chloride mg/L		480 Q	60.0
Sulfate mg/L		2200 Q	250
Fluoride mg/L		1.1 B,G	2.0
Nitrate mg/L		3.5 G	1.0
TDS mg/L		4100	10.0
Not Sampled	11/18/2003	--	--
Acetone µg/L	05/05/2004	3.7 J	10.0
Chloroform µg/L		0.88 J	1.0
cis-1,2-Dichloroethene µg/L		1.8	1.0
Tetrachloroethene µg/L		0.37 J	1.0
Trichloroethene µg/L		0.33 J	1.0
Manganese µg/L		220	10.0
Nickel µg/L		92	40.0
Calcium mg/L		510	0.20
Potassium mg/L		4.8	3.0
Magnesium mg/L		53.0	0.20
Sodium mg/L		830	5.0
Nitrate plus Nitrite mg/L		5.8	0.10
Chloride mg/L		530 Q	60.0
Sulfate mg/L		2300 Q	250
Fluoride mg/L		0.78 B,G	2.0
Nitrate mg/L		5.9 G	1.0
TDS mg/L		4100	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-32 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference; I, estimated result and exceeds the calibration range]

Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	11/17/2004	0.77 J	1.0
cis-1,2-Dichloroethene µg/L		1.0	1.0
Tetrachloroethene µg/L		0.68 J	1.0
Trichloroethene µg/L		0.31 J	1.0
Chromium µg/L		3.0 B	10.0
Manganese µg/L		41.0	10.0
Nickel µg/L		72.0	40.0
Calcium mg/L		520	0.20
Potassium mg/L		5.0	3.0
Magnesium mg/L		51.0	0.20
Sodium mg/L		810	5.0
Nitrate plus Nitrite mg/L		3.8	0.10
Chloride mg/L		460 Q	60.0
Sulfate mg/L		2100 Q	250
Fluoride mg/L		0.75 B,G	2.0
Nitrate mg/L		3.8 G	1.0
TDS mg/L		4300	10.0

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-48 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference; I, estimated result and exceeds the calibration range]

Analyte and unit	Date sampled	Result	RL
1,1-Dichloroethane µg/L	09/25/1993	0.53 J	1.0
1,2-Dichloroethene TOTAL µg/L		35.0	1.0
Tetrachloroethene µg/L		2.4	1.0
Trichloroethene µg/L		2.0	1.0
Antimony mg/L		0.01	0.001
Barium mg/L		0.01	0.01
Calcium mg/L		468	0.01
Chloride mg/L		632	0.5
Cobalt mg/L		0.017	0.001
Fluoride mg/L		3.6	0.5
Iron mg/L		0.28	0.1
Magnesium mg/L		51.4	0.2
Manganese mg/L		0.04	0.01
Molybdenum mg/L		0.002	0.001
Nickel mg/L		0.078	0.001
Nitrate as N mg/L		21.2	0.5
Nitrate plus Nitrite mg/L		19.4	0.1
Selenium mg/L		0.46	0.001
Sodium mg/L		764	5.0
Sulfate mg/L		2060	5.0
TDS mg/L		4120	10.0
Chloroform µg/L	05/28/1994	1.1	0.5
1,2-Dichloroethene TOTAL µg/L		40.0	1.0
Tetrachloroethene µg/L		4.2	1.0
Trichloroethene µg/L		3.0	1.0
Antimony mg/L		0.0033	0.002
Arsenic mg/L		0.011	0.005
Barium mg/L		0.039	0.01
Calcium mg/L		541	0.2
Chloride mg/L		729	5.0
Chromium mg/L		0.016	0.01
Cobalt mg/L		0.023	0.01
Copper mg/L		0.022	0.01
Iron mg/L		1.2	0.1
Magnesium mg/L		57.4	0.2

Analyte and unit	Date sampled	Result	RL
Manganese mg/L	05/28/1994	0.23	0.01
Molybdenum mg/L	-Continued	0.0022	0.001
Nickel mg/L		0.15	0.01
Nitrate as N mg/L		20.9	0.5
Nitrate plus Nitrite mg/L		20.3	0.1
Potassium mg/L		5.5	5.0
Sodium mg/L		846	5.0
Sulfate mg/L		1950	5.0
TDS mg/L		4330	20.0
Zinc mg/L		0.024	0.02
Chloroform µg/L	09/21/1994	1.3	0.5
1,1-Dichloroethane µg/L		0.79 J	1.0
1,2 cis-Dichloroethene µg/L		39.0	1.0
Methylene chloride µg/L		0.3 J	1.0
Tetrachloroethene µg/L		5.4	1.0
Trichloroethene µg/L		3.5	1.0
Antimony mg/L		0.0046	0.002
Arsenic mg/L		0.012	0.01
Chloride mg/L		273	10.0
Cobalt mg/L		0.028	0.002
Iron mg/L		6.3	0.04
Magnesium mg/L		59.3	5.0
Manganese mg/L		0.27	0.01
Nickel mg/L		0.1	0.02
Nitrate as N mg/L		22.3	0.5
Nitrate plus Nitrite mg/L		22.1	2.0
Potassium mg/L		5.0	5.0
Selenium mg/L		0.31	0.002
Sodium mg/L		848	5.0
Sulfate mg/L		797	10.0
TDS mg/L		4170	50.0
2-Chloroethyl vinyl etherµg/L	09/14/1995	1.6	1.0
1,1-Dichloroethane µg/L		0.85 J	1.0
1,2 cis-Dichloroethene µg/L		44.0	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-48 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference; I, estimated result and exceeds the calibration range]

Analyte and unit	Date sampled	Result	RL
1,2 trans-Dichloroethene µg/L	09/14/1995	0.22 J	1.0
Methylene chloride µg/L	-continued	0.36 J	1.0
Tetrachloroethene µg/L		6.6	1.0
Trichloroethene µg/L		3.6	1.0
Barium mg/L		0.013	0.002
Calcium mg/L		550	0.2
Chloride mg/L		769	1.0
Chromium mg/L		0.032	0.001
Cobalt mg/L		0.024	0.0005
Copper mg/L		0.0079	0.002
Fluoride mg/L		5.1	1.0
Iron mg/L		0.81	0.1
Magnesium mg/L		55.5	0.2
Manganese mg/L		0.071	0.01
Molybdenum mg/L		0.0016	0.0002
Nickel mg/L		0.12	0.0002
Nitrate as N mg/L		23.5	0.5
Nitrate plus Nitrite mg/L		21.6	0.5
Potassium mg/L		4.9	5.0
Sodium mg/L		813	5.0
Sulfate mg/L		1970	5.0
TDS mg/L		4060	50.0
Vanadium mg/L		0.014	0.0005
Acetone µg/L	05/31/1996	2.0 J	10.0
Bromomethane µg/L		0.22 J	1.0
Chloroform µg/L		1.5	0.5
1,1-Dichloroethane µg/L		0.68 J	1.0
1,2 cis-Dichloroethene µg/L		32.0	1.0
Tetrachloroethene µg/L		4.0	1.0
1,1,1-Trichloroethane µg/L		0.54 J	1.0
Trichloroethene µg/L		2.9	1.0
Chloride mg/L		741	1.0
Manganese mg/L		0.46	0.01
Nickel mg/L		0.066	0.04
Nitrate as N mg/L		23.1	0.5
Nitrate plus Nitrite mg/L		23.3	0.5

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	05/31/1996	1890	5.0
TDS mg/L	-continued	4440	50.0
Chloroform µg/L	09/06/1996	1.5	0.5
1,1-Dichloroethane µg/L		0.81 J	1.0
1,2 cis-Dichloroethene µg/L		34.0	1.0
Tetrachloroethene µg/L		4.9	1.0
1,1,1-Trichloroethane µg/L		0.64	1.0
Trichloroethene µg/L		3.0	1.0
Chloride mg/L		83.0	1.0
Manganese mg/L		0.49	0.01
Nickel mg/L		0.054	0.04
Nitrate as N mg/L		23.7	0.5
Nitrate plus Nitrite mg/L		24.5	0.5
Sulfate mg/L		1990	5.0
TDS mg/L		4660	50.0
Chloroform µg/L	05/21/1997	0.89	0.5
1,1-Dichloroethane µg/L		0.53 J	1.0
1,2 cis-Dichloroethene µg/L		15.0	1.0
Tetrachloroethene µg/L		4.2	1.0
Toluene µg/L		0.37 J	1.0
1,1,2-Trichloroethane µg/L		2.4	1.0
Chloride mg/L		591	1.0
Manganese mg/L		1.4	0.01
Nickel mg/L		0.06	0.04
Nitrate as N mg/L		25.1	0.5
Nitrate plus Nitrite mg/L		21.7	0.5
Sulfate mg/L		2040	5.0
TDS mg/L		4320	50.0
Chloroform µg/L	09/10/1997	0.72	0.5
1,1-Dichloroethane µg/L		0.33 J	1.0
1,2 cis-Dichloroethene µg/L		6.9	1.0
Tetrachloroethene µg/L		3.3	1.0
1,1,1-Trichloroethane µg/L		0.33 J	1.0
Trichloroethene µg/L		1.7	1.0
Chloride mg/L		322	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-48 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Manganese mg/L	09/10/1997	0.63	0.01
Nickel mg/L	-continued	0.048	0.04
Nitrate as N mg/L		17.0	0.5
Nitrate plus Nitrite mg/L		18.5	0.5
Sulfate mg/L		1,370	5.0
TDS mg/L		2,890	50.0
Chloroform µg/L	05/20/1998	1.2	1.0
1,1-Dichloroethane µg/L		0.60 J	1.0
cis-1,2-Dichloroethene µg/L		12.0	0.5
Methylene Chloride µg/L		0.48 JB	1.0
Tetrachloroethene µg/L		4.7	1.0
1,1,1-Trichloroethane µg/L		0.36 J	1.0
Trichloroethene µg/L		2.8	1.0
Chloride mg/L		580 Q	1.0
Manganese mg/L		0.26	0.01
Nickel mg/L		0.039 J	0.04
Nitrate as N mg/L		17.7 I	0.5
Nitrate plus Nitrite mg/L		22.0 Q	1.0
Sulfate mg/L		1710	250
TDS mg/L		6240 Q	50.0
Chloroform µg/L	09/01/1998	1.4	1.0
1,1-Dichloroethane µg/L		0.52 J	1.0
1,2-Dichloroethene TOTAL µg/L		8.8	1.0
Methylene Chloride µg/L		0.17 JB	1.0
Tetrachloroethene µg/L		4.3	1.0
1,1,1-Trichloroethane µg/L		0.33 J	1.0
Trichloroethene µg/L		2.5	1.0
Chloride mg/L		771 Q	3.0
Fluoride mg/L		1.6 JG	2.0
Manganese mg/L		0.13	0.01
Nickel mg/L		0.054	0.04
Nitrate as N mg/L		18.7 Q	5.0
Nitrate plus Nitrite mg/L		21.4 Q	1.0
Sulfate mg/L		1820 Q	250
TDS mg/L		4360	10.0

Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	06/08/1999	1.6	1.0
1,1-Dichloroethane µg/L		0.35 J	1.0
1,2-Dichloroethene TOTAL µg/L		0.35 J	1.0
Tetrachloroethene µg/L		7.4	1.0
1,1,1-Trichloroethane µg/L		2.4	1.0
Trichloroethene µg/L		0.23 J	1.0
Manganese mg/L		1.4	1.0
Nickel mg/L		0.086	0.010
Chloride mg/L		0.44	0.040
Nitrate as N mg/L		806 Q	300
Nitrate plus Nitrite mg/L		19.3 Q	1.0
Sulfate mg/L		1,660 Q	250
TDS mg/L		4,410	10.0
Chloroform µg/L	11/18/1999	2.9	1.0
1,1-Dichloroethane µg/L		0.54 J	1.0
cis-1,2-Dichloroethene µg/L		14	1.0
Tetrachloroethene µg/L		4.0	1.0
1,1,1-Trichloroethane µg/L		0.35 J	1.0
Trichloroethene µg/L		2.4	1.0
Manganese mg/L		0.055	0.015
Nickel mg/L		0.36	0.040
Nitrate plus Nitrite mg/L		24.7	0.50
Chloride mg/L		1260 Q	150
Sulfate mg/L		2090 Q	250
Fluoride mg/L		0.91 B, G	2.0
Nitrate as N mg/L		21.2 Q	5.0
TDS mg/L		4880	10.0
Not Sampled	06/01/2000	--	--
Not Sampled	11/16/2000	--	--
Acetone µg/L	05/23/2001	23	10.0
Bromoform µg/L		0.90 J	1.0
Chloroform µg/L		2.4	1.0
Dibromochloromethane µg/L		0.44 J	1.0
1,1-Dichloroethane µg/L		0.39 J	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-48 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference; I, estimated result and exceeds the calibration range]

Analyte and unit	Date sampled	Result	RL
cis-1,2-Dichloroethene µg/L	05/23/2001	11	1.0
Tetrachloroethene µg/L	-continued	2.4	1.0
Trichloroethene µg/L		1.7	1.0
Manganese µg/L		79	10.0
Nickel µg/L		54	40.0
Calcium mg/L		618	0.20
Potassium mg/L		5.6	3.0
Magnesium mg/L		66.2	0.20
Sodium mg/L		888	5.0
Nitrate plus Nitrite mg/L		16.4 Q	0.10
Chloride mg/L		975 Q	150
Sulfate mg/L		1970 Q	250
Fluoride mg/L		0.28 B, G	2.0
Nitrate mg/L		19.0 Q	10.0
TDS mg/L		5310	5.0
Acetone µg/L	11/07/2001	2.1 J	10.0
Chloroform µg/L		2.6	1.0
1,1-Dichloroethane µg/L		0.47 J	1.0
cis-1,2-Dichloroethene µg/L		12	1.0
Tetrachloroethene µg/L		3.9	1.0
Trichloroethene µg/L		2.1	1.0
Manganese µg/L		52.7	10.0
Nickel µg/L		434	40.0
Calcium mg/L		629	0.20
Potassium mg/L		5.1	3.0
Magnesium mg/L		66.8	0.20
Sodium mg/L		894	5.0
Nitrate plus Nitrite mg/L		18.1 Q	0.10
Chloride mg/L		1030 Q	150
Sulfate mg/L		2140 Q	250
Fluoride mg/L		0.59 B, G	2.0
Nitrate mg/L		21.1 B	10.0
TDS mg/L		5190	5.0
Not Sampled	05/16/2002	--	--

Analyte and unit	Date sampled	Result	RL
Chloroform µg/L	11/21/2002	2.0	1.0
1,1-Dichloroethane µg/L		0.52 J	1.0
cis-1,2-Dichloroethene µg/L		6.7	1.0
Tetrachloroethene µg/L		3.5	1.0
Trichloroethene µg/L		1.9	1.0
Chromium µg/L		56.0	10.0
Manganese µg/L		82.0	10.0
Nickel µg/L		550	40.0
Calcium mg/L		600	0.20
Potassium mg/L		4.7	3.0
Magnesium mg/L		62.0	0.20
Sodium mg/L		860	5.0
Nitrate plus Nitrite mg/L		13.0 Q	0.20
Chloride mg/L		910 J,Q	150
Sulfate mg/L		2300 Q	250
Fluoride mg/L		1.0 B, G	1.0
Nitrate mg/L		13.0 Q	5.0
TDS mg/L		4800	20.0
Acetone µg/L	05/14/2003	3.3 J	10.0
Chloroform µg/L		2.1	1.0
1,1-Dichloroethane µg/L		0.38 J	1.0
cis-1,2-Dichloroethene µg/L		6.3	1.0
Tetrachloroethene µg/L		2.6	1.0
Trichloroethene µg/L		1.6	1.0
Chromium µg/L		45.0	10.0
Manganese µg/L		100	10.0
Nickel µg/L		520	40.0
Calcium mg/L		600	0.20
Potassium mg/L		6.0	3.0
Magnesium mg/L		65.0	0.20
Sodium mg/L		910	5.0
Nitrate plus Nitrite mg/L		11.0 Q	0.50
Chloride mg/L		830 Q	150
Sulfate mg/L		2300 Q	250
Fluoride mg/L		1.2 B, G	2.0
Nitrate mg/L		13.0 Q	1.0
TDS mg/L		4800 J	10.0

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Analyte and unit	Date sampled	Result	RL
Not Sampled	11/18/2003	--	--
Chloroform µg/L	05/06/2004	1.6	1.0
1,1-Dichloroethane µg/L		0.25 J	1.0
cis-1,2-Dichloroethene µg/L		3.1	1.0
Methylene chloride µg/L		0.55 J,B	5.0
Tetrachloroethene µg/L		2.1	1.0
Trichloroethene µg/L		1.1	1.0
Chromium µg/L		27.0	10.0
Manganese µg/L		250	10.0
Nickel µg/L		780	40.0
Calcium mg/L		590	0.20
Potassium mg/L		5.1	3.0
Magnesium mg/L		65.0	0.20
Sodium mg/L		920	5.0
Nitrate plus Nitrite mg/L		14.0	0.10
Chloride mg/L		860 Q	60.0
Sulfate mg/L		2300 Q	250
Nitrate mg/L		12.0 Q	1.0
TDS mg/L		4800 Q	10.0
Acetone µg/L	11/18/2004	3.3 J,B	10.0
Chloroform µg/L		1.1	1.0
cis-1,2-Dichloroethene µg/L		1.7	1.0
Tetrachloroethene µg/L		1.6	1.0
Trichloroethene µg/L		0.80 J	1.0
Chromium µg/L		150	10.0
Manganese µg/L		880	10.0
Nickel µg/L		2500	40.0
Calcium mg/L		630	0.20
Potassium mg/L		5.6	3.0
Magnesium mg/L		65.0	0.20
Sodium mg/L		900	5.0
Nitrate plus Nitrite mg/L		11.0 Q	0.10
Chloride mg/L		990 Q	60.0
Sulfate mg/L		2200 Q	250
Nitrate mg/L		12.0 Q	1.0
Fluoride mg/L	11/18/2004	0.70 B,G	2.0
TDS mg/L -continued		5200 Q	10.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-49 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	09/25/1993	7.0 J	50.0
Benzene µg/L		1.2 J	5.0
1,1-Dichloroethane µg/L		2.1 J	5.0
1,2-Dichloroethene TOTAL µg/L		110	5.0
Methylene chloride µg/L		1.4 J	5.0
Tetrachloroethene µg/L		8.5	5.0
Trichloroethene µg/L		5.3	5.0
Antimony mg/L		0.009	0.001
Barium mg/L		0.014	0.01
Calcium mg/L		362	0.01
Chloride mg/L		316	0.5
Cobalt mg/L		0.027	0.001
Fluoride mg/L		3.2	0.5
Iron mg/L		0.44	0.1
Magnesium mg/L		40.1	0.2
Manganese mg/L		2.8	0.01
Molybdenum mg/L		0.012	0.001
Nickel mg/L		0.3	0.001
Nitrate as N mg/L		0.59	0.5
Nitrate plus Nitrite mg/L		0.4	0.1
Potassium mg/L		5.2	5.0
Selenium mg/L		0.0058	0.001
Sodium mg/L		578	5.0
Sulfate mg/L		1680	5.0
TDS mg/L		3050	10.0
Zinc mg/L		0.082	0.02
1,1-Dichloroethane µg/L	05/24/1994	1.3 J	5.0
1,2-Dichloroethene TOTAL µg/L		90.0	5.0
Methylene chloride µg/L		3.8 J	5.0
Tetrachloroethene µg/L		10.0	5.0
Trichloroethene µg/L		5.3	5.0
Antimony mg/L		0.0035	0.002
Barium mg/L		0.014	0.01
Calcium mg/L		365	0.2
Chloride mg/L		198	2.5
Chromium mg/L		0.019	0.01

Analyte and unit	Date sampled	Result	RL
Cobalt mg/L	05/24/1994	0.024	0.01
Copper mg/L	-Continued	0.014	0.01
Magnesium mg/L		35.1	0.2
Manganese mg/L		3.1	0.01
Molybdenum mg/L		0.0082	0.001
Nickel mg/L		0.19	0.01
Nitrate as N mg/L		1.0	0.5
Nitrate plus Nitrite mg/L		1.1	0.05
Selenium mg/L		0.0086	0.006
Sodium mg/L		511	5.0
Sulfate mg/L		1590	5.0
TDS mg/L		3030	10.0
Zinc mg/L		0.2	0.02
1,1-Dichloroethane µg/L	10/01/1994	1.2 J	5.0
1,2 cis-Dichloroethene µg/L		71.0	5.0
Methylene chloride µg/L		2.5 J	5.0
Tetrachloroethene µg/L		9.7	5.0
Trichloroethene µg/L		5.0	5.0
Chloride mg/L		222	5.0
Nitrate as N mg/L		0.58	0.5
Sulfate mg/L		1700	5.0
TDS mg/L		3280	50.0
Chloroform µg/L	09/14/1995	1.4	0.5
1,1-Dichloroethane µg/L		1.0	1.0
1,2 cis-Dichloroethene µg/L		73.0	1.0
Methylene chloride µg/L		0.47 J	1.0
Tetrachloroethene µg/L		9.9	1.0
Trichloroethene µg/L		4.1	1.0
Barium mg/L		0.014	0.002
Cadmium mg/L		0.00042	0.006
Calcium mg/L		426	0.2
Chloride mg/L		200	1.0
Chromium mg/L		0.017	0.001
Cobalt mg/L		0.026	0.0005
Copper mg/L		0.014	0.002

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-49 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Fluoride mg/L	09/14/1995	3.6	1.0
Magnesium mg/L	-continued	41.9	0.2
Manganese mg/L		1.0	0.01
Molybdenum mg/L		0.01	0.0002
Nickel mg/L		0.22	0.0002
Nitrate as N mg/L		1.3	0.5
Nitrate plus Nitrite mg/L		1.6	0.5
Potassium mg/L		4.2	5.0
Selenium mg/L		0.011	0.005
Sodium mg/L		545	5.0
Sulfate mg/L		670	5.0
TDS mg/L		2750	50.0
Vanadium mg/L		0.014	0.0005
Zinc mg/L		0.022	0.01
Acetone µg/L	06/01/1996	4.9 J	10.0
Chloroform µg/L		1.5	0.5
1,1-Dichloroethane µg/L		0.78 J	1.0
1,2 cis-Dichloroethene µg/L		55.0	1.0
Methylene chloride µg/L		0.45 J	1.0
Tetrachloroethene µg/L		7.3	1.0
1,1,1-Trichloroethane µg/L		0.36 J	1.0
Trichloroethene µg/L		3.7	1.0
Chloride mg/L		220	1.0
Manganese mg/L		0.55	0.01
Nickel mg/L		0.15	0.04
Nitrate as N mg/L		1.3	0.5
Nitrate plus Nitrite mg/L		1.5	0.5
Sulfate mg/L		1650	5.0
TDS mg/L		3200	50.0
Benzene µg/L	09/06/1996	0.38 J	1.0
Chloroform µg/L		0.93 J	0.5
1,1-Dichloroethane µg/L		0.54 J	1.0
1,2 cis-Dichloroethene µg/L		32.0	1.0
Methylene chloride µg/L		0.46 J	1.0
Tetrachloroethene µg/L		4.5	1.0
Trichloroethene µg/L		2.0	1.0
Chloride mg/L		308	1.0

Analyte and unit	Date sampled	Result	RL
Manganese mg/L	09/06/1996	0.62	0.01
Nickel mg/L	-continued	0.083	0.04
Nitrate as N mg/L		2.7	0.5
Nitrate plus Nitrite mg/L		2.9	0.5
Sulfate mg/L		1750	5.0
TDS mg/L		3360	50.0
Acetone µg/L	05/21/1997	3.2 J	10.0
Chloroform µg/L		1.0	0.5
1,1-Dichloroethane µg/L		0.47 J	1.0
1,2 cis-Dichloroethene µg/L		20.0	1.0
2-Hexanone µg/L		4.2	10.0
Tetrachloroethene µg/L		3.5	1.0
1,1,1-Trichloroethane µg/L		0.3 J	1.0
Trichloroethene µg/L		1.8	1.0
Manganese mg/L		0.28	0.01
Nickel mg/L		0.15	0.04
Nitrate plus Nitrite mg/L		2.8	0.5
Acetone µg/L	09/10/1997	6.7 J	10.0
Chloroform µg/L		1.4	0.5
1,1-Dichloroethane µg/L		0.61 J	1.0
1,2 cis-Dichloroethene µg/L		38.0	1.0
Methylene Chloride µg/L		0.24 J	1.0
Tetrachloroethene µg/L		6.4	1.0
1,1,1-Trichloroethane µg/L		0.46 J	1.0
Trichloroethene µg/L		2.9	1.0
Chloride mg/L		316	1.0
Manganese mg/L		0.47	0.01
Nickel mg/L		0.19	0.04
Nitrate as N mg/L		1.9	0.5
Nitrate plus Nitrite mg/L		1.8	0.5
Sulfate mg/L		1710	5.0
TDS mg/L		3510	50.0
Chloroform µg/L	05/20/1998	1.2	1.0
1,1-Dichloroethane µg/L		0.75 J	1.0
cis-1,2-Dichloroethene µg/L		43.0	0.5
Methylene Chloride µg/L		0.49 J	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-49 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Tetrachloroethene µg/L	05/20/1998	1.1	1.0
1,1,1-Trichloroethane µg/L	-Continued	0.26 J	1.0
Trichloroethene µg/L		3.4	1.0
Chloride mg/L		314 Q	15.0
Manganese mg/L		0.46	0.01
Nickel mg/L		0.18	0.04
Nitrate as N mg/L		3.4	0.5
Nitrate plus Nitrite mg/L		3.4 Q	0.5
Sulfate mg/L		1820 Q	100.0
TDS mg/L		9740 Q	50.0
Benzene µg/L	09/02/1998	0.26 J	1.0
Chloroform µg/L		1.2	1.0
1,1-Dichloroethane µg/L		0.87 J	1.0
Tetrachloroethene µg/L		5.0	1.0
1,1,1-Trichloroethane µg/L		0.22 J	1.0
Trichloroethene µg/L		2.6	1.0
Chloride mg/L		427 Q	30.0
Fluoride mg/L		0.72 JG	2.0
Manganese mg/L		0.091	0.01
Nickel mg/L		0.13	0.04
Nitrate as N mg/L		3.6 G	1.0
Nitrate plus Nitrite mg/L		3.2 Q	0.5
Sulfate mg/L		1650 Q	250
TDS mg/L		3520	10.0
Benzene µg/L	09/02/1998	0.26 J	1.0
Chloroform µg/L		1.2	1.0
1,1-Dichloroethane µg/L		0.87 J	1.0
Tetrachloroethene µg/L		5.0	1.0
1,1,1-Trichloroethane µg/L		0.22 J	1.0
Trichloroethene µg/L		2.6	1.0
Chloride mg/L		427 Q	30.0
Fluoride mg/L		0.72 JG	2.0
Manganese mg/L		0.091	0.01
Nickel mg/L		0.13	0.04
Nitrate as N mg/L		3.6 G	1.0
Nitrate plus Nitrite mg/L		3.2 Q	0.5

Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	09/02/1998	1650 Q	250
TDS mg/L	-continued	3520	10.0
Acetone µg/L	06/09/1999	2.6 J	10
Chloroform µg/L		0.95 J	1.0
1,1-Dichloroethane µg/L		1.0	1.0
cis-1,2-Dichloroethene µg/L		27.0	1.0
1,2-Dichloroethene total µg/L		28	1.0
Methylene Chloride µg/L		0.31 J,B	1.0
Tetrachloroethene µg/L		6.8	1.0
Toluene µg/L		0.30 J	1.0
Trichloroethene µg/L		2.9	1.0
Manganese mg/L		2.4	0.010
Nickel mg/L		0.21	0.040
Chloride mg/L		416 Q	30.0
Fluoride mg/L		0.77 J,G	2.0
Nitrate mg/L		3.5 G	1.0
Nitrate plus Nitrite mg/L		4.3	0.10
Sulfate mg/L		1680 Q	250
TDS mg/L		3550	10.0
Chloroform µg/L	11/18/1999	0.86 J	1.0
1,1-Dichloroethane µg/L		1.2	1.0
cis-1,2-Dichloroethene µg/L		19	1.0
1,2-Dichloroethene total µg/L		19	1.0
Methylene chloride µg/L		0.25 J	1.0
Tetrachloroethene µg/L		4.4	1.0
Toluene µg/L		0.10 J,B	1.0
1,1,1-Trichloroethane µg/L		0.11 J	1.0
Trichloroethene µg/L		2.3	1.0
2-Butanone (MEK) µg/L		2.6 J	5.0
Chloride mg/L		480 Q	150
Fluoride mg/L		0.63 B	1.0
Manganese mg/L		0.23	0.015
Nickel mg/L		0.16	0.040
Nitrate mg/L		5.2	0.50
Nitrate plus Nitrite mg/L		5.7	0.10

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-49 at Lee Acres Landfill site, northwestern, New Mexico

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Analyte and unit	Date sampled	Result	RL
Sulfate mg/L	11/18/1999	1850 Q	250
TDS mg/L	-continued	3650	10.0
Not Sampled	06/01/2000	--	--
Not Sampled	11/16/2000	--	--
Acetone µg/L	05/23/2001	4.2 J	10.0
Chloroform µg/L		0.66 J	1.0
1,1-Dichloroethane µg/L		0.86 J	1.0
cis-1,2-Dichloroethene µg/L		13	1.0
Tetrachloroethene µg/L		4.6	1.0
Trichloroethene µg/L		2.1	1.0
Manganese µg/L		170	10.0
Nickel µg/L		100	40.0
Calcium mg/L		408	0.20
Potassium mg/L		3.3	3.0
Magnesium mg/L		38.5	0.20
Sodium mg/L		583	5.0
Nitrate plus Nitrite mg/L		1.5	0.10
Chloride mg/L		282 Q	60.0
Sulfate mg/L		1650 Q	250
Fluoride mg/L		0.35 B, G	2.0
Nitrate mg/L		2.0 G	1.0
TDS mg/L		3460	10.0
Acetone µg/L	11/07/2001	2.4 J	10.0
Chloroform µg/L		0.60 J	1.0
1,1-Dichloroethane µg/L		0.73 J	1.0
cis-1,2-Dichloroethene µg/L		8.8	1.0
2-Hexanone µg/L		0.79 J	5.0
Tetrachloroethene µg/L		3.7	1.0
Trichloroethene µg/L		1.5	1.0
Manganese µg/L		90.8	10.0
Nickel µg/L		172	40.0
Calcium mg/L		428	0.20
Potassium mg/L		3.1	3.0
Magnesium mg/L		40.8	0.20
Sodium mg/L		598	5.0
Nitrate plus Nitrite mg/L		2.3	0.10

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	11/07/2001	325 Q	30.0
Sulfate mg/L	-continued	1720 Q	250
Nitrate mg/L		2.0	1.0
TDS mg/L		3570	10.0
Not Sampled	05/16/2002	--	--
Acetone µg/L	11/21/2002	3.4 J	10.0
Chloroform µg/L		0.86 J	1.0
1,1-Dichloroethane µg/L		0.61 J	1.0
cis-1,2-Dichloroethene µg/L		5.1	1.0
2-Hexanone µg/L		2.1 J	5.0
Tetrachloroethene µg/L		2.9	1.0
Trichloroethene µg/L		1.3	1.0
Chromium µg/L		2.9 B	10.0
Manganese µg/L		92.0	10.0
Nickel µg/L		150	40.0
Calcium mg/L		400	0.20
Potassium mg/L		3.1	3.0
Magnesium mg/L		36.0	0.20
Sodium mg/L		520	5.0
Nitrate plus Nitrite mg/L		1.3	0.10
Chloride mg/L		330 J,Q	30.0
Sulfate mg/L		1800 Q	250
Nitrate mg/L		1.3	1.0
TDS mg/L		3300	10.0
Chloroform µg/L	05/15/2003	0.87 J	1.0
1,1-Dichloroethane µg/L		0.39 J	1.0
cis-1,2-Dichloroethene µg/L		3.9	1.0
Tetrachloroethene µg/L		2.1	1.0
Trichloroethene µg/L		0.93 J	1.0
Chromium µg/L		5.3 B	10.0
Manganese µg/L		69.0	10.0
Nickel µg/L		150	40.0
Calcium mg/L		420	0.20
Potassium mg/L		3.5	3.0
Magnesium mg/L		37.0	0.20
Sodium mg/L		570	5.0
Nitrate plus Nitrite mg/L		1.0	0.10

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-49 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, method blank contamination; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Chloride mg/L	05/15/2003	260 Q	30.0
Sulfate mg/L	-continued	1600 Q	250
Nitrate mg/L		1.1	0.50
TDS mg/L		3100	10.0
Not Sampled	11/18/2003	--	--
Chloroform µg/L	05/06/2004	0.63 J	1.0
cis-1,2-Dichloroethene µg/L		1.5	1.0
2-Hexanone µg/L		2.9 J	5.0
Tetrachloroethene µg/L		1.4	1.0
Trichloroethene µg/L		0.53 J	1.0
Chromium µg/L		9.0 B	10.0
Manganese µg/L		170	10.0
Nickel µg/L		280	40.0
Calcium mg/L		420	0.20
Potassium mg/L		3.7	3.0
Magnesium mg/L		39.0	0.20
Sodium mg/L		590	5.0
Nitrate plus Nitrite mg/L		0.82	0.10
Chloride mg/L		150 Q	30.0
Sulfate mg/L		1700 Q	250
Nitrate mg/L		1.9	0.5
TDS mg/L		2900	10.0
Not sampled, dry.	11/18/2004	--	--

Analyte and unit	Date sampled	Result	RL

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-50 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
1,2-Dichloroethene TOTAL µg/L	09/28/1993	1.9	1.0
Tetrachloroethene µg/L		0.74 J	1.0
Trichloroethene µg/L		0.24 J	1.0
Antimony mg/L		0.012	0.001
Barium mg/L		0.016	0.01
Calcium mg/L		387	0.01
Chloride mg/L		42.2	0.5
Cobalt mg/L		0.016	0.001
Fluoride mg/L		2.9	0.5
Iron mg/L		0.58	0.1
Magnesium mg/L		30.4	0.2
Manganese mg/L		2.0	0.01
Molybdenum mg/L		0.027	0.001
Nickel mg/L		0.07	0.001
Nitrate as N mg/L		1.9	0.5
Nitrate plus Nitrite mg/L		1.7	0.1
Potassium mg/L		6.4	5.0
Selenium mg/L		0.0054	0.001
Sodium mg/L		372	5.0
Sulfate mg/L		1410	5.0
TDS mg/L		2640	10.0
Zinc mg/L		0.07	0.02
1,2 cis-Dichloroethene µg/L	09/14/1995	2.9	1.0
Methylene chloride µg/L		0.28 J	1
Tetrachloroethene µg/L		1.1	1.0
Trichloroethene µg/L		0.3 J	1.0
Barium mg/L		0.012	0.002
Calcium mg/L		389	0.2
Chloride mg/L		43.5	1.0
Chromium mg/L		0.0075	0.001
Cobalt mg/L		0.0098	0.0005
Copper mg/L		0.01	0.002
Fluoride mg/L		3.3	1.0
Magnesium mg/L		30.6	0.2
Manganese mg/L		1.7	0.01

Analyte and unit	Date sampled	Result	RL
Molybdenum mg/L	09/14/1995	0.019	0.0002
Nickel mg/L	-Continued	0.056	0.0002
Nitrate as N mg/L		1.5	0.5
Nitrate plus Nitrite mg/L		1.2	0.5
Potassium mg/L		2.3	5.0
Selenium mg/L		0.0067	0.005
Sodium mg/L		409	5.0
Sulfate mg/L		1680	5.0
TDS mg/L		2590	50.0
Vanadium mg/L		0.014	0.0005
1,2 cis-Dichloroethene µg/L	05/30/1996	2.8	1.0
Methylene chloride µg/L		0.27 J	1.0
Tetrachloroethene µg/L		1.5	1.0
Trichloroethene µg/L		0.39 J	1.0
Chloride mg/L		44.1	1.0
Fluoride mg/L		3.4	1.0
Manganese mg/L		1.7	0.01
Nitrate as N mg/L		1.2	0.5
Nitrate plus Nitrite mg/L		1.1	0.5
Sulfate mg/L		1690	5.0
TDS mg/L		2750	50.0
1,2 cis-Dichloroethene µg/L	09/06/1996	4.6	1.0
Tetrachloroethene µg/L		1.8	1.0
Trichloroethene µg/L		0.51 J	1.0
Chloride mg/L		46.6	1.0
Manganese mg/L		2.0	0.01
Nitrate as N mg/L		1.1	0.5
Nitrate plus Nitrite mg/L		1.3	0.5
Sulfate mg/L		1750	5.0
TDS mg/L		2610	50.0
1,2 cis-Dichloroethene µg/L	05/22/1997	4.8	1.0
Methylene chloride µg/L		0.41 J	1.0
Tetrachloroethene µg/L		2.4	1.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-50 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Trichloroethene µg/L	05/22/1997	0.67 J	1.0
Chloride mg/L	-continued	46.1	1.0
Manganese mg/L		2.0	0.01
Nitrate as N mg/L		1.1	0.5
Nitrate plus Nitrite mg/L		1.1	0.5
Sulfate mg/L		1650	5.0
TDS mg/L		2700	50.0
Acetone µg/L	09/11/1997	4.6 J	10.0
1,2 cis-Dichloroethene µg/L		1.9	1.0
Tetrachloroethene µg/L		1.4	1.0
Trichloroethene µg/L		0.31 J	1.0
Chloride mg/L		50.7	1.0
Manganese mg/L		1.7	0.01
Nitrate as N mg/L		1.3	0.5
Nitrate plus Nitrite mg/L		1.5	0.5
Sulfate mg/L		1560	5.0
TDS mg/L		2680	50.0
Methylene chloride µg/L	05/20/1998	0.44 J	1.0
Toluene µg/L		0.13 J	1.0
Chloride mg/L		112 Q	15.0
Manganese mg/L		1.5	0.01
Nickel mg/L		0.04	0.04
Nitrate as N mg/L		5.2	0.5
Nitrate plus Nitrite mg/L		5.6 Q	1.0
Sulfate mg/L		1530 Q	250
TDS mg/L		285 Q	50.0
Tetrachloroethene µg/L	09/02/1998	1.8	1.0
Trichloroethene µg/L		0.52 J	1.0
Chloride mg/L		100 Q	15.0
Fluoride mg/L		0.71 J	1.0
Manganese mg/L		1.3	0.01
Nickel mg/L		0.036 J	0.04
Nitrate as N mg/L		4.0	0.5
Nitrate plus Nitrite mg/L		4.1 Q	0.5
Sulfate mg/L		1630 Q	250
TDS mg/L		2840	10.0

Analyte and unit	Date sampled	Result	RL
Acetone µg/L	06/08/1999	3.5 J	10
cis-1,2-Dichloroethene µg/L		0.59 J	1.0
1,2-Dichloroethene total µg/L		0.59 J	1.0
Methylene chloride µg/L		0.21 JB	1.0
Tetrachloroethene µg/L		0.72 J	1.0
Trichloroethene µg/L		0.18 J	1.0
Manganese mg/L		0.88	0.010
Nickel mg/L		0.051	0.040
Chloride mg/L		130 Q	30.0
Fluoride mg/L		0.90 JG	2.0
Nitrate mg/L		6.6 G	1.0
Nitrate plus Nitrite mg/L		7.1	0.10
Sulfate mg/L		1590 Q	250
TDS mg/L		2910	10.0
cis-1,2-Dichloroethene µg/L	11/18/1999	0.23 J	1.0
1,2-Dichloroethene total µg/L		0.23 J	0.040
Tetrachloroethene µg/L		0.41 J	1.0
Chloride mg/L		67.2 Q	15.0
Fluoride mg/L		0.86 B	1.0
Manganese mg/L		0.68	0.015
Nickel mg/L		0.021 B	0.040
Nitrate mg/L		3.7	0.50
Nitrate plus Nitrite mg/L		3.7	0.10
Sulfate mg/L		1520 Q	250
TDS mg/L		2700	10.0
Not Sampled	06/01/2000	--	--
Not Sampled	11/16/2000	--	--
Acetone µg/L	05/23/2001	12	10.0
Tetrachloroethene µg/L		0.38 J	1.0
Manganese µg/L		220	10.0
Nickel µg/L		6.2 B	40.0
Calcium mg/L		302	0.20
Potassium mg/L		1.6 B	3.0
Magnesium mg/L		23.5	0.20
Sodium mg/L		335	5.0

Table 2.--Summary of concentrations of analytes in ground water from monitoring well GBR-50 at Lee Acres Landfill site, northwestern, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; J, result is detected below the reporting limit or is an estimated concentration; B, estimated result, result is less than RL; --, no data; mg/L, milligrams per liter; TDS, total dissolved solids; Q, reporting limit is elevated due to high analyte levels; G, reporting limit is elevated due to matrix interference]

Analyte and unit	Date sampled	Result	RL
Nitrate plus Nitrite mg/L	05/23/2001	2.7	0.10
Chloride mg/L	-continued	46.1	3.0
Sulfate mg/L		1390 Q	250
Fluoride mg/L		0.66 B	2.0
TDS mg/L		2550	10.0
Tetrachloroethene µg/L	11/06/2001	0.44 J	1.0
Manganese µg/L		202	10.0
Nickel µg/L		4.9 B	40.0
Calcium mg/L		351	0.20
Potassium mg/L		1.7 B	3.0
Magnesium mg/L		27.4	0.20
Sodium mg/L		385	5.0
Nitrate plus Nitrite mg/L		3.3	0.10
Chloride mg/L		45.6	3.0
Sulfate mg/L		1510 Q	250
Fluoride mg/L		0.46 B	2.0
Nitrate mg/L		2.8	0.50
TDS mg/L		2550	10.0
Not Sampled	05/16/2002	--	--
Tetrachloroethene µg/L	11/21/2002	0.69 J	1.0
Manganese µg/L		48.0	10.0
Nickel µg/L		2.3 B	40.0
Calcium mg/L		350	0.20
Potassium mg/L		1.8 B	3.0
Magnesium mg/L		26.0	0.20
Sodium mg/L		360	5.0
Nitrate plus Nitrite mg/L		2.4	0.10
Chloride mg/L		46.0 J	3.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		0.97 B	1.0
Nitrate mg/L		2.4	0.50
TDS mg/L		2500	10.0
Tetrachloroethene µg/L	05/14/2003	0.62 J	1.0
Manganese µg/L		46.0	10.0
Calcium mg/L		360	0.20

Analyte and unit	Date sampled	Result	RL
Potassium mg/L	05/14/2003	2.1 B	3.0
Magnesium mg/L	-continued	30.0	0.20
Sodium mg/L		410	5.0
Nitrate plus Nitrite mg/L		2.9	0.10
Chloride mg/L		45.0 J	3.0
Sulfate mg/L		1600 Q	250
Fluoride mg/L		1.1	1.0
Nitrate mg/L		2.7	0.50
TDS mg/L		2600	10.0
Not Sampled	11/18/2003	--	--
Methylene chloride µg/L	05/06/2004	0.59 J,B	5.0
Tetrachloroethene µg/L		0.85 J	1.0
Trichloroethene µg/L		0.19 J	1.0
Manganese µg/L		55.0	10.0
Calcium mg/L		380	0.20
Potassium mg/L		2.1 B	3.0
Magnesium mg/L		30.0	0.20
Sodium mg/L		400	5.0
Nitrate plus Nitrite mg/L		2.9	0.10
Chloride mg/L		47.0	3.0
Sulfate mg/L		1600 Q	250
Nitrate mg/L		2.5	0.50
TDS mg/L		2600	10.0
Tetrachloroethene µg/L	11/17/2004	0.78 J	1.0
Manganese µg/L		62.0	10.0
Nickel µg/L		4.9 B	40.0
Calcium mg/L		420	0.20
Potassium mg/L		7.4 B	3.0
Magnesium mg/L		39.0	0.20
Sodium mg/L		430	5.0
Nitrate plus Nitrite mg/L		2.3	0.10
Chloride mg/L		46.0 J	3.0
Sulfate mg/L		1900 Q	250
Fluoride mg/L		0.60 B	1.0
Nitrate mg/L		2.6	0.50

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-15
WELL LOCATION (LONGITUDE)	108° 05 ' 32 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 55 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	10/13/87
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,397.30 feet above MSL
ELEV BOTTOM OF WELL CASING	5,398.79 feet above MSL
ELEV BOTTOM OF SCREENED INT	5398.79 feet above MSL
ELEV OF TOP OF SCREENED INT	5,403.90 feet above MSL
SURVEYED ELEV OF CASING TOP	5,461.67 feet above MSL

Date of Report 04-25-2005

Signature Fredrick E. Gebhardt
Name (Typed) Fredrick E. Gebhardt

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-21
WELL LOCATION (LONGITUDE)	108° 05 ' 42 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 31 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	10/29/87
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,369.00 feet above MSL
ELEV BOTTOM OF WELL CASING	5,373.40 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,373.65 feet above MSL
ELEV OF TOP OF SCREENED INT	5,378.87 feet above MSL
SURVEYED ELEV OF CASING TOP	5,418.85 feet above MSL

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NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-39
WELL LOCATION (LONGITUDE)	108° 05 ' 38 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 45 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	11/29/87
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,389.30 feet above MSL
ELEV BOTTOM OF WELL CASING	5,392.12 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,392.12 feet above MSL
ELEV OF TOP OF SCREENED INT	5,401.99 feet above MSL
SURVEYED ELEV OF CASING TOP	5,443.70 feet above MSL

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-42
WELL LOCATION (LONGITUDE)	108° 05 ' 41 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 33 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ *UNCONFINED* X
WELL INSTALLATION DATE	12/7/87
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,371.10 feet above MSL
ELEV BOTTOM OF WELL CASING	5,372.90 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,373.13 feet above MSL
ELEV OF TOP OF SCREENED INT	5,383.07 feet above MSL
SURVEYED ELEV OF CASING TOP	5,422.73 feet above MSL

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MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-45
WELL LOCATION (LONGITUDE)	108° 05 ' 41 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 35 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	12/17/89
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,376.90 feet above MSL
ELEV BOTTOM OF WELL CASING	5,379.64 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,380.06 feet above MSL
ELEV OF TOP OF SCREENED INT	5,389.93 feet above MSL
SURVEYED ELEV OF CASING TOP	5,424.72 feet above MSL

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NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-48
WELL LOCATION (LONGITUDE)	108° 05 ' 42 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 38 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	1/6/90
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,380.30 feet above MSL
ELEV BOTTOM OF WELL CASING	5,385.54 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,385.96 feet above MSL
ELEV OF TOP OF SCREENED INT	5,395.52 feet above MSL
SURVEYED ELEV OF CASING TOP	5,433.46 feet above MSL

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-51
WELL LOCATION (LONGITUDE)	108° 05 ' 39 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 43 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	2/18/90
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,381.20feet above MSL
ELEV BOTTOM OF WELL CASING	5,382.20 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,382.95 feet above MSL
ELEV OF TOP OF SCREENED INT	5,392.48 feet above MSL
SURVEYED ELEV OF CASING TOP	5,445.36 feet above MSL

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-55
WELL LOCATION (LONGITUDE)	108° 05 ' 40 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 36 "
AQUIFER NAME	*Alluvium (110A VMB)*
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	1/20/90
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,385.60feet above MSL
ELEV BOTTOM OF WELL CASING	5,386.60 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,387.02 feet above MSL
ELEV OF TOP OF SCREENED INT	5,396.81 feet above MSL
SURVEYED ELEV OF CASING TOP	5,431.33 feet above MSL

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-56
WELL LOCATION (LONGITUDE)	108° 05 ' 40 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 39 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	1/20/90
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,386.66 feet above MSL
ELEV BOTTOM OF WELL CASING	5,387.77 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,388.20 feet above MSL
ELEV OF TOP OF SCREENED INT	5,397.74 feet above MSL
SURVEYED ELEV OF CASING TOP	5,437.60 feet above MSL

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-57
WELL LOCATION (LONGITUDE)	108° 05 ' 39 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 42 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	2/22/90
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,391.80 feet above MSL
ELEV BOTTOM OF WELL CASING	5,394.67 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,395.10 feet above MSL
ELEV OF TOP OF SCREENED INT	5,404.63 feet above MSL
SURVEYED ELEV OF CASING TOP	5,446.24 feet above MSL

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NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-60
WELL LOCATION (LONGITUDE)	108° 05 ' 41 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 31 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	1/23/90
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,375.40 feet above MSL
ELEV BOTTOM OF WELL CASING	5,377.38 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,377.79 feet above MSL
ELEV OF TOP OF SCREENED INT	5,387.35 feet above MSL
SURVEYED ELEV OF CASING TOP	5,420.14 feet above MSL

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MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-62
WELL LOCATION (LONGITUDE)	108° 05 ' 39 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 28
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	
UNCONFINED	X
WELL INSTALLATION DATE	3/2/90
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,375.70 feet above MSL
ELEV BOTTOM OF WELL CASING	5,376.20 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,376.72 feet above MSL
ELEV OF TOP OF SCREENED INT	5,386.26 feet above MSL
SURVEYED ELEV OF CASING TOP	5,412.67 feet above MSL

Date of Report 04-25-2005

Signature Fredrick E. Gebhardt
Name (Typed) Fredrick E. Gebhardt

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-67
WELL LOCATION (LONGITUDE)	108° 05 ' 40 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 22 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	4/10/91
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,361.10 feet above MSL
ELEV BOTTOM OF WELL CASING	5,361.40 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,361.74 feet above MSL
ELEV OF TOP OF SCREENED INT	5,371.33 feet above MSL
SURVEYED ELEV OF CASING TOP	5,406.41 feet above MSL

Date of Report 04-25-2005

Signature Fredrick E. Gebhardt
Name (Typed) Fredrick E. Gebhardt

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-68
WELL LOCATION (LONGITUDE)	108° 05 ' 38 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 22 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	4/31/91
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,366.70 feet above MSL
ELEV BOTTOM OF WELL CASING	5,367.73 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,367.73 feet above MSL
ELEV OF TOP OF SCREENED INT	5,377.34 feet above MSL
SURVEYED ELEV OF CASING TOP	5,408.64 feet above MSL

Date of Report 04-25-2005

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-69
WELL LOCATION (LONGITUDE)	108° 05 ' 41 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 24 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	4/14/91
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,366.60 feet above MSL
ELEV BOTTOM OF WELL CASING	5,369.30 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,369.56 feet above MSL
ELEV OF TOP OF SCREENED INT	5,379.15 feet above MSL
SURVEYED ELEV OF CASING TOP	5,410.52 feet above MSL

Date of Report 04-25-2005

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-70
WELL LOCATION (LONGITUDE)	108° 05 ' 39 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 24 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	4/15/91
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,370.90 feet above MSL
ELEV BOTTOM OF WELL CASING	5,371.10 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,371.39 feet above MSL
ELEV OF TOP OF SCREENED INT	5,380.99 feet above MSL
SURVEYED ELEV OF CASING TOP	5,411.40 feet above MSL

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-75
WELL LOCATION (LONGITUDE)	108° 05 ' 40 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 26 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	4/27/91
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,368.60 feet above MSL
ELEV BOTTOM OF WELL CASING	5,368.90 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,369.27 feet above MSL
ELEV OF TOP OF SCREENED INT	5,379.23 feet above MSL
SURVEYED ELEV OF CASING TOP	5,410.50 feet above MSL

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-76
WELL LOCATION (LONGITUDE)	108° 05 ' 40 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 27 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	4/29/91
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,371.05 feet above MSL
ELEV BOTTOM OF WELL CASING	5,372.40 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,372.81 feet above MSL
ELEV OF TOP OF SCREENED INT	5,382.80 feet above MSL
SURVEYED ELEV OF CASING TOP	5,414.33 feet above MSL

Date of Report 04-25-2005

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MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	BLM-77
WELL LOCATION (LONGITUDE)	108° 05 ' 40 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 28 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	5/1/91
DRILLING METHOD	HLWAG (Hollow-stem auger)
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	5,374.00 feet above MSL
ELEV BOTTOM OF WELL CASING	5,375.90 feet above MSL
ELEV BOTTOM OF SCREENED INT	5,376.25 feet above MSL
ELEV OF TOP OF SCREENED INT	5,386.24 feet above MSL
SURVEYED ELEV OF CASING TOP	5,414.33 feet above MSL

Date of Report 04-25-2005

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Name (Typed) Fredrick E. Gebhardt

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	GRB-17
WELL LOCATION (LONGITUDE)	108° 05 ' 42 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 20 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	Unknown
DRILLING METHOD	Unknown
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	Unknown
ELEV BOTTOM OF WELL CASING	Unknown
ELEV BOTTOM OF SCREENED INT	Unknown
ELEV OF TOP OF SCREENED INT	Unknown
SURVEYED ELEV OF CASING TOP	Unknown

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HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	GRB - 32
WELL LOCATION (LONGITUDE)	108° 05 ' 42 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 28 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	Unknown
DRILLING METHOD	Unknown
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	Unknown
ELEV BOTTOM OF WELL CASING	Unknown
ELEV BOTTOM OF SCREENED INT	Unknown
ELEV OF TOP OF SCREENED INT	Unknown
SURVEYED ELEV OF CASING TOP	Unknown

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525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	GRB - 48
WELL LOCATION (LONGITUDE)	108° 05 ' 41 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 29 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	Unknown
DRILLING METHOD	Unknown
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	Unknown
ELEV BOTTOM OF WELL CASING	Unknown
ELEV BOTTOM OF SCREENED INT	Unknown
ELEV OF TOP OF SCREENED INT	Unknown
SURVEYED ELEV OF CASING TOP	Unknown

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525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	GRB - 49
WELL LOCATION (LONGITUDE)	108° 05 ' 42 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 26 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	_____ UNCONFINED X
WELL INSTALLATION DATE	Unknown
DRILLING METHOD	Unknown
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	Unknown
ELEV BOTTOM OF WELL CASING	Unknown
ELEV BOTTOM OF SCREENED INT	Unknown
ELEV OF TOP OF SCREENED INT	Unknown
SURVEYED ELEV OF CASING TOP	Unknown

Date of Report 04-25-2005

Signature Fredrick E. Gebhardt
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MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUEZ, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME	Lee Acres Landfill
EPA I.D. NUMBER	Unknown
COUNTY	San Juan
WELL NUMBER	GRB - 50
WELL LOCATION (LONGITUDE)	108° 05 ' 43 "
WELL LOCATION (LATITUDE)	36 ° 42 ' 30 "
AQUIFER NAME	Alluvium (110A VMB)
AQUIFER CONFINED	UNCONFINED X
WELL INSTALLATION DATE	Unknown
DRILLING METHOD	Unknown
INNER CASING DIAMETER	2.0 inches
BOREHOLE DIAMETER	unknown
CASING MATERIAL	SS (Stainless steel)
METHOD OF DEVELOPMENT	Unknown
ELEV BOTTOM OF BOREHOLE	Unknown
ELEV BOTTOM OF WELL CASING	Unknown
ELEV BOTTOM OF SCREENED INT	Unknown
ELEV OF TOP OF SCREENED INT	Unknown
SURVEYED ELEV OF CASING TOP	Unknown

Date of Report 04-25-2005

Signature Fredrick E. Gebhardt
Name (Typed) Fredrick E. Gebhardt

APPENDIX I

Analytical Results from Severn Trent Services Laboratory for Ground-Water Samples
Collected November 16-18, 2004
Report Lot #D4K170331, D4K180279, and D4K190267

SEVERN TRENT STL

STL Denver
4955 Yarrow Street
Arvada, CO 80002

Tel: 303 736 0100 Fax: 303 431 7171
www.stl-inc.com

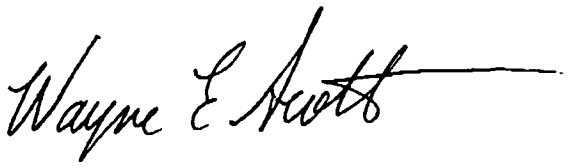
ANALYTICAL REPORT

Lee Acres Landfill
SDG: LEE-5
Lot #s: D4K170331, D4K180279, D4K190267

Richard Daddow

U.S. Geological Survey

STL DENVER



Wayne Scott
Project Manager

December 13, 2004

Table Of Contents

Standard Deliverables with Supporting Documentation

Report Contents	Number of Pages

Standard Deliverables

*(The **Cover Letter** and the **Report Cover** page are considered integral parts of this Standard Deliverable package. This report is incomplete unless all pages indicated in this Table of Contents are included.)*

253

- **Table of Contents**
- **Case Narrative**
- **Executive Summary – Detection Highlights**
- **Methods Summary**
- **Method/Analyst Summary**
- **Lot Sample Summary**
- **Analytical Results**
- **QC Data Association Summary**
- **QC Sample Results**
- **Chain-of-Custody**

Supporting Documentation

(Note: A one-page "Description of Supporting Documentation" is provided at the beginning of this section.).

	Check below when supporting documentation is present.
• Volatile GC/MS	/
• Semivolatile GC/MS	
• Volatile GC	
• Semivolatile GC	
• LC/MS or HPLC	
• Metals	/
• General Chemistry	/
• Subcontracted Data	

Case Narrative
LEE-5

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits.

The test results presented in this report meet all requirements of NELAC, and any exceptions are noted. This report shall not be reproduced, except in full, without written permission from the laboratory.

Sample Receiving

Twelve samples and one trip blank were received under chain of custody on November 17, 2004 at 4.8°C, 2.4°C, and 3.6°C and logged under lot D4K170331. Eight samples and one trip blank were received under chain of custody on November 18, 2004 at 5.9°C and 4.6°C and logged under lot D4K180279. Three samples, one trip blank, and one equipment blank were received under chain of custody on November 19, 2004 at 3.3°C and logged under lot D4K190267. These three lots are reported here under SDG LEE-5.

The chain of custody associated with lot D4K190267 listed sample GBR-48 while the bottles were labeled as GBR-49. The sample was logged per chain of custody.

GC/MS Volatile Organics, SW846 8260B

The vials for sample D4K190267-004 indicated as preserved with HCl; therefore, the fourteen-day holding time was applied. During the analysis of sample D4K190267-004, it was discovered the vials were at a neutral pH of 7. Samples not preserved to pH $\leq$ 2 are assigned a seven day holding time. This sample was analyzed thirteen days after collection, therefore exceeding the method prescribed holding time for non-preserved samples.

Acetone, methylene chloride, and methyl tert-butyl ether were detected in the method blank associated with batch 4329501 at concentrations below the reporting limit, but above the method detection limit. Associated positive sample results are flagged "B".

Methylene chloride was detected in the method blank associated with batch 4337178 at a concentration below the reporting limit but above the method detection limit. Associated positive sample results are flagged "B".

Acetone and methylene chloride were detected in the method blank associated with batch 4337403 at concentrations below the reporting limit, but above the method detection limit. Associated positive sample results are flagged "B".

The MS/MSD associated with batch 4329476 was performed on sample D4K170331-001 and was in control.

The MS/MSD associated with batch 4336202 was performed on sample D4K180279-006 and was in control.

The MS/MSD associated with batch 4337178 was performed on sample D4K170331-006 and was in control.

The MS/MSD associated with batch 4337570 was performed on sample D4K190267-004 and was in control.

The MS/MSDs associated with batches 4329501 and 4337403 were performed on samples from other clients and/or lots and were in control.

Dissolved Metals, SW846 6010B

The MS/MSD associated with batch 4323013 performed on sample D4K170331-006 was in control. The MS/MSD associated with batch 4324607 performed on sample D4K190267-001 was in control. The recoveries of calcium and sodium were not calculated because the concentrations of these metals in the native sample were more than four times greater than the spike amounts.

The MS/MSD associated with batch 4323679 was performed on a sample from another client and/or lot and was in control. Some recoveries were not calculated because high concentrations of the target analytes were present in the native sample.

General Chemistry, EPA 160.1, 353.2, 300.0A,

Samples D4K170331-001 through 012, D4K180279-001 through 004, 006 through 009, and D4K190267-001 through 003 were analyzed at dilutions for sulfate due to high analyte levels. The reporting limits are adjusted accordingly and the associated sample data are flagged "Q".

Samples D4K170331-005, 008 and 012, D4K180279-002 through 004, 006, 007, D4K190267-001, and 003 were analyzed at dilutions for chloride due to high analyte levels. The reporting limits are adjusted accordingly and the associated sample data are flagged "Q".

Samples D4K180279-007 and D4K190267-003 were analyzed at dilutions for total dissolved solids due to a high analyte level. The reporting limit is adjusted accordingly and the associated sample data is flagged "Q".

Sample D4K180279-007 was analyzed at dilutions for fluoride, nitrate, and orthophosphate due to matrix interference. The reporting limits are adjusted accordingly and the associated sample data are flagged "G".

Sample D4K190267-003 was analyzed at dilutions for fluoride and orthophosphate due to matrix interference. The reporting limits are adjusted accordingly and the associated sample data are flagged "G".

Sample D4K190267-003 was analyzed at dilutions for nitrate and nitrate+nitrite due to high analyte levels. The reporting limits are adjusted accordingly and the associated sample data are flagged "Q".

Chloride was detected in the method 300.0A blank associated with batch 4323580 at a concentration below the reporting limit but above the method detection limit. Associated sample results are flagged "J".

Orthophosphate was detected in the method 300.0A blank associated with batches 4323584, 4324503, and 4327357 at concentrations below the reporting limit but above the method detection limit. Associated sample results are flagged "J".

The method 300.0A MS/MSD performed on sample D4K170331-006 demonstrated orthophosphate recoveries that exceeded the lower control limits. The results of chloride, sulfate, and nitrate are estimate because the result concentration exceeds the calibration range.

The method 300.0A MS/MSD performed on sample D4K180279-001 demonstrated orthophosphate recoveries that exceeded the lower control limits. The results of chloride are estimate because the result concentration exceeds the calibration range.

The method 300.0A MS performed on sample D4K190267-001 demonstrated orthophosphate recovery that exceeded the lower control limits. The MSD demonstrated fluoride and orthophosphate recoveries that exceeded the upper control limits. The RPD was above the upper control limits for both analytes. The results of nitrate and sulfate are estimate because the result concentration exceeds the calibration range.

A method 300.0A MS/MSD associated with batch 4324501 was not requested and the laboratory was unable to designate one.

The method 353.2 MS/MSD performed on sample D4K170331-006 was in control for nitrate+nitrite.

The method 353.2 MS/MSD performed on sample D4K180279-001 was in control for nitrate+nitrite.

All other MS/MSDs were performed on sample from other clients and/or lots and were in control.

The method 160.1 duplicate performed on sample D4K170331-004 was in control for total dissolved solids.

The method 160.1 duplicate performed on sample D4K180279-004 was not in control for total dissolved solids.

The method 160.1 duplicate performed on a sample from another client and/or lot was in control for total dissolved solids.

Quality Control Definitions of Terms

Term	Definition
Batch	A set of up to 20 field samples plus associated laboratory QC samples that are similar in composition (matrix) and that are processed within the same time period with the same reagent and standard lots.
Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD)	A volume of regent water for aqueous samples or a contaminant-free solid matrix (Ottawa sand) for soil and sediment samples which is spiked with known amounts of representative target analytes and required surrogates. A LCS is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. An LCSD is a second Laboratory Control Sample.
Matrix Spike and Matrix Spike Duplicate (MS/MSD)	A field sample fortified with known quantities of target analytes that are also added to the LCS. Matrix spike duplicate is a second matrix spike sample. MSs/MSDs are carried throughout he entire analytical process and are used to determine sample matrix effect on accuracy of the measurement system. The accuracy and precision estimated using MS/MSD is only representative of the precision of the sample that was spiked.
Method Blank	A sample composed of all the reagents (in the same quantities) in reagent water carried through the entire analytical process. The method blank is used to monitor the level of contamination introduced during sample preparation steps.
Surrogate	Organic constituents not expected to be detected in environmental media and are added to every sample and QC at a known concentration. Surrogates are used to determine the efficiency of the sample preparation and the analytical process.
Sample Duplicate	A second aliquot of an environmental sample, taken form the same sample container when possible, that is processed independently with the first sample aliquot. The results are used to assess the effect of the sample matrix on the precision of the analytical process. The precision estimated using this sample is not necessarily representative to the precision for other samples in the batch.
Method Detection Limit "MDL"	The method detection limit is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from replicate analyses of low level standards in a typical representative matrix.
Reporting Limit "RL"	The STL reporting limit is normally the lowest level at which measurements become quantitatively meaningful, ie., the quantitation limit, which is approximately three times the MDL. Some projects require RLs that are less than the quantitation limit to achieve particular maximum contaminant levels (MCLs) or relevant and appropriate requirements (ARARs), but RLs cannot be less than the statistically determined MDL.

Quality Control Definitions of Qualifiers

Qualifier	Definition
*	Surrogate or Relative Percent Difference (RPD) is outside control limits.
a	Spiked analyte recovery is outside control limits.
B	Organics: Method blank contamination. The associated method blank contains the target analyte at a reportable level. Inorganics: Estimated result. Result is less than the RL
COL	More than 40% difference between the primary and confirmation detector results. The lower of the two results is reported.
DIL	The concentration is estimated or not reported due to dilution.
E	Estimated result. Result concentrations exceeds the calibration range.
G	Inorganics: Elevated reporting limit. The reporting limit is elevated due to matrix interference.
J	Organics: Estimated result. Result is less than RL Inorganics: Method blank contamination. The associated method blank contains the target analyte at a reportable level.
L	Serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present
N	Spiked analyte recovery is outside stated control limits.
NC	The recovery and/or RPD were not calculated.
ND	The analyte was not detected at the MDL concentration and with a measurable degree of confidence can be said not to be present at or above the RL concentration.
p	Relative percent difference (RPD) is outside stated control limits.
Q	Elevated reporting limit. The reporting limit is elevated due to high analyte levels.
V	General Chemistry: Elevated reporting limit due to limited sample volume.
Wa	Post digestion spike recovery fell between 40-85% due to matrix interference.
Wb	Post digestion spike recovery fell between 115-150% due to matrix interference.
I	Percent recovery is estimated since the results exceeded the calibration range.
T1	A tentatively identified compound that did not generate a spectral match of 80% or greater. Typically called "unknown"
T2	A tentatively identified compound with a spectral match of 80% or better
T3	A tentatively identified compound that was calibrated for by the lab, but not on the client target analyte list.
IC	Diluted due to high inorganic chloride.

EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K170331

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-15 11/16/04 08:20 001				
Chromium - DISSOLVED	3.6 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	7.6 B	10	ug/L	SW846 6010B
Calcium - DISSOLVED	390000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	2000 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	33000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	280000	5000	ug/L	SW846 6010B
Acetone	3.3 J	10	ug/L	SW846 8260B
Total Dissolved Solids	2400	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	5.6	0.10	mg/L	MCAWW 353.2
Chloride	45 J	3.0	mg/L	MCAWW 300.0A
Sulfate	1600 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.68 B	1.0	mg/L	MCAWW 300.0A
Nitrate	6.4	0.50	mg/L	MCAWW 300.0A
BLM-39 11/16/04 09:00 002				
Manganese - DISSOLVED	910	10	ug/L	SW846 6010B
Calcium - DISSOLVED	490000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	5300	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	35000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	520000	5000	ug/L	SW846 6010B
Total Dissolved Solids	3300	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	1.2	0.10	mg/L	MCAWW 353.2
Chloride	32 J	3.0	mg/L	MCAWW 300.0A
Sulfate	2500 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.77 B	1.0	mg/L	MCAWW 300.0A
Nitrate	2.1	0.50	mg/L	MCAWW 300.0A
BLM-98 11/16/04 09:15 003				
Manganese - DISSOLVED	890	10	ug/L	SW846 6010B
Calcium - DISSOLVED	480000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	5100	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	34000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	500000	5000	ug/L	SW846 6010B
trans-1,3-Dichloropropene	0.29 J	1.0	ug/L	SW846 8260B
Total Dissolved Solids	3200	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	1.5	0.10	mg/L	MCAWW 353.2
Chloride	37 J	3.0	mg/L	MCAWW 300.0A
Sulfate	2300 Q	250	mg/L	MCAWW 300.0A

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EXECUTIVE SUMMARY - Detection Highlights

LKE-5 : D4K170331

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-98 11/16/04 09:15 003				
Fluoride	0.78 B	1.0	mg/L	MCAWW 300.0A
Nitrate	3.0	0.50	mg/L	MCAWW 300.0A
BLM-48 11/16/04 09:40 004				
Chromium - DISSOLVED	9.4 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	10	10	ug/L	SW846 6010B
Calcium - DISSOLVED	380000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1900 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	29000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	280000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2300	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	5.8	0.10	mg/L	MCAWW 353.2
Chloride	49 J	3.0	mg/L	MCAWW 300.0A
Sulfate	1500 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.59 B	1.0	mg/L	MCAWW 300.0A
Nitrate	6.9	0.50	mg/L	MCAWW 300.0A
BLM-51 11/16/04 10:20 005				
Chromium - DISSOLVED	3.7 B	10	ug/L	SW846 6010B
Calcium - DISSOLVED	410000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	2300 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	32000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	320000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2500	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	6.4	0.10	mg/L	MCAWW 353.2
Chloride	50 J,Q	15	mg/L	MCAWW 300.0A
Sulfate	1600 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.62 B	1.0	mg/L	MCAWW 300.0A
Nitrate	7.7	0.50	mg/L	MCAWW 300.0A
BLM-45 11/16/04 11:00 006				
Chromium - DISSOLVED	5.3 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	88	10	ug/L	SW846 6010B
Nickel - DISSOLVED	3.7 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	400000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	2000 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	31000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	350000	5000	ug/L	SW846 6010B

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EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K170331

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-45 11/16/04 11:00 006				
Acetone	3.4 J	10	ug/L	SW846 8260B
Acetone	2.7 J	10	ug/L	SW846 8260B
Total Dissolved Solids	2600	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	3.8	0.10	mg/L	MCAWW 353.2
Chloride	44 J	3.0	mg/L	MCAWW 300.0A
Sulfate	1800 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.64 B	1.0	mg/L	MCAWW 300.0A
Nitrate	4.8	0.50	mg/L	MCAWW 300.0A
BLM-42 11/16/04 11:50 007				
Chromium - DISSOLVED	1.4 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	180	10	ug/L	SW846 6010B
Nickel - DISSOLVED	3.2 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	400000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	2200 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	29000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	360000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2700	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	3.0	0.10	mg/L	MCAWW 353.2
Chloride	42 J	3.0	mg/L	MCAWW 300.0A
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.65 B	1.0	mg/L	MCAWW 300.0A
Nitrate	3.4	0.50	mg/L	MCAWW 300.0A
Phosphate as P, Ortho	0.17 B,J	0.50	mg/L	MCAWW 300.0A
BLM-57 11/16/04 12:30 008				
Chromium - DISSOLVED	1.8 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	4900	10	ug/L	SW846 6010B
Nickel - DISSOLVED	36 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	330000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	3000	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	35000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	550000	5000	ug/L	SW846 6010B
Acetone	2.5 J	10	ug/L	SW846 8260B
1,1-Dichloroethane	0.87 J	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	0.39 J	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	0.39 J	1.0	ug/L	SW846 8260B

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EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K170331

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-57 11/16/04 12:30 008				
Total Dissolved Solids	3000	10	mg/L	MCAWW 160.1
Chloride	100 J,Q	15	mg/L	MCAWW 300.0A
Sulfate	2000 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.66 B	1.0	mg/L	MCAWW 300.0A
BLM-56 11/16/04 13:10 009				
Chromium - DISSOLVED	4.2 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	20	10	ug/L	SW846 6010B
Nickel - DISSOLVED	5.1 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	420000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1700 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	33000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	370000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2700	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	3.7	0.10	mg/L	MCAWW 353.2
Chloride	43 J	3.0	mg/L	MCAWW 300.0A
Sulfate	1700 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.67 B	1.0	mg/L	MCAWW 300.0A
Nitrate	4.3	0.50	mg/L	MCAWW 300.0A
BLM-99 11/16/04 13:20 010				
Chromium - DISSOLVED	1.4 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	30	10	ug/L	SW846 6010B
Nickel - DISSOLVED	3.0 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	420000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1800 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	32000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	360000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2700	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	3.7	0.10	mg/L	MCAWW 353.2
Chloride	43 J	3.0	mg/L	MCAWW 300.0A
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.66 B	1.0	mg/L	MCAWW 300.0A
Nitrate	4.4	0.50	mg/L	MCAWW 300.0A

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EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K170331

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-55 11/16/04 14:00 011				
Chromium - DISSOLVED	5.0 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	1200	10	ug/L	SW846 6010B
Nickel - DISSOLVED	71	40	ug/L	SW846 6010B
Calcium - DISSOLVED	430000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	2900 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	31000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	400000	5000	ug/L	SW846 6010B
Tetrachloroethene	0.34 J	1.0	ug/L	SW846 8260B
Total Dissolved Solids	2800	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	1.8	0.10	mg/L	MCAWW 353.2
Chloride	47 J	3.0	mg/L	MCAWW 300.0A
Sulfate	2000 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.63 B	1.0	mg/L	MCAWW 300.0A
Nitrate	2.0	0.50	mg/L	MCAWW 300.0A
BLM-69 11/16/04 15:10 012				
Chromium - DISSOLVED	4.2 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	2.1 B	10	ug/L	SW846 6010B
Calcium - DISSOLVED	360000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1400 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	27000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	300000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2300	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	4.4	0.10	mg/L	MCAWW 353.2
Chloride	49 J,Q	15	mg/L	MCAWW 300.0A
Sulfate	1500 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.63 B	1.0	mg/L	MCAWW 300.0A
Nitrate	4.9	0.50	mg/L	MCAWW 300.0A
BLM-69TB 11/16/04 15:15 013				
Methylene chloride	0.72 J,B	5.0	ug/L	SW846 8260B

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EXECUTIVE SUMMARY - Detection Highlights

LKR-5 : D4K180279

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-21 11/17/04 11:20 001				
Manganese - DISSOLVED	360	10	ug/L	SW846 6010B
Nickel - DISSOLVED	3.3 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	520000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	7400	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	39000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	490000	5000	ug/L	SW846 6010B
Total Dissolved Solids	3400	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	0.93	0.10	mg/L	MCAWW 353.2
Chloride	35	3.0	mg/L	MCAWW 300.0A
Sulfate	2100 Q	500	mg/L	MCAWW 300.0A
Fluoride	0.62 B	1.0	mg/L	MCAWW 300.0A
Nitrate	0.65	0.50	mg/L	MCAWW 300.0A
GBR-50 11/17/04 11:50 002				
Manganese - DISSOLVED	62	10	ug/L	SW846 6010B
Nickel - DISSOLVED	4.9 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	420000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	2300 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	32000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	430000	5000	ug/L	SW846 6010B
Tetrachloroethene	0.78 J	1.0	ug/L	SW846 8260B
Total Dissolved Solids	2800	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	2.3	0.10	mg/L	MCAWW 353.2
Chloride	46 Q	15	mg/L	MCAWW 300.0A
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.60 B	1.0	mg/L	MCAWW 300.0A
Nitrate	2.6	0.50	mg/L	MCAWW 300.0A
Phosphate as P, Ortho	0.19 B,J	0.50	mg/L	MCAWW 300.0A
BLM-77 11/17/04 12:30 003				
Manganese - DISSOLVED	2300	10	ug/L	SW846 6010B
Nickel - DISSOLVED	13 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	410000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1700 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	32000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	420000	5000	ug/L	SW846 6010B
Tetrachloroethene	0.47 J	1.0	ug/L	SW846 8260B
Total Dissolved Solids	2800	10	mg/L	MCAWW 160.1

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EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K180279

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-77 11/17/04 12:30 003				
Nitrate-Nitrite	0.057 B	0.10	mg/L	MCAWW 353.2
Chloride	52 Q	15	mg/L	MCAWW 300.0A
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.65 B	1.0	mg/L	MCAWW 300.0A
Nitrate	0.24 B	0.50	mg/L	MCAWW 300.0A
BLM-76 11/17/04 13:10 004				
Chromium - DISSOLVED	1.4 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	770	10	ug/L	SW846 6010B
Nickel - DISSOLVED	9.3 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	410000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1800 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	32000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	420000	5000	ug/L	SW846 6010B
Tetrachloroethene	0.65 J	1.0	ug/L	SW846 8260B
Total Dissolved Solids	2800	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	1.4	0.10	mg/L	MCAWW 353.2
Chloride	55 Q	15	mg/L	MCAWW 300.0A
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.51 B	1.0	mg/L	MCAWW 300.0A
Nitrate	1.5	0.50	mg/L	MCAWW 300.0A
BLM-76TB 11/17/04 13:15 005				
Acetone	8.2 J	10	ug/L	SW846 8260B
2-Butanone (MEK)	4.1 J	5.0	ug/L	SW846 8260B
GBR-17 11/17/04 08:30 006				
Chromium - DISSOLVED	6.3 B	10	ug/L	SW846 6010B
Calcium - DISSOLVED	360000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1100 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	27000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	310000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2200	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	4.1	0.10	mg/L	MCAWW 353.2
Chloride	49 Q	15	mg/L	MCAWW 300.0A
Sulfate	1400 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.62 B	1.0	mg/L	MCAWW 300.0A
Nitrate	5.0	0.50	mg/L	MCAWW 300.0A

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EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K180279

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GBR-32 11/17/04 09:30 007				
Chromium - DISSOLVED	3.0 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	41	10	ug/L	SW846 6010B
Nickel - DISSOLVED	72	40	ug/L	SW846 6010B
Calcium - DISSOLVED	520000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	5000	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	51000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	810000	5000	ug/L	SW846 6010B
Chloroform	0.77 J	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	1.0	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	1.0	1.0	ug/L	SW846 8260B
Tetrachloroethene	0.68 J	1.0	ug/L	SW846 8260B
Trichloroethene	0.31 J	1.0	ug/L	SW846 8260B
Total Dissolved Solids	4300 Q	20	mg/L	MCAWW 160.1
Nitrate-Nitrite	3.8	0.10	mg/L	MCAWW 353.2
Chloride	460 Q	60	mg/L	MCAWW 300.0A
Sulfate	2100 Q	500	mg/L	MCAWW 300.0A
Fluoride	0.75 B,G	2.0	mg/L	MCAWW 300.0A
Nitrate	3.8 G	1.0	mg/L	MCAWW 300.0A
BLM-62 11/17/04 10:20 008				
Chromium - DISSOLVED	2.0 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	30	10	ug/L	SW846 6010B
Nickel - DISSOLVED	2.6 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	530000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	5100	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	36000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	690000	5000	ug/L	SW846 6010B
Acetone	5.2 J	10	ug/L	SW846 8260B
Total Dissolved Solids	3000	10	mg/L	MCAWW 160.1
Chloride	19	3.0	mg/L	MCAWW 300.0A
Sulfate	2100 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.60 B	1.0	mg/L	MCAWW 300.0A
Nitrate	0.20 B	0.50	mg/L	MCAWW 300.0A
BLM-60 11/17/04 11:00 009				
Manganese - DISSOLVED	290	10	ug/L	SW846 6010B
Nickel - DISSOLVED	4.4 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	430000	200	ug/L	SW846 6010B

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EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K180279

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-60 11/17/04 11:00 009				
Potassium - DISSOLVED	2300 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	32000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	400000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2800	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	3.3	0.10	mg/L	MCAWW 353.2
Chloride	46	3.0	mg/L	MCAWW 300.0A
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.58 B	1.0	mg/L	MCAWW 300.0A
Nitrate	3.3	0.50	mg/L	MCAWW 300.0A

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EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K190267

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
BLM-67 11/18/04 09:00 001				
Chromium - DISSOLVED	4.9 B	10	ug/L	SW846 6010B
Manganese - DISSOLVED	12	10	ug/L	SW846 6010B
Calcium - DISSOLVED	350000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1500 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	26000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	310000	5000	ug/L	SW846 6010B
Acetone	2.8 J,B	10	ug/L	SW846 8260B
Total Dissolved Solids	2400	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	4.8	0.10	mg/L	MCAWW 353.2
Chloride	52 Q	15	mg/L	MCAWW 300.0A
Sulfate	1700 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.66 B	1.0	mg/L	MCAWW 300.0A
Nitrate	4.8	0.50	mg/L	MCAWW 300.0A
BLM-75 11/18/04 10:30 002				
Manganese - DISSOLVED	630	10	ug/L	SW846 6010B
Nickel - DISSOLVED	2.9 B	40	ug/L	SW846 6010B
Calcium - DISSOLVED	420000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	1700 B	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	30000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	380000	5000	ug/L	SW846 6010B
Total Dissolved Solids	2700	10	mg/L	MCAWW 160.1
Nitrate-Nitrite	2.3	0.10	mg/L	MCAWW 353.2
Chloride	46	3.0	mg/L	MCAWW 300.0A
Sulfate	1800 Q	250	mg/L	MCAWW 300.0A
Fluoride	0.58 B	1.0	mg/L	MCAWW 300.0A
Nitrate	2.4	0.50	mg/L	MCAWW 300.0A
GBR-48 11/18/04 11:10 003				
Chromium - DISSOLVED	150	10	ug/L	SW846 6010B
Manganese - DISSOLVED	880	10	ug/L	SW846 6010B
Nickel - DISSOLVED	2500	40	ug/L	SW846 6010B
Calcium - DISSOLVED	630000	200	ug/L	SW846 6010B
Potassium - DISSOLVED	5600	3000	ug/L	SW846 6010B
Magnesium - DISSOLVED	65000	200	ug/L	SW846 6010B
Sodium - DISSOLVED	900000	5000	ug/L	SW846 6010B
Acetone	3.3 J,B	10	ug/L	SW846 8260B
Chloroform	1.1	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	1.7	1.0	ug/L	SW846 8260B

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

LEE-5 : D4K190267

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GBR-48 11/18/04 11:10 003				
1,2-Dichloroethene (total)	1.7	1.0	ug/L	SW846 8260B
Tetrachloroethene	1.6	1.0	ug/L	SW846 8260B
Trichloroethene	0.80 J	1.0	ug/L	SW846 8260B
Total Dissolved Solids	5200 Q	20	mg/L	MCAWW 160.1
Nitrate-Nitrite	11 Q	0.50	mg/L	MCAWW 353.2
Chloride	990 Q	150	mg/L	MCAWW 300.0A
Sulfate	2200 Q	500	mg/L	MCAWW 300.0A
Fluoride	0.70 B,G	2.0	mg/L	MCAWW 300.0A
Nitrate	12 Q	1.0	mg/L	MCAWW 300.0A
GBR-48EB 11/18/04 12:00 004				
Calcium - DISSOLVED	200	200	ug/L	SW846 6010B
Acetone	2.8 J	10	ug/L	SW846 8260B
Methylene chloride	0.22 J	5.0	ug/L	SW846 8260B
Chloride	1.1 B	3.0	mg/L	MCAWW 300.0A
Sulfate	0.89 B	5.0	mg/L	MCAWW 300.0A
Fluoride	0.13 B	1.0	mg/L	MCAWW 300.0A

PREPARATION METHODS SUMMARY

LEE-5

PREPARATION DESCRIPTION	PREPARATION METHOD	ANALYTICAL METHOD
o-Phosphate	MCAWW 300.0A	MCAWW 300.0A
Acid Digestion for Total Recoverable Metals	SW846 3005A	SW846 6010B
Chloride	MCAWW 300.0A	MCAWW 300.0A
Filterable Residue (TDS)	MCAWW 160.1	MCAWW 160.1
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Nitrate	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.2	MCAWW 353.2
Sulfate	MCAWW 300.0A	MCAWW 300.0A
25 mL Purge-and-Trap	SW846 5030B/826	SW846 8260B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

ANALYTICAL METHODS SUMMARY

LEE-5

PARAMETER	ANALYTICAL METHOD
Chloride	MCAWW 300.0A
Filterable Residue (TDS)	MCAWW 160.1
Fluoride	MCAWW 300.0A
Inductively Coupled Plasma (ICP) Metals	SW846 6010B
Nitrate as N	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.2
Phosphate as P, Ortho	MCAWW 300.0A
Sulfate	MCAWW 300.0A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B
Volatile Organics by GC/MS	SW846 8260B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

METHOD / ANALYST SUMMARY

LEE-5

ANALYTICAL METHOD	ANALYST	ANALYST ID
MCAWW 160.1	David Kendall	002164
MCAWW 300.0A	Andrita Scofield	004409
MCAWW 353.2	Claire Likar	004382
SW846 6010B	Janel Motichka	2862
SW846 6010B	Luis Diaz	4729
SW846 6010B	Lynn-Anne Trudell	6645
SW846 8260B	Dan Appelhans	001008
SW846 8260B	Hauqing Zhou	005417
SW846 8260B	Heather Despres	009250
SW846 8260B	Joann Peterson	011674

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

LKE-5 : D4K170331

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GW7CK	001	BLM-15	11/16/04	08:20
GW7C1	002	BLM-39	11/16/04	09:00
GW7C5	003	BLM-98	11/16/04	09:15
GW7C9	004	BLM-48	11/16/04	09:40
GW7DD	005	BLM-51	11/16/04	10:20
GW7DH	006	BLM-45	11/16/04	11:00
GW7D0	007	BLM-42	11/16/04	11:50
GW7D2	008	BLM-57	11/16/04	12:30
GW7D7	009	BLM-56	11/16/04	13:10
GW7EA	010	BLM-99	11/16/04	13:20
GW7EC	011	BLM-55	11/16/04	14:00
GW7EF	012	BLM-69	11/16/04	15:10
GW7EG	013	BLM-69TB	11/16/04	15:15

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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SAMPLE SUMMARY

LER-5 : D4K180279

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GXAD0	001	BLM-21	11/17/04	11:20
GXAD7	002	GBR-50	11/17/04	11:50
GXAD9	003	BLM-77	11/17/04	12:30
GXAEC	004	BLM-76	11/17/04	13:10
GXAEE	005	BLM-76TB	11/17/04	13:15
GXAEJ	006	GBR-17	11/17/04	08:30
GXAEN	007	GBR-32	11/17/04	09:30
GXAEQ	008	BLM-62	11/17/04	10:20
GXAET	009	BLM-60	11/17/04	11:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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SAMPLE SUMMARY

LEE-5 : D4K190267

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GXEVE	001	BLM-67	11/18/04	09:00
GXEVQ	002	BLM-75	11/18/04	10:30
GXEVR	003	GBR-48	11/18/04	11:10
GXEVV	004	GBR-48EB	11/18/04	12:00
GXEVX	005	GBR-48TB	11/18/04	11:15

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-15

GC/MS Volatiles

Lot-Sample #...: D4K170331-001 Work Order #...: GW7CK1AJ Matrix.....: WATER
Date Sampled...: 11/16/04 08:20 Date Received..: 11/17/04
Prep Date.....: 11/23/04 Analysis Date..: 11/23/04
Prep Batch #...: 4329476 Analysis Time..: 18:28
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**3.3 J**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-15

GC/MS Volatiles

Lot-Sample #...: D4K170331-001 **Work Order #...:** GW7CK1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	99	(73 - 118)
1,2-Dichloroethane-d4	101	(62 - 128)
4-Bromofluorobenzene	112	(78 - 118)
Toluene-d8	103	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-15

GC/MS Volatiles

Lot-Sample #: D4K170331-001 **Work Order #:** GW7CK1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		7.6 J	M	14.732	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	9.0 J	M	15.348	ug/L
Unknown		2.6 J	M	16.381	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-39

GC/MS Volatiles

Lot-Sample #...: D4K170331-002 **Work Order #...:** GW7C11AJ **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:00 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 21:33
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-39

GC/MS Volatiles

Lot-Sample #...: D4K170331-002 **Work Order #...:** GW7C11AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 118)
1,2-Dichloroethane-d4	107	(62 - 128)
4-Bromofluorobenzene	109	(78 - 118)
Toluene-d8	101	(77 - 117)

US GEOLOGICAL SURVEY

BLM-39

GC/MS Volatiles

Lot-Sample #: D4K170331-002 **Work Order #:** GW7C11AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Acetic acid, 2-ethylhexyl este	103-09-3	56 J	M	15.332	ug/L
Unknown		2.1 J	M	15.604	ug/L
Unknown		20 J	M	16.346	ug/L
Unknown		2.9 J	M	16.727	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-98

GC/MS Volatiles

Lot-Sample #...: D4K170331-003 **Work Order #...:** GW7C51AJ **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:15 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 21:56
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	**0.29 J**	**1.0**	**ug/L**	**0.20**
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-98

GC/MS Volatiles

Lot-Sample #...: D4K170331-003 **Work Order #...:** GW7C51AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(73 - 118)
1,2-Dichloroethane-d4	99	(62 - 128)
4-Bromofluorobenzene	109	(78 - 118)
Toluene-d8	99	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-98

GC/MS Volatiles

Lot-Sample #: D4K170331-003 **Work Order #:** GW7C51AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
unknown		4.2 J	M	14.716	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	49 J	M	15.314	ug/L
unknown		18 J	M	16.347	ug/L
unknown		2.5 J	M	16.727	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-48

GC/MS Volatiles

Lot-Sample #...: D4K170331-004 **Work Order #...:** GW7C91AJ **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:40 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 22:19
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-48

GC/MS Volatiles

Lot-Sample #...: D4K170331-004 **Work Order #...:** GW7C91AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(73 - 118)
1,2-Dichloroethane-d4	102	(62 - 128)
4-Bromofluorobenzene	108	(78 - 118)
Toluene-d8	97	(77 - 117)

US GEOLOGICAL SURVEY

BLM-48

GC/MS Volatiles

Lot-Sample #: D4K170331-004 **Work Order #:** GW7C91AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		3.9 J	M	14.715	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	52 J	M	15.313	ug/L
Unknown		1.6 J	M	15.603	ug/L
Unknown		22 J	M	16.345	ug/L
Unknown		2.7 J	M	16.726	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-51

GC/MS Volatiles

Lot-Sample #...: D4K170331-005 Work Order #...: GW7DD1AJ Matrix.....: WATER
Date Sampled...: 11/16/04 10:20 Date Received..: 11/17/04
Prep Date.....: 11/23/04 Analysis Date..: 11/23/04
Prep Batch #...: 4329476 Analysis Time..: 22:43
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-51

GC/MS Volatiles

Lot-Sample #...: D4K170331-005 **Work Order #...:** GW7DD1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	103	(73 - 118)
1,2-Dichloroethane-d4	108	(62 - 128)
4-Bromofluorobenzene	112	(78 - 118)
Toluene-d8	102	(77 - 117)

US GEOLOGICAL SURVEY

BLM-51

GC/MS Volatiles

Lot-Sample #: D4K170331-005 **Work Order #:** GW7DD1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		4.0 J	M	14.732	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	45 J	M	15.33	ug/L
Unknown		21 J	M	16.344	ug/L
Unknown		1.5 J	M	16.725	ug/L
Unknown		2.0 J	M	16.761	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-45

GC/MS Volatiles

Lot-Sample #...: D4K170331-006 Work Order #...: GW7DH2AJ Matrix.....: WATER
Date Sampled...: 11/16/04 11:00 Date Received..: 11/17/04
Prep Date.....: 11/30/04 Analysis Date..: 11/30/04
Prep Batch #...: 4337178 Analysis Time..: 18:33
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**2.7 J**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-45

GC/MS Volatiles

Lot-Sample #...: D4K170331-006 **Work Order #...:** GW7DH2AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	105	(73 - 118)
1,2-Dichloroethane-d4	114	(62 - 128)
4-Bromofluorobenzene	97	(78 - 118)
Toluene-d8	95	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-45

GC/MS Volatiles

Lot-Sample #: D4K170331-006 **Work Order #:** GW7DH2AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		1.3 J	M	11.695	ug/L
Unknown		1.9 J	M	14.014	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-42

GC/MS Volatiles

Lot-Sample #...: D4K170331-007 **Work Order #...:** GW7D01AJ **Matrix.....:** WATER
Date Sampled...: 11/16/04 11:50 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 23:29
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
oroform	ND	1.0	ug/L	0.17
romethane	ND	2.0	ug/L	0.91
Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,3 Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-42

GC/MS Volatiles

Lot-Sample #...: D4K170331-007 **Work Order #...:** GW7D01AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	104	(73 - 118)
1,2-Dichloroethane-d4	108	(62 - 128)
4-Bromofluorobenzene	114	(78 - 118)
Toluene-d8	102	(77 - 117)

US GEOLOGICAL SURVEY

BLM-42

GC/MS Volatiles

Lot-Sample #: D4K170331-007 **Work Order #:** GW7D01AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		8.6 J	M	14.731	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	40 J	M	15.329	ug/L
Unknown		1.3 J	M	15.601	ug/L
Unknown		16 J	M	16.344	ug/L
Unknown		1.3 J	M	16.724	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BIM-57

GC/MS Volatiles

Lot-Sample #...: D4K170331-008 Work Order #...: GW7D21AJ Matrix.....: WATER
Date Sampled...: 11/16/04 12:30 Date Received..: 11/17/04
Prep Date.....: 11/23/04 Analysis Date..: 11/23/04
Prep Batch #...: 4329476 Analysis Time..: 23:52
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**2.5 J**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	**0.87 J**	**1.0**	**ug/L**	**0.22**
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	**0.39 J**	**1.0**	**ug/L**	**0.14**
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	**0.39 J**	**1.0**	**ug/L**	**0.24**
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-57

GC/MS Volatiles

Lot-Sample #...: D4K170331-008 **Work Order #...:** GW7D21AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(73 - 118)
1,2-Dichloroethane-d4	104	(62 - 128)
4-Bromofluorobenzene	108	(78 - 118)
Toluene-d8	98	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-57

GC/MS Volatiles

Lot-Sample #: D4K170331-008 **Work Order #:** GW7D21AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		6.7 J	M	14.732	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	39 J	M	15.33	ug/L
Unknown		1.6 J	M	15.62	ug/L
Unknown		15 J	M	16.345	ug/L
Unknown		1.4 J	M	16.725	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-56

GC/MS Volatiles

Lot-Sample #...: D4K170331-009 **Work Order #...:** GW7D71AJ **Matrix.....:** WATER
Date Sampled...: 11/16/04 13:10 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329476 **Analysis Time..:** 00:16
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-56

GC/MS Volatiles

Lot-Sample #...: D4K170331-009 **Work Order #...:** GW7D71AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(73 - 118)
1,2-Dichloroethane-d4	108	(62 - 128)
4-Bromofluorobenzene	112	(78 - 118)
Toluene-d8	100	(77 - 117)

US GEOLOGICAL SURVEY

BLM-56

GC/MS Volatiles

Lot-Sample #: D4K170331-009 **Work Order #:** GW7D71AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		2.8 J	M	14.732	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	33 J	M	15.33	ug/L
Unknown		13 J	M	16.344	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-99

GC/MS Volatiles

Lot-Sample #...: D4K170331-010 **Work Order #...:** GW7EA1AJ **Matrix.....:** WATER
Date Sampled...: 11/16/04 13:20 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329476 **Analysis Time..:** 00:39
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-99

GC/MS Volatiles

Lot-Sample #...: D4K170331-010 **Work Order #...:** GW7EA1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	108	(73 - 118)
1,2-Dichloroethane-d4	110	(62 - 128)
4-Bromofluorobenzene	116	(78 - 118)
Toluene-d8	106	(77 - 117)

US GEOLOGICAL SURVEY

BLM-99

GC/MS Volatiles

Lot-Sample #: D4K170331-010 **Work Order #:** GW7EA1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	3.3 J	M	9.5001	ug/L
Unknown		2.3 J	M	14.735	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	17 J	M	15.333	ug/L
Unknown		12 J	M	16.347	ug/L
Unknown		1.4 J	M	16.727	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-55

GC/MS Volatiles

Lot-Sample #...: D4K170331-011 **Work Order #...:** GW7EC1AJ **Matrix.....:** WATER
Date Sampled...: 11/16/04 14:00 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329476 **Analysis Time..:** 01:02
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	**0.34 J**	**1.0**	**ug/L**	**0.26**
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-55

GC/MS Volatiles

Lot-Sample #...: D4K170331-011 **Work Order #...:** GW7EC1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	103	(73 - 118)
1,2-Dichloroethane-d4	105	(62 - 128)
4-Bromofluorobenzene	109	(78 - 118)
Toluene-d8	99	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-55

GC/MS Volatiles

Lot-Sample #: D4K170331-011 **Work Order #:** GW7EC1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Acetic acid, 2-ethylhexyl este	103-09-3	13 J	M	15.33	ug/L
Unknown		7.1 J	M	16.363	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-69

GC/MS Volatiles

Lot-Sample #...: D4K170331-012 Work Order #...: GW7EF1AJ Matrix.....: WATER
Date Sampled...: 11/16/04 15:10 Date Received..: 11/17/04
Prep Date.....: 11/24/04 Analysis Date..: 11/24/04
Prep Batch #...: 4329501 Analysis Time..: 13:50
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-69

GC/MS Volatiles

Lab Sample #...: D4K170331-012 **Work Order #...:** GW7EF1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(73 - 118)
1,2-Dichloroethane-d4	110	(62 - 128)
4-Bromofluorobenzene	96	(78 - 118)
Toluene-d8	94	(77 - 117)

US GEOLOGICAL SURVEY

BLM-69

GC/MS Volatiles

Lot-Sample #: D4K170331-012 **Work Order #:** GW7EF1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotetrasiloxane, octamethyl	556-67-2	6.0 J	M	11.697	ug/L
Unknown		4.7 J	M	14.017	ug/L
Unknown		1.2 J	M	15.689	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-69TB

GC/MS Volatiles

Lot-Sample #...: D4K170331-013 **Work Order #...:** GW7EG1AA **Matrix.....:** WATER
Date Sampled...: 11/16/04 15:15 **Date Received..:** 11/17/04
Prep Date.....: 11/24/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329501 **Analysis Time..:** 14:10
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	**0.72 J,B**	**5.0**	**ug/L**	**0.21**
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-69TB

GC/MS Volatiles

Lot-Sample #...: D4K170331-013 **Work Order #...:** GW7EG1AA **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	108	(73 - 118)
1,2-Dichloroethane-d4	111	(62 - 128)
4-Bromofluorobenzene	98	(78 - 118)
Toluene-d8	92	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

US GEOLOGICAL SURVEY

BLM-69TB

GC/MS Volatiles

Lot-Sample #: D4K170331-013 **Work Order #:** GW7EG1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotetrasiloxane, octamethyl	556-67-2	3.2 J	M	11.699	ug/L
None				14.018	ug/L
None				15.691	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-21

GC/MS Volatiles

Lot-Sample #...: D4K180279-001 Work Order #...: GXAD01AJ Matrix.....: WATER
Date Sampled...: 11/17/04 11:20 Date Received..: 11/18/04
Prep Date.....: 11/29/04 Analysis Date..: 11/29/04
Prep Batch #...: 4336202 Analysis Time..: 15:06
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-21

GC/MS Volatiles

Lot-Sample #...: D4K180279-001 **Work Order #...:** GXAD01AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	95	(73 - 118)
1,2-Dichloroethane-d4	96	(62 - 128)
4-Bromofluorobenzene	99	(78 - 118)
To[illegible]ne-d8	100	(77 - 117)

US GEOLOGICAL SURVEY

BLM-21

GC/MS Volatiles

Lot-Sample #: D4K180279-001 **Work Order #:** GXAD01AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		9.6 J	M	14.696	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	45 J	M	15.294	ug/L
Unknown		1.5 J	M	15.584	ug/L
Unknown		13 J	M	16.327	ug/L
Unknown		3.7 J	M	16.707	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-50

GC/MS Volatiles

Lot-Sample #...: D4K180279-002 **Work Order #...:** GXAD71AJ **Matrix.....:** WATER
Date Sampled...: 11/17/04 11:50 **Date Received..:** 11/18/04
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 15:29
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	**0.78 J**	**1.0**	**ug/L**	**0.26**
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: GBR-50

GC/MS Volatiles

Lot-Sample #...: D4K180279-002 **Work Order #...:** GXAD71AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(73 - 118)
1,2-Dichloroethane-d4	102	(62 - 128)
4-Bromofluorobenzene	103	(78 - 118)
Toluene-d8	101	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

GBR-50

GC/MS Volatiles

Lot-Sample #: D4K180279-002 **Work Order #:** GXAD71AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		8.4 J	M	14.714	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	40 J	M	15.312	ug/L
Unknown		12 J	M	16.326	ug/L
Unknown		3.0 J	M	16.707	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-77

GC/MS Volatiles

Lot-Sample #...: D4K180279-003 Work Order #...: GXAD91AJ Matrix.....: WATER
Date Sampled...: 11/17/04 12:30 Date Received..: 11/18/04
Prep Date.....: 11/29/04 Analysis Date..: 11/29/04
Prep Batch #...: 4336202 Analysis Time..: 15:52
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	**0.47 J**	**1.0**	**ug/L**	**0.26**
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: BLM-77

GC/MS Volatiles

Lot-Sample #...: D4K180279-003 **Work Order #...:** GXAD91AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(73 - 118)
1,2-Dichloroethane-d4	97	(62 - 128)
4-Bromofluorobenzene	105	(78 - 118)
Toluene-d8	100	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-77

GC/MS Volatiles

Lot-Sample #: D4K180279-003 **Work Order #:** GXAD91AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	7.4 J	M	9.4816	ug/L
Unknown		13 J	M	14.716	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	61 J	M	15.314	ug/L
Unknown		2.7 J	M	15.586	ug/L
Unknown		15 J	M	16.329	ug/L
Unknown		2.6 J	M	16.709	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-76

GC/MS Volatiles

Lot-Sample #...: D4K180279-004 Work Order #...: GXAEC1AJ Matrix.....: WATER
Date Sampled...: 11/17/04 13:10 Date Received..: 11/18/04
Prep Date.....: 11/29/04 Analysis Date..: 11/29/04
Prep Batch #...: 4336202 Analysis Time..: 16:14
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	**0.65 J**	**1.0**	**ug/L**	**0.26**
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-76

GC/MS Volatiles

Lot-Sample #...: D4K180279-004 **Work Order #...:** GXAEC1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(73 - 118)
1,2-Dichloroethane-d4	104	(62 - 128)
4-Bromofluorobenzene	104	(78 - 118)
Toluene-d8	99	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-76

GC/MS Volatiles

Lot-Sample #: D4K180279-004 **Work Order #:** GXAEC1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	6.4 J	M	9.479	ug/L
Unknown		3.5 J	M	14.714	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	57 J	M	15.312	ug/L
Unknown		1.6 J	M	15.601	ug/L
Unknown		21 J	M	16.344	ug/L
Unknown		2.7 J	M	16.706	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-76TB

GC/MS Volatiles

Lot-Sample #...: D4K180279-005 **Work Order #...:** GXAEE1AA **Matrix.....:** WATER
Date Sampled...: 11/17/04 13:15 **Date Received..:** 11/18/04
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 16:37
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**8.2 J**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	**4.1 J**	**5.0**	**ug/L**	**2.0**
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-76TB

GC/MS Volatiles

Lot-Sample #...: D4K180279-005 **Work Order #...:** GXAEE1AA **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	101	(73 - 118)
1,2-Dichloroethane-d4	101	(62 - 128)
4-Bromofluorobenzene	103	(78 - 118)
Toluene-d8	100	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-76TB

GC/MS Volatiles

Lot-Sample #: D4K180279-005 **Work Order #:** GXAEE1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	6.4 J	M	9.4828	ug/L
Unknown		3.7 J	M	14.718	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	57 J	M	15.315	ug/L
Unknown		1.7 J	M	15.605	ug/L
Unknown		20 J	M	16.348	ug/L
Unknown		2.7 J	M	16.71	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-17

GC/MS Volatiles

Lot-Sample #...: D4K180279-006 **Work Order #...:** GXAEJ1AJ **Matrix.....:** WATER
Date Sampled...: 11/17/04 08:30 **Date Received..:** 11/18/04
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 17:00
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: GBR-17

GC/MS Volatiles

Lot-Sample #...: D4K180279-006 **Work Order #...:** GXAEJ1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(73 - 118)
1,2-Dichloroethane-d4	105	(62 - 128)
4-Bromofluorobenzene	107	(78 - 118)
Toluene-d8	102	(77 - 117)

US GEOLOGICAL SURVEY

GBR-17

GC/MS Volatiles

Lot-Sample #: D4K180279-006 **Work Order #:** GXAEJ1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	7.1 J	M	9.4827	ug/L
Unknown		11 J	M	14.717	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	60 J	M	15.315	ug/L
Unknown		2.2 J	M	15.605	ug/L
Unknown		21 J	M	16.348	ug/L
Unknown		2.1 J	M	16.728	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-32

GC/MS Volatiles

Lot-Sample #...: D4K180279-007 Work Order #...: GXAEN1AJ Matrix.....: WATER
Date Sampled...: 11/17/04 09:30 Date Received..: 11/18/04
Prep Date.....: 11/29/04 Analysis Date..: 11/29/04
Prep Batch #...: 4336202 Analysis Time..: 18:09
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	**0.77 J**	**1.0**	**ug/L**	**0.17**
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	**1.0**	**1.0**	**ug/L**	**0.14**
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	**1.0**	**1.0**	**ug/L**	**0.24**
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	**0.68 J**	**1.0**	**ug/L**	**0.26**
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	**0.31 J**	**1.0**	**ug/L**	**0.16**
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: GBR-32

GC/MS Volatiles

Lot-Sample #...: D4K180279-007 **Work Order #...:** GXAEN1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(73 - 118)
1,2-Dichloroethane-d4	105	(62 - 128)
4-Bromofluorobenzene	107	(78 - 118)
Toluene-d8	101	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

GBR-32

GC/MS Volatiles

Lot-Sample #: D4K180279-007 **Work Order #:** GXAEN1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	5.4 J	M	9.4819	ug/L
Unknown		2.5 J	M	14.717	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	20 J	M	15.314	ug/L
Unknown		11 J	M	16.347	ug/L
Unknown		1.3 J	M	16.709	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-62

GC/MS Volatiles

Lot-Sample #...: D4K180279-008 **Work Order #...:** GXAEQ1AJ **Matrix.....:** WATER
Date Sampled...: 11/17/04 10:20 **Date Received..:** 11/18/04
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 18:31
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**5.2 J**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-62

GC/MS Volatiles

Lot-Sample #...: D4K180279-008 **Work Order #...:** GXAEQ1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 118)
1,2-Dichloroethane-d4	111	(62 - 128)
4-Bromofluorobenzene	107	(78 - 118)
Toluene-d8	104	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

BLM-62

GC/MS Volatiles

Lot-Sample #: D4K180279-008 **Work Order #:** GXAEQ1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	4.7 J	M	9.4793	ug/L
Unknown		2.3 J	M	14.714	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	19 J	M	15.312	ug/L
Unknown		7.2 J	M	16.344	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-60

GC/MS Volatiles

Lot-Sample #...: D4K180279-009 Work Order #...: GXAET1AJ Matrix.....: WATER
Date Sampled...: 11/17/04 11:00 Date Received..: 11/18/04
Prep Date.....: 11/29/04 Analysis Date..: 11/29/04
Prep Batch #...: 4336202 Analysis Time..: 18:54
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-60

GC/MS Volatiles

Lot-Sample #...: D4K180279-009 **Work Order #...:** GXAET1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(73 - 118)
1,2-Dichloroethane-d4	102	(62 - 128)
4-Bromofluorobenzene	99	(78 - 118)
Toluene-d8	95	(77 - 117)

US GEOLOGICAL SURVEY

BLM-60

GC/MS Volatiles

Lot-Sample #: D4K180279-009 **Work Order #:** GXAET1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	4.5 J	M	9.4818	ug/L
Unknown		3.0 J	M	14.717	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	16 J	M	15.314	ug/L
Unknown		6.4 J	M	16.347	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-67

GC/MS Volatiles

Lot-Sample #...: D4K190267-001 Work Order #...: GXEVE1AJ Matrix.....: WATER
Date Sampled...: 11/18/04 09:00 Date Received..: 11/19/04
Prep Date.....: 12/01/04 Analysis Date..: 12/01/04
Prep Batch #...: 4337403 Analysis Time..: 16:49
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**2.8 J,B**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-67

GC/MS Volatiles

Lot-Sample #...: D4K190267-001 **Work Order #...:** GXEVE1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	94	(73 - 118)
1,2-Dichloroethane-d4	93	(62 - 128)
4-Bromofluorobenzene	91	(78 - 118)
Toluene-d8	94	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

US GEOLOGICAL SURVEY

BLM-67

GC/MS Volatiles

Lot-Sample #: D4K190267-001 **Work Order #:** GXEVE1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	1.2 J	M	8.7544	ug/L
Cyclotetrasiloxane, octamethyl	556-67-2	6.3 J	M	11.7	ug/L
Unknown		2.3 J	M	13.604	ug/L
Unknown		4.6 J	M	13.712	ug/L
Unknown		2.4 J	M	13.855	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	1.5 J	M	14.143	ug/L
Heneicosane	629-94-7	1.4 J	M	14.807	ug/L
Unknown		1.3 J	M	15.364	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-75

GC/MS Volatiles

Lot-Sample #...: D4K190267-002 Work Order #...: GXEVQ1AJ Matrix.....: WATER
Date Sampled...: 11/18/04 10:30 Date Received..: 11/19/04
Prep Date.....: 12/01/04 Analysis Date..: 12/01/04
Prep Batch #...: 4337403 Analysis Time..: 17:09
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: BLM-75

GC/MS Volatiles

Lot-Sample #...: D4K190267-002 **Work Order #...:** GXEVQ1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(73 - 118)
1,2-Dichloroethane-d4	97	(62 - 128)
4-Bromofluorobenzene	93	(78 - 118)
Toluene-d8	95	(77 - 117)

US GEOLOGICAL SURVEY

BLM-75

GC/MS Volatiles

Lot-Sample #: D4K190267-002 **Work Order #:** GXEVQ1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	2.4 J	M	8.7547	ug/L
Unknown		6.6 J	M	11.7	ug/L
Unknown		11 J	M	13.712	ug/L
Nonanal	124-19-6	1.1 J	M	13.856	ug/L
Tetradecane	629-59-4	1.1 J	M	15.131	ug/L
Unknown		3.4 J	M	15.347	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48

GC/MS Volatiles

Lot-Sample #...: D4K190267-003 **Work Order #...:** GXEVR1AJ **Matrix.....:** WATER
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/19/04
Prep Date.....: 12/01/04 **Analysis Date..:** 12/01/04
Prep Batch #...: 4337403 **Analysis Time..:** 17:29
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**3.3 J,B**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	**1.1**	**1.0**	**ug/L**	**0.17**
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	**1.7**	**1.0**	**ug/L**	**0.14**
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	**1.7**	**1.0**	**ug/L**	**0.24**
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	**1.6**	**1.0**	**ug/L**	**0.26**
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	**0.80 J**	**1.0**	**ug/L**	**0.16**
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48

GC/MS Volatiles

Lot-Sample #...: D4K190267-003 **Work Order #...:** GXEVR1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	98	(73 - 118)
1,2-Dichloroethane-d4	96	(62 - 128)
4-Bromofluorobenzene	93	(78 - 118)
Toluene-d8	96	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

US GEOLOGICAL SURVEY

GBR-48

GC/MS Volatiles

Lot-Sample #: D4K190267-003 **Work Order #:** GXEVR1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	2.2 J	M	8.7541	ug/L
Unknown		7.2 J	M	11.699	ug/L
Unknown		9.1 J	M	13.711	ug/L
Unknown		1.5 J	M	13.855	ug/L
Tetradecane	629-59-4	1.2 J	M	15.13	ug/L
Unknown		3.5 J	M	15.364	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48EB

GC/MS Volatiles

Lot-Sample #...: D4K190267-004 **Work Order #...:** GXEVV1AJ **Matrix.....:** WATER
Date Sampled...: 11/18/04 12:00 **Date Received..:** 11/19/04
Prep Date.....: 12/02/04 **Analysis Date..:** 12/02/04
Prep Batch #...: 4337570 **Analysis Time..:** 09:15
Dilution Factor: 1
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**2.8 J**	**10**	**ug/L**	**2.5**
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	**0.22 J**	**5.0**	**ug/L**	**0.21**
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

(Continued on next page)

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48EB

GC/MS Volatiles

Lot-Sample #...: D4K190267-004 **Work Order #...:** GXEVV1AJ **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	92	(73 - 118)
1,2-Dichloroethane-d4	92	(62 - 128)
4-Bromofluorobenzene	90	(78 - 118)
Toluene-d8	95	(77 - 117)

NOTE(S):

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

GBR-48EB

GC/MS Volatiles

Lot-Sample #: D4K190267-004 **Work Order #:** GXEVV1AJ **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	2.6 J	M	8.7358	ug/L
Unknown		1.1 J	M	13.585	ug/L
Unknown		6.7 J	M	13.711	ug/L
Unknown		2.0 J	M	13.855	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	1.3 J	M	14.124	ug/L
Tetradecane	629-59-4	1.1 J	M	15.112	ug/L
Unknown		4.1 J	M	15.346	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48TB

GC/MS Volatiles

Lot-Sample #...: D4K190267-005 **Work Order #...:** GXEVX1AA **Matrix.....:** WATER
Date Sampled...: 11/18/04 11:15 **Date Received..:** 11/19/04
Prep Date.....: 12/01/04 **Analysis Date..:** 12/01/04
Prep Batch #...: 4337403 **Analysis Time..:** 18:13
Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	ND	10	ug/L	2.5
Benzene	ND	1.0	ug/L	0.17
Bromodichloromethane	ND	1.0	ug/L	0.20
Bromoform	ND	1.0	ug/L	0.23
Bromomethane	ND	2.0	ug/L	0.22
2-Butanone (MEK)	ND	5.0	ug/L	2.0
Carbon disulfide	ND	1.0	ug/L	0.24
Carbon tetrachloride	ND	1.0	ug/L	0.20
Chlorobenzene	ND	1.0	ug/L	0.13
Dibromochloromethane	ND	1.0	ug/L	0.19
Chloroethane	ND	2.0	ug/L	0.18
Chloroform	ND	1.0	ug/L	0.17
Chloromethane	ND	2.0	ug/L	0.91
1,1-Dichloroethane	ND	1.0	ug/L	0.22
1,2-Dichloroethane	ND	1.0	ug/L	0.26
cis-1,2-Dichloroethene	ND	1.0	ug/L	0.14
trans-1,2-Dichloroethene	ND	1.0	ug/L	0.15
1,1-Dichloroethene	ND	1.0	ug/L	0.23
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.24
1,2-Dichloropropane	ND	1.0	ug/L	0.18
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.19
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.20
Ethylbenzene	ND	1.0	ug/L	0.12
2-Hexanone	ND	5.0	ug/L	1.7
Methylene chloride	ND	5.0	ug/L	0.21
4-Methyl-2-pentanone	ND	5.0	ug/L	0.98
Methyl tert-butyl ether	ND	5.0	ug/L	0.38
Styrene	ND	1.0	ug/L	0.14
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.21
Tetrachloroethene	ND	1.0	ug/L	0.26
Toluene	ND	1.0	ug/L	0.15
1,1,1-Trichloroethane	ND	1.0	ug/L	0.16
1,1,2-Trichloroethane	ND	1.0	ug/L	0.27
Trichloroethene	ND	1.0	ug/L	0.16
Vinyl chloride	ND	2.0	ug/L	0.19
Xylenes (total)	ND	2.0	ug/L	0.41

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US GEOLOGICAL SURVEY

Client Sample ID: GBR-48TB

GC/MS Volatiles

Lot-Sample #...: D4K190267-005 **Work Order #...:** GXEVX1AA **Matrix.....:** WATER

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	94	(73 - 118)
1,2-Dichloroethane-d4	95	(62 - 128)
4-Bromofluorobenzene	89	(78 - 118)
Toluene-d8	92	(77 - 117)

US GEOLOGICAL SURVEY

GBR-48TB

GC/MS Volatiles

Lot-Sample #: D4K190267-005 **Work Order #:** GXEVX1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	2.0 J	M	8.7393	ug/L
Unknown		6.6 J	M	11.703	ug/L
Unknown		7.8 J	M	13.715	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	1.3 J	M	14.146	ug/L
Unknown		11 J	M	15.349	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-15

DISSOLVED Metals

Lot-Sample #...: D4K170331-001 **Matrix.....:** WATER
Date Sampled...: 11/16/04 08:20 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	390000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7CK1AK
		Dilution Factor: 1		Analysis Time..: 14:20	MDL.....: 96	
Chromium	3.6 B	10	ug/L	SW846 6010B	11/19-11/22/04	GW7CK1AP
		Dilution Factor: 1		Analysis Time..: 12:50	MDL.....: 1.2	
Potassium	2000 B	3000	ug/L	SW846 6010B	11/19-11/22/04	GW7CK1AL
		Dilution Factor: 1		Analysis Time..: 14:20	MDL.....: 250	
Magnesium	33000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7CK1AM
		Dilution Factor: 1		Analysis Time..: 14:20	MDL.....: 17	
Manganese	7.6 B	10	ug/L	SW846 6010B	11/19-11/22/04	GW7CK1AQ
		Dilution Factor: 1		Analysis Time..: 14:20	MDL.....: 1.9	
Sodium	280000	5000	ug/L	SW846 6010B	11/19-11/22/04	GW7CK1AN
		Dilution Factor: 1		Analysis Time..: 14:20	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/19-11/22/04	GW7CK1AR
		Dilution Factor: 1		Analysis Time..: 12:50	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-39

DISSOLVED Metals

Lot-Sample #...: D4K170331-002 **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:00 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**490000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C11AK**
		Dilution Factor: 1		Analysis Time..: 14:25	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/19-11/22/04	GW7C11AP
		Dilution Factor: 1		Analysis Time..: 12:55	MDL.....: 1.2	
Potassium	**5300**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C11AL**
		Dilution Factor: 1		Analysis Time..: 14:25	MDL.....: 250	
Magnesium	**35000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C11AM**
		Dilution Factor: 1		Analysis Time..: 14:25	MDL.....: 17	
Manganese	**910**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C11AQ**
		Dilution Factor: 1		Analysis Time..: 14:25	MDL.....: 1.9	
Sodium	**520000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C11AN**
		Dilution Factor: 1		Analysis Time..: 14:25	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/19-11/22/04	GW7C11AR
		Dilution Factor: 1		Analysis Time..: 12:55	MDL.....: 2.0	

US GEOLOGICAL SURVEY

Client Sample ID: BLM-98

DISSOLVED Metals

Lot-Sample #...: D4K170331-003 **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:15 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**480000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C51AK**
		Dilution Factor: 1		Analysis Time..: 14:39	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/19-11/22/04	GW7C51AP
		Dilution Factor: 1		Analysis Time..: 15:31	MDL.....: 1.2	
Potassium	**5100**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C51AL**
		Dilution Factor: 1		Analysis Time..: 14:39	MDL.....: 250	
Magnesium	**34000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C51AM**
		Dilution Factor: 1		Analysis Time..: 14:39	MDL.....: 17	
Manganese	**890**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C51AQ**
		Dilution Factor: 1		Analysis Time..: 14:39	MDL.....: 1.9	
Sodium	**500000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7C51AN**
		Dilution Factor: 1		Analysis Time..: 14:39	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/19-11/22/04	GW7C51AR
		Dilution Factor: 1		Analysis Time..: 15:31	MDL.....: 2.0	

US GEOLOGICAL SURVEY

Client Sample ID: BLM-48

DISSOLVED Metals

Lot-Sample #...: D4K170331-004 Matrix.....: WATER
Date Sampled...: 11/16/04 09:40 Date Received..: 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	380000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7C91AK
		Dilution Factor: 1		Analysis Time..: 14:44	MDL.....: 96	
Chromium	9.4 B	10	ug/L	SW846 6010B	11/19-11/22/04	GW7C91AP
		Dilution Factor: 1		Analysis Time..: 15:36	MDL.....: 1.2	
Potassium	1900 B	3000	ug/L	SW846 6010B	11/19-11/22/04	GW7C91AL
		Dilution Factor: 1		Analysis Time..: 14:44	MDL.....: 250	
Magnesium	29000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7C91AM
		Dilution Factor: 1		Analysis Time..: 14:44	MDL.....: 17	
Manganese	10	10	ug/L	SW846 6010B	11/19-11/22/04	GW7C91AQ
		Dilution Factor: 1		Analysis Time..: 14:44	MDL.....: 1.9	
Sodium	280000	5000	ug/L	SW846 6010B	11/19-11/22/04	GW7C91AN
		Dilution Factor: 1		Analysis Time..: 14:44	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/19-11/22/04	GW7C91AR
		Dilution Factor: 1		Analysis Time..: 15:36	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-51

DISSOLVED Metals

Lot-Sample #...: D4K170331-005 **Matrix.....:** WATER
Date Sampled...: 11/16/04 10:20 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**410000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DD1AK**
		Dilution Factor: 1		Analysis Time..: 14:52	MDL.....: 96	
Chromium	**3.7 B**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DD1AP**
		Dilution Factor: 1		Analysis Time..: 15:41	MDL.....: 1.2	
Potassium	**2300 B**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DD1AL**
		Dilution Factor: 1		Analysis Time..: 14:52	MDL.....: 250	
Magnesium	**32000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DD1AM**
		Dilution Factor: 1		Analysis Time..: 14:52	MDL.....: 17	
Manganese	ND	10	ug/L	SW846 6010B	11/19-11/22/04	GW7DD1AQ
		Dilution Factor: 1		Analysis Time..: 14:52	MDL.....: 1.9	
Sodium	**320000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DD1AN**
		Dilution Factor: 1		Analysis Time..: 14:52	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/19-11/22/04	GW7DD1AR
		Dilution Factor: 1		Analysis Time..: 15:41	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-45

DISSOLVED Metals

Lot-Sample #...: D4K170331-006 **Matrix.....:** WATER
Date Sampled...: 11/16/04 11:00 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**400000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DH1AK**
		Dilution Factor: 1		Analysis Time..: 13:57	MDL.....: 96	
Chromium	**5.3 B**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DH1AP**
		Dilution Factor: 1		Analysis Time..: 13:42	MDL.....: 1.2	
Potassium	**2000 B**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DH1AL**
		Dilution Factor: 1		Analysis Time..: 13:57	MDL.....: 250	
Magnesium	**31000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DH1AM**
		Dilution Factor: 1		Analysis Time..: 13:57	MDL.....: 17	
Manganese	**88**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DH1AQ**
		Dilution Factor: 1		Analysis Time..: 13:42	MDL.....: 1.9	
Sodium	**350000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DH1AN**
		Dilution Factor: 1		Analysis Time..: 13:57	MDL.....: 1400	
Nickel	**3.7 B**	**40**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7DH1AR**
		Dilution Factor: 1		Analysis Time..: 13:42	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-42

DISSOLVED Metals

Lot-Sample #...: D4K170331-007 Matrix.....: WATER
Date Sampled...: 11/16/04 11:50 Date Received..: 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	400000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7D01AK
		Dilution Factor: 1		Analysis Time..: 14:57	MDL.....: 96	
Chromium	1.4 B	10	ug/L	SW846 6010B	11/19-11/22/04	GW7D01AP
		Dilution Factor: 1		Analysis Time..: 14:02	MDL.....: 1.2	
Potassium	2200 B	3000	ug/L	SW846 6010B	11/19-11/22/04	GW7D01AL
		Dilution Factor: 1		Analysis Time..: 14:57	MDL.....: 250	
Magnesium	29000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7D01AM
		Dilution Factor: 1		Analysis Time..: 14:57	MDL.....: 17	
Manganese	180	10	ug/L	SW846 6010B	11/19-11/22/04	GW7D01AQ
		Dilution Factor: 1		Analysis Time..: 14:57	MDL.....: 1.9	
Sodium	360000	5000	ug/L	SW846 6010B	11/19-11/22/04	GW7D01AN
		Dilution Factor: 1		Analysis Time..: 14:57	MDL.....: 1400	
Nickel	3.2 B	40	ug/L	SW846 6010B	11/19-11/22/04	GW7D01AR
		Dilution Factor: 1		Analysis Time..: 14:02	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-57

DISSOLVED Metals

Lot-Sample #...: D4K170331-008 **Matrix.....:** WATER
Date Sampled...: 11/16/04 12:30 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**330000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D21AK**
		Dilution Factor: 1		Analysis Time..: 15:02	MDL.....: 96	
Chromium	**1.8 B**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D21AP**
		Dilution Factor: 1		Analysis Time..: 14:07	MDL.....: 1.2	
Potassium	**3000**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D21AL**
		Dilution Factor: 1		Analysis Time..: 15:02	MDL.....: 250	
Magnesium	**35000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D21AM**
		Dilution Factor: 1		Analysis Time..: 15:02	MDL.....: 17	
Manganese	**4900**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D21AQ**
		Dilution Factor: 1		Analysis Time..: 15:02	MDL.....: 1.9	
Sodium	**550000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D21AN**
		Dilution Factor: 1		Analysis Time..: 15:02	MDL.....: 1400	
Nickel	**36 B**	**40**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D21AR**
		Dilution Factor: 1		Analysis Time..: 14:07	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-56

DISSOLVED Metals

Lot-Sample #...: D4K170331-009 **Matrix.....:** WATER
Date Sampled...: 11/16/04 13:10 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**420000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D71AK**
		Dilution Factor: 1		Analysis Time..: 15:07	MDL.....: 96	
Chromium	**4.2 B**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D71AP**
		Dilution Factor: 1		Analysis Time..: 14:12	MDL.....: 1.2	
Potassium	**1700 B**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D71AL**
		Dilution Factor: 1		Analysis Time..: 15:07	MDL.....: 250	
Magnesium	**33000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D71AM**
		Dilution Factor: 1		Analysis Time..: 15:07	MDL.....: 17	
Manganese	**20**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D71AQ**
		Dilution Factor: 1		Analysis Time..: 15:07	MDL.....: 1.9	
Sodium	**370000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D71AN**
		Dilution Factor: 1		Analysis Time..: 15:07	MDL.....: 1400	
Nickel	**5.1 B**	**40**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7D71AR**
		Dilution Factor: 1		Analysis Time..: 14:12	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-99

DISSOLVED Metals

Lot-Sample #...: D4K170331-010 **Matrix.....:** WATER
Date Sampled...: 11/16/04 13:20 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**420000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EA1AK**
		Dilution Factor: 1		Analysis Time..: 15:12	MDL.....: 96	
Chromium	**1.4 B**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EA1AP**
		Dilution Factor: 1		Analysis Time..: 14:18	MDL.....: 1.2	
Potassium	**1800 B**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EA1AL**
		Dilution Factor: 1		Analysis Time..: 15:12	MDL.....: 250	
Magnesium	**32000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EA1AM**
		Dilution Factor: 1		Analysis Time..: 15:12	MDL.....: 17	
Manganese	**30**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EA1AQ**
		Dilution Factor: 1		Analysis Time..: 15:12	MDL.....: 1.9	
Sodium	**360000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EA1AN**
		Dilution Factor: 1		Analysis Time..: 15:12	MDL.....: 1400	
Nickel	**3.0 B**	**40**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EA1AR**
		Dilution Factor: 1		Analysis Time..: 14:18	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-55

DISSOLVED Metals

Lot-Sample #...: D4K170331-011 Matrix.....: WATER
Date Sampled...: 11/16/04 14:00 Date Received..: 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	430000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7EC1AK
		Dilution Factor: 1		Analysis Time..: 15:17	MDL.....: 96	
Chromium	5.0 B	10	ug/L	SW846 6010B	11/19-11/22/04	GW7EC1AP
		Dilution Factor: 1		Analysis Time..: 14:23	MDL.....: 1.2	
Potassium	2900 B	3000	ug/L	SW846 6010B	11/19-11/22/04	GW7EC1AL
		Dilution Factor: 1		Analysis Time..: 15:17	MDL.....: 250	
Magnesium	31000	200	ug/L	SW846 6010B	11/19-11/22/04	GW7EC1AM
		Dilution Factor: 1		Analysis Time..: 15:17	MDL.....: 17	
Manganese	1200	10	ug/L	SW846 6010B	11/19-11/22/04	GW7EC1AQ
		Dilution Factor: 1		Analysis Time..: 15:17	MDL.....: 1.9	
Sodium	400000	5000	ug/L	SW846 6010B	11/19-11/22/04	GW7EC1AN
		Dilution Factor: 1		Analysis Time..: 15:17	MDL.....: 1400	
Nickel	71	40	ug/L	SW846 6010B	11/19-11/22/04	GW7EC1AR
		Dilution Factor: 1		Analysis Time..: 14:23	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-69

DISSOLVED Metals

Lot-Sample #...: D4K170331-012 **Matrix.....:** WATER
Date Sampled...: 11/16/04 15:10 **Date Received..:** 11/17/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323013						
Calcium	**360000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EF1AK**
		Dilution Factor: 1		Analysis Time..: 15:22	MDL.....: 96	
Chromium	**4.2 B**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EF1AP**
		Dilution Factor: 1		Analysis Time..: 14:28	MDL.....: 1.2	
Potassium	**1400 B**	**3000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EF1AL**
		Dilution Factor: 1		Analysis Time..: 15:22	MDL.....: 250	
Magnesium	**27000**	**200**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EF1AM**
		Dilution Factor: 1		Analysis Time..: 15:22	MDL.....: 17	
Manganese	**2.1 B**	**10**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EF1AQ**
		Dilution Factor: 1		Analysis Time..: 15:22	MDL.....: 1.9	
Sodium	**300000**	**5000**	**ug/L**	**SW846 6010B**	**11/19-11/22/04**	**GW7EF1AN**
		Dilution Factor: 1		Analysis Time..: 15:22	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/19-11/22/04	GW7EF1AR
		Dilution Factor: 1		Analysis Time..: 14:28	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-21

DISSOLVED Metals

Lot-Sample #...: D4K180279-001 **Matrix.....:** WATER
Date Sampled...: 11/17/04 11:20 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**520000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD01AK**
		Dilution Factor: 1		Analysis Time..: 06:13	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXAD01AP
		Dilution Factor: 1		Analysis Time..: 22:12	MDL.....: 1.2	
Potassium	**7400**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD01AL**
		Dilution Factor: 1		Analysis Time..: 06:13	MDL.....: 250	
Magnesium	**39000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD01AM**
		Dilution Factor: 1		Analysis Time..: 06:13	MDL.....: 17	
Manganese	**360**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD01AQ**
		Dilution Factor: 1		Analysis Time..: 06:13	MDL.....: 1.9	
Sodium	**490000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD01AN**
		Dilution Factor: 1		Analysis Time..: 06:13	MDL.....: 1400	
Nickel	**3.3 B**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAD01AR**
		Dilution Factor: 1		Analysis Time..: 22:12	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-50

DISSOLVED Metals

Lot-Sample #...: D4K180279-002 **Matrix.....: WATER**
Date Sampled...: 11/17/04 11:50 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**420000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD71AK**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXAD71AP
		Dilution Factor: 1		Analysis Time..: 22:28	MDL.....: 1.2	
Potassium	**2300 B**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD71AL**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 250	
Magnesium	**32000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD71AM**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 17	
Manganese	**62**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD71AQ**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 1.9	
Sodium	**430000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD71AN**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 1400	
Nickel	**4.9 B**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAD71AR**
		Dilution Factor: 1		Analysis Time..: 22:28	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-77

DISSOLVED Metals

Lot-Sample #...: D4K180279-003 **Matrix.....:** WATER
Date Sampled...: 11/17/04 12:30 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**410000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD91AK**
		Dilution Factor: 1		Analysis Time..: 06:23	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXAD91AP
		Dilution Factor: 1		Analysis Time..: 22:33	MDL.....: 1.2	
Potassium	**1700 B**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD91AL**
		Dilution Factor: 1		Analysis Time..: 06:23	MDL.....: 250	
Magnesium	**32000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD91AM**
		Dilution Factor: 1		Analysis Time..: 06:23	MDL.....: 17	
Manganese	**2300**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD91AQ**
		Dilution Factor: 1		Analysis Time..: 06:23	MDL.....: 1.9	
Sodium	**420000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAD91AN**
		Dilution Factor: 1		Analysis Time..: 06:23	MDL.....: 1400	
Nickel	**13 B**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAD91AR**
		Dilution Factor: 1		Analysis Time..: 22:33	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-76

DISSOLVED Metals

Lot-Sample #...: D4K180279-004 **Matrix.....:** WATER
Date Sampled...: 11/17/04 13:10 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**410000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEC1AK**
		Dilution Factor: 1		Analysis Time..: 06:28	MDL.....: 96	
Chromium	**1.4 B**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAEC1AP**
		Dilution Factor: 1		Analysis Time..: 22:38	MDL.....: 1.2	
Potassium	**1800 B**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEC1AL**
		Dilution Factor: 1		Analysis Time..: 06:28	MDL.....: 250	
Magnesium	**32000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEC1AM**
		Dilution Factor: 1		Analysis Time..: 06:28	MDL.....: 17	
Manganese	**770**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEC1AQ**
		Dilution Factor: 1		Analysis Time..: 06:28	MDL.....: 1.9	
Sodium	**420000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEC1AN**
		Dilution Factor: 1		Analysis Time..: 06:28	MDL.....: 1400	
Nickel	**9.3 B**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAEC1AR**
		Dilution Factor: 1		Analysis Time..: 22:38	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-17

DISSOLVED Metals

Lot-Sample #...: D4K180279-006 **Matrix.....:** WATER
Date Sampled...: 11/17/04 08:30 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**360000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEJ1AK**
		Dilution Factor: 1		Analysis Time..: 06:33	MDL.....: 96	
Chromium	**6.3 B**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAEJ1AP**
		Dilution Factor: 1		Analysis Time..: 22:43	MDL.....: 1.2	
Potassium	**1100 B**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEJ1AL**
		Dilution Factor: 1		Analysis Time..: 06:33	MDL.....: 250	
Magnesium	**27000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEJ1AM**
		Dilution Factor: 1		Analysis Time..: 06:33	MDL.....: 17	
Manganese	ND	10	ug/L	SW846 6010B	11/23-11/24/04	GXAEJ1AQ
		Dilution Factor: 1		Analysis Time..: 06:33	MDL.....: 1.9	
Sodium	**310000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEJ1AN**
		Dilution Factor: 1		Analysis Time..: 06:33	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/23-11/26/04	GXAEJ1AR
		Dilution Factor: 1		Analysis Time..: 22:43	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-32

DISSOLVED Metals

Lot-Sample #...: D4K180279-007 **Matrix.....:** WATER
Date Sampled...: 11/17/04 09:30 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**520000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEN1AK**
		Dilution Factor: 1		Analysis Time..: 06:47	MDL.....: 96	
Chromium	**3.0 B**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAEN1AP**
		Dilution Factor: 1		Analysis Time..: 22:48	MDL.....: 1.2	
Potassium	**5000**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEN1AL**
		Dilution Factor: 1		Analysis Time..: 06:47	MDL.....: 250	
Magnesium	**51000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEN1AM**
		Dilution Factor: 1		Analysis Time..: 06:47	MDL.....: 17	
Manganese	**41**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEN1AQ**
		Dilution Factor: 1		Analysis Time..: 06:47	MDL.....: 1.9	
Sodium	**810000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEN1AN**
		Dilution Factor: 1		Analysis Time..: 06:47	MDL.....: 1400	
Nickel	**72**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAEN1AR**
		Dilution Factor: 1		Analysis Time..: 22:48	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-62

DISSOLVED Metals

Lot-Sample #...: D4K180279-008 **Matrix.....:** WATER
Date Sampled...: 11/17/04 10:20 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**530000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEQ1AK**
		Dilution Factor: 1		Analysis Time..: 06:52	MDL.....: 96	
Chromium	**2.0 B**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAEQ1AP**
		Dilution Factor: 1		Analysis Time..: 22:53	MDL.....: 1.2	
Potassium	**5100**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEQ1AL**
		Dilution Factor: 1		Analysis Time..: 06:52	MDL.....: 250	
Magnesium	**36000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEQ1AM**
		Dilution Factor: 1		Analysis Time..: 06:52	MDL.....: 17	
Manganese	**30**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEQ1AQ**
		Dilution Factor: 1		Analysis Time..: 06:52	MDL.....: 1.9	
Sodium	**690000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAEQ1AN**
		Dilution Factor: 1		Analysis Time..: 06:52	MDL.....: 1400	
Nickel	**2.6 B**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAEQ1AR**
		Dilution Factor: 1		Analysis Time..: 22:53	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-60

DISSOLVED Metals

Lot-Sample #...: D4K180279-009 **Matrix.....:** WATER
Date Sampled...: 11/17/04 11:00 **Date Received..:** 11/18/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4323679						
Calcium	**430000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAET1AK**
		Dilution Factor: 1		Analysis Time..: 06:57	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXAET1AP
		Dilution Factor: 1		Analysis Time..: 22:58	MDL.....: 1.2	
Potassium	**2300 B**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAET1AL**
		Dilution Factor: 1		Analysis Time..: 06:57	MDL.....: 250	
Magnesium	**32000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAET1AM**
		Dilution Factor: 1		Analysis Time..: 06:57	MDL.....: 17	
Manganese	**290**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAET1AQ**
		Dilution Factor: 1		Analysis Time..: 06:57	MDL.....: 1.9	
Sodium	**400000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/24/04**	**GXAET1AN**
		Dilution Factor: 1		Analysis Time..: 06:57	MDL.....: 1400	
Nickel	**4.4 B**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXAET1AR**
		Dilution Factor: 1		Analysis Time..: 22:58	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-67

DISSOLVED Metals

Lot-Sample #...: D4K190267-001 **Matrix.....:** WATER
Date Sampled...: 11/18/04 09:00 **Date Received..:** 11/19/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4324607						
Calcium	**350000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVE1AK**
		Dilution Factor: 1		Analysis Time..: 06:16	MDL.....: 96	
Chromium	**4.9 B**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXEVE1AP**
		Dilution Factor: 1		Analysis Time..: 20:41	MDL.....: 1.2	
Potassium	**1500 B**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVE1AL**
		Dilution Factor: 1		Analysis Time..: 06:16	MDL.....: 250	
Magnesium	**26000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVE1AM**
		Dilution Factor: 1		Analysis Time..: 06:16	MDL.....: 17	
Manganese	**12**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVE1AQ**
		Dilution Factor: 1		Analysis Time..: 06:16	MDL.....: 1.9	
Sodium	**310000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVE1AN**
		Dilution Factor: 1		Analysis Time..: 06:16	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/23-11/26/04	GXEVE1AR
		Dilution Factor: 1		Analysis Time..: 20:41	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-75

DISSOLVED Metals

Lot-Sample #...: D4K190267-002 **Matrix.....:** WATER
Date Sampled...: 11/18/04 10:30 **Date Received..:** 11/19/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4324607						
Calcium	**420000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVQ1AK**
		Dilution Factor: 1		Analysis Time..: 07:04	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXEVQ1AP
		Dilution Factor: 1		Analysis Time..: 21:01	MDL.....: 1.2	
Potassium	**1700 B**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVQ1AL**
		Dilution Factor: 1		Analysis Time..: 07:04	MDL.....: 250	
Magnesium	**30000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVQ1AM**
		Dilution Factor: 1		Analysis Time..: 07:04	MDL.....: 17	
Manganese	**630**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVQ1AQ**
		Dilution Factor: 1		Analysis Time..: 07:04	MDL.....: 1.9	
Sodium	**380000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVQ1AN**
		Dilution Factor: 1		Analysis Time..: 07:04	MDL.....: 1400	
Nickel	**2.9 B**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXEVQ1AR**
		Dilution Factor: 1		Analysis Time..: 21:01	MDL.....: 2.0	

NOTE(S):

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48

DISSOLVED Metals

Lot-Sample #...: D4K190267-003 **Matrix.....:** WATER
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/19/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4324607						
Calcium	**630000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVR1AK**
		Dilution Factor: 1		Analysis Time..: 07:09	MDL.....: 96	
Chromium	**150**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXEVR1AP**
		Dilution Factor: 1		Analysis Time..: 21:06	MDL.....: 1.2	
Potassium	**5600**	**3000**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVR1AL**
		Dilution Factor: 1		Analysis Time..: 07:09	MDL.....: 250	
Magnesium	**65000**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVR1AM**
		Dilution Factor: 1		Analysis Time..: 07:09	MDL.....: 17	
Manganese	**880**	**10**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVR1AQ**
		Dilution Factor: 1		Analysis Time..: 07:09	MDL.....: 1.9	
Sodium	**900000**	**5000**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVR1AN**
		Dilution Factor: 1		Analysis Time..: 07:09	MDL.....: 1400	
Nickel	**2500**	**40**	**ug/L**	**SW846 6010B**	**11/23-11/26/04**	**GXEVR1AR**
		Dilution Factor: 1		Analysis Time..: 21:06	MDL.....: 2.0	

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48EB

DISSOLVED Metals

Lot-Sample #...: D4K190267-004 **Matrix.....:** WATER
Date Sampled...: 11/18/04 12:00 **Date Received..:** 11/19/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4324607						
Calcium	**200**	**200**	**ug/L**	**SW846 6010B**	**11/23-11/25/04**	**GXEVV1AK**
		Dilution Factor: 1		Analysis Time..: 07:14	MDL.....: 96	
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXEVV1AP
		Dilution Factor: 1		Analysis Time..: 21:11	MDL.....: 1.2	
Potassium	ND	3000	ug/L	SW846 6010B	11/23-11/25/04	GXEVV1AL
		Dilution Factor: 1		Analysis Time..: 07:14	MDL.....: 250	
Magnesium	ND	200	ug/L	SW846 6010B	11/23-11/25/04	GXEVV1AM
		Dilution Factor: 1		Analysis Time..: 07:14	MDL.....: 17	
Manganese	ND	10	ug/L	SW846 6010B	11/23-11/25/04	GXEVV1AQ
		Dilution Factor: 1		Analysis Time..: 07:14	MDL.....: 1.9	
Sodium	ND	5000	ug/L	SW846 6010B	11/23-11/25/04	GXEVV1AN
		Dilution Factor: 1		Analysis Time..: 07:14	MDL.....: 1400	
Nickel	ND	40	ug/L	SW846 6010B	11/23-11/26/04	GXEVV1AR
		Dilution Factor: 1		Analysis Time..: 21:11	MDL.....: 2.0	

US GEOLOGICAL SURVEY

Client Sample ID: BLM-15

General Chemistry

Lot-Sample #...: D4K170331-001 **Work Order #...:** GW7CK **Matrix.....:** WATER
Date Sampled...: 11/16/04 08:20 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**45 J**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 1		Analysis Time..: 03:15	MDL.....: 0.10	
Fluoride	**0.68 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 03:15	MDL.....: 0.10	
Nitrate	**6.4**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
		Dilution Factor: 1		Analysis Time..: 03:15	MDL.....: 0.020	
Nitrate-Nitrite	**5.6**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 03:15	MDL.....: 0.030	
Sulfate	**1600 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 03:28	MDL.....: 5.0	
Total Dissolved Solids	**2400**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-39

General Chemistry

Lot-Sample #...: D4K170331-002 **Work Order #...:** GW7C1 **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:00 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**32 J**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
	Dilution Factor: 1			Analysis Time..: 03:41	MDL.....: 0.10	
Fluoride	**0.77 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
	Dilution Factor: 1			Analysis Time..: 03:41	MDL.....: 0.10	
Nitrate	**2.1**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
	Dilution Factor: 1			Analysis Time..: 03:41	MDL.....: 0.020	
Nitrate-Nitrite	**1.2**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
	Dilution Factor: 1			Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
	Dilution Factor: 1			Analysis Time..: 03:41	MDL.....: 0.030	
Sulfate	**2500 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
	Dilution Factor: 50			Analysis Time..: 03:54	MDL.....: 5.0	
Total Dissolved Solids	**3300**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
	Dilution Factor: 1			Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-98

General Chemistry

Lot-Sample #...: D4K170331-003 **Work Order #...:** GW7C5 **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:15 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**37 J**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 1		Analysis Time..: 04:07	MDL.....: 0.10	
Fluoride	**0.78 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 04:07	MDL.....: 0.10	
Nitrate	**3.0**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
		Dilution Factor: 1		Analysis Time..: 04:07	MDL.....: 0.020	
Nitrate-Nitrite	**1.5**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 04:07	MDL.....: 0.030	
Sulfate	**2300 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 04:20	MDL.....: 5.0	
Total Dissolved Solids	**3200**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-48

General Chemistry

Lot-Sample #...: D4K170331-004 **Work Order #...:** GW7C9 **Matrix.....:** WATER
Date Sampled...: 11/16/04 09:40 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**49 J**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 1		Analysis Time..: 04:33	MDL.....: 0.10	
Fluoride	**0.59 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 04:33	MDL.....: 0.10	
Nitrate	**6.9**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
		Dilution Factor: 1		Analysis Time..: 04:33	MDL.....: 0.020	
Nitrate-Nitrite	**5.8**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 04:33	MDL.....: 0.030	
Sulfate	**1500 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 04:59	MDL.....: 5.0	
Total Dissolved Solids	**2300**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-51

General Chemistry

Lot-Sample #...: D4K170331-005 **Work Order #...:** GW7DD **Matrix.....:** WATER
Date Sampled...: 11/16/04 10:20 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**50 J,Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 5		Analysis Time..: 05:52	MDL.....: 0.50	
Fluoride	**0.62 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 05:12	MDL.....: 0.10	
Nitrate	**7.7**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
		Dilution Factor: 1		Analysis Time..: 05:12	MDL.....: 0.020	
Nitrate-Nitrite	**6.4**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 05:12	MDL.....: 0.030	
Sulfate	**1600 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 06:05	MDL.....: 5.0	
Total Dissolved Solids	**2500**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-45

General Chemistry

Lot-Sample #...: D4K170331-006 **Work Order #...:** GW7DH **Matrix.....:** WATER
Date Sampled...: 11/16/04 11:00 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**44 J**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 0.10	
Fluoride	**0.64 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 0.10	
Nitrate	**4.8**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 0.020	
Nitrate-Nitrite	**3.8**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 06:18	MDL.....: 0.030	
Sulfate	**1800 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 06:57	MDL.....: 5.0	
Total Dissolved Solids	**2600**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-42

General Chemistry

Lot-Sample #...: D4K170331-007 **Work Order #...:** GW7D0 **Matrix.....:** WATER
Date Sampled...: 11/16/04 11:50 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	42 J	3.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323580
		Dilution Factor: 1		Analysis Time..: 07:36	MDL.....: 0.10	
Fluoride	0.65 B	1.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323581
		Dilution Factor: 1		Analysis Time..: 07:36	MDL.....: 0.10	
Nitrate	3.4	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323582
		Dilution Factor: 1		Analysis Time..: 07:36	MDL.....: 0.020	
Nitrate-Nitrite	3.0	0.10	mg/L	MCAWW 353.2	11/24/04	4329527
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	0.17 B,J	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 07:36	MDL.....: 0.030	
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A	11/17-11/18/04	4323583
		Dilution Factor: 50		Analysis Time..: 07:49	MDL.....: 5.0	
Total Dissolved Solids	2700	10	mg/L	MCAWW 160.1	11/23/04	4329041
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-57

General Chemistry

Lot-Sample #...: D4K170331-008 **Work Order #...:** GW7D2 **Matrix.....:** WATER
Date Sampled...: 11/16/04 12:30 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**100 J,Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 5		Analysis Time..: 08:41	MDL.....: 0.50	
Fluoride	**0.66 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 08:28	MDL.....: 0.10	
Nitrate	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323582
		Dilution Factor: 1		Analysis Time..: 08:28	MDL.....: 0.020	
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	11/24/04	4329527
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 08:28	MDL.....: 0.030	
Sulfate	**2000 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 08:54	MDL.....: 5.0	
Total Dissolved Solids	**3000**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-56

General Chemistry

Lot-Sample #...: D4K170331-009 Work Order #...: GW7D7 Matrix.....: WATER
Date Sampled...: 11/16/04 13:10 Date Received..: 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	43 J	3.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323580
	Dilution Factor: 1			Analysis Time..: 09:07	MDL.....: 0.10	
Fluoride	0.67 B	1.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323581
	Dilution Factor: 1			Analysis Time..: 09:07	MDL.....: 0.10	
Nitrate	4.3	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323582
	Dilution Factor: 1			Analysis Time..: 09:07	MDL.....: 0.020	
Nitrate-Nitrite	3.7	0.10	mg/L	MCAWW 353.2	11/24/04	4329527
	Dilution Factor: 1			Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
	Dilution Factor: 1			Analysis Time..: 09:07	MDL.....: 0.030	
Sulfate	1700 Q	250	mg/L	MCAWW 300.0A	11/17-11/18/04	4323583
	Dilution Factor: 50			Analysis Time..: 09:20	MDL.....: 5.0	
Total Dissolved Solids	2700	10	mg/L	MCAWW 160.1	11/23/04	4329041
	Dilution Factor: 1			Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-99

General Chemistry

Lot-Sample #...: D4K170331-010 Work Order #...: GW7EA Matrix.....: WATER
Date Sampled...: 11/16/04 13:20 Date Received..: 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	43 J	3.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323580
		Dilution Factor: 1		Analysis Time..: 09:33	MDL.....: 0.10	
Fluoride	0.66 B	1.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323581
		Dilution Factor: 1		Analysis Time..: 09:33	MDL.....: 0.10	
Nitrate	4.4	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323582
		Dilution Factor: 1		Analysis Time..: 09:33	MDL.....: 0.020	
Nitrate-Nitrite	3.7	0.10	mg/L	MCAWW 353.2	11/24/04	4329527
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 09:33	MDL.....: 0.030	
Sulfate	1900 Q	250	mg/L	MCAWW 300.0A	11/17-11/18/04	4323583
		Dilution Factor: 50		Analysis Time..: 09:47	MDL.....: 5.0	
Total Dissolved Solids	2700	10	mg/L	MCAWW 160.1	11/23/04	4329041
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-55

General Chemistry

Lot-Sample #...: D4K170331-011 Work Order #...: GW7EC Matrix.....: WATER
Date Sampled...: 11/16/04 14:00 Date Received..: 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**47 J**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 1		Analysis Time..: 10:00	MDL.....: 0.10	
Fluoride	**0.63 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 10:00	MDL.....: 0.10	
Nitrate	**2.0**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
		Dilution Factor: 1		Analysis Time..: 10:00	MDL.....: 0.020	
Nitrate-Nitrite	**1.8**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 10:00	MDL.....: 0.030	
Sulfate	**2000 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 10:13	MDL.....: 5.0	
Total Dissolved Solids	**2800**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-69

General Chemistry

Lot-Sample #...: D4K170331-012 **Work Order #...:** GW7EF **Matrix.....:** WATER
Date Sampled...: 11/16/04 15:10 **Date Received..:** 11/17/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**49 J,Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 5		Analysis Time..: 11:05	MDL.....: 0.50	
Fluoride	**0.63 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323581**
		Dilution Factor: 1		Analysis Time..: 10:26	MDL.....: 0.10	
Nitrate	**4.9**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323582**
		Dilution Factor: 1		Analysis Time..: 10:26	MDL.....: 0.020	
Nitrate-Nitrite	**4.4**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/24/04**	**4329527**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1		Analysis Time..: 10:26	MDL.....: 0.030	
Sulfate	**1500 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323583**
		Dilution Factor: 50		Analysis Time..: 11:18	MDL.....: 5.0	
Total Dissolved Solids	**2300**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329041**
		Dilution Factor: 1		Analysis Time..: 11:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-21

General Chemistry

Lot-Sample #...: D4K180279-001 Work Order #...: GXAD0 Matrix.....: WATER
Date Sampled...: 11/17/04 11:20 Date Received..: 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	35	3.0	mg/L	MCAWW 300.0A	11/18/04	4324498
		Dilution Factor: 1		Analysis Time..: 19:33	MDL.....: 0.10	
Fluoride	0.62 B	1.0	mg/L	MCAWW 300.0A	11/18/04	4324502
		Dilution Factor: 1		Analysis Time..: 19:33	MDL.....: 0.10	
Nitrate	0.65	0.50	mg/L	MCAWW 300.0A	11/18/04	4324499
		Dilution Factor: 1		Analysis Time..: 19:33	MDL.....: 0.020	
Nitrate-Nitrite	0.93	0.10	mg/L	MCAWW 353.2	12/02/04	4337471
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/18/04	4324503
		Dilution Factor: 1		Analysis Time..: 19:33	MDL.....: 0.030	
Sulfate	2100 Q	500	mg/L	MCAWW 300.0A	12/03/04	4341472
		Dilution Factor: 100		Analysis Time..: 20:15	MDL.....: 10	
Total Dissolved Solids	3400	10	mg/L	MCAWW 160.1	11/23/04	4329049
		Dilution Factor: 1		Analysis Time..: 16:50	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-50

General Chemistry

Lot-Sample #...: D4K180279-002 **Work Order #...:** GXAD7 **Matrix.....:** WATER
Date Sampled...: 11/17/04 11:50 **Date Received..:** 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**46 Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324498**
		Dilution Factor: 5		Analysis Time..: 10:43	MDL.....: 0.50	
Fluoride	**0.60 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324502**
		Dilution Factor: 1		Analysis Time..: 20:51	MDL.....: 0.10	
Nitrate	**2.6**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324499**
		Dilution Factor: 1		Analysis Time..: 20:51	MDL.....: 0.020	
Nitrate-Nitrite	**2.3**	**0.10**	**mg/L**	**MCAWW 353.2**	**12/02/04**	**4337471**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	**0.19 B,J**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324503**
		Dilution Factor: 1		Analysis Time..: 20:51	MDL.....: 0.030	
Sulfate	**1900 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324501**
		Dilution Factor: 50		Analysis Time..: 21:30	MDL.....: 5.0	
Total Dissolved Solids	**2800**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329049**
		Dilution Factor: 1		Analysis Time..: 16:50	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-77

General Chemistry

Lot-Sample #...: D4K180279-003 **Work Order #...:** GXAD9 **Matrix.....:** WATER
Date Sampled...: 11/17/04 12:30 **Date Received..:** 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**52 Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324498**
	Dilution Factor: 5			Analysis Time..: 21:57	MDL.....: 0.50	
Fluoride	**0.65 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324502**
	Dilution Factor: 1			Analysis Time..: 21:43	MDL.....: 0.10	
Nitrate	**0.24 B**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324499**
	Dilution Factor: 1			Analysis Time..: 21:43	MDL.....: 0.020	
Nitrate-Nitrite	**0.057 B**	**0.10**	**mg/L**	**MCAWW 353.2**	**12/02/04**	**4337471**
	Dilution Factor: 1			Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/18/04	4324503
	Dilution Factor: 1			Analysis Time..: 21:43	MDL.....: 0.030	
Sulfate	**1900 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324501**
	Dilution Factor: 50			Analysis Time..: 22:10	MDL.....: 5.0	
Total Dissolved Solids	**2800**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329049**
	Dilution Factor: 1			Analysis Time..: 16:50	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-76

General Chemistry

Lot-Sample #...: D4K180279-004 **Work Order #...:** GXAEC **Matrix.....:** WATER
Date Sampled...: 11/17/04 13:10 **Date Received..:** 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**55 Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324498**
		Dilution Factor: 5		Analysis Time..: 22:36	MDL.....: 0.50	
Fluoride	**0.51 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324502**
		Dilution Factor: 1		Analysis Time..: 22:23	MDL.....: 0.10	
Nitrate	**1.5**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324499**
		Dilution Factor: 1		Analysis Time..: 22:23	MDL.....: 0.020	
Nitrate-Nitrite	**1.4**	**0.10**	**mg/L**	**MCAWW 353.2**	**12/02/04**	**4337471**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/18/04	4324503
		Dilution Factor: 1		Analysis Time..: 22:23	MDL.....: 0.030	
Sulfate	**1900 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324501**
		Dilution Factor: 50		Analysis Time..: 22:49	MDL.....: 5.0	
Total Dissolved Solids	**2800**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329049**
		Dilution Factor: 1		Analysis Time..: 16:50	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-17

General Chemistry

Lot-Sample #...: D4K180279-006 **Work Order #...:** GXAEJ **Matrix.....:** WATER
Date Sampled...: 11/17/04 08:30 **Date Received..:** 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**49 Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324498**
		Dilution Factor: 5		Analysis Time..: 10:56	MDL.....: 0.50	
Fluoride	**0.62 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324502**
		Dilution Factor: 1		Analysis Time..: 23:02	MDL.....: 0.10	
Nitrate	**5.0**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324499**
		Dilution Factor: 1		Analysis Time..: 23:02	MDL.....: 0.020	
Nitrate-Nitrite	**4.1**	**0.10**	**mg/L**	**MCAWW 353.2**	**12/02/04**	**4337471**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/18/04	4324503
		Dilution Factor: 1		Analysis Time..: 23:02	MDL.....: 0.030	
Sulfate	**1400 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324501**
		Dilution Factor: 50		Analysis Time..: 23:15	MDL.....: 5.0	
Total Dissolved Solids	**2200**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329049**
		Dilution Factor: 1		Analysis Time..: 16:50	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-32

General Chemistry

Lot-Sample #...: D4K180279-007 **Work Order #...:** GXAEN **Matrix.....:** WATER
Date Sampled...: 11/17/04 09:30 **Date Received..:** 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**460 Q**	**60**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324498**
		Dilution Factor: 20		Analysis Time..: 00:07	MDL.....: 2.0	
Fluoride	**0.75 B,G**	**2.0**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324502**
		Dilution Factor: 2		Analysis Time..: 23:28	MDL.....: 0.20	
Nitrate	**3.8 G**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324499**
		Dilution Factor: 2		Analysis Time..: 23:28	MDL.....: 0.040	
Nitrate-Nitrite	**3.8**	**0.10**	**mg/L**	**MCAWW 353.2**	**12/02/04**	**4337471**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND G	1.0	mg/L	MCAWW 300.0A	11/18/04	4324503
		Dilution Factor: 2		Analysis Time..: 23:28	MDL.....: 0.060	
Sulfate	**2100 Q**	**500**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324501**
		Dilution Factor: 100		Analysis Time..: 11:09	MDL.....: 10	
Total Dissolved Solids	**4300 Q**	**20**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329049**
		Dilution Factor: 2		Analysis Time..: 16:50	MDL.....: 7.2	

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-62

General Chemistry

Lot-Sample #...: D4K180279-008 Work Order #...: GXAEQ Matrix.....: WATER
Date Sampled...: 11/17/04 10:20 Date Received..: 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	19	3.0	mg/L	MCAWW 300.0A	11/18-11/19/04	4324498
		Dilution Factor: 1		Analysis Time..: 00:33	MDL.....: 0.10	
Fluoride	0.60 B	1.0	mg/L	MCAWW 300.0A	11/18-11/19/04	4324502
		Dilution Factor: 1		Analysis Time..: 00:33	MDL.....: 0.10	
Nitrate	0.20 B	0.50	mg/L	MCAWW 300.0A	11/18-11/19/04	4324499
		Dilution Factor: 1		Analysis Time..: 00:33	MDL.....: 0.020	
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	12/02/04	4337471
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/18-11/19/04	4324503
		Dilution Factor: 1		Analysis Time..: 00:33	MDL.....: 0.030	
Sulfate	2100 Q	250	mg/L	MCAWW 300.0A	11/18-11/19/04	4324501
		Dilution Factor: 50		Analysis Time..: 00:46	MDL.....: 5.0	
Total Dissolved Solids	3000	10	mg/L	MCAWW 160.1	11/23/04	4329049
		Dilution Factor: 1		Analysis Time..: 16:50	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-60

General Chemistry

Lot-Sample #...: D4K180279-009 **Work Order #...:** GXAET **Matrix.....:** WATER
Date Sampled...: 11/17/04 11:00 **Date Received..:** 11/18/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**46**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324498**
		Dilution Factor: 1		Analysis Time..: 00:59	MDL.....: 0.10	
Fluoride	**0.58 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324502**
		Dilution Factor: 1		Analysis Time..: 00:59	MDL.....: 0.10	
Nitrate	**3.3**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324499**
		Dilution Factor: 1		Analysis Time..: 00:59	MDL.....: 0.020	
Nitrate-Nitrite	**3.3**	**0.10**	**mg/L**	**MCAWW 353.2**	**12/02/04**	**4337471**
		Dilution Factor: 1		Analysis Time..: 01:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/18-11/19/04	4324503
		Dilution Factor: 1		Analysis Time..: 00:59	MDL.....: 0.030	
Sulfate	**1900 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/18-11/19/04**	**4324501**
		Dilution Factor: 50		Analysis Time..: 01:25	MDL.....: 5.0	
Total Dissolved Solids	**2800**	**10**	**mg/L**	**MCAWW 160.1**	**11/23/04**	**4329049**
		Dilution Factor: 1		Analysis Time..: 16:50	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-67

General Chemistry

Lot-Sample #...: D4K190267-001 **Work Order #...:** GXEVE **Matrix.....:** WATER
Date Sampled...: 11/18/04 09:00 **Date Received..:** 11/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**52 Q**	**15**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327354**
		Dilution Factor: 5		Analysis Time..: 16:39	MDL.....: 0.50	
Fluoride	**0.66 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327356**
		Dilution Factor: 1		Analysis Time..: 16:00	MDL.....: 0.10	
Nitrate	**4.8**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327352**
		Dilution Factor: 1		Analysis Time..: 16:00	MDL.....: 0.020	
Nitrate-Nitrite	**4.8**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/23/04**	**4329500**
		Dilution Factor: 1		Analysis Time..: 20:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/19/04	4327357
		Dilution Factor: 1		Analysis Time..: 16:00	MDL.....: 0.030	
Sulfate	**1700 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327353**
		Dilution Factor: 50		Analysis Time..: 17:19	MDL.....: 5.0	
Total Dissolved Solids	**2400**	**10**	**mg/L**	**MCAWW 160.1**	**11/24/04**	**4334355**
		Dilution Factor: 1		Analysis Time..: 10:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Client Sample ID: BLM-75

General Chemistry

Lot-Sample #...: D4K190267-002 **Work Order #...:** GXEVQ **Matrix.....:** WATER
Date Sampled...: 11/18/04 10:30 **Date Received..:** 11/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**46**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327354**
		Dilution Factor: 1		Analysis Time..: 18:24	MDL.....: 0.10	
Fluoride	**0.58 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327356**
		Dilution Factor: 1		Analysis Time..: 18:24	MDL.....: 0.10	
Nitrate	**2.4**	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327352**
		Dilution Factor: 1		Analysis Time..: 18:24	MDL.....: 0.020	
Nitrate-Nitrite	**2.3**	**0.10**	**mg/L**	**MCAWW 353.2**	**11/23/04**	**4329500**
		Dilution Factor: 1		Analysis Time..: 20:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/19-11/20/04	4327357
		Dilution Factor: 1		Analysis Time..: 00:16	MDL.....: 0.030	
Sulfate	**1800 Q**	**250**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327353**
		Dilution Factor: 50		Analysis Time..: 18:50	MDL.....: 5.0	
Total Dissolved Solids	**2700**	**10**	**mg/L**	**MCAWW 160.1**	**11/24/04**	**4334355**
		Dilution Factor: 1		Analysis Time..: 10:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48

General Chemistry

Lot-Sample #...: D4K190267-003 **Work Order #...:** GXEVR **Matrix.....:** WATER
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**990 Q**	**150**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327354**
	Dilution Factor: 50			Analysis Time..: 19:16	MDL.....: 5.0	
Fluoride	**0.70 B,G**	**2.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327356**
	Dilution Factor: 2			Analysis Time..: 19:30	MDL.....: 0.20	
Nitrate	**12 Q**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327352**
	Dilution Factor: 2			Analysis Time..: 19:03	MDL.....: 0.040	
Nitrate-Nitrite	**11 Q**	**0.50**	**mg/L**	**MCAWW 353.2**	**11/23/04**	**4329500**
	Dilution Factor: 5			Analysis Time..: 20:00	MDL.....: 0.16	
Phosphate as P, Ortho	ND G	1.0	mg/L	MCAWW 300.0A	11/19-11/20/04	4327357
	Dilution Factor: 2			Analysis Time..: 00:29	MDL.....: 0.060	
Sulfate	**2200 Q**	**500**	**mg/L**	**MCAWW 300.0A**	**11/22/04**	**4328485**
	Dilution Factor: 100			Analysis Time..: 15:36	MDL.....: 10	
Total Dissolved Solids	**5200 Q**	**20**	**mg/L**	**MCAWW 160.1**	**11/24/04**	**4334355**
	Dilution Factor: 2			Analysis Time..: 10:40	MDL.....: 7.2	

NOTE(S):

RL Reporting Limit

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

B Estimated result. Result is less than RL.

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.

US GEOLOGICAL SURVEY

Client Sample ID: GBR-48EB

General Chemistry

Lot-Sample #...: D4K190267-004 **Work Order #...:** GXEVV **Matrix.....:** WATER
Date Sampled...: 11/18/04 12:00 **Date Received..:** 11/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**1.1 B**	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327354**
		Dilution Factor: 1		Analysis Time..: 19:29	MDL.....: 0.10	
Fluoride	**0.13 B**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327356**
		Dilution Factor: 1		Analysis Time..: 19:29	MDL.....: 0.10	
Nitrate	ND	0.50	mg/L	MCAWW 300.0A	11/19/04	4327352
		Dilution Factor: 1		Analysis Time..: 19:29	MDL.....: 0.020	
Nitrate-Nitrite	ND	0.10	mg/L	MCAWW 353.2	11/23/04	4329500
		Dilution Factor: 1		Analysis Time..: 20:00	MDL.....: 0.031	
Phosphate as P, Ortho	ND	0.50	mg/L	MCAWW 300.0A	11/19-11/20/04	4327357
		Dilution Factor: 1		Analysis Time..: 00:42	MDL.....: 0.030	
Sulfate	**0.89 B**	**5.0**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327353**
		Dilution Factor: 1		Analysis Time..: 19:29	MDL.....: 0.10	
Total Dissolved Solids	ND	10	mg/L	MCAWW 160.1	11/24/04	4334355
		Dilution Factor: 1		Analysis Time..: 10:40	MDL.....: 3.6	

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

QC DATA ASSOCIATION SUMMARY

LEE-5 : D4K170331

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
002	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
003	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
004	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
005	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336

(Continued on next page)

QC DATA ASSOCIATION SUMMARY

LEE-5 : D4K170331

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
005	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
006	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 8260B		4337178	4337125
	WATER	SW846 6010B		4323013	4323005
007	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
008	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
009	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333

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QC DATA ASSOCIATION SUMMARY

LEE-5 : D4K170331

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
009	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
010	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
011	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329476	4329292
	WATER	SW846 6010B		4323013	4323005
012	WATER	MCAWW 160.1		4329041	4334267
	WATER	MCAWW 353.2		4329527	4329316
	WATER	MCAWW 300.0A		4323580	4323336
	WATER	MCAWW 300.0A		4323583	4323354
	WATER	MCAWW 300.0A		4323581	4323333
	WATER	MCAWW 300.0A		4323582	4323344
	WATER	MCAWW 300.0A		4323584	4323348
	WATER	SW846 8260B		4329501	4334218
	WATER	SW846 6010B		4323013	4323005
013	WATER	SW846 8260B		4329501	4334218
001	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4341472	4341298
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364

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QC DATA ASSOCIATION SUMMARY

LEE-5 : D4K180279

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	MCAWW 300.0A		4324503	4334365
	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
002	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4324501	4334366
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364
	WATER	MCAWW 300.0A		4324503	4334365
	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
003	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4324501	4334366
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364
	WATER	MCAWW 300.0A		4324503	4334365
	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
004	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4324501	4334366
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364
	WATER	MCAWW 300.0A		4324503	4334365
	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
005	WATER	SW846 8260B		4336202	4336137
006	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4324501	4334366
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364
	WATER	MCAWW 300.0A		4324503	4334365

(Continued on next page)

QC DATA ASSOCIATION SUMMARY

LEE-5 : D4K180279

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
006	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
007	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4324501	4334366
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364
	WATER	MCAWW 300.0A		4324503	4334365
	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
008	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4324501	4334366
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364
	WATER	MCAWW 300.0A		4324503	4334365
	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
009	WATER	MCAWW 160.1		4329049	4334272
	WATER	MCAWW 353.2		4337471	4337296
	WATER	MCAWW 300.0A		4324498	4334361
	WATER	MCAWW 300.0A		4324501	4334366
	WATER	MCAWW 300.0A		4324502	4334360
	WATER	MCAWW 300.0A		4324499	4334364
	WATER	MCAWW 300.0A		4324503	4334365
	WATER	SW846 8260B		4336202	4336137
	WATER	SW846 6010B		4323679	4323393
001	WATER	MCAWW 160.1		4334355	4334293
	WATER	MCAWW 353.2		4329500	4329299
	WATER	MCAWW 300.0A		4327354	4334340
	WATER	MCAWW 300.0A		4327353	4334352
	WATER	MCAWW 300.0A		4327356	4334338
	WATER	MCAWW 300.0A		4327352	4334349
	WATER	MCAWW 300.0A		4327357	4334351
	WATER	SW846 8260B		4337403	4337238
	WATER	SW846 6010B		4324607	4324396

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QC DATA ASSOCIATION SUMMARY

LKE-5 : D4K190267

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
002	WATER	MCAWW 160.1		4334355	4334293
	WATER	MCAWW 353.2		4329500	4329299
	WATER	MCAWW 300.0A		4327354	4334340
	WATER	MCAWW 300.0A		4327353	4334352
	WATER	MCAWW 300.0A		4327356	4334338
	WATER	MCAWW 300.0A		4327352	4334349
	WATER	MCAWW 300.0A		4327357	4334351
	WATER	SW846 8260B		4337403	4337238
	WATER	SW846 6010B		4324607	4324396
003	WATER	MCAWW 160.1		4334355	4334293
	WATER	MCAWW 353.2		4329500	4329299
	WATER	MCAWW 300.0A		4327354	4334340
	WATER	MCAWW 300.0A		4328485	4328301
	WATER	MCAWW 300.0A		4327356	4334338
	WATER	MCAWW 300.0A		4327352	4334349
	WATER	MCAWW 300.0A		4327357	4334351
	WATER	SW846 8260B		4337403	4337238
	WATER	SW846 6010B		4324607	4324396
004	WATER	MCAWW 160.1		4334355	4334293
	WATER	MCAWW 353.2		4329500	4329299
	WATER	MCAWW 300.0A		4327354	4334340
	WATER	MCAWW 300.0A		4327353	4334352
	WATER	MCAWW 300.0A		4327356	4334338
	WATER	MCAWW 300.0A		4327352	4334349
	WATER	MCAWW 300.0A		4327357	4334351
	WATER	SW846 8260B		4337570	4337360
	WATER	SW846 6010B		4324607	4324396
005	WATER	SW846 8260B		4337403	4337238

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT0F1AA **Matrix.....:** WATER
MB Lot-Sample #: D4K240000-476

Prep Date.....: 11/23/04 **Analysis Time..:** 15:54
Analysis Date..: 11/23/04 **Prep Batch #...:** 4329476
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	ND	10	ug/L	SW846 8260B
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	2.0	ug/L	SW846 8260B
2-Butanone (MEK)	ND	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Methylene chloride	ND	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
Methyl tert-butyl ether	ND	5.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Xylenes (total)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(73 - 118)

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METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT0F1AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dichloroethane-d4	105	(62 - 128)		
4-Bromofluorobenzene	106	(78 - 118)		
Toluene-d8	99	(77 - 117)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

US GEOLOGICAL SURVEY

Method Blank Report

GC/MS Volatiles

Lot-Sample #: D4K240000-476 B **Work Order #:** GXT0F1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/L

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT0F1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4K240000-476 GXT0F1AD-LCSD
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 15:31
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**114**	**(75 - 120)**			**SW846 8260B**
	113	**(75 - 120)**	**0.98**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**114**	**(78 - 118)**			**SW846 8260B**
	117	**(78 - 118)**	**2.5**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**98**	**(66 - 132)**			**SW846 8260B**
	100	**(66 - 132)**	**1.4**	**(0-26)**	**SW846 8260B**
Toluene	**110**	**(78 - 118)**			**SW846 8260B**
	113	**(78 - 118)**	**3.0**	**(0-22)**	**SW846 8260B**
Trichloroethene	**117**	**(79 - 122)**			**SW846 8260B**
	117	**(79 - 122)**	**0.47**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(73 - 118)
	101	(73 - 118)
1,2-Dichloroethane-d4	108	(62 - 128)
	104	(62 - 128)
4-Bromofluorobenzene	106	(78 - 118)
	111	(78 - 118)
Toluene-d8	99	(77 - 117)
	103	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT0F1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4K240000-476 GXT0F1AD-LCSD
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 15:31
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**10.0**	**11.4**	**ug/L**	**114**		**SW846 8260B**
	10.0	**11.3**	**ug/L**	**113**	**0.98**	**SW846 8260B**
Chlorobenzene	**10.0**	**11.4**	**ug/L**	**114**		**SW846 8260B**
	10.0	**11.7**	**ug/L**	**117**	**2.5**	**SW846 8260B**
1,1-Dichloroethene	**10.0**	**9.84**	**ug/L**	**98**		**SW846 8260B**
	10.0	**9.97**	**ug/L**	**100**	**1.4**	**SW846 8260B**
Toluene	**10.0**	**11.0**	**ug/L**	**110**		**SW846 8260B**
	10.0	**11.3**	**ug/L**	**113**	**3.0**	**SW846 8260B**
Trichloroethene	**10.0**	**11.7**	**ug/L**	**117**		**SW846 8260B**
	10.0	**11.7**	**ug/L**	**117**	**0.47**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(73 - 118)
	101	(73 - 118)
1,2-Dichloroethane-d4	108	(62 - 128)
	104	(62 - 128)
4-Bromofluorobenzene	106	(78 - 118)
	111	(78 - 118)
Toluene-d8	99	(77 - 117)
	103	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GW7CK1AU-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K170331-001 GW7CK1AV-MSD
Date Sampled...: 11/16/04 08:20 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 18:51
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**108**	**(75 - 120)**			**SW846 8260B**
	113	**(75 - 120)**	**4.4**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**115**	**(78 - 118)**			**SW846 8260B**
	116	**(78 - 118)**	**0.89**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**91**	**(66 - 132)**			**SW846 8260B**
	92	**(66 - 132)**	**0.40**	**(0-26)**	**SW846 8260B**
Toluene	**110**	**(78 - 118)**			**SW846 8260B**
	110	**(78 - 118)**	**0.47**	**(0-22)**	**SW846 8260B**
Trichloroethene	**108**	**(79 - 122)**			**SW846 8260B**
	110	**(79 - 122)**	**1.5**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	99	(73 - 118)
	100	(73 - 118)
1,2-Dichloroethane-d4	98	(62 - 128)
	101	(62 - 128)
4-Bromofluorobenzene	107	(78 - 118)
	107	(78 - 118)
Toluene-d8	99	(77 - 117)
	100	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GW7CK1AU-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K170331-001 GW7CK1AV-MSD
Date Sampled...: 11/16/04 08:20 **Date Received..:** 11/17/04
Prep Date.....: 11/23/04 **Analysis Date..:** 11/23/04
Prep Batch #...: 4329476 **Analysis Time..:** 18:51
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**10.0**	**10.8**	**ug/L**	**108**		**SW846 8260B**
	ND	**10.0**	**11.3**	**ug/L**	**113**	**4.4**	**SW846 8260B**
Chlorobenzene	**ND**	**10.0**	**11.5**	**ug/L**	**115**		**SW846 8260B**
	ND	**10.0**	**11.6**	**ug/L**	**116**	**0.89**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**10.0**	**9.12**	**ug/L**	**91**		**SW846 8260B**
	ND	**10.0**	**9.16**	**ug/L**	**92**	**0.40**	**SW846 8260B**
Toluene	**ND**	**10.0**	**11.0**	**ug/L**	**110**		**SW846 8260B**
	ND	**10.0**	**11.0**	**ug/L**	**110**	**0.47**	**SW846 8260B**
Trichloroethene	**ND**	**10.0**	**10.8**	**ug/L**	**108**		**SW846 8260B**
	ND	**10.0**	**11.0**	**ug/L**	**110**	**1.5**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	99	(73 - 118)
	100	(73 - 118)
1,2-Dichloroethane-d4	98	(62 - 128)
	101	(62 - 128)
4-Bromofluorobenzene	107	(78 - 118)
	107	(78 - 118)
Toluene-d8	99	(77 - 117)
	100	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT2C1AA **Matrix.....:** WATER
MB Lot-Sample #: D4K240000-501

Prep Date.....: 11/24/04 **Analysis Time..:** 13:29
Analysis Date..: 11/24/04 **Prep Batch #...:** 4329501
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	**3.4 J**	**10**	**ug/L**	**SW846 8260B**
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	2.0	ug/L	SW846 8260B
2-Butanone (MEK)	ND	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Methylene chloride	**0.67 J**	**5.0**	**ug/L**	**SW846 8260B**
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
Methyl tert-butyl ether	**1.2 J**	**5.0**	**ug/L**	**SW846 8260B**
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Xylenes (total)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	108	(73 - 118)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT2C1AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dichloroethane-d4	114	(62 - 128)		
4-Bromofluorobenzene	98	(78 - 118)		
Toluene-d8	93	(77 - 117)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Method Blank Report

GC/MS Volatiles

Lot-Sample #: D4K240000-501 B **Work Order #:** GXT2C1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotetrasiloxane, octamethyl	556-67-2	3.3 J	M	11.694	ug/L
Unknown		6.6 J	M	14.014	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT2C1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4K240000-501 GXT2C1AD-LCSD
Prep Date.....: 11/24/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329501 **Analysis Time..:** 12:49
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**115**	**(75 - 120)**			**SW846 8260B**
	113	**(75 - 120)**	**2.1**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**99**	**(78 - 118)**			**SW846 8260B**
	96	**(78 - 118)**	**2.3**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**96**	**(66 - 132)**			**SW846 8260B**
	92	**(66 - 132)**	**4.2**	**(0-26)**	**SW846 8260B**
Toluene	**96**	**(78 - 118)**			**SW846 8260B**
	93	**(78 - 118)**	**3.3**	**(0-22)**	**SW846 8260B**
Trichloroethene	**111**	**(79 - 122)**			**SW846 8260B**
	110	**(79 - 122)**	**0.74**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 118)
	109	(73 - 118)
1,2-Dichloroethane-d4	114	(62 - 128)
	113	(62 - 128)
4-Bromofluorobenzene	98	(78 - 118)
	99	(78 - 118)
Toluene-d8	94	(77 - 117)
	93	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXT2C1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4K240000-501 GXT2C1AD-LCSD
Prep Date.....: 11/24/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329501 **Analysis Time..:** 12:49
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**10.0**	**11.5**	**ug/L**	**115**		**SW846 8260B**
	10.0	**11.3**	**ug/L**	**113**	**2.1**	**SW846 8260B**
Chlorobenzene	**10.0**	**9.85**	**ug/L**	**99**		**SW846 8260B**
	10.0	**9.63**	**ug/L**	**96**	**2.3**	**SW846 8260B**
1,1-Dichloroethene	**10.0**	**9.59**	**ug/L**	**96**		**SW846 8260B**
	10.0	**9.19**	**ug/L**	**92**	**4.2**	**SW846 8260B**
Toluene	**10.0**	**9.60**	**ug/L**	**96**		**SW846 8260B**
	10.0	**9.29**	**ug/L**	**93**	**3.3**	**SW846 8260B**
Trichloroethene	**10.0**	**11.1**	**ug/L**	**111**		**SW846 8260B**
	10.0	**11.0**	**ug/L**	**110**	**0.74**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 118)
	109	(73 - 118)
1,2-Dichloroethane-d4	114	(62 - 128)
	113	(62 - 128)
4-Bromofluorobenzene	98	(78 - 118)
	99	(78 - 118)
Toluene-d8	94	(77 - 117)
	93	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXC0L1AX-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K180423-009 GXC0L1A0-MSD
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/18/04
Prep Date.....: 11/24/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329501 **Analysis Time..:** 17:13
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**116**	**(75 - 120)**			**SW846 8260B**
	118	**(75 - 120)**	**2.2**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**99**	**(78 - 118)**			**SW846 8260B**
	101	**(78 - 118)**	**2.6**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**93**	**(66 - 132)**			**SW846 8260B**
	95	**(66 - 132)**	**2.5**	**(0-26)**	**SW846 8260B**
Toluene	**94**	**(78 - 118)**			**SW846 8260B**
	96	**(78 - 118)**	**2.6**	**(0-22)**	**SW846 8260B**
Trichloroethene	**112**	**(79 - 122)**			**SW846 8260B**
	116	**(79 - 122)**	**2.9**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(73 - 118)
	108	(73 - 118)
1,2-Dichloroethane-d4	119	(62 - 128)
	114	(62 - 128)
4-Bromofluorobenzene	99	(78 - 118)
	97	(78 - 118)
Toluene-d8	92	(77 - 117)
	92	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXC0L1AX-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K180423-009 GXC0L1A0-MSD
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/18/04
Prep Date.....: 11/24/04 **Analysis Date..:** 11/24/04
Prep Batch #...: 4329501 **Analysis Time..:** 17:13
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**10.0**	**11.6**	**ug/L**	**116**		**SW846 8260B**
	ND	**10.0**	**11.8**	**ug/L**	**118**	**2.2**	**SW846 8260B**
Chlorobenzene	**ND**	**10.0**	**9.88**	**ug/L**	**99**		**SW846 8260B**
	ND	**10.0**	**10.1**	**ug/L**	**101**	**2.6**	**SW846 8260B**
1,1- ..loroethene	**ND**	**10.0**	**9.25**	**ug/L**	**93**		**SW846 8260B**
	ND	**10.0**	**9.48**	**ug/L**	**95**	**2.5**	**SW846 8260B**
Toluene	**ND**	**10.0**	**9.40**	**ug/L**	**94**		**SW846 8260B**
	ND	**10.0**	**9.65**	**ug/L**	**96**	**2.6**	**SW846 8260B**
Trichloroethene	**ND**	**10.0**	**11.2**	**ug/L**	**112**		**SW846 8260B**
	ND	**10.0**	**11.6**	**ug/L**	**116**	**2.9**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	110	(73 - 118)
	108	(73 - 118)
1,2-Dichloroethane-d4	119	(62 - 128)
	114	(62 - 128)
4-Bromofluorobenzene	99	(78 - 118)
	97	(78 - 118)
Toluene-d8	92	(77 - 117)
	92	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX17D1AA **Matrix.....:** WATER
MB Lot-Sample #: D4L010000-202

Prep Date.....: 11/29/04 **Analysis Time..:** 13:30
Analysis Date..: 11/29/04 **Prep Batch #...:** 4336202
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	ND	10	ug/L	SW846 8260B
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	2.0	ug/L	SW846 8260B
2-Butanone (MEK)	ND	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Methylene chloride	ND	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
Methyl tert-butyl ether	ND	5.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Xylenes (total)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	93	(73 - 118)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX17D1AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dichloroethane-d4	94	(62 - 128)		
4-Bromofluorobenzene	96	(78 - 118)		
Toluene-d8	91	(77 - 117)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

US GEOLOGICAL SURVEY

Method Blank Report

GC/MS Volatiles

Lot-Sample #: D4L010000-202 B **Work Order #:** GX17D1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotrisiloxane, hexamethyl-	541-05-9	5.6 J	M	9.4815	ug/L
Unknown		23 J	M	14.698	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	35 J	M	15.314	ug/L
Unknown		10 J	M	16.328	ug/L
Unknown		5.5 J	M	16.709	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX17D1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L010000-202 GX17D1AD-LCSD
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 12:33
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**106**	**(75 - 120)**			**SW846 8260B**
	108	**(75 - 120)**	**2.1**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**103**	**(78 - 118)**			**SW846 8260B**
	108	**(78 - 118)**	**4.3**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**83**	**(66 - 132)**			**SW846 8260B**
	88	**(66 - 132)**	**6.0**	**(0-26)**	**SW846 8260B**
Toluene	**100**	**(78 - 118)**			**SW846 8260B**
	108	**(78 - 118)**	**7.4**	**(0-22)**	**SW846 8260B**
Trichloroethene	**104**	**(79 - 122)**			**SW846 8260B**
	106	**(79 - 122)**	**1.6**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	95	(73 - 118)
	94	(73 - 118)
1,2-Dichloroethane-d4	100	(62 - 128)
	99	(62 - 128)
4-Bromofluorobenzene	95	(78 - 118)
	94	(78 - 118)
Toluene-d8	88	(77 - 117)
	93	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX17D1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L010000-202 GX17D1AD-LCSD
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 12:33
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**10.0**	**10.6**	**ug/L**	**106**		**SW846 8260B**
	10.0	**10.8**	**ug/L**	**108**	**2.1**	**SW846 8260B**
Chlorobenzene	**10.0**	**10.3**	**ug/L**	**103**		**SW846 8260B**
	10.0	**10.8**	**ug/L**	**108**	**4.3**	**SW846 8260B**
1,1-Dichloroethene	**10.0**	**8.33**	**ug/L**	**83**		**SW846 8260B**
	10.0	**8.85**	**ug/L**	**88**	**6.0**	**SW846 8260B**
Toluene	**10.0**	**10.0**	**ug/L**	**100**		**SW846 8260B**
	10.0	**10.8**	**ug/L**	**108**	**7.4**	**SW846 8260B**
Trichloroethene	**10.0**	**10.4**	**ug/L**	**104**		**SW846 8260B**
	10.0	**10.6**	**ug/L**	**106**	**1.6**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	95	(73 - 118)
	94	(73 - 118)
1,2-Dichloroethane-d4	100	(62 - 128)
	99	(62 - 128)
4-Bromofluorobenzene	95	(78 - 118)
	94	(78 - 118)
Toluene-d8	88	(77 - 117)
	93	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXAEJ1AT-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K180279-006 GXAEJ1AU-MSD
Date Sampled...: 11/17/04 08:30 **Date Received..:** 11/18/04
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 17:23
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**108**	**(75 - 120)**			**SW846 8260B**
	110	**(75 - 120)**	**1.9**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**111**	**(78 - 118)**			**SW846 8260B**
	111	**(78 - 118)**	**0.15**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**81**	**(66 - 132)**			**SW846 8260B**
	82	**(66 - 132)**	**1.6**	**(0-26)**	**SW846 8260B**
Toluene	**106**	**(78 - 118)**			**SW846 8260B**
	105	**(78 - 118)**	**0.90**	**(0-22)**	**SW846 8260B**
Trichloroethene	**109**	**(79 - 122)**			**SW846 8260B**
	109	**(79 - 122)**	**0.21**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(73 - 118)
	102	(73 - 118)
1,2-Dichloroethane-d4	102	(62 - 128)
	106	(62 - 128)
4-Bromofluorobenzene	105	(78 - 118)
	102	(78 - 118)
Toluene-d8	99	(77 - 117)
	99	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXAEJ1AT-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K180279-006 GXAEJ1AU-MSD
Date Sampled...: 11/17/04 08:30 **Date Received..:** 11/18/04
Prep Date.....: 11/29/04 **Analysis Date..:** 11/29/04
Prep Batch #...: 4336202 **Analysis Time..:** 17:23
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**10.0**	**10.8**	**ug/L**	**108**		**SW846 8260B**
	ND	**10.0**	**11.0**	**ug/L**	**110**	**1.9**	**SW846 8260B**
Chlorobenzene	**ND**	**10.0**	**11.1**	**ug/L**	**111**		**SW846 8260B**
	ND	**10.0**	**11.1**	**ug/L**	**111**	**0.15**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**10.0**	**8.05**	**ug/L**	**81**		**SW846 8260B**
	ND	**10.0**	**8.18**	**ug/L**	**82**	**1.6**	**SW846 8260B**
Toluene	**ND**	**10.0**	**10.6**	**ug/L**	**106**		**SW846 8260B**
	ND	**10.0**	**10.5**	**ug/L**	**105**	**0.90**	**SW846 8260B**
Trichloroethene	**ND**	**10.0**	**10.9**	**ug/L**	**109**		**SW846 8260B**
	ND	**10.0**	**10.9**	**ug/L**	**109**	**0.21**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(73 - 118)
	102	(73 - 118)
1,2-Dichloroethane-d4	102	(62 - 128)
	106	(62 - 128)
4-Bromofluorobenzene	105	(78 - 118)
	102	(78 - 118)
Toluene-d8	99	(77 - 117)
	99	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX4MH1AA **Matrix.....:** WATER
MB Lot-Sample #: D4L020000-178

Prep Date.....: 11/30/04 **Analysis Time..:** 16:46
Analysis Date..: 11/30/04 **Prep Batch #...:** 4337178
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	ND	10	ug/L	SW846 8260B
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	2.0	ug/L	SW846 8260B
2-Butanone (MEK)	ND	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Methylene chloride	**1.1 J**	**5.0**	**ug/L**	**SW846 8260B**
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
Methyl tert-butyl ether	ND	5.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Xylenes (total)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 118)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX4MH1AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dichloroethane-d4	121	(62 - 128)		
4-Bromofluorobenzene	97	(78 - 118)		
Toluene-d8	97	(77 - 117)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Method Blank Report

GC/MS Volatiles

Lot-Sample #: D4L020000-178 B **Work Order #:** GX4MH1AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		3.1 J	M	14.969	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX4MH1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L020000-178 GX4MH1AD-LCSD
Prep Date.....: 11/30/04 **Analysis Date..:** 11/30/04
Prep Batch #...: 4337178 **Analysis Time..:** 17:12
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**113**	**(75 - 120)**			**SW846 8260B**
	114	**(75 - 120)**	**0.77**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**97**	**(78 - 118)**			**SW846 8260B**
	97	**(78 - 118)**	**0.090**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**88**	**(66 - 132)**			**SW846 8260B**
	90	**(66 - 132)**	**2.1**	**(0-26)**	**SW846 8260B**
Toluene	**95**	**(78 - 118)**			**SW846 8260B**
	93	**(78 - 118)**	**1.9**	**(0-22)**	**SW846 8260B**
Trichloroethene	**108**	**(79 - 122)**			**SW846 8260B**
	110	**(79 - 122)**	**1.3**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 118)
	108	(73 - 118)
1,2-Dichloroethane-d4	112	(62 - 128)
	119	(62 - 128)
4-Bromofluorobenzene	97	(78 - 118)
	100	(78 - 118)
Toluene-d8	95	(77 - 117)
	92	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX4MH1AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L020000-178 GX4MH1AD-LCSD
Prep Date.....: 11/30/04 **Analysis Date..:** 11/30/04
Prep Batch #...: 4337178 **Analysis Time..:** 17:12
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**10.0**	**11.3**	**ug/L**	**113**		**SW846 8260B**
	10.0	**11.4**	**ug/L**	**114**	**0.77**	**SW846 8260B**
Chlorobenzene	**10.0**	**9.71**	**ug/L**	**97**		**SW846 8260B**
	10.0	**9.72**	**ug/L**	**97**	**0.090**	**SW846 8260B**
1,1-Dichloroethene	**10.0**	**8.81**	**ug/L**	**88**		**SW846 8260B**
	10.0	**9.00**	**ug/L**	**90**	**2.1**	**SW846 8260B**
Toluene	**10.0**	**9.50**	**ug/L**	**95**		**SW846 8260B**
	10.0	**9.32**	**ug/L**	**93**	**1.9**	**SW846 8260B**
Trichloroethene	**10.0**	**10.8**	**ug/L**	**108**		**SW846 8260B**
	10.0	**11.0**	**ug/L**	**110**	**1.3**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 118)
	108	(73 - 118)
1,2-Dichloroethane-d4	112	(62 - 128)
	119	(62 - 128)
4-Bromofluorobenzene	97	(78 - 118)
	100	(78 - 118)
Toluene-d8	95	(77 - 117)
	92	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GW7DH1DX-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K170331-006 GW7DH1D0-MSD
Date Sampled...: 11/16/04 11:00 **Date Received..:** 11/17/04
Prep Date.....: 11/30/04 **Analysis Date..:** 11/30/04
Prep Batch #...: 4337178 **Analysis Time..:** 18:53
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**118**	**(75 - 120)**			**SW846 8260B**
	117	**(75 - 120)**	**1.0**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**101**	**(78 - 118)**			**SW846 8260B**
	101	**(78 - 118)**	**0.25**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**93**	**(66 - 132)**			**SW846 8260B**
	100	**(66 - 132)**	**7.4**	**(0-26)**	**SW846 8260B**
Toluene	**98**	**(78 - 118)**			**SW846 8260B**
	97	**(78 - 118)**	**1.7**	**(0-22)**	**SW846 8260B**
Trichloroethene	**115**	**(79 - 122)**			**SW846 8260B**
	114	**(79 - 122)**	**0.11**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	108	(73 - 118)
	110	(73 - 118)
1,2-Dichloroethane-d4	119	(62 - 128)
	122	(62 - 128)
4-Bromofluorobenzene	98	(78 - 118)
	100	(78 - 118)
Toluene-d8	93	(77 - 117)
	93	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GW7DH1DX-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K170331-006 GW7DH1D0-MSD
Date Sampled...: 11/16/04 11:00 **Date Received..:** 11/17/04
Prep Date.....: 11/30/04 **Analysis Date..:** 11/30/04
Prep Batch #...: 4337178 **Analysis Time..:** 18:53
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**10.0**	**11.8**	**ug/L**	**118**		**SW846 8260B**
	ND	**10.0**	**11.7**	**ug/L**	**117**	**1.0**	**SW846 8260B**
Chlorobenzene	**ND**	**10.0**	**10.1**	**ug/L**	**101**		**SW846 8260B**
	ND	**10.0**	**10.1**	**ug/L**	**101**	**0.25**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**10.0**	**9.25**	**ug/L**	**93**		**SW846 8260B**
	ND	**10.0**	**9.97**	**ug/L**	**100**	**7.4**	**SW846 8260B**
Toluene	**ND**	**10.0**	**9.84**	**ug/L**	**98**		**SW846 8260B**
	ND	**10.0**	**9.68**	**ug/L**	**97**	**1.7**	**SW846 8260B**
Trichloroethene	**ND**	**10.0**	**11.5**	**ug/L**	**115**		**SW846 8260B**
	ND	**10.0**	**11.4**	**ug/L**	**114**	**0.11**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	108	(73 - 118)
	110	(73 - 118)
1,2-Dichloroethane-d4	119	(62 - 128)
	122	(62 - 128)
4-Bromofluorobenzene	98	(78 - 118)
	100	(78 - 118)
Toluene-d8	93	(77 - 117)
	93	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX5041AA **Matrix.....:** WATER
MB Lot-Sample #: D4L020000-403

Prep Date.....: 12/01/04 **Analysis Time..:** 10:20
Analysis Date..: 12/01/04 **Prep Batch #...:** 4337403
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	**2.8 J**	**10**	**ug/L**	**SW846 8260B**
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	2.0	ug/L	SW846 8260B
2-Butanone (MEK)	ND	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Methylene chloride	**0.59 J**	**5.0**	**ug/L**	**SW846 8260B**
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
Methyl tert-butyl ether	ND	5.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Xylenes (total)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	99	(73 - 118)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX5041AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dichloroethane-d4	97	(62 - 128)		
4-Bromofluorobenzene	99	(78 - 118)		
Toluene-d8	103	(77 - 117)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

US GEOLOGICAL SURVEY

Method Blank Report

GC/MS Volatiles

Lot-Sample #: D4L020000-403 B **Work Order #:** GX5041AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Unknown		1.6 J	M	11.7	ug/L
Unknown		1.2 J	M	13.586	ug/L
Unknown		13 J	M	13.712	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	29 J	M	14.143	ug/L
Unknown		1.8 J	M	14.412	ug/L
Unknown		8.4 J	M	14.969	ug/L
Unknown		7.7 J	M	15.346	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX5041AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L020000-403 GX5041AD-LCSD
Prep Date.....: 12/01/04 **Analysis Date..:** 12/01/04
Prep Batch #...: 4337403 **Analysis Time..:** 09:01
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**110**	**(75 - 120)**			**SW846 8260B**
	114	**(75 - 120)**	**3.7**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**109**	**(78 - 118)**			**SW846 8260B**
	113	**(78 - 118)**	**3.3**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**85**	**(66 - 132)**			**SW846 8260B**
	89	**(66 - 132)**	**4.9**	**(0-26)**	**SW846 8260B**
Toluene	**106**	**(78 - 118)**			**SW846 8260B**
	109	**(78 - 118)**	**3.4**	**(0-22)**	**SW846 8260B**
Trichloroethene	**106**	**(79 - 122)**			**SW846 8260B**
	112	**(79 - 122)**	**5.2**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	93	(73 - 118)
	99	(73 - 118)
1,2-Dichloroethane-d4	91	(62 - 128)
	99	(62 - 128)
4-Bromofluorobenzene	92	(78 - 118)
	97	(78 - 118)
Toluene-d8	96	(77 - 117)
	99	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX5041AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L020000-403 GX5041AD-LCSD
Prep Date.....: 12/01/04 **Analysis Date..:** 12/01/04
Prep Batch #...: 4337403 **Analysis Time..:** 09:01
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**10.0**	**11.0**	**ug/L**	**110**		**SW846 8260B**
	10.0	**11.4**	**ug/L**	**114**	**3.7**	**SW846 8260B**
Chlorobenzene	**10.0**	**10.9**	**ug/L**	**109**		**SW846 8260B**
	10.0	**11.3**	**ug/L**	**113**	**3.3**	**SW846 8260B**
1,1-Dichloroethene	**10.0**	**8.50**	**ug/L**	**85**		**SW846 8260B**
	10.0	**8.93**	**ug/L**	**89**	**4.9**	**SW846 8260B**
Toluene	**10.0**	**10.6**	**ug/L**	**106**		**SW846 8260B**
	10.0	**10.9**	**ug/L**	**109**	**3.4**	**SW846 8260B**
Trichloroethene	**10.0**	**10.6**	**ug/L**	**106**		**SW846 8260B**
	10.0	**11.2**	**ug/L**	**112**	**5.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	93	(73 - 118)
	99	(73 - 118)
1,2-Dichloroethane-d4	91	(62 - 128)
	99	(62 - 128)
4-Bromofluorobenzene	92	(78 - 118)
	97	(78 - 118)
Toluene-d8	96	(77 - 117)
	99	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX0GT1AC-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K300239-003 GX0GT1AD-MSD
Date Sampled...: 11/29/04 07:20 **Date Received..:** 11/30/04
Prep Date.....: 12/01/04 **Analysis Date..:** 12/01/04
Prep Batch #...: 4337403 **Analysis Time..:** 13:12
Dilution Factor: 10

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**99**	**(75 - 120)**			**SW846 8260B**
	105	**(75 - 120)**	**6.2**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**99**	**(78 - 118)**			**SW846 8260B**
	102	**(78 - 118)**	**3.3**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**88**	**(66 - 132)**			**SW846 8260B**
	92	**(66 - 132)**	**4.9**	**(0-26)**	**SW846 8260B**
Toluene	**97**	**(78 - 118)**			**SW846 8260B**
	102	**(78 - 118)**	**5.1**	**(0-22)**	**SW846 8260B**
Trichloroethene	**98**	**(79 - 122)**			**SW846 8260B**
	102	**(79 - 122)**	**4.4**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	96	(73 - 118)
	97	(73 - 118)
1,2-Dichloroethane-d4	96	(62 - 128)
	96	(62 - 128)
4-Bromofluorobenzene	92	(78 - 118)
	96	(78 - 118)
Toluene-d8	98	(77 - 117)
	100	(77 - 117)

NOTE(S)

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX0GT1AC-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K300239-003 GX0GT1AD-MSD
Date Sampled...: 11/29/04 07:20 **Date Received..:** 11/30/04
Prep Date.....: 12/01/04 **Analysis Date..:** 12/01/04
Prep Batch #...: 4337403 **Analysis Time..:** 13:12
Dilution Factor: 10

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**100**	**98.8**	**ug/L**	**99**		**SW846 8260B**
	ND	**100**	**105**	**ug/L**	**105**	**6.2**	**SW846 8260B**
Chlorobenzene	**ND**	**100**	**98.7**	**ug/L**	**99**		**SW846 8260B**
	ND	**100**	**102**	**ug/L**	**102**	**3.3**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**100**	**87.5**	**ug/L**	**88**		**SW846 8260B**
	ND	**100**	**91.9**	**ug/L**	**92**	**4.9**	**SW846 8260B**
Toluene	**4.8**	**100**	**101**	**ug/L**	**97**		**SW846 8260B**
	4.8	**100**	**107**	**ug/L**	**102**	**5.1**	**SW846 8260B**
Trichloroethene	**ND**	**100**	**98.0**	**ug/L**	**98**		**SW846 8260B**
	ND	**100**	**102**	**ug/L**	**102**	**4.4**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	96	(73 - 118)
	97	(73 - 118)
1,2-Dichloroethane-d4	96	(62 - 128)
	96	(62 - 128)
4-Bromofluorobenzene	92	(78 - 118)
	96	(78 - 118)
Toluene-d8	98	(77 - 117)
	100	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX7A81AA **Matrix.....:** WATER
MB Lot-Sample #: D4L020000-570

Prep Date.....: 12/02/04 **Analysis Time..:** 08:36
Analysis Date..: 12/02/04 **Prep Batch #...:** 4337570
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	ND	10	ug/L	SW846 8260B
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	2.0	ug/L	SW846 8260B
2-Butanone (MEK)	ND	5.0	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	2.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	2.0	ug/L	SW846 8260B
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260B
cis-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
trans-1,2-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260B
1,2-Dichloroethene (total)	ND	1.0	ug/L	SW846 8260B
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
2-Hexanone	ND	5.0	ug/L	SW846 8260B
Methylene chloride	ND	5.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
Methyl tert-butyl ether	ND	5.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
Trichloroethene	ND	1.0	ug/L	SW846 8260B
Vinyl chloride	ND	2.0	ug/L	SW846 8260B
Xylenes (total)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	91	(73 - 118)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX7A81AA **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dichloroethane-d4	91	(62 - 128)		
4-Bromofluorobenzene	88	(78 - 118)		
Toluene-d8	94	(77 - 117)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

US GEOLOGICAL SURVEY

Method Blank Report

GC/MS Volatiles

Lot-Sample #: D4L020000-570 B **Work Order #:** GX7A81AA **Matrix:** WATER

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Cyclotetrasiloxane, octamethyl	556-67-2	1.7 J	M	11.684	ug/L
Unknown		1.5 J	M	13.588	ug/L
Unknown		2.1 J	M	13.84	ug/L
Acetic acid, 2-ethylhexyl este	103-09-3	2.3 J	M	14.127	ug/L
Pentatriacontane	630-07-9	1.3 J	M	14.774	ug/L
Unknown		18 J	M	15.349	ug/L
Unknown		15 J	M	13.696	ug/L

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX7A81AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L020000-570 GX7A81AD-LCSD
Prep Date.....: 12/02/04 **Analysis Date..:** 12/02/04
Prep Batch #...: 4337570 **Analysis Time..:** 08:16
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**109**	**(75 - 120)**			**SW846 8260B**
	108	**(75 - 120)**	**0.85**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**107**	**(78 - 118)**			**SW846 8260B**
	105	**(78 - 118)**	**1.6**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**82**	**(66 - 132)**			**SW846 8260B**
	79	**(66 - 132)**	**3.9**	**(0-26)**	**SW846 8260B**
Toluene	**104**	**(78 - 118)**			**SW846 8260B**
	98	**(78 - 118)**	**5.6**	**(0-22)**	**SW846 8260B**
Trichloroethene	**105**	**(79 - 122)**			**SW846 8260B**
	103	**(79 - 122)**	**2.2**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	92	(73 - 118)
	95	(73 - 118)
1,2-Dichloroethane-d4	92	(62 - 128)
	96	(62 - 128)
4-Bromofluorobenzene	90	(78 - 118)
	92	(78 - 118)
Toluene-d8	94	(77 - 117)
	94	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GX7A81AC-LCS **Matrix.....:** WATER
LCS Lot-Sample#: D4L020000-570 GX7A81AD-LCSD
Prep Date.....: 12/02/04 **Analysis Date..:** 12/02/04
Prep Batch #...: 4337570 **Analysis Time..:** 08:16
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Benzene	**10.0**	**10.9**	**ug/L**	**109**		**SW846 8260B**
	10.0	**10.8**	**ug/L**	**108**	**0.85**	**SW846 8260B**
Chlorobenzene	**10.0**	**10.7**	**ug/L**	**107**		**SW846 8260B**
	10.0	**10.5**	**ug/L**	**105**	**1.6**	**SW846 8260B**
1,1-Dichloroethene	**10.0**	**8.21**	**ug/L**	**82**		**SW846 8260B**
	10.0	**7.89**	**ug/L**	**79**	**3.9**	**SW846 8260B**
Toluene	**10.0**	**10.4**	**ug/L**	**104**		**SW846 8260B**
	10.0	**9.82**	**ug/L**	**98**	**5.6**	**SW846 8260B**
Trichloroethene	**10.0**	**10.5**	**ug/L**	**105**		**SW846 8260B**
	10.0	**10.3**	**ug/L**	**103**	**2.2**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	92	(73 - 118)
	95	(73 - 118)
1,2-Dichloroethane-d4	92	(62 - 128)
	96	(62 - 128)
4-Bromofluorobenzene	90	(78 - 118)
	92	(78 - 118)
Toluene-d8	94	(77 - 117)
	94	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXEVV1AT-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K190267-004 GXEVV1AU-MSD
Date Sampled...: 11/18/04 12:00 **Date Received..:** 11/19/04
Prep Date.....: 12/02/04 **Analysis Date..:** 12/02/04
Prep Batch #...: 4337570 **Analysis Time..:** 09:35
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	**102**	**(75 - 120)**			**SW846 8260B**
	103	**(75 - 120)**	**0.16**	**(0-21)**	**SW846 8260B**
Chlorobenzene	**100**	**(78 - 118)**			**SW846 8260B**
	101	**(78 - 118)**	**1.3**	**(0-20)**	**SW846 8260B**
1,1-Dichloroethene	**71**	**(66 - 132)**			**SW846 8260B**
	73	**(66 - 132)**	**3.2**	**(0-26)**	**SW846 8260B**
Toluene	**97**	**(78 - 118)**			**SW846 8260B**
	97	**(78 - 118)**	**0.57**	**(0-22)**	**SW846 8260B**
Trichloroethene	**96**	**(79 - 122)**			**SW846 8260B**
	98	**(79 - 122)**	**2.6**	**(0-23)**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	95	(73 - 118)
	94	(73 - 118)
1,2-Dichloroethane-d4	94	(62 - 128)
	94	(62 - 128)
4-Bromofluorobenzene	92	(78 - 118)
	90	(78 - 118)
Toluene-d8	97	(77 - 117)
	95	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

GC/MS Volatiles

Client Lot #...: LEE-5 **Work Order #...:** GXEVV1AT-MS **Matrix.....:** WATER
MS Lot-Sample #: D4K190267-004 GXEVV1AU-MSD
Date Sampled...: 11/18/04 12:00 **Date Received..:** 11/19/04
Prep Date.....: 12/02/04 **Analysis Date..:** 12/02/04
Prep Batch #...: 4337570 **Analysis Time..:** 09:35
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	**ND**	**10.0**	**10.2**	**ug/L**	**102**		**SW846 8260B**
	ND	**10.0**	**10.3**	**ug/L**	**103**	**0.16**	**SW846 8260B**
Chlorobenzene	**ND**	**10.0**	**9.98**	**ug/L**	**100**		**SW846 8260B**
	ND	**10.0**	**10.1**	**ug/L**	**101**	**1.3**	**SW846 8260B**
1,1-Dichloroethene	**ND**	**10.0**	**7.12**	**ug/L**	**71**		**SW846 8260B**
	ND	**10.0**	**7.35**	**ug/L**	**73**	**3.2**	**SW846 8260B**
Toluene	**ND**	**10.0**	**9.65**	**ug/L**	**97**		**SW846 8260B**
	ND	**10.0**	**9.71**	**ug/L**	**97**	**0.57**	**SW846 8260B**
Trichloroethene	**ND**	**10.0**	**9.57**	**ug/L**	**96**		**SW846 8260B**
	ND	**10.0**	**9.82**	**ug/L**	**98**	**2.6**	**SW846 8260B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	95	(73 - 118)
	94	(73 - 118)
1,2-Dichloroethane-d4	94	(62 - 128)
	94	(62 - 128)
4-Bromofluorobenzene	92	(78 - 118)
	90	(78 - 118)
Toluene-d8	97	(77 - 117)
	95	(77 - 117)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

METHOD BLANK REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: D4K180000-013 **Prep Batch #...:** 4323013						
Calcium	ND	200	ug/L	SW846 6010B	11/19-11/22/04	GW8KA1AA
		Dilution Factor: 1				
		Analysis Time..: 13:43				
Chromium	ND	10	ug/L	SW846 6010B	11/19-11/22/04	GW8KA1AF
		Dilution Factor: 1				
		Analysis Time..: 12:31				
Magnesium	ND	200	ug/L	SW846 6010B	11/19-11/22/04	GW8KA1AD
		Dilution Factor: 1				
		Analysis Time..: 13:43				
Manganese	ND	10	ug/L	SW846 6010B	11/19-11/22/04	GW8KA1AG
		Dilution Factor: 1				
		Analysis Time..: 12:31				
Nickel	ND	40	ug/L	SW846 6010B	11/19-11/22/04	GW8KA1AH
		Dilution Factor: 1				
		Analysis Time..: 12:31				
Potassium	ND	3000	ug/L	SW846 6010B	11/19-11/22/04	GW8KA1AC
		Dilution Factor: 1				
		Analysis Time..: 13:43				
Sodium	ND	5000	ug/L	SW846 6010B	11/19-11/22/04	GW8KA1AE
		Dilution Factor: 1				
		Analysis Time..: 13:43				
MB Lot-Sample #: D4K180000-679 **Prep Batch #...:** 4323679						
Calcium	ND	200	ug/L	SW846 6010B	11/23-11/24/04	GXC8K1AC
		Dilution Factor: 1				
		Analysis Time..: 04:51				
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXC8K1AU
		Dilution Factor: 1				
		Analysis Time..: 21:26				
Magnesium	ND	200	ug/L	SW846 6010B	11/23-11/24/04	GXC8K1AE
		Dilution Factor: 1				
		Analysis Time..: 04:51				

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METHOD BLANK REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Manganese	ND	10	ug/L	SW846 6010B	11/23-11/24/04	GXC8K1AV
		Dilution Factor: 1				
		Analysis Time..: 04:51				
Nickel	ND	40	ug/L	SW846 6010B	11/23-11/26/04	GXC8K1AW
		Dilution Factor: 1				
		Analysis Time..: 21:26				
Potassium	ND	3000	ug/L	SW846 6010B	11/23-11/24/04	GXC8K1AD
		Dilution Factor: 1				
		Analysis Time..: 04:51				
Sodium	ND	5000	ug/L	SW846 6010B	11/23-11/24/04	GXC8K1AF
		Dilution Factor: 1				
		Analysis Time..: 04:51				

MB Lot-Sample #: D4K190000-607 **Prep Batch #...:** 4324607

Calcium	ND	200	ug/L	SW846 6010B	11/23-11/25/04	GXHED1AA
		Dilution Factor: 1				
		Analysis Time..: 06:02				
Chromium	ND	10	ug/L	SW846 6010B	11/23-11/26/04	GXHED1AF
		Dilution Factor: 1				
		Analysis Time..: 20:25				
Magnesium	ND	200	ug/L	SW846 6010B	11/23-11/25/04	GXHED1AD
		Dilution Factor: 1				
		Analysis Time..: 06:02				
Manganese	ND	10	ug/L	SW846 6010B	11/23-11/25/04	GXHED1AG
		Dilution Factor: 1				
		Analysis Time..: 06:02				
Nickel	ND	40	ug/L	SW846 6010B	11/23-11/26/04	GXHED1AH
		Dilution Factor: 1				
		Analysis Time..: 20:25				
Potassium	ND	3000	ug/L	SW846 6010B	11/23-11/25/04	GXHED1AC
		Dilution Factor: 1				
		Analysis Time..: 06:02				
Sodium	ND	5000	ug/L	SW846 6010B	11/23-11/25/04	GXHED1AE
		Dilution Factor: 1				
		Analysis Time..: 06:02				

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METHOD BLANK REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

DISSOLVED Metals

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP-BATCH #
Calcium	104	(89 - 110)			SW846 6010B	11/19-11/22/04	4323013
	102	(89 - 110)	1.8	(0-20)	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1			Analysis Time..: 13:47		
Chromium	96	(89 - 112)			SW846 6010B	11/19-11/22/04	4323013
	97	(89 - 112)	1.3	(0-20)	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1			Analysis Time..: 12:36		
Magnesium	104	(91 - 111)			SW846 6010B	11/19-11/22/04	4323013
	102	(91 - 111)	1.9	(0-20)	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1			Analysis Time..: 13:47		
Manganese	94	(90 - 110)			SW846 6010B	11/19-11/22/04	4323013
	95	(90 - 110)	1.3	(0-20)	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1			Analysis Time..: 12:36		
Nickel	94	(90 - 110)			SW846 6010B	11/19-11/22/04	4323013
	95	(90 - 110)	1.0	(0-20)	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1			Analysis Time..: 12:36		
Potassium	105	(86 - 111)			SW846 6010B	11/19-11/22/04	4323013
	104	(86 - 111)	1.6	(0-20)	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1			Analysis Time..: 13:47		
Sodium	104	(91 - 112)			SW846 6010B	11/19-11/22/04	4323013
	102	(91 - 112)	1.6	(0-20)	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1			Analysis Time..: 13:47		
Calcium	107	(89 - 110)			SW846 6010B	11/23-11/24/04	4323679
	106	(89 - 110)	1.2	(0-20)	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1			Analysis Time..: 04:56		
Chromium	99	(89 - 112)			SW846 6010B	11/23-11/26/04	4323679
	97	(89 - 112)	2.0	(0-20)	SW846 6010B	11/23-11/26/04	4323679
		Dilution Factor: 1			Analysis Time..: 21:32		
Magnesium	110	(91 - 111)			SW846 6010B	11/23-11/24/04	4323679
	109	(91 - 111)	0.90	(0-20)	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1			Analysis Time..: 04:56		

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

DISSOLVED Metals

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP-BATCH #
Manganese	103	(90 - 110)			SW846 6010B	11/23-11/24/04	4323679
	101	(90 - 110)	1.1	(0-20)	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1			Analysis Time..: 04:56		
Nickel	96	(90 - 110)			SW846 6010B	11/23-11/26/04	4323679
	94	(90 - 110)	2.2	(0-20)	SW846 6010B	11/23-11/26/04	4323679
		Dilution Factor: 1			Analysis Time..: 21:32		
Potassium	109	(86 - 111)			SW846 6010B	11/23-11/24/04	4323679
	107	(86 - 111)	0.94	(0-20)	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1			Analysis Time..: 04:56		
Sodium	110	(91 - 112)			SW846 6010B	11/23-11/24/04	4323679
	110	(91 - 112)	0.70	(0-20)	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1			Analysis Time..: 04:56		
Calcium	104	(89 - 110)			SW846 6010B	11/23-11/25/04	4324607
	105	(89 - 110)	0.46	(0-20)	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1			Analysis Time..: 06:07		
Chromium	98	(89 - 112)			SW846 6010B	11/23-11/26/04	4324607
	97	(89 - 112)	1.3	(0-20)	SW846 6010B	11/23-11/26/04	4324607
		Dilution Factor: 1			Analysis Time..: 20:30		
Magnesium	106	(91 - 111)			SW846 6010B	11/23-11/25/04	4324607
	106	(91 - 111)	0.41	(0-20)	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1			Analysis Time..: 06:07		
Manganese	99	(90 - 110)			SW846 6010B	11/23-11/25/04	4324607
	100	(90 - 110)	0.41	(0-20)	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1			Analysis Time..: 06:07		
Nickel	95	(90 - 110)			SW846 6010B	11/23-11/26/04	4324607
	94	(90 - 110)	1.2	(0-20)	SW846 6010B	11/23-11/26/04	4324607
		Dilution Factor: 1			Analysis Time..: 20:30		
Potassium	106	(86 - 111)			SW846 6010B	11/23-11/25/04	4324607
	106	(86 - 111)	0.50	(0-20)	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1			Analysis Time..: 06:07		

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

DISSOLVED Metals

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP-BATCH #
Sod.....	106	(91 - 112)			SW846 6010B	11/23-11/25/04	4324607
	106	(91 - 112)	0.03	(0-20)	SW846 6010B	11/23-11/25/04	4324607

Dilution Factor: 1 Analysis Time..: 06:07

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

DISSOLVED Metals

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Calcium	50000	51800	ug/L	104		SW846 6010B	11/19-11/22/04	4323013
	50000	50900	ug/L	102	1.8	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1				Analysis Time..: 13:47		
Chromium	200	192	ug/L	96		SW846 6010B	11/19-11/22/04	4323013
	200	194	ug/L	97	1.3	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1				Analysis Time..: 12:36		
Magnesium	50000	52000	ug/L	104		SW846 6010B	11/19-11/22/04	4323013
	50000	51000	ug/L	102	1.9	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1				Analysis Time..: 13:47		
Manganese	500	471	ug/L	94		SW846 6010B	11/19-11/22/04	4323013
	500	477	ug/L	95	1.3	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1				Analysis Time..: 12:36		
Nickel	500	471	ug/L	94		SW846 6010B	11/19-11/22/04	4323013
	500	476	ug/L	95	1.0	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1				Analysis Time..: 12:36		
Potassium	50000	52700	ug/L	105		SW846 6010B	11/19-11/22/04	4323013
	50000	51900	ug/L	104	1.6	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1				Analysis Time..: 13:47		
Sodium	50000	52100	ug/L	104		SW846 6010B	11/19-11/22/04	4323013
	50000	51200	ug/L	102	1.6	SW846 6010B	11/19-11/22/04	4323013
		Dilution Factor: 1				Analysis Time..: 13:47		
Calcium	50000	53700	ug/L	107		SW846 6010B	11/23-11/24/04	4323679
	50000	53100	ug/L	106	1.2	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1				Analysis Time..: 04:56		
Chromium	200	198	ug/L	99		SW846 6010B	11/23-11/26/04	4323679
	200	194	ug/L	97	2.0	SW846 6010B	11/23-11/26/04	4323679
		Dilution Factor: 1				Analysis Time..: 21:32		
Magnesium	50000	54800	ug/L	110		SW846 6010B	11/23-11/24/04	4323679
	50000	54300	ug/L	109	0.90	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1				Analysis Time..: 04:56		

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LABORATORY CONTROL SAMPLE DATA REPORT

DISSOLVED Metals

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Manganese	500	513	ug/L	103		SW846 6010B	11/23-11/24/04	4323679
	500	507	ug/L	101	1.1	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1				Analysis Time..: 04:56		
Nickel	500	480	ug/L	96		SW846 6010B	11/23-11/26/04	4323679
	500	470	ug/L	94	2.2	SW846 6010B	11/23-11/26/04	4323679
		Dilution Factor: 1				Analysis Time..: 21:32		
Potassium	50000	54300	ug/L	109		SW846 6010B	11/23-11/24/04	4323679
	50000	53700	ug/L	107	0.94	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1				Analysis Time..: 04:56		
Sodium	50000	55100	ug/L	110		SW846 6010B	11/23-11/24/04	4323679
	50000	54800	ug/L	110	0.70	SW846 6010B	11/23-11/24/04	4323679
		Dilution Factor: 1				Analysis Time..: 04:56		
Calcium	50000	52200	ug/L	104		SW846 6010B	11/23-11/25/04	4324607
	50000	52400	ug/L	105	0.46	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1				Analysis Time..: 06:07		
Chromium	200	196	ug/L	98		SW846 6010B	11/23-11/26/04	4324607
	200	194	ug/L	97	1.3	SW846 6010B	11/23-11/26/04	4324607
		Dilution Factor: 1				Analysis Time..: 20:30		
Magnesium	50000	52900	ug/L	106		SW846 6010B	11/23-11/25/04	4324607
	50000	53200	ug/L	106	0.41	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1				Analysis Time..: 06:07		
Manganese	500	496	ug/L	99		SW846 6010B	11/23-11/25/04	4324607
	500	498	ug/L	100	0.41	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1				Analysis Time..: 06:07		
Nickel	500	477	ug/L	95		SW846 6010B	11/23-11/26/04	4324607
	500	471	ug/L	94	1.2	SW846 6010B	11/23-11/26/04	4324607
		Dilution Factor: 1				Analysis Time..: 20:30		
Potassium	50000	52800	ug/L	106		SW846 6010B	11/23-11/25/04	4324607
	50000	53100	ug/L	106	0.50	SW846 6010B	11/23-11/25/04	4324607
		Dilution Factor: 1				Analysis Time..: 06:07		

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LABORATORY CONTROL SAMPLE DATA REPORT

DISSOLVED Metals

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sodium	50000	52800	ug/L	106		SW846 6010B	11/23-11/25/04	4324607
	50000	52900	ug/L	106	0.03	SW846 6010B	11/23-11/25/04	4324607

Dilution Factor: 1 Analysis Time..: 06:07

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/16/04 11:00 **Date Received..:** 11/17/04

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: D4K170331-006 **Prep Batch #...:** 4323013							
Calcium	NC,MSB	(48 - 153)			SW846 6010B	11/19-11/22/04	GW7DH1A9
	NC,MSB	(48 - 153)		(0-25)	SW846 6010B	11/19-11/22/04	GW7DH1CA
		Dilution Factor: 1					
		Analysis Time..: 14:06					
Chromium	99	(73 - 135)			SW846 6010B	11/19-11/22/04	GW7DH1CJ
	96	(73 - 135)	3.0	(0-25)	SW846 6010B	11/19-11/22/04	GW7DH1CK
		Dilution Factor: 1					
		Analysis Time..: 13:52					
Magnesium	110	(62 - 146)			SW846 6010B	11/19-11/22/04	GW7DH1CE
	105	(62 - 146)	2.9	(0-25)	SW846 6010B	11/19-11/22/04	GW7DH1CF
		Dilution Factor: 1					
		Analysis Time..: 14:06					
Manganese	100	(79 - 121)			SW846 6010B	11/19-11/22/04	GW7DH1CL
	97	(79 - 121)	3.2	(0-25)	SW846 6010B	11/19-11/22/04	GW7DH1CM
		Dilution Factor: 1					
		Analysis Time..: 13:52					
Nickel	101	(84 - 120)			SW846 6010B	11/19-11/22/04	GW7DH1CN
	98	(84 - 120)	3.4	(0-25)	SW846 6010B	11/19-11/22/04	GW7DH1CP
		Dilution Factor: 1					
		Analysis Time..: 13:52					
Potassium	107	(76 - 132)			SW846 6010B	11/19-11/22/04	GW7DH1CC
	104	(76 - 132)	3.6	(0-25)	SW846 6010B	11/19-11/22/04	GW7DH1CD
		Dilution Factor: 1					
		Analysis Time..: 14:06					
Sodium	NC,MSB	(70 - 203)			SW846 6010B	11/19-11/22/04	GW7DH1CG
	NC,MSB	(70 - 203)		(0-40)	SW846 6010B	11/19-11/22/04	GW7DH1CH
		Dilution Factor: 1					
		Analysis Time..: 14:06					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

MATRIX SPIKE SAMPLE DATA REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/16/04 11:00 **Date Received..:** 11/17/04

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: D4K170331-006 **Prep Batch #...:** 4323013									
Calcium									
	400000	50000	473000	ug/L			SW846 6010B	11/19-11/22/04	GW7DH1A9
			Qualifiers: NC,MSB						
	400000	50000	463000	ug/L			SW846 6010B	11/19-11/22/04	GW7DH1CA
			Qualifiers: NC,MSB						
			Dilution Factor: 1						
			Analysis Time..: 14:06						
Chromium									
	5.3	200	203	ug/L	99		SW846 6010B	11/19-11/22/04	GW7DH1CJ
	5.3	200	197	ug/L	96	3.0	SW846 6010B	11/19-11/22/04	GW7DH1CK
			Dilution Factor: 1						
			Analysis Time..: 13:52						
Magnesium									
	31000	50000	85500	ug/L	110		SW846 6010B	11/19-11/22/04	GW7DH1CE
	31000	50000	83000	ug/L	105	2.9	SW846 6010B	11/19-11/22/04	GW7DH1CF
			Dilution Factor: 1						
			Analysis Time..: 14:06						
Manganese									
	88	500	590	ug/L	100		SW846 6010B	11/19-11/22/04	GW7DH1CL
	88	500	572	ug/L	97	3.2	SW846 6010B	11/19-11/22/04	GW7DH1CM
			Dilution Factor: 1						
			Analysis Time..: 13:52						
Nickel									
	3.7	500	509	ug/L	101		SW846 6010B	11/19-11/22/04	GW7DH1CN
	3.7	500	493	ug/L	98	3.4	SW846 6010B	11/19-11/22/04	GW7DH1CP
			Dilution Factor: 1						
			Analysis Time..: 13:52						
Potassium									
	2000	50000	55700	ug/L	107		SW846 6010B	11/19-11/22/04	GW7DH1CC
	2000	50000	53700	ug/L	104	3.6	SW846 6010B	11/19-11/22/04	GW7DH1CD
			Dilution Factor: 1						
			Analysis Time..: 14:06						
Sodium									
	350000	50000	425000	ug/L			SW846 6010B	11/19-11/22/04	GW7DH1CG
			Qualifiers: NC,MSB						
	350000	50000	413000	ug/L			SW846 6010B	11/19-11/22/04	GW7DH1CH
			Qualifiers: NC,MSB						
			Dilution Factor: 1						
			Analysis Time..: 14:06						

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MATRIX SPIKE SAMPLE DATA REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/16/04 11:00 **Date Received..:** 11/17/04

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

MATRIX SPIKE SAMPLE EVALUATION REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/18/04

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: D4K180423-009 **Prep Batch #...:** 4323679							
Calcium	NC,MSB	(48 - 153)			SW846 6010B	11/23-11/24/04	GXC0L1A3
	NC,MSB	(48 - 153)		(0-25)	SW846 6010B	11/23-11/24/04	GXC0L1A4
		Dilution Factor: 1					
		Analysis Time..: 05:15					
Chromium	100	(73 - 135)			SW846 6010B	11/23-11/26/04	GXC0L1CQ
	97	(73 - 135)	3.3	(0-25)	SW846 6010B	11/23-11/26/04	GXC0L1CR
		Dilution Factor: 1					
		Analysis Time..: 22:02					
Magnesium	118	(62 - 146)			SW846 6010B	11/23-11/24/04	GXC0L1A7
	115	(62 - 146)	1.3	(0-25)	SW846 6010B	11/23-11/24/04	GXC0L1A8
		Dilution Factor: 1					
		Analysis Time..: 05:15					
Manganese	102	(79 - 121)			SW846 6010B	11/23-11/24/04	GXC0L1CU
	100	(79 - 121)	2.1	(0-25)	SW846 6010B	11/23-11/24/04	GXC0L1CV
		Dilution Factor: 1					
		Analysis Time..: 05:15					
Nickel	97	(84 - 120)			SW846 6010B	11/23-11/26/04	GXC0L1CX
	94	(84 - 120)	2.5	(0-25)	SW846 6010B	11/23-11/26/04	GXC0L1C0
		Dilution Factor: 1					
		Analysis Time..: 22:02					
Potassium	117	(76 - 132)			SW846 6010B	11/23-11/24/04	GXC0L1A5
	114	(76 - 132)	2.2	(0-25)	SW846 6010B	11/23-11/24/04	GXC0L1A6
		Dilution Factor: 1					
		Analysis Time..: 05:15					
Sodium	NC,MSB	(70 - 203)			SW846 6010B	11/23-11/24/04	GXC0L1A9
	NC,MSB	(70 - 203)		(0-40)	SW846 6010B	11/23-11/24/04	GXC0L1CA
		Dilution Factor: 1					
		Analysis Time..: 05:15					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

MATRIX SPIKE SAMPLE DATA REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/18/04

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: D4K180423-009 **Prep Batch #...:** 4323679									
Calcium									
	620000	50000	687000	ug/L			SW846 6010B	11/23-11/24/04	GXC0L1A3
			Qualifiers: NC,MSB						
	620000	50000	684000	ug/L			SW846 6010B	11/23-11/24/04	GXC0L1A4
			Qualifiers: NC,MSB						
			Dilution Factor: 1						
			Analysis Time..: 05:15						
Chromium									
	ND	200	200	ug/L	100		SW846 6010B	11/23-11/26/04	GXC0L1CQ
	ND	200	193	ug/L	97	3.3	SW846 6010B	11/23-11/26/04	GXC0L1CR
			Dilution Factor: 1						
			Analysis Time..: 22:02						
Magnesium									
	68000	50000	126000	ug/L	118		SW846 6010B	11/23-11/24/04	GXC0L1A7
	68000	50000	125000	ug/L	115	1.3	SW846 6010B	11/23-11/24/04	GXC0L1A8
			Dilution Factor: 1						
			Analysis Time..: 05:15						
Manganese									
	17	500	529	ug/L	102		SW846 6010B	11/23-11/24/04	GXC0L1CU
	17	500	518	ug/L	100	2.1	SW846 6010B	11/23-11/24/04	GXC0L1CV
			Dilution Factor: 1						
			Analysis Time..: 05:15						
Nickel									
	ND	500	485	ug/L	97		SW846 6010B	11/23-11/26/04	GXC0L1CX
	ND	500	473	ug/L	94	2.5	SW846 6010B	11/23-11/26/04	GXC0L1C0
			Dilution Factor: 1						
			Analysis Time..: 22:02						
Potassium									
	9400	50000	67800	ug/L	117		SW846 6010B	11/23-11/24/04	GXC0L1A5
	9400	50000	66300	ug/L	114	2.2	SW846 6010B	11/23-11/24/04	GXC0L1A6
			Dilution Factor: 1						
			Analysis Time..: 05:15						
Sodium									
	290000	50000	354000	ug/L			SW846 6010B	11/23-11/24/04	GXC0L1A9
			Qualifiers: NC,MSB						
	290000	50000	352000	ug/L			SW846 6010B	11/23-11/24/04	GXC0L1CA
			Qualifiers: NC,MSB						
			Dilution Factor: 1						
			Analysis Time..: 05:15						

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MATRIX SPIKE SAMPLE DATA REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/18/04 11:10 **Date Received..:** 11/18/04

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

MATRIX SPIKE SAMPLE EVALUATION REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/18/04 09:00 **Date Received..:** 11/19/04

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: D4K190267-001 **Prep Batch #...:** 4324607							
Calcium	NC,MSB	(48 - 153)			SW846 6010B	11/23-11/25/04	GXEVE1AU
	NC,MSB	(48 - 153)		(0-25)	SW846 6010B	11/23-11/25/04	GXEVE1AV
		Dilution Factor: 1					
		Analysis Time..: 06:26					
Chromium	95	(73 - 135)			SW846 6010B	11/23-11/26/04	GXEVE1A4
	96	(73 - 135)	0.83	(0-25)	SW846 6010B	11/23-11/26/04	GXEVE1A5
		Dilution Factor: 1					
		Analysis Time..: 20:51					
Magnesium	106	(62 - 146)			SW846 6010B	11/23-11/25/04	GXEVE1A0
	107	(62 - 146)	0.72	(0-25)	SW846 6010B	11/23-11/25/04	GXEVE1A1
		Dilution Factor: 1					
		Analysis Time..: 06:26					
Manganese	95	(79 - 121)			SW846 6010B	11/23-11/25/04	GXEVE1A6
	97	(79 - 121)	1.6	(0-25)	SW846 6010B	11/23-11/25/04	GXEVE1A7
		Dilution Factor: 1					
		Analysis Time..: 06:26					
Nickel	95	(84 - 120)			SW846 6010B	11/23-11/26/04	GXEVE1A8
	96	(84 - 120)	1.2	(0-25)	SW846 6010B	11/23-11/26/04	GXEVE1A9
		Dilution Factor: 1					
		Analysis Time..: 20:51					
Potassium	107	(76 - 132)			SW846 6010B	11/23-11/25/04	GXEVE1AW
	109	(76 - 132)	1.1	(0-25)	SW846 6010B	11/23-11/25/04	GXEVE1AX
		Dilution Factor: 1					
		Analysis Time..: 06:26					
Sodium	NC,MSB	(70 - 203)			SW846 6010B	11/23-11/25/04	GXEVE1A2
	NC,MSB	(70 - 203)		(0-40)	SW846 6010B	11/23-11/25/04	GXEVE1A3
		Dilution Factor: 1					
		Analysis Time..: 06:26					

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

MATRIX SPIKE SAMPLE DATA REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/18/04 09:00 **Date Received..:** 11/19/04

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: D4K190267-001 **Prep Batch #...:** 4324607									
Calcium									
	350000	50000	411000	ug/L			SW846 6010B	11/23-11/25/04	GXEVE1AU
			Qualifiers: NC,MSB						
	350000	50000	408000	ug/L			SW846 6010B	11/23-11/25/04	GXEVE1AV
			Qualifiers: NC,MSB						
			Dilution Factor: 1						
			Analysis Time..: 06:26						
Chromium									
	4.9	200	196	ug/L	95		SW846 6010B	11/23-11/26/04	GXEVE1A4
	4.9	200	197	ug/L	96	0.83	SW846 6010B	11/23-11/26/04	GXEVE1A5
			Dilution Factor: 1						
			Analysis Time..: 20:51						
Magnesium									
	26000	50000	79200	ug/L	106		SW846 6010B	11/23-11/25/04	GXEVE1A0
	26000	50000	79700	ug/L	107	0.72	SW846 6010B	11/23-11/25/04	GXEVE1A1
			Dilution Factor: 1						
			Analysis Time..: 06:26						
Manganese									
	12	500	489	ug/L	95		SW846 6010B	11/23-11/25/04	GXEVE1A6
	12	500	497	ug/L	97	1.6	SW846 6010B	11/23-11/25/04	GXEVE1A7
			Dilution Factor: 1						
			Analysis Time..: 06:26						
Nickel									
	ND	500	476	ug/L	95		SW846 6010B	11/23-11/26/04	GXEVE1A8
	ND	500	482	ug/L	96	1.2	SW846 6010B	11/23-11/26/04	GXEVE1A9
			Dilution Factor: 1						
			Analysis Time..: 20:51						
Potassium									
	1500	50000	55200	ug/L	107		SW846 6010B	11/23-11/25/04	GXEVE1AW
	1500	50000	55800	ug/L	109	1.1	SW846 6010B	11/23-11/25/04	GXEVE1AX
			Dilution Factor: 1						
			Analysis Time..: 06:26						
Sodium									
	310000	50000	365000	ug/L			SW846 6010B	11/23-11/25/04	GXEVE1A2
			Qualifiers: NC,MSB						
	310000	50000	361000	ug/L			SW846 6010B	11/23-11/25/04	GXEVE1A3
			Qualifiers: NC,MSB						
			Dilution Factor: 1						
			Analysis Time..: 06:26						

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MATRIX SPIKE SAMPLE DATA REPORT

DISSOLVED Metals

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 11/18/04 09:00 **Date Received..:** 11/19/04

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and/or RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		Work Order #: GXCRQ1AA		MB Lot-Sample #:	D4K180000-580	
	1.1 B	**3.0**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323580**
		Dilution Factor: 1				
		Analysis Time..: 03:02				
Chloride		Work Order #: GXW8P1AA		MB Lot-Sample #:	D4K190000-498	
	ND	3.0	mg/L	MCAWW 300.0A	11/18/04	4324498
		Dilution Factor: 1				
		Analysis Time..: 16:43				
Chloride		Work Order #: GXW561AA		MB Lot-Sample #:	D4K220000-354	
	ND	3.0	mg/L	MCAWW 300.0A	11/19/04	4327354
		Dilution Factor: 1				
		Analysis Time..: 15:47				
Fluoride		Work Order #: GXCQN1AA		MB Lot-Sample #:	D4K180000-581	
	ND	1.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323581
		Dilution Factor: 1				
		Analysis Time..: 03:02				
Fluoride		Work Order #: GXW8L1AA		MB Lot-Sample #:	D4K190000-502	
	ND	1.0	mg/L	MCAWW 300.0A	11/18/04	4324502
		Dilution Factor: 1				
		Analysis Time..: 16:43				
Fluoride		Work Order #: GXW5X1AA		MB Lot-Sample #:	D4K220000-356	
	ND	1.0	mg/L	MCAWW 300.0A	11/19/04	4327356
		Dilution Factor: 1				
		Analysis Time..: 15:47				
Nitrate		Work Order #: GXCTV1AA		MB Lot-Sample #:	D4K180000-582	
	ND	0.50	mg/L	MCAWW 300.0A	11/17-11/18/04	4323582
		Dilution Factor: 1				
		Analysis Time..: 03:02				
Nitrate		Work Order #: GXW8T1AA		MB Lot-Sample #:	D4K190000-499	
	ND	0.50	mg/L	MCAWW 300.0A	11/18/04	4324499
		Dilution Factor: 1				
		Analysis Time..: 16:43				
Nitrate		Work Order #: GXW7A1AA		MB Lot-Sample #:	D4K220000-352	
	ND	0.50	mg/L	MCAWW 300.0A	11/19/04	4327352
		Dilution Factor: 1				
		Analysis Time..: 15:47				

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METHOD BLANK REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate-Nitrite		Work Order #: GXT131AA		MB Lot-Sample #: D4K240000-500		
	ND	0.10	mg/L	MCAWW 353.2	11/23/04	4329500
		Dilution Factor: 1				
		Analysis Time..: 20:00				
Nitrate-Nitrite		Work Order #: GXT5V1AA		MB Lot-Sample #: D4K240000-527		
	ND	0.10	mg/L	MCAWW 353.2	11/24/04	4329527
		Dilution Factor: 1				
		Analysis Time..: 01:00				
Nitrate-Nitrite		Work Order #: GX6JH1AA		MB Lot-Sample #: D4L020000-471		
	ND	0.10	mg/L	MCAWW 353.2	12/02/04	4337471
		Dilution Factor: 1				
		Analysis Time..: 01:00				
Phosphate as P, Ortho		Work Order #: GXCT81AA		MB Lot-Sample #: D4K180000-584		
	0.17 B	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/17-11/18/04**	**4323584**
		Dilution Factor: 1				
		Analysis Time..: 03:02				
Phosphate as P, Ortho		Work Order #: GXW8W1AA		MB Lot-Sample #: D4K190000-503		
	0.13 B	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/18/04**	**4324503**
		Dilution Factor: 1				
		Analysis Time..: 16:43				
Phosphate as P, Ortho		Work Order #: GXW7G1AA		MB Lot-Sample #: D4K220000-357		
	0.15 B	**0.50**	**mg/L**	**MCAWW 300.0A**	**11/19/04**	**4327357**
		Dilution Factor: 1				
		Analysis Time..: 15:47				
Sulfate		Work Order #: GXCXG1AA		MB Lot-Sample #: D4K180000-583		
	ND	5.0	mg/L	MCAWW 300.0A	11/17-11/18/04	4323583
		Dilution Factor: 1				
		Analysis Time..: 03:02				
Sulfate		Work Order #: GXW8X1AA		MB Lot-Sample #: D4K190000-501		
	ND	5.0	mg/L	MCAWW 300.0A	11/18/04	4324501
		Dilution Factor: 1				
		Analysis Time..: 16:43				

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METHOD BLANK REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate		Work Order #: GXW7P1AA		MB Lot-Sample #: D4K220000-353		
	ND	5.0	mg/L	MCAWW 300.0A	11/19/04	4327353
		Dilution Factor: 1				
		Analysis Time..: 15:47				
Sulfate		Work Order #: GXPGM1AA		MB Lot-Sample #: D4K230000-485		
	ND	5.0	mg/L	MCAWW 300.0A	11/22/04	4328485
		Dilution Factor: 1				
		Analysis Time..: 15:19				
Sulfate		Work Order #: G0D7P1AA		MB Lot-Sample #: D4L060000-472		
	ND	5.0	mg/L	MCAWW 300.0A	12/03/04	4341472
		Dilution Factor: 1				
		Analysis Time..: 16:05				
Total Dissolved Solids		Work Order #: GXWWP1AA		MB Lot-Sample #: D4K240000-041		
	ND	10	mg/L	MCAWW 160.1	11/23/04	4329041
		Dilution Factor: 1				
		Analysis Time..: 11:40				
Total Dissolved Solids		Work Order #: GXWWX1AA		MB Lot-Sample #: D4K240000-049		
	ND	10	mg/L	MCAWW 160.1	11/23/04	4329049
		Dilution Factor: 1				
		Analysis Time..: 16:50				
Total Dissolved Solids		Work Order #: GXWX21AA		MB Lot-Sample #: D4K290000-355		
	ND	10	mg/L	MCAWW 160.1	11/24/04	4334355
		Dilution Factor: 1				
		Analysis Time..: 10:40				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		WO#:GXCRQ1AC-LCS/GXCRQ1AD-LCSD LCS Lot-Sample#: D4K180000-580					
	102	(90 - 110)			MCAWW 300.0A	11/17-11/18/04	4323580
	102	(90 - 110)	0.34	(0-10)	MCAWW 300.0A	11/17-11/18/04	4323580
		Dilution Factor: 1			Analysis Time..: 02:23		
Chloride		WO#:GXW561AC-LCS/GXW561AD-LCSD LCS Lot-Sample#: D4K220000-354					
	110	(90 - 110)			MCAWW 300.0A	11/19/04	4327354
	101	(90 - 110)	9.2	(0-10)	MCAWW 300.0A	11/19/04	4327354
		Dilution Factor: 1			Analysis Time..: 15:21		
Chloride		WO#:GXW8P1AC-LCS/GXW8P1AD-LCSD LCS Lot-Sample#: D4K190000-498					
	102	(90 - 110)			MCAWW 300.0A	11/18/04	4324498
	101	(90 - 110)	0.34	(0-10)	MCAWW 300.0A	11/18/04	4324498
		Dilution Factor: 1			Analysis Time..: 16:17		
Fluoride		WO#:GXCQN1AC-LCS/GXCQN1AD-LCSD LCS Lot-Sample#: D4K180000-581					
	104	(90 - 110)			MCAWW 300.0A	11/17-11/18/04	4323581
	104	(90 - 110)	0.24	(0-10)	MCAWW 300.0A	11/17-11/18/04	4323581
		Dilution Factor: 1			Analysis Time..: 02:23		
Fluoride		WO#:GXW5X1AC-LCS/GXW5X1AD-LCSD LCS Lot-Sample#: D4K220000-356					
	104	(90 - 110)			MCAWW 300.0A	11/19/04	4327356
	104	(90 - 110)	0.0	(0-10)	MCAWW 300.0A	11/19/04	4327356
		Dilution Factor: 1			Analysis Time..: 15:21		
Fluoride		WO#:GXW8L1AC-LCS/GXW8L1AD-LCSD LCS Lot-Sample#: D4K190000-502					
	104	(90 - 110)			MCAWW 300.0A	11/18/04	4324502
	104	(90 - 110)	0.24	(0-10)	MCAWW 300.0A	11/18/04	4324502
		Dilution Factor: 1			Analysis Time..: 16:17		
Nitrate		WO#:GXCTV1AC-LCS/GXCTV1AD-LCSD LCS Lot-Sample#: D4K180000-582					
	100	(90 - 110)			MCAWW 300.0A	11/17-11/18/04	4323582
	100	(90 - 110)	0.25	(0-10)	MCAWW 300.0A	11/17-11/18/04	4323582
		Dilution Factor: 1			Analysis Time..: 02:23		
Nitrate		WO#:GXW7A1AC-LCS/GXW7A1AD-LCSD LCS Lot-Sample#: D4K220000-352					
	100	(90 - 110)			MCAWW 300.0A	11/19/04	4327352
	100	(90 - 110)	0.19	(0-10)	MCAWW 300.0A	11/19/04	4327352
		Dilution Factor: 1			Analysis Time..: 15:21		

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate		WO#:GXW8T1AC-LCS/GXW8T1AD-LCSD LCS Lot-Sample#: D4K190000-499					
	100	(90 - 110)			MCAWW 300.0A	11/18/04	4324499
	100	(90 - 110)	0.0	(0-10)	MCAWW 300.0A	11/18/04	4324499
		Dilution Factor: 1			Analysis Time..: 16:17		
Nitrate-Nitrite		WO#:GXT131AC-LCS/GXT131AD-LCSD LCS Lot-Sample#: D4K240000-500					
	99	(92 - 112)			MCAWW 353.2	11/23/04	4329500
	99	(92 - 112)	0.27	(0-10)	MCAWW 353.2	11/23/04	4329500
		Dilution Factor: 1			Analysis Time..: 20:00		
Nitrate-Nitrite		WO#:GXT5V1AC-LCS/GXT5V1AD-LCSD LCS Lot-Sample#: D4K240000-527					
	93	(92 - 112)			MCAWW 353.2	11/24/04	4329527
	93	(92 - 112)	0.16	(0-10)	MCAWW 353.2	11/24/04	4329527
		Dilution Factor: 1			Analysis Time..: 01:00		
Nitrate-Nitrite		WO#:GX6JH1AC-LCS/GX6JH1AD-LCSD LCS Lot-Sample#: D4L020000-471					
	97	(92 - 112)			MCAWW 353.2	12/02/04	4337471
	98	(92 - 112)	0.95	(0-10)	MCAWW 353.2	12/02/04	4337471
		Dilution Factor: 1			Analysis Time..: 01:00		
Phosphate as P, Ortho		WO#:GXCT81AC-LCS/GXCT81AD-LCSD LCS Lot-Sample#: D4K180000-584					
	104	(90 - 110)			MCAWW 300.0A	11/17-11/18/04	4323584
	104	(90 - 110)	0.72	(0-10)	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1			Analysis Time..: 02:23		
Phosphate as P, Ortho		WO#:GXW7G1AC-LCS/GXW7G1AD-LCSD LCS Lot-Sample#: D4K220000-357					
	104	(90 - 110)			MCAWW 300.0A	11/19/04	4327357
	104	(90 - 110)	0.24	(0-10)	MCAWW 300.0A	11/19/04	4327357
		Dilution Factor: 1			Analysis Time..: 15:21		
Phosphate as P, Ortho		WO#:GXW8W1AC-LCS/GXW8W1AD-LCSD LCS Lot-Sample#: D4K190000-503					
	102	(90 - 110)			MCAWW 300.0A	11/18/04	4324503
	103	(90 - 110)	0.72	(0-10)	MCAWW 300.0A	11/18/04	4324503
		Dilution Factor: 1			Analysis Time..: 16:17		

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate		WO#:GXCXG1AC-LCS/GXCXG1AD-LCSD LCS Lot-Sample#: D4K180000-583					
	100	(90 - 110)			MCAWW 300.0A	11/17-11/18/04	4323583
	101	(90 - 110)	0.79	(0-10)	MCAWW 300.0A	11/17-11/18/04	4323583
		Dilution Factor: 1			Analysis Time..: 02:23		
Sulfate		WO#:GXPGM1AC-LCS/GXPGM1AD-LCSD LCS Lot-Sample#: D4K230000-485					
	102	(90 - 110)			MCAWW 300.0A	11/22/04	4328485
	101	(90 - 110)	0.49	(0-10)	MCAWW 300.0A	11/22/04	4328485
		Dilution Factor: 1			Analysis Time..: 14:46		
Sulfate		WO#:GXW7P1AC-LCS/GXW7P1AD-LCSD LCS Lot-Sample#: D4K220000-353					
	100	(90 - 110)			MCAWW 300.0A	11/19/04	4327353
	100	(90 - 110)	0.20	(0-10)	MCAWW 300.0A	11/19/04	4327353
		Dilution Factor: 1			Analysis Time..: 15:21		
Sulfate		WO#:GXW8X1AC-LCS/GXW8X1AD-LCSD LCS Lot-Sample#: D4K190000-501					
	100	(90 - 110)			MCAWW 300.0A	11/18/04	4324501
	100	(90 - 110)	0.30	(0-10)	MCAWW 300.0A	11/18/04	4324501
		Dilution Factor: 1			Analysis Time..: 16:17		
Sulfate		WO#:G0D7P1AC-LCS/G0D7P1AD-LCSD LCS Lot-Sample#: D4L060000-472					
	97	(90 - 110)			MCAWW 300.0A	12/03/04	4341472
	97	(90 - 110)	0.31	(0-10)	MCAWW 300.0A	12/03/04	4341472
		Dilution Factor: 1			Analysis Time..: 15:31		
Total Dissolved Solids		WO#:GXWWP1AC-LCS/GXWWP1AD-LCSD LCS Lot-Sample#: D4K240000-041					
	97	(86 - 106)			MCAWW 160.1	11/23/04	4329041
	99	(86 - 106)	1.8	(0-20)	MCAWW 160.1	11/23/04	4329041
		Dilution Factor: 1			Analysis Time..: 11:40		
Total Dissolved Solids		WO#:GXWWX1AC-LCS/GXWWX1AD-LCSD LCS Lot-Sample#: D4K240000-049					
	101	(86 - 106)			MCAWW 160.1	11/23/04	4329049
	99	(86 - 106)	2.0	(0-20)	MCAWW 160.1	11/23/04	4329049
		Dilution Factor: 1			Analysis Time..: 16:50		
Total Dissolved Solids		WO#:GXWX21AC-LCS/GXWX21AD-LCSD LCS Lot-Sample#: D4K290000-355					
	100	(86 - 106)			MCAWW 160.1	11/24/04	4334355
	101	(86 - 106)	0.79	(0-20)	MCAWW 160.1	11/24/04	4334355
		Dilution Factor: 1			Analysis Time..: 10:40		

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride			WO#:GXCRQ1AC-LCS/GXCRQ1AD-LCSD	LCS Lot-Sample#: D4K180000-580				
	20.0	20.4	mg/L	102		MCAWW 300.0A	11/17-11/18/04	4323580
	20.0	20.3	mg/L	102	0.34	MCAWW 300.0A	11/17-11/18/04	4323580
			Dilution Factor: 1			Analysis Time..: 02:23		
Chloride			WO#:GXW561AC-LCS/GXW561AD-LCSD	LCS Lot-Sample#: D4K220000-354				
	20.0	22.1	mg/L	110		MCAWW 300.0A	11/19/04	4327354
	20.0	20.2	mg/L	101	9.2	MCAWW 300.0A	11/19/04	4327354
			Dilution Factor: 1			Analysis Time..: 15:21		
Chloride			WO#:GXW8P1AC-LCS/GXW8P1AD-LCSD	LCS Lot-Sample#: D4K190000-498				
	20.0	20.3	mg/L	102		MCAWW 300.0A	11/18/04	4324498
	20.0	20.2	mg/L	101	0.34	MCAWW 300.0A	11/18/04	4324498
			Dilution Factor: 1			Analysis Time..: 16:17		
Fluoride			WO#:GXCQN1AC-LCS/GXCQN1AD-LCSD	LCS Lot-Sample#: D4K180000-581				
	4.00	4.16	mg/L	104		MCAWW 300.0A	11/17-11/18/04	4323581
	4.00	4.17	mg/L	104	0.24	MCAWW 300.0A	11/17-11/18/04	4323581
			Dilution Factor: 1			Analysis Time..: 02:23		
Fluoride			WO#:GXW5X1AC-LCS/GXW5X1AD-LCSD	LCS Lot-Sample#: D4K220000-356				
	4.00	4.14	mg/L	104		MCAWW 300.0A	11/19/04	4327356
	4.00	4.14	mg/L	104	0.0	MCAWW 300.0A	11/19/04	4327356
			Dilution Factor: 1			Analysis Time..: 15:21		
Fluoride			WO#:GXW8L1AC-LCS/GXW8L1AD-LCSD	LCS Lot-Sample#: D4K190000-502				
	4.00	4.14	mg/L	104		MCAWW 300.0A	11/18/04	4324502
	4.00	4.15	mg/L	104	0.24	MCAWW 300.0A	11/18/04	4324502
			Dilution Factor: 1			Analysis Time..: 16:17		
Nitrate			WO#:GXCTV1AC-LCS/GXCTV1AD-LCSD	LCS Lot-Sample#: D4K180000-582				
	4.00	4.00	mg/L	100		MCAWW 300.0A	11/17-11/18/04	4323582
	4.00	3.99	mg/L	100	0.25	MCAWW 300.0A	11/17-11/18/04	4323582
			Dilution Factor: 1			Analysis Time..: 02:23		
Nitrate			WO#:GXW7A1AC-LCS/GXW7A1AD-LCSD	LCS Lot-Sample#: D4K220000-352				
	4.00	3.99	mg/L	100		MCAWW 300.0A	11/19/04	4327352
	4.00	3.98	mg/L	100	0.19	MCAWW 300.0A	11/19/04	4327352
			Dilution Factor: 1			Analysis Time..: 15:21		

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LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate		WO#:GXW8T1AC-LCS/GXW8T1AD-LCSD				LCS Lot-Sample#: D4K190000-499		
	4.00	3.98	mg/L	100		MCAWW 300.0A	11/18/04	4324499
	4.00	3.98	mg/L	100	0.0	MCAWW 300.0A	11/18/04	4324499
		Dilution Factor: 1				Analysis Time..: 16:17		
Nitrate-Nitrite		WO#:GXT131AC-LCS/GXT131AD-LCSD				LCS Lot-Sample#: D4K240000-500		
	4.00	3.94	mg/L	99		MCAWW 353.2	11/23/04	4329500
	4.00	3.95	mg/L	99	0.27	MCAWW 353.2	11/23/04	4329500
		Dilution Factor: 1				Analysis Time..: 20:00		
Nitrate-Nitrite		WO#:GXT5V1AC-LCS/GXT5V1AD-LCSD				LCS Lot-Sample#: D4K240000-527		
	4.00	3.74	mg/L	93		MCAWW 353.2	11/24/04	4329527
	4.00	3.73	mg/L	93	0.16	MCAWW 353.2	11/24/04	4329527
		Dilution Factor: 1				Analysis Time..: 01:00		
Nitrate-Nitrite		WO#:GX6JH1AC-LCS/GX6JH1AD-LCSD				LCS Lot-Sample#: D4L020000-471		
	4.00	3.87	mg/L	97		MCAWW 353.2	12/02/04	4337471
	4.00	3.91	mg/L	98	0.95	MCAWW 353.2	12/02/04	4337471
		Dilution Factor: 1				Analysis Time..: 01:00		
Phosphate as P, Ortho		WO#:GXCT81AC-LCS/GXCT81AD-LCSD				LCS Lot-Sample#: D4K180000-584		
	4.00	4.15	mg/L	104		MCAWW 300.0A	11/17-11/18/04	4323584
	4.00	4.18	mg/L	104	0.72	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1				Analysis Time..: 02:23		
Phosphate as P, Ortho		WO#:GXW7G1AC-LCS/GXW7G1AD-LCSD				LCS Lot-Sample#: D4K220000-357		
	4.00	4.16	mg/L	104		MCAWW 300.0A	11/19/04	4327357
	4.00	4.17	mg/L	104	0.24	MCAWW 300.0A	11/19/04	4327357
		Dilution Factor: 1				Analysis Time..: 15:21		
Phosphate as P, Ortho		WO#:GXW8W1AC-LCS/GXW8W1AD-LCSD				LCS Lot-Sample#: D4K190000-503		
	4.00	4.10	mg/L	102		MCAWW 300.0A	11/18/04	4324503
	4.00	4.13	mg/L	103	0.72	MCAWW 300.0A	11/18/04	4324503
		Dilution Factor: 1				Analysis Time..: 16:17		

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LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate			WO#:GXCXG1AC-LCS/GXCXG1AD-LCSD			LCS Lot-Sample#: D4K180000-583		
	20.0	20.0	mg/L	100		MCAWW 300.0A	11/17-11/18/04	4323583
	20.0	20.2	mg/L	101	0.79	MCAWW 300.0A	11/17-11/18/04	4323583
			Dilution Factor: 1			Analysis Time..: 02:23		
Sulfate			WO#:GXPGM1AC-LCS/GXPGM1AD-LCSD			LCS Lot-Sample#: D4K230000-485		
	20.0	20.4	mg/L	102		MCAWW 300.0A	11/22/04	4328485
	20.0	20.2	mg/L	101	0.49	MCAWW 300.0A	11/22/04	4328485
			Dilution Factor: 1			Analysis Time..: 14:46		
Sulfate			WO#:GXW7P1AC-LCS/GXW7P1AD-LCSD			LCS Lot-Sample#: D4K220000-353		
	20.0	19.9	mg/L	100		MCAWW 300.0A	11/19/04	4327353
	20.0	20.0	mg/L	100	0.20	MCAWW 300.0A	11/19/04	4327353
			Dilution Factor: 1			Analysis Time..: 15:21		
Sulfate			WO#:GXW8X1AC-LCS/GXW8X1AD-LCSD			LCS Lot-Sample#: D4K190000-501		
	20.0	20.0	mg/L	100		MCAWW 300.0A	11/18/04	4324501
	20.0	20.0	mg/L	100	0.30	MCAWW 300.0A	11/18/04	4324501
			Dilution Factor: 1			Analysis Time..: 16:17		
Sulfate			WO#:G0D7P1AC-LCS/G0D7P1AD-LCSD			LCS Lot-Sample#: D4L060000-472		
	20.0	19.4	mg/L	97		MCAWW 300.0A	12/03/04	4341472
	20.0	19.4	mg/L	97	0.31	MCAWW 300.0A	12/03/04	4341472
			Dilution Factor: 1			Analysis Time..: 15:31		
Total Dissolved Solids			WO#:GXWWP1AC-LCS/GXWWP1AD-LCSD			LCS Lot-Sample#: D4K240000-041		
	500	484	mg/L	97		MCAWW 160.1	11/23/04	4329041
	500	493	mg/L	99	1.8	MCAWW 160.1	11/23/04	4329041
			Dilution Factor: 1			Analysis Time..: 11:40		
Total Dissolved Solids			WO#:GXWWX1AC-LCS/GXWWX1AD-LCSD			LCS Lot-Sample#: D4K240000-049		
	500	506	mg/L	101		MCAWW 160.1	11/23/04	4329049
	500	496	mg/L	99	2.0	MCAWW 160.1	11/23/04	4329049
			Dilution Factor: 1			Analysis Time..: 16:50		
Total Dissolved Solids			WO#:GXWX21AC-LCS/GXWX21AD-LCSD			LCS Lot-Sample#: D4K290000-355		
	500	500	mg/L	100		MCAWW 160.1	11/24/04	4334355
	500	504	mg/L	101	0.79	MCAWW 160.1	11/24/04	4334355
			Dilution Factor: 1			Analysis Time..: 10:40		

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LABORATORY CONTROL SAMPLE DATA REPORT

General Chemistry

Lot-Sample #...: LEE-5 **Matrix.....:** WATER

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride		WO#: GW7DH1AT-MS/GW7DH1AU-MSD				MS Lot-Sample #: D4K170331-006	
	114 I	(80 - 120)			MCAWW 300.0A	11/17-11/18/04	4323580
	118 I	(80 - 120)	1.5	(0-20)	MCAWW 300.0A	11/17-11/18/04	4323580
		Dilution Factor: 1					
		Analysis Time..: 06:31					
Chloride		WO#: GXAD01AW-MS/GXAD01AX-MSD				MS Lot-Sample #: D4K180279-001	
	117 I	(80 - 120)			MCAWW 300.0A	11/18/04	4324498
	118 I	(80 - 120)	0.25	(0-20)	MCAWW 300.0A	11/18/04	4324498
		Dilution Factor: 1					
		Analysis Time..: 19:46					
Chloride		WO#: GXEQ91AM-MS/GXEQ91AN-MSD				MS Lot-Sample #: D4K190255-001	
	110 I	(80 - 120)			MCAWW 300.0A	11/19/04	4327354
	112 I	(80 - 120)	0.52	(0-20)	MCAWW 300.0A	11/19/04	4327354
		Dilution Factor: 1					
		Analysis Time..: 19:55					
Chloride		WO#: GXEVE1CD-MS/GXEVE1CE-MSD				MS Lot-Sample #: D4K190267-001	
	106	(80 - 120)			MCAWW 300.0A	11/19/04	4327354
	106	(80 - 120)	0.32	(0-20)	MCAWW 300.0A	11/19/04	4327354
		Dilution Factor: 1					
		Analysis Time..: 16:52					
Fluoride		WO#: GW7DH1AV-MS/GW7DH1AW-MSD				MS Lot-Sample #: D4K170331-006	
	82	(80 - 120)			MCAWW 300.0A	11/17-11/18/04	4323581
	90	(80 - 120)	7.7	(0-20)	MCAWW 300.0A	11/17-11/18/04	4323581
		Dilution Factor: 1					
		Analysis Time..: 06:31					
Fluoride		WO#: GXAD01AU-MS/GXAD01AV-MSD				MS Lot-Sample #: D4K180279-001	
	82	(80 - 120)			MCAWW 300.0A	11/18/04	4324502
	82	(80 - 120)	0.63	(0-20)	MCAWW 300.0A	11/18/04	4324502
		Dilution Factor: 1					
		Analysis Time..: 19:46					
Fluoride		WO#: GXEVE1CA-MS/GXEVE1CC-MSD				MS Lot-Sample #: D4K190267-001	
	87	(80 - 120)			MCAWW 300.0A	11/19/04	4327356
	137 N,*	(80 - 120)	40	(0-20)	MCAWW 300.0A	11/19/04	4327356
		Dilution Factor: 1					
		Analysis Time..: 16:13					

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MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate		WO#: GW7DH1AX-MS/GW7DH1A0-MSD				MS Lot-Sample #: D4K170331-006	
	115 I	(80 - 120)			MCAWW 300.0A	11/17-11/18/04	4323582
	119 I	(80 - 120)	2.0	(0-20)	MCAWW 300.0A	11/17-11/18/04	4323582
		Dilution Factor: 1					
		Analysis Time..: 06:31					
Nitrate		WO#: GXAD01A0-MS/GXAD01A1-MSD				MS Lot-Sample #: D4K180279-001	
	99	(80 - 120)			MCAWW 300.0A	11/18/04	4324499
	99	(80 - 120)	0.17	(0-20)	MCAWW 300.0A	11/18/04	4324499
		Dilution Factor: 1					
		Analysis Time..: 19:46					
Nitrate		WO#: GXEQ91AR-MS/GXEQ91AT-MSD				MS Lot-Sample #: D4K190255-001	
	110	(80 - 120)			MCAWW 300.0A	11/19/04	4327352
	111	(80 - 120)	0.45	(0-20)	MCAWW 300.0A	11/19/04	4327352
		Dilution Factor: 1					
		Analysis Time..: 19:55					
Nitrate		WO#: GXEVE1CF-MS/GXEVE1CG-MSD				MS Lot-Sample #: D4K190267-001	
	115 I	(80 - 120)			MCAWW 300.0A	11/19/04	4327352
	116 I	(80 - 120)	0.18	(0-20)	MCAWW 300.0A	11/19/04	4327352
		Dilution Factor: 1					
		Analysis Time..: 16:13					
Nitrate-Nitrite		WO#: GW7DH1A5-MS/GW7DH1A6-MSD				MS Lot-Sample #: D4K170331-006	
	76	(62 - 119)			MCAWW 353.2	11/24/04	4329527
	76	(62 - 119)	0.32	(0-30)	MCAWW 353.2	11/24/04	4329527
		Dilution Factor: 1					
		Analysis Time..: 01:00					
Nitrate-Nitrite		WO#: GXAAK1AT-MS/GXAAK1AU-MSD				MS Lot-Sample #: D4K180269-001	
	89	(62 - 119)			MCAWW 353.2	11/23/04	4329500
	88	(62 - 119)	0.98	(0-30)	MCAWW 353.2	11/23/04	4329500
		Dilution Factor: 1					
		Analysis Time..: 20:00					
Nitrate-Nitrite		WO#: GXAD01A6-MS/GXAD01A7-MSD				MS Lot-Sample #: D4K180279-001	
	83	(62 - 119)			MCAWW 353.2	12/02/04	4337471
	83	(62 - 119)	0.09	(0-30)	MCAWW 353.2	12/02/04	4337471
		Dilution Factor: 1					
		Analysis Time..: 01:00					

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MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Id #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho		WO#: GW7DH1A3-MS/GW7DH1A4-MSD				MS Lot-Sample #: D4K170331-006	
	12 N	(80 - 120)			MCAWW 300.0A	11/17-11/18/04	4323584
	12 N	(80 - 120)	1.6	(0-20)	MCAWW 300.0A	11/17-11/18/04	4323584
		Dilution Factor: 1					
		Analysis Time..: 06:31					
Phosphate as P, Ortho		WO#: GXAD01A2-MS/GXAD01A3-MSD				MS Lot-Sample #: D4K180279-001	
	9.8 N	(80 - 120)			MCAWW 300.0A	11/18/04	4324503
	10 N	(80 - 120)	3.0	(0-20)	MCAWW 300.0A	11/18/04	4324503
		Dilution Factor: 1					
		Analysis Time..: 19:46					
Phosphate as P, Ortho		WO#: GXEVE1CH-MS/GXEVE1CJ-MSD				MS Lot-Sample #: D4K190267-001	
	15 N	(80 - 120)			MCAWW 300.0A	11/19/04	4327357
	486 N,*,I	(80 - 120)	188	(0-20)	MCAWW 300.0A	11/19/04	4327357
		Dilution Factor: 1					
		Analysis Time..: 16:13					
Sulfate		WO#: GWXVN1CV-MS/GWXVN1CW-MSD				MS Lot-Sample #: D4K120422-001	
	100	(80 - 120)			MCAWW 300.0A	11/22/04	4328485
	98	(80 - 120)	0.99	(0-20)	MCAWW 300.0A	11/22/04	4328485
		Dilution Factor: 1					
		Analysis Time..: 20:17					
Sulfate		WO#: GW7DH1A1-MS/GW7DH1A2-MSD				MS Lot-Sample #: D4K170331-006	
	114 I	(80 - 120)			MCAWW 300.0A	11/17-11/18/04	4323583
	114 I	(80 - 120)	0.12	(0-20)	MCAWW 300.0A	11/17-11/18/04	4323583
		Dilution Factor: 1					
		Analysis Time..: 07:10					
Sulfate		WO#: GXEVE1CK-MS/GXEVE1CL-MSD				MS Lot-Sample #: D4K190267-001	
	111 I	(80 - 120)			MCAWW 300.0A	11/19/04	4327353
	112 I	(80 - 120)	0.56	(0-20)	MCAWW 300.0A	11/19/04	4327353
		Dilution Factor: 1					
		Analysis Time..: 17:58					
Sulfate		WO#: GX7VV1ER-MS/GX7VV1ET-MSD				MS Lot-Sample #: D4L030136-001	
	95 I	(80 - 120)			MCAWW 300.0A	12/03-12/04/04	4341472
	88 I	(80 - 120)	2.7	(0-20)	MCAWW 300.0A	12/03-12/04/04	4341472
		Dilution Factor: 1					
		Analysis Time..: 12:34					

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MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

I Estimated result. Result concentration exceeds the calibration range.

N Spiked analyte recovery is outside stated control limits.

* Relative percent difference (RPD) is outside stated control limits.

MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride			WO#: GW7DH1AT-MS/GW7DH1AU-MSD MS Lot-Sample #: D4K170331-006						
	44	25.0	72.8 I	mg/L	114		MCAWW 300.0A	11/17-11/18/04	4323580
	44	25.0	73.8 I	mg/L	118	1.5	MCAWW 300.0A	11/17-11/18/04	4323580
			Dilution Factor: 1						
			Analysis Time..: 06:31						
Chloride			WO#: GXAD01AW-MS/GXAD01AX-MSD MS Lot-Sample #: D4K180279-001						
	35	25.0	64.0 I	mg/L	117		MCAWW 300.0A	11/18/04	4324498
	35	25.0	64.2 I	mg/L	118	0.25	MCAWW 300.0A	11/18/04	4324498
			Dilution Factor: 1						
			Analysis Time..: 19:46						
Chloride			WO#: GXEQ91AM-MS/GXEQ91AN-MSD MS Lot-Sample #: D4K190255-001						
	26	25.0	53.7 I	mg/L	110		MCAWW 300.0A	11/19/04	4327354
	26	25.0	54.0 I	mg/L	112	0.52	MCAWW 300.0A	11/19/04	4327354
			Dilution Factor: 1						
			Analysis Time..: 19:55						
Chloride			WO#: GXEVE1CD-MS/GXEVE1CE-MSD MS Lot-Sample #: D4K190267-001						
	52	125	184	mg/L	106		MCAWW 300.0A	11/19/04	4327354
	52	125	185	mg/L	106	0.32	MCAWW 300.0A	11/19/04	4327354
			Dilution Factor: 1						
			Analysis Time..: 16:52						
Fluoride			WO#: GW7DH1AV-MS/GW7DH1AW-MSD MS Lot-Sample #: D4K170331-006						
	0.64	5.00	4.75	mg/L	82		MCAWW 300.0A	11/17-11/18/04	4323581
	0.64	5.00	5.13	mg/L	90	7.7	MCAWW 300.0A	11/17-11/18/04	4323581
			Dilution Factor: 1						
			Analysis Time..: 06:31						
Fluoride			WO#: GXAD01AU-MS/GXAD01AV-MSD MS Lot-Sample #: D4K180279-001						
	0.62	5.00	4.71	mg/L	82		MCAWW 300.0A	11/18/04	4324502
	0.62	5.00	4.74	mg/L	82	0.63	MCAWW 300.0A	11/18/04	4324502
			Dilution Factor: 1						
			Analysis Time..: 19:46						
Fluoride			WO#: GXEVE1CA-MS/GXEVE1CC-MSD MS Lot-Sample #: D4K190267-001						
	0.66	5.00	5.00	mg/L	87		MCAWW 300.0A	11/19/04	4327356
	0.66	5.00	7.50	mg/L	137	40	MCAWW 300.0A	11/19/04	4327356
			Qualifiers: N,*						
			Dilution Factor: 1						
			Analysis Time..: 16:13						

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MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate			WO#: GW7DH1AX-MS/GW7DH1A0-MSD				MS Lot-Sample #: D4K170331-006		
	4.8	5.00	10.6 I	mg/L	115		MCAWW 300.0A	11/17-11/18/04	4323582
	4.8	5.00	10.8 I	mg/L	119	2.0	MCAWW 300.0A	11/17-11/18/04	4323582
			Dilution Factor: 1						
			Analysis Time..: 06:31						
Nitrate			WO#: GXAD01A0-MS/GXAD01A1-MSD				MS Lot-Sample #: D4K180279-001		
	0.65	5.00	5.60	mg/L	99		MCAWW 300.0A	11/18/04	4324499
	0.65	5.00	5.61	mg/L	99	0.17	MCAWW 300.0A	11/18/04	4324499
			Dilution Factor: 1						
			Analysis Time..: 19:46						
Nitrate			WO#: GXEQ91AR-MS/GXEQ91AT-MSD				MS Lot-Sample #: D4K190255-001		
	3.3	5.00	8.82	mg/L	110		MCAWW 300.0A	11/19/04	4327352
	3.3	5.00	8.86	mg/L	111	0.45	MCAWW 300.0A	11/19/04	4327352
			Dilution Factor: 1						
			Analysis Time..: 19:55						
Nitrate			WO#: GXEVE1CF-MS/GXEVE1CG-MSD				MS Lot-Sample #: D4K190267-001		
	4.8	5.00	10.6 I	mg/L	115		MCAWW 300.0A	11/19/04	4327352
	4.8	5.00	10.6 I	mg/L	116	0.18	MCAWW 300.0A	11/19/04	4327352
			Dilution Factor: 1						
			Analysis Time..: 16:13						
Nitrate-Nitrite			WO#: GW7DH1A5-MS/GW7DH1A6-MSD				MS Lot-Sample #: D4K170331-006		
	3.8	4.00	6.84	mg/L	76		MCAWW 353.2	11/24/04	4329527
	3.8	4.00	6.87	mg/L	76	0.32	MCAWW 353.2	11/24/04	4329527
			Dilution Factor: 1						
			Analysis Time..: 01:00						
Nitrate-Nitrite			WO#: GXAAK1AT-MS/GXAAK1AU-MSD				MS Lot-Sample #: D4K180269-001		
	ND	4.00	3.59	mg/L	89		MCAWW 353.2	11/23/04	4329500
	ND	4.00	3.55	mg/L	88	0.98	MCAWW 353.2	11/23/04	4329500
			Dilution Factor: 1						
			Analysis Time..: 20:00						
Nitrate-Nitrite			WO#: GXAD01A6-MS/GXAD01A7-MSD				MS Lot-Sample #: D4K180279-001		
	0.93	4.00	4.24	mg/L	83		MCAWW 353.2	12/02/04	4337471
	0.93	4.00	4.25	mg/L	83	0.09	MCAWW 353.2	12/02/04	4337471
			Dilution Factor: 1						
			Analysis Time..: 01:00						

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MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Phosphate as P, Ortho			WO#: GW7DH1A3-MS/GW7DH1A4-MSD MS Lot-Sample #: D4K170331-006						
	ND	5.00	0.600 N	mg/L	12		MCAWW 300.0A	11/17-11/18/04	4323584
	ND	5.00	0.610 N	mg/L	12	1.6	MCAWW 300.0A	11/17-11/18/04	4323584
			Dilution Factor: 1						
			Analysis Time..: 06:31						
Phosphate as P, Ortho			WO#: GXAD01A2-MS/GXAD01A3-MSD MS Lot-Sample #: D4K180279-001						
	ND	5.00	0.488 N	mg/L	9.8		MCAWW 300.0A	11/18/04	4324503
	ND	5.00	0.503 N	mg/L	10	3.0	MCAWW 300.0A	11/18/04	4324503
			Dilution Factor: 1						
			Analysis Time..: 19:46						
Phosphate as P, Ortho			WO#: GXEVE1CH-MS/GXEVE1CJ-MSD MS Lot-Sample #: D4K190267-001						
	ND	5.00	0.758 N	mg/L	15		MCAWW 300.0A	11/19/04	4327357
	ND	5.00	24.3	mg/L	486	188	MCAWW 300.0A	11/19/04	4327357
			Qualifiers: N,*,I						
			Dilution Factor: 1						
			Analysis Time..: 16:13						
Sulfate			WO#: GWXVN1CV-MS/GWXVN1CW-MSD MS Lot-Sample #: D4K120422-001						
	430	500	926	mg/L	100		MCAWW 300.0A	11/22/04	4328485
	430	500	917	mg/L	98	0.99	MCAWW 300.0A	11/22/04	4328485
			Dilution Factor: 1						
			Analysis Time..: 20:17						
Sulfate			WO#: GW7DH1A1-MS/GW7DH1A2-MSD MS Lot-Sample #: D4K170331-006						
	1800	1250	3210 I	mg/L	114		MCAWW 300.0A	11/17-11/18/04	4323583
	1800	1250	3210 I	mg/L	114	0.12	MCAWW 300.0A	11/17-11/18/04	4323583
			Dilution Factor: 1						
			Analysis Time..: 07:10						
Sulfate			WO#: GXEVE1CK-MS/GXEVE1CL-MSD MS Lot-Sample #: D4K190267-001						
	1700	1250	3060 I	mg/L	111		MCAWW 300.0A	11/19/04	4327353
	1700	1250	3080 I	mg/L	112	0.56	MCAWW 300.0A	11/19/04	4327353
			Dilution Factor: 1						
			Analysis Time..: 17:58						

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MATRIX SPIKE SAMPLE DATA REPORT

General Chemistry

Client Lot #...: LEE-5 **Matrix.....:** WATER
Date Sampled...: 12/02/04 11:45 **Date Received..:** 12/03/04

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate			WO#: GX7VV1ER-MS/GX7VV1ET-MSD				MS Lot-Sample #: D4L030136-001		
	3400	2500	5800 I	mg/L	95		MCAWW 300.0A	12/03-12/04/04	4341472
	3400	2500	5640 I	mg/L	88	2.7	MCAWW 300.0A	12/03-12/04/04	4341472
			Dilution Factor: 1						
			Analysis Time..: 12:34						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

I Estimated result. Result concentration exceeds the calibration range.

N Spiked analyte recovery is outside stated control limits.

* Relative percent difference (RPD) is outside stated control limits.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D4K170331 **Work Order #...:** GW7C9-SMP **Matrix.....:** WATER
GW7C9-DUP
Date Sampled...: 11/16/04 09:40 **Date Received..:** 11/17/04

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Dissolved Solids						SD Lot-Sample #: D4K170331-004		
	2300	2300	mg/L	0.39	(0-20)	MCAWW 160.1	11/23/04	4329041

Dilution Factor: 1 Analysis Time..: 11:40

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D4K170331 **Work Order #...:** GXAEC-SMP **Matrix.....:** WATER
GXAEC-DUP
Date Sampled...: 11/17/04 13:10 **Date Received..:** 11/18/04

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Dissolved Solids						SD Lot-Sample #: D4K180279-004		
	2800	2200	mg/L	24	(0-20)	MCAWW 160.1	11/23/04	4329049

Dilution Factor: 1 Analysis Time..: 16:50

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: D4K170331 **Work Order #...:** GXFQM-SMP **Matrix.....:** WATER
GXFQM-DUP
Date Sampled...: 11/18/04 14:55 **Date Received..:** 11/19/04

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Total Dissolved Solids						SD Lot-Sample #: D4K190312-005		
	1500	1500	mg/L	1.5	(0-20)	MCAWW 160.1	11/24/04	4334355

Dilution Factor: 1 Analysis Time..: 10:40

STL Denver

4°C to 11/17/04

1 of 3

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

Project Name & Number: Lee Acres Landfill, Ground Water Sampling for BLM 86369JR01	PACKING AND SHIPPING DETAILS
Sampling Location: Lee Acres Landfill, San Juan County, New Mexico	Packed and Sealed for Shipping by: Fred Gebhardt; Seal Number: 555834
Team Leader: Fred Gebhardt — Project chief--Fred Gebhardt	Delivered to Shipper by: Fred Gebhardt; Airbill Number: 847291041180
	Sampling Status: ☐ Done ☒ Continuing

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
~~May~~ NOV, 16 2004	0820	BLM-15	Groundwater	6	E160.1 (TDS), E300 (common anions), E353.2 (nitrate + nitrite), SW6010 (dissolved Ca, Cr, K, Mg, Mn, Na, Ni) and SW5030/SW8260 (VOC include MTBE)	Environmental Sample
"	0900	BLM-39	"	6	"	"
"	0915	BLM-98	"	6	"	"
"	0940	BLM-48	"	6	"	"

Additional Comments
Please batch all samples collected during the week of ~~May 9, 2004. Thanks.~~ NOV. 15, 2004. THANKS. VOC SAMPLES ARE IN COOLER 3 OF 3. WITH SEAL # 555854

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
Fredrick S. Gebhardt	TO FEDERAL EXPRESS	11/16/04	1700	Severn Trent Laboratories 4955 Yarrow Street Arvada, CO 80002 ph: (303) 736-~~0176~~ 0193 Attention: ~~Susan Decker~~ WAYNE SCOTT	Condition of Contents
	Jonelle Bruden	11/17/04	0915		Contents Temperature
					Laboratory Project Number

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STL Denver

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

2 OF 3

Project Name & Number	PACKING AND SHIPPING DETAILS	
Lee Acres Landfill, Ground Water Sampling for BLM 86369JR01	Packed and Sealed for Shipping by: Fred Gebhardt	Seal Number: 555844
Sampling Location: Lee Acres Landfill, San Juan County, New Mexico	Delivered to Shipper by: Fred Gebhardt	Airbill Number: 847291041180
Team Leader: Fred Gebhardt Project chief--Fred Gebhardt	Sampling Status: ☐ Done ☒ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
NOV, 16, 2004	1020	BLM-51	Groundwater	6	E160.1 (TDS), E300 (common anions), E353.2 (nitrate + nitrite), SW6010 (dissolved Ca, Cr, K, Mg, Mn, Na, Ni) and SW5030/SW8260 (VOC include MTBE)	Environmental Sample
"	1100	BLM-45	"	6	"	"
"	1100	BLM-45 MS	"	6	"	MATRIX SPIKE
"	1100	BLM-45 MSD	"	6	"	MATRIX SPIKE DUPLICATE
"	1150	BLM-42	"	6	"	ENVIRONMENTAL SAMPLE
"	1230	BLM-57	"	6	"	"

Additional Comments: PLEASE BATCH ALL SAMPLES COLLECTED DURING THE WEEK OF NOV. 15, 2004. THANKS
VOC SAMPLES ARE IN COOLER 3 OF 3, WITH SEAL # 555854

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
Fredrick S. Gebhardt	TO FEDERAL EXPRESS	11/16/04	1700	Severn Trent Laboratories 4955 Yarrow Street Arvada, CO 80002 ph: (303) 736-0118 Attention: Susan Decker	Condition of Contents
	Jonor Brudin	11/17/04	0715		Contents Temperature
					Laboratory Project Number

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STL Denver

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

1 OF 2

4.6 oil water

Project Name & Number	PACKING AND SHIPPING DETAILS	
Lee Acres Landfill, Ground Water Sampling for BLM 86369JR01	Packed and Sealed for Shipping by: Fred Gebhardt	Seal Number: 555874
Sampling Location: Lee Acres Landfill, San Juan County, New Mexico	Delivered to Shipper by: Fred Gebhardt	Airbill Number: 847291041228
Team Leader: Fred Gebhardt — Project chief--Fred Gebhardt	Sampling Status: ☐ Done ☒ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
~~May~~ NOV. 17, 2004	0830	GBR-17	Groundwater	6	E160.1 (TDS), E300 (common anions), E353.2 (nitrate + nitrite), SW6010 (dissolved Ca, Cr, K, Mg, Mn, Na, Ni) and SW5030/SW8260 (VOC include MTBE)	Environmental Sample
"	0930	GBR-32	"	6	"	"
"	1020	BLM-62	"	6	"	"
"	1100	BLM-60	"	6	"	"

Additional Comments
Please batch all samples collected during the week of ~~May 3, 2004. Thanks~~. NOV. 15, 2004. THANKS.
VOC SAMPLES ARE IN COOLER 2 OF 2, WITH SEAL # 555864

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
Fredrick S. Gebhardt	TO FEDERAL EXPRESS	11/17/04	1630	Severn Trent Laboratories 4955 Yarrow Street Arvada, CO 80002 ph: (303) 736-~~0118~~ 0193 Attention: ~~Susan Decker~~ WAYNE SCOTT	Condition of Contents
	Aaron Bindell	11/18	0930		Contents Temperature
					Laboratory Project Number

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STL Denver

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

Project Name & Number	PACKING AND SHIPPING DETAILS	
Lee Acres Landfill, Ground Water Sampling for BLM 86369JR01	Packed and Sealed for Shipping by: Fred Gebhardt	Seal Number: 555 864
Sampling Location: Lee Acres Landfill, San Juan County, New Mexico	Delivered to Shipper by: Fred Gebhardt	Airbill Number: 847291041228
Team Leader: Fred Gebhardt — Project chief--Fred Gebhardt	Sampling Status: ☐ Done ☒ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
~~May~~ NOV. 17, 2004	1120	BLM-21	Groundwater	6	E160.1 (TDS), E300 (common anions), E353.2 (nitrate + nitrite), SW6010 (dissolved Ca, Cr, K, Mg, Mn, Na, Ni) and SW5030/SW8260 (VOC include MTBE)	Environmental Sample
"	1150	GBR-50	"	6	"	"
"	1230	BLM-77	"	6	"	"
"	1310	BLM-76	"	6	"	"
"	1315	BLM-76 TB	ULTRA PURE WATER	2	VOC ONLY SW5030/SW8260	TRIP BLANK

Additional Comments
Please batch all samples collected during the week of ~~May 3, 2004. Thanks~~. NOV. 15, 2004. THANKS. THIS COOLER CONTAINS VOC SAMPLES FROM 1 OF 2 COOLER WITH SEAL # 555874, ALSO TWO VOC SAMPLES FROM YESTERDAY.

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
Frederick E. Gebhardt	TO FEDERAL EXPRESS	11/17/04	1630	Severn Trent Laboratories 4955 Yarrow Street Arvada, CO 80002 ph: (303) ~~736-0118~~ 736-0193 Attention: ~~Susan Decker~~ WAYNE SCOTT	Condition of Contents
	Aaron Birdsell	11/18	0930		Contents Temperature
					Laboratory Project Number

STL Denver

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

33 GR 11/19/04

Project Name & Number	PACKING AND SHIPPING DETAILS	
Lee Acres Landfill, Ground Water Sampling for BLM 86369JR01	Packed and Sealed for Shipping by: Fred Gebhardt	Seal Number: 555884
Sampling Location: Lee Acres Landfill, San Juan County, New Mexico	Delivered to Shipper by: Fred Gebhardt	Airbill Number: 8472 9104 1191
Team Leader: Fred Gebhardt — Project chief--Fred Gebhardt	Sampling Status: ☒ Done ☐ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
~~May~~ NOV. 18, 2004	0900	BLM-67	Groundwater	6	E160.1 (TDS), E300 (common anions), E353.2 (nitrate + nitrite), SW6010 (dissolved Ca, Cr, K, Mg, Mn, Na, Ni) and SW5030/SW8260 (VOC include MTBE)	Environmental Sample
"	1030	BLM-75	"	6	"	"
"	1110	GBR-48	"	6	"	"
"	1200	GBR-48 EB	ULTRA PURE WATER	6	"	EQUIPMENT BLANK
"	1115	GBR-48 TB	"	2	VOC ONLY SW5030/SW8260	TRIP BLANK

Additional Comments
Please batch all samples collected during the week of ~~May 3, 2004. Thanks.~~ NOV. 15, 2004. THANKS

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
Fredrick E. Gebhardt	TO FEDERAL EXPRESS	11/18/04	1500	Severn Trent Laboratories 4955 Yarrow Street Arvada, CO 80002 ph: (303) 736-~~0118~~ 0193 Attention: ~~Susan Decker~~ WAYNE SCOTT	Condition of Contents
	Sam Bissell	11/19	0945		Contents Temperature
					Laboratory Project Number

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STL Denver

Sample Receiving Checklist

Lot #: 0414470331 Date/Time Received: 11/17/04 0915

Company Name & Sampling Site: USGS

Cooler #(s): 1 2 3

Temperatures (°C): 4.8 2.4 3.6

PM to Complete This Section: *Yes* ☐ *No* ☐

Residual Chlorine check required: ☐ ☐

Quarantined: *Yes* ☐ *No* ☐

Time Zone: • EDT/EST • CDT/CST • MDT/MST • PDT/PST • OTHER

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Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
☐	☑	☐	1. Cooler seals intact. (N/A if hand delivered)	
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
	☐	☑	4. Multiphase samples present? If yes, comment below.	
			PHOTOGRAPH BROKEN BOTTLES/MULTIPHASE SAMPLES	
	☑	☐	5. Proper container & preservatives used (ref. Attachment D of SOP# DEN-QA-0003)	
	☑	☐	6. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☐	☑	8. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	9. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	10. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	11. VOA samples filled completely, comment if no.	
☐	☑	☐	12. VOA vials preserved, check label. Preservative ☑HCl ☑4±2°C ☐Sodium Thiosulfate	
	☐	☑	13. Did samples require preservation with sodium thiosulfate?	
☑	☐	☐	14. If yes to #13, did the samples contain residual chlorine?	
☐	☐	☑	15. Sediment present in dissolved/filtered bottles.	
	☑	☐	16. Are analyses with short holding times requested?	
	☐	☑	17. Was a quick Turn Around (TAT) requested?	
☐	☑	☐	18. Is extra sample volume provided for MS, MSD or matrix duplicates?	
			DOUBLECHECK METALS,SAMPLE LABELS & SUBCONTRACT	
☑	☐	☐	19. Subcontract COC signed and sent with samples to bottle prep?	
	☑	☐	20. Were sample labels double-checked by a second person?	AG
☐	☑	☐	21. Were sample bottles and COC double checked for dissolved/filtered metals by a second person?	TG
☑	☐	☐	22. If applicable, were AFCEE Metals placed in the walkin refrigerator?	
☐	☑	☐	23. Were special instructions read and followed?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR).

WEL 11-19-04

STL Denver

Sample Receiving Checklist

Lot #: D4K180279 Date/Time Received: 11/18/04 0930

Company Name & Sampling Site: USGS Lee Acres

*Cooler #(s): 1 2

Temperatures (°C): 5.6 5.9 4.6

PM to Complete This Section: *Yes* ☐ *No* ☐ Residual chlorine check required: ☐ ☐ Quarantined: *Yes* ☐ *No* ☐

Time Zone:

• EDT/EST • CDT/CST • MDT/MST • PDT/PST • OTHER

23969

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
☐	☑	☐	1. Cooler seals intact. (N/A if hand delivered)	
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
	☐	☑	4. Multiphase samples present? If yes, comment below.	
			PHOTOGRAPH BROKEN BOTTLES/MULTIPHASE SAMPLES	
	☑	☐	5. Proper container & preservatives used (ref. Attachment D of SOP# DEN-QA-0003)	
☐	☑	☐	6. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☐	☑	8. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	9. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	10. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	11. VOA samples filled completely, comment if no.	
☐	☑	☐	12. VOA vials preserved, check label. Preservative ☑HCl ☐4±2°C ☐Sodium Thiosulfate	
	☐	☑	13. Did samples require preservation with sodium thiosulfate?	
☑	☐	☐	14. If yes to #13, did the samples contain residual chlorine?	
☑	☐	☐	15. Sediment present in dissolved/filtered bottles.	
	☑	☐	16. Are analyses with short holding times requested?	
	☐	☑	17. Was a quick Turn Around (TAT) requested?	
☑	☐	☐	18. Is extra sample volume provided for MS, MSD or matrix duplicates?	
			DOUBLECHECK METALS,SAMPLE LABELS & SUBCONTRACT	
☑	☐	☐	19. Subcontract COC signed and sent with samples to bottle prep?	
	☑	☐	20. Were sample labels double-checked by a second person?	
☑	☐	☐	21. Were sample bottles and COC double checked for dissolved/filtered metals by a second person?	
☑	☐	☐	22. If applicable, were AFCEE Metals placed in the walkin refrigerator?	
☐	☑	☐	23. Were special instructions read and followed?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR).

WEA 11-19-04

STL Denver

Sample Receiving Checklist

Lot #: D4K190267 Date/Time Received: 11/9/04 0945

Company Name & Sampling Site: USAS Lee Acres

*Cooler #(s): 1

Temperatures (°C): 3.3

PM to Complete This Section: *Yes* ☐ *No* ☐ Quarantined: *Yes* ☐ *No* ☐

Residual chlorine check required: ☐

Time Zone:

• EDT/EST • CDT/CST • MDT/MST • PDT/PST • OTHER

23969

Unpacking & Labeling Check Points:

N/A	Yes	No		Initials
☐	☑	☐	1. Cooler seals intact. (N/A if hand delivered)	KB
	☑	☐	2. Chain of custody present.	
	☐	☑	3. Bottles broken and/or are leaking, comment if yes.	
	☐	☑	4. Multiphase samples present? If yes, comment below.	
			PHOTOGRAPH BROKEN BOTTLES/MULTIPHASE SAMPLES	
	☑	☐	5. Proper container & preservatives used (ref. Attachment D of SOP# DEN-QA-0003)	
☐	☑	☐	6. pH of all samples checked and meet requirements, note exceptions.	
	☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times.	
	☐	☑	8. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.	
	☑	☐	9. Chain of custody agrees with bottle count, comment if no.	
	☑	☐	10. Chain of custody agrees with labels, comment if no.	
☐	☑	☐	11. VOA samples filled completely, comment if no.	
☐	☑	☐	12. VOA vials preserved, check label. Preservative ☑HCl ☐4±2°C ☐Sodium Thiosulfate	
	☐	☑	13. Did samples require preservation with sodium thiosulfate?	
☑	☐	☐	14. If yes to #13, did the samples contain residual chlorine?	
☐	☐	☑	15. Sediment present in dissolved/filtered bottles.	
	☑	☐	16. Are analyses with short holding times requested?	
	☐	☑	17. Was a quick Turn Around (TAT) requested?	
☑	☐	☐	18. Is extra sample volume provided for MS, MSD or matrix duplicates?	
			DOUBLECHECK METALS,SAMPLE LABELS & SUBCONTRACT	
☑	☐	☐	19. Subcontract COC signed and sent with samples to bottle prep?	
	☑	☐	20. Were sample labels double-checked by a second person?	KB
☐	☑	☐	21. Were sample bottles and COC double checked for dissolved/filtered metals by a second person?	
☑	☐	☐	22. If applicable, were AFCEE Metals placed in the walkin refrigerator?	
☐	☑	☐	23. Were special instructions read and followed?	

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR).

APPENDIX II

USGS Laboratory Quality Assurance/Quality Control Results

April 2005

LABORATORY DATA VALIDATION CHECKLIST

SECTION 1.0: GENERAL INFORMATION (also see Appendix A)

Data reviewer(s) name, affiliation, title, signature, and date of review:
Fredrick E. Gebhardt, USGS-WRD, Hydrologic Technician 25APR05

Data Inventory

1.1 Sample project number: Severn Trent Services D4K170331, D4K180279, and D4K190267.

1.2 Operable unit and site: Lee Acres Landfill, National Priority List site

Sample collection date: _____

1.3 Sample locations (location IDs): BLM-15, 21, 39, 42, 45, 48, 51, 55, 56, 57, 60, 62, 67, 69, 75, 76, 77, and GBR-17, 32, 48, and 50. BLM-98, and BLM-99 were duplicate samples for BLM-39 and BLM-56, respectively.

1.4 Sample matrix (ground water, soil, other): ground water

1.5 Type and number of field samples (environmental and quality control) in sample project:

Type	number	Type	number
environmental	**21**	MS/MSD	**1 PAIR**
field duplicate	2	trip blank	3
equipment blank	1	ambient blank	0

Data validation level: note--see appendix A for description of different levels

LEVEL 1

SECTION 2.0: DATA REPORTS AND COMPLETENESS

Name of reviewer(s) and review date: Fredrick E. Gebhardt 25APR05

Laboratory Data Reports

2.1 Analytical Results Report--report date: December 13, 2004

2.2 Raw Data Report--number of volumes: Raw data not reviewed

2.3 Was completeness of lab reports acceptable? Yes √ No _____
(overview, analytical results, quality-control report)

Data Completeness

2.4 Were all samples requested on chain of custody form analyzed by lab? Yes √ No _____

	Appendix-IX Volatile Organics Compounds SW8260B	Metals Dissolved SW6010B	Nitrate+Nitrite by MCAWW 353.2	Fluoride, Nitrate, Chloride, Sulfate, Orthophosphate by MCAWW 300.0A	Total Dissolved Solids by MCAWW 160.1
requested:	29	26	26	26	26
analyzed:	29	26	26	26	26

2.5 List cancelled analyses on cancelled-data worksheet: None

2.6 Were sample cooler seals intact upon receipt by lab? Yes

2.7 What were the sample cooler temperatures upon receipt by lab?
2.4 – 5.9 °C @ Severn Trent

2.8 Additional comments:

SECTION 3.0: DATA VALIDATION REVIEW

TABLE II-1. Data validation worksheet table for July 11 and 12, 2001, sampling round at HTA - validation parameters, analytes, and methods.

Data Validation Para-meters	Volatiles SW5030/ SW8260B	Metals (Dissolved) SW3005/SW6010B	Nitrate plus Nitrite MCAWW353.2	Fluoride, Chloride, Nitrate, Orthophosphate, and Sulfate MCAWW300.0A	Total Dissolved Solids MCAWW160.
Holding times	14-day limit	180-day limit	28-day limit	48- hour limit for nitrate and orthophosphate, 28-day limit for all others	7 day limit
Met	☑ Yes	☑ Yes	☑ Yes	☑ Yes	☑ Yes
Surrogate Spike Recovery	%R varies for surrogates	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Met	☑ Yes	☐ Yes	☐ Yes	☐ Yes	☐ Yes
Project Reporting limit	No limits provided Not Applicable	No limits provided Not Applicable		Severn Trent:	Severn Trent: 10 mg/L
Met	☑ Yes	☑ Yes	☑ Yes	☑ Yes	☑ Yes
Field Duplicates	RPD < 30%	RPD < 30%	RPD < 30%	RPD < 30%	RPD < 30%
Met	☑ Yes ☐ No, see notes	☑ Yes ☐ No, see notes	☑ Yes ☐ No, see notes	☐ Yes ☑ No, see	☑ Yes ☐ No, see notes
Equipment Blank	<3 x RL	<3 x RL	<2x RL	<3x RL	<3 x RL
Met	☑ Yes ☐ No, see notes	☐ Yes ☑ No, see notes	☑ Yes ☐ No, see notes	☑ Yes ☐ No, see notes	☑ Yes ☐ No, see notes
Trip Blanks	Presence of contaminants	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Met	☐ Yes, see notes	☐ Yes, see notes	☐ Yes, see notes	☐ Yes, see notes	☐ Yes, see notes
Tentatively Identified Comps.	No. of compounds per site	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Presence	All ground-water samples collected during this sample round had a minimum of two TICs.	Not Applicable	Not Applicable	Not Applicable	Not Applicable

TABLE II-1. Data validation worksheet table for July 11 and 12, 2001, sampling round at HTA - validation parameters, analytes, and methods.

Data Validation Para-meters	Volatiles SW5030/ SW8260B	Metals (Dissolved) SW3005/SW6010B	Nitrate plus Nitrite MCAWW353.2	Fluoride, Chloride, Nitrate, Orthophosphate, and Sulfate MCAWW300.0A	Total Dissolved Solids MCAWW160.
Lab Control Samples	%R and RPD within 3 SD of historical performance	%R and RPD within 3 SD of historical performance	%R and RPD within 3 SD of historical performance	%R and RPD within 3 SD of historical performance	%R and RPD within 3 SD of historical performance
Met	☑ Yes	☑ Yes	☑ Yes	☑ Yes	☑ Yes
	☐ No, see notes	☐ No, see notes	☐ No, see notes	☐ No, see notes	☐ No, see notes
Lab Method Blanks	< RL except for common lab contaminants, then < 5 x RL	< RL except for common lab contaminants, then < 2 x RL	< 2 x RL	< RL except for common lab contaminants, then < 5 x RL	< RL
Met	☐ Yes	☑ Yes	☑ Yes	☐ Yes	☑ Yes
	☑ No, see notes	☐ No, see notes	☐ No, see notes	☑ No, see notes	☐ No, see notes
Matrix Spike and Duplicates	Met various %R and RPD requirements	Met various %R and RPD requirements	Met various %R and RPD requirements	Meet %R and RPD requirements	%R between 87 and 107%, RPD < 10%
Met	☑ Yes	☑ Yes	☑ Yes	☐ Yes	☑ Yes
	☐ No, see notes	☐ No, see notes	☐ No, see notes	☑ No, see notes	☐ No, see notes
Results over RL with Qualifiers	List: none	List: none	List: Elevated reporting limits for nitrate, orthophosphate, chloride, fluoride, and sulfate due to high levels or matrix interference.	List: none	List: All samples had elevated reporting limits due to high analyte levels for TDS.

Table II-1. Data validation worksheet table for July 11 and 12, 2001, sampling round at HTA- notes.

Analyte and Method:	Notes of Data Validation Parameters:
Explosives SW8330	- 5 of the 28 surrogate spike recoveries were outside of control limits for percent recovery. - 3 of 14 parameters showed percent recoveries outside of recovery limits for matrix spike and/or matrix spike duplicate analysis. RDX and HMX matrix spike and matrix spike duplicate analysis resulted in percent recoveries and relative percent differences within recovery limits.
Total Metals SW6010B and SW6020 and Mercury SW7470A	- Percent recoveries for magnesium and silver during the matrix spike and matrix spike duplicate sample analysis were outside of recovery limits.
Ammonia MCAWW350.1 and Nitrate-Nitrite MCAWW353.2	- Percent recoveries for ammonia and nitrate-nitrite during the matrix spike and matrix spike duplicate sample analysis were outside of recovery limits.
Perchlorate EPA 314.0	- Certain perchlorate samples were re-analyzed following review of the initial laboratory data. Sites HTA-3, 12, 22, 22-1 (duplicate) 27, 29, and 30-1 (equipment blank) were re-analyzed due to anomalous results and the presence of perchlorate (9.4 ug/L) in the method blank (reporting limit of 20 ug/L). Re-analysis occurred beyond the holding time and did not provide substantial results that warrant revising the initial data except for the environmental sample for HTA22. The initial laboratory data for HTA22 and HTA22-1 (duplicate) indicated a difference greater than an order of magnitude. Lab error was assumed to be at fault and re-analysis was requested. Re-analysis of the HTA22 and HTA22-1 samples (outside of holding times) indicate that the HTA22-1 initial concentration was correct but that the initial HTA22 concentration was likely reported in error. The rerun concentration is reported in Table I.

Appendix A -- Laboratory Data Validation Checklist

Instruction Notes for the Data Validation Checklist

This data validation checklist will be used when validating the chemical analytical results. Data validation is a systematic and independent verification of data quality and consists of checking, verifying, evaluating, and qualifying the chemical analytical results.

Two different levels of data validation are used with level I being not as detailed or as rigorous as level II. Level I data validation includes: (1) checking holding times limits, (2) evaluating the results of field and laboratory quality-control (QC) samples such as field replicates, matrix spikes, surrogate samples, and duplicate control samples, and (3) checking that contamination during sample processing has not occurred in QC blanks such as equipment, method, ambient, and trip blanks. Most of the information and data used to conduct a level I data validation is contained in the summary-data reports prepared by the reporting laboratory. Level II data validation includes all the level I guidelines plus using the raw-data reports prepared by the reporting laboratory to: (1) check that the laboratory instruments have been properly tuned and calibrated, and (2) verify that selected sample results do not have any omissions, problems, discrepancies, transcription errors, and reduction (dilution, conversion) errors.

Field samples (environmental and QC) are processed and analyzed by the reporting laboratory in specific groups of samples called sample projects (also called sample cases). A sample project usually consists of 20 or fewer samples that are collected from one or more sampling locations (monitoring well) in a given sampling period. Numerous laboratory QC samples also are analyzed with the field samples for each sample project.

This data validation checklist is designed to be used when validating the analytical results for a given sample project and it has a multi-level organization. The first part of the checklist contains general information (section 1.0) about the scope (who, when, how, and what) of the data validation and data reports and completeness (section 2.0) for each sample project. Sections 1.0 and 2.0 will be completed and included with all data validation checklists. The data validation checklist also contains numerous supplemental sections that are listed at the bottom of the first page of this document. These supplemental checklist sections are used for specific analytical methods and will be marked with a checkmark (√) when they are completed for a given sample project. Specific project-required frequency and QC acceptance criteria, and pertinent reference page numbers are listed with most of the checklist items. The major data-validation references are the USEPA guidance documents (USEPA 1994).

References

USEPA, 1994, USEPA Contract laboratory program national functional guidelines for organic data review, February 1994, Publication 9240.1-05, Document number PB94-963501, 124 p.
NOTE: this reference is abbreviated FG-ORG in this checklist.

USEPA, 1994, USEPA contract laboratory program national functional guidelines for inorganic data review, February 1994, Publication 9240.1-05-01, Document number PB94-963502, 42 p.
NOTE: this reference is abbreviated FG-INORG in this checklist.

USGS, 1992, Laboratory data validation checklist: Wyoming District, U.S. Geological Survey checklist prepared for the U.S. Air Force, multiple pages

Checklist Abbreviations, Acronyms, and Notes

Abbreviation	
AB	Ambient blank
Al	Aluminum
Ag	Silver
As	Arsenic
Ba	Barium
Be	Beryllium
BLM	U.S. Bureau of Land Management
Ca	Calcium
CCV	Continuing calibration verification
Cd	Cadmium
Cl	Chloride
Co	Cobalt
Conc.	Concentration
Cr	Chromium
Cu	Copper
Diss.	Dissolved
DRO	Diesel range organics with GC/FID analysis C1-C28
DUP	Duplicate environmental sample
EB	Equipment blank
Fe	Iron
FG-INORG	Functional guidelines (EPA) for evaluating inorganic analyses
FG-ORG	Functional guidelines (EPA) for evaluating organic analyses
FI	Fluoride
GBR	Giant-Bloomfield Refinery
GFAA	Graphite furnace atomic absorption
Hg	Mercury
ICP	Inductively coupled plasma
ID	Identification
IS	Internal standards
J	Estimated value qualifier
K	Potassium
LCS	Laboratory control sample
MCAWW	"Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 subsequent revisions.
Mg	Magnesium
mg/L	Milligrams per liter
Mn	Manganese
Mo	Molybdenum
MS/MSD	Matrix spike/ matrix spike duplicate
MW	Monitoring well
Na	Sodium

NA	Not applicable
ND	Not detected
Ni	Nickel
NO2	Nitrate
NO3	Nitrite
Pb	Lead
PO4	Orthophosphate
PRL	Project reporting limit
QC	Quality control
RCLs	Recovery Control Limits
RL	Reporting limits
RPD	Relative percentage differences
SA	Environmental sample
SAP	Sampling and Analysis Plan
Sb	Antimony
SCS	Single control sample
SD	Standard deviation
Se	Selenium
Sn	Tin
SO4	Sulfate
SVOC	Semivolatile organic compounds
SW	Test Methods for Evaluation Solid Waste, Physical/Chemical Methods, SW-846, 3rd edition, November 1986 and its updates
TB	Trip blank
TDS	Total dissolved solids
TIC	Tentatively identified compound
Tl	Thallium
TOC	Total organic carbon
Tot.	Total
TOX	Total organic halogen
TPH	Total petroleum hydrocarbons
TSS	Total suspended solids
USEPA	United States Environmental Protection Agency
USGS/WRD	United States Geological Survey, Water Resources Division
V	Vanadium
VOC	Volatile organic compounds
Zn	Zinc
µg/L	Micrograms per liter
<	Less than
>	Greater than
%	Percent
%R	Percent recovery

CONTRACT LABORATORY DATA-REVIEW WORKSHEET

1.0 GENERAL INFORMATION Laboratory Lot Number: SDG: LEE-5

Data reviewer: Richard Daddow Review date: 12/21/04

District, Project, & Account #: New Mexico Lee Acres Landfill 8636-9JR01

2.0 DATA DELIVERABLES

Date of Lab analytical report: 12/13/04 Number of copies: bound 1 unbound 2

No. of volumes of raw-data report: — No. of CD copies of raw-data report: 1

Raw-data report reviewed? Yes ___ No X Electronic data files on CD? Yes X No ___

EDD file format: QWDATA X STL QUANT002 ___ ERPIMS ___ Other ___

Comments—Data Reports SDG includes lots D4K170331, D4K180279, and D4K190267

Date rec'd data deliverables: 12/21/04 Date sent deliverables to USGS office 12/22/04

3.0 INVOICE STATUS FOR LOT: OK Invoice copy attached X

4.0 SAMPLE INFORMATION *(Page #'s listed in this worksheet refer to lab analytical report)*

Sample collection date(s): 11/16-18/04 Sample matrix: Water

No. of sample types in lot: Environmental 23 Trip blank 3 Equip. blank 1

MS/MSD 2 Other: ___

4.1 Were accelerated turn-around times (TATs) requested for analyses? Yes ___ No X

If yes, list TAT period and if completed: ___

4.2 Were analyses on chain-of-custody (COC) form performed by lab? YES X **NO** ___

If **no**, list missing or cancelled analyses and reason for non-performance: ___

4.3 Were the samples properly preserved, labeled, no lab log-in problems, and(or) at appropriate temperature (<6 deg. C) upon receipt by the laboratory: Yes ___ No X

If **no**, list sample/lab IDs, and associated problems with when delivered at laboratory:

Sample GBR-48 was listed on COC while the bottles were labeled GBR-49 Sample logged in as per COC (4.2)

Laboratory Lot No: SDG: LEE-5

4.4 Were preparation (extraction) and(or) analysis holding times met? Yes X No ____

If **no**, list analytical methods and sample/lab IDs for samples that exceeded holding-time limits:

4.5 Did surrogate recoveries meet QC acceptance criteria? Yes X No ____ NA ____

If **no**, list methods, surrogates, associated sample/lab IDs, lab report page #s: ____

4.6 Were dilution factors greater than 1 for ***organic*** analyses? Yes ____ No X NA ____

If **ye** , list analytical method, lab/sample IDs, and reason for raised dilution factors: dilution ____ high-analyte levels ____ matrix interferences ____ other ____

4.7 Were dilution factors greater than 1 for **inorganic** analyses? Yes X No ____ NA ____

If **yes**, list analytical method, lab/sample IDs, and reason for raised dilution factors: dilution ____ high-analyte levels ____ matrix interferences ____ other ____

N[illegible] with dilution factors greater than one:
300 (SO_4, Cl, F, NO_3, ortho P), 160.1 (TDS),
353.2 (NO_3+NO_2)

4.8 Additional comments about sample analyses: ____

Laboratory Lot No: SOG: LEE-5

5.0 QUALITY CONTROL (QC) ANALYSES and RESULTS

5.1 Were any target analytes detected in the **Laboratory Method Blanks**? Yes X No____

If **yes**, list method, analytes, report page #s: ____

8260B 3 analytes (p. 166) 8260B 1 analyte (p. 180)
8260B 2 analytes (p. 187)
300 (Cl) (p. 219) 300 ortho P (p. 220)

5.2 Did lab control samples (LCS/LSCD) meet percent recoveries (%R) criteria? Yes___No___

If **no**, list method, analytes, LCS/LCSD, and report page #s:____

5.3 Did the **MS/MSD** results meet %R or RPD acceptance criteria? Yes____No X NA____

Note: matrix spike and matrix spike duplicate (MS/MSD) data are used to evaluate the effect of sample matrix on the analytical process and should be only used in conjunction with other available lab QC data. In some cases, MS samples not directly associated with this lot may be used by the laboratory.

List analytical method and if MS samples are associated with this lot.

If did not meet acceptance criteria also list analytes; MS, MSD or RPD; and lab report page #:

300 (F) MSD/RPD ~~(p. 230)~~ (p. 230) associated MS lot # yes X no____
300 ortho P MS/MSD (p. 232) associated MS lot # yes X no____
____ associated MS lot # yes____ no____
____ associated MS lot # yes____ no____

No MS results reported for method(s): 6010B (Ca, Na)

5.4 Did the **lab-sample duplicate** results meet RPD acceptance criteria? Yes___No X NA___

160.1 (TDS) p. 239

5.5 Additional comments about QC results: ____

Laboratory Lot No: SAB: WEE -5

6.0 ANALYTICAL METHODS USED in this LABORATORY LOT NUMBER

X VOCs by GC/MS--method 8260B/ 524.2 *[water (W) or solids (S) analysis holding-time (HT) of 14 days]*

____ Gasoline Range Organics (GRO)+BTEX-method 8015M(GRO)/ 8021 *[W and S: analysis HT 14 days]*

____ Diesel Range Organics-method 8015M-DRO *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

____ Pesticides by GC--method 8081A *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

____ PCBs by GC--method 8082 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Pesticides by GC--method 8141A *[W: prep HT 7 days; S: prep HT 14 days; analysis HT 40 days]*

____ Herbicides by GC--method 8151A *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ SVOCs by GC/MS--method 8270C *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Dioxins and Furans--methods 8280/ 8290 *[W and S: prep HT 30 days; analysis HT 45 days]*

____ PAHs by HPLC method 8310 *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Explosives by HPLC method 8330 or 8321A *[W: prep HT 7 days; S: prep HT14 days; analysis HT 40 days]*

____ Hexane extractable materials (HEM and SGT-HEM)-method 1664/ 9071B *[W/S: analysis HT 28 days]*

____ Total or dissolved organic carbon (TOC/DOC)--methods 415.1 or 9060 *[W: analysis HT 28 days]*

____ Perchlorate--methods 314.0 or 8321A or IC/MS/MS

____ Total organic halides (TOX)--method 9020 *[W: analysis HT 28 days]*

X Metals by ICP--method 6010B/200.7 Dissolved _____Total X *[W and S: analysis HT 180 days]*

____ Metals by ICP/MS--method 6020/200.8 Dissolved _____Total _____ *[W and S: analysis HT 180 days]*

____ Metals by GFAA methods *[W and S: analysis HT 180 days]* Methods:Sb-7041, As-7060, Cd-7131 Cr-7191, Pb-7421, Se-7740, Tl-7841 List GFAA metals: _____

____ Hexavalent chromium--method 7196 *[W: analysis HT **24 hours**]*

____ Mercury by CVAA--method 7470A (W) and 7471A (S) *[W and S: analysis HT 28 days]*

X Inorganic anions--method 300 *[W: analysis HT **48 hours**-* NO_2, NO_3, ortho-P; *HT 28 days--*Br, Cl, F, SO_4*]*

X Total dissolved solids (TDS)--method 160.1 and(or) TSS--method 160.2 *[W: analysis HT 7 days]*

____ Total alkalinity--method 310.1 *[W: analysis HT 14 days]*

____ Nitrogen, ammonia--method 350.1 *[W: analysis HT 28 days]*

____ Nitrogen, TKN--method 351.2 *[W: analysis HT 28 days]*

X Nitrogen, nitrate + nitrite--method 353.2 *[W: analysis HT 28 days]* NO_3 or NO_2 only *[HT **48 hours**]*

____ Nitrogen, nitrite--method 354.1 *[W: analysis HT **48 hours**]*

____ Total phosphorus-method 365.3 and ortho P by 365.3 *[total P: W: analysis HT 28 days, ortho P **48 hours**]*

____ Cyanide, total and(or) amenable--methods 9012A/ 335.3 *[W and S: analysis HT 14 days]*

____ Moisture content--methods D2216 or 160.3M

____ Other analyses: _____

_____

APPENDIX III

Field Data

April 2005

Sample container and preservation requirements

Parameters and Methods	Bottle Size and Type	Preservatives
Volatile Organic Compounds by method SW8260	Three 40 ml glass vials	200 µL 50% Hydrochloric Acid, Chilled – 4 degrees Celsius
Dissolved Metals: (Mn-Manganese, Ni-Nickel) by method SW6010	16 oz. polyethylene	10 mL 20% Nitric Acid, pH<2
Nitrate plus Nitrite by method E353.2	16 oz. glass	2 mL 50% Sulfuric Acid, pH<2, Chilled – 4 degrees Celsius
Total dissolved solids by methods E160.1; Fluoride, Chloride, nitrate, orthophosphate, and sulfate by method E300.0	32 oz. polyethylene	None, Chilled – 4 degrees Celsius

11-15-04 LEE ACRES

1430 ARRIVED AT LEE ACRES LANDFILL NR FARMINGTON, NM. USGS CREW - FRED GEBHARDT

MET WITH CONSTRUCTION CREW WORKING ON ROADWAY THROUGH LANDFILL. WELLS BLM 55, 56, 57 & 68 ARE EFFECTED BY THE ROAD CREW. WELLS ARE EXPOSED BY THE CONSTRUCTION OF ROAD. WILL WORK AROUND ROAD CREW TO SAMPLE THESE WELLS.

WATER LEVELS

BLM-15	41.16	GBR-17	38.92
BLM-39	40.23	GBR-32	40.52
BLM-51	45.75	GBR-48	42.10
BLM-48	41.89	GBR-49	38.31
BLM-45	37.22	GBR-50	37.13
BLM-42	39.48	BLM-55	43.31
BLM-21	38.11	BLM-56	42.98
BLM-60	39.28	BLM-57	47.05
BLM-77	37.32		
BLM-76	38.51		
BLM-75	36.33		
BLM-70	40.10		
BLM-69	38.18		
BLM-67	37.88		
BLM-68	40.95 → TD 41.21		
BLM-62	35.92		

11-16-2004 LEE ACRES

0730 FRED GERHARDT - USGS ARRIVES AT LEE ACRES LANDFILL.

METER CALIBRATION:

pH METER: ORION MODEL 250A SERIAL#012942
CALIBRATION BUFFERS 7.00 & 10.0
READINGS 7.04 & 10.17
SLOPE 100.5

CONDUCTIVITY METER ORION MODEL 130A S#SS158
CALIBRATION STANDARD 2560
READING 2560
SLOPE 475

0750 ARRIVE AT WELL BLM-15

TIME	VOL	PH	COND	TEMP
0805	<0.5	6.69	2660	15.6
0808	2.0	6.72	2830	15.0
0810	4.0	6.81	2810	15.0
0812	6.0	6.88	2780	14.9
0815	8.0	6.93	2730	14.9
0818	10	6.95	2740	15.0

0820 COLLECTED ENVIRONMENTAL SAMPLE BLM-15

11-16-04 LEE ACRES

0839 ARRIVED AT BLM-39.

TIME	VOL	TEMP	pH	COND
0846	<0.5	14.2	7.01	4050
0847	1.0	14.5	7.09	3730
0848	2.0	14.7	7.12	3280
0849	3.0	14.8	7.08	3220
0851	4.0	14.8	7.06	3500
0852	5.0	14.8	7.07	3530
0853	6.0	14.9	7.03	3830

0900 COLLECTED ENVIRONMENTAL SAMPLE BLM-39

0915 COLLECTED DUPLICATE SAMPLE BLM-98.

** HEAVY EQUIPMENT NEARBY, SMELL DIESEL FUEL.

0923 ARRIVED AT BLM-48

TIME	VOL	TEMP	pH	COND
0928	<0.5	13.7	6.61	3680
0930	1.0	14.7	7.00	2670
0932	2.0	15.1	7.02	2700
0933	3.0	15.2	7.01	2690
0934	4.0	15.3	7.01	2690

0940 COLLECTED ENVIRONMENTAL SAMPLE BLM-48

11-16-04 LEE ACRES

0955 ARRIVED AT WELL BLM-51

TIME	VOL	TEMP	PH	COND
1002	<0.5	13.9	7.09	2590
1005	2.0	14.6	7.02	2880
1008	4.0	14.8	7.01	2870
1011	6.0	14.9	7.02	2870
1014	8.0	14.9	7.03	2880
1016	10.0	14.9	7.03	2880

1020 COLLECTED ENVIRONMENTAL SAMPLE BLM-51

** HEAVY EQUIPMENT NEARBY, SMELL DIESEL FUEL.

1034 ARRIVED AT WELL BLM-45

TIME	VOL	TEMP	PH	COND
1040	<0.5	14.4	7.04	3310
1041	1.0	15.0	7.05	2930
1042	2.0	15.4	7.02	2960
1043	3.0	15.5	7.02	2970
1045	4.0	15.5	7.02	2990
1046	5.0	15.6	7.02	3000

1100 COLLECTED ENVIRONMENTAL SAMPLE BLM-45

" MATRIX SPIKE SAMPLE BLM-45 MS

" MATRIX SPIKE DUPLICATE SAMPLE BLM-45 MSD

11-16-04 LEE ACRES

1130 ARRIVED AT WELL BLM-42

TIME	VOL	TEMP	PH	COND
1137	<0.5	15.0	6.85	4340
1138	1.0	15.4	6.98	4030
1139	2.0	15.5	6.96	3250
1140	3.0	15.6	6.96	3220
1141	4.0	15.7	6.96	3140
1142	5.0	15.7	6.97	3120

1150 COLLECTED ENVIRONMENTAL SAMPLE BLM-42.
I WAS JUST NOTIFIED ~~BY~~ BY THE HEAVY EQUIPMENT OPERATORS THAT THEY WILL BE PLUGGING WELLS BLM-56 + 57 ~~AS SOON~~ LATER TODAY.

1200 INFORMED DALE WIRTH OF BLM ABOUT WELL SITUATION

1210 ARRIVED AT WELL BLM-57.

TIME	VOL	TEMP	PH	COND
1216	<0.5	14.7	6.87	3700
1217	1.0	15.6	6.81	3720
1219	2.0	16.1	6.80	3730
1221	3.0	16.2	6.85	3680
1224	4.0	16.3	6.89	3640

1230 COLLECTED ENVIRONMENTAL SAMPLE BLM-57.

11-16-02 LEE ACRES

1250 ARRIVED AT WELL BLM-56

TIME	VOL	TEMP	pH	COND
1300	< 0.5	15.2	6.62	2870
1301	1.0	15.4	6.61	2660
1302	2.0	15.5	6.71	2780
1303	3.0	15.6	6.82	2910
1304	4.0	15.7	6.86	2950
1305	5.0	15.8	6.90	2980

1310 COLLECTED ENVIRONMENTAL SAMPLE BLM-56.

1320 COLLECTED DUPLICATE SAMPLE BLM-99.

** HEAVY EQUIPMENT OPERATING ALONG SIDE WELL DURING SAMPLING, STRONG DIESEL SMELL.

1340 ARRIVED AT WELL BLM-55.

TIME	VOL	TEMP	pH	COND
1348	< 0.5	16.2	7.10	3220
1350	1.0	16.0	7.35	3230
1352	2.0	15.9	7.20	3210

1400 COLLECTED ENVIRONMENTAL SAMPLE BLM-55

11-16-04 LEE ACRES

1434 ARRIVED AT WELL BLM-62.

TIME	VOL	TEMP	PH	COND
1442	< 0.5	15.6	6.06	4910
1443	1.0	15.9	6.16	4940
1445	2.0	15.9	6.32	4990

WELL WENT DRY, WILL ALLOW IT TO RECHARGE OVER NIGHT & SAMPLE TOMORROW.

1450 ARRIVED AT WELL BLM-69

TIME	VOL	TEMP	PH	COND
1500	< 0.5	15.0	6.95	2490
1501	1.0	15.2	6.96	2700
1502	2.0	15.2	6.97	2670
1503	3.0	15.2	6.97	2680
1504	4.0	15.3	6.98	2690
1505	5.0	15.3	7.00	2680

1510 COLLECTED ENVIRONMENTAL SAMPLE BLM-69.

1515 COLLECTED TRIP BLANK BLM-69TB

FINISHED SAMPLING FOR THE DAY WILL NOW PACK & SHIP.

Frederick E. Gebhardt

11-17-04 LEE ACRES

0730 FRED GEBHARDT - USGS ARRIVES AT LEE ACRES LANDFILL. WELL GBR-17.

METER CALIBRATION

pH METER: ORION MODEL 250A S/N 012942
CALIBRATION ~~READINGS~~ BUFFERS 7.0 + 10.0
READINGS 7.01 + 10.07
SLOPE 101.4

CONDUCTIVITY METER: ORION MODEL 130A S/N 55158
CALIBRATION STANDARD 2560
READING 2560
SLOPE 475

TIME	VOL	TEMP	pH	COND
0809	< 0.5	14.7	6.79	2110
0812	2.0	14.9	6.86	2640
0815	4.0	14.8	6.97	2640
0818	6.0	14.7	7.07	2640
0820	8.0	14.7	7.11	2650
0823	10	14.8	7.13	2650

0830 COLLECTED ENVIRONMENTAL SAMPLE ~~BEH~~ GBR-17.

11-17-04 LEE ACRES

0845 ARRIVED AT WELL GBR-32.

TIME	VOL	TEMP.	pH	COND
0855	<0.5	13.8	7.26	5230
0857	1.0	14.6	7.25	5220
0859	2.0	14.1	7.59	5130

WELL WENT DRY WILL SAMPLE LATER.

0930 COLLECTED SAMPLE GBR-32.

0905 ARRIVED AT WELL GBR-49. THIS WELL WILL BE SAMPLED USING A TEFLON BAILER.

TIME	VOL	TEMP	pH	COND
0911	INITIAL	13.8	6.97	5660
0917	1.5 L	13.7	7.38	5780

WELL WENT DRY, WILL SAMPLE ~~TOMORROW~~ TOMORROW

0950 RETURNED TO WELL BLM-62, PURGED WELL YESTERDAY, WILL ONLY SAMPLE TODAY.

0955 PENNY HOWARD OF SAN JUAN CO. ROAD DEPT. CONSTRUCTION DIVISION ARRIVES ON SITE. SHE EXPLAINS THE REMEDEATION PLANS FOR LEE ACRES. IT APPEARS THE MAJORITY OF WELLS WILL BE PLUGGED.

1020 COLLECTED ENVIRONMENTAL SAMPLE BLM-62.

11-17-04 LEE ACRES

1035 ARRIVED AT WELL BLM-60.

TIME	VOL	TEMP	pH	COND
1049	<0.5	14.6	6.14	3530
1050	1.0	15.1	6.64	3190
1051	2.0	15.4	6.71	3200
1052	3.0	15.5	6.74	3310
1053	4.0	15.5	6.85	3210

1100 COLLECTED ENVIRONMENTAL SAMPLE BLM-60.

1110 ARRIVED AT WELL BLM-21

TIME	VOL	TEMP	pH	COND
1113	<0.5	14.8	6.96	3740
1114	1.0	15.0	7.11	3080
1115	2.0	15.2	7.05	3280
1117	3.0	15.3	7.03	~~3~~23620
1118	4.0	15.3	7.11	3510

1120 COLLECTED ENVIRONMENTAL SAMPLE BLM-21

11-17-04 LEE ACRES

1138 ARRIVED AT WELL GBR-50.

TIME	VOL	TEMP	pH	COND
1143	<0.5	15.3	6.73	3690
1144	1.0	15.5	7.14	3280
1145	2.0	15.5	7.18	3250
1146	3.0	15.6	7.19	3240
1148	4.0	15.6	7.18	3230

1150 COLLECTED ENVIRONMENTAL SAMPLE GBR-50.

1205 ARRIVED AT WELL BLM-77.

TIME	VOL	TEMP	pH	COND
1212	<0.5	15.5	6.65	3270
1214	2.0	15.7	6.84	3280
1217	4.0	15.8	7.03	3260
1220	6.0	15.8	7.08	3270
1222	8.0	15.8	7.13	3270
1225	10	15.7	7.14	3270

1230 COLLECTED ENVIRONMENTAL SAMPLE BLM-77

11-17-04 LEE ACRES

1245 ARRIVED AT WELL BLM-76

TIME	VOL	TEMP	pH	COND
1251	<0.5	14.9	6.43	3300
1252	1.0	15.3	6.92	3270
1254	2.0	15.3	7.12	3260
1255	3.0	15.5	7.18	3260
1256	4.0	15.5	7.14	3260
1257	5.0	15.5	7.13	3270
1258	6.0	15.5	7.13	3280
1300	7.0	15.7	7.13	3280

1310 COLLECTED ENVIRONMENTAL SAMPLE BLM-76 WELL DRIED DURING SAMPLING RECOVERED QUICKLY.

1315 COLLECTED TRIP BLANK BLM-76 TB.

1320 RETURNED TO WELL GBR-49.

1330 TRIED TO COLLECT A PARTIAL SAMPLE, NO SUCESS, THE WELL DOESN'T SEEM TO BE RECHARGING. WILL TRY AGAIN TOMORROW.

1400 WENT TO WELLS BLM-68 & BLM-70. NEITHER WELL HAVE ENOUGH WATER TO SAMPLE. BLM-70 HAS 0.06 OF WATER BLM-68 HAS 0.26.

PACK & SHIP

11-19-04 LEE ACRES

0800 FRED GEBHARDT - USGS ARRIVES AT LEE ACRES LANDFILL.

METER CALIBRATION

pH METER: ORION MODEL 250A S/N 012942
CALIBRATION BUFFERS 7.0 & 10.0
READINGS 7.01 & 10.06
SLOPE 102.4

CONDUCTIVITY METER: ORION MODEL 130A S/N 55158
CALIBRATION STANDARD 2560
READING 2560
SLOPE 470

0835 ARRIVED AT WELL BLM-67

TIME	VOL	TEMP	pH	COND
0840	<0.5	14.5	6.77	2690
0841	1.0	14.9	6.81	2710
0842	2.0	15.0	6.85	2690

WELL WENT DRY JUST BEFORE SAMPLING SHOULD RECHARGE QUICKLY.

0910 COLLECTED ENVIRONMENTAL SAMPLE BLM-67

11-18-04 LEE ACRES

0915 RETURNED TO WELL GBR-49, IT DIDN'T RECHARGE OVERNITE, NOT ENOUGH WATER TO SAMPLE.

0930 ARRIVED AT WELL BLM-75

TIME	VOL	TEMP	pH	COND
0935	<0.5	13.6	7.30	3030
0938	2.0	14.8	7.39	3040
0942	4.0	15.0	7.39	3000
0946	6.0	15.3	7.38	3000

WELL PURGE GOING VERY SLOW, IT DOESN'T APPEAR THAT THE WELL IS RECHARGING VERY QUICKLY

0953	8.0	15.4	7.39	3010
1000	10.0	15.4	7.40	3000
1009	12.0	15.4	7.40	2990

WELL WENT DRY, WILL ALLOW IT TO RECHARGE THEN SAMPLE.

1020 IT WAS DISCOVERED THAT THE WELL DIDN'T GO DRY OR RECHARG SLOWLY, THE PUMP WAS GOING BAD. THE PUMP DIED. REPLACED

1023	14.0	15.4	7.40	3000

1030 COLLECTED ENVIRONMENTAL SAMPLE BLM-75

11-18-04 LEE ACRES

1050 ARRIVED AT WELL GBR-48

TIME	VOL	TEMP	PH	COND
1058	<0.5	14.6	5.78	6140
1101	1.0	15.0	5.99	6180
1103	2.0	15.3	6.35	6160
1105	3.0	15.0	6.82	6190

1110 COLLECTED ENVIRONMENTAL SAMPLE GBR-48

1115 COLLECTED TRIP BLANK GBR-48TB

1200 COLLECTED EQUIPMENT BLANK GBR-48EB.

PACK & SHIP.

RECORD OF DECISION
FOR THE
LEE ACRES LANDFILL SUPERFUND SITE,
FARMINGTON, NEW MEXICO

U.S. Environment Protection Agency
Region 6 Superfund Division

MAY 2004

171035

LEE ACRES LANDFILL SUPERFUND SITE
RECORD OF DECISION

CONCURRENCE

Petra Sanchez
Remedial Project Manager

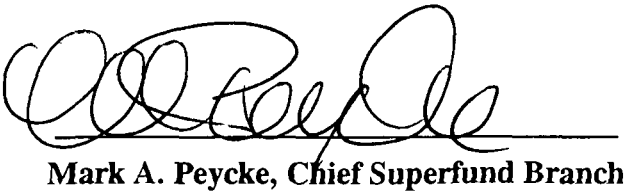
Don Williams, Team Leader
New Mexico/ Technical Section

Wren Stenger, Branch Chief
Louisiana / New Mexico/Oklahoma Branch

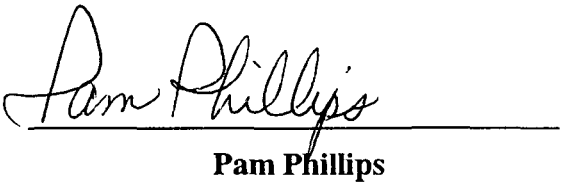
Michael C. Barra
Site Attorney, Office of Regional Counsel

LEE ACRES LANDFILL SUPERFUND SITE
RECORD OF DECISION

CONCURRENCE



Mark A. Peycke, Chief Superfund Branch
Office of Regional Counsel



Pam Phillips
Deputy Director, Superfund Division

The United States Department of the Interior

Bureau of Land Management

Lee Acres Landfill
Farmington, New Mexico

Record of Decision

June 2004

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Declaration

Site Name and Location

This decision document presents the selected remedy for the Lee Acres Landfill National Priorities List (NPL) Site near Farmington, New Mexico, which comprises 60 acres owned by the United States, and is commonly known as the Lee Acres Landfill. The site is approximately 4.5 miles east of Farmington, New Mexico. Lee Acres is listed in the Environmental Protection Agency's (EPA) National Superfund Database, identification number NMD980750020.

Statement of Basis and Purpose

This decision document presents the selected remedy for the Lee Acres Landfill near Farmington, New Mexico, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601, et seq., as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the Administrative Record file for this site.

EPA and the State of New Mexico Environmental Department (NMED) have reviewed the Administrative Record for the Lee Acres Landfill and concur with the selected remedy. The Department of the Interior, Bureau of Land Management (BLM), is the lead agency for response action at the Lee Acres Landfill.

The selected remedy is protective of human health and the environment, and complies with Federal and State requirements that are legally applicable or relevant and appropriate requirements (ARARs) for the remedial action. The selected remedy also is cost effective.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in the ROD, may present an imminent and substantial endangerment to public health and the environment.

Description of Selected Remedy

The selected remedy will consist of closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory. Surface water run-on and run-off controls will be constructed to divert run-on and maximize run-off. Because contaminant concentrations, for which clean-up levels are listed in Table 2, have been decreasing, and the plume is not migrating, the selected remedy for ground water is monitored natural attenuation. Institutional controls will ensure the long-term effectiveness of the remedy. This response action is comprehensive, and will address all actual or potential risk at the site. No additional response actions are anticipated.

BLM will continue to monitor ground water to ensure the effectiveness of the capillary barrier cap and natural attenuation remedy. If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with applicable or relevant and appropriate requirements (ARARs). Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance. This approach was selected to ensure that any contaminant increases that may occur are in fact a long-term trend rather than a short-term event.

Institutional controls will be utilized to prevent access to contaminated ground water and to hazardous substances encapsulated in the landfill. An area of 134.68 acres of public land, which

includes the Lee Acres Landfill and a buffer area around it, was withdrawn by BLM from surface entry and mining for a period of 50 years (see 62 FR 2177, Public Land Order No. 7234). The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could disturb the integrity of the containment system, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill site.

The landfill contents at the former Lee Acres Landfill are the source materials at this site, and are not considered principal threat wastes (i.e., highly toxic or highly mobile waste that generally cannot be reliably contained). The landfill contents consist of common household waste, various types of construction debris, and industrial wastes such as paint thinners, grease and oil strippers and cleaners, pesticides, and general cleaning chemicals. The lagoons, which formerly contained liquid waste, were drained and covered with clean soil in 1986. In addition, the contaminated ground water is not considered a principal threat waste because it is not considered a source of contamination. The selected remedy will significantly reduce the mobility of remaining sources in the former landfill; however, the selected remedy will not actively reduce the existing toxicity and volume. Light non-aqueous phase liquids (LNAPLS) and dense non-aqueous phase liquids (DNAPLS) were not found in concentrations that exceed EPA action levels during the Remedial Investigation (RI), and therefore were not considered further in the RI/FS process. The same reasoning was used for landfill gases, which were not measured in elevated concentrations during the RI.

The major components of the selected remedy are:

- landfill cover (capillary barrier cover) with lysimeters;
- surface water run-on and run-off controls;
- monitored natural attenuation of ground water; and

- institutional controls, in the form of withdrawal of site by BLM, and implemented through the District Resource Management Plan/Final Environmental Impact Statement.

Statutory Determination

The selected remedy is protective of human health and the environment. The selected remedy for the soil pathway will attain State and Federal ARARs. The selected remedy for the ground-water pathway will attain ARARs within a reasonable time frame not to exceed the ground-water monitoring period of 30 years.

The selected remedy does not satisfy the statutory preference for treatment as a principle element of the remedy because the landfill waste is high-volume, low-risk waste that can be reliably contained, and would not be cost-effective to treat. The selected remedy is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than each five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

Data Certification Checklist

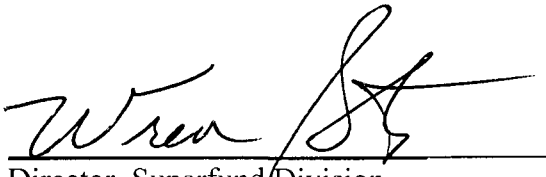
The following information has been included in the ROD.

- The chemicals of concern (COCs) and their respective concentrations.
- Baseline risk represented by the COCs.
- Current and future land and ground water assumptions used in the baseline risk assessment and ROD.
- Land and ground-water use that will be available at the site as a result of the selected remedy.

- Estimated capital, operation and maintenance (O&M), and total present worth costs; discount rate and number of years over which cost estimates are projected.
- Factors that led to selecting the remedy.
- Clean-up levels established for COCs and the basis for these levels.
- How source materials constituting principal threats are addressed.

Authorizing Signatures

Assistant Secretary — Date
Policy, Management and Budget
Department of the Interior



6/24/04

Director, Superfund Division — Date
Region 6
U.S. Environmental Protection Agency

- Estimated capital, operation and maintenance (O&M), and total present worth costs; discount rate and number of years over which cost estimates are projected.
- Factors that led to selecting the remedy.
- Clean-up levels established for COCs and the basis for these levels.
- How source materials constituting principal threats are addressed.

Authorizing Signatures

P J Sz 7/22/04

Assistant Secretary — Date
Policy, Management and Budget
Department of the Interior

Director, Superfund Division — Date
Region 6
U.S. Environmental Protection Agency

1.0 INTRODUCTION

This Record of Decision presents the selected remedy for the remediation of soil and ground-water contamination at the Lee Acres Landfill Superfund Site. In an effort to promote technology advancement, the Bureau of Land Management (BLM), the Environmental Protection Agency (EPA), and the New Mexico Environment Department (NMED) have worked together to select a comprehensive remedy that is appropriate for the climate conditions at the site. The remedy selection is based on the potential risk presented by the site, the most current data available, ease of implementation, public support, and cost effectiveness. Data collected subsequent to the finalization of the Proposed Plan (PP) up through November 1999, have been incorporated into and evaluated for the remedy selection in this ROD.

The technology selected for the closure and capping of the landfill soils is a capillary barrier cover designed by the Department of Energy's (DOE) Sandia National Laboratory in Albuquerque NM, the University of New Mexico, and BLM's Farmington Field Office. Both EPA and NMED have been involved in the development of the plan, and have received copies of the September 1998, January 1999, March 1999, and June 2000 pilot study reports from UNM in order to review the results of the project collected to date. The results of the data collected during the pilot project monitoring period were interpreted by the designers at Sandia and UNM. Success of the pilot was defined as "no measurable infiltration at the bottom of the cap; failure of the cap would have been the detection of measurable infiltration at the bottom of the cap". The results have shown that the capillary barrier performed as originally expected. However, there was an unexpected increase, followed by decreases, in some VOCs in two monitoring wells within the landfill boundary, BLM 56 and 57. It is suspected that the increases in concentrations were temporary spikes caused by the installation of the pilot project. In order to more closely monitor this situation, sampling frequency was increased to quarterly for wells BLM 57, 56, and 49.

Because the contaminant concentrations have been decreasing in all wells located outside the landfill cells, and the plume has not been moving, the selected remedy for the contaminated ground water is monitored natural attenuation. BLM will continue to monitor ground water to

ensure the continued effectiveness of the monitored natural attenuation remedy. If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with ARARs. Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance.

The total estimated cost of the preferred alternatives for soil and ground water is $2.2 million. The total future cost for remediation of the Lee Acres Landfill is not expected to exceed $3.5 million over 30 years.

2.0 SITE LOCATION AND DESCRIPTION

The Lee Acres Landfill is located approximately 4.5 miles east of Farmington, New Mexico (Figure 1), on federal land managed by the BLM. In May 1962, San Juan County leased 20 acres (W1/2NW1/4SW1/4 of Section 22, T29N, R12W). Another 40 acres was leased in 1980 (S1/2SW1/4NW1/4; NW1/4NE1/4SW1/4; and NE14NW1/4SW1/4 of Section 22, T29N, R12W) (BLM 1981). All 60 acres are contained in a fenced area as one site (see Figure 1).

3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Lee Acres Landfill was operated by San Juan County through leases dating from 1962 until April 1993. The original lease was approved by BLM in 1962 for use of the property as a municipal solid waste landfill. In 1980, San Juan County, with the knowledge of both the State and BLM, expanded the use of the landfill to allow the disposal of liquid waste. Containment berms were built, and lagoons were established in the northwest and southwest quadrants of the landfill. These are referred to as the "northern lagoon" and "southern lagoon" respectively. Figures 2 through 4, based on photogrammetric data, illustrate landfill use and development history. Section 16 presents a chronological summary of the regulatory events at the landfill.

In 1985, the berm of the northern lagoon was breached during routine maintenance activities, releasing both the liquid contents and hydrogen sulfide gas. A resident that was present at the landfill, and several emergency response team members were hospitalized due to inhalation of the gas. New Mexico Environmental Improvement Division (NMEID), the predecessor of the NMED, responded to the release, aerated the lagoon, and treated the lagoon contents with ferric chloride to neutralize the hydrogen sulfide and stabilize other chemicals that might be present in the liquid contents of the lagoon. The landfill was closed to liquid waste disposal in 1985 and was closed to solid waste disposal in 1986. It was covered with 4 to 15 feet of clean soil in 1986. A Preliminary Investigation was performed by BLM in 1988. The Lee Acres Landfill was placed on the National Priorities List (NPL) by the Environmental Protection Agency (EPA) in 1990.

During the period of operation of the landfill, the Giant-Bloomfield Refinery (GBR), located immediately south of the landfill, was also in full operation, refining mainly diesel and unleaded gasoline. It has been discovered that the refinery lost approximately 45,000 barrels of refined product into the soils and ground water from about 1975 to 1984. In their efforts to recover the product and remediate the contaminated ground water, GBR installed numerous recovery wells and an air stripping system under the regulatory authority of New Mexico Oil and Gas Division.

In 1986, volatile organic compounds (VOCs) were found at concentrations greater than the associated maximum contaminant levels (MCLs) in samples collected from three domestic water supply wells in the Lee Acres subdivision located down-gradient from the landfill and refinery. The BLM agreed to connect the 13 residents in the subdivision who were using private drinking water wells to a municipal water supply. During the construction of the connections, BLM provided those residents with at least 8,700 gallons of bottled water. The hookups were completed in 1987.

In January 1993, EPA, NMED, and BLM entered into a technical Memorandum of Understanding (MOU) that developed a technical working group to complete the Remedial

Investigation (RI), the Feasibility Study (FS), and the Proposed Plan (PP). The RI was approved by EPA and NMED in May 1995, and the FS was approved by the two agencies in May 1996. Subsequently, the PP was approved by the EPA and NMED in September 1996. The public review and response period was completed in November 1996 with no comments received.

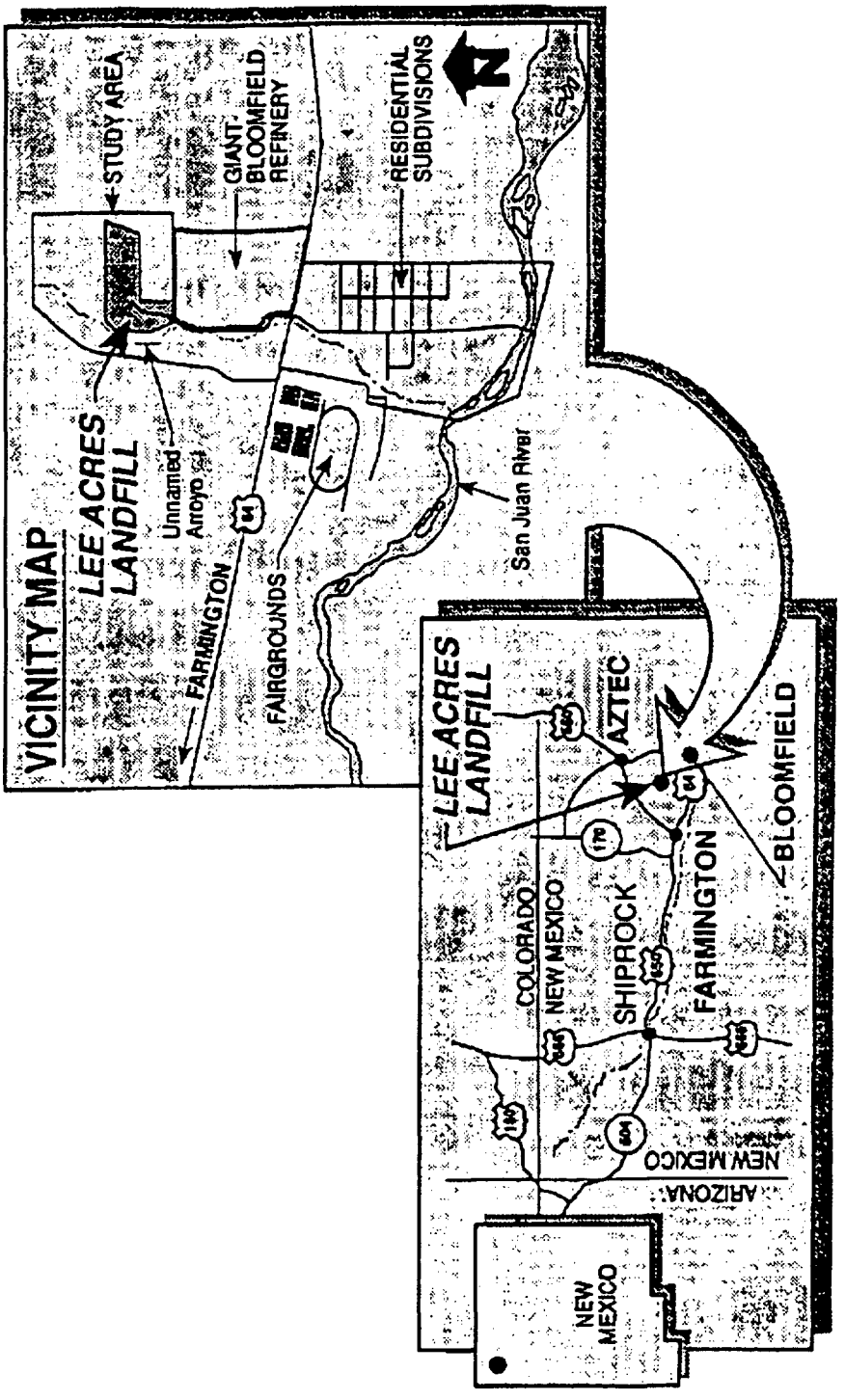


Figure 1 Lee Acres Landfill Location

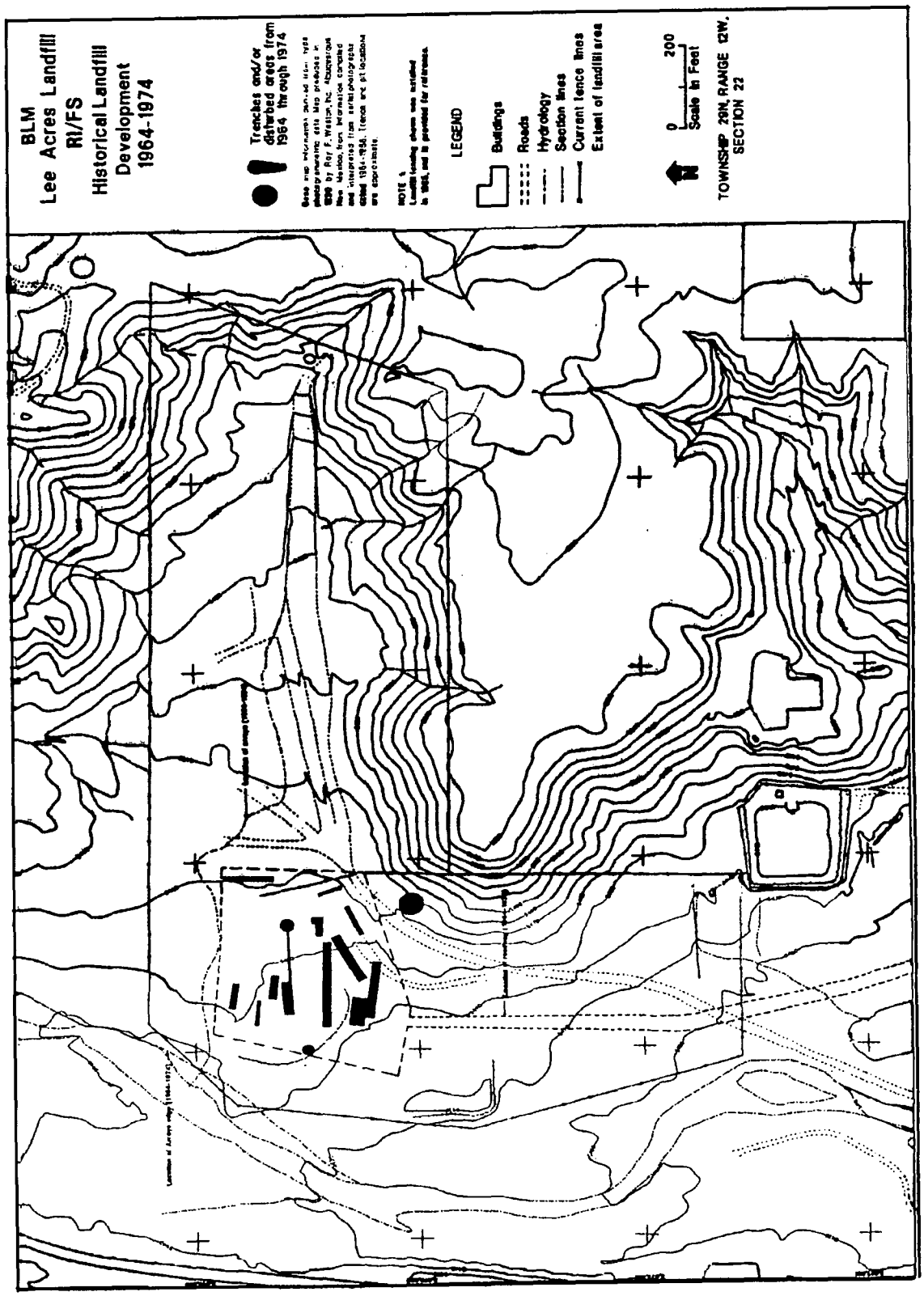


Figure 2 Historical Landfill Development, 1964-1974

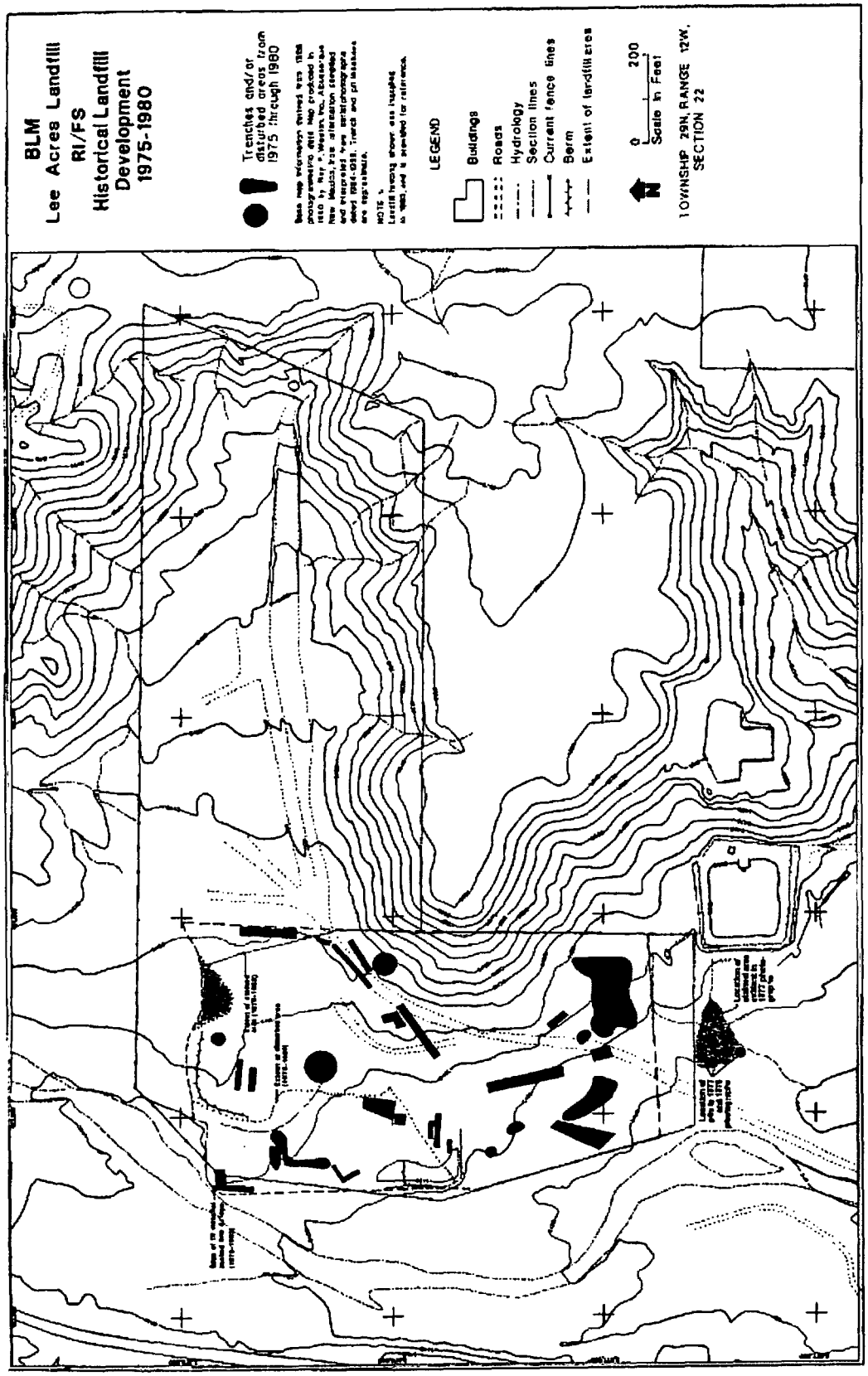


Figure 3 Historical Landfill Development, 1975-1980

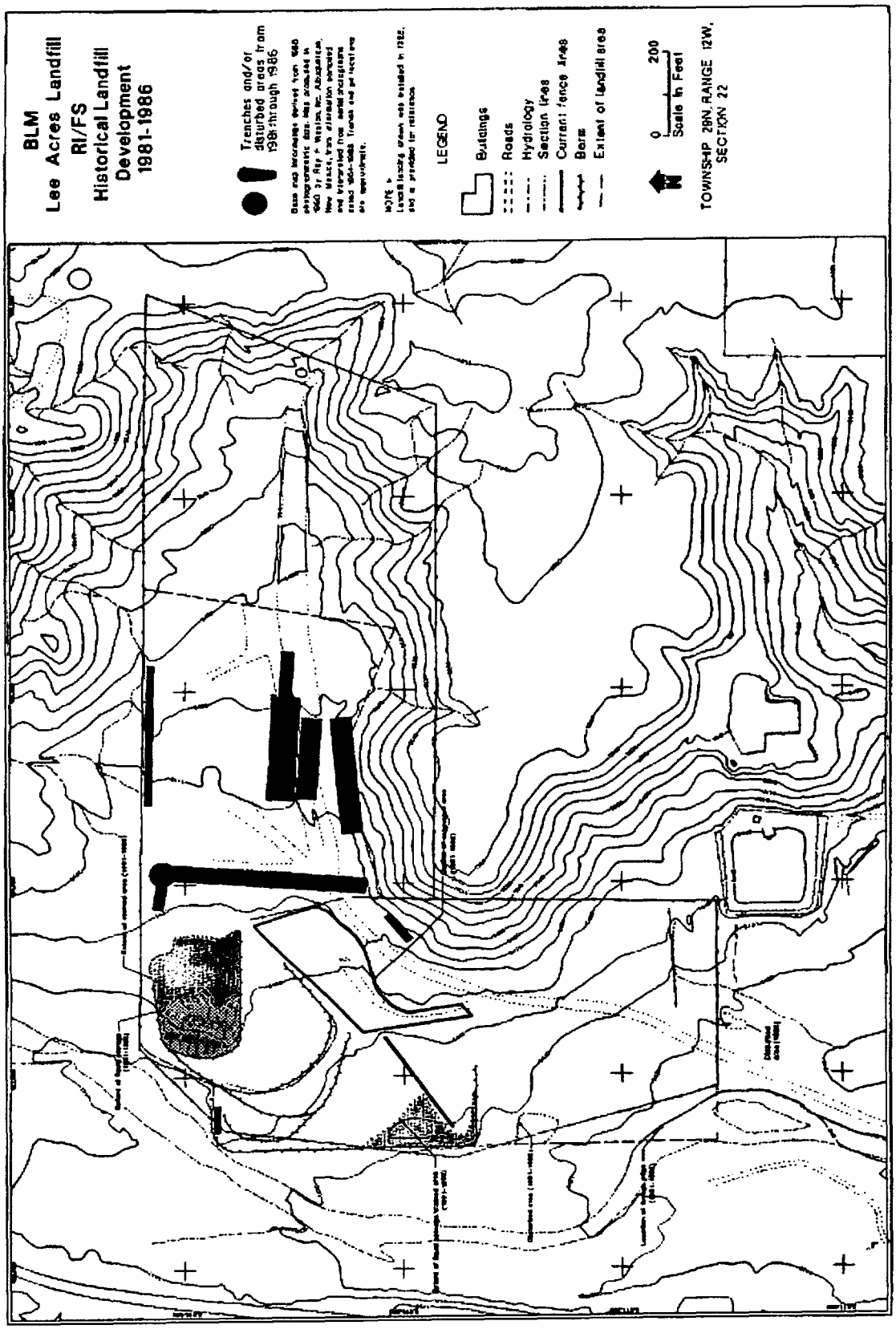


Figure 4 Historical Landfill Development, 1981-1986

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

BLM began a public participation program in 1990 regarding the Lee Acres Landfill, in fulfillment of the public participation requirements in CERCLA and section 300.430(f)(3) of the NCP. Scoping meetings were held in Santa Fe, Albuquerque and Farmington. Two Open Houses were held in 1993 and 1994 at the Farmington District Office. Fact Sheets and newsletters were published periodically during the RI/FS process as well. No comments, input or public response were received during these outreach efforts.

Responsiveness Summary

The RI/FS Report and the PP for the Lee Acres Landfill were released to the public on September 16, 1996. These documents were made available to the public in both the Administrative Record and the information repositories listed in Table 1. The notice of availability of the documents was published in the Farmington Times, Durango Herald, and the Albuquerque Journal. A public comment period was held from September 16, 1996 through November 16, 1996. In addition, a public meeting was held at San Juan College in Farmington, New Mexico on September 26, 1996. At this meeting, representatives of the BLM, EPA Region VI, NMED, Sandia National Laboratory and Department of Energy (DOE) were present to answer questions from the public. No members of the public attended the meeting, and no comments were received on the RI/FS and PP during the public comment period. The public response is part of the Administrative Record. The decisions in the ROD are based on the data included in the Administrative Record.

Lee Acres Landfill RI/FS Information Repositories

Bureau Of Land Management Contact: Mr. Joel Farrell 1235 La Plata Highway Farmington, New Mexico 87401 505-599-6311
Alturian Public Library Contact: Ms. Suzy Horvath 201 W. Chaco Aztec, New Mexico 87410 505-334-9456
New Mexico Environment Department Ground Water Protection and Remediation Bureau Contact: Ms. Robin Brown 1190 St. Francis Drive Santa Fe, New Mexico 87503 505-827-2434
Environmental Protection Agency Library Contact: Mr. Sairam Appaji 1445 Ross Avenue Dallas, Texas 75202 214-665-3126
Farmington Public Library Contact: Ms. Nancy Gorman 100 W. Broadway Farmington, New Mexico 87401 505-599-1270

Table 1 Administrative Record Repository Locations

5.0 SCOPE AND ROLE OF OPERABLE UNITS

Two environmental media are being addressed by this ROD for the Lee Acres Landfill: soil within and beneath the landfill, and contaminated shallow alluvia ground water beneath and south of the landfill. With this remedy, all potential risk from the site is being addressed. No additional response actions are anticipated.

The primary concern for remediation of the soils within the landfill is the potential for the leaching of the residual contamination from the landfill soils into the ground water. This ROD presents alternatives designed to prevent future leaching of contaminants by percolation of surface moisture into the ground water through the contaminated trash layers and the lagoon sediments that are still in place in the landfill. Although contaminated soils exist within the landfill, the most highly contaminated soils have been covered with clean soil. This reduction of percolation and natural degradation of the contaminants has been occurring within the soil since the landfill's closure.

The primary concern for the ground-water pathway is potential ingestion of manganese, nickel, and chlorinated volatile organic compounds (VOCs) that are present in the ground water. These contaminants pose a potential risk to human health because the EPA's Hazard Index (HI) for noncarcinogenic risk is exceeded, and the concentrations of some chlorinated VOCs exceed ARARs.

Ground-water contamination forms a plume in the alluvial aquifer. The plume extends from the landfill south onto the adjacent property owned by GBR. Three concentrated areas of ground-water contamination remain. Two of the concentrated areas correspond to the locations of the former liquid waste lagoons at the landfill. The third concentrated area of ground-water contamination is south of the landfill located near wells GBR-32, GBR-48, and GBR-49. The source of the third center of contamination has not been identified. Identifying the source of the third center of contamination is not necessary because long-term ground-water monitoring data (March 1990 to November 1999) demonstrate that the ground-water contamination levels are decreasing and the contaminant plume is receding. The decrease in the contaminant concentrations and plume size is attributed to closing the liquid waste lagoons to use, allowing the contents to evaporate, backfilling the lagoons with clean soil, and closing the landfill. Under

favorable conditions, natural physical, chemical, or biological processes can act to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or ground water. These processes include biodegradation; dispersion; dilution; sorption; volatilization; and chemical or biological stabilization, transformation, or destruction of contaminants. (Monitored Natural Attenuation of Chlorinated Solvents, U.S. EPA Remedial Technology Fact Sheet).

To protect public health, welfare, and the environment from hazardous substances that will remain at the landfill following the completion of remedial action, BLM has withdrawn 134.68 acres of public land, within which the landfill is located, from settlement, sale, location, and entry, as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). In light of this withdrawal, the current and reasonably foreseeable future uses of the withdrawn land, including the ground water beneath the land, will not include any use that will result in an unacceptable risk to human health or the environment due to exposure to hazardous substances remaining at the landfill. Pursuant to the authority vested in the Secretary of the Interior by Section 104 of CERCLA, 42 U.S.C. 9604, and Section 204 of the Federal Land Policy and Management Act, 43 U.S.C. 1714, this withdrawal, and the resulting restriction on use, will remain in effect until January 15, 2047, unless the Secretary determines that the withdrawal should be extended.

6.0 SUMMARY OF SITE CHARACTERISTICS

The Lee Acres Landfill is in the eastern portion of San Juan County, a dissected high plateau within the Navajo Section of the Colorado Plateau physiographic province. This high plateau is dissected by the San Juan and Animas Rivers that originate in the San Juan Mountains of southern Colorado, coalesce near Farmington, and flow west to the Colorado River. The landfill is located in the southern drainage basin of the interfluvial ridge between the two rivers. The intermittent surficial waters from the area drain through an unnamed arroyo system that joins the San Juan River south of the Lee Acres subdivision.

In this part of San Juan County, much of the land is publicly owned, open rangeland. Several governmental agencies, industries, developers, and private citizens own or lease land within the original study area for the site (Figure 5). The original study area (circa 1986) was significantly

larger than the site is now. It was re-defined in 1993 for the RI. No Indian reservations, tribal lands, or railroad land grants are within the study area. Residential, commercial, and industrial developments are concentrated in the incorporated municipalities of Aztec, Bloomfield, and Farmington, and adjacent to the transportation corridors between these towns. The majority of the residential development in the area is considered low income housing. The major vehicular transportation route in the vicinity of the former landfill is U.S. Highway 64, also known as the Bloomfield Highway. The highway is located approximately ½ mile south of the landfill boundary.

Figure 5 is a general land use map of the study area prepared on the basis of 1988 aerial photographs and surface reconnaissance. Land use has not changed significantly since 1988.

The land in the region of the study area is used predominantly as open rangeland for livestock and wildlife. It is also used for: 1) industrial purposes by the Giant-Bloomfield Refinery (GBR), and by the El Paso Natural Gas Substation, which is north of the study area; 2) residential purposes south of the study area and north of the San Juan River; and 3) public recreational purposes at the San Juan County Fairgrounds southwest of the study area.

The rangeland vegetation in the area is not well suited to supporting large numbers of livestock; approximately 12 acres are required to feed one mature cow and calf for one month (one animal-unit-month). Oil and natural gas wells are present near the landfill. A north to south trending natural gas pipeline is located approximately 500 feet west of the landfill site. No public schools, prisons, or hospitals are within three miles of the site. The nearest educational facility is a private school operated by the Mennonite community approximately one mile north of the landfill. Future use of this area is expected to remain much the same as it is now, with the exception of a possible county road expansion.

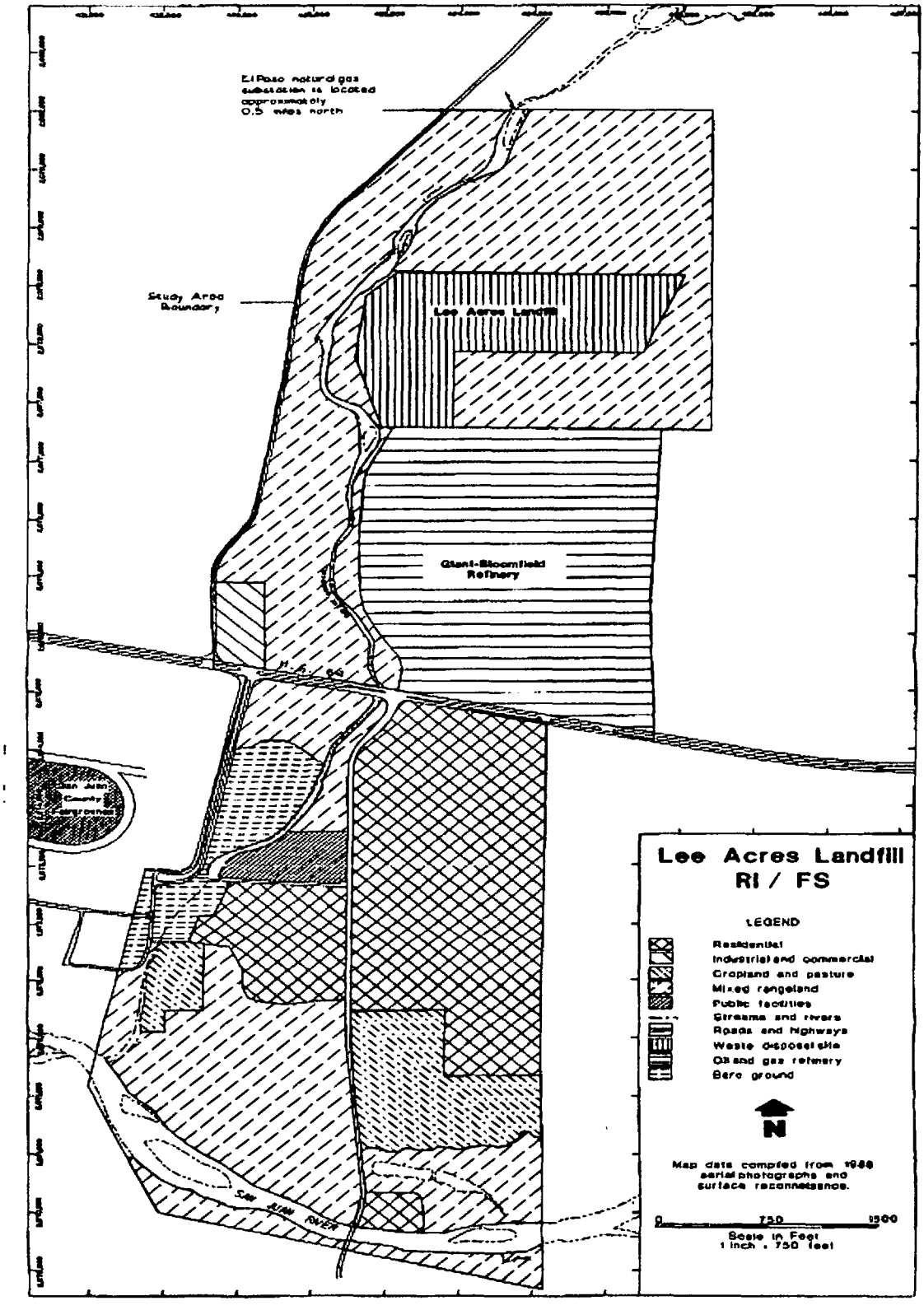


Figure 5 Lee Acres Landfill Vicinity Land Use Map

The 60-acre landfill can be divided into two portions. The eastern 40 acres is sublain by tertiary Nacimiento Formation claystone/siltstone facies interfingered with Nacimiento sandstone facies that forms the low permeable barrier to bedrock aquifers. This portion of the landfill was generally used for solid waste disposal and dead animal pits. The western 20 acres of the landfill is underlain by quaternary alluvium classified as unconsolidated silty sand to sandy gravel. The thickness of the alluvium, from ground surface to bedrock, is up to 60 feet near the center of the channel and the depth to water is 34 to 47 feet. Alluvial ground water is present beneath approximately 8 acres along the western edge of the landfill (Figure 6), but not the eastern portion of the landfill.

The western edge of the landfill is underlain by an unconfined alluvial aquifer. The aquifer is bound on both sides by the margins of an incised bedrock channel which is approximately 600 feet wide in the area near the landfill. Ground water in the alluvial aquifer moves southward at a rate of approximately 0.17 feet per day (62 feet/year), based on the hydraulic data collected in 1993. Farther south, the saturated alluvium interfingers with the San Juan River deposits and is not bound by the bedrock channel. The alluvium is comprised of poor to moderately sorted, fine to medium sands with some gravel and cobbles. Unconsolidated silt and clay lenses are common. The underlying regional bedrock aquifer is unaffected by the contamination from the Lee Acres Landfill site.

Based on historical records and field sampling, soil investigations at the landfill identified four major areas that are either known or potential contaminant source areas that pose a threat to ground water. The former northern and southern liquid waste lagoons have been identified as known contaminant source areas.

The areas of the site identified as potential sources, based on analytical results, include the southern region of the landfill, which may have been either a lagoon area or solid waste disposal area, and an area south of the landfill fence that includes the GBR firewater storage ponds.

The landfill is surrounded on the north, east and west by undeveloped property. GBR is located south of the landfill, and the GBR property is bounded on the south by Highway 64. South of Highway 64, there is a residential area, the Lee Acres Subdivision, which extends to the San Juan

River. The San Juan River is about one mile south of the Lee Acres Landfill. It was this subdivision that required the domestic water supply in 1986, due to contamination from sources that were not specifically identified. Ground water in the study area is not currently used for municipal, domestic, or agricultural water supplies. The landfill has been withdrawn from public use until at least 2047.

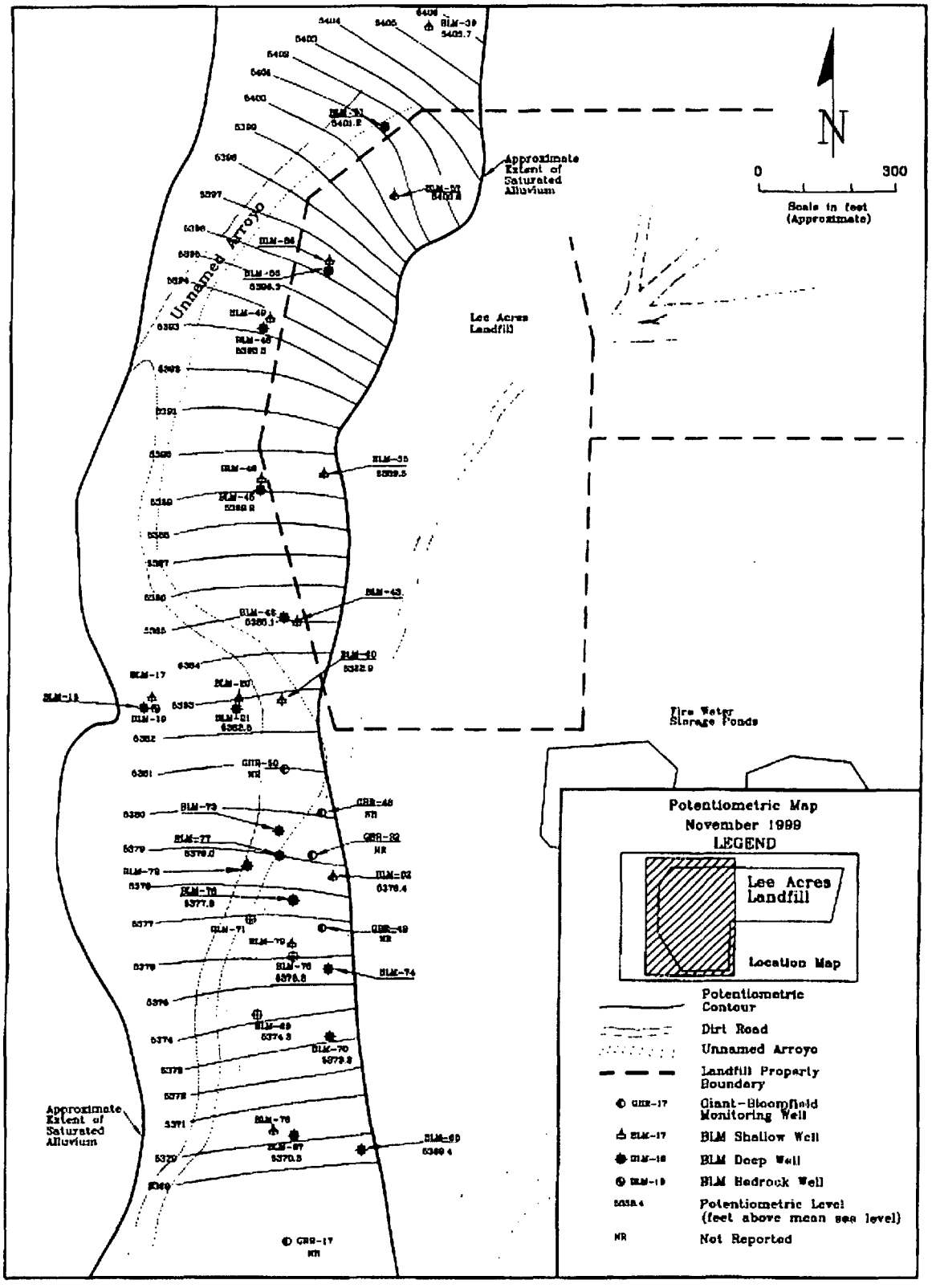


Figure 6 Saturated Alluvium Extent and Potentiometric Surface Map, November 1999

6.1 Field Investigation and Data Collection Activities

Following the lagoon treatment by NMEID in 1985, AEPCO, a BLM contractor, completed a site inspection at the landfill in 1986.

In February 1987 under agreement with BLM, the United States Geological Survey (USGS) installed 12 ground-water monitoring wells/piezometers in the adjacent arroyo. Several geophysical surveys were conducted.

In March 1987, GBR announced the implementation of ground-water remediation to remove petroleum products.

During the fall of 1988, DOI held RI scoping meetings in Farmington, Santa Fe and Albuquerque, New Mexico to initiate public involvement in the project and to begin to collect historical data.

In September 1993, field data collection for use in the RI Report was completed and USGS took over the semi-annual monitoring program at Lee Acres Landfill. This monitoring program is ongoing. The data used in the FS and PP to determine appropriate actions on the site were current through the date of the release of those documents (from 1993 through May 1996). Data collected through November 1999 are presented and discussed in this ROD.

6.2 Nature and Extent of Soil Contamination, Lee Acres Study Area

Soil samples were collected from both the vadose and saturated zones during the initial stage of the RI. Details of the soil sampling programs are found in the RI. The landfill is estimated to contain approximately 800,000 cubic yards of contaminated soil and waste. Waste types encountered within the landfill consist of common household waste and various types of construction debris. Typical types of household and industrial wastes that contain many of the chemicals listed below include paint thinners, grease and oil strippers and cleaners, pesticides, general cleaning chemicals, dry cleaning chemicals, carburetor cleaners, used oil from automotive and heavy equipment, kitchen and restaurant cleaners and grease, oil field wastes,

spent copier and toner cartridges, and many other types of materials. It is probable that many of these products or their containers were placed in both lagoons, as well as other parts of the landfill during the period from 1974 through 1986.

The following methods for soil testing at the Lee Acres Landfill were used during the RI in 1993 and earlier. Samples were collected during borehole installation and from well installation. Soil samples from boreholes BH 01 through BH 39 and wells BLM 39 through BLM 66 were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/PCBs and metals using EPA methods 8010, 8020, 8270, 8080 and TCLP. Soil samples from boreholes BH 40 through BH 53 and well bores BLM 67 through BLM 79 were analyzed for VOCs, metals, chloride, and sulfate.

Soil samples collected for the RI in 1990 identified chlorinated and non-chlorinated VOCs, SVOCs, and pesticides in the subsurface above the method detection limits (MDLs). Chlorinated VOCs, common in solvents, were found in soil samples including 1,2-*trans*-dichloroethene (1,2-*trans*-DCE), tetrachloroethane (PCE), trichloroethene (TCE), trichloromethane, dichloromethane, and other constituents in very low concentrations. During the 1990 sampling event, 1,2-*trans*-DCE was detected in one soil sample collected in the landfill and in two samples collected off-site. Other VOC contaminants detected in vadose zone soils on and south of the landfill included TCE, PCE, and petroleum, gasoline, and oil field wastes such as benzene, toluene, ethylene and xylene (BTEX) compounds. On the site, the highest concentrations of BTEX were found in the region of the former northern liquid waste lagoon and east of the northern lagoon. The majority of the VOC compounds are indicative of solvent and stripper well wastes, while the BTEX compounds are related to petroleum hydrocarbon wastes. Chlorinated VOCs were found in relatively low concentrations (<10 μg/kg) in the landfill. The highest concentration (252,600μg/kg) was found in the northern lagoon. Areas outside the lagoon, but adjacent to it ranged in concentration from 30 to 51 μg/kg.

Pesticide concentrations ranged from 5.7 μg/kg to 405 μg/kg. These sites were very localized in the borehole grid, predominantly in the southwestern portion of the landfill. SVOCs, predominantly *bis*(2-ethylhexyl)phthalate and dichlorobenzene were detected in landfill soils in concentrations at or near MDLs. The highest concentrations of SVOCs in the soils were found

just inside the south landfill entrance, near the former southern liquid waste lagoon, and in the eastern 40-acre portion of the landfill. The highest concentrations of pesticides were at or near MDLs. They were located in soil samples from the eastern and southern portions of the landfill.

The soil investigations within the landfill boundary identified four areas that are either known or potential contaminant source areas. The former lagoons are considered to have acted as a source of manganese found in ground water, because manganese concentrations in ground water samples collected from beneath the former lagoons were the highest measured, and the lysimeter samples collected from beneath the former lagoons reveal remnants of past leachate migration. The southern region of the landfill has been identified as a potential source area based on analytical results from soils in the region near BH 13.

6.3 Nature and Extent of Ground Water Contamination, Lee Acres Study Area

Quaternary alluvium forms an unconfined aquifer. It is poorly to moderately sorted, fine-grained to coarse-grained sands, with some gravels and cobbles. Unconsolidated silt and clay lenses are common south of U.S. 64 , where the unnamed arroyo channel alluvium mixes with San Juan River deposits. The extent of the saturated alluvium at the site is demonstrated in Figure 6. The unconfined aquifer was defined during the RI because it is bounded on the east by bedrock and the saturated zone ends with no confining feature on the west or above the ground water. This type of configuration is, by geologic definition, an unconfined aquifer. There are no known beneficial uses of this aquifer; however, it is a potential drinking water source. Pursuant to Section 7.28 of the Rules and Regulations Governing Drilling of Wells and Appropriation and Use of Ground Water in New Mexico, the unconfined alluvial aquifer is part of the San Juan Underground Water Basin. The New Mexico Water Quality Control Commission Regulations 3101.A classify all ground water with an existing total dissolved solids concentration less than 10,000 milligrams per liter as protected.

Ground water in the unnamed arroyo alluvial aquifer flows from north to south toward the San Juan River within a paleochannel in the bedrock. South of U.S. 64, ground water is no longer contained within the incised unnamed arroyo bedrock channel where the alluvium interfingers with San Juan River terrace and flood plain deposits. In this area, ground water from the

unnamed arroyo alluvium discharges and mixes with the ground water of the San Juan River Valley. Most of the domestic, municipal, and agricultural water in the San Juan Basin comes from wells completed in the Quaternary surficial valley deposits or underlying sandstones. Recharge is derived from upstream alluvial aquifer flow and infiltration from meteoric precipitation. Infiltration from the fire water storage ponds southeast of the landfill and the landfill liquid waste lagoons contributed to alluvial aquifer recharge in the past. These sources were later drained, and no longer impact the alluvial aquifer.

Horizontal gradients in the alluvial aquifer range from 0.004 feet per foot (feet/ft) to 0.014 feet/ft. The gradients are steeper in the northern portion of the study area and generally decrease toward the south, the direction of the ground water movement as shown in Figure 6.

The method for determining the background manganese concentrations was developed and agreed upon by EPA, NMED and BLM. The concentration of 346 μg/l manganese was determined by averaging data collected during the RI from three wells located up-gradient of the landfill that were determined to be unaffected by activities at the landfill.

Manganese above the background concentration forms a plume in the alluvial aquifer extending from beneath the Lee Acres Landfill to the south. Figure 7 shows the extent of the manganese plume as of May 1994. Figure 8 shows the extent of the manganese plume as of November 1999. The highest concentrations of manganese are found in BLM-57, located beneath the northern liquid waste disposal lagoon, with an initial concentration in 1990 of 7880 μg/l, and 7100 μg/l in November 1999.

In BLM-55, located beneath the southern lagoon, the initial concentration in 1990 was 3560 μg/l and was reported as below detection limits in November of 1999. Also in November 1999, the alluvial aquifer manganese concentrations measured in 9 of the 13 wells sampled south of the landfill were below the average background concentration of 346 μg/l (Figure 8). The total volume of the manganese plume was approximately 5.3 million gallons. The manganese in the ground water is attributed to either past disposal of liquid in the former liquid waste lagoons or the interaction between the native soils and reducing agents in the lagoons. Since the cessation of activity in the landfill, the migration of the manganese plume appears to have halted. Figures 7

through 10 demonstrate the halting of plume migration, as well as declining concentrations over time.

Nickel is also identified as a contaminant of concern (COC) based on New Mexico Water Quality Control Commission (NMWQCC) criteria. Currently, there is no Federal MCLG or MCL for nickel. In February 1995, EPA remanded the MCLG and MCL for nickel, and has not identified a new value. The State of New Mexico's promulgated standard of 200 µg/L is the clean-up level for the Lee Acres Landfill. With the exception of GBR-48, nickel concentrations have been and continue to be below the ARAR of 200 µg/l (Figure 9).

Figure 7, based on May 1994 data, shows that the VOC plume concentrations detected beneath the landfill are below ARARs but were above ARARs in the portion of the plume south of the landfill and west of the firewater ponds. Since May 1994, the 1,2-*cis*-DCE levels have decreased and are equal to or less than the MCL for 1,2-*cis*-DCE, (i.e., 70 µg/l). For example GBR 49 has gone from 90 µg/l to 19 µg /l in November 1999. The highest 1,2-*cis*-DCE concentration in November 1999 was 19 µg/l, in well GBR 49.

As shown in Figure 7, the highest concentrations of VOCs are found centered in the area around wells GBR 32, GBR-48 and BLM 68. The VOC plume, consisting mainly of 1,2-DCE, is about 300-feet long and 60-feet wide. In 1999, the estimated volume of VOC contaminated ground water was 600,000 gallons. The 1,2-DCE concentration in this plume ranges from below Method Detection Limit (MDL) up to 19 µg/l as of November 1999. PCE and TCE also exist within the VOC plume, with concentrations ranging from below MDL to 7.9 µg/l (PCE) and below MDL to 3.5 µg/l (TCE). Figures 10 through 12 show 1,2-DCE, TCE, and PCE aerial distribution in the aquifer. Figures 13 through 15 show concentration trends versus time for three representative wells (GBR-48, GBR-32, and BLM-68) in the chlorinated VOC plume. Overall, the chlorinated VOCs in these wells all show generally stable or declining concentrations for each constituent over time. As of November 1999, only two ground-water samples collected from monitoring wells at the site contained VOC concentrations greater than the associated clean-up levels listed in Table 2. The concentration of PCE measured in a water

sample collected from well BLM-68 was 5.3 μg/l and the clean-up level is 5.0 μg/l. The concentration of vinyl chloride measured in a sample collected from well BLM-57 contained 2.6 μg/l and the associated clean-up level is 1.0 μg/l.

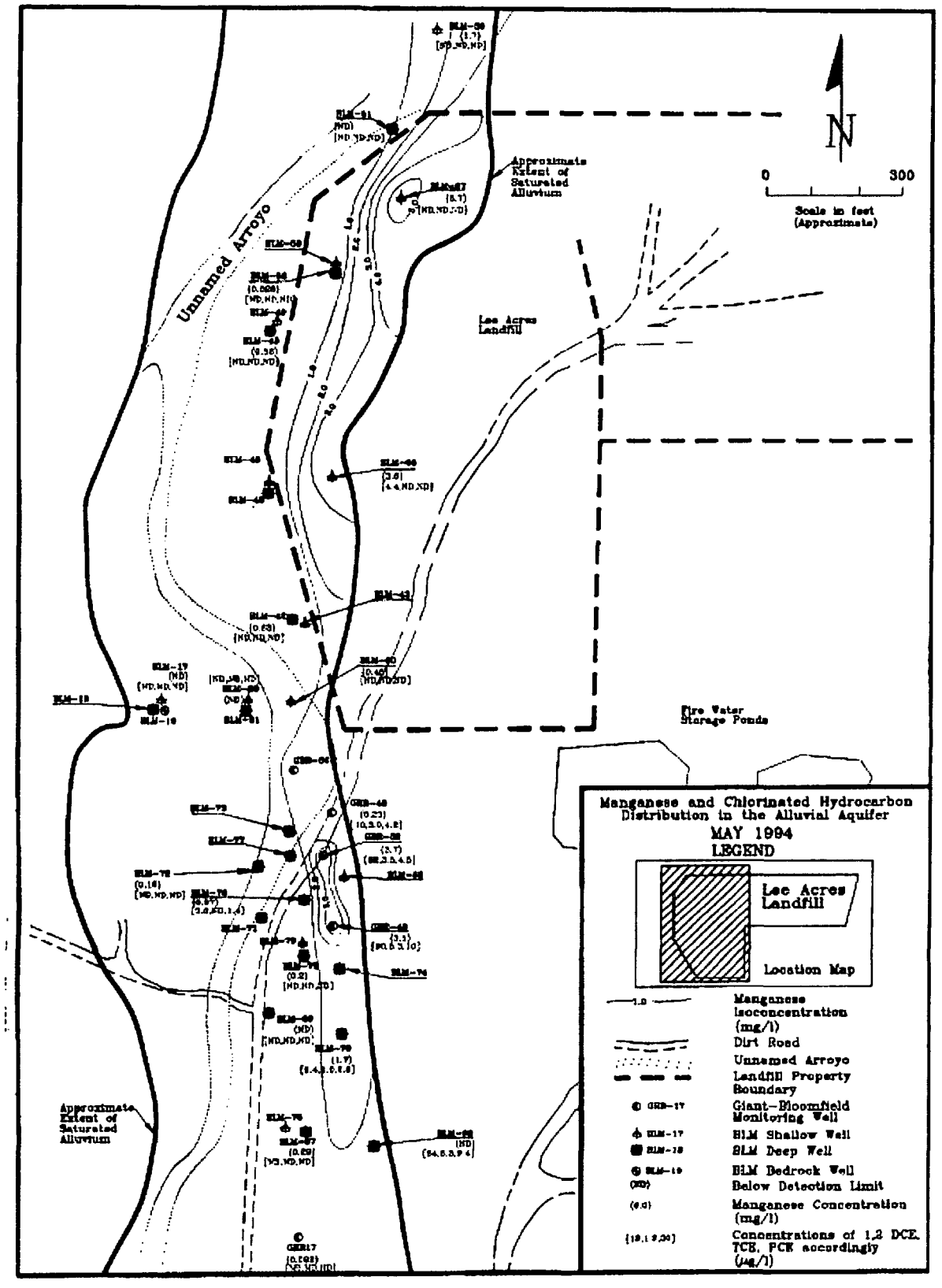


Figure 7 Multi-contaminant Map, May 1994

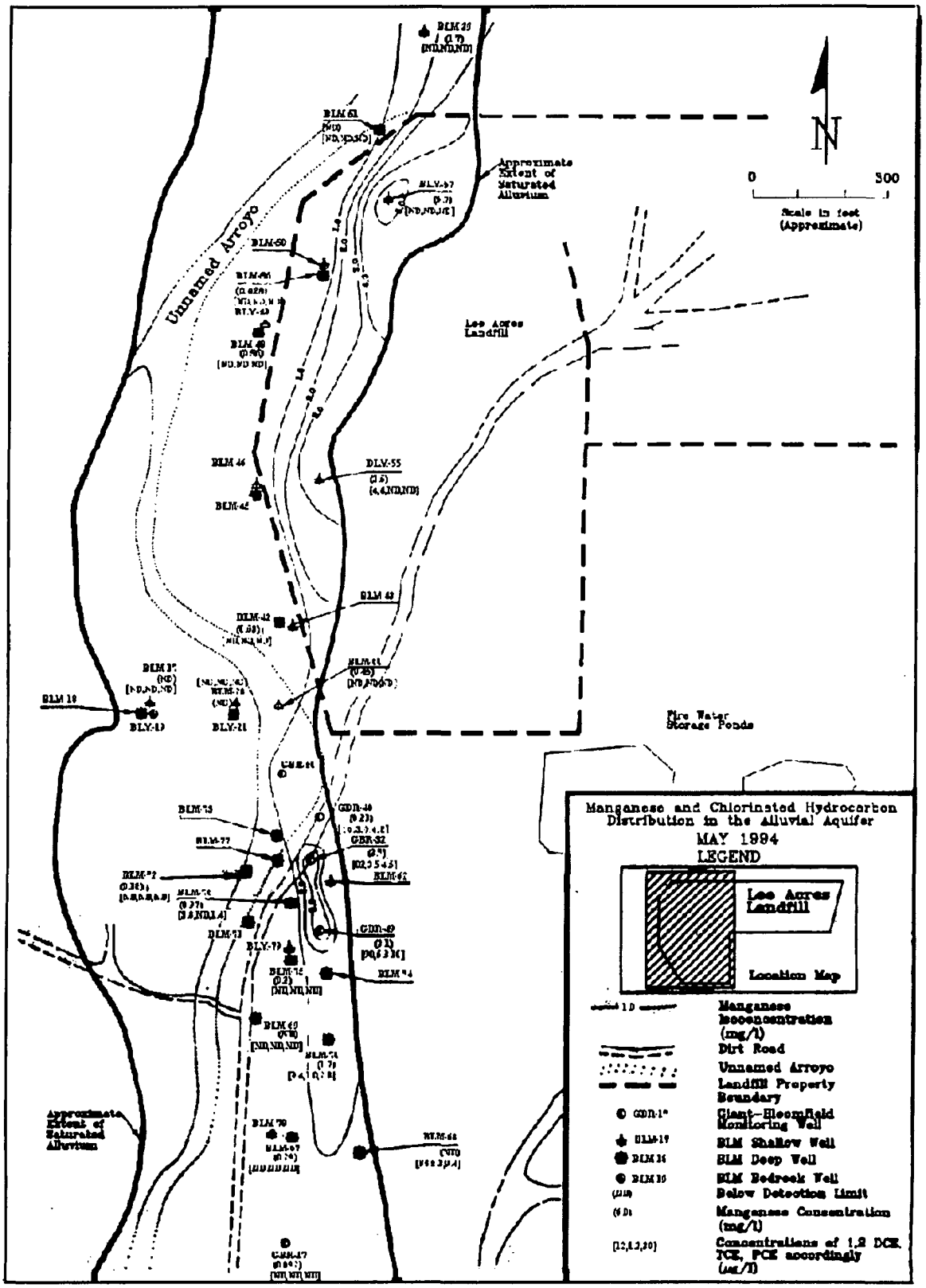


Figure 8 Manganese Distribution Map - November 1999

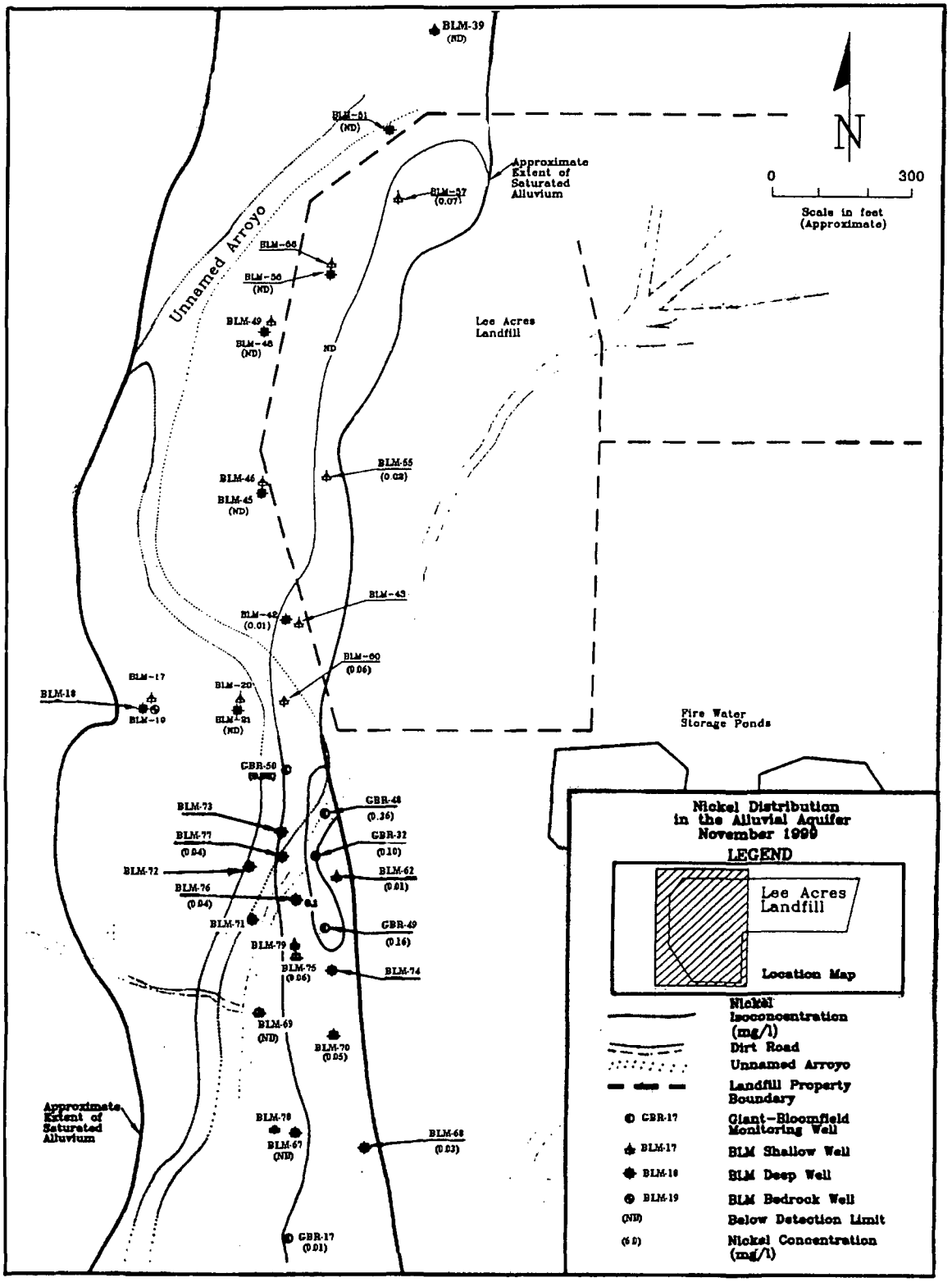


Figure 9 Nickel Distribution Map - November 1999

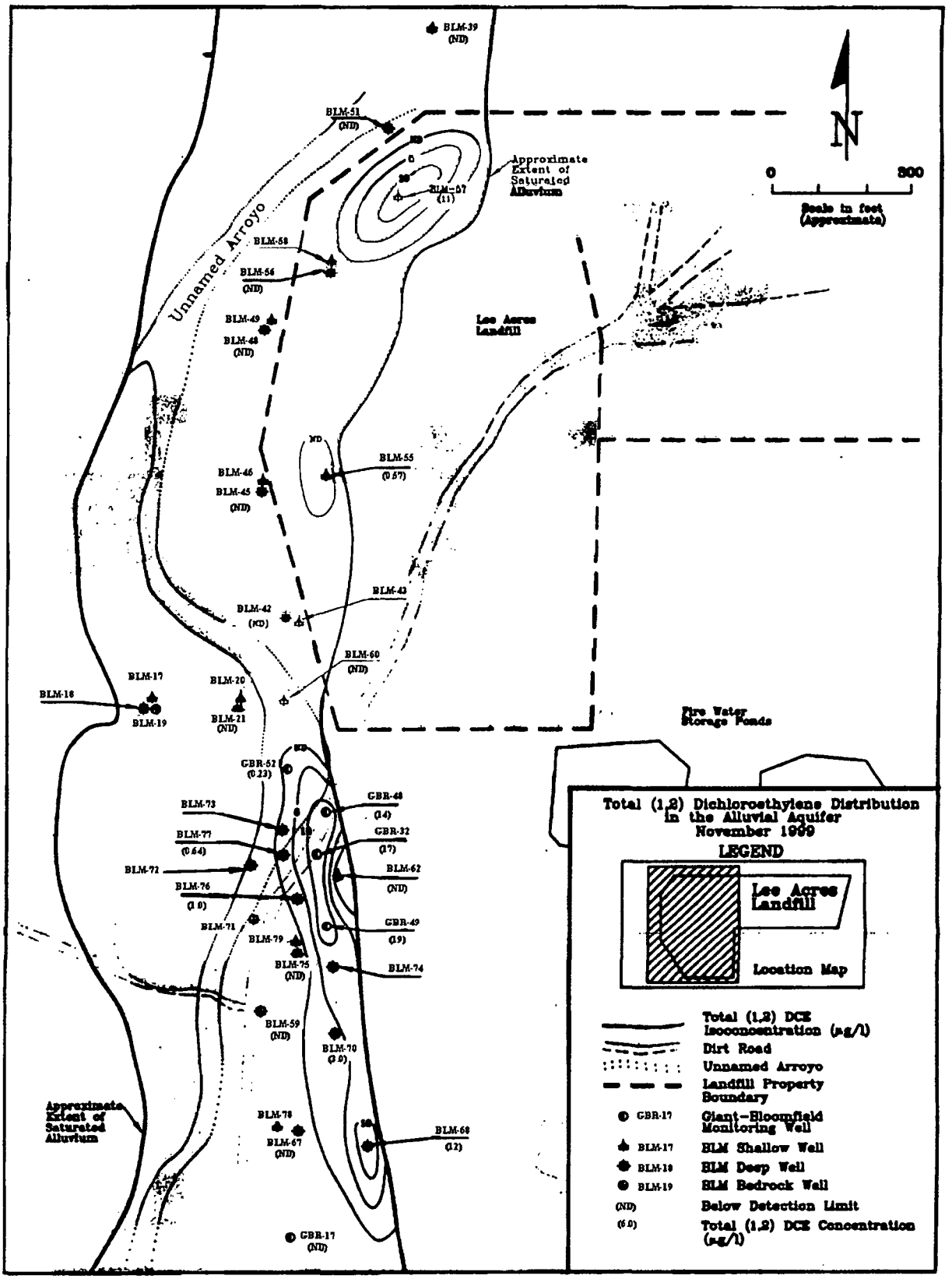


Figure 10 1,2-DCE Distribution Map - November 1999

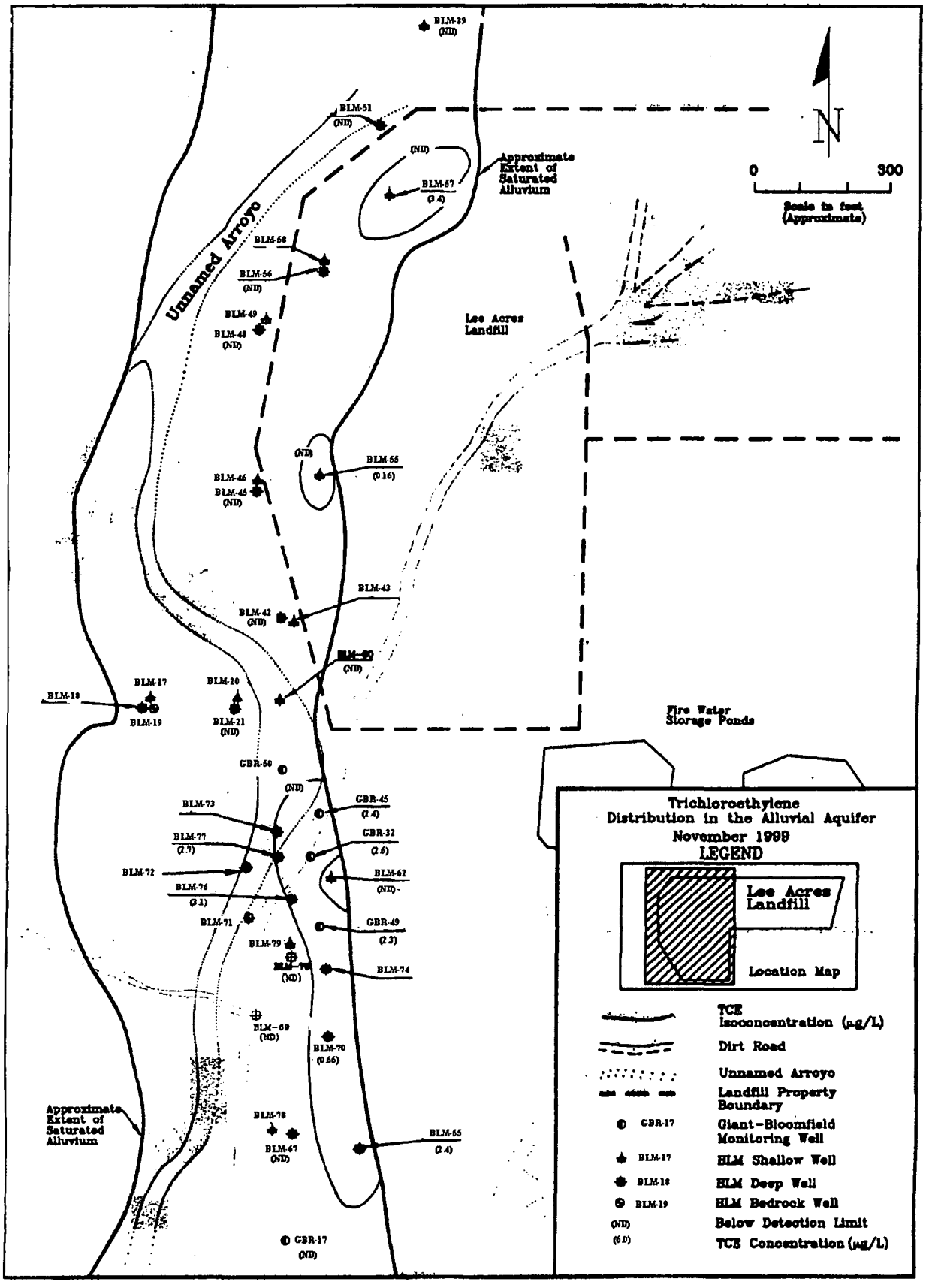


Figure 11 TCE Distribution Map - November 1999

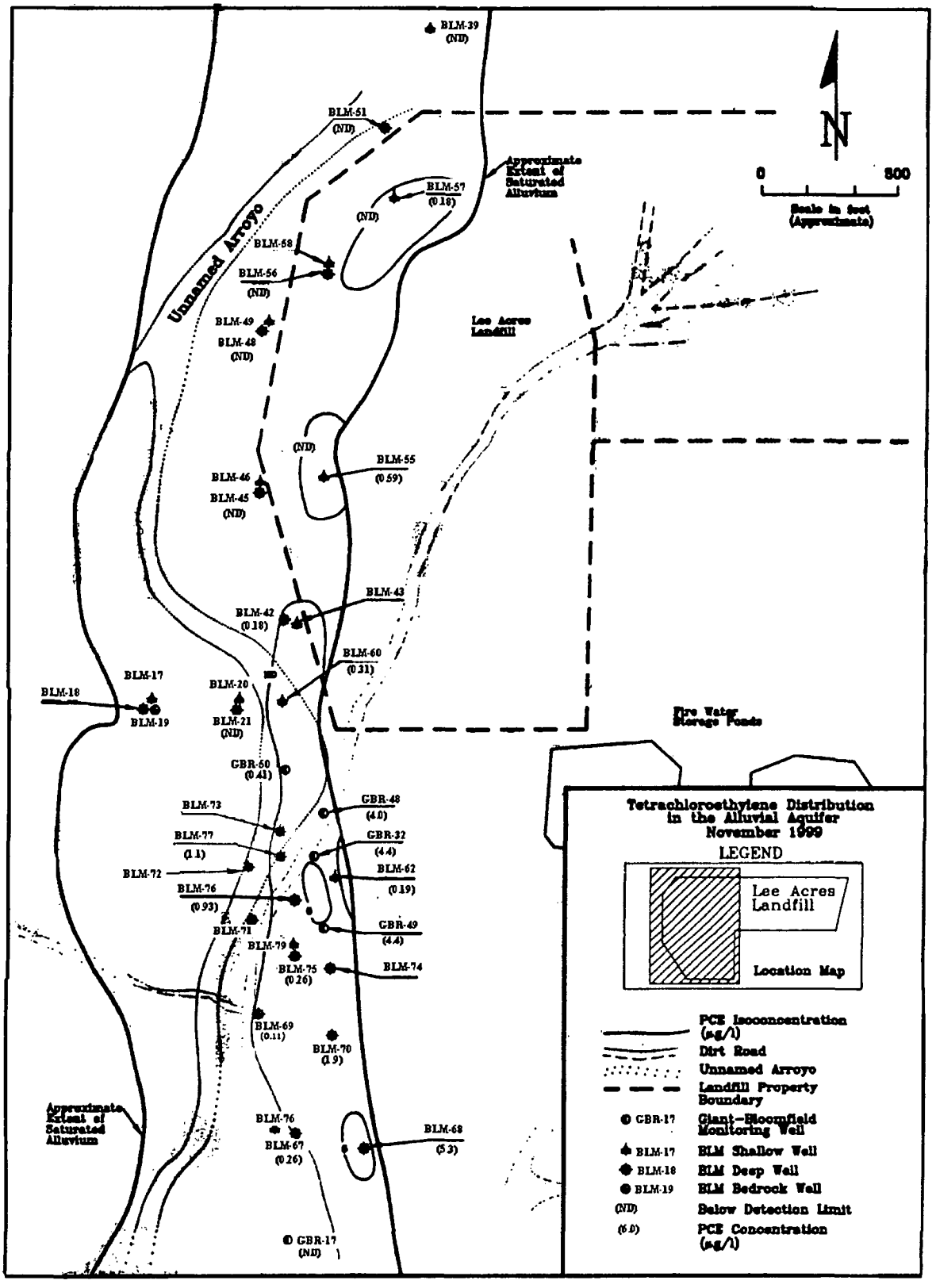


Figure 12 PCE Distribution Map - November 1999

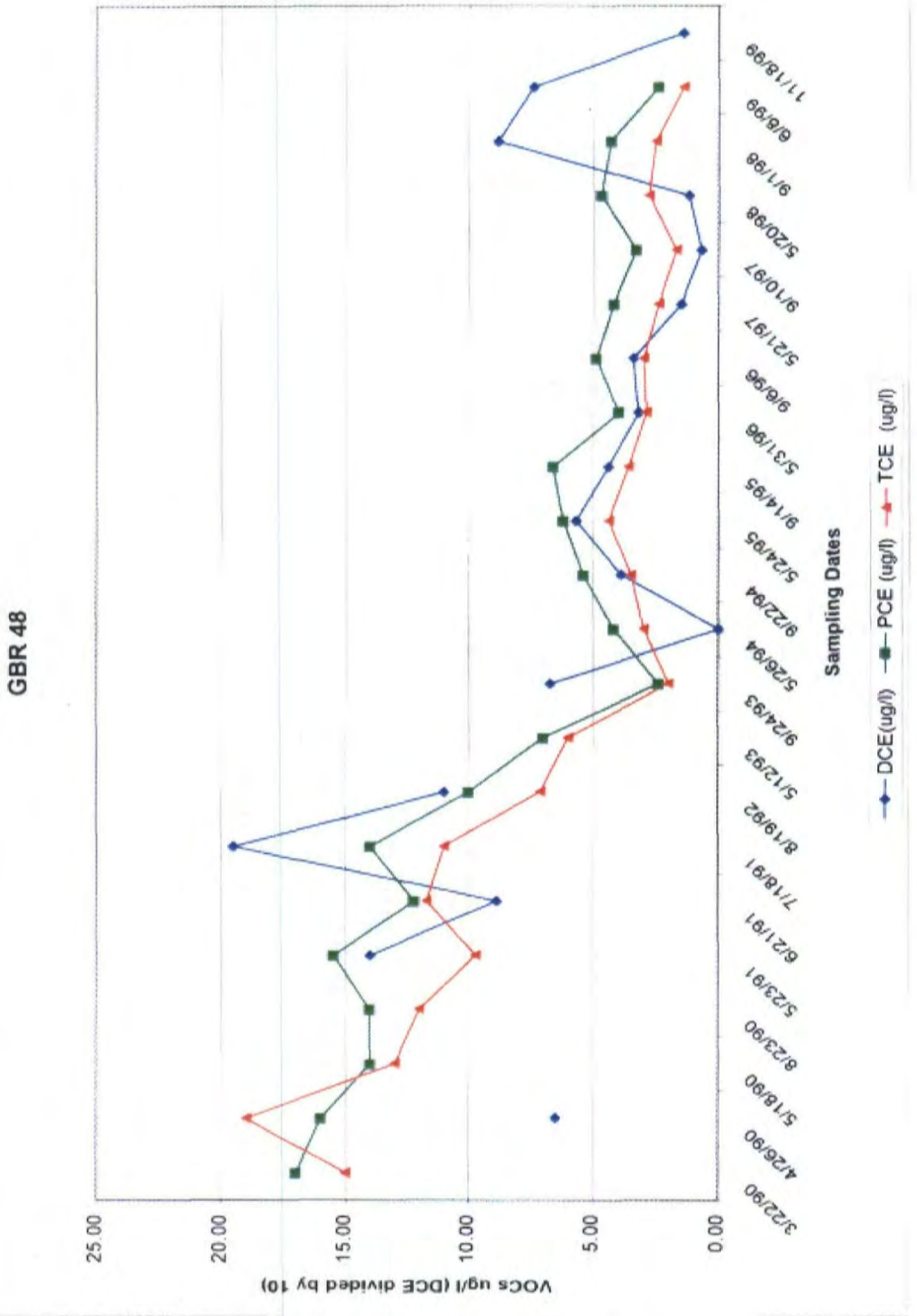


Figure 13 1,2-DCE, PCE and TCE Concentrations vs. Time, GBR-48

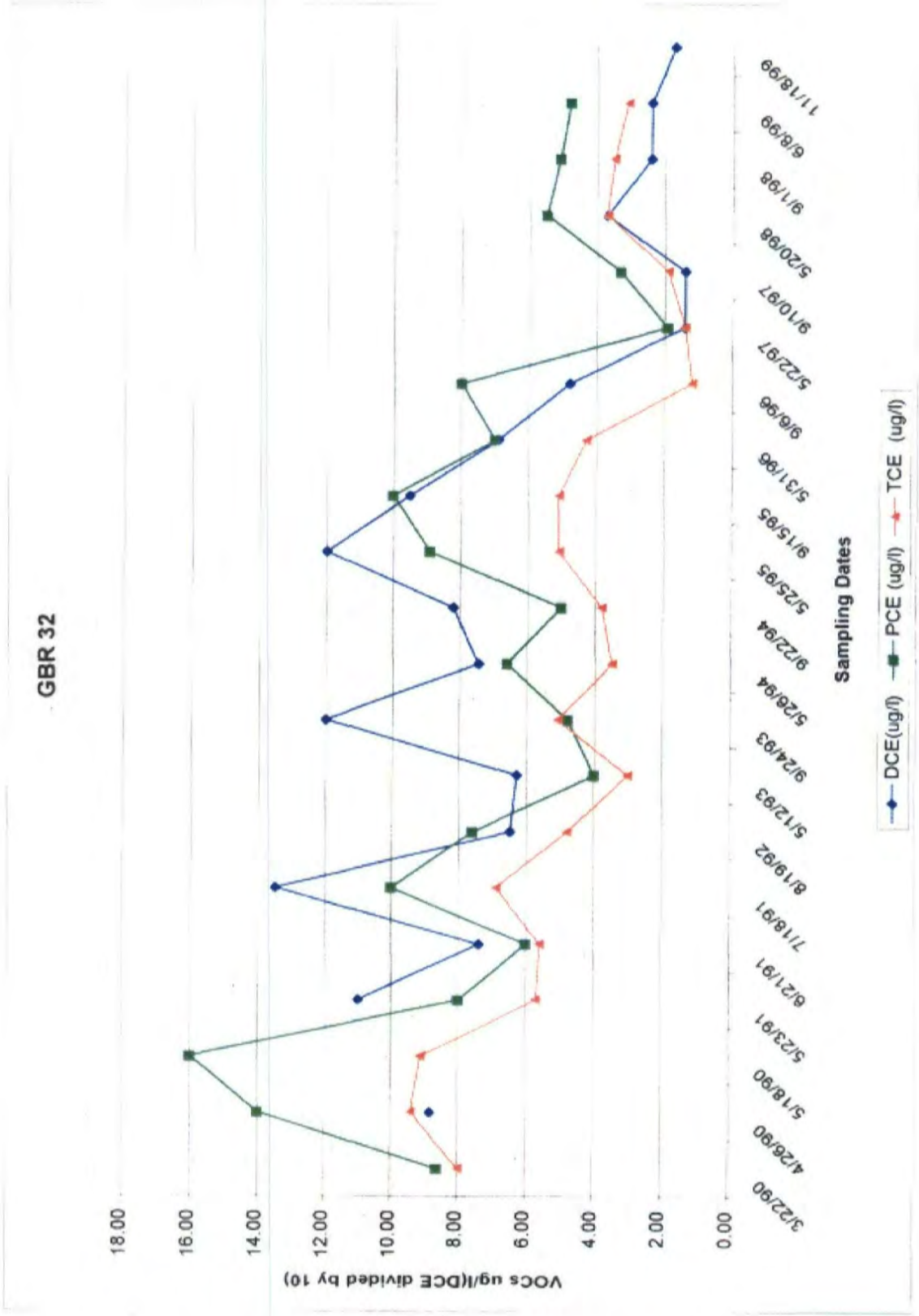


Figure 14 1,2-DCE, PCE and TCE Concentrations vs. Time, GBR-32

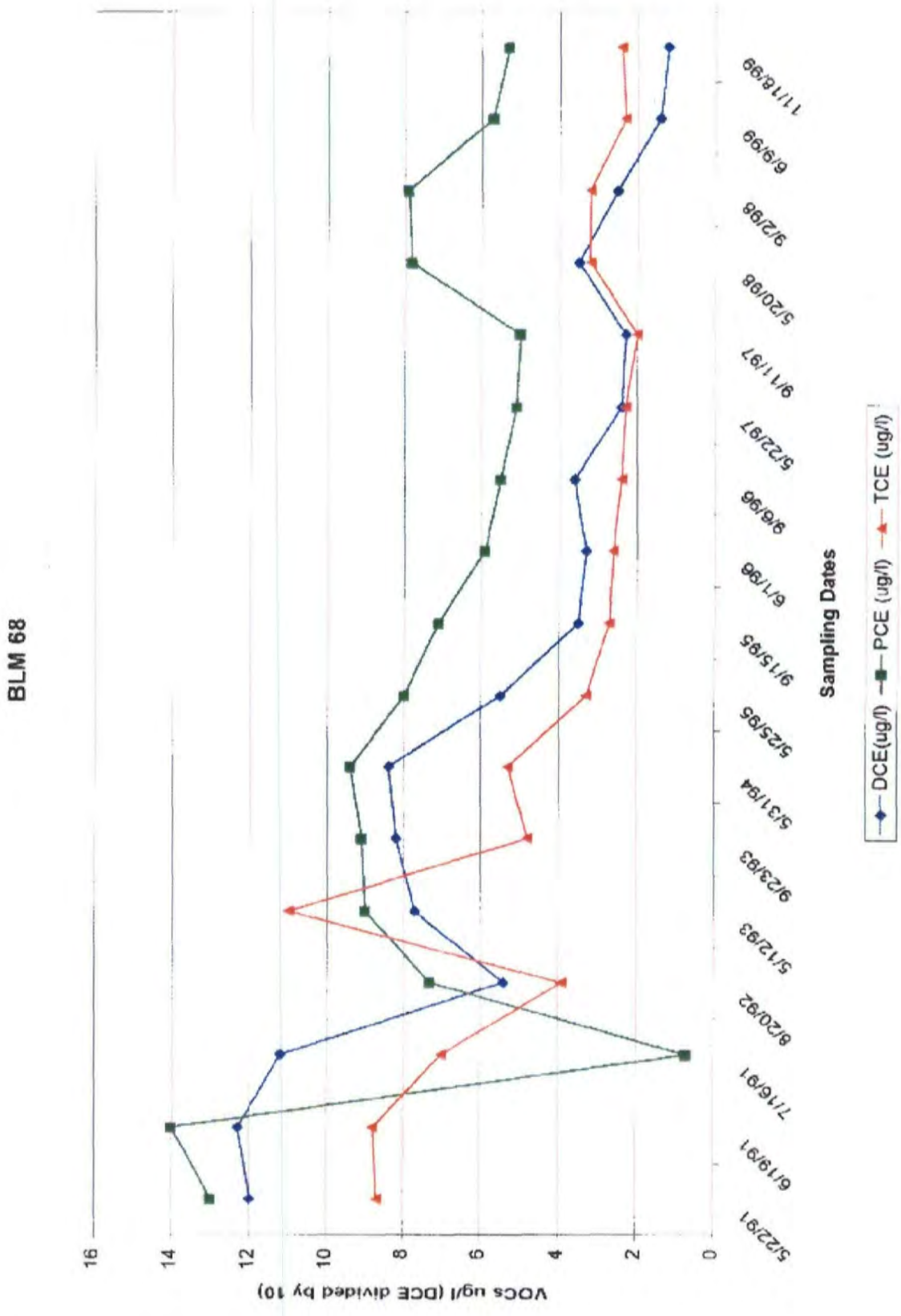


Figure 15 1,2-DCE, PCE and TCE Concentrations vs. Time, BLM 68

7.0 SUMMARY OF SITE RISKS

7.1 Human Health Risk Assessment Summary

The human health and ecological risk assessments were completed in September 1994. The Contaminants of Potential Concern (COPCs) are defined as those chemicals present within the former Lee Acres Landfill resulting from past activities, and include only those chemicals above reportable limits or at concentrations above naturally occurring levels that have been determined not to be sampling or laboratory artifacts. (Weston RIR 1995).

The Contaminants of Concern (COCs) are a subset of the COPCs, and were derived from the COPCs. COCs include contaminants contributing to the risk, and contaminants that exceed State or Federal ARARs. Clean-up levels for the COCs are listed in Table 2.

Manganese was found to be the only non-carcinogenic COC with a Hazard Index (HI) exceeding the EPA non-carcinogenic target of 1. On-site resident drinking water ingestion was the only ingestion pathway evaluated because preliminary findings showed that risk scenario to be an order of magnitude higher than any others during the preliminary risk assessment.

The risk assessment was for a child living on the site, weighing 16 kg for 6 years (350 days per year) drinking 1 liter per day of water containing 6,340 μg/l Manganese. The child would have to be living this scenario for 2,190 days before any toxic effects would occur. Toxic effects of manganese include: delusions, hallucinations, insomnia, depression and some symptoms of Parkinson's Disease.

No landfill gases were recorded during the RI, and therefore are not included in the risk assessment.

The primary pathways of concern at the Lee Acres Landfill are:

- potential future leaching of contaminants through the vadose zone to the alluvial aquifer; and
- ingestion of manganese and VOC-contaminated ground water.

The RI eliminates ingestion, inhalation, and contact with contaminated soil or waste within the former landfill as a pathway of concern because the fill material is covered with an average of 4.5-feet of clean soil. Information collected during the RI also indicated that liquid in the former liquid waste lagoons created a hydraulic head and provided the moisture needed to push the contaminated liquid downward and forced the leachate of the lagoon contaminants into the alluvial ground-water aquifer. The landfill and adjoining public lands have been withdrawn by the BLM (Federal Register, December 9, 1995), and the lagoons will never be re-activated. Also, the lagoons were drained and covered with clean soil in 1986. These actions have impacted the leachate pathway and mitigated much of the possibility of future contamination from the lagoon sediments due to leaching.

Ground-water data obtained between August 1992 and September 1993 were used in the development of the contaminants of potential concern (COPCs). COPCs were developed with two methods: 1) frequency of detection analysis; and 2) statistical comparison of data to study area background data the Shapiro-Wilks "goodness-of-fit" test, D'Agostino's "goodness-of-fit" test, and the Coefficient-of-Variation Test.

The following are the COPCs identified in the human health risk assessment:

1,1,1-trichloroethane (1,1,1-TCA)
1,1-dichloroethane (1,1-DCA)
1,1-dichloroethene (1,1-DCE)
1,2-*trans*-dichloroethene (1,2-*trans*-DCE)
1,2-*cis*-dichloroethene (1,2-*cis*-DCE)
carbon disulfide,
dichloromethane
tetrachloroethene (PCE)
trichloroethene (TCE)
vinyl chloride (VC)

chloride
cobalt
manganese
molybdenum
nickel

Although chloride is identified as a COPC, it is not a CERCLA hazardous substance and has no toxicity factors. Therefore, the risks associated with chloride in the alluvial aquifer were not quantitatively assessed.

The COCs are those contaminants contributing to the risk, which are listed in Table 2 with clean-up levels identified. The COCs for the Lee Acres Landfill are:

manganese;
nickel;
1,2-*cis*-dichoroethene (1,2-*cis*-DCE);
1,2-*trans*-dichloroethene (1,2-*trans*-DCE);
tetrachloroethylene (PCE);
trichloroethylene (TCE), and
vinyl chloride.

For purposes of consideration, the human health risk calculation is based on the scenario of a hypothetical on-site resident. This assumption was used to assess the potential exposures to materials containing COCs. Exposure pathways considered included inhalation and dermal exposure, as well as ingestion. Inhalation and dermal exposure pathways were discounted because the landfill has been covered with clean soil. The scenario for ingestion used was that of an on-site resident who uses the ground water from the most highly contaminated well within the landfill as the primary drinking water supply. This scenario provides the worst case human health exposure potential. The carcinogenic health risk calculation is less that one in 100,000. This places the carcinogenic risk factor within the NMED and EPA acceptable risk ranges. The actual carcinogenic risk is much lower and is not further considered.

Manganese contamination in the alluvial aquifer poses the most significant non-carcinogenic risk with Hazard Index values (HI) ranging from 20 to 40 based on ground-water concentrations in wells beneath the landfill cells. An HI ranking of greater than one (1) indicates that there is the potential for non-carcinogenic health effects from exposure. Exposure to manganese contamination in ground water may result in adverse health effects, including delusions, hallucinations, insomnia, depression, and some symptoms of Parkinson's Disease.

7.2 Ecological Risk Assessment Summary

The study area addressed by the ecological risk assessment is somewhat unique because the waste cells and lagoons associated with landfilling and disposal activities have been covered by an average of 4.5 ft of clean material. Consequently, a majority of the chemicals detected in the RI are associated with deep subsurface soil and ground water and do not pose a risk to biological receptors either incidentally or routinely inhabiting the former Lee Acres Landfill.

By virtue of their presence in the upper 5 ft of soil (before it was covered with 4.5 ft of clean soil) and their relative hazard, dieldrin and DDT were identified as COPCs. The effects of both occur most strongly at upper trophic levels through alteration of biochemical pathways and impairment of reproductive potential. Most common effects in mammals such as mice, vole and rats, are hyperactivity and increased liver mass. In birds, thinning of the egg shell walls impairs reproductivity.

The estimated exposure dosages were compared to the toxicological endpoint dosages for dieldrin and DDT as well as for a simultaneous exposure to both chemicals. The results suggest that there is no risk to biological indicators associated with the former Lee Acres Landfill and additional concern is not warranted.

A screening-level ecological risk assessment was conducted to evaluate the potential threat to the environment posed by existing levels of contamination in soil at the Lee Acres Landfill. The risk characterization is an integration of the exposure and toxicity assessment results. Relative toxicity of individual COPCs and cumulative toxicity were determined. Ecological receptors were identified and an uncertainty analysis performed.

Data indicated that there was no ecological risk to the flora in the vicinity of the Lee Acres Landfill. The San Juan River is located 1.5 miles south of the site, and its fauna and flora were not impacted.

Dieldrin and DDT were identified through the selection process outlined in the RI Section 9.2. (Weston 1995). The risk assessment focused on the movement of COPCs detected in the upper soil layers through a food chain consisting of:

- vegetation, exposure from soil;
- soil macro invertebrates, exposure from soil;
- kangaroo rat, exposure from ingestion of vegetation and invertebrates; and
- red-tailed hawk, exposure from ingestion of small mammals.

Results of the exposure assessment suggest that very low concentrations of dieldrin and DDT are accumulated by receptors. The toxicity assessment identified numerous laboratory studies that exposed mice, rats and various avian species to dieldrin and DDT. The estimated exposure concentrations were compared to the toxicological endpoint concentrations for dieldrin and DDT, as well as for a simultaneous exposure to both chemicals. The results suggest that adverse effects for biological receptors associated with the landfill are unlikely.

8.0 REMEDIAL ACTION OBJECTIVES (RAOs)

8.1 Development of Remedial Action Objectives for the Soil Pathway

At present, the landfill site contains heterogeneous solid waste and variably contaminated soils. The liquid waste lagoons have been abandoned and covered with soil. Contaminants and their concentrations were described earlier in this ROD.

The RAOs for the potential soil pathway are:

-Reduce or eliminate the potential for future leaching of contaminants from the landfill to ground water by preventing moisture infiltration.

-Reduce or eliminate the potential for future direct exposure to contaminated soil and waste.

-Reduce or eliminate the potential for future migration of contaminants through storm water run-off or erosion.

The potential migration and exposure pathways from the landfill soil source areas include the production of leachate, human or ecological direct contact exposure, and migration of soil contaminants through storm water run-off or erosion. However, none of these pathways is currently contributing contamination. The potential for direct exposure to contaminated soil was dismissed in the RI because waste cells and landfill trenches are covered with an average of 4.5 feet of clean soil, the landfill would not be able to sustain a house or industrial structure because of the uneven settling that is characteristic of landfills (Davis and Cornwell 1991), and the post-closure care of landfills does not permit disturbance of the soil cap (40 CFR 258 Subpart D). Furthermore, BLM has withdrawn the Lee Acres Landfill from public use to ensure that the site will never be sold, leased, or used for public purposes for a minimum of 50 years, and to restrict access to contaminated ground water.

The possible activation of the leaching pathway is a potential threat at the Lee Acres Landfill. The leachate would result primarily from infiltration of meteoric water from the former liquid waste disposal lagoons or contaminated subsurface soils. The lagoon sediments, which are contaminated with BTEX compounds, present the highest potential for leachate production at the site. Therefore, elimination or reduction of the potential leachate pathway is considered as an RAO.

The possible leaching of contaminants from the landfill soils will be resolved by placing a cap over the western portion of the landfill. The selected capping alternative has been tested and demonstrated to be effective through a pilot project, directed by Sandia National Laboratory, DOE, and BLM, which lasted two years. The pilot project involved development and testing of an arid climate-specific capillary barrier on a portion of the landfill. The success of the pilot project was determined by no infiltration of surface water through the lowest layer in the cap and thus the trash layer of the landfill. Based on the final pilot project report results, the capillary barrier cap will be expanded to include the balance of the western portion of the landfill. If the

installed capillary barrier does not continue to perform as expected, an evaluation will be performed to determine the cause, and appropriate corrective actions will be taken, if needed. As previously stated, the RAOs are designed to prevent exposure to landfill soils, to prevent leachate production, and to contain/remediate contaminated ground water.

8.2 Development of Remedial Action Objectives for the Ground Water Pathway

Infiltration of meteoric water into the subsurface has caused movement of some contaminants into the ground-water system. Although there is no current domestic ground-water use downgradient from the landfill or upgradient of the refinery, installation of new domestic/industrial ground-water wells in the future could result in unacceptable risk due to manganese exposure.

The RAOs for ground water are:

- Elimination or significant reduction of the risk posed by elevated manganese levels in ground water by eliminating access to the ground water.

- Reduction of levels of manganese, nickel, 1,2-DCE, PCE, TCE, and VC to comply with ARARs.

Table 2 presents the clean-up levels for the COCs which were detected with concentration levels in excess of acceptable risk levels or ARARs, and which also exceeded site background concentrations within alluvial ground-water wells. The ARARs presented in Table 3 consist of maximum contaminant levels (MCLs) set by the Federal Safe Drinking Water Act (SDWA) and the ground-water standards listed in the NMWQCC Regulations.

For most of the COCs (1,2-DCE, PCE, and TCE), the chemical-specific ARARs, which are the Federal SDWA MCLs, are the clean-up levels for the alluvial aquifer. For nickel, the clean-up level is the New Mexico Water Quality Control Commission (NMWQCC) standard. For manganese, the elevated background level of manganese indicates that ground water at the landfill is unsuitable for drinking water. As a consequence, the federal MCL for manganese is

neither relevant nor appropriate for purposes of establishing cleanup levels at the landfill. New Mexico Water Quality Control Commission (NMWQCC) Regulations, section 4101 (B), provide that if background levels of any water contaminant exceed state standards established pursuant to section 4103 of the NMWQCC Regulations, then cleanup standards for such pollution shall be the background concentration. Accordingly, the clean-up level for manganese contamination in the ground water at the site is the state ARAR, or the background concentration, which is 346μg/L. This background concentration was determined by averaging data collected in three background wells, BLM 14, 15 and BLM 39 during the RI. The clean-up level for vinyl chloride (1 μg/L) is based on NMWQCC Section 4101(B) standards. This clean-up level is more stringent than the Federal MCL of 2μg/L, and so is the ARAR since it is a more stringent promulgated standard.

The remedial action objectives for the Lee Acres Landfill are to prevent further contamination of ground water from leaching of contaminants that may exist in the landfill soils, and to eliminate all possibility of human and ecological exposure to contaminated soils and ground water emanating from the landfill while utilizing the most cost-effective remedial technologies available.

To prevent human exposure to contaminated soils and ground water, BLM has withdrawn 134.68 acres of public land, within which the landfill is located, from settlement, sale, location, and entry, as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). As a result of this withdrawal, ground water beneath the landfill will not be used as a drinking water source for the 50 year duration of the withdrawal. In the event that potential exposure to hazardous substances in such ground water poses an unacceptable risk to human health at the end of this period, BLM may extend the withdrawal, take other necessary steps, or fulfill all requirements of section 120(h) of CERCLA, as appropriate, to ensure that public health and the environment is protected from contaminated soils and ground water at and beneath the landfill.

Table 2 Remedial Goals (Clean-up Levels)

Constituent	Site Historic Maximum Concentration (µg/L)	Risk-Based Preliminary Remediation Goal (µg/L)	SDWA MCL (µg/L)	NMWQCC Standards (µg/L)	Site Background Mean[a] (µg/L)	Cleanup Levels (µg/L)
Manganese	6,335	176	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-*cis*-Dichloroethene	77	NA	70	per part 101z.z[g]	NA	70
1,2-*trans*-Dichloroethene	120	NA	100	per part 101z.z[g]	NA	100
Tetrachloroethylene (PCE)	10	NA	5	20	NA	5
Trichloroethylene (TCE)	11	NA	5	100	NA	5
Vinyl Chloride	3.1	NA	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL)
c Standard for domestic supply.
d NMWQCC regulation Part 3-101.2 does not require cleanup level below site background level.
e Highest value of 12,500 µg/L occurred during the May 1993 sampling period and was determined to be a statistical anomaly for the purposes of this table, the next highest value is specified.
f Standard for irrigation use.
g No NMWQCC specific to 1,2-DCE exists, therefore Part 101.z.z. is referenced for State ARAR
NA - not applicable.
NOTE: Dichloromethene was detected once in 95 samples at a concentration level of 27 µg/L; however, this concentration was considered a statistical anomaly and is not presented

State Chemical-Specific ARARs for Lee Acres Landfill Groundwater Contaminants of Potential Concern

Chemical	Citation	Requirement	Maximum Concentration Detected (µg/L)	Status	Comments
METALS					
Manganese	NMAC 20.6.2.4101(b)	Water quality standard = background Below 1 x 10^{-5} risk	6,335	ARAR	Average background concentration for manganese (346 µg/L) is the ARAR
Nickel	NMAC 20.6.2.4103(b)	Water quality standard = 200 µg/L Below 1 x 10^{-5} risk	12,500	ARAR	12,500 µg/L was one time occurrence and was determined to be a statistical anomaly. Next highest value is 578 µg/L.
ORGANICS					
1,2-*cis*-Dichloroethylene 1,2-*cis* DCE	NMAC 20.6.2.4103(b)	Below 1 x 10^{-5} risk	77	ARAR	New Mexico has established health-based numerical groundwater standard applicable to all water containing less than 10,000 mg/L total dissolved solids which apply to all groundwater, whether used for domestic, commercial, or agricultural purposes. Groundwater of quality better than the standards is allowed to deteriorate to the standards. Groundwater of worse quality than the standards may not be degraded further.
1,2-*trans*-Dichloroethylene 1,2-*trans* DCE	NMAC 20.6.2.4103(b)	Below 1 x 10^{-5} risk	120	ARAR	
Tetrachloroethylene (PCE)	NMAC 20.6.2.4103(b)	Water quality standard = 20 µg/L Below 1 x 10^{-5} risk	10	ARAR	
Trichloroethylene (TCE)	NMAC 20.6.2.4103(b)	Water quality standard = 100 µg/L Below 1 x 10^{-5} risk	11	ARAR	
Vinyl Chloride (VC)	NMAC 20.6.2.4103(b)	Water quality standard = 1 µg/L Below 1 x 10^{-5} risk	3.1	ARAR	

Table 3a Federal Applicable or Relevant and Appropriate Requirements (ARARs)

Federal Chemical Specific ARARs for Lee Acres Landfill Groundwater Contaminants of Potential Concern

Chemical	Citation	Requirement	Maximum Concentration Detected (µg/L)	Status	Comments
METALS					
Nickel		NONE	12,500	ARAR	12,500 (µg/L) was one time occurrence, and was determined to be a statistical anomaly. Next highest value is 578 µg/L
ORGANICS					
1,2-*cis*-Dichloroethylene 1,2-*cis* DCE	SDWA	Water quality standard = 70 µg/L	77	ARAR	Groundwater remedial actions will need to ensure that drinking water quality water supplies do not exceed ARAR concentrations
1,2-*trans*-Dichloroethylene 1,2-*trans* DCE	SDWA	Water quality standard = 100 µg/L	120	ARAR	
Tetrachloroethylene (PCE)	SDWA	Water quality standard = 5 µg/L	10	ARAR	
Trichloroethylene (TCE)	SDWA	Water quality standard = 5 µg/L Below 1 x 10^{-5}	11	ARAR	
Vinyl Chloride (VC)	SDWA	Water quality standard = 2 µg/L	3.1	ARAR	

ARAR - applicable or relevant and appropriate requirements

µg/L - micrograms per Liter

SDWA - Safe Drinking Water Act

9.0 DISCUSSION OF EVALUATED ALTERNATIVES AND BALANCING CRITERIA

After an initial screening of 34 different soil remedial options and 50 ground-water options, five soil and five ground-water technologies and process options were evaluated in greater detail with respect to effectiveness, implementability and approximate cost. The technologies and process options were then combined into remedial alternatives.

These alternatives were screened against the two threshold criteria and five balancing criteria identified in CERCLA. The final remedies selected for the ground-water and soil pathways are Alternatives S-5(a) and G-2(a), which are modified versions of Alternatives S-5 and G-2. Selection of the alternatives was based on a comparative analysis of the alternatives with respect to the threshold and balancing criteria and two modifying criteria (i.e., State acceptance and community acceptance). These two criteria were evaluated based on comments to the RI/FS, responses to the PP, and participation in public meetings/hearings. The nine criteria are defined as follows:

The two threshold criteria are:

Overall Protection of Human Health and the Environment–Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment, and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls. The RAOs were developed, using the results of the risk assessment, to be protective of human health and the environment. The initial screening of alternatives retained only those options and technologies that were either required by the National Contingency Plan (NCP) or were determined to be effective in meeting the RAOs.

Compliance with ARARs–Section 121(d) of CERCLA and NCP Section 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are

collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

ARARs were considered in the development of the RAOs, and include chemical-specific, location-specific, and action-specific ARARs. The ARARs for ground water were used to develop the remediation goals, or clean-up levels, which are the concentration levels that the proposed alternatives must meet. RAOs for soil require reducing the potential for exposure to contaminated soils and migration of contaminants through the surface water pathway.

The five balancing criteria are:

Long-Term Effectiveness and Permanence--Under this criterion, an alternative is assessed in terms of its long-term effectiveness in maintaining protection of human health and the environment after response objectives have been met. The magnitude of residual risk and adequacy and reliability of controls are taken into consideration, as well as comparison of effectiveness to similar technologies.

Short-Term Effectiveness--Under this criterion, an alternative is assessed in terms of its effectiveness in protecting human health and the environment during the construction and implementation of a remedy before response objectives have been met. The time until the response objectives have been met is also factored into this criterion.

Implementability--Under this criterion, an alternative is assessed in terms of its technical and administrative feasibility and the availability of required goods and services. Also considered is the reliability of the technology, the ability to monitor the effectiveness of the remedy, ease of undertaking additional remedial actions (if necessary), need for regulatory permits, and availability of land to implement the option.

Reduction of toxicity, mobility, or volume (TMV)--Under this criterion, an alternative is assessed in terms of the anticipated performance of the specific treatment technologies it employs. Factors such as the volume of materials destroyed or treated, the degree of expected reduction, the degree

to which treatment is irreversible, and the type and quantity of remaining residuals are taken into consideration.

Cost--Under this criterion, an alternative is assessed in terms of its present worth, capital, and operation and maintenance (O&M) costs, and these costs relative to similar technologies.

The two modifying criteria are:

State Acceptance- Under this criterion, an alternative is evaluated in terms of the technical and administrative issues and concerns the state may have. Frequently, state acceptance is closely related to compliance with state ARARs.

Community Acceptance - Under this criterion, an alternative is evaluated in terms of the issues and concerns the public may have had.

10.0 SOIL PATHWAY ALTERNATIVES

The five alternatives considered for soil remediation were:

- S-1 No Action
- S-2 Institutional and Surface Controls
- S-3 Institutional and Surface Controls and Capping with Flexible Membrane Liner (FML)
- S-4 Institutional and Surface Controls, Hot Spot Bioremediation, and Capping with Low Permeability Cap
- S-5 Institutional and Surface Controls, Hot Spot Bioremediation, and Engineered Low Permeability Soil Cap on the West Half of the Landfill, Installation of Lysimeters to Monitor Possible Leachate Generation

All of the proposed alternatives for the soil pathway (except for the No Action Alternative) would require long-term monitoring and maintenance to ensure that the remedial action continues to be effective, and the use of institutional controls as described in Alternative S-2.

Alternative S-1 - No Action

No cost is associated with this alternative.

Years to Implement: 0

Under this alternative, no further action would be taken at the site. The current fence would not be maintained, and there would be no sampling or monitoring to evaluate the level of leachate production. Consideration of this alternative is required by the NCP.

Alternative S-2 - Institutional and Surface Controls

Total Capital Cost: $80,400

Total Operation & Maintenance (O & M) Cost: $0

Additional Cost: $21,200

Additional costs include remedial design ($4,300), inflation escalation, 5% contingency, and 3% internal project management.

Total Alternative S-2 Cost: $101,600

Years to Implement: 0.8

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production by limiting the amount of infiltration, and would limit the potential for contaminant migration through storm water run-off or erosion. Specific surface water controls will be identified in the remedial design. This alternative would include restricting access to the site by maintaining the current fencing.

In addition, an area of 135 acres of public land, which includes the Lee Acres Landfill and a buffer area around it, was withdrawn by BLM from surface entry and mining for a period of 50 years (see 62 FR 2177, Public Land Order No. 7234). The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities, and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could

disturb the integrity of the containment system, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill Site. Discretionary restrictions on the use of the land at the Lee Acres Landfill site that are in compliance with the current withdrawal will be implemented in accordance with BLM's current resource management plan. The prevailing management plan for the Lee Acres Landfill Site is the 1991 Albuquerque District Resource Management Plan/Final Environmental Impact Statement for Oil and Gas Leasing and Development. The Farmington Field Office is currently revising the Plan, which is expected to be finalized in May 2003. In addition, long-term ground-water monitoring would be used to determine whether contaminant leaching from the landfill material to the ground water is occurring.

Alternative S-3 - Institutional and Surface Controls and Capping with Flexible Membrane Liner (FML)

Total Capital Cost: $9,568,700

Total O & M Cost: $176,800

Additional costs include remedial design ($360,600), inflation escalation, 5% contingency, and 3% internal project management.

Additional Costs: $2,519,000

Total Alternative S-3 Cost: $12,264,500

Years to Implement 1.5

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production by limiting the amount of infiltration, and would limit the potential for contaminant migration through storm water run-off or erosion. The amount of infiltration would be further reduced by placing an FML cap over the entire landfill (an estimated 60 acres), including the lagoons and all solid waste disposal areas. This alternative would include restricting access to the site by maintaining the current fencing and placing an administrative withdrawal on the property as discussed in Alternative S-2. Long-term ground-water monitoring would be used to determine if additional contaminants were leaching from the landfill material and contributing to the existing ground-water contamination.

Alternative S-4 - Institutional and Surface Controls, Hot Spot Bioremediation, and Capping with Engineered, Low Permeability Cap

Total Capital Cost: $4,923,800

Total O&M Cost: $300,000

Additional costs include remedial design ($0.2 million), inflation escalation, 5% contingency, and 3% internal project management

Additional Costs: $1,367,300

Total Alternative S-4 Cost: $6,588,400

Years to Implement: 1.0

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production by limiting the amount of infiltration and would limit the potential for contaminant migration through storm water run-off or erosion. The amount of infiltration would be further reduced by placing a low permeability cap over the western portion of the landfill (an estimated 20-30 acres), including the lagoons and all solid waste disposal areas. Two types of caps were considered: a conventional compacted clay cap; and an innovative capillary barrier cap developed by Sandia National Laboratory (FS, Appendix G-2, BLM, 1996). This alternative would include restricting access to the site by maintaining the current fencing and continuing the administrative withdrawal on the property as discussed in Alternative S-2. Long-term ground-water monitoring would be used to determine if additional contaminants were leaching from the landfill material and contributing to the existing ground-water contamination.

The effectiveness of the low permeability soil cap would be increased by treating or excavating the BTEX-contaminated lagoon area sediments, which are expected to be the contaminants most likely to produce leachate. For purposes of analysis of this alternative, the proposed method for reducing BTEX contamination is *in-situ* bioremediation. If determined to be ineffective during the remedial design phase, pilot-scale studies, or through evaluation of the implemented alternative, the method will be adjusted to reduce BTEX concentrations through excavation and *ex-situ* treatment, which may include on-site bioremediation (landfarming) or shipment to an off-

site facility. Also, further sampling may prove that the BTEX compounds are being naturally degraded, which would eliminate the necessity for bioremediation.

Alternative S-5 - Institutional and Surface Controls, Hot Spot Remediation, and Engineered Low Permeability Soil Cap on the West Half of the Landfill, Installation of Lysimeters to Monitor Possible Leachate Generation

Total Capital Cost (approximate): $1.9 million for a conventional clay cap, or approximately $1.2 million for the capillary barrier.
Total O&M Cost: $300,000
Additional costs include remedial design ($0.2 million), inflation escalation, 5% contingency and 3% internal project management
Additional Costs: $1.4 million
Total Alternative S-5 Cost (approximate): $3.6 million
Years to Implement: 1

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production from the west half of the landfill by limiting the amount of infiltration and would limit the potential for contaminant migration through storm water run-off or erosion. The amount of infiltration would be further reduced by placing a capillary barrier cap over the western half of the landfill (an estimated 25 acres), including the lagoons and most of the solid waste disposal areas. Two types of caps were considered: a conventional compacted clay cap; and an innovative capillary barrier cap being developed by Sandia National Laboratory. A system of lysimeters would be installed in the landfill to monitor leachate generation (see Figure 17). If leachate does occur, a collection system could be installed or the area could be capped at a later time. This alternative would also include restricting access to the site by maintaining the current fencing and placing an administrative withdrawal on the property, as discussed in Alternative S-2. Long-term ground-water monitoring would be used to determine if additional contaminants were leaching from the landfill material and contributing to the existing ground-water contamination.

The effectiveness of the low permeability soil cap would be increased by treating or excavating

the BTEX-contaminated lagoon area sediments, which are expected to be the contaminants most likely to produce leachate. For purposes of analysis of this alternative, the proposed method for reducing BTEX contamination is *in-situ* bioremediation. If this is determined to be ineffective during the remedial design phase, pilot-scale studies, or through evaluation of the implemented alternative, the method can be adjusted to reduce BTEX concentrations through excavation and *ex-situ* treatment, which may include on-site bioremediation (landfarming) or shipment to an off-site facility. Also, further sampling may prove that the BTEX compounds are being naturally degraded, which would eliminate the necessity for bioremediation.

Selected Soil Pathway Alternative

Based on the results of the pilot study conducted at the Lee Acres Landfill, EPA, BLM, and the State of New Mexico concluded that the cap is performing as expected, and that hot spot bioremediation of the lagoon area sediments is not necessary to improve the long-term performance of the remedy. Accordingly, Alternative S-5 was modified by eliminating the hot spot treatment, and is presented below as Alternative S-5(a). Alternative S-5(a) is the selected alternative based on the successful outcome of the pilot project results.

Alternative S-5(a) - Institutional and Surface Controls, Capping with Capillary Barrier Cover on the Western Portion of the Landfill, and Installation of Lysimeters to Monitor Possible Leachate Generation

Total Capital Cost (approximately): $1.2 million for the capillary barrier
Total O&M Cost: $300,000
Additional costs include remedial design ($0.2 million), inflation escalation, 5% contingency and 3% internal project management
Additional Costs: $0.5 million
Total Alternative S-5 Cost (approximate): $1.9 million
Years to Implement: 1

This alternative is a modified version of Alternative S-5. Alternative S-5(a) does not include the hot spot bioremediation of BTEX-contaminated lagoon sediments included in Alternative S-5.

The purpose of the hot spot remediation included in Alternative S-5 was to increase the effectiveness of the low permeability cap. However, based on the results of the pilot study conducted at the Lee Acres Landfill, EPA, BLM, and the State of New Mexico concluded that the cap is performing as expected, and that hot spot bioremediation of the lagoon area sediments is not necessary to improve the performance of the remedy. The performance of the cap will be monitored, and if monitoring data indicate that the cap is not performing as anticipated, an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken if needed.

Overall Protection of Human Health and the Environment

Alternative S-5(a) will protect human health and the environment by limiting access to the contaminated soils, by using surface water run-on and run-off controls to limit the amount of run-on infiltration and protect the landfill from erosion, and by capping with low permeability soil to eliminate other infiltration.

Compliance with ARARs

This alternative will include an engineered low permeability cap that will meet the minimum requirements of 40 CFR Part 258, to comply with ARARs. Although there is slight risk of leachate production, the entire site has been fenced and withdrawn from use. There is no risk to human health or the environment from the east half of the landfill. Lysimeter installation and monitoring will further ensure that no risk develops from this area. The performance of the cap will be monitored, and if monitoring data indicate that the cap is not performing as anticipated, an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken if needed.

Long-Term Effectiveness and Permanence

The long-term effectiveness of this alternative depends on continued maintenance of the low permeability cap and surface controls, and no leachate occurring beneath the eastern portion of the landfill. The permanence and level of residual risk for this alternative will be the same as S-4, and the residual risk will be lower than that for alternatives S-1, S-2, and S-3. Lysimeter installation and ground-water monitoring will provide information regarding leachate generation

and contaminant characteristics throughout the entire landfill. The number and placement of lysimeters will be determined in the design phase.

Short-Term Effectiveness

The short-term effectiveness for this alternative is the same as that for S-4. The possibility of a release during installation of the lysimeters also exists, making the risk the same as S-4. Therefore, this alternative is expected to present a greater level of short-term risk to workers and residents during overall implementation than S-1, S-2 and S-3.

Implementability

None of the soil pathway alternatives would require permits, and none would require the use of additional property that is not controlled by BLM. This makes the administrative implementability of these alternatives equal. Alternative S-5(a) would be easily implemented with readily available materials and technology and is expected to be reliable in meeting its objective of elimination of the production of leachate by both limiting infiltration and reducing leachable contaminant concentrations. The installation of the low permeability cap will be much easier to implement than the FML cap. Installation of lysimeters in the landfill will be easily implementable, and will monitor for possible leachate production. These activities make this alternative more difficult to implement than Alternatives S-1 and S-2 but easier to implement than Alternative S-3. In addition, because the low permeability cap requires only compaction, this alternative is expected to be more flexible in allowing additional soil or ground-water remedial actions than Alternative S-3, which would require re-welding of the FML. Overall, this alternative is expected to be much more easily implemented than Alternative S-3, and slightly less easily than Alternative S-4.

Reduction of Toxicity, Mobility, or Volume of Contaminants

Overall, this alternative provides a greater reduction of mobility than Alternatives S-1 and S-2 and the same reduction as Alternatives S-3 and S-4. Installation of the low-permeability cap, lysimeters and site monitoring will not actively reduce contaminant toxicity or volume, but it will reduce the mobility of the contamination. In addition, reduction of ground-water contaminant concentrations through natural attenuation is expected to continue, thereby reducing toxicity and

volume of contaminants in ground water. Lysimeters will be used to monitor the effectiveness and integrity of the cap.

Cost

The estimated cost for this alternative is $1.9 million of which about half ($1.2 million) is the capital cost for installing the low permeability cap. The cost for the cap assumes a 25-acre low permeability cap covered with soil and vegetated, and 30-year O&M period. It is expected that a minimum of six lysimeters will need to be installed and checked quarterly. The lysimeters are expected to cost approximately $34,000. The overall cost is more than the cost of Alternatives S-1 and S-2, but less than the cost of Alternatives S-3 and S-4.

11.0 GROUND-WATER PATHWAY ALTERNATIVES

The five alternatives considered for ground-water remediation were:

G-1 No Action
G-2 Institutional Controls and Monitoring
G-3 Extraction Well System, Sheet Piling Containment, Precipitation/Flocculation Treatment, and Subsurface Disposal
G-4 Permeable Treatment Wall using Sheet Piling Containment
G-5 Permeable Treatment Wall using Sheet Piling Containment and Extraction and Reinjection of Manganese Hot Spots

Alternative G-1 - No Action

There is no cost associated with this alternative.
Years to Implement: 0

Under this alternative, no further action would be taken at the site. Ground-water contaminant levels would not be monitored, and no institutional actions would be taken to ensure that residents do not become exposed to contaminated ground water resulting from landfill operations. Retention of this alternative is required by the NCP.

Alternative G-2 - Institutional Controls and Monitoring

Total Capital Cost: $ 40,000

Total O&M Cost: $235,000

Additional Costs: $32,000

Total Alternative G-2 Cost: $ 307,000

Years to Implement: 0.5

This alternative would include restricted access to, and long-term monitoring of, areas with ground-water contamination exceeding clean-up levels. Access would be restricted by fencing and withdrawal of the landfill site from public uses to limit future use of the property as discussed in Soil Alternative S-2. In order to implement monitoring of ground-water contamination south of the landfill, BLM will seek the cooperation of Giant Industries (Giant) in allowing access for installing and taking samples from wells on Giant Property. Absent such cooperation, BLM will exercise its authorities under CERCLA to obtain access to Giant property for the purpose of taking samples and otherwise implementing this response action. Ground water would be monitored on the south of the landfill to evaluate changes in the plume geometry and contaminant concentrations. For purposes of cost analysis, it is assumed that a minimum of 18 wells would be monitored. Five new wells would be sampled quarterly for three years, semi-annually for two years, and then annually for 25 years. The existing wells would be monitored semi-annually for five years and annually for 25 years, as required by CERCLA. The wells would be monitored for the COCs identified in Table 2.

Alternative G-3 - Extraction Well System, Sheet Piling Containment, Precipitation/Flocculation Treatment and On-site Subsurface Disposal

Total Capital Cost: $552,200

Total O&M Cost: $899,000

Additional costs include remedial design ($72,600), inflation escalation, 5% contingency, and 10% internal project management.

Additional Costs: $859,200

Total Alternative G-3 Cost: $2,310,400

Years to Implement: 1.5

This alternative would meet the RAOs by withdrawing the contaminated ground water through an extraction well system, removing the contaminants in an on-site treatment system, and reinjecting the treated ground water into the subsurface. Based on the capture zone modeling presented in Appendix E of the Feasibility Study Report (FS, BLM, 1996), it is assumed that a total of 26 extraction wells would be required, oriented north-south, to capture the entire manganese plume. This alternative includes the installation of sheet piling along the western side of the plume. This containment structure is expected to increase the effectiveness of the extraction well system and decrease the remediation time by limiting the volume of uncontaminated ground water extracted. The withdrawn ground water would be treated in an on-site precipitation and flocculation system. The treated ground water would be returned to the aquifer through one of two subsurface disposal options, either an infiltration gallery or shallow injection wells. A specific treatment option for VOCs is not included because the VOC clean-up levels are expected to have been met through degradation in the aquifer, extraction, and handling on the surface. Influent concentrations would be monitored to verify that VOC concentrations remain below clean-up levels. If it is determined that VOC clean-up levels are not met by this system, a specific VOC treatment option can be added to the manganese treatment train. The exact number and locations of the extraction wells and disposal wells or infiltration gallery would be determined during the remedial design phase. However, the subsurface disposal locations must be designed to return ground water to the aquifer in locations that would not adversely affect the extraction system on GBR property south of the landfill. Metal-bearing sludge produced in the precipitation and flocculation system would be sent off-site for recovery or for disposal in a RCRA-permitted facility. For purposes of cost analysis, it is assumed that five wells, all currently in place, would be monitored quarterly for five years, semi-annually for five years, and then annually for the remainder of the 30-year O&M period to verify the effectiveness of the system. The monitoring frequency may be changed as necessary if EPA, BLM, and the State concur that site conditions have changed sufficiently to warrant a change in monitoring frequency. These frequencies are the expected level of activity at the site and thus were used for cost estimation purposes for the ROD. The wells would be monitored for VOCs, manganese, nickel, and general chemistry.

Alternative G-4 - Permeable Treatment Wall using Sheet Piling Containment

Total Capital Cost: $788,000

Total O&M Cost: $493,600

Additional costs include remedial design ($31,300), inflation escalation, 5% contingency, and 10% internal project management,

Additional Costs: $552,200

Total Alternative G-4 Cost: $1,833,800

Years to Implement: 1.5

This alternative would meet the RAOs by treating both VOCs and manganese in a "funnel and gate" system. The "gate" or treatment wall would be located at the down-gradient end of the plume. The containment walls, the "funnel," would be constructed of sealable sheet piling. The type of reactive material in the treatment wall (iron-based material or limestone) would be chosen during the design phase and would require further testing of both the iron-based material and the limestone (FS, Appendix G-1, BLM, 1996). A pilot test of this technology using iron as the reactive media resulted in a 99% reduction in VOCs and an 86% reduction in manganese. This system would not require removal of water from the aquifer or disposal of treated water and, therefore, would have no adverse affect on GBR's remedial efforts. However, it would require periodic replacement of the reactive material in the gate, and the spent material would be shipped off-site for either regeneration or disposal. The efficiency of the system would be monitored by wells placed down-gradient of the reactive wall. For purposes of cost analysis, it is assumed that five wells (two newly installed down-gradient of the treatment wall) would be monitored quarterly for five years, semi-annually for five years, and then annually for the remainder of the 30 year O&M period to verify the effectiveness of the system. The monitoring frequency may be changed as necessary if EPA, BLM, and the State concur that site conditions have changed sufficiently to warrant a change in monitoring frequency. These frequencies are the expected level of activity at the site and thus were used for cost estimation purposes for the ROD. The wells would be monitored for VOCs, manganese, nickel and general chemistry.

Alternative G-5 - Permeable Treatment Wall using Sheet Piling Containment and Extraction-and -Reinjection of Ground Water in Manganese Hot Spots

Total Capital Cost: $891,000

Total O&M Cost: $524,300

Additional costs include remedial design ($42,500), inflation escalation, 5% contingency, and 10% internal project management.

Additional Costs: $611,500

Total Alternative G-5 Cost: $2,026,900

Years to Implement: 1.5

This alternative would meet the RAOs by treating both VOCs and manganese in a funnel and reactive wall system. The manganese concentrations in the northern and southern lagoon hot spots would also be reduced by limited extraction and reinjection of ground water within those two areas. The extracted water would be reinjected in front of the treatment wall and would then pass through the treatment system. The wall's hydraulic conductivity would be engineered to accommodate the additional hydraulic head without interrupting the natural hydraulic gradient of the system. The treatment wall would be located at the down-gradient end of the plume. The containment walls would be constructed of sealable sheet piling. The type of reactive material in the reactive wall (iron-based material or limestone) would be chosen during the design phase and would require further testing of both the iron-based material and the limestone (FS, Appendix G-1, BLM, 1996). This system would not require net removal of water from the aquifer or disposal of treated water and therefore would have no adverse affect on GBR's remediation effort. However, it would require periodic replacement of the reactive material in the wall. Spent material would be shipped off-site for regeneration or disposal. The extraction and reinjection portion of the alternative would include a withdrawal well located in each lagoon area. The exact number and location of wells would be determined during the remedial design phase. The withdrawn ground water would be transported over the surface to the treatment reactive wall, and reinjected upgradient of the reactive wall so the water would be treated as it flows through the reactive wall. This would combine the advantages of short-term reduction of hot spot concentrations with the advantages of *in-situ* treatment, eliminating the need for surface treatment and subsurface disposal facilities. For purposes of cost analysis, it is assumed that five wells (two

newly installed down-gradient of the wall) would be monitored quarterly for five years, semi-annually for five years, and then annually for the remainder of the 30-year O&M period to verify the effectiveness of the system. The monitoring frequency may be changed as necessary if EPA, BLM, and the State concur that site conditions have changed sufficiently to warrant a change in monitoring frequency. These frequencies are the expected level of activity at the site and thus were used for cost estimation purposes for the ROD. The wells would be monitored for VOCs, manganese, nickel and general chemistry.

Selected Ground-Water Pathway Alternatives

Long-term ground-water monitoring data collected at the Lee Acres Landfill from March 1990 to November 1999 indicate that ground-water contamination levels are decreasing and the contaminant plume is receding. The decrease in the contaminant concentrations and plume size likely is attributable to closing the liquid waste lagoons to use, to closing the landfill, and to the process of natural attenuation of contaminants in the ground water. Due to the decreasing ground-water contamination levels, Alternative G-2 was modified by adding monitored natural attenuation as an element of the alternative, which is presented as Alternative G-2(a). Alternative G-2(a) is the selected remedy for the ground-water pathway.

Alternative G-2(a) - Institutional Controls, Natural Attenuation and Monitoring

Total Capital Cost: $0.00
Total O&M Cost: $235,000
Additional Costs: $32,000
Total Alternative G-2(a) Cost: $267,000
Years to Implement: 0.5

This alternative would include restricted access to, and long-term monitoring of, areas with ground-water contamination exceeding clean-up levels identified in Table 2. Reduction in concentration levels of COCs would be achieved through natural attenuation. Data indicate that natural attenuation is occurring for all COCs at the site, and MCLs have been met in most ground-water monitoring wells located outside the landfill cells area. Access would be restricted by

fencing and deed restrictions to limit future use of the property. To implement monitoring of ground-water contamination south of the landfill, BLM will seek the cooperation of Giant Industries (Giant) in allowing access for installing and taking samples from wells on Giant property. Absent such cooperation, BLM will exercise its authorities under CERCLA to obtain access to Giant property for the purpose of taking samples and otherwise implementing this response action. Ground-water monitoring on and south of the landfill would be conducted to evaluate changes in the plume geometry and contaminant concentrations. For purposes of cost analysis, it is assumed that a minimum of 14 wells would be monitored. The wells would be monitored for VOCs, manganese, nickel and general chemistry. Monitoring frequency will be determined during the remedy design.

If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with ARARs. Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance. This approach was selected to ensure that any contaminant increases that may occur are in fact a long-term trend rather than a short-term event.

Overall Protection of Human Health and the Environment

Alternative G-2(a) will protect human health and the environment by limiting access to contaminated ground water. Evaluation of current data (post 1993) indicates that the VOC plume concentrations are decreasing. For almost all sampling locations, the results are below MCLs for VOCs. The manganese plume has decreased in concentration, with the exception of BLM 57 in September 1997, which is under the landfill cells. No migration has been detected since 1993. BLM will continue to monitor ground water to ensure the continued effectiveness of the monitored natural attenuation remedy. BLM cannot limit access to ground water south of the landfill. However, it is expected that the GBR remedial project will be continuing. Since the VOC and manganese plumes have stopped moving, long-term monitoring would enable action to

be taken if migration occurs. This alternative would be protective of human health and the environment as long as contaminants continue to be attenuated in the subsurface.

Compliance with ARARs

VOC concentrations are expected to decrease below ARARs through the process of natural attenuation. Based on data collected through November 1999, it appears that the migration of manganese and nickel has halted and concentrations of manganese and nickel are also expected to decrease below ARARs through natural attenuation. Clean-up levels will be achieved in monitoring wells, the locations of which will be determined during remedy design.

Long-Term Effectiveness and Permanence

This alternative would maintain protection of human health after the remedial objectives have been met. This alternative would have less residual risk than Alternative G-1, because potential migration will be monitored. Natural attenuation will occur under either alternative. The other ground-water alternatives (G-3, G-4, and G-5) would actively decrease contaminant concentrations and may result in less residual risk than this alternative.

Short-Term Effectiveness

Implementation of this alternative would include no construction requiring exposure to contaminated media. Some of the monitoring wells required to continue to monitor the ground water are already in place, but additional monitoring wells may be required. Because this alternative relies on natural attenuation rather than treatment to reduce ground-water contamination, it may be less effective in the short-term than other alternatives.

Implementability

Additional monitoring wells on property adjacent to the landfill will require the cooperation of the adjacent property owner, or access pursuant to CERCLA authorities. The need to obtain such cooperation or access is not expected to limit the implementability of this alternative. This alternative would not preclude the undertaking of additional remedial actions at a later time. This alternative is expected to be more easily implemented than Alternatives G-3, G-4, and G-5.

Reduction of Toxicity, Mobility, or Volume of Contaminants

There would be no active reduction of TMV by this alternative, although the TMV of the VOCs and manganese is expected to continue to decrease due to natural attenuation. Based on data collected through November 1999, ground-water monitoring indicates that overall, manganese concentrations are declining, indicating that it is being naturally attenuated. Alternatives G-3 through G-5 will actively treat the contaminants and will reduce the TMV of all of the contaminants more than Alternatives G-1 or G-2.

Cost

The cost associated with this alternative is $267,000 almost all due to O&M costs associated with monitoring wells for 30 years. The total cost is much less than the costs associated with Alternatives G-3 through G-5.

12.0 SELECTED REMEDIAL ALTERNATIVES

12.1 Selected Soil Alternative

The selection of the remedy for the soil pathway was based on the five balancing, two threshold and two modifying criteria. Table 4 presents each alternative in relation to each criterion.

The selected alternative for landfill soil remediation is Alternative S-5(a) - Institutional and Surface Controls, Engineered Low Permeability Cap (Capillary Barrier) on the Western Portion of the Landfill, and Installation of Lysimeters to Monitor Possible Leachate Generation. The cap will minimize leaching of contamination from the soil by reducing or eliminating water infiltration. The effectiveness of the system in minimizing leachate will be monitored by lysimeters. Institutional and surface controls will be used to protect the integrity of the cap and monitoring system, and to prevent exposure to contamination. This alternative provides long-term protection of human health and the environment with a cost-effective remedy that was selected on the basis of site-specific, long-term monitoring data.

The engineered low permeability cap was developed at Sandia National Laboratories (Appendix G-2, BLM FS, 1996) and tested on-site in a pilot plot. It is an innovative technology consisting of a capillary barrier specifically designed for arid climate landfills. An 18-month large-scale test of the capping technology was conducted at the northern lagoon at the Lee Acres Landfill. The results of the test demonstrated that the cap should be effective at the Lee Acres Landfill Site. The EPA and NMED, by their concurrence in this ROD, approve installation of the capillary barrier cap at the Lee Acres Landfill.

BLM will continue to monitor ground water to ensure the effectiveness of the capillary barrier cap and natural attenuation remedy. If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with ARARs. Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance. Figures 16, 17 and 18 illustrate the location of the pilot project and the recommended cap location.

Surface water run-on and run-off control structures will be constructed to divert run-on and maximize run-off. Specific surface water control features will be determined during remedy design, and their ongoing performance ensured through long-term monitoring and maintenance.

An area of 134.68 acres of public land, which includes the Lee Acres Landfill and a buffer area around it, was withdrawn by BLM from surface entry and mining for a period of 50 years (see 62 FR 2177, Public Land Order No. 7234). At the end of the 50 year period of the withdrawal, if hazardous substances remain at the Lee Acres Landfill above levels that prevent unrestricted use, the withdrawal will be extended or other controls will be implemented.

The area withdrawn is described as follows (see Figure 19 for a map of the withdrawn area):

New Mexico Principal Meridian
T. 29N., R. 12W.,
Sec. 21, lots 6 and 7 (everything southeast of County Road No. 5569);
Sec. 22, lot 5 (everything southeast of County Road No. 5569);
lot 6 W\1/2\, lot 11 W\1/2\, and lot 12;
Sec. 28, lot 2.

The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could disturb the integrity of the containment system, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill Site.

Discretionary restrictions on the use of the land at the Lee Acres Landfill Site that are in compliance with the current withdrawal, will be implemented in accordance with BLM's current resource management plan. Resource management plans enable BLM to manage public lands and resources in a balanced manner, as directed by the Federal Land Policy and Management Act (FLPMA) of 1976. Resource management plans also allow BLM to analyze impacts to public lands, as prescribed under the National Environmental Policy Act (NEPA) of 1969.

The prevailing resource management plan for the Lee Acres Landfill Site is the Farmington Resource Management Plan and Final Environmental Impact Statement, dated September 2003. The Final RMP/EIS does not contain any changes to current management of the established Lee Acres withdrawal. The restrictions of this withdrawal will remain to protect public health, welfare and the environment from the hazardous materials that remain onsite, for a period of fifty years. At the end of the 50 year period of the withdrawal, if hazardous substances remain at the Lee Acres Landfill above levels that prevent unrestricted use, the withdrawal will be extended or other controls will be implemented.

All future proposals for Lee Acres Landfill Site will have to be in accordance with the current withdrawal as well as the current resource management plan. Any person or entity proposing an activity within the Lee Acres Landfill site would do so through an application to the Farmington Field Office. This application would be reviewed for conformance with the withdrawal and the current resource management plan, which refers to this Record of Decision. Only those applications that are in conformance with the provisions of these documents will be subject to further NEPA review and analysis. Final determination on any future proposed actions at the Lee Acres Landfill Site will be made by the Farmington Field Office, following a proposal-specific NEPA analysis that will include consultation with the appropriate governmental entities.

BLM is responsible for implementing, maintaining, and monitoring of the surface and institutional controls for the duration of the remedies selected in the ROD and for as long as hazardous substances remain on site above levels that prevent unrestricted use. BLM will submit to EPA a monitoring report on the status of the surface and institutional controls at least annually. The report, at a minimum, will contain an evaluation of whether all of the surface and institutional controls requirements of the ROD are being met, including the results of a visual field inspection of all areas subject to surface and institutional controls, and a description of any deficiencies in the surface and institutional controls and measures that have been or will be taken to correct the deficiencies. BLM will notify EPA in writing within 72 hours of discovery of any activity that is inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least 45 days in advance of any proposals for major land use changes inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least six months prior to any transfer, sale, or lease of any property subject to surface or institutional controls under the terms of this ROD and consult with EPA on specific wording for property transfer or lease documents. BLM will notify EPA of any activities that violate the restrictions in the land use plan described above, the effect of the activities on the protectiveness of the remedy, and any proposed actions to address the violation of the restrictions. BLM also will consult with EPA prior to proposing any changes in the restrictions in the land use plan described above.

12.2 Selected Ground Water Alternative

Selection of the remedy for the ground-water pathway was based on the five balancing, two threshold and two modifying criteria. Table 5 presents each alternative in relation to the nine criteria.

The selected remedial alternative for ground water is G-2(a) - Institutional Controls, Natural Attenuation with Monitoring. Natural attenuation will be relied upon to achieve clean-up levels for ground water. Ground water will be monitored to document that natural attenuation is occurring. Institutional controls will be used to prevent exposure to ground-water contamination until cleanup levels are achieved. The institutional controls include the withdrawal discussed in Section 12.1 above, which will be implemented in accordance with the finalized Resource Management Plan/Final Environmental Impact Statement, expected to be finalized in May 2003.

Monitored natural attenuation was selected for the Lee Acres Landfill based on ground-water monitoring data collected from 1993 through 1999. These data indicate that the VOC plume concentrations are decreasing. For almost all sampling locations, the results are below MCLs for VOCs. The manganese plume has decreased in concentration, with the exception of BLM 57 in September 1997, which is under the landfill cells. No migration has been detected since 1993. BLM will continue to monitor ground water to ensure the continued effectiveness of the monitored natural attenuation remedy. Monitoring frequency will be determined during the remedy design.

13.0 STATUTORY DETERMINATION

Under CERCLA Section 121, BLM and EPA must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), are cost-effective, utilize permanent solutions, and use alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that

permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element.

The selected remedies protect human health and the environment through capping the landfill to prevent leachate production from the soils, and monitoring future movement or chemical changes in the ground water.

The selected remedies of capping and monitored natural attenuation will comply with all applicable or relevant and appropriate requirements (ARARs). The ARARs are presented in Table 3, and clean-up levels are presented in Table 2.

The selected remedy is cost-effective in terms of its long-term effectiveness and permanence, reduction in toxicity and mobility, and short-term effectiveness. The selected remedy is consistent with EPA's presumptive remedy for landfills (i.e., containment), and the cover design takes into consideration the expected performance of landfill covers in an arid climate such as the area in which the site is located. In addition, based on years of ground-water monitoring data, natural attenuation of the ground-water contamination is expected to continue, and clean-up levels achieved within a reasonable timeframe.

The selected remedy provides the best balance of trade-offs with respect to the balancing criteria set out in section 300.436(f)(1) of the NCP, such that it represents the maximum extent to which permanence and treatment can be utilized at this site. While treatment is not being utilized at the site, the containment remedy provides permanent reduction of low-level risk from the landfill contents. Monitored natural attenuation will provide a permanent reduction in risk from the ground-water pathway. The contaminant source at the Lee Acres Landfill is not considered principal threat waste, but rather is high-volume, low-risk waste such as is discussed in the NCP as appropriate for engineering controls (see section 300.430(a)(1)(iii)(B) of the NCP, which states, that...."EPA expects to use engineering controls, such as containment, for waste that poses a relatively low long-term threat or where treatment is impracticable.")
Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will

be conducted no less often than each five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

14.0 DOCUMENTATION OF SIGNIFICANT CHANGES

In the Proposed Plan, Soil Alternatives S-4 and S-5 included a provision for hot spot bioremediation of BTEX-contaminated lagoon sediments in the event it was needed to increase the effectiveness of the low-permeability cap. Based on the results of the capillary barrier pilot study conducted by the Department of Energy's Sandia National Laboratory, EPA, BLM, and the State of New Mexico concluded that the cap is performing as expected, and that hot spot bioremediation of the lagoon area sediments is not necessary. Accordingly, Alternative S-5 was modified by eliminating the hot spot bioremediation element, and presented as Alternative S-5(a), which is the selected remedy for the soil pathway.

As a result of the ground-water monitoring data, Alternative G-2 from the Proposed Plan also was modified by adding monitored natural attenuation as an element of the remedy, and is presented as Alternative G-2(a) in this Record of Decision. Data collected through November 1999 support the conclusion that contamination levels are continuing to decline through natural attenuation, with the exception of BLM 57, which is located directly beneath the landfill cell. The concentrations of 1,2-DCE increased through May 1999, and the November 1999 sampling indicates reduction in concentrations. A report being prepared by UNM will evaluate these conditions. It is suspected that these data are related to the installation of the capillary barrier pilot cap. Because of the increase in concentrations, monitoring frequency has been increased to quarterly and piezometers have been installed and sampled until trends can be verified.

BLM and EPA believe that these changes to the alternatives outlined in the Proposed Plan could have been reasonably anticipated by the public from the time the Proposed Plan and RI/FS Report were released for public comment to the final selection of the remedy. For the soil alternative, the Proposed Plan stated that "...further sampling may prove that the BTEX compounds are being naturally degraded, which would eliminate the necessity for bioremediation." The possibility that

bioremediation might not be implemented was noted in the Proposed Plan, and sampling data confirm that the treatment option is not needed.

For the ground-water pathway, Alternative G-2(a) includes a monitored natural attenuation element rather than ground-water monitoring only (Alternative G-2), which was the preferred alternative in the Proposed Plan. By identifying monitored natural attenuation as a remedial action for the ground-water, clean-up levels are identified and must be attained. While inclusion of monitored natural attenuation in the remedy does not change in any way the technical approach to cleaning up the ground water, it does result in the identification of site-specific remediation objectives within a specified timeframe. BLM and EPA believe that identifying clean-up levels for ground-water contaminants provides a more comprehensive remedy than Alternative G-2, but, from a technical standpoint, it does not significantly differ from the preferred alternative identified in the Proposed Plan.

Finally, in the proposed plan, Alternative S-5 was described to cover 62 acres. Upon further study, BLM, EPA and NMED have agreed that the cap size for Alternative S-5(a) will be reduced from 62 acres to about 25 acres. This cap size reduction necessitates the installation of lysimeters to monitor for potential leachate production.

Alternative	Long-term effective-ness	Short-term effective-ness	Implementability	Reduction of TMV	Cost	Overall Protection of Human Health and the Environment	Compliance with ARARs	State Acceptance	Public Acceptance
S-1 No Action	Not Effective	Not Effective	Easily implemented	Will not reduce TMV	$0.00	Does not eliminate the potential for leaching so will not be protective of human health and the environment	Does not comply with ARARs		
S-2 Institutional and Surface controls	Not Effective	Not Effective	Easily implemented	Will not reduce TMV	$0.1 million	Will limit access, but not eliminate the potential for leaching, therefore is not completely protective of human health and the environment	Does not comply with ARARs		
S-3 Institutional and Surface Controls and Capping with Flexible Membrane Liner	Expected to be fully effective for the long-term	Fully effective	Installation and maintenance is more complicated than the other alternatives, however managerial implementation is similar to the other capping options	Fully complies	$12.26 million	Expected to be fully protective of human health and the environment	Fully complies with ARARs for soil		
S-4 Institutional and Surface Controls, and Capping with an Engineered, Low Permeability Cap(as defined in the New Mexico Solid Waste Regulations) over the Western Portion of the Landfill, with Lysimeters to Monitor Possible Leachate Production	Expected to be fully effective for the long-term	Fully effective	Easily implemented, moderate level of difficulty in installation and maintenance	Fully complies	$2.7 million	Expected to be fully protective of human health and the environment	Fully complies with ARARs for soil		

Table 4 Alternative Criteria Evaluation Comparison Table for Soil Page 1

S-5 Institutional and Surface Controls, and Capping with Engineered Low Permeability Cap (Capillary Barrier Cap) on the Western Portion of Landfill, Lysimeters to Monitor Possible Leachate Production	Expected to be fully effective for the long-term	Fully	Easily implemented	Fully complies	$1.9 million	Expected to be fully protective of human health and the environment	Fully complies with ARARs for soil	

Table 4 Alternative Criteria Evaluation Comparison Table for Soil **Page 2**

Alternative	Long-term effectiveness	Short-term effectiveness	Implementability	Reduction of TMV	Cost	Overall Protection of Human Health and the Environment	Compliance with ARARs	State Acceptance	Public Acceptance
G-1 No Action	Not Effective	Not Effective	Easily implementable	Does not reduce TMV	$0.00	Not protective of human health or the environment	Does not comply with ARARs		
G-2 Institutional Controls, Natural Attenuation with Monitoring	Effective as long as site ground water conditions do not change	Effective as long as site ground water conditions do not change	Land ownership may present some difficulty in obtaining agreements	Does not actively reduce TMV, but will passively reduce TMV	$0.31 million	Protective of human health and the environment providing no site ground water conditions change	Expected to fully comply		
G-3 Extraction Well System, Sheet Piling Containment, Precipitation/ Flocculation Treatment and On-site Subsurface Disposal	Fully effective, however will dewater alluvial aquifer, potentially affecting down-gradient recovery program	Fully effective	Land ownership may present some difficulty in obtaining agreements	Actively reduces TMV	$2.3 million	Protective of human health and the environment	Expected to fully comply with ARARs		
G-4 Permeable Treatment Wall using Sheet Piling Containment	Full effective, will not dewater alluvial ground water	Fully effective	Land ownership may present some difficulty in obtaining agreements	Actively reduces TMV	$1.8 million	Protective of human health and the environment	Expected to fully comply with ARARs		
G-5 Permeable Treatment Wall using Sheet Piling Containment and Extraction-and-Re-injection of Ground water in Manganese Hot Spots	Fully effective, however will dewater alluvial aquifer, potentially affecting down-gradient recovery program	Fully effective	Land ownership may present some difficulty in obtaining agreements	Actively reduces TMV	$2.0 million	Protective of human health and the environment	Expected to fully comply with ARARs		

Table 5 Alternative Criteria Evaluation Comparison Table for Ground Water

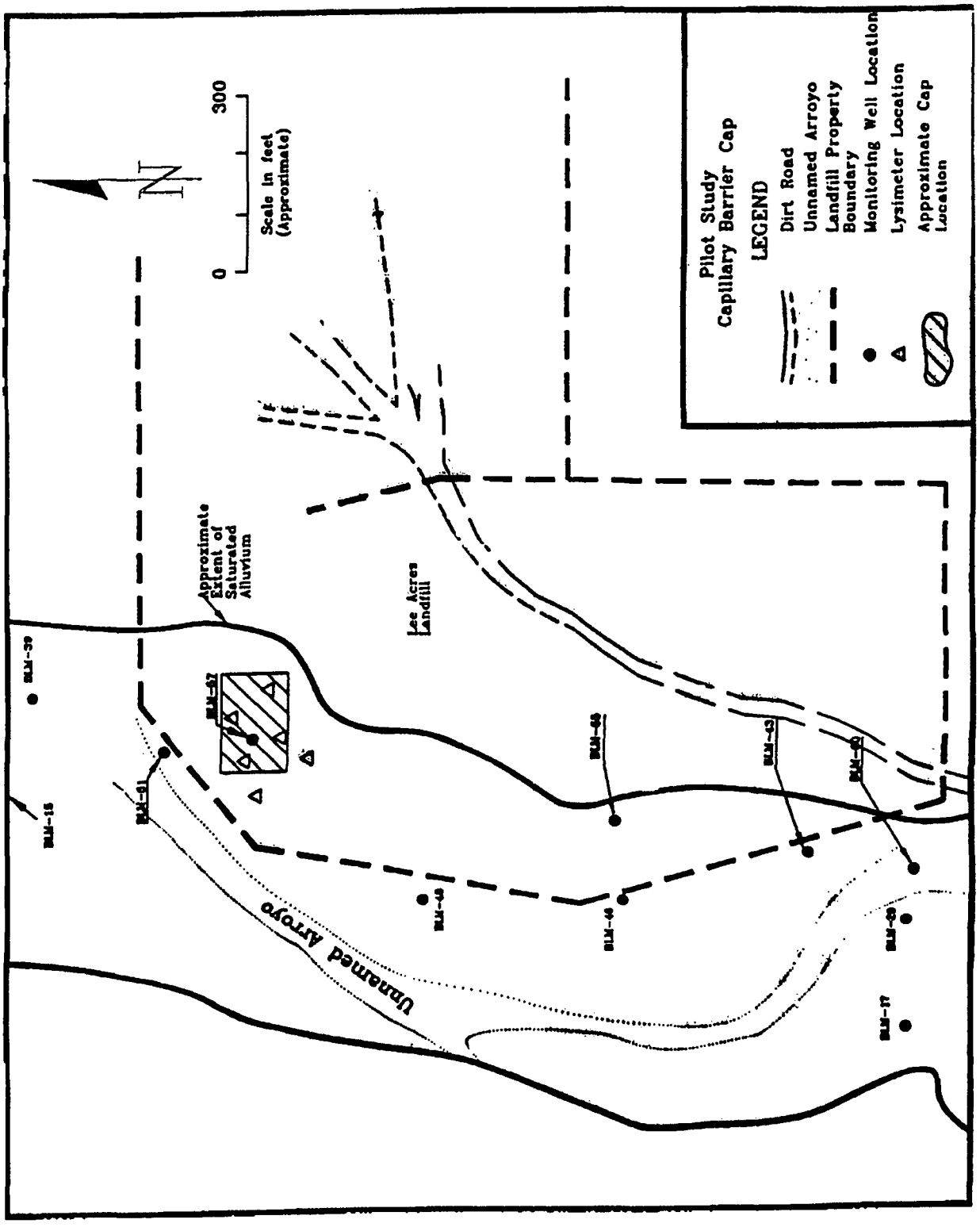


Figure 16 Location of Capillary Barrier Pilot Project

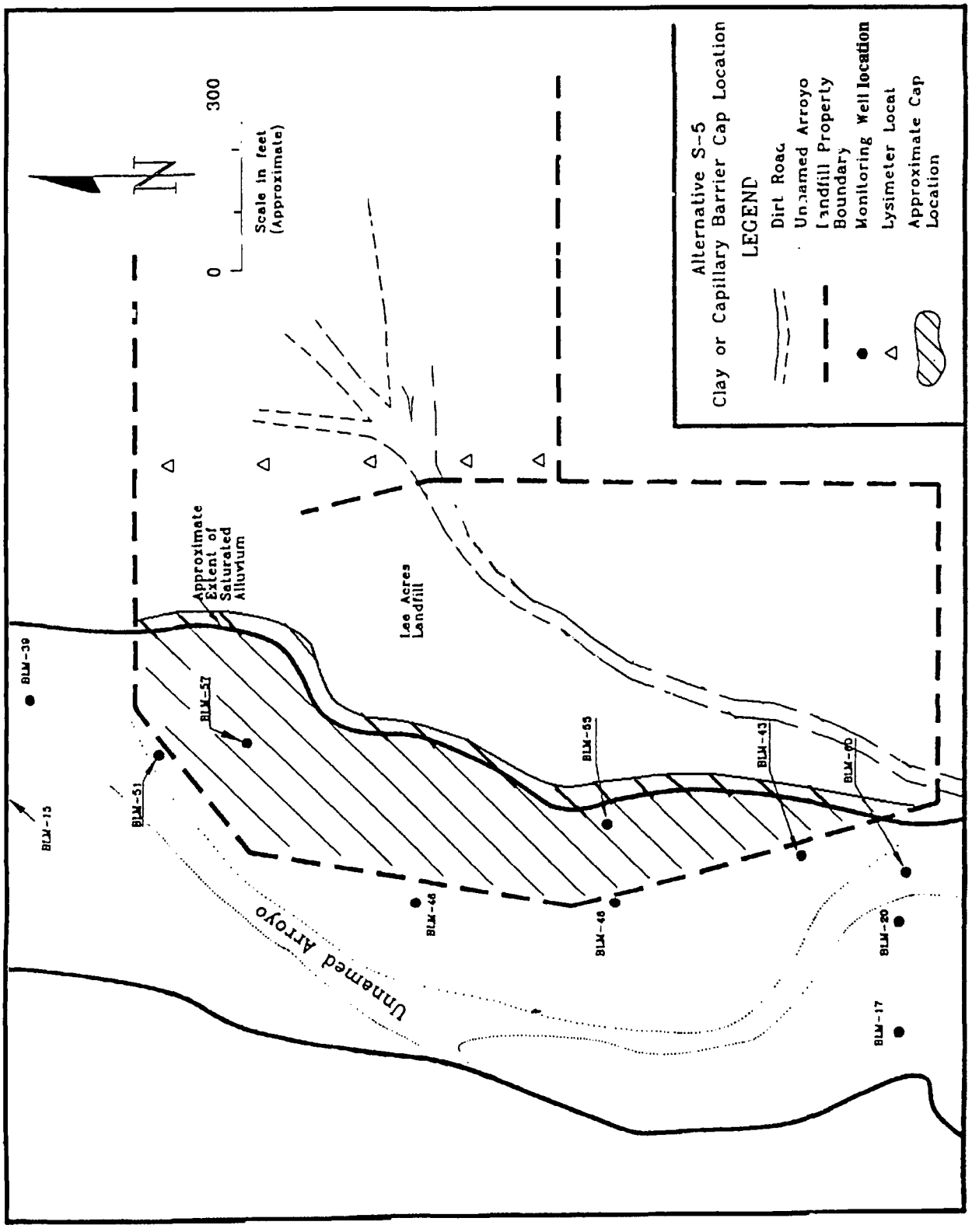


Figure 17 Landfill Cap and Possible Lysimeter Location Alternative

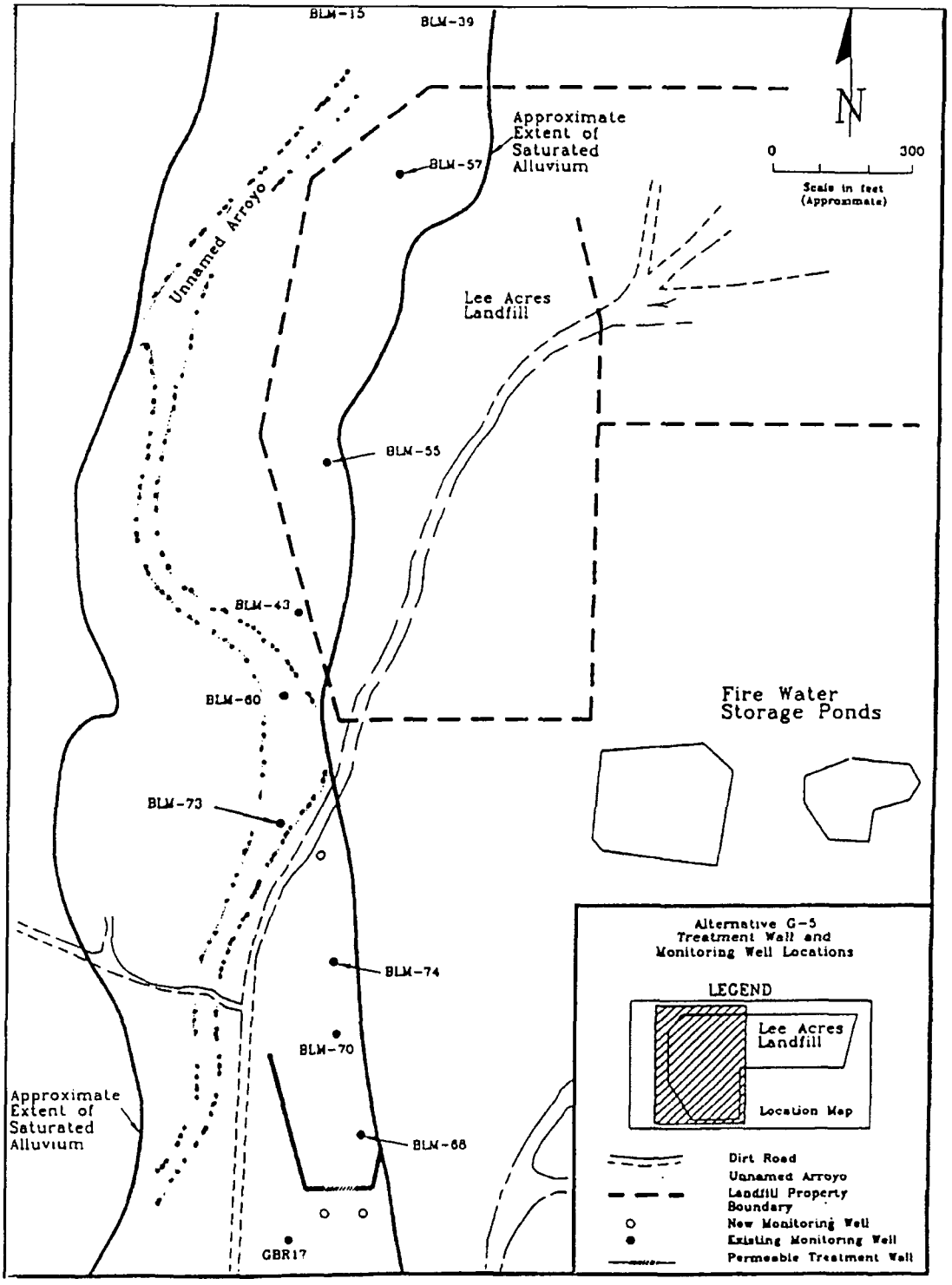


Figure 18 Alternative G-5, Sheet Piling and Reactive Wall Location

Lee Acres Landfill

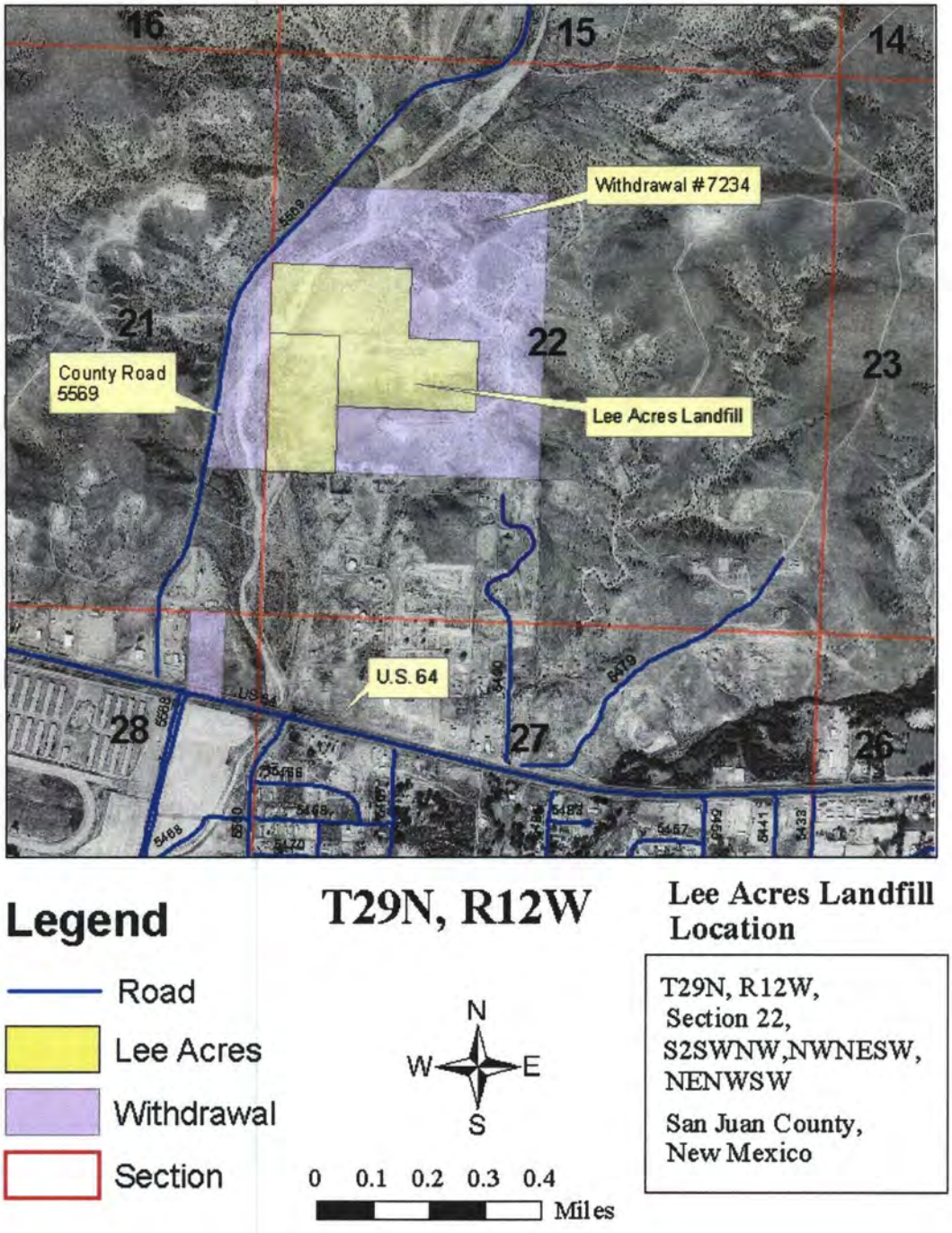


Figure 19 Lee Acres Landfill and Land Withdrawal Location

To obtain further information regarding the Lee Acres Landfill, please contact:

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15.0 GLOSSARY OF TERMS

ARARS.....Applicable or Relevant and Appropriate Requirements

BH.....Borehole

BLM.....Bureau of Land Management

BTEX.....Benzene, Toluene, Ethyl benzene, Xylene

CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act

COC.....Contaminants of Concern

COPC.....Contaminants of Potential Concern

DCE.....Dichloroethene

DOI.....Department of the Interior

EPA..... Environmental Protection Agency

ES.....Executive Summary

FML.....Flexible Membrane Liner

FS .....Feasibility Study

GBR.....Giant Bloomfield Refinery

MCL.....Maximum Contaminant Level

MDL.....Minimum Detection Level

mg/l.....Milligrams per liter (parts per million)

MOU..... Memorandum of Understanding

NCP.....National Contingency Plan

NMED..... New Mexico Environment Department

NMEID.....New Mexico Environmental Improvement Department

NMOCD.....New Mexico Oil Conservation Department

NMWQCC.....New Mexico Water Quality Control Commission

NPL.....National Priorities List

O & M.....Operation and Maintenance

PCE.....Tetrachloroethene

PRG.....Preliminary Remediation Goals

RAO.....Remedial Action Objectives

RI..... Remedial Investigation

RIR.....Remedial Investigation Report

SARA.....Superfund Amendments and Reauthorization Act

SDWA.....Safe Drinking Water Act

SVOC .....Semi-volatile Organic Compounds

TCE.....Trichloroethene

TMV.....Toxicity, Mobility, and Volume

:g/l.....micrograms per liter (parts per billions)

VOC.....Volatile Organic Compounds

16.0 LEE ACRES REGULATORY CHRONOLOGY

Date	Event
May 1, 1962	Lee Acres officially opened
Apr. 25, 1980	San Juan County Development Plan for landfill includes provisions for combined sludge and dead animal pit.
Nov. 10, 1980	NMEID found refuse pit almost full and not compacted or covered at required frequency. Suggested either additional land for expansion or new location.
Aug. 24, 1981	NMEID submits to EPA Potential Hazardous Waste Site Inspection Report, reporting surface impoundment with liquids, sludge, oily wastes, drilling fluids and drilling muds.
Sept. 9, 1981	NMEID reported noncompliance regarding required 2 feet of final cover over original landfill area.
Apr. 18, 1985	Lagoon breach and vapor release incident occurred. Eleven people treated for hydrogen sulfide poisoning.
May 8, 1985	BLM compliance exam reported sludge pit was fenced and a "No Dumping" sign posted.
Jan. 14, 1986	NMEID inspection reported the liquid waste lagoon was 96 to 97% evaporated
Apr. 24, 1986	NMEID inspection reported the liquid waste lagoon was completely covered with soil.
Apr. 25, 1986	Lee Acres Landfill officially closed by BLM suspending leases, except for a 5 acre transfer station.
Oct. 21, 1986	NMEID Administrative Order issued for BLM to provide water to residents, and prepare plans to investigate, cleanup, and monitor ground water.
Nov. 5, 1986	BLM begins bottled water delivery to 13 identified residents.
Dec. 1986	BLM fenced landfill to prevent direct contact.
Dec. 24, 1986	BLM and Lee Acres Water Users Assoc. enter agreement to permanently hook up Lee Acres residents to the community supply system.
1987	Lee Acres residents hooked up to community water system.
March 1989	BLM conducts preliminary investigation.

Dec. 19, 1989	Clean Water Act Sec. 404 nationwide permit received for arroyo erosion control construction.
Aug. 28, 1990	Lee Acres Landfill placed on the National Priorities List by EPA.
Sept. 13, 1991	CERCLA 107 letters issued by EPA to BLM, San Juan County and Giant Bloomfield Refinery.
Jan. 1993	BLM, EPA and NMED enter into a technical MOU for completion of the Remedial Investigation.
Sept. 1993	Final Remedial Investigation Report.
May 19, 1995	EPA and NMED approve Remedial Investigation.
May 8, 1996	EPA and NMED approve Feasibility Study.
Sept. 1996	EPA and NMED approve Proposed Plan
Nov. 16, 1996	Public review and comment period completed.

Chavez, Carl J, EMNRD

From: Stuart Hyde <shyde@ltenv.com>
Sent: Tuesday, October 22, 2019 11:21 AM
To: Smith.Nelly@epa.gov
Cc: Ogden, Sarah, NMENV; Devin Hencmann; McCartney, Gregory J.; Chavez, Carl J, EMNRD; Ashley Ager
Subject: [EXT] Giant Bloomfield Refinery (GW-040) Site, Requested Groundwater Data
Attachments: 2019_LTE Letter_EPA Requested Analytical Data.pdf; 2018 ANNUAL REPORT.pdf

Ms. Smith,

Please find attached a letter and table summarizing requested data from the Giant Bloomfield Refinery (GBR) site (also known as "GW-040" site). The table summarizes the information that you had requested from Mr. Carl Chavez in your September 13, 2019 email. Specifically, the table includes data for chloride, sulfate, chromium, iron, manganese, and total dissolved solid concentrations collected between 2010 and 2018. In addition, the table includes information regarding wellhead elevations, well depths, screened intervals, and depth to water (for the latest sampling event in 2018). Also attached is the *2018 Annual Report* summarizing all analytical results from last year's annual monitoring.

According to Ms. Ogden at the NMED, annual samples are collected at the Lee Acres site. Would you be able to provide annual reports for this sampling to LTE? We would be interested to see the data and the groundwater-elevation information collected during your sampling. Thanks and please let us know if you have any questions regarding the provided information.

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

Stuart Hyde, LG
Project Geologist
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970.903.1607 *cell*
848 East Second Avenue Durango, CO 81301
www.ltenv.com

Think before you print. Click for our email disclosure.

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
970.385.1096

October 4, 2019

Nelly Smith, Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency – Region 6
1445 Ross Avenue, Suite 1200, Dallas, TX 75202

RE: EPA-Requested Information
Giant Bloomfield Refinery GW-40 Site
Western Refining Southwest, Inc. (Marathon Petroleum Company, LP)
Bloomfield, New Mexico

Dear Ms. Smith:

At the request of the United States Environmental Protection Agency (USEPA), in conjunction with the New Mexico Oil Conservation Division (NMOCD), LT Environmental has prepared the attached table (Table 1) to provide requested well information and analytical data for the former Giant Bloomfield Refinery, "GW-40" site (the "Site"). Specifically, the table provides well information that includes wellhead elevation, well depth, well-screen interval, well diameter, and depth to water measurements. The table also presents analytical results for select constituents requested by the USEPA, collected during annual sampling events between 2010 and 2018 (chloride, sulfate, chromium, iron, manganese, and total dissolved solids). In addition, the *2018 Annual Report* prepared for the Site is attached for your review. The report includes analytical results for the 2018 groundwater-sampling event, as well as figures presenting well locations, cross sections, and groundwater potentiometric surface maps with interpreted groundwater-flow directions. We understand that this information will be used as part of the upcoming five-year review for the upgradient Lee Acres Superfund Site.

Please contact us if you have questions regarding the attached information.

Sincerely,

LT ENVIRONMENTAL, INC.

Devin Hencmann
Project Geologist

Stuart Hyde, LG
Project Geologist

cc: Greg McCartney, Marathon Petroleum Company, LP
Carl Chavez, NMOCD

TABLE 1
2010 to 2018 - ANNUAL COMPLIANCE GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Lee Acres Sampling, 1992 RI Report (5)												
Lee Acres Site 1, Subarea 2, OU 2 - Alluvial Aquifer							**8.8 - 730**	**195 - 4,370**	**0.0108 - 0.124**	**0.118 - 1.71**	**0.0161 - 8.62**	**943 - 6,560**
Lee Acres Site 1, Subarea 3, OU 2 - Southern Area - Alluvial Aquifer							**19 - 2,110**	**830 - 2,610**	**0.0145 - 0.0406**	**0.148 - 23.9**	**0.0214 - 4.23**	**622 - 5,300**
Lee Acres Site 2, Subarea 4 - Alluvial Aquifer							**3.5 - 604**	**310 - 3,220**	**0.043 - 0.110**	**0.0749 - 64.1**	**0.0131 - 3.4**	**616 - 6,370**
GBR Sampling, Upgradient Wells (6)												
GBR-32	5,414.86	45	25 - 40	2	Oct 2018	33.95	200	1,700	0.074	2.7	1.9	3,110
					Dec 2017		290	1,600	0.13	2.3	1.2	3,210
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		380	1,900	1.4	5.9	0.70	3,800
					Jan 2013		400	2,200	0.098	1.2	0.40	4,320
					Jan 2012		500	**2,800**	0.030	0.88	0.50	4,290
					Jan 2011		420	2,300	0.13	NT	NT	4,010
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-48	5,413.90	43.6	28.4 - 38.4	2	Oct 2018	35.62	300	1,800	0.036	18	0.49	3,580
					Dec 2017		350	1,900	0.13	40	1.7	3,690
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		420	2,100	0.92	52	2.0	4,030
					Jan 2013		230	2,200	0.52	17	0.94	4,020
					Jan 2012		200	1,700	0.63	15	0.83	2,940
					Jan 2011		390	2,200	0.71	9.3	NT	3,510
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-49	*	38.5	25.9 - 36.3	2	Oct 2018	32.06	180	1,800	1.2	23	0.98	3,010
					Dec 2017		150	1,300	0.018	0.44	0.30	2,720
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		63	1,400	0.060	41	3.9	2,340
					Jan 2013		240	1,600	0.041	4.6	1.3	3,290
					Jan 2012		260	2,000	0.018	0.23	0.34	3,470
					Jan 2011		310	2,000	0.48	NT	NT	3,390
					Jan 2010		NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GBR-50	*	42.5	26.91 - 37.26		Oct 2018	31.26	59	1,700	0.044	4.0	0.13	2,770
					Dec 2017		54	1,500	0.16	5.8	0.32	2,590
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		52	1,700	0.013	3.6	0.22	2,800
					Jan 2013		49	1,600	<0.0060	1.3	0.12	2,830
					Jan 2012		49	1,800	0.0069	0.72	0.041	2,730
					Jan 2011		46	1,800	0.023	NT	NT	2,640
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR Sampling, Source-Area Wells												
GRW-3/GBR-29 or 43	5,388.77	58.3	34.5 - 50.2	6	Oct 2018	43.13	99	640	NT	18	0.80	2,190
					Dec 2017		74	1,400	NT	54	1.9	2,920
					Aug 2015		NT	NT	NT	NT	NT	NT
					Jan 2017		NT	NT	NT	NT	NT	NT
					Nov 2014		26	2,200	NT	0.86	0.44	3,680
					Jan 2013		59	1,300	NT	2.8	0.54	2,620
					Jan 2012		54	1,300	NT	2.8	0.67	2,660
					Jan 2011		95	480	NT	NT	NT	1,810
					Jan 2010		NT	NT	NT	NT	NT	NT
GRW-6/GBR-44	5,390.81	58.6	32.6 - 48.3	6	Oct 2018	40.89	100	1,300	NT	**890**	**45**	2,390
					Dec 2017		120	1,200	NT	40	**9.1**	2,570
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		86	1,600	NT	35	**8.5**	3,170
					Jan 2013		100	1,500	NT	2.4	1.2	2,760
					Apr 2012		80	1,900	NT	0.47	1.0	2,740
					Jan 2011		110	1,400	NT	NT	NT	2,490
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-17	5,402.69	51	31 - 51	2	Oct 2018	34.00	49	1,200	NT	**100**	3.0	2,180
					Dec 2017		50	1,000	NT	9.3	0.25	2,110
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		44	1,200	NT	3.7	0.13	1,980
					Jan 2013		47	1,300	NT	1.2	0.045	2,700
					Jan 2012		46	1,400	NT	3.9	0.15	2,150
					Jan 2011		47	1,300	NT	NT	NT	2,140
					Jan 2010		NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GBR-24D	5,396.77	46.3	33 - 43	2	Oct 2018	30.92	130	2,300	NT	9.1	1.8	3,780
					Dec 2017		140	1,800	NT	11	1.8	3,560
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		210	1,800	NT	12	1.7	3,410
					Jan 2013		200	1,700	NT	3.6	1.8	3,430
					Jan 2012		200	2,000	NT	2.4	1.7	3,320
					Jan 2011		170	2,400	NT	NT	NT	3,410
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-30	5,395.59	45	25 - 40	2	Oct 2018	32.31	250	1,500	NT	28	0.76	3,000
					Dec 2017		220	1,300	NT	38	1.4	2,770
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		270	1,400	NT	88	2.2	2,520
					Jan 2013		310	1,500	NT	**130**	6.1	3,340
					Jan 2012		390	1,700	NT	2.9	0.29	3,240
					Jan 2011		320	1,600	NT	NT	NT	3,340
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-31	5,396.58	45	24.6 - 39.6	2	Oct 2018	32.27	220	1,400	NT	13	3.1	2,660
					Dec 2017		93	1,700	NT	21	4.2	2,940
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		230	1,500	NT	12	1.6	3,100
					Jan 2013		79	1,600	NT	15	0.77	2,720
					Jan 2012		74	1,700	NT	3.8	0.27	2,760
					Jan 2011		97	1,800	NT	NT	NT	2,740
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR-51	5,389.68	59.5	38.5 - 54.25	6	Oct 2018	NM	54	1,300	NT	0.059	<0.0020	2,330
					Dec 2017		51	1,200	NT	0.080	<0.020	2,250
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		54	1,400	NT	16	0.47	2,320
					Jan 2013		56	1,500	NT	9.7	0.88	2,540
					Jan 2012		53	1,600	NT	3.1	0.16	2,440
					Jan 2011		53	1,600	NT	NT	NT	2,380
					Jan 2010		NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
GBR-52	5,387.74	50.78	30.08 - 45.75	6	Oct 2018	NM	54	1,500	NT	0.12	0.0028	2,580
					Dec 2017		54	1,500	NT	0.048	<0.0020	2,640
					Jan 2017		NT	NT	NT	NT	NT	NT
					Aug 2015		NT	NT	NT	NT	NT	NT
					Nov 2014		65	1,700	NT	12	0.25	2,540
					Jan 2013		63	1,700	NT	2.3	0.036	2,770
					Jan 2012		60	1,800	NT	2.2	0.032	2,720
					Jan 2011		62	1,900	NT	NT	NT	2,700
					Jan 2010		NT	NT	NT	NT	NT	NT
GBR Sampling, Downgradient Wells												
SHS-1	5,383.54	50.97	35.67 - 45.67	4	June 2017	P&A	100	1,300	NT	NT	NT	2,400
					Jan 2011		NT	NT	NT	NT	NT	NT
SHS-2	5,381.66	41.28	30.98 - 40.98	4	June 2017	P&A	310	2,200	NT	NT	NT	4,100
					Jan 2011		NT	NT	NT	NT	NT	NT
SHS-4	5,383.62	55	37 - 47	2	June 2017	P&A	59	1,600	NT	NT	NT	2,270
SHS-5	5,378.36	53.33	37.62 - 48.0	4	June 2017	P&A	50	1,200	NT	NT	NT	2,030
					Jan 2011		NT	NT	NT	NT	NT	NT
SHS-6	5,378.17	47.88	32.48 - 42.85	4	Jan 2018	37.85	NT	NT	NT	NT	NT	NT
SHS-8	5,380.25	52.5	30.83 - 46.60	4	Oct 2018	38.25	130	890	NT	50	3.1	2,730
SHS-8					Jan 2018		NT	NT	NT	NT	NT	NT
SHS-8					Dec 2017		110	1,200	NT	10	3.6	2,730
SHS-8					Jan 2017		NT	NT	NT	NT	NT	NT
SHS-8					Aug 2015		NT	NT	NT	NT	NT	NT
SHS-8					Nov 2014		110	350	NT	**260**	5.0	1,400
SHS-8					Jan 2013		120	770	0.099	**100**	4.7	1,800
SHS-8					Jan 2012		170	430	NT	15	2.3	2,040
SHS-8					Jan 2011		150	150	0.0063	NT	NT	1,440
SHS-8					Jan 2010		NT	NT	NT	NT	NT	NT
SHS-9	5,380.79	49.88	34.46 - 44.46	4	Jan 2018	37.43	NT	NT	NT	NT	NT	NT
SHS-13	5,367.81	47.4	27 - 42	4	Jan 2018	35.85	NT	NT	NT	NT	NT	NT
SHS-14	5,367.07	54	28.70 - 48.70	4	Jan 2018	34.18	NT	NT	NT	NT	NT	NT
SHS-15	5,366.21	47.8	27.40 - 42.40	4	Jan 2018	33.00	NT	NT	NT	NT	NT	NT

Exploration Location	Wellhead Elevation (feet)	Well Depth (feet)	Screened Interval (depth in feet)	Well Diameter (inches)	Sample Date	Depth to Water (feet BTOC)	USEPA Method 300.0: Anions		USEPA Method 200.7: Total Metals			USEPA Method SM2540C Modified: Total Dissolved Solids
							chloride	sulfate	chromium	iron	manganese	total dissolved solids
NMWQCC Standard							**250**	**600**	**0.05**	**1.0**	**0.2**	**1,000**
GBR Background Threshold Values (1)							**560**	**2,546**	**1.553**	**97.06**	**6.42**	**4,566**
Regional Background Levels (Stone, et al. 1983) (2)							**2 - 34,000**	**1.9 - 14,000**	**0.001 - 0.06**	**0.01 - 16**	**0 - 2.6**	NA
Lee Acres RI Background Concentrations - Alluvial Aquifer (1992) (3)							**6.4 - 404**	**420 - 2,120**	**0.0144 - 0.113**	**0 - 1.48**	**0.0161 - 0.423**	**760 - 3,600**
Lee Acres RI/ROD Remedial Goals (1992/2004) (4)							**34,000**	**14,000**	**0.06**	**16**	**0.346**	**10,000**
Units							mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SHS-16	5,362.58	42.6	22.2 - 37.2	4	Jan 2018	32.68	NT	NT	NT	NT	NT	NT
SHS-17	5,364.35	46.21	35.67 - 45.67	4	Jan 2018	32.63	NT	NT	NT	NT	NT	NT
SHS-18	5,373.64	47.36	37.36 - 47.36	4	Jan 2018	39.24	NT	NT	NT	NT	NT	NT
SHS-19	5,378.89	52.4	32.40 - 52.40	4	Jan 2018	37.77	NT	NT	NT	NT	NT	NT

Notes

(1) Background Concentrations Proposed for the Giant Bloomfield Refinery Site. Based on Statistical Analysis Prepared by LT Environmental and Submitted to New Mexico Oil Conservation District in an Email Dated June 10, 2019.
(2) Regional Background Concentrations Established in Document Titled *Hydrogeology and Water Resources of San Juan Basin, New Mexico,* Stone et al., dated 1983
(3) "Background" Concentration Proposed in Lee Acres DRAFT *Remedial Investigation Report* Prepared for the US Bureau of Land Management (dated February 1992)
(4) Contaminant Concentrations Established as the "Remedial Goals" or "Background" Concentrations for the Lee Acres Superfund Site. Based on the Lee Acres DRAFT *Remedial Investigation Report* and *Record of Decision* (dated May 2004).
(5) The Lee Acres *Remedial Investigation Report* Presents Analytical Data for Areas of the Site and Not Data for Individual Wells
(6) Well Location Used for Statistical Analysis of Background Concentrations
* Top-of-Casing Elevation is Unknown
NM Not Measured
P&A Plugged and Abandoned
µg/L micrograms per liter
BOLD Indicates Concentration Exceeds the Greater Value of the NMWQCC Water-Quality Standards or Background Threshold Values Proposed for the Giant Bloomfield Refinery
mg/L milligrams per liter
NMWQCC New Mexico Water Quality Control Commission
NT Not Tested
USEPA United States Environmental Protection Agency

2018 ANNUAL REPORT

FORMER GIANT BLOOMFIELD REFINERY
BLOOMFIELD, NEW MEXICO
DISCHARGE PERMIT GW-040

December 2018

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EXECUTIVE SUMMARY

This 2018 Annual Report summarizes work completed from January 2018 through December 2018 at the former Giant Bloomfield Refinery (Site) in Bloomfield, New Mexico. The scope of work for this project was the continued monitoring of petroleum hydrocarbon impacts to groundwater identified upon cessation of refinery operations. The Site is operated by Western Refining Southwest, Inc. (Western) and regulated by the New Mexico Oil Conservation Division (NMOCD) through Discharge Permit GW-040 that was originally issued for a groundwater recovery and remediation system consisting of groundwater recovery wells, a carbon filtration unit, and a treated-water infiltration trench. Prior to August 2015, the groundwater recovery system had been in operation for approximately 27 years and had significantly improved groundwater conditions over that time. As noted in previous annual reports, sampling of the influent to the treatment system had not detected the presence of volatile organic compounds (VOCs) in 13 years. Due to these observed conditions, in 2015, Western implemented more intensive monitoring of the groundwater to evaluate background water quality and the extent of any residual impact. To facilitate the evaluation, compliance samples were analyzed for additional parameters and additional groundwater samples were collected. The recovery system was shut off in August 2015, and Western monitored groundwater elevations, water quality, and phase-separated hydrocarbon (PSH) accumulation for a 5-month period under static conditions. Observations indicated no measurable change in groundwater conditions after ceasing the recovery operations.

Based on the favorable observations in 2015, Western did not resume pumping operations, but continued more frequent groundwater monitoring in 2016 and 2017 to confirm equilibrium conditions and better characterize residual impact. Monthly voluntary monitoring of static groundwater conditions occurred throughout 2017.

In January 2018, additional sampling was conducted for monitoring wells SHS-6, SHS-8, SHS-9, and SHS-13 through SHS-19. Sampling activities were conducted as described above. Monitoring wells samples were analyzed for VOCs according to EPA Method 8260B, GRO by EPA method 8015D, DRO and MRO by EPA method 8015M/D. During 2018, static groundwater conditions were monitored in January and October. Annual groundwater monitoring was conducted in October 2018. Groundwater samples were analyzed in accordance with Discharge Permit GW-040. Laboratory analytical results indicated VOCs and polycyclic aromatic hydrocarbons (PAHs) were not detected in exceedance of the New Mexico Water Quality Control Commission (NMWQCC) standards in groundwater samples collected from monitoring wells and recovery wells.

1.0 INTRODUCTION

This 2018 Annual Report summarizes groundwater monitoring activities completed between January 2018 and December 2018 at the former Giant Bloomfield Refinery (Site) in Bloomfield, New Mexico. The Site is operated by Western Refining Southwest, Inc. (Western) and currently regulated by the New Mexico Oil Conservation Division (NMOCD) under a discharge permit (GW-040); however, Western did not discharge any water at the Site during 2018. Prior to August 2015, the groundwater recovery system had been in operation for approximately 27 years and had significantly improved groundwater conditions over that time. As noted in previous annual reports, sampling of the influent to the treatment system had not detected the presence of volatile organic compounds (VOCs) in 13 years. Due to these observed conditions, in 2015 Western implemented more intensive monitoring of the groundwater to evaluate background water quality and the extent of any residual impact. To facilitate the evaluation, compliance samples were analyzed for additional parameters and additional groundwater samples were collected. The recovery system was shut off in August 2015, and Western monitored groundwater elevations, water quality, and phase-separated hydrocarbon (PSH) accumulation for a 5-month period under static conditions. Observations indicated no measurable change in groundwater conditions after ceasing the recovery operations. Based on the favorable observations in 2015, Western did not resume pumping operations, but continued more frequent groundwater monitoring in 2016 and 2017 during the time period covered by this report. Western conducted measured groundwater elevations in January and October, conducted closure sampling for monitoring wells, (SHS-6, SHS-8, SHS-9, and SHS-13 through SHS-19) and performed annual compliance sampling in October 2018.

1.1 SITE DESCRIPTION

The Site is on the northeast corner of United States Highway 64 and County Road 3500, approximately five miles west of Bloomfield, New Mexico, in the southwest quarter of Section 22 and the northwest quarter of Section 27, Township 29 North, Range 12 West in San Juan County, New Mexico (Figure 1). Components of the former remediation system still on site include two control buildings, two carbon filtration tanks, an aboveground storage tank, an infiltration trench, groundwater monitoring wells, and groundwater recovery wells (Figure 2).

1.2 SITE HISTORY

The former refinery, under ownership of Giant Industries (Giant), Arizona, produced leaded and unleaded gasoline, diesel, kerosene, and other refined petroleum products from 1974 to 1982 and is currently inactive. The refining operations and subsequent truck loading and unloading activities impacted groundwater, which was identified and investigated as part of the site closure requirements prescribed by the NMOCD in 1986. Details of a subsurface investigation and initial remediation efforts are contained in a 1987 report entitled, *Soil and Groundwater Investigations and Remedial Action Plan, Giant Industries, Inc. Bloomfield Refinery, Bloomfield, New Mexico*. The investigation identified three source areas (Figure 2).

- Northern Area (Diesel Spill Area): 10,000 to 15,000 gallons of diesel were released from a pipeline in 1985;

- Central Area (Truck Fueling Area): 15,000 gallons of diesel were released from a pipeline in 1986; and
- Southern Area: Historical releases from a former firefighting drill area east and upgradient of the Site that may have collected in a former seep and a stormwater catchment area.

Concurrent with refinery operations, the former Lee Acres Landfill located upgradient of the Site operated as a San Juan County landfill from 1962 to 1986 (Figure 1). Landfill operations included solid waste disposal in trenches and a series of lagoons used for disposal of a variety of liquid wastes. The NMOCD sampled the lagoons in 1985 and demonstrated that the liquids in the impoundments contained a variety of chlorinated solvents, petroleum hydrocarbon constituents, heavy metals, and salts. In April 1985, a breach in the dike retaining the lagoons released liquid wastes into an arroyo west of the Site. The arroyo drains south toward the Lee Acres Subdivision, where the NMOCD and the New Mexico Environment Department (NMED) identified impacted groundwater in domestic water wells in 1988. In response, the NMOCD required Giant to investigate petroleum hydrocarbon impacts to groundwater downgradient of the refinery in the Lee Acres Subdivision, and the NMED conducted a separate investigation to identify potential impacts from the landfill. The results of the subsurface investigation conducted by Giant south of the refinery are contained in three volumes of the 1992 report, *Remedial Investigation Report for Lee Acres Landfill*. The NMED, in conjunction with the Bureau of Land Management (BLM) and the United States Geological Survey (USGS), published their results in three reports referenced in Section 5.0 of this report.

The investigations identified two separate plumes of impacted groundwater that commingled across the refinery and flowed downgradient into the Lee Acres Subdivision. Groundwater contaminants detected in the refinery plume included PSH and dissolved-phase petroleum hydrocarbons. The dissolved-phase constituents included benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, and 1,2-dichloroethane (EDC). The landfill contaminant plume contained total dissolved solids (TDS), chloride, sulfate, manganese, metals, BTEX, naphthalene, 1,1-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, tetrachloroethene (PCE), 1,1,1-trichloroethane, and trichloroethene (TCE).

Beginning in 1988, Giant installed a groundwater recovery, treatment, and disposal system in stages to restrict migration of contaminants and to remediate groundwater impacts caused by Giant's former operations. A total of 45 monitoring wells were initially installed and designated GBR monitoring wells (Figure 2). Of these 45 monitoring wells, 11 were converted to recovery wells and re-named with GRW designations. An additional 17 monitoring wells were installed in the Lee Acres Subdivision and designated as SHS monitoring and recovery wells. Four SHS wells initially operated as recovery wells. Giant pumped groundwater from the recovery wells into storage tanks, then treated the groundwater with an air stripper and carbon filtration and re-injected treated groundwater into the subsurface through two infiltration trenches. Western acquired the Site from Giant in June 2007.

As groundwater quality improved over time, the remediation system was gradually simplified and eventually shut down following extensive assessment of site conditions. The air stripper was eliminated in the 1980s once product accumulation declined. In 2008, Western conducted a supplemental evaluation of the remedial operations, which included shutting down the remediation system and sampling groundwater wells under static conditions to redefine the area of impact and assess effectiveness of the remediation system. Existing equipment was inspected and repaired to optimize performance. Results from the sampling event were included in the *2008 Annual Report* submitted to the NMOCD. Pumping and treating operations were resumed in February 2009.

Western stopped recovering groundwater south of Highway 64 in 2009 as groundwater sampling results indicated no change to contaminant concentrations. Aboveground storage of groundwater was eliminated in 2014 based on reduced groundwater recovery volumes. By 2015, the system consisted of only 9 active groundwater recovery wells that pumped groundwater directly into the carbon filtration tanks. The water then passed through the treated water infiltration trench.

Following 13 years of regular influent and effluent sampling without the detection of VOCs, Western conducted another assessment of site groundwater conditions in 2015. Western sampled and monitored select wells to characterize groundwater under active pumping conditions, then shut down the recovery system to allow groundwater to equilibrate. A second sampling and monitoring event was conducted on the same groundwater monitoring wells to compare active groundwater recovery to static conditions. Assessment results suggested the remediation system had successfully remediated the groundwater impact it was originally designed to address but was no longer an effective method for remediating residual impact at the Site. As such, Western did not turn the recovery system back on, focusing instead on monitoring existing site conditions to better characterize the residual impact. Results of the assessment were included in the *2015 Annual Report*.

In August 2015, additional groundwater samples were collected from select monitoring wells to establish a reference for groundwater conditions when the remediation system is operational. Historical documentation was reviewed to determine which wells had the most potential to contain impacted groundwater or to exhibit a change in water quality before and after the remediation system was inactivated. Monitoring wells GBR-8, GBR-11, GBR-20, GBR-21D, GBR-22, GBR-25, GBR-26, GBR-34, SHS-2, SHS-8, and SHS-9 were selected due to radius of influence of actively pumping recovery wells and/or historical documentation of PSH measured in the monitoring wells. Samples from these monitoring wells were collected and analyzed for chloride by United States Environmental Protection Agency (EPA) Method 300.0, BTEX by EPA Method 8260B, total petroleum hydrocarbon (TPH)-gasoline range organics (GRO) by EPA Method 8015D, and TPH-diesel range organics (DRO) by EPA Method 8015M/D. Follow-up samples were collected after the system was turned off and groundwater conditions were allowed to equilibrate. Sampling from these monitoring wells under equilibrium conditions continued in March, July, and October of 2016 and were documented in the *2016 Annual Report*.

At the request of the New Mexico Department of transportation (NMDOT), Western submitted Well Plugging Plans of Operations to the New Mexico Office of State Engineer (NMOSE) to plug and abandon SHS-1, SHS-2, SHS-3, SHS-4, and SHS-5 on June 5, 2017, approved on June 7, 2017. These wells were in the right of way of the highway and in the way of pending construction. On June 14, 2017, each well was cemented to the surface and the well vault was removed per the NMOSE requirements. Sampling activities were documented in the *2017 Annual Report*.

1.2.1 SITE HYDROLOGY

The Site is located on weathered outcrops of the Nacimiento Formation, which is comprised of shales, sandstones, and siltstones of Cretaceous-Tertiary age. The San Juan River is approximately 2,000 feet south of the Site. Immediately west is a large unnamed arroyo, which is underlain by 30 feet to 60 feet of Quaternary alluvial sediments. Older Quaternary terrace deposits of cobbles and boulders were observed on the interfluvial ridges adjacent to the arroyo. These terrace deposits may have been used as fill on the Site. The outcropping surfaces of the Nacimiento Formation have been eroded to form a paleo channel that appears to be similar in morphology to the existing surface arroyo located to the

west of the Site. The bedrock is overlain by recent alluvial deposits (gravel, sand, silt, and clay), which thicken toward the south-southwest as illustrated on the cross section on Figure 3 and Figure 4.

The subsurface geology is a controlling feature for groundwater flow direction and potential contaminant migration. Shallow groundwater is generally unconfined with some local areas potentially under semi-confined conditions. There are two aquifers of concern that are in direct hydraulic communication: a shallow aquifer composed of recent alluvial materials and a bedrock aquifer that exists in the underlying Nacimiento Formation (Figures 3 and 4, respectively). The alluvial aquifer generally has the higher permeability of the two aquifers, and recovery wells completed within this aquifer have higher yields with larger radii of influence.

1.2.2 SCOPE OF WORK

The scope of work for this project in 2018 included semi-annual monitoring of groundwater elevations and the presence of PSH under equilibrium conditions, an annual compliance groundwater sampling event, and the plugging and closure sampling of wells (SHS-6, SHS-8, SHS-9, and SHS-13 through SHS-19). A summary of field activities, results, and conclusions, as related to annual discharge permit compliance and monitoring results are presented in the subsequent sections of this report.

2.0 METHODOLOGY

2.1 ANNUAL GROUNDWATER MONITORING COMPLIANCE

Although no discharge occurred during 2018, Western conducted annual compliance sampling of wells specified in Discharge Permit GW-040. Western measured depth to groundwater semi-annually in 53 monitoring wells and 15 former recovery wells with a Keck oil-water interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with de-ionized water before each measurement. Depth to groundwater measurements were used to calculate quarterly groundwater elevations at the Site to determine direction of groundwater flow.

Annual groundwater compliance samples were collected in October 2018. Samples were collected from groundwater monitoring wells and former recovery wells within and south of Highway 64 as specified in Discharge Permit GW-040. The volume of groundwater in the wells was calculated and a minimum of three well casing volumes of groundwater was purged from each well using a disposable bailer. As groundwater was extracted, pH, electrical conductivity (EC), and temperature were monitored. Wells were purged until these properties stabilized or the well was bailed dry, indicating the purge water was representative of aquifer conditions. Stabilization was defined as three consecutive stable readings for each water property (plus or minus (±) 0.4 units for pH, ±10 percent for EC, and ±2 degrees Celsius for temperature). Once each well was properly purged, groundwater samples were collected in bottles or vials and shipped to Hall Environmental Analysis Laboratory (HEAL) of Albuquerque, New Mexico. Groundwater samples collected from monitoring wells GRW-3, GRW-6, GBR-17, GBR-24D, GBR-30, GBR-31, GBR-32, GBR-48, GBR-49, GBR-50, GBR-51, GBR-52, and SHS-8 were analyzed for VOCs according to EPA Method 8260B and general water chemistry (GWC) parameters including pH by EPA Standard Method 4500, EC by EPA Method 2510B, TDS by EPA Standard Method 2540C, alkalinity by EPA Standard Method 2320B, hardness by EPA Standard Method 2340B, anions (bromide, chloride, sulfate, fluoride, nitrite-nitrate, and phosphorus) by EPA Method 300.0, and cations (calcium, iron, magnesium, potassium, and sodium) by EPA Method 200.7. In addition, groundwater samples collected from monitoring wells GRW-3, GRW-6, GBR-17, GBR-24D, GBR-30, and GBR-31 were analyzed for polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C, and groundwater samples collected from GBR-32, GBR-48, GBR-49, and GBR-50 were analyzed for metals (barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, zinc, antimony, arsenic, selenium, thallium, and mercury).

2.1.1 SHS WELL CLOSURE SAMPLING

In January 2018, additional sampling was conducted for monitoring wells SHS-6, SHS-8, SHS-9, and SHS-13 through SHS-19. Sampling activities were conducted as described above. Monitoring wells samples were analyzed for VOCs according to EPA Method 8260B, GRO by EPA method 8015D, DRO and MRO by EPA method 8015M/D.

3.0 RESULTS

3.1 ANNUAL GROUNDWATER MONITORING COMPLIANCE

Groundwater elevations measured in groundwater monitoring and recovery wells are presented in Table 1, and semi-annual potentiometric surface maps are depicted on Figures 5 and 6. Groundwater flow direction was consistently toward the southwest throughout the year. Phase-separated hydrocarbons were encountered in GBR-7, GBR-22, and GBR-41.

Laboratory analytical results from annual groundwater compliance sampling are presented in Table 2, and the complete laboratory analytical reports are presented in Appendix A. Isopach maps and geologic cross sections illustrating the distribution of analytes are not included due to the fact that sampling events do not include wells from all of the current source areas. Such a presentation of results would not be indicative of actual conditions at the Site. Laboratory analytical results from 2018 as compared to New Mexico Water Quality Control Commission (NMWQCC) standards are summarized below:

- VOCs were detected in the annual groundwater samples in trace concentrations that did not exceed NMWQCC standards;
    - EDC was detected in groundwater from monitoring well GBR-24D;
    - PCE was detected in groundwater from monitoring well GBR-48; and
    - Sec-butylbenzene and tert-butylbenzene were detected in groundwater from monitoring well GRW-3;
- TDS exceeded the NMWQCC standard in all samples collected from the groundwater monitoring and former recovery wells;
- Chloride concentrations exceeded the NMWQCC standard in groundwater samples collected from up-gradient well GBR-48;
- Nickel concentrations exceeded the NMWQCC standard in groundwater samples collected from up-gradient well GBR-49;
- Sulfate concentrations exceeded the NMWQCC standard in all samples collected from groundwater monitoring and former recovery wells;
- Chromium concentrations exceeded the NMWQCC standard in groundwater samples collected from monitoring wells GBR-32 and GBR-49, which are located within the arroyo adjacent to and upgradient of the Site;
- Iron was detected in concentrations exceeding the NMWQCC standard in groundwater samples from all groundwater monitoring and former recovery wells, except up-gradient wells GBR-51 and GBR-52; and
- Manganese was detected in concentrations exceeding the NMWQCC standard in groundwater samples from all groundwater monitoring and former recovery wells, except up-gradient wells GBR-50, GBR-51 and GBR-52.

3.1.1 SHS WELL CLOSURE SAMPLING

Laboratory analytical results from groundwater samples collected at SHS-6, SHS-8, SHS-9, and SHS-13 through SHS-19 are presented in Table 3, and the complete laboratory analytical reports are presented in Appendix A. Laboratory analytical results from 2018 are summarized below:

- DRO was detected in groundwater samples collected from down-gradient wells SHS—8, SHS-9, and SHS-13;
- GRO was detected in groundwater samples collected from down-gradient well SHS-9;
- Naphthalene was detected in groundwater samples collected from down-gradient well SHS-9;
- 1-methylnaphthalene was detected in groundwater samples collected from down-gradient well SHS-9; and

All detected analytes did not have correlating NMWQCC standards.

4.0 CONCLUSIONS

By 2015, Western had documented over 13 years of pumping and treating groundwater that did not contain detectable concentrations of VOCs. Western shut down the pump and treatment system in August 2015, to evaluate its effectiveness at addressing residual impact at the Site. Continued monitoring and sampling conducted under equilibrium conditions suggest the remediation system was not actively remediating contaminants of concern at the Site, therefore Western did not reactivate the system.

Conclusions from the continued monitoring of static groundwater conditions at the Site include:

- PSH accumulation did not change significantly from observations during pumping conditions:
  - Although measurable PSH was observed in monitoring wells GBR-7, GBR-22, and GBR-41, these wells have historically contained PSH;
  - There was no PSH migration into monitoring wells where PSH had not previously been observed;
- Groundwater impacted by petroleum hydrocarbons is characterized by presence of PSH and little to no dissolved-phase hydrocarbons regulated by the NMWQCC; and
- Field observations and laboratory analytical results indicate impacted areas are consistent with previously identified source areas and do not appear to have been affected by the cessation of pump and treat remediation efforts.

Annual compliance sampling was conducted in October 2018. Contaminants of concern were either not detected in groundwater samples or, if detected, can be attributed to an upgradient source or naturally occurring background conditions. Annual groundwater samples collected from monitoring and recovery wells did not contain VOCs or PAHs exceeding NMWQCC standards.

Annual groundwater monitoring well sampling results are consistently compliant with standards for general chemistry parameters and metals, with the exception of TDS, chloride, and sulfate. Elevated TDS, chloride, and sulfate are historically characteristic of groundwater at the Site and are most likely related to historical releases at the Lee Acres Landfill reported in 1985. These analytes were identified in earlier studies as constituents within the groundwater contaminant plume that originated from the landfill. Previous investigations of the landfill reported elevated levels of chloride present in the water sampled from the liquid waste lagoons (McQuillan, D. and Longmire, P., *Water Quality Investigations at the Lee Acres Landfill and Vicinity, San Juan County, New Mexico*), and the landfill accepted produced water from natural gas well operations in the San Juan Basin. During initial landfill investigations, the upgradient area near GBR-32, GBR-48, GBR-49, and GBR-50 was identified as the “northern containment slug.” Groundwater representative of this area contained TDS concentrations ranging from 2,125 milligrams per kilogram (mg/kg) to 6,068 mg/kg, chloride concentrations ranging from 14.7 mg/kg to 2,110 mg/kg, and sulfate concentrations ranging from 1,920 mg/kg to 5,830 mg/kg (Roy F. Weston, Inc., *Remedial Investigation Report for Lee Acres Landfill, Volume 1*).

Heavy metals, including chromium, iron, manganese, and nickel were detected in groundwater monitoring and former recovery wells during the annual sampling in October 2018. Additionally,

chromium, iron, nickel, and manganese concentrations exceeded NMWQCC standards. Previous studies conducted for the Lee Acres Landfill identified chromium, iron, lead, manganese, nickel, and selenium in groundwater sampled upgradient of the Site. *The Remedial Investigation Report for Lee Acres Landfill, Volume 1* states that the upgradient background alluvial aquifer contains elevated levels of chromium and manganese and suggests an unidentified source that is unrelated to the landfill or the Site.

It is apparent that the remediation system successfully remediated petroleum hydrocarbon impacts as designed. Following the reduction in petroleum hydrocarbon concentrations, the remediation system's primary purpose was to provide hydraulic control and restrict migration of potential contaminants off site. By shutting down the system to re-establish equilibrium conditions, Western has demonstrated the remediation system has no effect on existing petroleum hydrocarbon groundwater impacts or the migration of impacts off site. Residual impacts at the Site consist of PSH accumulations, which based on thicknesses measured and locations consistent with original source areas, are likely to be adsorbed by soil in the three original source areas. With no active source, the residual contaminants are not likely to migrate with or without the hydraulic barrier introduced by the remediation system.

5.0 REFERENCES

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FIGURES

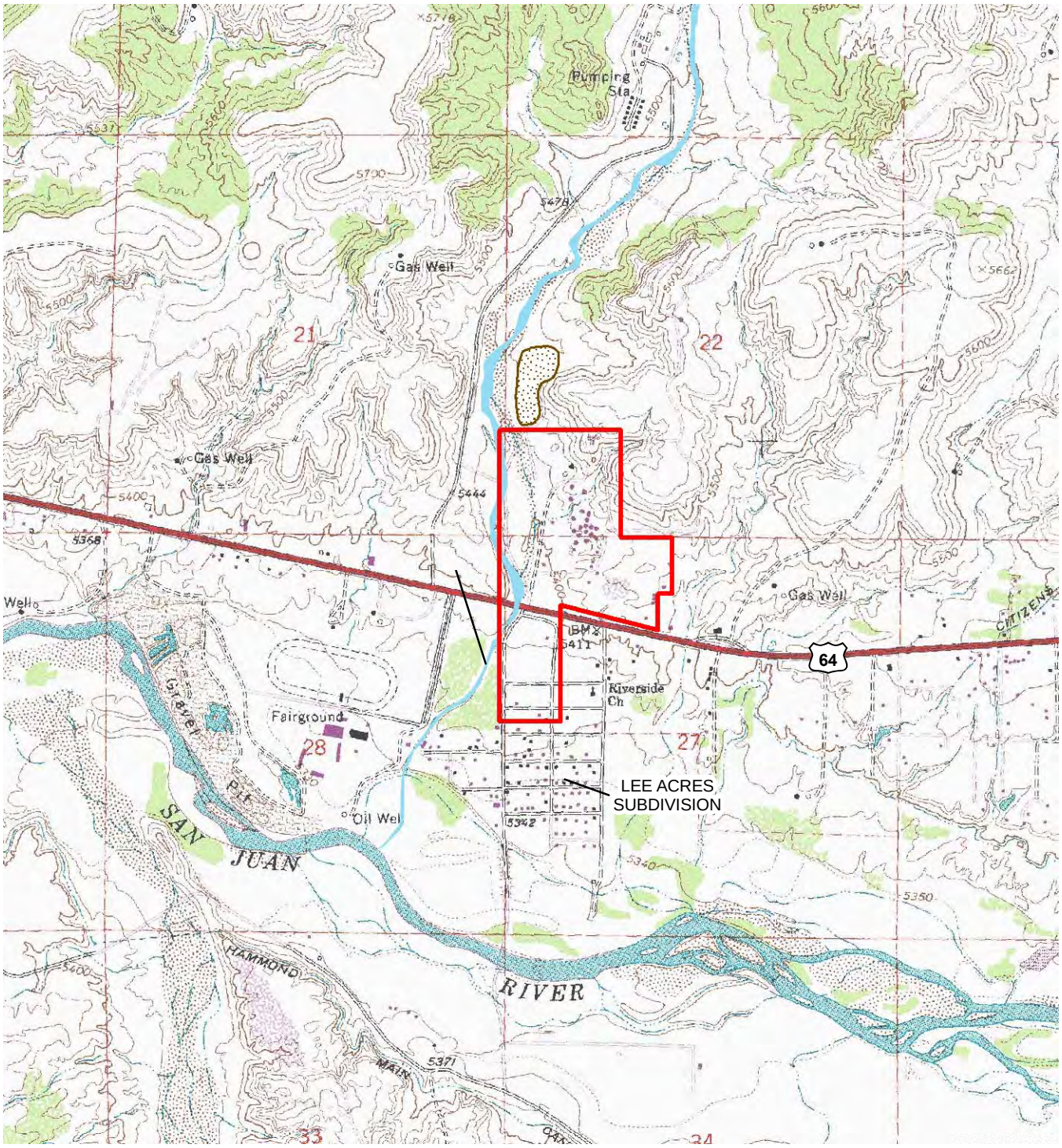

IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

0 2,000 4,000
Feet

N

LEGEND

- SITE LOCATION
- ARROYO
- FORMER LEE ACRES LANDFILL

FIGURE 1
SITE LOCATION MAP
FORMER GIANT BLOOMFIELD REFINERY
SWSW SEC 22 & WNW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

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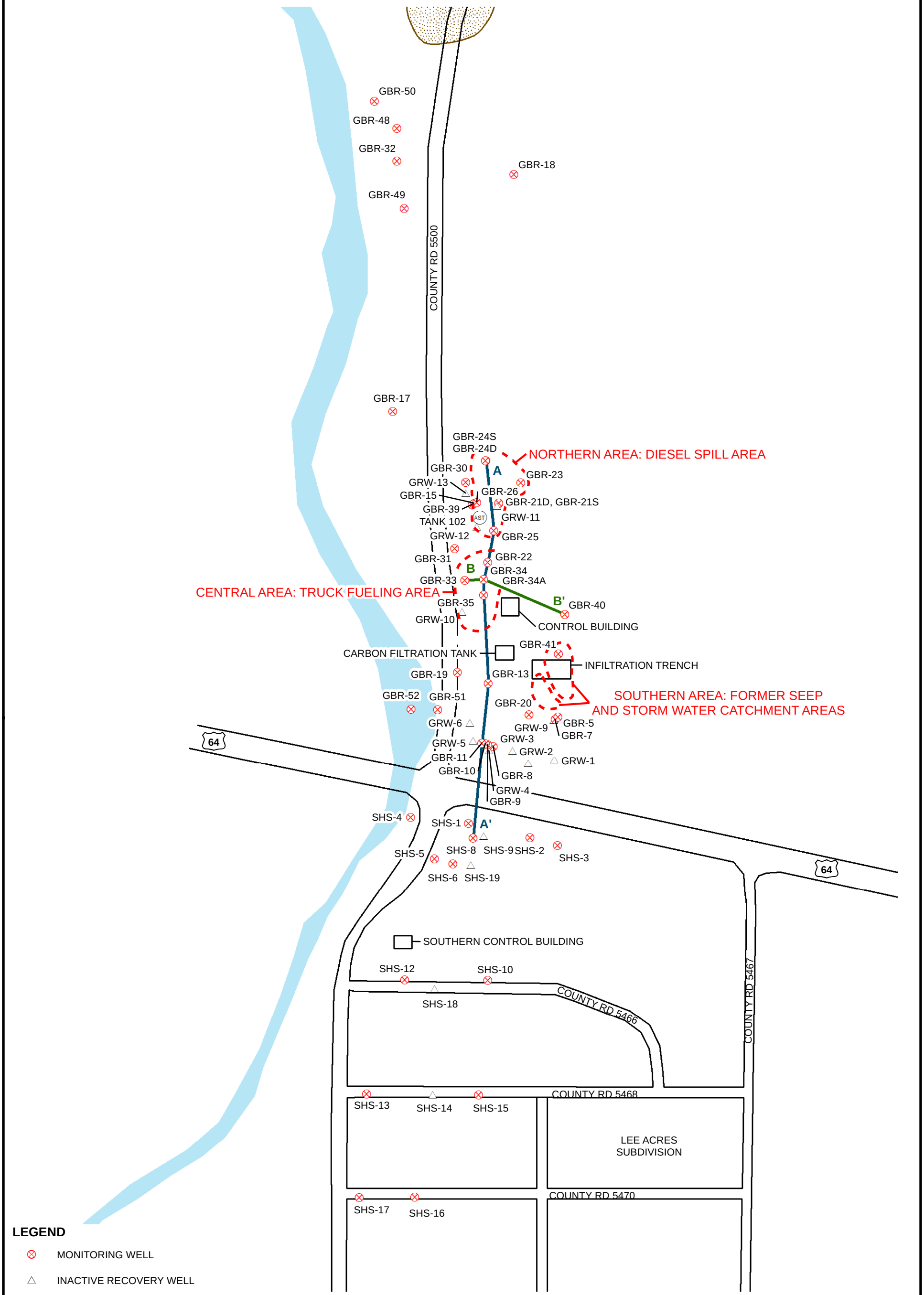


FIGURE 2
SITE MAP
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

P:\Western Refining\GIS\MXD\WR1009 GIANT\WR1009_GIANT_FIG02_SITE.mxd

NORTH

A

SOUTH

A'

GBR 24D

GBR 25

GBR 22

GBR 34

GBR 35

GBR 13

GBR 1

SHS 8

ELEVATION IN FEET

5,400
5,395
5,390
5,385
5,380
5,375
5,370
5,365
5,360
5,355
5,350
5,345
5,340
5,335
5,330

SILTED IN

TD = 49 FEET BGS

TD = 48 FEET BGS

TD = 48 FEET BGS

TD = 48' FEET BGS

TD = 50 FEET BGS

TD = 48 FEET BGS

TD = 55 FEET BGS

TD = 53 FEET BGS

SCREENED INTERVAL UNKNOWN

LEGEND

- SANDY SILT
- CLAYEY SAND
- SILTY SAND
- SAND
- PEBBLES/GRAVEL
- NACIMIENTO SHALE
- NACIMIENTO SANDSTONE

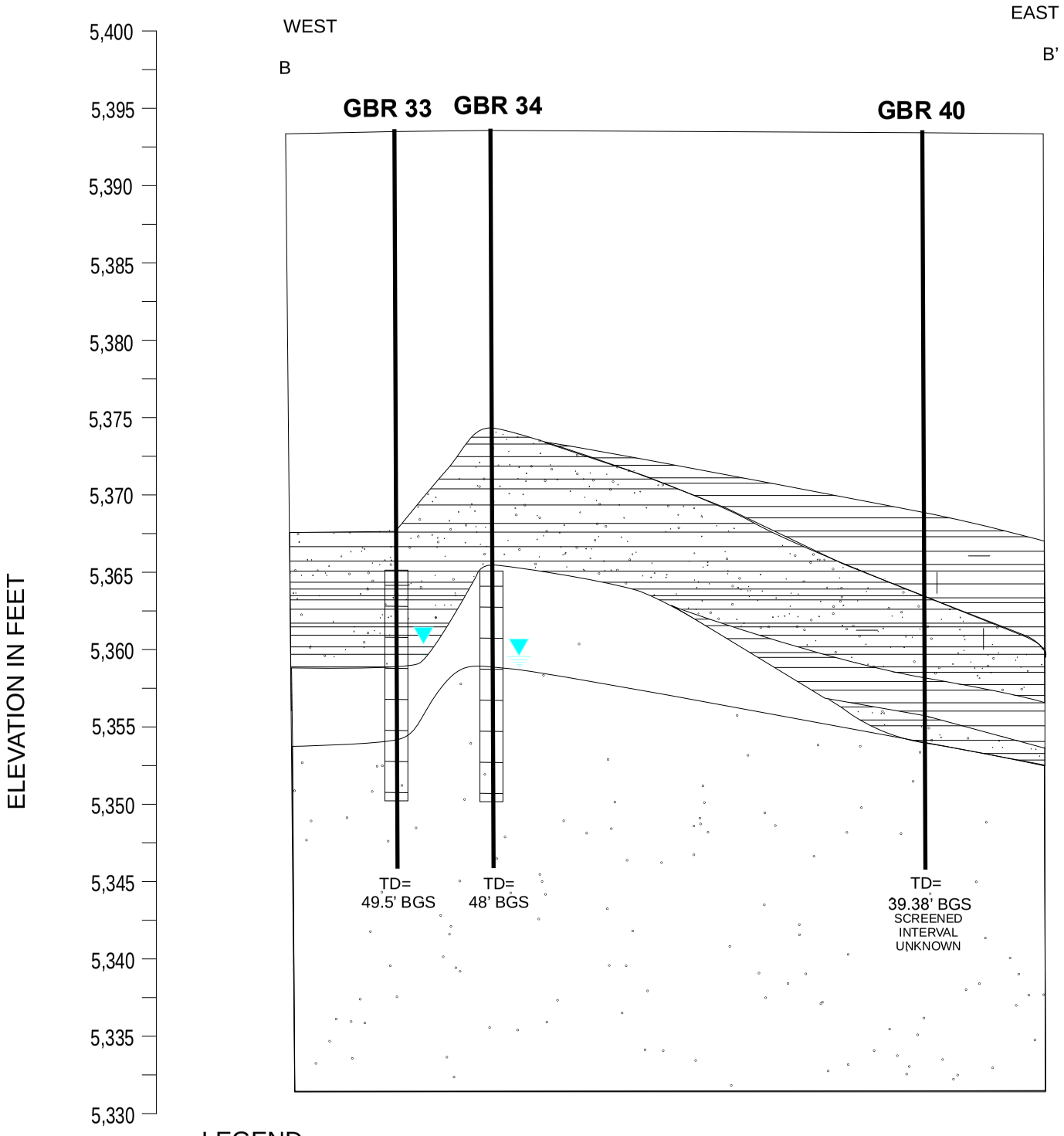
- BOREHOLE
- SCREENED INTERVAL
- BGS — BELOW GROUND SURFACE
- TD — TOTAL DEPTH IN FEET
- GROUNDWATER ELEVATION FROM OCTOBER 2018

HORIZONTAL SCALE
1" = 10 FEET

VERTICAL SCALE
1" = 90 FEET

FIGURE 3
CROSS SECTION A-A'
FORMER GIANT BLOOMFIELD REFINERY
SWSW SEC 22 &WNW SEC 27 T29N R12W
WESTERN REFINING SOUTHWEST, INC.

WR1009 1/16



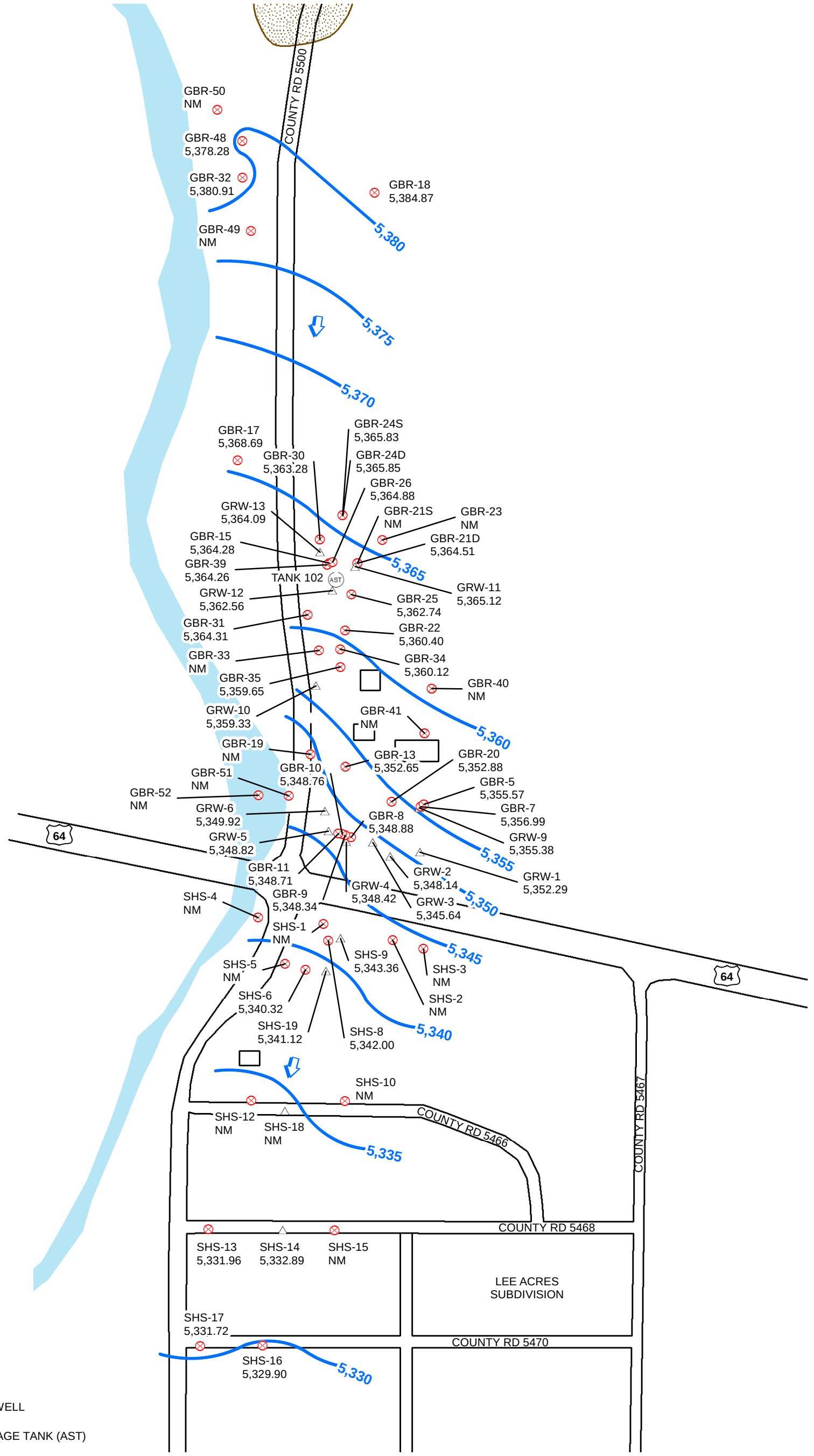
LEGEND

- CLAYEY SAND
- CLAY
- SAND
- NACIMIENTO SANDSTONE
- DRY
- BOREHOLE
- SCREENED INTERVAL
- BGS BELOW GROUND SURFACE
- TD TOTAL DEPTH IN FEET
- GROUNDWATER ELEVATION OCTOBER 2017

HORIZONTAL SCALE
1" = 10 FEET

VERTICAL SCALE
1" = 90 FEET

FIGURE 4
CROSS SECTION B-B'
FORMER GIANT BLOOMFIELD REFINERY
SWSW SEC 22 &WNW SEC 27 T29N R12W
WESTERN REFINING SOUTHWEST, INC.



LEGEND

NM: NOT MEASURED

PO: PAVED OVER

- MONITORING WELL
- INACTIVE RECOVERY WELL
- ABOVEGROUND STORAGE TANK (AST)
- GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 5 FEET
  GROUNDWATER ELEVATION MEASURED IN FEET
  ABOVE MEAN SEA LEVEL IN JANUARY, 2018
- ARROYO
- FORMER LEE ACRES LANDFILL
- ESTIMATED GROUNDWATER FLOW DIRECTION

FIGURE 5
GROUNDWATER POTENTIOMETRIC SURFACE MAP (JANUARY 2018)
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

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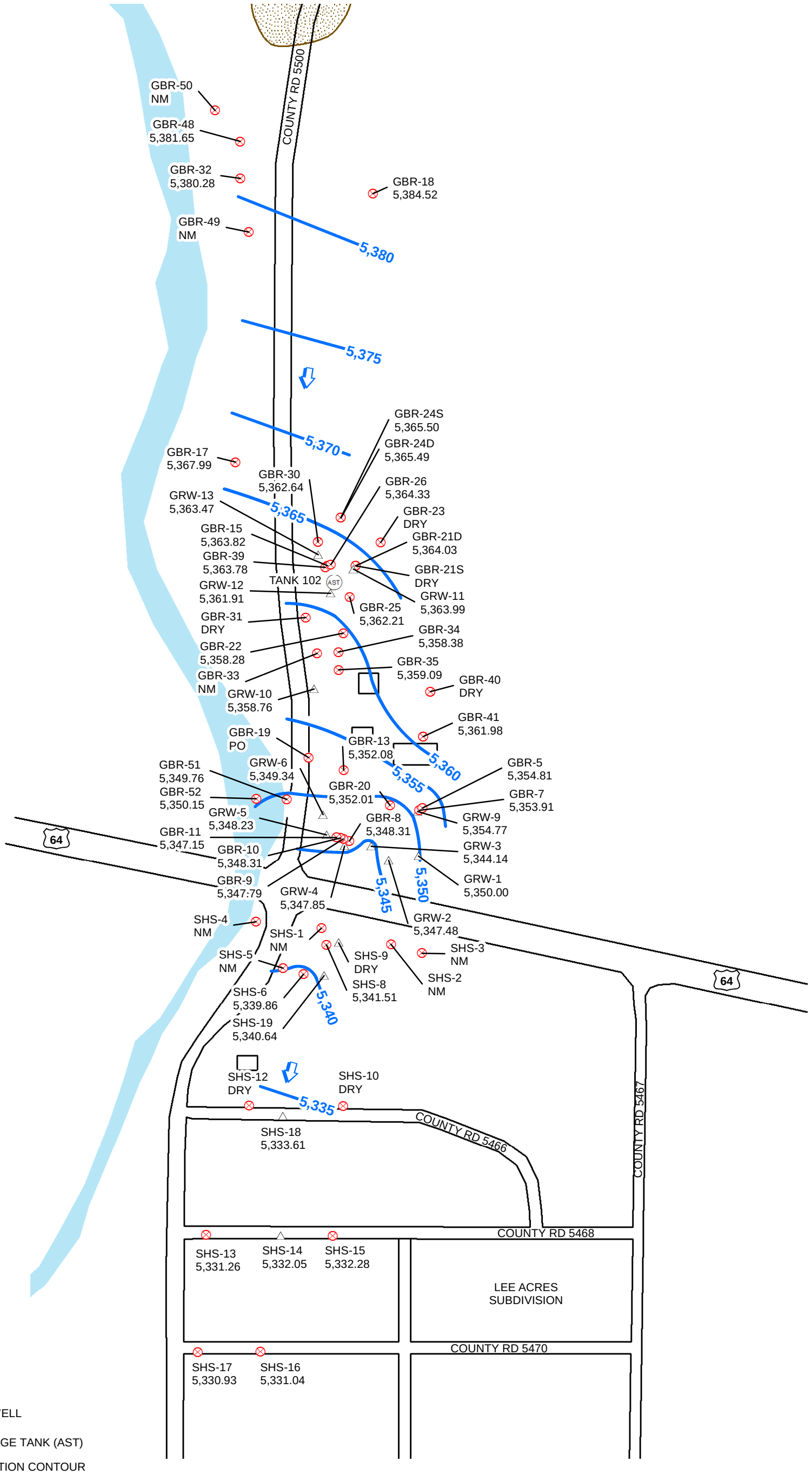

LEGEND

NM: NOT MEASURED

PO: PAVED OVER

- MONITORING WELL
- INACTIVE RECOVERY WELL
- ABOVEGROUND STORAGE TANK (AST)
- GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 5 FEET
  GROUNDWATER ELEVATION MEASURED IN FEET
  ABOVE MEAN SEA LEVEL IN OCTOBER, 2018
- ARROYO
- FORMER LEE ACRES LANDFILL
- ESTIMATED GROUNDWATER FLOW DIRECTION

FIGURE 6
GROUNDWATER POTENTIOMETRIC SURFACE MAP (OCTOBER 2018)
FORMER GIANT BLOOMFIELD REFINERY
SW SEC 22 & NW SEC 27 T29N R12W
SAN JUAN COUNTY, NEW MEXICO
WESTERN REFINING SOUTHWEST, INC.

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TABLE 1
GROUNDWATER ELEVATIONS AND THICKNESS OF PHASE-SEPARATED HYDROCARBONS

FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, INC.
SAN JUAN COUNTY, NEW MEXICO

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	January 2018				October 2018			
			Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)	Depth to Water (feet) BTOC	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)
GRW-1	5,394.30	73.35	42.01	-	-	5,352.29	44.30	-	-	5,350.00
GRW-2	5,391.28	61.00	43.14	-	-	5,348.14	43.80	-	-	5,347.48
GRW-3	5,388.77	58.30	43.13	-	-	5,345.64	44.63	-	-	5,344.14
GRW-4	5,390.02	60.00	41.60	-	-	5,348.42	42.17	-	-	5,347.85
GRW-5	5,390.56	68.30	41.74	-	-	5,348.82	42.33	-	-	5,348.23
GRW-6	5,390.81	53.80	40.89	-	-	5,349.92	41.47	-	-	5,349.34
GRW-9	5,395.70	54.40	40.32	-	-	5,355.38	40.93	-	-	5,354.77
GRW-10	5,395.02	66.02	35.69	-	-	5,359.33	36.26	-	-	5,358.76
GRW-11	5,397.85	64.00	32.73	-	-	5,365.12	33.86	-	-	5,363.99
GRW-12	5,397.24	48.00	34.68	-	-	5,362.56	35.33	-	-	5,361.91
GRW-13	5,396.90	61.30	32.81	-	-	5,364.09	33.43	-	-	5,363.47
GBR-5	5,395.07	47.08	39.50	-	-	5,355.57	40.26	-	-	5,354.81
GBR-7	5,395.85	51.65	38.86	-	-	5,356.99	41.94	41.71	0.23	5,353.91
GBR-8	5,390.50	50.90	41.62	-	-	5,348.88	42.19	-	-	5,348.31
GBR-9	5,389.92	67.22	41.58	-	-	5,348.34	42.13	-	-	5,347.79
GBR-10	5,390.57	47.56	41.81	-	-	5,348.76	42.26	-	-	5,348.31
GBR-11	5,389.43	51.87	40.72	-	-	5,348.71	42.28	-	-	5,347.15
GBR-13	5,393.04	45.47	40.39	-	-	5,352.65	40.96	-	-	5,352.08
GBR-15	5,397.99	58.42	33.71	-	-	5,364.28	34.17	-	-	5,363.82
GBR-17	5,402.69	43.20	34.00	-	-	5,368.69	34.70	-	-	5,367.99
GBR-18	5,421.68	47.85	36.81	-	-	5,384.87	37.16	-	-	5,384.52
GBR-19* **	5,393.83	46.23	-	-	-	-	-	-	-	-
GBR-20	5,393.47	54.57	40.59	-	-	5,352.88	41.46	-	-	5,352.01
GBR-21D	5,400.19	49.77	35.68	-	-	5,364.51	36.16	-	-	5,364.03
GBR-21S	5,400.65	49.77	Dry		-	-	Dry	-	-	-
GBR-22	5,395.91	38.73	35.51	-	-	5,360.40	37.63	37.60	0.03	5,358.28
GBR-23** **	5,403.72	39.45	Dry	-	-	-	37.33	-	-	5,366.39
GBR-24D	5,396.77	51.40	30.92	-	-	5,365.85	31.28	-	-	5,365.49
GBR-24S	5,396.08	37.05	30.25	-	-	5,365.83	30.58	-	-	5,365.50
GBR-25	5,397.03	37.12	34.29	-	-	5,362.74	34.82	-	-	5,362.21
GBR-26	5,396.72	41.29	31.84	-	-	5,364.88	32.39	-	-	5,364.33
GBR-30	5,395.59	41.66	32.31	-	-	5,363.28	32.95	-	-	5,362.64
GBR-31	5,396.58	43.50	32.27	-	-	5,364.31	Dry	-	-	-
GBR-32	5,414.86	47.83	33.95	-	-	5,380.91	34.58	-	-	5,380.28
GBR-33	5,396.28	45.72	Dry	-	-	-	34.44	-	-	5,361.84
GBR-34	5,394.00	42.20	33.88	-	-	5,360.12	35.62			5,358.38
GBR-35	5,393.66	42.35	34.01	-	-	5,359.65	34.57	-	-	5,359.09
GBR-39	5,397.55	41.42	33.29	-	-	5,364.26	33.77	-	-	5,363.78
GBR-40	5,400.76	39.38	Dry	-	-	-	Dry	-	-	-
GBR-41	5,396.35	34.28	34.31	34.28	0.03	5,362.04	34.37	34.25	0.12	5,361.98
GBR-48	5,413.90	43.54	35.62	-	-	5,378.28	32.25	-	-	5,381.65
GBR-49	*	40.30	32.06	-	-	-	32.71	-	-	-
GBR-50	*	44.37	31.26	-	-	-	31.94	-	-	-
GBR-51	5,389.68	57.07	NM	-	-	-	39.92	-	-	5,349.76
GBR-52	5,387.74	52.73	NM	-	-	-	37.59	-	-	5,350.15
SHS-1**** **	5,383.54	50.40	P&A	-	-	-	P&A	-	-	-

TABLE 1
GROUNDWATER ELEVATIONS AND THICKNESS OF PHASE-SEPARATED HYDROCARBONS

FORMER GIANT BLOOMFIELD REFINERY
WESTERN REFINING SOUTHWEST, INC.
SAN JUAN COUNTY, NEW MEXICO

Well Number	Wellhead Elevation (feet)	Total Depth (feet)	January 2018				October 2018			
			Depth to Water (feet BTOC)	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)	Depth to Water (feet) BTOC	Depth to Product (feet)	PSH Thickness (feet)	Adjusted GWEL (feet)
SHS-2	5,381.66	44.56	P&A	-	-	-	P&A	-	-	-
SHS-3**	5,383.33	-	P&A	-	-	-	P&A	-	-	-
SHS-4	5,383.62	52.16	P&A	-	-	-	P&A	-	-	-
SHS-5	5,378.36	47.85	P&A	-	-	-	P&A	-	-	-
SHS-6	5,378.17	52.78	37.85	-	-	5,340.32	38.31	-	-	5,339.86
SHS-8	5,380.25	50.92	38.25	-	-	5,342.00	38.74	-	-	5,341.51
SHS-9	5,380.79	46.25	37.43	-	-	5,343.36	Dry	-	-	-
SHS-10	5,373.80	45.80	Dry	-	-	-	Dry	-	-	-
SHS-12	5,373.94	52.41	Dry	-	-	-	Dry	-	-	-
SHS-13	5,367.81	47.51	35.85	-	-	5,331.96	36.55	-	-	5,331.26
SHS-14	5,367.07	52.71	34.18	-	-	5,332.89	35.02	-	-	5,332.05
SHS-15***	5,366.21	47.78	33.00	-	-	5,333.21	33.93	-	-	5,332.28
SHS-16	5,362.58	42.20	32.68	-	-	5,329.90	31.54	-	-	5,331.04
SHS-17	5,364.35	46.21	32.63	-	-	5,331.72	33.42	-	-	5,330.93
SHS-18	5,373.64	47.36	39.24	-	-	5,334.40	40.03	-	-	5,333.61
SHS-19	5,378.89	52.40	37.77	-	-	5,341.12	38.25	-	-	5,340.64

Notes:
BTOC - below top of casing
D - designates that the well screen is deep
GWEL - groundwater elevation
NM - not measured
P&A - plugged and abandoned
PSH - phase-separated hydrocarbon
S - designates that the well screen is shallow
* Top-of-casing elevation is unknown
** Well is damaged by a tree root
*** Well was paved over in June 2010
**** Well hit by a vehicle May 2014
***** Well visibly broken/buried January 2016
****** Well buried and unable to locate May 2016
- indicates no GWEL or PSH measured
When PSH is detected, the GWEL is corrected using an estimated density correction factor of 0.88.

TABLE 2
2018 ANNUAL COMPLIANCE - GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Analyte	NMWQCC Standard	Unit	GRW-3 11-Oct	GRW-6 12-Oct	GBR-17 12-Oct	GBR-24D 15-Oct	GBR-30 15-Oct	GBR-31 15-Oct	GBR-32 15-Oct	GBR-48 15-Oct	GBR-49 15-Oct	GBR-50 15-Oct	GBR-51 11-Oct	GBR-52 12-Oct	SHS-8 11-Oct
USEPA Method 8260B - Volatiles															
benzene	**10**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
toluene	**750**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
ethylbenzene	**750**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
methyl tert-butyl ether (MTBE)	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trimethylbenzene	**620**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trimethylbenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloroethane (EDC)	**10**	µg/L	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromoethane (EDB)	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
naphthalene	**NE**	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1-methylnaphthalene	**NE**	µg/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2-methylnaphthalene	**NE**	µg/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
acetone	**NE**	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
bromobenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromodichloromethane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromoform	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromomethane	**NE**	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-butanone	**NE**	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
carbon disulfide	**NE**	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
carbon tetrachloride	**10**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chlorobenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloroethane	**NE**	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
chloroform	**100**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloromethane	**NE**	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-chlorotoluene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-chlorotoluene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-DCE	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-dichloropropene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromo-3-chloropropane	**NE**	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
dibromochloromethane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dibromomethane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichlorobenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-dichlorobenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dichlorodifluoromethane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethane	**25**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethene	**5**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloropropane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichloropropane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-dichloropropane	**NE**	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-dichloropropene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
hexachlorobutadiene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-hexanone	**NE**	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0
isopropylbenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-isopropytoluene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-methyl-2-pentanone	**NE**	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
methylene chloride	**100**	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-butylbenzene	**NE**	µg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-propylbenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
sec-butylbenzene	**NE**	µg/L	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
styrene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
tert-butylbenzene	**NE**	µg/L	3.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-tetrachloroethane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-tetrachloroethane	**10**	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

TABLE 2
2018 ANNUAL COMPLIANCE - GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Analyte	NMWQCC Standard	Unit	GRW-3 11-Oct	GRW-6 12-Oct	GBR-17 12-Oct	GBR-24D 15-Oct	GBR-30 15-Oct	GBR-31 15-Oct	GBR-32 15-Oct	GBR-48 15-Oct	GBR-49 15-Oct	GBR-50 15-Oct	GBR-51 11-Oct	GBR-52 12-Oct	SHS-8 11-Oct
tetrachloroethene (PCE)	**20**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-DCE	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-dichloropropene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichlorobenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-trichloroethane	**60**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-trichloroethane	**10**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichloroethene (TCE)	**100**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichlorofluoromethane	**NE**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichloropropane	**NE**	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
vinyl chloride	**1**	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
xylenes, total	**620**	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
USEPA Method 8270C: Polycylic Aromatic Hydrocarbons															
naphthalene	**30**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
1-methylnaphthalene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
2-methylnaphthalene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
acenaphthylene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
acenaphthene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
fluorene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	0.96	NT	NT	NT	NT	NT	NT	NT
phenanthrene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
anthracene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
fluoranthene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
pyrene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
benz(a)anthracene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
chrysene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
benzo(b)fluoranthene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
benzo(k)fluoranthene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
benzo(a)pyrene	**0.7**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
dibenz(a,h)anthracene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
benzo(g,h,i)perylene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
indeno(1,2,3-cd)pyrene	**NE**	µg/L	<10	<0.50	<0.50	<0.50	<0.50	<0.50	NT	NT	NT	NT	NT	NT	NT
USEPA Method 300.0: Anions															
bromide	**NE**	mg/L	0.51	<0.50	0.15	0.60	0.77	1.1	0.47	0.79	0.47	0.24	0.26	0.28	0.84
chloride	**250**	mg/L	99	100	49	130	250	220	200	**300**	180	59	54	54	130
sulfate	**600**	mg/L	**640**	**1,300**	**1,200**	**2,300**	**1,500**	**1,400**	**1,700**	**1,800**	**1,800**	**1,700**	**1,300**	**1,500**	**890**
fluoride	**1.6**	mg/L	<0.50	1.1	0.64	0.92	0.62	0.50	0.39	0.34	0.52	0.60	0.33	0.71	<0.50
nitrate + nitrite as N	**NE**	mg/L	<0.50	<0.50	5.4	<0.10	<0.10	<0.10	0.65	2.7	0.84	6.9	7.1	6.9	<0.50
phosphorus, orthophosphate (As P)	**NE**	mg/L	<2.5	<2.5	<10	<10	<10	<0.50	<10	<10	<10	<10	<10	<10	<2.5
USEPA Method 200.7: Total Metals															
barium	**NE**	mg/L	NT	NT	NT	NT	NT	NT	0.021	0.13	0.22	0.023	NT	NT	NT
beryllium	**NE**	mg/L	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0020	<0.0020	NT	NT	NT
cadmium	**0.01**	mg/L	NT	NT	NT	NT	NT	NT	<0.0020	<0.0020	<0.0020	<0.0020	NT	NT	NT
calcium	**NE**	mg/L	230	430	440	460	480	440	430	500	420	460	420	440	300
chromium	**0.05**	mg/L	NT	NT	NT	NT	NT	NT	**0.074**	0.036	**1.2**	0.044	NT	NT	NT
iron	**1.0**	mg/L	**18**	**890**	**100**	**9.1**	**28**	**13**	**2.7**	**18**	**23**	**4.0**	0.059	0.12	**50**
magnesium	**NE**	mg/L	57	41	47	41	43	42	42	50	39	35	30	32	48
manganese	**0.2**	mg/L	**0.80**	**45**	**3.0**	**1.8**	**0.76**	**3.1**	**1.9**	**0.49**	**0.98**	0.13	<0.0020	0.0028	**3.1**
nickel	**0.2**	mg/L	NT	NT	NT	NT	NT	NT	0.086	0.067	**0.39**	0.035	NT	NT	NT
potassium	**NE**	mg/L	1.1	2.2	6.9	7.5	5.1	2.9	2.0	5.7	4.9	2.2	<1.0	<1.0	3.3
silver	**0.05**	mg/L	NT	NT	NT	NT	NT	NT	0.011	0.0094	0.0072	0.011	NT	NT	NT
sodium	**NE**	mg/L	500	390	260	660	420	390	490	550	440	340	290	310	540
zinc	**10**	mg/L	NT	NT	NT	NT	NT	NT	0.012	0.040	0.14	0.015	NT	NT	NT
USEPA Method 200.8: Total Metals															
antimony	**NE**	mg/L	NT	NT	NT	NT	NT	NT	<0.0010	<0.0010	<0.0010	<0.0010	NT	NT	NT

TABLE 2
2018 ANNUAL COMPLIANCE - GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Analyte	NMWQCC Standard	Unit	GRW-3 11-Oct	GRW-6 12-Oct	GBR-17 12-Oct	GBR-24D 15-Oct	GBR-30 15-Oct	GBR-31 15-Oct	GBR-32 15-Oct	GBR-48 15-Oct	GBR-49 15-Oct	GBR-50 15-Oct	GBR-51 11-Oct	GBR-52 12-Oct	SHS-8 11-Oct
arsenic	**0.1**	mg/L	NT	NT	NT	NT	NT	NT	0.0025	0.0054	0.012	0.0032	NT	NT	NT
copper	**1.0**	mg/L	NT	NT	NT	NT	NT	NT	0.0047	0.018	0.032	0.0036	NT	NT	NT
lead	**0.05**	mg/L	NT	NT	NT	NT	NT	NT	0.00096	0.011	0.015	0.0021	NT	NT	NT
selenium	**0.05**	mg/L	NT	NT	NT	NT	NT	NT	0.0010	0.0088	0.0048	0.0066	NT	NT	NT
thallium	**NE**	mg/L	NT	NT	NT	NT	NT	NT	<0.00050	<0.00050	<0.00050	<0.00050	NT	NT	NT
USEPA Method 245.1: Mercury															
mercury	**0.002**	mg/L	NT	NT	NT	NT	NT	NT	<0.00020	<0.00020	<0.00020	<0.00020	NT	NT	NT
SM 2340B: Hardness															
hardness (as CaCO3)	**NE**	mg/L	820	1200	1300	1,300	1,400	1,300	1,300	1,500	1,200	1,300	1,200	1,200	940
USEPA Method SM 2320B:															
alkalinity, total (As CaCO3)	**NE**	mg/L CaCO3	948.4	363.5	214.7	224.2	256.9	325.6	275.4	286.4	210.6	187.6	196.9	210.2	815.8
carbonate	**NE**	mg/L CaCO3	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000	<2.000
bicarbonate	**NE**	mg/L CaCO3	948.4	363.5	214.7	224.2	256.9	325.6	275.4	286.4	210.6	187.6	196.9	210.2	815.8
USEPA Method 120.1:															
specific conductance	**NE**	µmhos/cm	2,900	3,000	2,400	4,300	3,400	3,300	3,700	4,100	3,600	3,000	2,700	2,800	3,200
USEPA Method SM4500-H+B: pH															
pH	**6-9**	pH units	7.53	7.55	7.63	7.68	7.59	7.57	7.71	7.57	7.24	7.58	7.51	7.53	7.63
USEPA Method SM2540C Modified: Total Dissolved Solids															
total dissolved solids	**1,000**	mg/L	**2,190**	**2,390**	**2,180**	**3,780**	**3,000**	**2,660**	**3,110**	**3,580**	**3,010**	**2,770**	**2,330**	**2,580**	**2,730**

Notes:
µg/L - micrograms per liter
BOLD - indicates concentration exceeds the NMWQCC standard
mg/L - milligrams per liter
NE - not established
NMWQCC - New Mexico Water Quality Control Commission
NT - not tested
USEPA - United States Environmental Protection Agency

TABLE 3
2018 SHS WELL CLOSURE SAMPLING - GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Analyte	NMWQCC Standard	Unit	SHS-6	SHS-8	SHS-9	SHS-13	SHS-14	SHS-15	SHS-16	SHS-17	SHS-18	SHS-19
			23-Jan	23-Jan	23-Jan	22-Jan	22-Jan	23-Jan	22-Jan	22-Jan	23-Jan	23-Jan
USEPA Method 8015M/D - Diesel Range												
Diesel Range Organics (DRO)	**NE**	mg/L	<0.20	5.8	13	1.2	<1.0	<0.20	<1.0	<1.0	<0.20	0.32
Motor Oil Range Organics (MRO)	**NE**	mg/L	<2.5	<2.5	<2.5	<5.0	<5.0	<2.5	<5.0	<5.0	<2.5	<2.5
USEPA Method 8015D - Gasoline Range												
Gasoline Range Organics (GRO)	**NE**	mg/L	<0.05	<0.050	0.38	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
USEPA Method 8260B - Volatiles												
benzene	**10**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
toluene	**750**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
ethylbenzene	**750**	µg/L	<1.0	<1.0	32	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
methyl tert-butyl ether (MTBE)	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trimethylbenzene	**620**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trimethylbenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloroethane (EDC)	**10**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromoethane (EDB)	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
naphthalene	**NE**	µg/L	<2.0	<2.0	5.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1-methylnaphthalene	**NE**	µg/L	<4.0	<4.0	12	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2-methylnaphthalene	**NE**	µg/L	<4.0	<4.0	<10	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
acetone	**NE**	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
bromobenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromodichloromethane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromoform	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromomethane	**NE**	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-butanone	**NE**	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
carbon disulfide	**NE**	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
carbon tetrachloride	**10**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chlorobenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloroethane	**NE**	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
chloroform	**100**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloromethane	**NE**	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-chlorotoluene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-chlorotoluene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-DCE	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-dichloropropene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromo-3-chloropropane	**NE**	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
dibromochloromethane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dibromomethane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichlorobenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-dichlorobenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dichlorodifluoromethane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethane	**25**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethene	**5**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloropropane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichloropropane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-dichloropropane	**NE**	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-dichloropropene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
hexachlorobutadiene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-hexanone	**NE**	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
isopropylbenzene	**NE**	µg/L	<1.0	<1.0	6.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

TABLE 3
2018 SHS WELL CLOSURE SAMPLING - GROUNDWATER LABORATORY ANALYTICAL RESULTS

FORMER GIANT BLOOMFIELD REFINERY
SAN JUAN COUNTRY, NEW MEXICO
WESTERN REFINING PIPELINE, LLC.

Analyte	NMWQCC Standard	Unit	SHS-6	SHS-8	SHS-9	SHS-13	SHS-14	SHS-15	SHS-16	SHS-17	SHS-18	SHS-19
			23-Jan	23-Jan	23-Jan	22-Jan	22-Jan	23-Jan	22-Jan	22-Jan	23-Jan	23-Jan
4-isopropytoluene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-methyl-2-pentanone	**NE**	µg/L	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
methylene chloride	**100**	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-butylbenzene	**NE**	µg/L	<3.0	<3.0	<7.5	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-propylbenzene	**NE**	µg/L	<1.0	<1.0	8.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
sec-butylbenzene	**NE**	µg/L	<1.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
styrene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
tert-butylbenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5
1,1,1,2-tetrachloroethane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-tetrachloroethane	**10**	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
tetrachloroethene (PCE)	**20**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-DCE	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-dichloropropene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichlorobenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-trichloroethane	**60**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-trichloroethane	**10**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichloroethene (TCE)	**100**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichlorofluoromethane	**NE**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichloropropane	**NE**	µg/L	<2.0	<2.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
vinyl chloride	**1**	µg/L	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
xylenes, total	**620**	µg/L	<1.5	<1.5	<3.8	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5

Notes:
mg/L - miligrams per liter
NE - not established
NMWQCC - New Mexico Water Quality Control Commission
USEPA - United States Environmental Protection Agency
µg/L - micrograms per liter

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 30, 2018

Devin Hencmann

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL:
FAX

RE: GBR SHS Well Sampling OrderNo.: 1801A53

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 4 sample(s) on 1/23/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-16
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 12:15:00 PM
Lab ID: 1801A53-001 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/25/2018 2:21:13 PM	36184
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/25/2018 2:21:13 PM	36184
Surr: DNOP	111	77.5-161		%Rec	1	1/25/2018 2:21:13 PM	36184
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 12:08:47 PM	G48661
Surr: BFB	92.5	69.3-150		%Rec	1	1/24/2018 12:08:47 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 1:18:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 1:18:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 1:18:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-16
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 12:15:00 PM
Lab ID: 1801A53-001 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 1:18:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 1:18:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 1:18:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 1:18:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	85.9	70-130		%Rec	1	1/27/2018 1:18:00 AM	B48749
Surr: 4-Bromofluorobenzene	80.4	70-130		%Rec	1	1/27/2018 1:18:00 AM	B48749
Surr: Dibromofluoromethane	86.8	70-130		%Rec	1	1/27/2018 1:18:00 AM	B48749
Surr: Toluene-d8	88.8	70-130		%Rec	1	1/27/2018 1:18:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-17
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 1:30:00 PM
Lab ID: 1801A53-002 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/25/2018 3:44:09 PM	36184
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/25/2018 3:44:09 PM	36184
Surr: DNOP	109	77.5-161		%Rec	1	1/25/2018 3:44:09 PM	36184
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 12:32:52 PM	G48661
Surr: BFB	94.0	69.3-150		%Rec	1	1/24/2018 12:32:52 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 1:41:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 1:41:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 1:41:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-17
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 1:30:00 PM
Lab ID: 1801A53-002 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 1:41:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 1:41:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 1:41:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 1:41:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	85.1	70-130		%Rec	1	1/27/2018 1:41:00 AM	B48749
Surr: 4-Bromofluorobenzene	79.2	70-130		%Rec	1	1/27/2018 1:41:00 AM	B48749
Surr: Dibromofluoromethane	87.3	70-130		%Rec	1	1/27/2018 1:41:00 AM	B48749
Surr: Toluene-d8	89.8	70-130		%Rec	1	1/27/2018 1:41:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-13
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 2:15:00 PM
Lab ID: 1801A53-003 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	1.2	1.0		mg/L	1	1/25/2018 4:12:02 PM	36184
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/25/2018 4:12:02 PM	36184
Surr: DNOP	108	77.5-161		%Rec	1	1/25/2018 4:12:02 PM	36184
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 12:56:36 PM	G48661
Surr: BFB	90.0	69.3-150		%Rec	1	1/24/2018 12:56:36 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 2:04:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 2:04:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 2:04:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-13
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 2:15:00 PM
Lab ID: 1801A53-003 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 2:04:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 2:04:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 2:04:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 2:04:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	83.8	70-130		%Rec	1	1/27/2018 2:04:00 AM	B48749
Surr: 4-Bromofluorobenzene	78.5	70-130		%Rec	1	1/27/2018 2:04:00 AM	B48749
Surr: Dibromofluoromethane	87.1	70-130		%Rec	1	1/27/2018 2:04:00 AM	B48749
Surr: Toluene-d8	88.3	70-130		%Rec	1	1/27/2018 2:04:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-14
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 3:30:00 PM
Lab ID: 1801A53-004 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/25/2018 4:39:34 PM	36184
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/25/2018 4:39:34 PM	36184
Surr: DNOP	113	77.5-161		%Rec	1	1/25/2018 4:39:34 PM	36184
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 1:20:29 PM	G48661
Surr: BFB	93.2	69.3-150		%Rec	1	1/24/2018 1:20:29 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 3:12:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 3:12:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 3:12:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-14
Project: GBR SHS Well Sampling **Collection Date:** 1/22/2018 3:30:00 PM
Lab ID: 1801A53-004 **Matrix:** AQUEOUS **Received Date:** 1/23/2018 6:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 3:12:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 3:12:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 3:12:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 3:12:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	85.3	70-130		%Rec	1	1/27/2018 3:12:00 AM	B48749
Surr: 4-Bromofluorobenzene	78.2	70-130		%Rec	1	1/27/2018 3:12:00 AM	B48749
Surr: Dibromofluoromethane	87.6	70-130		%Rec	1	1/27/2018 3:12:00 AM	B48749
Surr: Toluene-d8	90.2	70-130		%Rec	1	1/27/2018 3:12:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A53**

31-Jan-18

Client: Western Refining Southwest, Inc.

Project: GBR SHS Well Sampling

Sample ID **LCS-36184**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **LCSW**	Batch ID: **36184**	RunNo: **48690**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566253** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.7	1.0	5.000	0	115	92.3	135			
Surr: DNOP	0.54		0.5000		108	77.5	161			

Sample ID **MB-36184**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **PBW**	Batch ID: **36184**	RunNo: **48690**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566254** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.0		1.000		104	77.5	161			

Sample ID **1801A53-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **SHS-16**	Batch ID: **36184**	RunNo: **48690**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566503** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.8	1.0	5.000	0	116	83.3	151			
Surr: DNOP	0.55		0.5000		111	77.5	161			

Sample ID **1801A53-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range**
Client ID: **SHS-16**	Batch ID: **36184**	RunNo: **48690**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566504** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.9	1.0	5.000	0	118	83.3	151	1.50	20	
Surr: DNOP	0.56		0.5000		112	77.5	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A53**
31-Jan-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G48661**	RunNo: **48661**
Prep Date:	Analysis Date: **1/24/2018**	SeqNo: **1565743** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		89.0	69.3	150			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G48661**	RunNo: **48661**
Prep Date:	Analysis Date: **1/24/2018**	SeqNo: **1565744** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.45	0.050	0.5000	0	90.3	75.8	123			
Surr: BFB	19		20.00		94.6	69.3	150			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A53**

31-Jan-18

Client: Western Refining Southwest, Inc.

Project: GBR SHS Well Sampling

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568655** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.8	70	130			
Toluene	20	1.0	20.00	0	102	70	130			
Chlorobenzene	21	1.0	20.00	0	105	70	130			
1,1-Dichloroethene	22	1.0	20.00	0	110	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	95.1	70	130			
Surr: 1,2-Dichloroethane-d4	8.8		10.00		88.0	70	130			
Surr: 4-Bromofluorobenzene	8.0		10.00		80.5	70	130			
Surr: Dibromofluoromethane	8.8		10.00		88.0	70	130			
Surr: Toluene-d8	9.0		10.00		90.4	70	130			

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A53**

31-Jan-18

Client: Western Refining Southwest, Inc.

Project: GBR SHS Well Sampling

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A53**

31-Jan-18

Client: Western Refining Southwest, Inc.

Project: GBR SHS Well Sampling

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.7		10.00		86.6	70	130			
Surr: 4-Bromofluorobenzene	8.0		10.00		79.6	70	130			
Surr: Dibromofluoromethane	8.8		10.00		88.2	70	130			
Surr: Toluene-d8	8.8		10.00		88.2	70	130			

Sample ID **1801a53-003ams**	SampType: **MS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **SHS-13**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/27/2018**	SeqNo: **1568666** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	100	70	130			
Toluene	21	1.0	20.00	0	103	70	130			
Chlorobenzene	21	1.0	20.00	0	105	70	130			
1,1-Dichloroethene	22	1.0	20.00	0	110	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	96.7	70	130			
Surr: 1,2-Dichloroethane-d4	8.6		10.00		86.0	70	130			
Surr: 4-Bromofluorobenzene	7.9		10.00		79.0	70	130			
Surr: Dibromofluoromethane	8.7		10.00		86.6	70	130			
Surr: Toluene-d8	8.9		10.00		89.2	70	130			

Sample ID **1801a53-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **SHS-13**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/27/2018**	SeqNo: **1568667** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	97.1	70	130	3.13	20	
Toluene	20	1.0	20.00	0	101	70	130	2.09	20	
Chlorobenzene	20	1.0	20.00	0	101	70	130	3.59	20	
1,1-Dichloroethene	22	1.0	20.00	0	110	70	130	0.772	20	
Trichloroethene (TCE)	19	1.0	20.00	0	94.9	70	130	1.79	20	
Surr: 1,2-Dichloroethane-d4	8.4		10.00		84.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	8.1		10.00		81.3	70	130	0	0	
Surr: Dibromofluoromethane	8.6		10.00		85.9	70	130	0	0	
Surr: Toluene-d8	9.0		10.00		89.8	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1801A53 RcptNo: 1

Received By: Anne Thorne 1/23/2018 6:55:00 AM

Completed By: Dennis Suazo 1/23/2018 10:43:54 AM

Reviewed By: SRee 01/23/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Not Present			

Chain-of-Custody Record

Client: Allen Hains

Western Refining

Mailing Address: 111 CR 4990

Bloomfield, NM

Phone #: 505-632-8613

email or Fax#: allen.s.hains@andeavor.com

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: GBR SHS Well Sampling

Project #: ATE! WR1007 | Western PO: 12623210

Project Manager: Devin Hencmann

Sampler: Josh Adams

On Ice: ☑ Yes ☐ No

Sample Temperature: 2.4-CF-1.0=1.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1801A53	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	8260 VOC	TPH GRO	TPH DRO Ext		Air Bubbles (Y or N)
1-22-18	1215	GW	SHS-16	5 VOA 3 250ml Am	HCl, NaO	001												X	X	X		
	1330		SHS-17			002												X	X	X		
	1415		SHS-13			003												X	X	X		
↓	1530	↓	SHS-14	↓	↓	004												X	X	X		

Date:	Time:	Relinquished by:	Received by:	Date	Time
1-22-18	1625			1/22/18	1625
1/22/18	1904			01/23/18	0655

Remarks: Bill western

cc: dhencmann@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 06, 2018

Devin Hencmann

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX (505) 632-3911

RE: GBR SHS Well Sampling OrderNo.: 1801A88

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 6 sample(s) on 1/24/2018 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued January 31, 2018.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-15
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 11:30:00 AM
Lab ID: 1801A88-001 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/25/2018 3:15:10 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 3:15:10 PM	36182
Surr: DNOP	123	79.2-146		%Rec	1	1/25/2018 3:15:10 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 1:44:22 PM	G48661
Surr: BFB	92.5	69.3-150		%Rec	1	1/24/2018 1:44:22 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-15
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 11:30:00 AM
Lab ID: 1801A88-001 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 5:06:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 5:06:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 5:06:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	85.0	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749
Surr: 4-Bromofluorobenzene	79.8	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749
Surr: Dibromofluoromethane	88.0	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749
Surr: Toluene-d8	89.1	70-130		%Rec	1	1/27/2018 5:06:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-18
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 12:30:00 PM
Lab ID: 1801A88-002 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/25/2018 4:21:24 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 4:21:24 PM	36182
Surr: DNOP	128	79.2-146		%Rec	1	1/25/2018 4:21:24 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 2:08:16 PM	G48661
Surr: BFB	92.4	69.3-150		%Rec	1	1/24/2018 2:08:16 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-18
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 12:30:00 PM
Lab ID: 1801A88-002 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 5:29:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 5:29:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 5:29:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	84.9	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749
Surr: 4-Bromofluorobenzene	79.0	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749
Surr: Dibromofluoromethane	86.7	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749
Surr: Toluene-d8	88.3	70-130		%Rec	1	1/27/2018 5:29:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-9
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:15:00 PM
Lab ID: 1801A88-003 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	13	0.20		mg/L	1	1/25/2018 4:43:40 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 4:43:40 PM	36182
Surr: DNOP	98.3	79.2-146		%Rec	1	1/25/2018 4:43:40 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.38	0.25		mg/L	5	1/25/2018 10:19:50 AM	G48661
Surr: BFB	112	69.3-150		%Rec	5	1/25/2018 10:19:50 AM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Toluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Ethylbenzene	32	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,4-Trimethylbenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,3,5-Trimethylbenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Naphthalene	5.1	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1-Methylnaphthalene	12	10	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Methylnaphthalene	ND	10	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Acetone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromodichloromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromoform	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Bromomethane	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Butanone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Carbon disulfide	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Carbon Tetrachloride	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chloroethane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chloroform	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Chloromethane	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Chlorotoluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
4-Chlorotoluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
cis-1,2-DCE	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
cis-1,3-Dichloropropene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Dibromochloromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Dibromomethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-9
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:15:00 PM
Lab ID: 1801A88-003 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,4-Dichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Dichlorodifluoromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1-Dichloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1-Dichloroethene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2-Dichloropropane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,3-Dichloropropane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2,2-Dichloropropane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1-Dichloropropene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Hexachlorobutadiene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
2-Hexanone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Isopropylbenzene	6.6	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
4-Isopropyltoluene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
4-Methyl-2-pentanone	ND	25	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Methylene Chloride	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
n-Butylbenzene	ND	7.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
n-Propylbenzene	8.4	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
sec-Butylbenzene	2.8	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Styrene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
tert-Butylbenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Tetrachloroethene (PCE)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
trans-1,2-DCE	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
trans-1,3-Dichloropropene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,3-Trichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,4-Trichlorobenzene	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,1-Trichloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,1,2-Trichloroethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Trichloroethene (TCE)	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Trichlorofluoromethane	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
1,2,3-Trichloropropane	ND	5.0	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Vinyl chloride	ND	2.5	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Xylenes, Total	ND	3.8	D	µg/L	5	1/27/2018 5:52:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	82.6	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749
Surr: 4-Bromofluorobenzene	83.3	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749
Surr: Dibromofluoromethane	85.8	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749
Surr: Toluene-d8	89.7	70-130	D	%Rec	5	1/27/2018 5:52:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-8
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:45:00 PM
Lab ID: 1801A88-004 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	5.8	0.20		mg/L	1	1/25/2018 5:05:47 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 5:05:47 PM	36182
Surr: DNOP	124	79.2-146		%Rec	1	1/25/2018 5:05:47 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 4:14:35 PM	G48661
Surr: BFB	96.9	69.3-150		%Rec	1	1/24/2018 4:14:35 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-8
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 1:45:00 PM
Lab ID: 1801A88-004 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 6:14:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 6:14:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 6:14:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	83.8	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749
Surr: 4-Bromofluorobenzene	80.9	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749
Surr: Dibromofluoromethane	86.5	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749
Surr: Toluene-d8	88.4	70-130		%Rec	1	1/27/2018 6:14:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-6
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 2:40:00 PM
Lab ID: 1801A88-005 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/25/2018 5:27:50 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 5:27:50 PM	36182
Surr: DNOP	118	79.2-146		%Rec	1	1/25/2018 5:27:50 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 4:38:38 PM	G48661
Surr: BFB	94.4	69.3-150		%Rec	1	1/24/2018 4:38:38 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-6
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 2:40:00 PM
Lab ID: 1801A88-005 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 6:37:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
tert-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 6:37:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 6:37:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	83.8	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749
Surr: 4-Bromofluorobenzene	80.7	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749
Surr: Dibromofluoromethane	86.6	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749
Surr: Toluene-d8	87.8	70-130		%Rec	1	1/27/2018 6:37:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-19
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 3:30:00 PM
Lab ID: 1801A88-006 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	0.32	0.20		mg/L	1	1/25/2018 5:49:55 PM	36182
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/25/2018 5:49:55 PM	36182
Surr: DNOP	118	79.2-146		%Rec	1	1/25/2018 5:49:55 PM	36182
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/24/2018 5:02:43 PM	G48661
Surr: BFB	97.6	69.3-150		%Rec	1	1/24/2018 5:02:43 PM	G48661
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Toluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Ethylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Naphthalene	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Methylnaphthalene	ND	4.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Acetone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromodichloromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromoform	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Bromomethane	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Butanone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Carbon disulfide	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Carbon Tetrachloride	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chloroethane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chloroform	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Chloromethane	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
4-Chlorotoluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
cis-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Dibromochloromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Dibromomethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-19
Project: GBR SHS Well Sampling **Collection Date:** 1/23/2018 3:30:00 PM
Lab ID: 1801A88-006 **Matrix:** GROUNDWA **Received Date:** 1/24/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1-Dichloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1-Dichloroethene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,3-Dichloropropane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2,2-Dichloropropane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Hexachlorobutadiene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
2-Hexanone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Isopropylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
4-Isopropyltoluene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
4-Methyl-2-pentanone	ND	10		µg/L	1	1/27/2018 7:00:00 AM	B48749
Methylene Chloride	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
n-Butylbenzene	ND	3.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
n-Propylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
sec-Butylbenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Styrene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
tert-Butylbenzene	1.5	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
trans-1,2-DCE	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Trichlorofluoromethane	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Vinyl chloride	ND	1.0		µg/L	1	1/27/2018 7:00:00 AM	B48749
Xylenes, Total	ND	1.5		µg/L	1	1/27/2018 7:00:00 AM	B48749
Surr: 1,2-Dichloroethane-d4	85.3	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749
Surr: 4-Bromofluorobenzene	81.1	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749
Surr: Dibromofluoromethane	87.7	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749
Surr: Toluene-d8	88.8	70-130		%Rec	1	1/27/2018 7:00:00 AM	B48749

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **1801A88-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **SHS-15**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566496** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.9	0.20	2.500	0	117	89.6	145			
Surr: DNOP	0.29		0.2500		114	79.2	146			

Sample ID **1801A88-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **SHS-15**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566497** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.0	0.20	2.500	0	119	89.6	145	2.31	20	
Surr: DNOP	0.28		0.2500		113	79.2	146	0	0	

Sample ID **LCS-36182**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566498** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.3	0.20	2.500	0	90.8	76.5	158			
Surr: DNOP	0.23		0.2500		93.7	79.2	146			

Sample ID **MB-36182**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **36182**	RunNo: **48688**
Prep Date: **1/24/2018**	Analysis Date: **1/25/2018**	SeqNo: **1566499** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.60		0.5000		120	79.2	146			

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**

06-Feb-18

Client: Western Refining Southwest, Inc.

Project: GBR SHS Well Sampling

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G48661**	RunNo: **48661**
Prep Date:	Analysis Date: **1/24/2018**	SeqNo: **1565743** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		89.0	69.3	150			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G48661**	RunNo: **48661**
Prep Date:	Analysis Date: **1/24/2018**	SeqNo: **1565744** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.45	0.050	0.5000	0	90.3	75.8	123			
Surr: BFB	19		20.00		94.6	69.3	150			

Sample ID **1801A88-003AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SHS-9**	Batch ID: **G48661**	RunNo: **48707**
Prep Date:	Analysis Date: **1/25/2018**	SeqNo: **1566585** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	2.7	0.25	2.500	0.3800	93.4	52.5	149			
Surr: BFB	120		100.0		119	69.3	150			

Sample ID **1801A88-003AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SHS-9**	Batch ID: **G48661**	RunNo: **48707**
Prep Date:	Analysis Date: **1/25/2018**	SeqNo: **1566586** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	2.7	0.25	2.500	0.3800	92.7	52.5	149	160	20	R
Surr: BFB	120		100.0		119	69.3	150	0	0	

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568655** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.8	70	130			
Toluene	20	1.0	20.00	0	102	70	130			
Chlorobenzene	21	1.0	20.00	0	105	70	130			
1,1-Dichloroethene	22	1.0	20.00	0	110	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	95.1	70	130			
Surr: 1,2-Dichloroethane-d4	8.8		10.00		88.0	70	130			
Surr: 4-Bromofluorobenzene	8.0		10.00		80.5	70	130			
Surr: Dibromofluoromethane	8.8		10.00		88.0	70	130			
Surr: Toluene-d8	9.0		10.00		90.4	70	130			

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1801A88**
06-Feb-18

Client: Western Refining Southwest, Inc.
Project: GBR SHS Well Sampling

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B48749**	RunNo: **48749**
Prep Date:	Analysis Date: **1/26/2018**	SeqNo: **1568656** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.7		10.00		86.6	70	130			
Surr: 4-Bromofluorobenzene	8.0		10.00		79.6	70	130			
Surr: Dibromofluoromethane	8.8		10.00		88.2	70	130			
Surr: Toluene-d8	8.8		10.00		88.2	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1801A88 RcptNo: 1

Received By: Anne Thorne 1/24/2018 7:00:00 AM Anne Thorne
Completed By: Anne Thorne 1/24/2018 8:48:49 AM Anne Thorne
Reviewed By: JMO 1/24/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: Allen Hains
Western Refining
Mailing Address: 111 CR 4990
Bloomfield, NM
Phone #: 505-632-8013
email or Fax#: allen.s.hains@andeavor.com
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____
Project Name: GBR SHS well sampling
Project #: Western PO = 12623210
Project Manager: Devin Hencmann
Sampler:
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	8260 VOC	TPH GRO	TPH DRO extended	Air Bubbles (Y or N)
1-23-18	1130	GW	SHS-15	5 VOA's 1 250 amber	HCl, ice	1801A88 001												X	X	X	
	1230		SHS-18			002												X	X	X	
	1315		SHS-9			003												X	X	X	
	1345		SHS-8			004												X	X	X	
	1440		SHS-6			005												X	X	X	
	1530		SHS-A			006												X	X	X	

Date	Time	Relinquished by	Received by	Date	Time
1-23-18	1600			1/23/18	1600
1/23/18	1720			01/24/18	0700

Remarks: Bill western PO
cc: dhencmann@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 30, 2018

Devin Hencmann

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL:
FAX

RE: GBR Annual Sampling OrderNo.: 1810743

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 3 sample(s) on 10/12/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-8
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 12:35:00 PM
Lab ID: 1810743-001 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	940	6.6		mg/L	1	10/24/2018	R55135
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	ND	0.50		mg/L	5	10/12/2018 6:00:54 PM	R54864
Chloride	130	10		mg/L	20	10/12/2018 6:13:44 PM	R54864
Nitrogen, Nitrite (As N)	ND	0.50		mg/L	5	10/12/2018 6:00:54 PM	R54864
Bromide	0.84	0.50		mg/L	5	10/12/2018 6:00:54 PM	R54864
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	10/12/2018 6:00:54 PM	R54864
Phosphorus, Orthophosphate (As P)	ND	2.5		mg/L	5	10/12/2018 6:00:54 PM	R54864
Sulfate	890	10	*	mg/L	20	10/12/2018 6:13:44 PM	R54864
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3200	5.0		µmhos/c	1	10/18/2018 5:24:28 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	815.8	20.00		mg/L Ca	1	10/18/2018 5:24:28 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 5:24:28 PM	R55027
Total Alkalinity (as CaCO3)	815.8	20.00		mg/L Ca	1	10/18/2018 5:24:28 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2730	200	*D	mg/L	1	10/17/2018 6:17:00 PM	41026
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.63		H	pH units	1	10/18/2018 5:24:28 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	300	10		mg/L	10	10/24/2018 5:49:33 PM	41058
Iron	50	2.0	*	mg/L	100	10/24/2018 5:56:48 PM	41058
Magnesium	48	1.0		mg/L	1	10/18/2018 12:10:06 AM	41058
Manganese	3.1	0.020	*	mg/L	10	10/24/2018 5:49:33 PM	41058
Potassium	3.3	1.0		mg/L	1	10/18/2018 12:10:06 AM	41058
Sodium	540	10		mg/L	10	10/24/2018 5:49:33 PM	41058
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Toluene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Ethylbenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Naphthalene	ND	2.0		µg/L	1	10/18/2018 5:49:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-8
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 12:35:00 PM
Lab ID: 1810743-001 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
2-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Acetone	ND	10		µg/L	1	10/18/2018 5:49:00 PM	R54984
Bromobenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Bromodichloromethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Bromoform	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Bromomethane	ND	3.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
2-Butanone	ND	10		µg/L	1	10/18/2018 5:49:00 PM	R54984
Carbon disulfide	ND	10		µg/L	1	10/18/2018 5:49:00 PM	R54984
Carbon Tetrachloride	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Chlorobenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Chloroethane	ND	2.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Chloroform	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Chloromethane	ND	3.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
2-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
4-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
cis-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Dibromochloromethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Dibromomethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,1-Dichloroethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,1-Dichloroethene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,3-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
2,2-Dichloropropane	ND	2.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,1-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Hexachlorobutadiene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
2-Hexanone	ND	10		µg/L	1	10/18/2018 5:49:00 PM	R54984
Isopropylbenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
4-Isopropyltoluene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
4-Methyl-2-pentanone	ND	10		µg/L	1	10/18/2018 5:49:00 PM	R54984
Methylene Chloride	ND	3.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
n-Butylbenzene	ND	3.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
n-Propylbenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** SHS-8
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 12:35:00 PM
Lab ID: 1810743-001 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
sec-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Styrene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
tert-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
trans-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Trichlorofluoromethane	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Vinyl chloride	ND	1.0		µg/L	1	10/18/2018 5:49:00 PM	R54984
Xylenes, Total	ND	1.5		µg/L	1	10/18/2018 5:49:00 PM	R54984
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/18/2018 5:49:00 PM	R54984
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	1	10/18/2018 5:49:00 PM	R54984
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/18/2018 5:49:00 PM	R54984
Surr: Toluene-d8	95.3	70-130		%Rec	1	10/18/2018 5:49:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-51
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 2:15:00 PM
Lab ID: 1810743-002 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1200	6.6		mg/L	1	10/24/2018	R55135
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.33	0.10		mg/L	1	10/12/2018 6:26:36 PM	R54864
Chloride	54	10		mg/L	20	10/12/2018 6:39:28 PM	R54864
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/12/2018 6:26:36 PM	R54864
Bromide	0.26	0.10		mg/L	1	10/12/2018 6:26:36 PM	R54864
Nitrogen, Nitrate (As N)	7.1	2.0		mg/L	20	10/12/2018 6:39:28 PM	R54864
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/12/2018 6:39:28 PM	R54864
Sulfate	1300	25	*	mg/L	50	10/23/2018 6:18:08 PM	R55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	2700	5.0		µmhos/c	1	10/18/2018 5:54:26 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	196.9	20.00		mg/L Ca	1	10/18/2018 5:54:26 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 5:54:26 PM	R55027
Total Alkalinity (as CaCO3)	196.9	20.00		mg/L Ca	1	10/18/2018 5:54:26 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2330	20.0	*	mg/L	1	10/17/2018 6:17:00 PM	41026
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.51		H	pH units	1	10/18/2018 5:54:26 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	420	10		mg/L	10	10/24/2018 5:58:49 PM	41058
Iron	0.059	0.020		mg/L	1	10/18/2018 12:12:08 AM	41058
Magnesium	30	1.0		mg/L	1	10/18/2018 12:12:08 AM	41058
Manganese	ND	0.0020		mg/L	1	10/18/2018 12:12:08 AM	41058
Potassium	ND	1.0		mg/L	1	10/18/2018 12:12:08 AM	41058
Sodium	290	10		mg/L	10	10/24/2018 5:58:49 PM	41058
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Toluene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Ethylbenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Naphthalene	ND	2.0		µg/L	1	10/18/2018 6:12:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-51
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 2:15:00 PM
Lab ID: 1810743-002 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
2-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Acetone	ND	10		µg/L	1	10/18/2018 6:12:00 PM	R54984
Bromobenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Bromodichloromethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Bromoform	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Bromomethane	ND	3.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
2-Butanone	ND	10		µg/L	1	10/18/2018 6:12:00 PM	R54984
Carbon disulfide	ND	10		µg/L	1	10/18/2018 6:12:00 PM	R54984
Carbon Tetrachloride	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Chlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Chloroethane	ND	2.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Chloroform	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Chloromethane	ND	3.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
2-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
4-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
cis-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Dibromochloromethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Dibromomethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,1-Dichloroethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,1-Dichloroethene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,3-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
2,2-Dichloropropane	ND	2.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,1-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Hexachlorobutadiene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
2-Hexanone	ND	10		µg/L	1	10/18/2018 6:12:00 PM	R54984
Isopropylbenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
4-Isopropyltoluene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
4-Methyl-2-pentanone	ND	10		µg/L	1	10/18/2018 6:12:00 PM	R54984
Methylene Chloride	ND	3.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
n-Butylbenzene	ND	3.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
n-Propylbenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-51
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 2:15:00 PM
Lab ID: 1810743-002 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
sec-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Styrene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
tert-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
trans-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Trichlorofluoromethane	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Vinyl chloride	ND	1.0		µg/L	1	10/18/2018 6:12:00 PM	R54984
Xylenes, Total	ND	1.5		µg/L	1	10/18/2018 6:12:00 PM	R54984
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	10/18/2018 6:12:00 PM	R54984
Surr: 4-Bromofluorobenzene	97.8	70-130		%Rec	1	10/18/2018 6:12:00 PM	R54984
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/18/2018 6:12:00 PM	R54984
Surr: Toluene-d8	95.9	70-130		%Rec	1	10/18/2018 6:12:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GRW-3
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 3:40:00 PM
Lab ID: 1810743-003 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	820	6.6		mg/L	1	10/24/2018	R55135
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	ND	0.50		mg/L	5	10/12/2018 6:52:20 PM	R54864
Chloride	99	10		mg/L	20	10/12/2018 7:05:12 PM	R54864
Nitrogen, Nitrite (As N)	ND	0.50		mg/L	5	10/12/2018 6:52:20 PM	R54864
Bromide	0.51	0.50		mg/L	5	10/12/2018 6:52:20 PM	R54864
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	10/12/2018 6:52:20 PM	R54864
Phosphorus, Orthophosphate (As P)	ND	2.5		mg/L	5	10/12/2018 6:52:20 PM	R54864
Sulfate	640	10	*	mg/L	20	10/12/2018 7:05:12 PM	R54864
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	2900	5.0		µmhos/c	1	10/18/2018 6:14:44 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	948.4	20.00		mg/L Ca	1	10/18/2018 6:14:44 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 6:14:44 PM	R55027
Total Alkalinity (as CaCO3)	948.4	20.00		mg/L Ca	1	10/18/2018 6:14:44 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2190	100	*D	mg/L	1	10/17/2018 6:17:00 PM	41026
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.53		H	pH units	1	10/18/2018 6:14:44 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	230	10		mg/L	10	10/24/2018 6:00:43 PM	41058
Iron	18	1.0	*	mg/L	50	10/24/2018 6:02:20 PM	41058
Magnesium	57	1.0		mg/L	1	10/18/2018 12:14:21 AM	41058
Manganese	0.80	0.0020	*	mg/L	1	10/18/2018 12:14:21 AM	41058
Potassium	1.1	1.0		mg/L	1	10/18/2018 12:14:21 AM	41058
Sodium	500	10		mg/L	10	10/24/2018 6:00:43 PM	41058
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Acenaphthene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Acenaphthylene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Anthracene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Benz(a)anthracene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Benzo(a)pyrene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Benzo(b)fluoranthene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Benzo(g,h,i)perylene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Benzo(k)fluoranthene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Chrysene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GRW-3
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 3:40:00 PM
Lab ID: 1810743-003 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Dibenz(a,h)anthracene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Fluoranthene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Fluorene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
1-Methylnaphthalene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
2-Methylnaphthalene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Naphthalene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Phenanthrene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Pyrene	ND	10		µg/L	1	10/18/2018 9:52:14 PM	40995
Surr: Nitrobenzene-d5	43.7	33.2-94		%Rec	1	10/18/2018 9:52:14 PM	40995
Surr: 2-Fluorobiphenyl	49.3	34-90.9		%Rec	1	10/18/2018 9:52:14 PM	40995
Surr: 4-Terphenyl-d14	75.8	15-149		%Rec	1	10/18/2018 9:52:14 PM	40995
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Toluene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Ethylbenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Naphthalene	ND	2.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
2-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Acetone	ND	10		µg/L	1	10/18/2018 6:36:00 PM	R54984
Bromobenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Bromodichloromethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Bromoform	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Bromomethane	ND	3.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
2-Butanone	ND	10		µg/L	1	10/18/2018 6:36:00 PM	R54984
Carbon disulfide	ND	10		µg/L	1	10/18/2018 6:36:00 PM	R54984
Carbon Tetrachloride	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Chlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Chloroethane	ND	2.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Chloroform	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Chloromethane	ND	3.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
2-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
4-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
cis-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GRW-3
Project: GBR Annual Sampling **Collection Date:** 10/11/2018 3:40:00 PM
Lab ID: 1810743-003 **Matrix:** AQUEOUS **Received Date:** 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Dibromochloromethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Dibromomethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,1-Dichloroethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,1-Dichloroethene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,3-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
2,2-Dichloropropane	ND	2.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,1-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Hexachlorobutadiene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
2-Hexanone	ND	10		µg/L	1	10/18/2018 6:36:00 PM	R54984
Isopropylbenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
4-Isopropyltoluene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
4-Methyl-2-pentanone	ND	10		µg/L	1	10/18/2018 6:36:00 PM	R54984
Methylene Chloride	ND	3.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
n-Butylbenzene	ND	3.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
n-Propylbenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
sec-Butylbenzene	1.5	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Styrene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
tert-Butylbenzene	3.6	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
trans-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Trichlorofluoromethane	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Vinyl chloride	ND	1.0		µg/L	1	10/18/2018 6:36:00 PM	R54984
Xylenes, Total	ND	1.5		µg/L	1	10/18/2018 6:36:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GRW-3
Project: GBR Annual Sampling
Collection Date: 10/11/2018 3:40:00 PM
Lab ID: 1810743-003
Matrix: AQUEOUS
Received Date: 10/12/2018 8:07:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Surr: 1,2-Dichloroethane-d4	99.4	70-130		%Rec	1	10/18/2018 6:36:00 PM	R54984
Surr: 4-Bromofluorobenzene	97.6	70-130		%Rec	1	10/18/2018 6:36:00 PM	R54984
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/18/2018 6:36:00 PM	R54984
Surr: Toluene-d8	95.9	70-130		%Rec	1	10/18/2018 6:36:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**

30-Oct-18

Client: Western Refining Southwest, Inc.

Project: GBR Annual Sampling

Sample ID	**MB-41058**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**PBW**	Batch ID:	**41058**	RunNo:	**54983**					
Prep Date:	**10/17/2018**	Analysis Date:	**10/17/2018**	SeqNo:	**1827394**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID	**LLLCS-41058**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID:	**41058**	RunNo:	**54983**					
Prep Date:	**10/17/2018**	Analysis Date:	**10/17/2018**	SeqNo:	**1827395**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0	0.5000	0	104	50	150			
Iron	0.025	0.020	0.02000	0	127	50	150			
Magnesium	ND	1.0	0.5000	0	99.2	50	150			
Manganese	0.0022	0.0020	0.002000	0	108	50	150			
Potassium	ND	1.0	0.5000	0	100	50	150			
Sodium	ND	1.0	0.5000	0	79.4	50	150			

Sample ID	**LCS-41058**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**LCSW**	Batch ID:	**41058**	RunNo:	**54983**					
Prep Date:	**10/17/2018**	Analysis Date:	**10/17/2018**	SeqNo:	**1827396**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	98.1	85	115			
Iron	0.50	0.020	0.5000	0	100	85	115			
Magnesium	48	1.0	50.00	0	96.7	85	115			
Manganese	0.50	0.0020	0.5000	0	101	85	115			
Potassium	48	1.0	50.00	0	95.2	85	115			
Sodium	48	1.0	50.00	0	96.1	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**
30-Oct-18

Client: Western Refining Southwest, Inc.
Project: GBR Annual Sampling

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R54864**	RunNo: **54864**
Prep Date:	Analysis Date: **10/12/2018**	SeqNo: **1823166** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R54864**	RunNo: **54864**
Prep Date:	Analysis Date: **10/12/2018**	SeqNo: **1823167** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.49	0.10	0.5000	0	97.4	90	110			
Chloride	4.7	0.50	5.000	0	94.9	90	110			
Nitrogen, Nitrite (As N)	0.97	0.10	1.000	0	97.4	90	110			
Bromide	2.4	0.10	2.500	0	96.7	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	97.3	90	110			
Sulfate	9.5	0.50	10.00	0	94.7	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R55111**	RunNo: **55111**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1831988** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R55111**	RunNo: **55111**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1831989** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.5	0.50	10.00	0	95.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**

30-Oct-18

Client: Western Refining Southwest, Inc.

Project: GBR Annual Sampling

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827896** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.8	70	130			
Toluene	19	1.0	20.00	0	96.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.4	70	130			
1,1-Dichloroethene	21	1.0	20.00	0	103	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	89.7	70	130			
Surr: 1,2-Dichloroethane-d4	9.6		10.00		96.0	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.5	70	130			
Surr: Dibromofluoromethane	9.9		10.00		98.6	70	130			
Surr: Toluene-d8	9.5		10.00		95.4	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827897** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**

30-Oct-18

Client: Western Refining Southwest, Inc.

Project: GBR Annual Sampling

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827897** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**
30-Oct-18

Client: Western Refining Southwest, Inc.
Project: GBR Annual Sampling

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827897** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		97.6	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.2	70	130			
Surr: Dibromofluoromethane	10		10.00		99.9	70	130			
Surr: Toluene-d8	9.5		10.00		94.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**
30-Oct-18

Client: Western Refining Southwest, Inc.
Project: GBR Annual Sampling

Sample ID **lcs-40995**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **40995**	RunNo: **54987**
Prep Date: **10/15/2018**	Analysis Date: **10/18/2018**	SeqNo: **1827975** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	72	10	100.0	0	71.9	55.1	104			
Pyrene	75	10	100.0	0	75.3	64.9	105			
Surr: 2-Fluorophenol	110		200.0		56.2	15	74.1			
Surr: Phenol-d5	110		200.0		57.0	15	59.8			
Surr: 2,4,6-Tribromophenol	140		200.0		69.2	22.1	112			
Surr: Nitrobenzene-d5	68		100.0		68.4	33.2	94			
Surr: 2-Fluorobiphenyl	67		100.0		67.5	34	90.9			
Surr: 4-Terphenyl-d14	78		100.0		77.6	15	149			

Sample ID **mb-40995**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **40995**	RunNo: **54987**
Prep Date: **10/15/2018**	Analysis Date: **10/18/2018**	SeqNo: **1827977** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Anthracene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Chrysene	ND	10								
Dibenz(a,h)anthracene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
Naphthalene	ND	10								
Phenanthrene	ND	10								
Pyrene	ND	10								
Surr: 2-Fluorophenol	130		200.0		63.4	15	74.1			
Surr: Phenol-d5	110		200.0		54.7	15	59.8			
Surr: 2,4,6-Tribromophenol	130		200.0		66.6	22.1	112			
Surr: Nitrobenzene-d5	70		100.0		70.1	33.2	94			
Surr: 2-Fluorobiphenyl	65		100.0		65.4	34	90.9			
Surr: 4-Terphenyl-d14	83		100.0		83.4	15	149			

Qualifiers:

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**

30-Oct-18

Client: Western Refining Southwest, Inc.

Project: GBR Annual Sampling

Sample ID	**lcsd-40995**	SampType:	**LCSD**	TestCode:	**EPA Method 8270C: Semivolatiles**					
Client ID:	**LCSS02**	Batch ID:	**40995**	RunNo:	**55106**					
Prep Date:	**10/15/2018**	Analysis Date:	**10/23/2018**	SeqNo:	**1831736**	Units:	**µg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	61	10	100.0	0	61.3	55.1	104	16.0	34.9	
Pyrene	74	10	100.0	0	74.3	64.9	105	1.36	30.7	
Surr: 2-Fluorophenol	96		200.0		48.0	15	74.1	0	0	
Surr: Phenol-d5	86		200.0		42.8	15	59.8	0	0	
Surr: 2,4,6-Tribromophenol	120		200.0		60.0	22.1	112	0	0	
Surr: Nitrobenzene-d5	55		100.0		55.4	33.2	94	0	0	
Surr: 2-Fluorobiphenyl	56		100.0		55.6	34	90.9	0	0	
Surr: 4-Terphenyl-d14	78		100.0		78.0	15	149	0	0	

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**

30-Oct-18

Client: Western Refining Southwest, Inc.

Project: GBR Annual Sampling

Sample ID	**lcs-1 98.3uS eC**	SampType:	**lcs**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829292**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	5.0	98.30	0	102	80	120			

Sample ID	**lcs-2 98.3uS eC**	SampType:	**lcs**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829318**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	5.0	98.30	0	106	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**
30-Oct-18

Client: Western Refining Southwest, Inc.
Project: GBR Annual Sampling

Sample ID **mb-1 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829250**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-1 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829251**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.16	20.00	80.00	0	96.4	90	110			

Sample ID **mb-2 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829275**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-2 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829276**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.48	20.00	80.00	0	96.8	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810743**

30-Oct-18

Client: Western Refining Southwest, Inc.

Project: GBR Annual Sampling

Sample ID	**MB-41026**	SampType:	**MBLK**		TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**PBW**	Batch ID:	**41026**		RunNo:	**54952**				
Prep Date:	**10/16/2018**	Analysis Date:	**10/17/2018**		SeqNo:	**1826150**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	**LCS-41026**	SampType:	**LCS**		TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**LCSW**	Batch ID:	**41026**		RunNo:	**54952**				
Prep Date:	**10/16/2018**	Analysis Date:	**10/17/2018**		SeqNo:	**1826151**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	999	20.0	1000	0	99.9	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1810743** RcptNo: **1**

Received By: **Victoria Zellar** 10/12/2018 8:07:00 AM Victoria Zellar

Completed By: **Erin Melendrez** 10/12/2018 9:07:21 AM

Reviewed By: VV2 10/12/18

Labeled By: IO 10/12/2018

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Client		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☐	No ☑	
8. Was preservative added to bottles?	Yes ☑	No ☐	NA ☐ 0.4mL HNO3
9. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: 3 (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? YES
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: IO 10/12/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

Poured off of 500mL unpres plastic in to 250mL plastic For Metals analysis. Added approx 0.4mL HNO3 to samples for acceptable pH level. Held for 24 hours prior analysis. IO 10/12/2018

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.3	Good	Yes			
2	2.7	Good	Yes			

Chain-of-Custody Record

Client: Western Refining
Alan Hains

Mailing Address:

Phone #: 970-385-1096

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name:
GBR Annual Sampling

Project #:

Project Manager:
Devin Horsman

Sampler: Josh Adams

On Ice: ☑ Yes ☐ No VVZ 10/12/18

Sample Temperature: 2 rads - 3.5-(0.5)0.6=3.3 3.5-(0.5)0.6=2.7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1810743	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See attached			Air Bubbles (Y or N)
10-11-18	1235	GW	BHS-8	various	various	-001												X			
↓	1415		GBR-51	↓	↓	-002												X			
↓	1540	↓	GRW-3	↓	↓	-003												X			

Date	Time	Relinquished by:	Received by:	Date	Time
10-11-18	1623			10/11/18	1623
10/11/18	1814		VVZ 10/12/18	10/12/18	807

Remarks: cc: dhorsman@iteny.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

GIANT BLOOMFIELD REFINERY
WESTERN REFINING
ATTACHMENT TO COC

SAMPLING CONDUCTED ON _____ BY _____

Sample ID	ANNUALLY (DEC)
GRW-3	VOC GWC PAH
GRW-6	VOC GWC PAH
GBR-17	VOC GWC PAH
GBR-24D	VOC GWC PAH
GBR-30	VOC GWC PAH
GBR-31	VOC GWC PAH
GBR-32	VOC GWC METALS
GBR-48	VOC GWC METALS
GBR-49	VOC GWC METALS
GBR-50	VOC GWC METALS
GBR-51	VOC GWC
GBR-52	VOC GWC
SHS-8	VOC GWC

Analysis	method	Bottle
VOC	method 8260	3 - HCL VOA

PAH	method 8270	1 - Liter Amber (non preserved)

GWC		
pH	SM 4500-H+B	1 - 500ml (non preserved)
EC	SM 2510B	
TDS	SM 2540C MOD	
alkaliaity	SM 2320B	
hardness	SM 2340B	
ANIONS	EPA Method 300.0	
	nitrate/nitrite	1 - 250ml H2SO4
	bromide	1 - 500ml HNO3
	chloride	
	sulfate	
	phosporus	
	fluoride	
CATIONS / METALS	EPA Method 200.7	
	calcium	
	iron	
	magnesium	
	manganese	
	potassium	
	sodium	
Metals	EPA Method 200.7	1 - 500ml HNO3
	barium	
	beryllium	
	cadmium	
	chromium	
	silver	
	lead	
	nickel	
	EPA 200.8	
	copper	
	zinc	
	antimony	
	arsenic	
	selenium	
	thallium	
	Epa Method 245.1	
	mercury	

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 12, 2018

Devin Hencmann

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX (505) 632-3911

RE: Giant Bloomfield Refining OrderNo.: 1810828

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 7 sample(s) on 10/16/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-30
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 1:40:00 PM
Lab ID: 1810828-001 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1400	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.62	0.10		mg/L	1	10/16/2018 1:12:30 PM	R54924
Chloride	250	10	*	mg/L	20	10/16/2018 1:24:54 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 1:12:30 PM	R54924
Bromide	0.77	0.10		mg/L	1	10/16/2018 1:12:30 PM	R54924
Nitrogen, Nitrate (As N)	1.8	0.10		mg/L	1	10/16/2018 1:12:30 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/16/2018 1:24:54 PM	R54924
Sulfate	1500	25	*	mg/L	50	10/23/2018 10:09:39 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3400	5.0		µmhos/c	1	10/18/2018 8:45:49 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	256.9	20.00		mg/L Ca	1	10/18/2018 8:45:49 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 8:45:49 PM	R55027
Total Alkalinity (as CaCO3)	256.9	20.00		mg/L Ca	1	10/18/2018 8:45:49 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	3000	100	*D	mg/L	1	10/18/2018 4:49:00 PM	41051
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.59		H	pH units	1	10/18/2018 8:45:49 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	480	10		mg/L	10	10/29/2018 3:47:25 PM	41098
Iron	28	1.0	*	mg/L	50	10/29/2018 3:49:24 PM	41098
Magnesium	43	1.0		mg/L	1	10/29/2018 3:45:17 PM	41098
Manganese	0.76	0.0020	*	mg/L	1	10/29/2018 3:45:17 PM	41098
Potassium	5.1	1.0		mg/L	1	10/29/2018 3:45:17 PM	41098
Sodium	420	10		mg/L	10	10/29/2018 3:47:25 PM	41098
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Naphthalene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
1-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
2-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Acenaphthylene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Acenaphthene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Fluorene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Phenanthrene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Anthracene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Fluoranthene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-30
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 1:40:00 PM
Lab ID: 1810828-001 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Pyrene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Benz(a)anthracene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Chrysene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Benzo(b)fluoranthene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Benzo(k)fluoranthene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Benzo(a)pyrene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Dibenz(a,h)anthracene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Benzo(g,h,i)perylene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Indeno(1,2,3-cd)pyrene	ND	0.50		µg/L	1	10/24/2018 4:29:42 PM	41072
Surr: N-hexadecane	85.2	35.2-113		%Rec	1	10/24/2018 4:29:42 PM	41072
Surr: Benzo(e)pyrene	104	48.3-123		%Rec	1	10/24/2018 4:29:42 PM	41072
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Toluene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Ethylbenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Naphthalene	ND	2.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Acetone	ND	10		µg/L	1	10/23/2018 2:28:59 AM	D55077
Bromobenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Bromoform	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Bromomethane	ND	3.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
2-Butanone	ND	10		µg/L	1	10/23/2018 2:28:59 AM	D55077
Carbon disulfide	ND	10		µg/L	1	10/23/2018 2:28:59 AM	D55077
Carbon Tetrachloride	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Chlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Chloroethane	ND	2.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Chloroform	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Chloromethane	ND	3.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-30
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 1:40:00 PM
Lab ID: 1810828-001 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Dibromomethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
2,2-Dichloropropane	ND	2.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
2-Hexanone	ND	10		µg/L	1	10/23/2018 2:28:59 AM	D55077
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2018 2:28:59 AM	D55077
Methylene Chloride	ND	3.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
n-Butylbenzene	ND	3.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Styrene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Vinyl chloride	ND	1.0		µg/L	1	10/23/2018 2:28:59 AM	D55077
Xylenes, Total	ND	1.5		µg/L	1	10/23/2018 2:28:59 AM	D55077
Surr: 1,2-Dichloroethane-d4	92.2	70-130		%Rec	1	10/23/2018 2:28:59 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GBR-30
Project: Giant Bloomfield Refining
Collection Date: 10/15/2018 1:40:00 PM
Lab ID: 1810828-001 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/23/2018 2:28:59 AM	D55077
Surr: Dibromofluoromethane	91.7	70-130		%Rec	1	10/23/2018 2:28:59 AM	D55077
Surr: Toluene-d8	94.8	70-130		%Rec	1	10/23/2018 2:28:59 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-31
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 3:05:00 PM
Lab ID: 1810828-002 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1300	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.50	0.10		mg/L	1	10/16/2018 1:37:18 PM	R54924
Chloride	220	10		mg/L	20	10/16/2018 1:49:42 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 1:37:18 PM	R54924
Bromide	1.1	0.10		mg/L	1	10/16/2018 1:37:18 PM	R54924
Nitrogen, Nitrate (As N)	ND	0.10		mg/L	1	10/16/2018 1:37:18 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	0.50		mg/L	1	10/16/2018 1:37:18 PM	R54924
Sulfate	1400	25	*	mg/L	50	10/23/2018 10:22:31 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3300	5.0		µmhos/c	1	10/18/2018 8:59:15 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	325.6	20.00		mg/L Ca	1	10/18/2018 8:59:15 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 8:59:15 PM	R55027
Total Alkalinity (as CaCO3)	325.6	20.00		mg/L Ca	1	10/18/2018 8:59:15 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2660	100	*D	mg/L	1	10/18/2018 4:49:00 PM	41051
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.57		H	pH units	1	10/18/2018 8:59:15 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	440	10		mg/L	10	10/29/2018 3:53:29 PM	41098
Iron	13	0.40	*	mg/L	20	11/1/2018 1:04:04 PM	41098
Magnesium	42	1.0		mg/L	1	10/29/2018 3:51:27 PM	41098
Manganese	3.1	0.020	*	mg/L	10	10/29/2018 3:53:29 PM	41098
Potassium	2.9	1.0		mg/L	1	10/29/2018 3:51:27 PM	41098
Sodium	390	10		mg/L	10	10/29/2018 3:53:29 PM	41098
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Naphthalene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
1-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
2-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Acenaphthylene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Acenaphthene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Fluorene	0.96	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Phenanthrene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Anthracene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Fluoranthene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-31
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 3:05:00 PM
Lab ID: 1810828-002 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Pyrene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Benz(a)anthracene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Chrysene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Benzo(b)fluoranthene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Benzo(k)fluoranthene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Benzo(a)pyrene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Dibenz(a,h)anthracene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Benzo(g,h,i)perylene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Indeno(1,2,3-cd)pyrene	ND	0.50		µg/L	1	10/24/2018 4:53:53 PM	41072
Surr: N-hexadecane	83.2	35.2-113		%Rec	1	10/24/2018 4:53:53 PM	41072
Surr: Benzo(e)pyrene	94.1	48.3-123		%Rec	1	10/24/2018 4:53:53 PM	41072
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Toluene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Ethylbenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Naphthalene	ND	2.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Acetone	ND	10		µg/L	1	10/23/2018 2:57:37 AM	D55077
Bromobenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Bromoform	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Bromomethane	ND	3.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
2-Butanone	ND	10		µg/L	1	10/23/2018 2:57:37 AM	D55077
Carbon disulfide	ND	10		µg/L	1	10/23/2018 2:57:37 AM	D55077
Carbon Tetrachloride	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Chlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Chloroethane	ND	2.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Chloroform	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Chloromethane	ND	3.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-31
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 3:05:00 PM
Lab ID: 1810828-002 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Dibromomethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
2,2-Dichloropropane	ND	2.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
2-Hexanone	ND	10		µg/L	1	10/23/2018 2:57:37 AM	D55077
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2018 2:57:37 AM	D55077
Methylene Chloride	ND	3.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
n-Butylbenzene	ND	3.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Styrene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Vinyl chloride	ND	1.0		µg/L	1	10/23/2018 2:57:37 AM	D55077
Xylenes, Total	ND	1.5		µg/L	1	10/23/2018 2:57:37 AM	D55077
Surr: 1,2-Dichloroethane-d4	90.9	70-130		%Rec	1	10/23/2018 2:57:37 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-31
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 3:05:00 PM
Lab ID: 1810828-002 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	1	10/23/2018 2:57:37 AM	D55077
Surr: Dibromofluoromethane	92.4	70-130		%Rec	1	10/23/2018 2:57:37 AM	D55077
Surr: Toluene-d8	95.4	70-130		%Rec	1	10/23/2018 2:57:37 AM	D55077

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-24D
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 2:15:00 PM
Lab ID: 1810828-003 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1300	6.6		mg/L	1	10/25/2018	R55178
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.92	0.10		mg/L	1	10/16/2018 2:02:06 PM	R54924
Chloride	130	10		mg/L	20	10/16/2018 2:14:30 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 2:02:06 PM	R54924
Bromide	0.60	0.10		mg/L	1	10/16/2018 2:02:06 PM	R54924
Nitrogen, Nitrate (As N)	ND	0.10		mg/L	1	10/16/2018 2:02:06 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/16/2018 2:14:30 PM	R54924
Sulfate	2300	50	*	mg/L	100	10/23/2018 10:35:23 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	4300	5.0		µmhos/c	1	10/18/2018 9:14:46 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	224.2	20.00		mg/L Ca	1	10/18/2018 9:14:46 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 9:14:46 PM	R55027
Total Alkalinity (as CaCO3)	224.2	20.00		mg/L Ca	1	10/18/2018 9:14:46 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	3780	100	*D	mg/L	1	10/18/2018 4:49:00 PM	41051
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.68		H	pH units	1	10/18/2018 9:14:46 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	460	10		mg/L	10	10/25/2018 7:52:41 PM	41098
Iron	9.1	0.20	*	mg/L	10	11/1/2018 1:06:05 PM	41098
Magnesium	41	1.0		mg/L	1	10/25/2018 7:50:37 PM	41098
Manganese	1.8	0.020	*	mg/L	10	10/25/2018 7:52:41 PM	41098
Potassium	7.5	1.0		mg/L	1	10/25/2018 7:50:37 PM	41098
Sodium	660	10		mg/L	10	10/25/2018 7:52:41 PM	41098
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Naphthalene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
1-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
2-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Acenaphthylene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Acenaphthene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Fluorene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Phenanthrene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Anthracene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Fluoranthene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-24D
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 2:15:00 PM
Lab ID: 1810828-003 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Pyrene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Benz(a)anthracene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Chrysene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Benzo(b)fluoranthene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Benzo(k)fluoranthene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Benzo(a)pyrene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Dibenz(a,h)anthracene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Benzo(g,h,i)perylene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Indeno(1,2,3-cd)pyrene	ND	0.50		µg/L	1	10/24/2018 5:18:06 PM	41072
Surr: N-hexadecane	53.8	35.2-113		%Rec	1	10/24/2018 5:18:06 PM	41072
Surr: Benzo(e)pyrene	80.1	48.3-123		%Rec	1	10/24/2018 5:18:06 PM	41072
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Toluene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Ethylbenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2-Dichloroethane (EDC)	1.2	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Naphthalene	ND	2.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Acetone	ND	10		µg/L	1	10/23/2018 3:26:14 AM	D55077
Bromobenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Bromoform	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Bromomethane	ND	3.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
2-Butanone	ND	10		µg/L	1	10/23/2018 3:26:14 AM	D55077
Carbon disulfide	ND	10		µg/L	1	10/23/2018 3:26:14 AM	D55077
Carbon Tetrachloride	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Chlorobenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Chloroethane	ND	2.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Chloroform	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Chloromethane	ND	3.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-24D
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 2:15:00 PM
Lab ID: 1810828-003 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Dibromomethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
2,2-Dichloropropane	ND	2.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
2-Hexanone	ND	10		µg/L	1	10/23/2018 3:26:14 AM	D55077
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2018 3:26:14 AM	D55077
Methylene Chloride	ND	3.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
n-Butylbenzene	ND	3.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Styrene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Vinyl chloride	ND	1.0		µg/L	1	10/23/2018 3:26:14 AM	D55077
Xylenes, Total	ND	1.5		µg/L	1	10/23/2018 3:26:14 AM	D55077
Surr: 1,2-Dichloroethane-d4	94.0	70-130		%Rec	1	10/23/2018 3:26:14 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-24D
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 2:15:00 PM
Lab ID: 1810828-003 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	10/23/2018 3:26:14 AM	D55077
Surr: Dibromofluoromethane	91.6	70-130		%Rec	1	10/23/2018 3:26:14 AM	D55077
Surr: Toluene-d8	97.4	70-130		%Rec	1	10/23/2018 3:26:14 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-49
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 1:00:00 PM
Lab ID: 1810828-004 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Antimony	ND	0.0010		mg/L	1	10/31/2018 10:25:14 AM	41210
Arsenic	0.012	0.0010	*	mg/L	1	10/29/2018 7:47:09 PM	41210
Copper	0.032	0.0010		mg/L	1	10/29/2018 7:47:09 PM	41210
Lead	0.015	0.00050		mg/L	1	10/29/2018 7:47:09 PM	41210
Selenium	0.0048	0.0010		mg/L	1	10/29/2018 7:47:09 PM	41210
Thallium	ND	0.00050		mg/L	1	10/29/2018 7:47:09 PM	41210
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1200	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.52	0.10		mg/L	1	10/16/2018 2:26:54 PM	R54924
Chloride	180	10		mg/L	20	10/16/2018 2:39:18 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 2:26:54 PM	R54924
Bromide	0.47	0.10		mg/L	1	10/16/2018 2:26:54 PM	R54924
Nitrogen, Nitrate (As N)	0.84	0.10		mg/L	1	10/16/2018 2:26:54 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/16/2018 2:39:18 PM	R54924
Sulfate	1800	25	*	mg/L	50	10/23/2018 10:48:15 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3600	5.0		µmhos/c	1	10/18/2018 9:31:43 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	210.6	20.00		mg/L Ca	1	10/18/2018 9:31:43 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 9:31:43 PM	R55027
Total Alkalinity (as CaCO3)	210.6	20.00		mg/L Ca	1	10/18/2018 9:31:43 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	3010	200	*D	mg/L	1	10/18/2018 4:49:00 PM	41051
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.24		H	pH units	1	10/18/2018 9:31:43 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Barium	0.22	0.0020		mg/L	1	10/29/2018 7:07:25 PM	41210
Beryllium	ND	0.0020		mg/L	1	10/29/2018 7:07:25 PM	41210
Cadmium	ND	0.0020		mg/L	1	10/29/2018 7:07:25 PM	41210
Calcium	420	5.0		mg/L	5	10/30/2018 7:28:36 PM	41210
Chromium	1.2	0.030	*	mg/L	5	10/30/2018 7:28:36 PM	41210
Iron	23	1.0	*	mg/L	50	10/30/2018 7:30:46 PM	41210
Magnesium	39	1.0		mg/L	1	10/30/2018 7:26:34 PM	41210
Manganese	0.98	0.0020	*	mg/L	1	10/29/2018 7:07:25 PM	41210
Nickel	0.39	0.010	*	mg/L	1	10/29/2018 7:07:25 PM	41210

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-49
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 1:00:00 PM
Lab ID: 1810828-004 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Potassium	4.9	1.0		mg/L	1	10/30/2018 7:26:34 PM	41210
Silver	0.0072	0.0050		mg/L	1	10/29/2018 7:07:25 PM	41210
Sodium	440	5.0		mg/L	5	10/30/2018 7:28:36 PM	41210
Zinc	0.14	0.010		mg/L	1	11/7/2018 4:29:21 PM	41346
EPA METHOD 245.1: MERCURY						Analyst: **rde**	
Mercury	ND	0.00020		mg/L	1	10/31/2018 3:58:54 PM	41267
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Toluene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Ethylbenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Naphthalene	ND	2.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Acetone	ND	10		µg/L	1	10/23/2018 4:51:47 AM	D55077
Bromobenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Bromoform	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Bromomethane	ND	3.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
2-Butanone	ND	10		µg/L	1	10/23/2018 4:51:47 AM	D55077
Carbon disulfide	ND	10		µg/L	1	10/23/2018 4:51:47 AM	D55077
Carbon Tetrachloride	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Chlorobenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Chloroethane	ND	2.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Chloroform	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Chloromethane	ND	3.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Dibromomethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-49
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 1:00:00 PM
Lab ID: 1810828-004 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
2,2-Dichloropropane	ND	2.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
2-Hexanone	ND	10		µg/L	1	10/23/2018 4:51:47 AM	D55077
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2018 4:51:47 AM	D55077
Methylene Chloride	ND	3.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
n-Butylbenzene	ND	3.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Styrene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Vinyl chloride	ND	1.0		µg/L	1	10/23/2018 4:51:47 AM	D55077
Xylenes, Total	ND	1.5		µg/L	1	10/23/2018 4:51:47 AM	D55077
Surr: 1,2-Dichloroethane-d4	92.4	70-130		%Rec	1	10/23/2018 4:51:47 AM	D55077
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/23/2018 4:51:47 AM	D55077
Surr: Dibromofluoromethane	92.0	70-130		%Rec	1	10/23/2018 4:51:47 AM	D55077
Surr: Toluene-d8	97.7	70-130		%Rec	1	10/23/2018 4:51:47 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-32
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 12:25:00 PM
Lab ID: 1810828-005 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Antimony	ND	0.0010		mg/L	1	10/31/2018 10:27:35 AM	41210
Arsenic	0.0025	0.0010		mg/L	1	10/29/2018 7:49:30 PM	41210
Copper	0.0047	0.0010		mg/L	1	10/29/2018 7:49:30 PM	41210
Lead	0.00096	0.00050		mg/L	1	10/29/2018 7:49:30 PM	41210
Selenium	0.0010	0.0010		mg/L	1	10/29/2018 7:49:30 PM	41210
Thallium	ND	0.00050		mg/L	1	10/29/2018 7:49:30 PM	41210
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1300	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.39	0.10		mg/L	1	10/16/2018 3:16:31 PM	R54924
Chloride	200	10		mg/L	20	10/16/2018 3:28:56 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 3:16:31 PM	R54924
Bromide	0.47	0.10		mg/L	1	10/16/2018 3:16:31 PM	R54924
Nitrogen, Nitrate (As N)	0.65	0.10		mg/L	1	10/16/2018 3:16:31 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/16/2018 3:28:56 PM	R54924
Sulfate	1700	25	*	mg/L	50	10/23/2018 11:26:48 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3700	5.0		µmhos/c	1	10/18/2018 9:59:03 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	275.4	20.00		mg/L Ca	1	10/18/2018 9:59:03 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 9:59:03 PM	R55027
Total Alkalinity (as CaCO3)	275.4	20.00		mg/L Ca	1	10/18/2018 9:59:03 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	3110	40.0	*D	mg/L	1	10/18/2018 4:49:00 PM	41051
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.71		H	pH units	1	10/18/2018 9:59:03 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Barium	0.021	0.0020		mg/L	1	10/29/2018 7:18:11 PM	41210
Beryllium	ND	0.0020		mg/L	1	10/29/2018 7:18:11 PM	41210
Cadmium	ND	0.0020		mg/L	1	10/29/2018 7:18:11 PM	41210
Calcium	430	5.0		mg/L	5	11/1/2018 1:08:12 PM	41210
Chromium	0.074	0.0060		mg/L	1	10/29/2018 7:18:11 PM	41210
Iron	2.7	0.10	*	mg/L	5	11/1/2018 1:08:12 PM	41210
Magnesium	42	1.0		mg/L	1	10/30/2018 7:33:00 PM	41210
Manganese	1.9	0.010	*	mg/L	5	11/1/2018 1:08:12 PM	41210
Nickel	0.086	0.010		mg/L	1	10/29/2018 7:18:11 PM	41210

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-32
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 12:25:00 PM
Lab ID: 1810828-005 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Potassium	2.0	1.0		mg/L	1	10/30/2018 7:33:00 PM	41210
Silver	0.011	0.0050		mg/L	1	10/29/2018 7:18:11 PM	41210
Sodium	490	5.0		mg/L	5	11/8/2018 3:20:41 PM	41346
Zinc	0.012	0.010		mg/L	1	11/7/2018 4:37:48 PM	41346
EPA METHOD 245.1: MERCURY						Analyst: **rde**	
Mercury	ND	0.00020		mg/L	1	10/31/2018 4:05:34 PM	41267
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Toluene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Ethylbenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Naphthalene	ND	2.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Acetone	ND	10		µg/L	1	10/23/2018 5:20:20 AM	D55077
Bromobenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Bromoform	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Bromomethane	ND	3.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
2-Butanone	ND	10		µg/L	1	10/23/2018 5:20:20 AM	D55077
Carbon disulfide	ND	10		µg/L	1	10/23/2018 5:20:20 AM	D55077
Carbon Tetrachloride	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Chlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Chloroethane	ND	2.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Chloroform	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Chloromethane	ND	3.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Dibromomethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-32
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 12:25:00 PM
Lab ID: 1810828-005 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
2,2-Dichloropropane	ND	2.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
2-Hexanone	ND	10		µg/L	1	10/23/2018 5:20:20 AM	D55077
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2018 5:20:20 AM	D55077
Methylene Chloride	ND	3.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
n-Butylbenzene	ND	3.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Styrene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Vinyl chloride	ND	1.0		µg/L	1	10/23/2018 5:20:20 AM	D55077
Xylenes, Total	ND	1.5		µg/L	1	10/23/2018 5:20:20 AM	D55077
Surr: 1,2-Dichloroethane-d4	91.2	70-130		%Rec	1	10/23/2018 5:20:20 AM	D55077
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/23/2018 5:20:20 AM	D55077
Surr: Dibromofluoromethane	92.9	70-130		%Rec	1	10/23/2018 5:20:20 AM	D55077
Surr: Toluene-d8	96.9	70-130		%Rec	1	10/23/2018 5:20:20 AM	D55077

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-48
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 11:50:00 AM
Lab ID: 1810828-006 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Antimony	ND	0.0010		mg/L	1	10/31/2018 10:34:37 AM	41210
Arsenic	0.0054	0.0010		mg/L	1	10/29/2018 7:56:32 PM	41210
Copper	0.018	0.0010		mg/L	1	10/29/2018 7:56:32 PM	41210
Lead	0.011	0.00050		mg/L	1	10/29/2018 7:56:32 PM	41210
Selenium	0.0088	0.0010		mg/L	1	10/29/2018 7:56:32 PM	41210
Thallium	ND	0.00050		mg/L	1	10/29/2018 7:56:32 PM	41210
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1500	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.34	0.10		mg/L	1	10/16/2018 3:41:20 PM	R54924
Chloride	300	10	*	mg/L	20	10/16/2018 3:53:45 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 3:41:20 PM	R54924
Bromide	0.79	0.10		mg/L	1	10/16/2018 3:41:20 PM	R54924
Nitrogen, Nitrate (As N)	2.7	2.0		mg/L	20	10/16/2018 3:53:45 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/16/2018 3:53:45 PM	R54924
Sulfate	1800	50	*	mg/L	100	10/23/2018 11:39:41 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	4100	5.0		µmhos/c	1	10/18/2018 10:12:55 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	286.4	20.00		mg/L Ca	1	10/18/2018 10:12:55 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 10:12:55 PM	R55027
Total Alkalinity (as CaCO3)	286.4	20.00		mg/L Ca	1	10/18/2018 10:12:55 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	3580	100	*D	mg/L	1	10/18/2018 4:49:00 PM	41051
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.57		H	pH units	1	10/18/2018 10:12:55 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Barium	0.13	0.0020		mg/L	1	10/29/2018 7:22:34 PM	41210
Beryllium	ND	0.0020		mg/L	1	10/29/2018 7:22:34 PM	41210
Cadmium	ND	0.0020		mg/L	1	10/29/2018 7:22:34 PM	41210
Calcium	500	20		mg/L	20	10/30/2018 7:37:03 PM	41210
Chromium	0.036	0.0060		mg/L	1	10/29/2018 7:22:34 PM	41210
Iron	18	0.40	*	mg/L	20	10/30/2018 7:37:03 PM	41210
Magnesium	50	1.0		mg/L	1	10/30/2018 7:35:02 PM	41210
Manganese	0.49	0.0020	*	mg/L	1	10/29/2018 7:22:34 PM	41210
Nickel	0.067	0.010		mg/L	1	10/29/2018 7:22:34 PM	41210

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-48
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 11:50:00 AM
Lab ID: 1810828-006 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Potassium	5.7	1.0		mg/L	1	10/30/2018 7:35:02 PM	41210
Silver	0.0094	0.0050		mg/L	1	10/29/2018 7:22:34 PM	41210
Sodium	550	20		mg/L	20	10/30/2018 7:37:03 PM	41210
Zinc	0.040	0.010		mg/L	1	11/7/2018 4:39:51 PM	41346
EPA METHOD 245.1: MERCURY						Analyst: **rde**	
Mercury	ND	0.00020		mg/L	1	10/31/2018 4:07:48 PM	41267
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Toluene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Ethylbenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Naphthalene	ND	2.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Acetone	ND	10		µg/L	1	10/23/2018 5:48:54 AM	D55077
Bromobenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Bromoform	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Bromomethane	ND	3.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
2-Butanone	ND	10		µg/L	1	10/23/2018 5:48:54 AM	D55077
Carbon disulfide	ND	10		µg/L	1	10/23/2018 5:48:54 AM	D55077
Carbon Tetrachloride	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Chlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Chloroethane	ND	2.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Chloroform	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Chloromethane	ND	3.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Dibromomethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077

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Hall Environmental Analysis Laboratory, Inc.

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Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 11:50:00 AM
Lab ID: 1810828-006 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
2,2-Dichloropropane	ND	2.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
2-Hexanone	ND	10		µg/L	1	10/23/2018 5:48:54 AM	D55077
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2018 5:48:54 AM	D55077
Methylene Chloride	ND	3.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
n-Butylbenzene	ND	3.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Styrene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Tetrachloroethene (PCE)	1.2	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Vinyl chloride	ND	1.0		µg/L	1	10/23/2018 5:48:54 AM	D55077
Xylenes, Total	ND	1.5		µg/L	1	10/23/2018 5:48:54 AM	D55077
Surr: 1,2-Dichloroethane-d4	87.5	70-130		%Rec	1	10/23/2018 5:48:54 AM	D55077
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/23/2018 5:48:54 AM	D55077
Surr: Dibromofluoromethane	89.9	70-130		%Rec	1	10/23/2018 5:48:54 AM	D55077
Surr: Toluene-d8	96.2	70-130		%Rec	1	10/23/2018 5:48:54 AM	D55077

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Qualifiers:

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PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-50
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 11:20:00 AM
Lab ID: 1810828-007 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Antimony	ND	0.0010		mg/L	1	10/31/2018 10:36:58 AM	41210
Arsenic	0.0032	0.0010		mg/L	1	10/29/2018 7:58:53 PM	41210
Copper	0.0036	0.0010		mg/L	1	10/31/2018 10:36:58 AM	41210
Lead	0.0021	0.00050		mg/L	1	10/29/2018 7:58:53 PM	41210
Selenium	0.0066	0.0010		mg/L	1	10/29/2018 7:58:53 PM	41210
Thallium	ND	0.00050		mg/L	1	10/29/2018 7:58:53 PM	41210
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1300	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.60	0.10		mg/L	1	10/16/2018 4:06:09 PM	R54924
Chloride	59	10		mg/L	20	10/16/2018 4:18:33 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 4:06:09 PM	R54924
Bromide	0.28	0.10		mg/L	1	10/16/2018 4:06:09 PM	R54924
Nitrogen, Nitrate (As N)	6.9	2.0		mg/L	20	10/16/2018 4:18:33 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/16/2018 4:18:33 PM	R54924
Sulfate	1700	25	*	mg/L	50	10/23/2018 11:52:32 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3000	5.0		µmhos/c	1	10/18/2018 10:27:18 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	187.6	20.00		mg/L Ca	1	10/18/2018 10:27:18 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 10:27:18 PM	R55027
Total Alkalinity (as CaCO3)	187.6	20.00		mg/L Ca	1	10/18/2018 10:27:18 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2770	40.0	*D	mg/L	1	10/18/2018 4:49:00 PM	41051
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.58		H	pH units	1	10/18/2018 10:27:18 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Barium	0.023	0.0020		mg/L	1	10/29/2018 7:26:46 PM	41210
Beryllium	ND	0.0020		mg/L	1	10/29/2018 7:26:46 PM	41210
Cadmium	ND	0.0020		mg/L	1	10/29/2018 7:26:46 PM	41210
Calcium	460	5.0		mg/L	5	11/1/2018 1:10:18 PM	41210
Chromium	0.044	0.0060		mg/L	1	10/29/2018 7:26:46 PM	41210
Iron	4.0	0.10	*	mg/L	5	11/1/2018 1:10:18 PM	41210
Magnesium	35	1.0		mg/L	1	10/30/2018 7:39:07 PM	41210
Manganese	0.13	0.0020	*	mg/L	1	10/29/2018 7:26:46 PM	41210
Nickel	0.035	0.010		mg/L	1	10/29/2018 7:26:46 PM	41210

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-50
Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 11:20:00 AM
Lab ID: 1810828-007 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Potassium	2.2	1.0		mg/L	1	10/30/2018 7:39:07 PM	41210
Silver	0.011	0.0050		mg/L	1	10/29/2018 7:26:46 PM	41210
Sodium	340	5.0		mg/L	5	11/8/2018 3:22:38 PM	41346
Zinc	0.015	0.010		mg/L	1	11/7/2018 4:41:56 PM	41346
EPA METHOD 245.1: MERCURY						Analyst: **rde**	
Mercury	ND	0.00020		mg/L	1	10/31/2018 4:10:03 PM	41267
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Toluene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Ethylbenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Naphthalene	ND	2.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
2-Methylnaphthalene	ND	4.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Acetone	ND	10		µg/L	1	10/23/2018 6:17:30 AM	D55077
Bromobenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Bromodichloromethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Bromoform	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Bromomethane	ND	3.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
2-Butanone	ND	10		µg/L	1	10/23/2018 6:17:30 AM	D55077
Carbon disulfide	ND	10		µg/L	1	10/23/2018 6:17:30 AM	D55077
Carbon Tetrachloride	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Chlorobenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Chloroethane	ND	2.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Chloroform	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Chloromethane	ND	3.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
2-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
4-Chlorotoluene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
cis-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Dibromochloromethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Dibromomethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077

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Hall Environmental Analysis Laboratory, Inc.

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Project: Giant Bloomfield Refining **Collection Date:** 10/15/2018 11:20:00 AM
Lab ID: 1810828-007 **Matrix:** AQUEOUS **Received Date:** 10/16/2018 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,1-Dichloroethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,1-Dichloroethene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,3-Dichloropropane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
2,2-Dichloropropane	ND	2.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,1-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Hexachlorobutadiene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
2-Hexanone	ND	10		µg/L	1	10/23/2018 6:17:30 AM	D55077
Isopropylbenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
4-Isopropyltoluene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
4-Methyl-2-pentanone	ND	10		µg/L	1	10/23/2018 6:17:30 AM	D55077
Methylene Chloride	ND	3.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
n-Butylbenzene	ND	3.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
n-Propylbenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
sec-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Styrene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
tert-Butylbenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
trans-1,2-DCE	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Trichlorofluoromethane	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Vinyl chloride	ND	1.0		µg/L	1	10/23/2018 6:17:30 AM	D55077
Xylenes, Total	ND	1.5		µg/L	1	10/23/2018 6:17:30 AM	D55077
Surr: 1,2-Dichloroethane-d4	90.5	70-130		%Rec	1	10/23/2018 6:17:30 AM	D55077
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/23/2018 6:17:30 AM	D55077
Surr: Dibromofluoromethane	91.7	70-130		%Rec	1	10/23/2018 6:17:30 AM	D55077
Surr: Toluene-d8	98.0	70-130		%Rec	1	10/23/2018 6:17:30 AM	D55077

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**MB-41098**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**PBW**	Batch ID:	**41098**	RunNo:	**55103**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/23/2018**	SeqNo:	**1832203**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Potassium	ND	1.0								

Sample ID	**LLLCS-41098**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID:	**41098**	RunNo:	**55103**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/23/2018**	SeqNo:	**1832204**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0	0.5000	0	96.7	50	150			
Iron	0.023	0.020	0.02000	0	113	50	150			
Magnesium	ND	1.0	0.5000	0	95.2	50	150			
Manganese	ND	0.0020	0.002000	0	95.5	50	150			
Potassium	ND	1.0	0.5000	0	110	50	150			

Sample ID	**LCS-41098**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**LCSW**	Batch ID:	**41098**	RunNo:	**55103**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/23/2018**	SeqNo:	**1832205**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	44	1.0	50.00	0	87.1	85	115			
Iron	0.50	0.020	0.5000	0	99.6	85	115			
Magnesium	45	1.0	50.00	0	89.4	85	115			
Manganese	0.49	0.0020	0.5000	0	97.4	85	115			
Potassium	44	1.0	50.00	0	88.4	85	115			

Sample ID	**MB-41098**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**PBW**	Batch ID:	**41098**	RunNo:	**55178**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**	SeqNo:	**1834489**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID	**LLLCS-41098**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID:	**41098**	RunNo:	**55178**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**	SeqNo:	**1834490**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**LLLCS-41098**	SampType:	**LCSLL**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**BatchQC**	Batch ID:	**41098**		RunNo:	**55178**				
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**		SeqNo:	**1834490**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0	0.5000	0	94.8	50	150			

Sample ID	**LCS-41098**	SampType:	**LCS**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**LCSW**	Batch ID:	**41098**		RunNo:	**55178**				
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**		SeqNo:	**1834491**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	52	1.0	50.00	0	103	85	115			

Sample ID	**MB-41210**	SampType:	**MBLK**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**PBW**	Batch ID:	**41210**		RunNo:	**55244**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**		SeqNo:	**1837491**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Iron	ND	0.020								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Nickel	ND	0.010								
Potassium	ND	1.0								
Silver	ND	0.0050								
Sodium	ND	1.0								

Sample ID	**LLLCS-41210**	SampType:	**LCSLL**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**BatchQC**	Batch ID:	**41210**		RunNo:	**55244**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**		SeqNo:	**1837492**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	100	50	150			
Beryllium	ND	0.0020	0.002000	0	97.0	50	150			
Cadmium	0.0023	0.0020	0.002000	0	115	50	150			
Calcium	ND	1.0	0.5000	0	101	50	150			
Chromium	ND	0.0060	0.006000	0	98.8	50	150			
Iron	0.020	0.020	0.02000	0	102	50	150			
Magnesium	ND	1.0	0.5000	0	102	50	150			
Manganese	0.0021	0.0020	0.002000	0	106	50	150			

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**LLLCS-41210**	SampType:	**LCSLL**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**BatchQC**	Batch ID:	**41210**		RunNo:	**55244**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**		SeqNo:	**1837492**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nickel	ND	0.010	0.005000	0	88.0	50	150			
Potassium	ND	1.0	0.5000	0	84.1	50	150			
Silver	0.0052	0.0050	0.005000	0	104	50	150			
Sodium	ND	1.0	0.5000	0	146	50	150			

Sample ID	**LCS-41210**	SampType:	**LCS**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**LCSW**	Batch ID:	**41210**		RunNo:	**55244**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**		SeqNo:	**1837493**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	98.9	85	115			
Beryllium	0.50	0.0020	0.5000	0	100	85	115			
Cadmium	0.49	0.0020	0.5000	0	98.3	85	115			
Calcium	47	1.0	50.00	0	94.8	85	115			
Chromium	0.49	0.0060	0.5000	0	98.2	85	115			
Iron	0.49	0.020	0.5000	0	98.3	85	115			
Magnesium	49	1.0	50.00	0	98.2	85	115			
Manganese	0.48	0.0020	0.5000	0	96.7	85	115			
Nickel	0.49	0.010	0.5000	0	97.4	85	115			
Potassium	47	1.0	50.00	0	94.9	85	115			
Silver	0.11	0.0050	0.1000	0	108	85	115			
Sodium	49	1.0	50.00	0	97.5	85	115			

Sample ID	**MB-41346**	SampType:	**MBLK**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**PBW**	Batch ID:	**41346**		RunNo:	**55469**				
Prep Date:	**11/5/2018**	Analysis Date:	**11/7/2018**		SeqNo:	**1847080**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								
Zinc	ND	0.010								

Sample ID	**LLLCS-41346**	SampType:	**LCSLL**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**BatchQC**	Batch ID:	**41346**		RunNo:	**55469**				
Prep Date:	**11/5/2018**	Analysis Date:	**11/7/2018**		SeqNo:	**1847081**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0	0.5000	0	129	50	150			
Zinc	ND	0.010	0.005000	0	147	50	150			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**LCS-41346**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**LCSW**	Batch ID:	**41346**	RunNo:	**55469**					
Prep Date:	**11/5/2018**	Analysis Date:	**11/7/2018**	SeqNo:	**1847082**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	49	1.0	50.00	0	98.8	85	115			
Zinc	0.51	0.010	0.5000	0	101	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**MB-41210**	SampType:	**MBLK**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**PBW**	Batch ID:	**41210**	RunNo:	**55267**					
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**	SeqNo:	**1838460**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Copper	ND	0.0010								
Lead	ND	0.00050								
Selenium	ND	0.0010								
Thallium	ND	0.00050								

Sample ID	**MSLLLCS-41210**	SampType:	**LCSLL**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**BatchQC**	Batch ID:	**41210**	RunNo:	**55267**					
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**	SeqNo:	**1838462**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0011	0.0010	0.001000	0	107	50	150			
Copper	0.0011	0.0010	0.001000	0	111	50	150			
Lead	0.00050	0.00050	0.0005000	0	101	50	150			
Selenium	0.0010	0.0010	0.001000	0	105	50	150			
Thallium	ND	0.00050	0.0005000	0	91.5	50	150			

Sample ID	**MSLCS-41210**	SampType:	**LCS**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**LCSW**	Batch ID:	**41210**	RunNo:	**55267**					
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**	SeqNo:	**1838464**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.025	0.0010	0.02500	0	102	85	115			
Copper	0.026	0.0010	0.02500	0	104	85	115			
Lead	0.013	0.00050	0.01250	0	100	85	115			
Selenium	0.025	0.0010	0.02500	0	101	85	115			
Thallium	0.013	0.00050	0.01250	0	100	85	115			

Sample ID	**1810828-005CMSLL**	SampType:	**MSLL**	TestCode:	**EPA 200.8: Metals**					
Client ID:	**GBR-32**	Batch ID:	**41210**	RunNo:	**55267**					
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**	SeqNo:	**1838478**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.029	0.0010	0.02500	0.002511	106	70	130			
Copper	0.028	0.0010	0.02500	0.004665	95.1	70	130			
Lead	0.013	0.00050	0.01250	0.0009640	99.0	70	130			
Selenium	0.026	0.0010	0.02500	0.001014	102	70	130			
Thallium	0.013	0.00050	0.01250	0	100	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**1810828-005CMSDL**	SampType:	**MSDLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**GBR-32**	Batch ID:	**41210**		RunNo:	**55267**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**		SeqNo:	**1838479**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.030	0.0010	0.02500	0.002511	109	70	130	2.23	20	
Copper	0.029	0.0010	0.02500	0.004665	97.4	70	130	1.96	20	
Lead	0.014	0.00050	0.01250	0.0009640	101	70	130	1.73	20	
Selenium	0.027	0.0010	0.02500	0.001014	103	70	130	1.03	20	
Thallium	0.013	0.00050	0.01250	0	102	70	130	1.74	20	

Sample ID	**1810828-007CMSLL**	SampType:	**MSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**GBR-50**	Batch ID:	**41210**		RunNo:	**55267**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/29/2018**		SeqNo:	**1838484**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.030	0.0010	0.02500	0.003235	105	70	130			
Lead	0.014	0.00050	0.01250	0.002125	98.8	70	130			
Selenium	0.031	0.0010	0.02500	0.006615	99.5	70	130			
Thallium	0.012	0.00050	0.01250	0	99.1	70	130			

Sample ID	**MB-41210**	SampType:	**MBLK**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**PBW**	Batch ID:	**41210**		RunNo:	**55293**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/31/2018**		SeqNo:	**1839652**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								

Sample ID	**MSLLLCS-41210**	SampType:	**LCSLL**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**BatchQC**	Batch ID:	**41210**		RunNo:	**55293**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/31/2018**		SeqNo:	**1839653**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.0011	0.0010	0.001000	0	115	50	150			

Sample ID	**MSLCS-41210**	SampType:	**LCS**		TestCode:	**EPA 200.8: Metals**				
Client ID:	**LCSW**	Batch ID:	**41210**		RunNo:	**55293**				
Prep Date:	**10/26/2018**	Analysis Date:	**10/31/2018**		SeqNo:	**1839654**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.027	0.0010	0.02500	0	108	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID **1810828-005CMSLL** SampType: **MSLL** TestCode: **EPA 200.8: Metals**

Client ID: **GBR-32** Batch ID: **41210** RunNo: **55293**

Prep Date: **10/26/2018** Analysis Date: **10/31/2018** SeqNo: **1839667** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.026	0.0010	0.02500	0	105	70	130			

Sample ID **1810828-005CMSDL** SampType: **MSDLL** TestCode: **EPA 200.8: Metals**

Client ID: **GBR-32** Batch ID: **41210** RunNo: **55293**

Prep Date: **10/26/2018** Analysis Date: **10/31/2018** SeqNo: **1839668** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.027	0.0010	0.02500	0	107	70	130	1.84	20	

Sample ID **1810828-007CMSLL** SampType: **MSLL** TestCode: **EPA 200.8: Metals**

Client ID: **GBR-50** Batch ID: **41210** RunNo: **55293**

Prep Date: **10/26/2018** Analysis Date: **10/31/2018** SeqNo: **1839671** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.024	0.0010	0.02500	0	97.6	70	130			
Copper	0.036	0.0010	0.02500	0.003619	128	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**MB-41267**	SampType:	**MBLK**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**PBW**	Batch ID:	**41267**	RunNo:	**55306**					
Prep Date:	**10/30/2018**	Analysis Date:	**10/31/2018**	SeqNo:	**1839934**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	**LCS-41267**	SampType:	**LCS**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**LCSW**	Batch ID:	**41267**	RunNo:	**55306**					
Prep Date:	**10/30/2018**	Analysis Date:	**10/31/2018**	SeqNo:	**1839935**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	98.8	80	120			

Sample ID	**1810828-004CMS**	SampType:	**MS**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**GBR-49**	Batch ID:	**41267**	RunNo:	**55306**					
Prep Date:	**10/30/2018**	Analysis Date:	**10/31/2018**	SeqNo:	**1839937**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0050	0.00020	0.005000	.00007223	97.6	75	125			

Sample ID	**1810828-004CMSD**	SampType:	**MSD**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**GBR-49**	Batch ID:	**41267**	RunNo:	**55306**					
Prep Date:	**10/30/2018**	Analysis Date:	**10/31/2018**	SeqNo:	**1839938**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	.00007223	96.9	75	125	0.709	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R54924**	RunNo: **54924**
Prep Date:	Analysis Date: **10/16/2018**	SeqNo: **1825722** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R54924**	RunNo: **54924**
Prep Date:	Analysis Date: **10/16/2018**	SeqNo: **1825723** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Chloride	4.8	0.50	5.000	0	95.9	90	110			
Nitrogen, Nitrite (As N)	0.99	0.10	1.000	0	98.5	90	110			
Bromide	2.5	0.10	2.500	0	98.3	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	102	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	98.3	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A55111**	RunNo: **55111**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1832031** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A55111**	RunNo: **55111**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1832032** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.5	0.50	10.00	0	95.2	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID **1810828-003ams**	SampType: **MS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **GBR-24D**	Batch ID: **D55077**	RunNo: **55077**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1831050** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	92.7	60.5	137			
Toluene	19	1.0	20.00	0	93.7	70	130			
Chlorobenzene	19	1.0	20.00	0	94.4	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	97.8	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.5	70	130			
Surr: 1,2-Dichloroethane-d4	9.1		10.00		91.3	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.7	70	130			
Surr: Dibromofluoromethane	9.1		10.00		90.6	70	130			
Surr: Toluene-d8	9.5		10.00		95.2	70	130			

Sample ID **1810828-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **GBR-24D**	Batch ID: **D55077**	RunNo: **55077**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1831051** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	17	1.0	20.00	0	85.8	60.5	137	7.63	20	
Toluene	18	1.0	20.00	0	88.8	70	130	5.36	20	
Chlorobenzene	19	1.0	20.00	0	93.1	70	130	1.36	20	
1,1-Dichloroethene	18	1.0	20.00	0	87.8	70	130	10.7	20	
Trichloroethene (TCE)	16	1.0	20.00	0	78.6	70	130	4.79	20	
Surr: 1,2-Dichloroethane-d4	9.0		10.00		90.4	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130	0	0	
Surr: Dibromofluoromethane	9.3		10.00		93.2	70	130	0	0	
Surr: Toluene-d8	9.9		10.00		98.7	70	130	0	0	

Sample ID **rb3**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **D55077**	RunNo: **55077**
Prep Date:	Analysis Date: **10/22/2018**	SeqNo: **1831057** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**
12-Nov-18

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refining

Sample ID **rb3**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **D55077**	RunNo: **55077**
Prep Date:	Analysis Date: **10/22/2018**	SeqNo: **1831057** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID **rb3**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **D55077**	RunNo: **55077**
Prep Date:	Analysis Date: **10/22/2018**	SeqNo: **1831057** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.3		10.00		93.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.2	70	130			
Surr: Toluene-d8	9.8		10.00		97.9	70	130			

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **D55077**	RunNo: **55077**
Prep Date:	Analysis Date: **10/22/2018**	SeqNo: **1831188** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.7	70	130			
Toluene	19	1.0	20.00	0	96.7	70	130			
Chlorobenzene	19	1.0	20.00	0	96.5	70	130			
1,1-Dichloroethene	21	1.0	20.00	0	103	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	90.6	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.5	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	9.5		10.00		94.8	70	130			
Surr: Toluene-d8	9.6		10.00		95.6	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID **lcs-41072**	SampType: **LCS**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833493** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	9.5	0.50	20.00	0	47.4	28.6	113			
1-Methylnaphthalene	10	0.50	20.00	0	51.3	27	113			
2-Methylnaphthalene	9.7	0.50	20.00	0	48.3	26.3	112			
Acenaphthylene	12	0.50	20.00	0	62.2	36.2	114			
Acenaphthene	13	0.50	20.00	0	63.9	35.6	116			
Fluorene	13	0.50	20.00	0	66.8	38.4	116			
Phenanthrene	15	0.50	20.00	0	76.8	42.3	118			
Anthracene	16	0.50	20.00	0	78.6	42.2	117			
Fluoranthene	16	0.50	20.00	0	78.2	42.5	118			
Pyrene	16	0.50	20.00	0	81.0	40.8	121			
Benz(a)anthracene	15	0.50	20.00	0	72.9	43	118			
Chrysene	14	0.50	20.00	0	70.1	39.4	119			
Benzo(b)fluoranthene	15	0.50	20.00	0	74.1	47.8	115			
Benzo(k)fluoranthene	14	0.50	20.00	0	71.1	40.5	120			
Benzo(a)pyrene	15	0.50	20.00	0	72.7	41.5	115			
Dibenz(a,h)anthracene	15	0.50	20.00	0	74.7	48.6	115			
Benzo(g,h,i)perylene	16	0.50	20.00	0	80.0	42	119			
Indeno(1,2,3-cd)pyrene	15	0.50	20.00	0	75.4	42.9	118			
Surr: N-hexadecane	48		87.60		54.6	35.2	113			
Surr: Benzo(e)pyrene	14		20.00		70.0	48.3	123			

Sample ID **lcsd-41072**	SampType: **LCSD**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS02**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833495** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	15	0.50	20.00	0	73.3	28.6	113	42.9	40.7	R
1-Methylnaphthalene	15	0.50	20.00	0	73.0	27	113	34.9	38.4	
2-Methylnaphthalene	14	0.50	20.00	0	72.3	26.3	112	39.8	25.5	R
Acenaphthylene	18	0.50	20.00	0	89.7	36.2	114	36.2	34.1	R
Acenaphthene	17	0.50	20.00	0	85.2	35.6	116	28.6	32.1	
Fluorene	17	0.50	20.00	0	87.3	38.4	116	26.6	28	
Phenanthrene	21	0.50	20.00	0	103	42.3	118	29.4	37.4	
Anthracene	22	0.50	20.00	0	108	42.2	117	31.3	36.2	
Fluoranthene	21	0.50	20.00	0	106	42.5	118	30.6	26.6	R
Pyrene	20	0.50	20.00	0	102	40.8	121	23.1	26.8	
Benz(a)anthracene	20	0.50	20.00	0	101	43	118	32.7	25.1	R
Chrysene	19	0.50	20.00	0	94.0	39.4	119	29.1	23.3	R
Benzo(b)fluoranthene	20	0.50	20.00	0	102	47.8	115	31.9	22.5	R

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID **lcsd-41072**	SampType: **LCSD**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS02**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833495** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	20	0.50	20.00	0	99.5	40.5	120	33.3	30.9	R
Benzo(a)pyrene	20	0.50	20.00	0	101	41.5	115	32.3	23.2	R
Dibenz(a,h)anthracene	21	0.50	20.00	0	106	48.6	115	34.9	26.5	R
Benzo(g,h,i)perylene	21	0.50	20.00	0	105	42	119	27.0	30.7	
Indeno(1,2,3-cd)pyrene	21	0.50	20.00	0	104	42.9	118	32.2	25.4	R
Surr: N-hexadecane	53		87.60		60.8	35.2	113	0	0	
Surr: Benzo(e)pyrene	18		20.00		92.1	48.3	123	0	0	

Sample ID **mb-41072**	SampType: **MBLK**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBW**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833497** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.50								
1-Methylnaphthalene	ND	0.50								
2-Methylnaphthalene	ND	0.50								
Acenaphthylene	ND	0.50								
Acenaphthene	ND	0.50								
Fluorene	ND	0.50								
Phenanthrene	ND	0.50								
Anthracene	ND	0.50								
Fluoranthene	ND	0.50								
Pyrene	ND	0.50								
Benz(a)anthracene	ND	0.50								
Chrysene	ND	0.50								
Benzo(b)fluoranthene	ND	0.50								
Benzo(k)fluoranthene	ND	0.50								
Benzo(a)pyrene	ND	0.50								
Dibenz(a,h)anthracene	ND	0.50								
Benzo(g,h,i)perylene	ND	0.50								
Indeno(1,2,3-cd)pyrene	ND	0.50								
Surr: N-hexadecane	46		87.60		52.9	35.2	113			
Surr: Benzo(e)pyrene	14		20.00		71.2	48.3	123			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**lcs-1 98.3uS eC**	SampType:	**lcs**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829292**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	5.0	98.30	0	102	80	120			

Sample ID	**1810828-003c dup**	SampType:	**dup**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**GBR-24D**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829311**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	4300	5.0						0.581	20	

Sample ID	**lcs-2 98.3uS eC**	SampType:	**lcs**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829318**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	5.0	98.30	0	106	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**1810828-003c dup**	SampType:	**dup**		TestCode:	**SM4500-H+B / 9040C: pH**				
Client ID:	**GBR-24D**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829349**	Units:	**pH units**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.64									H

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**

12-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refining

Sample ID	**mb-1 alk**	SampType:	**mblk**		TestCode:	**SM2320B: Alkalinity**					
Client ID:	**PBW**	Batch ID:	**R55027**		RunNo:	**55027**					
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829250**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	ND	20.00									

Sample ID	**lcs-1 alk**	SampType:	**lcs**		TestCode:	**SM2320B: Alkalinity**					
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**					
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829251**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	77.16	20.00	80.00	0	96.4	90	110				

Sample ID	**mb-2 alk**	SampType:	**mblk**		TestCode:	**SM2320B: Alkalinity**					
Client ID:	**PBW**	Batch ID:	**R55027**		RunNo:	**55027**					
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829275**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	ND	20.00									

Sample ID	**lcs-2 alk**	SampType:	**lcs**		TestCode:	**SM2320B: Alkalinity**					
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**					
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829276**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Total Alkalinity (as CaCO3)	77.48	20.00	80.00	0	96.8	90	110				

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810828**
12-Nov-18

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refining

Sample ID **MB-41051**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **41051**	RunNo: **54991**
Prep Date: **10/17/2018**	Analysis Date: **10/18/2018**	SeqNo: **1827708** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-41051**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **41051**	RunNo: **54991**
Prep Date: **10/17/2018**	Analysis Date: **10/18/2018**	SeqNo: **1827709** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	101	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1810828 RcptNo: 1

Received By: Anna Thorne 10/16/2018 7:00:00 AM

Completed By: Erin Melendrez 10/16/2018 8:35:04 AM

Reviewed By: JAB 10/16/18
LB; IO 10/16/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
    # of preserved bottles checked for pH: 14 (<2 or >12 unless noted)
    Adjusted? NO
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐
    Checked by: IO 10/16/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date:	
By Whom:		Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person	
Regarding:			
Client Instructions:			

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.7	Good	Yes			
2	1.1	Good	Yes			

Chain-of-Custody Record

Client: Western Refinery
Allen Haines
Mailing Address:

Phone #: 970-385-1096
email or Fax#: dhencmann@ltenv.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☒ EDD (Type) PDF

Turn-Around Time:
■ Standard ☐ Rush
Project Name: Giant Bloomfield Refinery
Project #:
Project Manager: Devin Hencmann
Sampler: E. Carroll & M. MrdJenovich
On Ice: ☒ Yes ☐ No
Sample Temperature: #1 Cooler 2.1-CF-1.0-1.1 #2 Cooler 2.1-CF-1.0-1.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1810828	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_2, NO_3, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached				Air Bubbles (Y or N)
~~10/15/18~~																						
10/15/18	1340	GW	GBR-30	various	various	-001												X				
	15:05		GBR-31			-002												X				
	1415		GBR-24D			-003												X				
	1300		GBR-49			-004												X				
	1225		GBR-32			-005												X				
	1150		GBR-48			-006												X				
	1120		GBR-50			-007												X				

Date	Time	Relinquished by:	Received by:	Date	Time
10/15/18	1600			10/15/18	1600
10/15/18	1811			10/16/18	0700

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 02, 2018

Devin Hencmann

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX (505) 632-3911

RE: Giant Bloomfield Refinery OrderNo.: 1810834

Dear Devin Hencmann:

Hall Environmental Analysis Laboratory received 3 sample(s) on 10/13/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-52
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 2:00:00 PM
Lab ID: 1810834-001 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1200	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.71	0.10		mg/L	1	10/16/2018 9:53:35 PM	R54924
Chloride	54	10		mg/L	20	10/16/2018 10:06:00 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	10/16/2018 9:53:35 PM	R54924
Bromide	0.28	0.10	H	mg/L	1	10/16/2018 9:53:35 PM	R54924
Nitrogen, Nitrate (As N)	6.9	2.0	H	mg/L	20	10/16/2018 10:06:00 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10	H	mg/L	20	10/16/2018 10:06:00 PM	R54924
Sulfate	1500	25	*	mg/L	50	10/23/2018 9:18:15 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	2800	5.0		µmhos/c	1	10/18/2018 8:05:13 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	210.2	20.00		mg/L Ca	1	10/18/2018 8:05:13 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 8:05:13 PM	R55027
Total Alkalinity (as CaCO3)	210.2	20.00		mg/L Ca	1	10/18/2018 8:05:13 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2580	20.0	*	mg/L	1	10/19/2018 5:32:00 PM	41078
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.53		H	pH units	1	10/18/2018 8:05:13 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	440	10		mg/L	10	10/29/2018 3:20:53 PM	41098
Iron	0.12	0.020		mg/L	1	10/29/2018 3:18:40 PM	41098
Magnesium	32	1.0		mg/L	1	10/29/2018 3:18:40 PM	41098
Manganese	0.0028	0.0020		mg/L	1	10/29/2018 3:18:40 PM	41098
Potassium	ND	1.0		mg/L	1	10/29/2018 3:18:40 PM	41098
Sodium	310	10		mg/L	10	10/29/2018 3:20:53 PM	41098
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Toluene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Ethylbenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Naphthalene	ND	2.0		µg/L	1	10/18/2018 7:48:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-52
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 2:00:00 PM
Lab ID: 1810834-001 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
2-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Acetone	ND	10		µg/L	1	10/18/2018 7:48:00 PM	R54984
Bromobenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Bromodichloromethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Bromoform	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Bromomethane	ND	3.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
2-Butanone	ND	10		µg/L	1	10/18/2018 7:48:00 PM	R54984
Carbon disulfide	ND	10		µg/L	1	10/18/2018 7:48:00 PM	R54984
Carbon Tetrachloride	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Chlorobenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Chloroethane	ND	2.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Chloroform	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Chloromethane	ND	3.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
2-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
4-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
cis-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Dibromochloromethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Dibromomethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,1-Dichloroethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,1-Dichloroethene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,3-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
2,2-Dichloropropane	ND	2.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,1-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Hexachlorobutadiene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
2-Hexanone	ND	10		µg/L	1	10/18/2018 7:48:00 PM	R54984
Isopropylbenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
4-Isopropyltoluene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
4-Methyl-2-pentanone	ND	10		µg/L	1	10/18/2018 7:48:00 PM	R54984
Methylene Chloride	ND	3.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
n-Butylbenzene	ND	3.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
n-Propylbenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
sec-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Styrene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
tert-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
trans-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Trichlorofluoromethane	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Vinyl chloride	ND	1.0		µg/L	1	10/18/2018 7:48:00 PM	R54984
Xylenes, Total	ND	1.5		µg/L	1	10/18/2018 7:48:00 PM	R54984
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	10/18/2018 7:48:00 PM	R54984
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/18/2018 7:48:00 PM	R54984
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/18/2018 7:48:00 PM	R54984
Surr: Toluene-d8	98.5	70-130		%Rec	1	10/18/2018 7:48:00 PM	R54984

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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-17
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 3:00:00 PM
Lab ID: 1810834-002 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1300	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.64	0.10		mg/L	1	10/16/2018 10:43:13 PM	R54924
Chloride	49	10		mg/L	20	10/16/2018 10:55:38 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.10	H	mg/L	1	10/16/2018 10:43:13 PM	R54924
Bromide	0.15	0.10		mg/L	1	10/16/2018 10:43:13 PM	R54924
Nitrogen, Nitrate (As N)	5.4	2.0	H	mg/L	20	10/16/2018 10:55:38 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	10	H	mg/L	20	10/16/2018 10:55:38 PM	R54924
Sulfate	1200	25	*	mg/L	50	10/23/2018 9:31:05 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	2400	5.0		µmhos/c	1	10/18/2018 8:17:10 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	214.7	20.00		mg/L Ca	1	10/18/2018 8:17:10 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 8:17:10 PM	R55027
Total Alkalinity (as CaCO3)	214.7	20.00		mg/L Ca	1	10/18/2018 8:17:10 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2180	20.0	*	mg/L	1	10/19/2018 5:32:00 PM	41078
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.63		H	pH units	1	10/18/2018 8:17:10 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	440	10		mg/L	10	10/29/2018 3:25:22 PM	41098
Iron	100	4.0	*	mg/L	200	10/30/2018 6:48:01 PM	41098
Magnesium	47	1.0		mg/L	1	10/29/2018 3:23:13 PM	41098
Manganese	3.0	0.020	*	mg/L	10	10/29/2018 3:25:22 PM	41098
Potassium	6.9	1.0		mg/L	1	10/29/2018 3:23:13 PM	41098
Sodium	260	10		mg/L	10	10/29/2018 3:25:22 PM	41098
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Naphthalene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
1-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
2-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Acenaphthylene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Acenaphthene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Fluorene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Phenanthrene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Anthracene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Fluoranthene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GBR-17
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 3:00:00 PM
Lab ID: 1810834-002 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Pyrene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Benz(a)anthracene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Chrysene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Benzo(b)fluoranthene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Benzo(k)fluoranthene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Benzo(a)pyrene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Dibenz(a,h)anthracene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Benzo(g,h,i)perylene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Indeno(1,2,3-cd)pyrene	ND	0.50		µg/L	1	10/24/2018 5:42:18 PM	41072
Surr: N-hexadecane	66.2	35.2-113		%Rec	1	10/24/2018 5:42:18 PM	41072
Surr: Benzo(e)pyrene	87.3	48.3-123		%Rec	1	10/24/2018 5:42:18 PM	41072
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Toluene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Ethylbenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Naphthalene	ND	2.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
2-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Acetone	ND	10		µg/L	1	10/18/2018 8:12:00 PM	R54984
Bromobenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Bromodichloromethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Bromoform	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Bromomethane	ND	3.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
2-Butanone	ND	10		µg/L	1	10/18/2018 8:12:00 PM	R54984
Carbon disulfide	ND	10		µg/L	1	10/18/2018 8:12:00 PM	R54984
Carbon Tetrachloride	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Chlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Chloroethane	ND	2.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Chloroform	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Chloromethane	ND	3.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
2-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
4-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
cis-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984

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Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Dibromochloromethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Dibromomethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,1-Dichloroethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,1-Dichloroethene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,3-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
2,2-Dichloropropane	ND	2.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,1-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Hexachlorobutadiene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
2-Hexanone	ND	10		µg/L	1	10/18/2018 8:12:00 PM	R54984
Isopropylbenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
4-Isopropyltoluene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
4-Methyl-2-pentanone	ND	10		µg/L	1	10/18/2018 8:12:00 PM	R54984
Methylene Chloride	ND	3.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
n-Butylbenzene	ND	3.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
n-Propylbenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
sec-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Styrene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
tert-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
trans-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Trichlorofluoromethane	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Vinyl chloride	ND	1.0		µg/L	1	10/18/2018 8:12:00 PM	R54984
Xylenes, Total	ND	1.5		µg/L	1	10/18/2018 8:12:00 PM	R54984
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/18/2018 8:12:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GBR-17
Project: Giant Bloomfield Refinery
Collection Date: 10/12/2018 3:00:00 PM
Lab ID: 1810834-002 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	10/18/2018 8:12:00 PM	R54984
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/18/2018 8:12:00 PM	R54984
Surr: Toluene-d8	98.3	70-130		%Rec	1	10/18/2018 8:12:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GRW-6
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 12:45:00 PM
Lab ID: 1810834-003 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	1200	6.6		mg/L	1	10/29/2018	R55244
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	1.1	0.50		mg/L	5	10/16/2018 11:08:02 PM	R54924
Chloride	100	10		mg/L	20	10/16/2018 11:20:27 PM	R54924
Nitrogen, Nitrite (As N)	ND	0.50	H	mg/L	5	10/16/2018 11:08:02 PM	R54924
Bromide	ND	0.50		mg/L	5	10/16/2018 11:08:02 PM	R54924
Nitrogen, Nitrate (As N)	ND	0.50	H	mg/L	5	10/16/2018 11:08:02 PM	R54924
Phosphorus, Orthophosphate (As P)	ND	2.5	H	mg/L	5	10/16/2018 11:08:02 PM	R54924
Sulfate	1300	25	*	mg/L	50	10/23/2018 9:43:56 PM	A55111
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3000	5.0		µmhos/c	1	10/18/2018 8:29:12 PM	R55027
SM2320B: ALKALINITY						Analyst: **MRA**	
Bicarbonate (As CaCO3)	363.5	20.00		mg/L Ca	1	10/18/2018 8:29:12 PM	R55027
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/18/2018 8:29:12 PM	R55027
Total Alkalinity (as CaCO3)	363.5	20.00		mg/L Ca	1	10/18/2018 8:29:12 PM	R55027
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2390	200	*D	mg/L	1	10/19/2018 5:32:00 PM	41078
SM4500-H+B / 9040C: PH						Analyst: **MRA**	
pH	7.55		H	pH units	1	10/18/2018 8:29:12 PM	R55027
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Calcium	430	10		mg/L	10	10/29/2018 3:31:18 PM	41098
Iron	890	40	*	mg/L	2E	10/30/2018 6:50:11 PM	41098
Magnesium	41	1.0		mg/L	1	10/29/2018 3:29:24 PM	41098
Manganese	45	0.10	*	mg/L	50	10/29/2018 3:43:25 PM	41098
Potassium	2.2	1.0		mg/L	1	10/29/2018 3:29:24 PM	41098
Sodium	390	10		mg/L	10	10/29/2018 3:31:18 PM	41098
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Naphthalene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
1-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
2-Methylnaphthalene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Acenaphthylene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Acenaphthene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Fluorene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Phenanthrene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Anthracene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Fluoranthene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GRW-6
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 12:45:00 PM
Lab ID: 1810834-003 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: PAHS						Analyst: **DAM**	
Pyrene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Benz(a)anthracene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Chrysene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Benzo(b)fluoranthene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Benzo(k)fluoranthene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Benzo(a)pyrene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Dibenz(a,h)anthracene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Benzo(g,h,i)perylene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Indeno(1,2,3-cd)pyrene	ND	0.50		µg/L	1	10/24/2018 6:06:28 PM	41072
Surr: N-hexadecane	66.1	35.2-113		%Rec	1	10/24/2018 6:06:28 PM	41072
Surr: Benzo(e)pyrene	89.7	48.3-123		%Rec	1	10/24/2018 6:06:28 PM	41072
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Toluene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Ethylbenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Naphthalene	ND	2.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
2-Methylnaphthalene	ND	4.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Acetone	ND	10		µg/L	1	10/18/2018 8:35:00 PM	R54984
Bromobenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Bromodichloromethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Bromoform	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Bromomethane	ND	3.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
2-Butanone	ND	10		µg/L	1	10/18/2018 8:35:00 PM	R54984
Carbon disulfide	ND	10		µg/L	1	10/18/2018 8:35:00 PM	R54984
Carbon Tetrachloride	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Chlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Chloroethane	ND	2.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Chloroform	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Chloromethane	ND	3.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
2-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
4-Chlorotoluene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
cis-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GRW-6
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 12:45:00 PM
Lab ID: 1810834-003 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Dibromochloromethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Dibromomethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,1-Dichloroethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,1-Dichloroethene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,3-Dichloropropane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
2,2-Dichloropropane	ND	2.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,1-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Hexachlorobutadiene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
2-Hexanone	ND	10		µg/L	1	10/18/2018 8:35:00 PM	R54984
Isopropylbenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
4-Isopropyltoluene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
4-Methyl-2-pentanone	ND	10		µg/L	1	10/18/2018 8:35:00 PM	R54984
Methylene Chloride	ND	3.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
n-Butylbenzene	ND	3.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
n-Propylbenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
sec-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Styrene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
tert-Butylbenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
trans-1,2-DCE	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Trichlorofluoromethane	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Vinyl chloride	ND	1.0		µg/L	1	10/18/2018 8:35:00 PM	R54984
Xylenes, Total	ND	1.5		µg/L	1	10/18/2018 8:35:00 PM	R54984
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	10/18/2018 8:35:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** GRW-6
Project: Giant Bloomfield Refinery **Collection Date:** 10/12/2018 12:45:00 PM
Lab ID: 1810834-003 **Matrix:** AQUEOUS **Received Date:** 10/13/2018 10:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **RAA**	
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	10/18/2018 8:35:00 PM	R54984
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/18/2018 8:35:00 PM	R54984
Surr: Toluene-d8	98.0	70-130		%Rec	1	10/18/2018 8:35:00 PM	R54984

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**

02-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID	**MB-41098**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**PBW**	Batch ID:	**41098**	RunNo:	**55103**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/23/2018**	SeqNo:	**1832203**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Potassium	ND	1.0								

Sample ID	**LLLCS-41098**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID:	**41098**	RunNo:	**55103**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/23/2018**	SeqNo:	**1832204**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0	0.5000	0	96.7	50	150			
Iron	0.023	0.020	0.02000	0	113	50	150			
Magnesium	ND	1.0	0.5000	0	95.2	50	150			
Manganese	ND	0.0020	0.002000	0	95.5	50	150			
Potassium	ND	1.0	0.5000	0	110	50	150			

Sample ID	**LCS-41098**	SampType:	**LCS**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**LCSW**	Batch ID:	**41098**	RunNo:	**55103**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/23/2018**	SeqNo:	**1832205**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	44	1.0	50.00	0	87.1	85	115			
Iron	0.50	0.020	0.5000	0	99.6	85	115			
Magnesium	45	1.0	50.00	0	89.4	85	115			
Manganese	0.49	0.0020	0.5000	0	97.4	85	115			
Potassium	44	1.0	50.00	0	88.4	85	115			

Sample ID	**MB-41098**	SampType:	**MBLK**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**PBW**	Batch ID:	**41098**	RunNo:	**55178**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**	SeqNo:	**1834489**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID	**LLLCS-41098**	SampType:	**LCSLL**	TestCode:	**EPA Method 200.7: Metals**					
Client ID:	**BatchQC**	Batch ID:	**41098**	RunNo:	**55178**					
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**	SeqNo:	**1834490**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**

02-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID	**LLLCS-41098**	SampType:	**LCSLL**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**BatchQC**	Batch ID:	**41098**		RunNo:	**55178**				
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**		SeqNo:	**1834490**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0	0.5000	0	94.8	50	150			

Sample ID	**LCS-41098**	SampType:	**LCS**		TestCode:	**EPA Method 200.7: Metals**				
Client ID:	**LCSW**	Batch ID:	**41098**		RunNo:	**55178**				
Prep Date:	**10/19/2018**	Analysis Date:	**10/25/2018**		SeqNo:	**1834491**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	52	1.0	50.00	0	103	85	115			

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**
02-Nov-18

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refinery

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R54924**	RunNo: **54924**
Prep Date:	Analysis Date: **10/16/2018**	SeqNo: **1825722** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R54924**	RunNo: **54924**
Prep Date:	Analysis Date: **10/16/2018**	SeqNo: **1825723** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Chloride	4.8	0.50	5.000	0	95.9	90	110			
Nitrogen, Nitrite (As N)	0.99	0.10	1.000	0	98.5	90	110			
Bromide	2.5	0.10	2.500	0	98.3	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	102	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	98.3	90	110			

Sample ID **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A55111**	RunNo: **55111**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1832031** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A55111**	RunNo: **55111**
Prep Date:	Analysis Date: **10/23/2018**	SeqNo: **1832032** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.5	0.50	10.00	0	95.2	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**

02-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827896** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.8	70	130			
Toluene	19	1.0	20.00	0	96.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.4	70	130			
1,1-Dichloroethene	21	1.0	20.00	0	103	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	89.7	70	130			
Surr: 1,2-Dichloroethane-d4	9.6		10.00		96.0	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.5	70	130			
Surr: Dibromofluoromethane	9.9		10.00		98.6	70	130			
Surr: Toluene-d8	9.5		10.00		95.4	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827897** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**
02-Nov-18

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refinery

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827897** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**
02-Nov-18

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refinery

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R54984**	RunNo: **54984**
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1827897** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		97.6	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.2	70	130			
Surr: Dibromofluoromethane	10		10.00		99.9	70	130			
Surr: Toluene-d8	9.5		10.00		94.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**

02-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID **lcs-41072**	SampType: **LCS**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833493** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	9.5	0.50	20.00	0	47.4	28.6	113			
1-Methylnaphthalene	10	0.50	20.00	0	51.3	27	113			
2-Methylnaphthalene	9.7	0.50	20.00	0	48.3	26.3	112			
Acenaphthylene	12	0.50	20.00	0	62.2	36.2	114			
Acenaphthene	13	0.50	20.00	0	63.9	35.6	116			
Fluorene	13	0.50	20.00	0	66.8	38.4	116			
Phenanthrene	15	0.50	20.00	0	76.8	42.3	118			
Anthracene	16	0.50	20.00	0	78.6	42.2	117			
Fluoranthene	16	0.50	20.00	0	78.2	42.5	118			
Pyrene	16	0.50	20.00	0	81.0	40.8	121			
Benz(a)anthracene	15	0.50	20.00	0	72.9	43	118			
Chrysene	14	0.50	20.00	0	70.1	39.4	119			
Benzo(b)fluoranthene	15	0.50	20.00	0	74.1	47.8	115			
Benzo(k)fluoranthene	14	0.50	20.00	0	71.1	40.5	120			
Benzo(a)pyrene	15	0.50	20.00	0	72.7	41.5	115			
Dibenz(a,h)anthracene	15	0.50	20.00	0	74.7	48.6	115			
Benzo(g,h,i)perylene	16	0.50	20.00	0	80.0	42	119			
Indeno(1,2,3-cd)pyrene	15	0.50	20.00	0	75.4	42.9	118			
Surr: N-hexadecane	48		87.60		54.6	35.2	113			
Surr: Benzo(e)pyrene	14		20.00		70.0	48.3	123			

Sample ID **lcs-41143**	SampType: **LCS**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW**	Batch ID: **41143**	RunNo: **55145**
Prep Date: **10/23/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833494** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: N-hexadecane	49		87.60		56.3	35.2	113			
Surr: Benzo(e)pyrene	11		20.00		54.9	48.3	123			

Sample ID **lcsd-41072**	SampType: **LCSD**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS02**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833495** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	15	0.50	20.00	0	73.3	28.6	113	42.9	40.7	R
1-Methylnaphthalene	15	0.50	20.00	0	73.0	27	113	34.9	38.4	
2-Methylnaphthalene	14	0.50	20.00	0	72.3	26.3	112	39.8	25.5	R
Acenaphthylene	18	0.50	20.00	0	89.7	36.2	114	36.2	34.1	R
Acenaphthene	17	0.50	20.00	0	85.2	35.6	116	28.6	32.1	
Fluorene	17	0.50	20.00	0	87.3	38.4	116	26.6	28	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**

02-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID **lcsd-41072**	SampType: **LCSD**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS02**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833495** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenanthrene	21	0.50	20.00	0	103	42.3	118	29.4	37.4	
Anthracene	22	0.50	20.00	0	108	42.2	117	31.3	36.2	
Fluoranthene	21	0.50	20.00	0	106	42.5	118	30.6	26.6	R
Pyrene	20	0.50	20.00	0	102	40.8	121	23.1	26.8	
Benz(a)anthracene	20	0.50	20.00	0	101	43	118	32.7	25.1	R
Chrysene	19	0.50	20.00	0	94.0	39.4	119	29.1	23.3	R
Benzo(b)fluoranthene	20	0.50	20.00	0	102	47.8	115	31.9	22.5	R
Benzo(k)fluoranthene	20	0.50	20.00	0	99.5	40.5	120	33.3	30.9	R
Benzo(a)pyrene	20	0.50	20.00	0	101	41.5	115	32.3	23.2	R
Dibenz(a,h)anthracene	21	0.50	20.00	0	106	48.6	115	34.9	26.5	R
Benzo(g,h,i)perylene	21	0.50	20.00	0	105	42	119	27.0	30.7	
Indeno(1,2,3-cd)pyrene	21	0.50	20.00	0	104	42.9	118	32.2	25.4	R
Surr: N-hexadecane	53		87.60		60.8	35.2	113	0	0	
Surr: Benzo(e)pyrene	18		20.00		92.1	48.3	123	0	0	

Sample ID **lcsd-41143**	SampType: **LCSD**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS02**	Batch ID: **41143**	RunNo: **55145**
Prep Date: **10/23/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833496** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: N-hexadecane	140		175.2		79.0	35.2	113	0	0	
Surr: Benzo(e)pyrene	33		40.00		82.6	48.3	123	0	0	

Sample ID **mb-41072**	SampType: **MBLK**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBW**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833497** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.50								
1-Methylnaphthalene	ND	0.50								
2-Methylnaphthalene	ND	0.50								
Acenaphthylene	ND	0.50								
Acenaphthene	ND	0.50								
Fluorene	ND	0.50								
Phenanthrene	ND	0.50								
Anthracene	ND	0.50								
Fluoranthene	ND	0.50								
Pyrene	ND	0.50								
Benz(a)anthracene	ND	0.50								
Chrysene	ND	0.50								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**

02-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID **mb-41072**	SampType: **MBLK**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBW**	Batch ID: **41072**	RunNo: **55145**
Prep Date: **10/18/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833497** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(b)fluoranthene	ND	0.50								
Benzo(k)fluoranthene	ND	0.50								
Benzo(a)pyrene	ND	0.50								
Dibenz(a,h)anthracene	ND	0.50								
Benzo(g,h,i)perylene	ND	0.50								
Indeno(1,2,3-cd)pyrene	ND	0.50								
Surr: N-hexadecane	46		87.60		52.9	35.2	113			
Surr: Benzo(e)pyrene	14		20.00		71.2	48.3	123			

Sample ID **mb-41143**	SampType: **MBLK**	TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBW**	Batch ID: **41143**	RunNo: **55145**
Prep Date: **10/23/2018**	Analysis Date: **10/24/2018**	SeqNo: **1833498** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: N-hexadecane	51		87.60		58.3	35.2	113			
Surr: Benzo(e)pyrene	11		20.00		56.1	48.3	123			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**

02-Nov-18

Client: Western Refining Southwest, Inc.

Project: Giant Bloomfield Refinery

Sample ID	**lcs-1 98.3uS eC**	SampType:	**lcs**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829292**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	5.0	98.30	0	102	80	120			

Sample ID	**lcs-2 98.3uS eC**	SampType:	**lcs**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R55027**		RunNo:	**55027**				
Prep Date:		Analysis Date:	**10/18/2018**		SeqNo:	**1829318**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	100	5.0	98.30	0	106	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**
02-Nov-18

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refinery

Sample ID **mb-1 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829250**	Units: **mg/L CaCO3**						

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-1 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829251**	Units: **mg/L CaCO3**						

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.16	20.00	80.00	0	96.4	90	110			

Sample ID **mb-2 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829275**	Units: **mg/L CaCO3**						

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-2 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R55027**	RunNo: **55027**							
Prep Date:	Analysis Date: **10/18/2018**	SeqNo: **1829276**	Units: **mg/L CaCO3**						

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.48	20.00	80.00	0	96.8	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1810834**
02-Nov-18

Client: Western Refining Southwest, Inc.
Project: Giant Bloomfield Refinery

Sample ID **MB-41078**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **41078**	RunNo: **55034**
Prep Date: **10/18/2018**	Analysis Date: **10/19/2018**	SeqNo: **1829460** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-41078**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **41078**	RunNo: **55034**
Prep Date: **10/18/2018**	Analysis Date: **10/19/2018**	SeqNo: **1829461** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	999	20.0	1000	0	99.9	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1810834** RcptNo: 1

Received By: **Victoria Zellar** **10/13/2018 10:20:00 AM** Victoria Zellar

Completed By: **Erin Melendrez** **10/16/2018 9:42:31 AM**

Reviewed By: JAB 10/16/18

Labeled By: IO 10/16/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Courier		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☐	No ☑	
8. Was preservative added to bottles?	Yes ☑	No ☐	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	0.4mL HNO3 No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 3
(<2 or >12 unless noted)
Adjusted? YES
Checked by: IO 10/16/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

For wet chem analysis poured off approx 350mL. For metals analysis added approx 0.4mL HNO3 to samples for acceptable pH. Held for 24 hours prior Analysis. IO 10/16/2018

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.7	Good	Yes			

Chain-of-Custody Record

Client: Western Refining
Allan Haines
Mailing Address:

Phone #: 970-385-1096
email or Fax#: aharmann@henv.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☒ EDD (Type) POE

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Giant Bloomfield Refinery

Project #:

Project Manager: Devin Hencomann

Sampler: Josh Adams
On Ice: ☒ Yes ☐ No
Sample Temperature: 5.9 + (0.2) = 5.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	see attached				Air Bubbles (Y or N)
~~10-12-18~~	~~12:45~~	~~GW~~	~~GRW-6~~	3-HCl VOA, 500ml, 1 liter	HCl	1810834																
10-12-18	14:00	GW	GBR-52	3-VOA, 1-500ml	HCl	-001												X				
↓	15:00	↓	GBR-17	3-VOA, 1-500ml 1-liter	HCl	-002												X				
↓	1245	↓	GRW-6	various	various	-003												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
10-12-18	1533		Christen Walk	10/12/18	1533
10/12/18	1834	Christen Walk	Victoria Gillan	10/13/18	10:20

Remarks:
cc: ~~ethenc~~ aharmann@henv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

10/12/18

GIANT BLOOMFIELD REFINERY
WESTERN REFINING
ATTACHMENT TO COC

SAMPLING CONDUCTED ON _____ **BY**_____

Sample ID	ANNUALLY (DEC)
~~GRW-3~~	VOC
	GWC
	PAH
~~GRW-6~~	VOC
	GWC
	PAH
~~GBR-17~~	VOC
	GWC
	PAH
GBR-24D	VOC
	GWC
	PAH
~~GBR-30~~	VOC
	GWC
	PAH
GBR-31	VOC
	GWC
	PAH
GBR-32	VOC
	GWC
	METALS
~~GBR-48~~	VOC
	GWC
	METALS
GBR-49	VOC
	GWC
	METALS
GBR-50	VOC
	GWC
	METALS
~~GBR-51~~	VOC
	GWC
~~GBR-52~~	VOC
	GWC
~~SHS-8~~	VOC
	GWC

Analysis	method	Bottle
VOC	method 8260	3 - HCL VOA

PAH	method 8270	1 - Liter Amber (non preserved)

GWC		
pH	SM 4500-H+B	1 - 500ml (non preserved)
EC	SM 2510B	
TDS	SM 2540C MOD	
alkalinity	SM 2320B	
hardness	SM 2340B	
ANIONS	EPA Method 300.0	
	nitrate/nitrite	1 - 250ml H2SO4
	bromide	1 - 500ml HNO3
	chloride	
	sulfate	
	phosporus	
	fluoride	
CATIONS / METALS	EPA Method 200.7	
	calcium	
	iron	
	magnesium	
	manganese	
	potassium	
	sodium	
Metals	EPA Method 200.7	1 - 500ml HNO3
	barium	
	beryllium	
	cadmium	
	chromium	
	silver	
	lead	
	nickel	
	EPA 200.8	
	copper	
	zinc	
	antimony	
	arsenic	
	selenium	
	thallium	
	Epa Method 245.1	
	mercury	

GRW-6
GBR-52
GBR-17

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, September 17, 2019 3:15 PM
To: 'Smith.Nelly@epa.gov'
Cc: Ogden, Sarah, NMENV; Garman, Mark, NMENV; Ortelli, Angelo, NMENV; 'l1thomas@blm.gov'; Griswold, Jim, EMNRD; Wade, Gabriel, EMNRD; 'gjmccartney@marathonpetroleum.com'; 'Devin Hencmann'
Subject: FW: Lee Acres -] Background Concentrations for COCs at GBR EPA SUPERFUND SITE 5-Yr. REVIEW and OCD "GW-40" Marathon Petroleum Company's Bloomfield Refinery
Attachments: ROD.pdf; 20.006.0002New Final.pdf

Nelly:

Good afternoon. The New Mexico Oil Conservation Division (OCD) is replying with an update to your original e-mail msg. of inquiry dated 9/13 regarding the above subject OCD Permitted Site.

OCD has communicated with the Marathon Petroleum Company (MPC) regarding the above subject 5-Yr. Review of the Lee Acres Superfund Site in San Juan County. Mr. Gregory J. McCartney P.E. has now indicated MPC would like to be involved in the USEPA 5-Yr. Review of the Lee Landfill due to the possible groundwater contaminant hydrogeologic migration of certain constituents of concern (COCs) encroaching onto the OCD "GW-40" Site from the North and/or possibly from the Lee Acres Landfill Superfund Site. MPC's Environmental Consultant Lead is Mr. Devin Hencmann with LT Environmental, Inc. (LT) and LT is now working to respond to USEPA contaminant hydrogeology questions from the OCD's "GW-40" Site.

MPC's contacts for the GW-40 Site are:

Mr. Gregory J. McCartney P.E.
Senior Environmental Professional
Marathon Petroleum Company LP
539 S. Main St. Room M-7081
Findlay OH 45840
phone: 419-421-2338
mobile: 419-310-4888
email: gjmccartney@marathonpetroleum.com

Mr. Devin Hencmann
Project Geologist
LT Environmental, Inc.
848 East 2nd Avenue, Durango CO 81301
(970) 385-1096 office
(970) 403-6023 cell
Email: dhencmann@ltenv.com

Refineries in New Mexico are permitted by the OCD under the WQCC Regulations 20.6.2 NMAC (see attachment). The regulation associated with COCs encroaching on the GW-40 Site is one of "background" as defined under 20.6.2.7(B)(1) NMAC as follows:

"background" means, for purposes of ground water abatement plans only and for no other purposes in this part or any other regulations including but not limited to surface water standards, the amount of ground water contaminants naturally occurring from undisturbed geologic sources or water contaminants which the responsible person establishes are occurring from a source other than the responsible person's facility; this definition shall not prevent the secretary from requiring abatement of commingled plumes of pollution, shall not prevent responsible persons from seeking contribution or other legal or equitable relief from other persons, and shall not preclude the secretary from exercising enforcement authority under any applicable statute, regulation or common law;

As per 20.6.2.4101(B) NMAC: If the background concentration of any water contaminant exceeds the standard or requirement of Subsections A, B, and C of Section 20.6.2.4103 NMAC, pollution shall be abated by the responsible person to the background concentration.

OCD is currently reviewing the GW-40 Site for groundwater background considerations; therefore, the USEPA's 5-Yr. Review of the Lee Acres Superfund Site appears to be timely. OCD needs to be copied on all correspondence related to this matter for communication purposes. USEPA is welcome to send correspondence to the OCD with copies to MPC and LT from now on in this matter. OCD has developed a folder in its administrative record for "GW-40" that will be kept current in the event all parties wish to view records in this matter.

Please contact me if you have any questions or concerns based on this message. OCD looks forward to the communication with the various parties in this matter.

Thank you for contacting OCD.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

****

From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Tuesday, September 17, 2019 2:03 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Wade, Gabriel, EMNRD <Gabriel.Wade@state.nm.us>; McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>
Subject: [EXT] RE: MPC GW-50 EPA 5-Yr. Review Inquiries [Giant Former Bloomfield Refinery (located 5 mi. W of Bloomfield on HW-64).]

Carl,

Greg McCartney's contact info can be found below and he is copied on this correspondence.

The information requested in the USEPA email dated 9/13/19 included, data/concentrations encountered for Cl, Cr, Fe, Mn, SO4 and TDS at OCD GW-40, in addition to any information about OCD GW-40 (depth of sampling), historical data, sampling location, and sampling methodology.

Thank you,

Devin

Gregory J. McCartney P.E.
Senior Environmental Professional
Marathon Petroleum Company LP
539 S. Main St. Room M-7081
Findlay OH 45840
phone: 419-421-2338
mobile: 419-310-4888
email: gjmccartney@marathonpetroleum.com

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Friday, September 13, 2019 4:38 PM
To: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>; Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: [EXT] Lee Acres -] Background Concentrations for COCs at GBR

Mr. Chavez,

Just to follow-up on your questions posted below. There are not groundwater monitoring wells (EPA Superfund program) located further downgradient "BLM-68".

The results of the Remedial Investigation (RI) indicated that the plume was not migrating downgradient BLM-68 . There is a well located downgradient: GBR-17 (Refinery well – see Page 40 of attachment) that was used during the RI and Record of Decision, but it shows not detections. What is the location of OCD GW-40?

We (NMED, EPA, and BLM) are in the process of reviewing the remedy for the site. Every five years, EPA (or the lead Agency, BLM is this case) reviews and evaluates the remedy to determine whether it remains protective of human health and the environment.

I appreciate if you share the data/concentrations encountered for Cl, Cr, Fe, Mn, SO4 and TDS at OCD GW-40 with us, in addition to any information about OCD GW-40 (depth of sampling), historical data, sampling location, and sampling methodology.

Thanks,

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

From: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Sent: Wednesday, June 19, 2019 2:01 PM

To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith, Nelly <Smith.Nelly@epa.gov>; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Mr. Chavez:

EPA is the lead regulatory agency on this superfund site and they will be able to coordinate with the responsible party (BLM) to better address your inquiries. Feel free to communicate directly with EPA – I believe Ms. Nelly Smith (EPA RPM) is out of office through this week. Her contact information is below.

Nelly Smith
Remedial Project Manager
U.S. Environmental Protection Agency - Region 6
ph: 214-665-7109
email: Smith.Nelly@epa.gov

Thanks,

SMO

From: Chavez, Carl J, EMNRD
Sent: Tuesday, June 18, 2019 5:12 PM
To: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith.Nelly@epa.gov; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Re: Lee Acres Landfill Superfund Site

Ms. Ogden, good afternoon.

The New Mexico Oil Conservation Division (OCD) is in receipt of the New Mexico Environment Department (NMED) reply to the OCD communiqué below.

OCD has reviewed the constituents of concern coincident to those inorganic constituents monitored at the OCD "GW-40" site located hydrogeologically downgradient from the Lee Acres Landfill.

The elevated detections at upgradient MWs associated with the "GW-40" Site may be from hydrogeologic contaminant migration away from the Lee Acres Landfill Superfund Site as the history of the site and the potential for contaminant migration over time may explain the OCD detections.

OCD requests to know if any MWs were installed further downgradient than "BLM-68" from the Lee Acres Landfill Site toward the OCD "GW-40" Site? Perhaps MWs exist or a historical investigation of the GW contamination associated with Lee Acres was conducted to eliminate the possibility of undetected plume migration over time further toward the south.

Thank you for the reply and information.

From: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Sent: Tuesday, June 18, 2019 4:32 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>;

Smith.Nelly@epa.gov; l1thomas@blm.gov
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Mr. Carl J. Chavez,

Thank you for contacting us about the Lee Acres Landfill Superfund Site. I am the NMED project manager for the site.

I attached the most recent 2017 laboratory results from Site monitoring wells that was provided from BLM. Below is also a table of the cleanup goals for the Site contaminants of concern—it includes a reference list of historical max Site contaminant concentrations. The selected groundwater remedy is institutional controls and monitored natural attenuation.

Groundwater is monitored at the Site in eight wells on an annual basis. The downgradient-most wells are BLM -68, BLM-75, and BLM-77 (see the attached Site map). Of the seven contaminants of concern identified at the site, fluctuating Manganese concentrations continue to be of primary concern in the downgradient monitoring wells at the Site.

In the 2018 GW-040 Annual Report (from the link you provided), Manganese concentrations at the former Giant Bloomfield Refinery ranged from 130 ug/L (GBR-50) to 1900 ug/L (GBR-32) in the four designated upgradient wells that were sampled in October 2018. For comparison, in March 2017, dissolved Manganese concentrations in Lee Acres downgradient-most wells were 4,800 ug/L (BLM-62), 1.8* ug/L (BLM-75 & BLM-77), and 0.62* ug/L (BLM-68). Lee Acres upgradient well (BLM-39) was 120 ug/L. Lee Acres dissolved Nickel concentrations were all below MCL of 200 ug/L. Concentrations ranged from 14 ug/L (BLM- 62) to 53 ug/L (BLM-80 and BLM 68). One of the upgradient refinery wells (GBR-49) had an exceeding Nickel concentration of 390 ug/L in 2018.

I am forwarding your inquiry regarding Site contaminants and off-site plume migration to the Nelly Smith, EPA Remedial Project Manager and Whitney Thomas, the BLM interim project manager for the Lee Acres landfill Superfund Site.

Thank you,
SMO

Table 2 Remedial Goals (Clean-up Levels)

Constituent	Site Historic Maximum Concentration (µg/L)	Risk-Based Preliminary Remediation Goal (µg/L)	SDWA MCL (µg/L)	NMWQCC Standards (µg/L)	Site Background Mean[a] (µg/L)	Cleanup Levels (µg/L)
Manganese	6,335	176	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-*cis*-Dichloroethene	77	NA	70	per part 101z.z[g]	NA	70
1,2-*trans*-Dichloroethene	120	NA	100	per part 101z.z[g]	NA	100
Tetrachloroethylene (PCE)	10	NA	5	20	NA	5
Trichloroethylene (TCE)	11	NA	5	100	NA	5
Vinyl Chloride	3.1	NA	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL)
c Standard for domestic supply.
d NMWQCC regulation Part 3-101.Z does not require cleanup level below site background level.
e Highest value of 12,500 µg/L occurred during the May 1993 sampling period and was determined to be a statistical anomaly for the purposes of this table, the next highest value is specified.
f Standard for irrigation use.
g No NMWQCC specific to 1,2-DCE exists, therefore Part 101.z.z. is referenced for State ARAR.
NA - not applicable.
NOTE: Dichloromethene was detected once in 95 samples at a concentration level of 27 µg/L, however, this concentration was considered a statistical anomaly and is not presented.

- 52 -

From: Kieling, Martyne, NMENV
Sent: Monday, June 17, 2019 8:22 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Cc: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Carl,
I am out of the office, family commitments in Kansas. I will forward this to Mark Garman the Superfund Oversight Section Program Manager and the state Project Manager Maggie (Sarah) Ogden. They will be able to address your questions.

Thank you for being this to our attention.
All the best

Martyne Kieling

New Mexico Environment Department
Ground Water Quality Bureau – Superfund Oversight Section

1190 S. St. Francis Drive
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Innovation|Science|Collaboration|Compliance

From: Chavez, Carl J, EMNRD
Sent: Friday, June 14, 2019 5:04 PM
To: Kieling, Martyne, NMENV <Martyne.Kieling@state.nm.us>
Cc: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: FW: [EXT] Background Concentrations for COCs at GBR

Martyne:

Good afternoon.

I'm contacting NMED to let you know OCD believes migrating contamination from the Lea Acres Superfund Site located hydrogeologically upgradient from the OCD GW-40 site is present at our site of contamination.

OCD observes on the above NMED Website, it lists the OCD "GW-40" site as a site of interest in the map on the webpage.

While we are addressing organic contamination at the GW-40 site, we are noticing elevated levels of Cl, Cr, Fe, Mn, SO4 and TDS at the far upgradient MWs at our site, and the Lea Acres Superfund Site appears to be located hydrogeologically upgradient based on consistent piezometric monitoring.

Can you tell OCD is there is a remedial system in place at Lea Acres? Is NMED observing the above listed constituents migrating off-property?

OCD would appreciate it if you could contact me to communicate on this matter at your convenience.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Monday, June 10, 2019 3:13 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>

Cc: McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>
Subject: [EXT] Background Concentrations for COCs at GBR

Carl,

Attached are the tables you had requested in your email dated 5/9/2019 for establishing background concentrations for constituents of concern at the former Giant Bloomfield Refinery. Statistics have been rerun replacing all Non-Detects with the PQLs. We presented results from the various statistical runs in one table to make comparing the different results easier. Explanations are also presented in the table.
I have also attached a table containing the historical data that was used in the stats, and the bio of the LTE data analyst that ran the statistics. Paloma Lang can be reached at **plang.ltenv.com** if you have any questions. Please cc myself on any correspondence so I can follow through and sure you receive an answer in a timely manner.

Thank you,
Devin

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

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TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 6 WATER QUALITY
PART 2 GROUND AND SURFACE WATER PROTECTION

20.6.2.1 ISSUING AGENCY: Water Quality Control Commission
[12-1-95; 20.6.2.1 NMAC - Rn, 20 NMAC 6.2.I.1000, 1-15-01]

20.6.2.2 SCOPE: All persons subject to the Water Quality Act, NMSA 1978, Sections 74-6-1 et seq.
[12-1-95; 20.6.2.2 NMAC - Rn, 20 NMAC 6.2.I.1001, 1-15-01]

20.6.2.3 STATUTORY AUTHORITY: Standards and Regulations are adopted by the commission under the authority of the Water Quality Act, NMSA 1978, Sections 74-6-1 through 74-6-17.
[2-18-77, 9-20-82, 12-1-95; 20.6.2.3 NMAC - Rn, 20 NMAC 6.2.I.1002, 1-15-01]

20.6.2.4 DURATION: Permanent.
[12-1-95; 20.6.2.4 NMAC - Rn, 20 NMAC 6.2.I.1003, 1-15-01]

20.6.2.5 EFFECTIVE DATE: December 1, 1995 unless a later date is cited at the end of a section.
[12-1-95, 11-15-96; 20.6.2.5 NMAC - Rn, 20 NMAC 6.2.I.1004, 1-15-01; A, 1-15-01]

20.6.2.6 OBJECTIVE: The objective of this Part is to implement the Water Quality Act, NMSA 1978, Sections 74-6-1 et seq.
[12-1-95; 20.6.2.6 NMAC - Rn, 20 NMAC 6.2.I.1005, 1-15-01]

20.6.2.7 DEFINITIONS: The following terms, as used in this part shall have the following meanings; terms defined in the Water Quality Act, but not defined in this part, will have the meaning given in the act.

A. Definitions that begin with the letter "A."

(1) "abandoned well" means a well whose use has been permanently discontinued or which is in a state of disrepair such that it cannot be rehabilitated for its intended purpose or other purposes including monitoring and observation;

(2) "abate" or "abatement" means the investigation, containment, removal or other mitigation of water pollution;

(3) "abatement plan" means a description of any operational, monitoring, contingency and closure requirements and conditions for the prevention, investigation and abatement of water pollution, and includes Stage 1, Stage 2, or Stage 1 and 2 of the abatement plan, as approved by the secretary;

(4) "adjacent properties" means properties that are contiguous to the discharge site or property that would be contiguous to the discharge site but for being separated by a public or private right of way, including roads and highways.

B. Definitions that begin with the letter "B."

(1) "background" means, for purposes of ground water abatement plans only and for no other purposes in this part or any other regulations including but not limited to surface water standards, the amount of ground water contaminants naturally occurring from undisturbed geologic sources or water contaminants which the responsible person establishes are occurring from a source other than the responsible person's facility; this definition shall not prevent the secretary from requiring abatement of commingled plumes of pollution, shall not prevent responsible persons from seeking contribution or other legal or equitable relief from other persons, and shall not preclude the secretary from exercising enforcement authority under any applicable statute, regulation or common law;

C. Definitions that begin with the letter "C."

(1) "casing" means pipe or tubing of appropriate material, diameter and weight used to support the sides of a well hole and thus prevent the walls from caving, to prevent loss of drilling mud into porous ground, or to prevent fluid from entering or leaving the well other than to or from the injection zone;

(2) "cementing" means the operation whereby a cementing slurry is pumped into a drilled hole and/or forced behind the casing;

(3) "cesspool" means a **"drywell"** that receives untreated domestic liquid waste containing human excreta, and which sometimes has an open bottom and/or perforated sides; a large capacity cesspool means a cesspool that receives liquid waste greater than that regulated by 20.7.3 NMAC;

(4) **"collapse"** means the structural failure of overlying materials caused by removal of underlying materials;

(5) **"commission"** means:

(a) the New Mexico water quality control commission or

(b) the department, when used in connection with any administrative and enforcement activity;

(6) **"confining zone"** means a geological formation, group of formations, or part of a formation that is capable of limiting fluid movement from an injection zone;

(7) **"conventional mining"** means the production of minerals from an open pit or underground excavation; underground excavations include mine shafts, workings and air vents, but does not include excavations primarily caused by in situ extraction activities;

D. Definitions that begin with the letter "D."

(1) **"daily composite sample"** means a sample collected over any twenty-four hour period at intervals not to exceed one hour and obtained by combining equal volumes of the effluent collected, or means a sample collected in accordance with federal permit conditions where a permit has been issued under the national pollutant discharge elimination system or for those facilities which include a waste stabilization pond in the treatment process where the retention time is greater than twenty (20) days, means a sample obtained by compositing equal volumes of at least two grab samples collected within a period of not more than twenty-four (24) hours;

(2) **"department", "agency",** or **"division"** means the New Mexico environment department or a constituent agency designated by the commission;

(3) **"discharge permit"** means a discharge plan approved by the department;

(4) **"discharge permit modification"** means a change to the requirements of a discharge permit that result from a change in the location of the discharge, a significant increase in the quantity of the discharge, a significant change in the quality of the discharge; or as required by the secretary;

(5) **"discharge permit renewal"** means the re-issuance of a discharge permit for the same, previously permitted discharge;

(6) **"discharge plan"** means a description of any operational, monitoring , contingency, and closure requirements and conditions for any discharge of effluent or leachate which may move directly or indirectly into ground water;

(7) **"discharge site"** means the entire site where the discharge and associated activities will take place;

(8) **"disposal"** means to abandon, deposit, inter or otherwise discard a fluid as a final action after its use has been achieved;

(9) **"domestic liquid waste"** means human excreta and water-carried waste from typical residential plumbing fixtures and activities, including but not limited to waste from toilets, sinks, bath fixtures, clothes or dishwashing machines and floor drains;

(10) **"domestic liquid waste treatment unit"** means a watertight unit designed, constructed and installed to stabilize only domestic liquid waste and to retain solids contained in such domestic liquid waste, including but not limited to aerobic treatment units and septic tanks;

(11) **"drywell"** means a well, other than an improved sinkhole or subsurface fluid distribution system, completed above the water table so that its bottom and sides are typically dry except when receiving fluids;

E. Definitions that begin with the letter "E."

"experimental technology" means a technology which has not been proven feasible under the conditions in which it is being tested;

F. Definitions that begin with the letter "F."

"fluid" means material or substance which flows or moves whether in a semisolid, liquid, sludge, gas, or any other form or state;

G. Definitions that begin with the letter "G."

"ground water" means interstitial water which occurs in saturated earth material and which is capable of entering a well in sufficient amounts to be utilized as a water supply;

H. Definitions that begin with the letter "H."

"hazard to public health" exists when water which is used or is reasonably expected to be used in the future as a human drinking water supply exceeds at the time and place of such use, one or more of the standards of Subsection A of 20.6.2.3103 NMAC, or the naturally occurring concentrations, whichever is higher in determining whether a discharge would cause a hazard to public health to exist, the secretary shall investigate and

consider the purification and dilution reasonably expected to occur from the time and place of discharge to the time and place of withdrawal for use as human drinking water;

I. Definitions that begin with the letter "I."

(1) "improved sinkhole" means a naturally occurring karst depression or other natural crevice found in volcanic terrain and other geologic settings which have been modified by man for the purpose of directing and emplacing fluids into the subsurface;

(2) "injection" means the subsurface emplacement of fluids through a well;

(3) "injection zone" means a geological formation, group of formations, or part of a formation receiving fluids through a well;

J Definitions that begin with the letter "J." [RESERVED]

K. Definitions that begin with the letter "K." [RESERVED]

L. Definitions that begin with the letter "L." [RESERVED]

M. Definitions that begin with the letter "M."

"motor vehicle waste disposal well" means a well which receives or has received fluids from vehicular repair or maintenance activities;

N. Definitions that begin with the letter "N."

"non-aqueous phase liquid" means an interstitial body of liquid oil, petroleum product, petrochemical, or organic solvent, including an emulsion containing such material;

O. Definitions that begin with the letter "O."

(1) "operational area" means a geographic area defined in a project discharge permit where a group of wells or well fields in close proximity comprise a single class III well operation;

(2) "owner of record" means an owner of property according to the property records of the tax assessor in the county in which the discharge site is located at the time the application was deemed administratively complete;

P. Definitions that begin with the letter "P."

(1) "packer" means a device lowered into a well to produce a fluid-tight seal within the casing;

(2) "person" means an individual or any other entity including partnerships, corporation, associations, responsible business or association agents or officers, the state or a political subdivision of the state or any agency, department or instrumentality of the United States and any of its officers, agents or employees;

(3) "petitioner" means a person seeking a variance from a regulation of the commission pursuant to Section 74-6-4(H) NMSA 1978;

(4) "plugging" means the act or process of stopping the flow of water, oil or gas into or out of a geological formation, group of formations or part of a formation through a borehole or well penetrating these geologic units;

(5) "project discharge permit" means a discharge permit which describes the operation of similar class III wells or well fields within one or more individual operational areas;

Q. Definitions that begin with the letter "Q." [RESERVED]

R. Definitions that begin with the letter "R."

(1) "refuse" includes food, swill, carrion, slops and all substances from the preparation, cooking and consumption of food and from the handling, storage and sale of food products, the carcasses of animals, junked parts of automobiles and other machinery, paper, paper cartons, tree branches, yard trimmings, discarded furniture, cans, oil, ashes, bottles, and all unwholesome material;

(2) "responsible person" means a person who is required to submit an abatement plan or who submits an abatement plan pursuant to this part;

S. Definitions that begin with the letter "S."

(1) "secretary" or **"director"** means the secretary of the New Mexico department of environment or the director of a constituent agency designated by the commission;

(2) "sewer system" means pipelines, conduits, pumping stations, force mains, or other structures, devices, appurtenances or facilities used for collecting or conducting wastes to an ultimate point for treatment or disposal;

(3) "sewerage system" means a system for disposing of wastes, either by surface or underground methods, and includes sewer systems, treatment works, disposal wells and other systems;

(4) "significant modification of Stage 2 of the abatement plan" means a change in the abatement technology used excluding design and operational parameters, or re-location of 25 percent or more of the

compliance sampling stations, for any single medium, as designated pursuant to Paragraph (4) of Subsection E of 20.6.2.4106 NMAC;

(5) "subsurface fluid distribution system" means an assemblage of perforated pipes, drain tiles, or other mechanisms intended to distribute fluids below the surface of the ground;

(6) "subsurface water" means ground water and water in the vadose zone that may become ground water or surface water in the reasonably foreseeable future or may be utilized by vegetation;

T. Definitions that begin with the letter "T."

(1) "TDS" means total dissolved solids as determined by the "calculation method" (sum of constituents), by the "residue on evaporation method at 180 degrees" of the "*U.S. geological survey techniques of water resource investigations*," or by conductivity, as the secretary may determine;

(2) "toxic pollutant" means any water contaminant or combination of the water contaminants in the list below

- **(a)** acrolein (CAS 107-02-8)
- **(b)** acrylonitrile (CAS 107-13-1)
- **(c)** benzene and alkylbenzenes
  - **(i)** benzene (CAS 71-43-2)
  - **(ii)** toluene (methylbenzene) (CAS 108-88-3)
  - **(iii)** ethylbenzene (CAS 100-41-4)
  - **(iv)** xylenes (dimethyl benzene isomers): o-xylene (CAS 95-47-6); m-xylene (CAS 108-38-3); and p-xylene (CAS 106-42-3)
  - **(v)** styrene (ethenylbenzene) (CAS 100-42-5)
- **(d)** chlorinated benzenes
  - **(i)** monochlorobenzene (CAS 108-90-7)
  - **(ii)** 1,2-dichlorobenzene (ortho-dichlorobenzene) (CAS 95-50-1)
  - **(iii)** 1,4-dichlorobenzene (para-dichlorobenzene) (CAS 106-46-7)
  - **(iv)** 1,2,4-trichlorobenzene (CAS 120-82-1)
  - **(v)** 1,2,4,5-tetrachlorobenzene (CAS 95-94-3)
  - **(vi)** pentachlorobenzene (CAS 608-93-5)
  - **(vii)** hexachlorobenzene (CAS 118-74-1)
- **(e)** chlorinated phenols
  - **(i)** 2,4-dichlorophenol (CAS 120-83-2)
  - **(ii)** 2,4,5-trichlorophenol (CAS 95-95-4)
  - **(iii)** 2,4,6-trichlorophenol (CAS 88-06-2)
  - **(iv)** pentachlorophenol (PCP) (CAS 87-86-5)
- **(f)** chloroalkyl ethers
  - **(i)** bis (2-chloroethyl) ether (CAS 111-44-4)
  - **(ii)** bis (2-chloroisopropyl) ether (CAS 108-60-1)
  - **(iii)** bis (chloromethyl) ether (CAS 542-88-1)
- **(g)** 1,2-dichloropropane (propylene dichloride, PDC) (CAS 78-87-5)
- **(h)** dichloropropenes (CAS 542-75-6)
- **(i)** 1,4-dioxane (CAS 123-91-1)
- **(j)** halogenated ethanes
  - **(i)** 1,2-dibromoethane (ethylene dibromide, EDB) (CAS 106-93-4)
  - **(ii)** 1,1-dichloroethane (1,1-DCA) (CAS 75-34-3)
  - **(iii)** 1,2-dichloroethane (ethylene dichloride, EDC) (CAS 107-06-2)
  - **(iv)** 1,1,1-trichloroethane (TCA) (CAS 71-55-6)
  - **(v)** 1,1,2-trichloroethane (1,1,2-TCA) (CAS 79-00-5)
  - **(vi)** 1,1,2,2-tetrachloroethane (CAS 79-34-5)
  - **(vii)** hexachloroethane (CAS 67-72-1)
- **(k)** halogenated ethenes
  - **(i)** chlorothene (vinyl chloride) (CAS 75-01-4)
  - **(ii)** 1,1-dichloroethene (1,1-DCE) (CAS 75-35-4)
  - **(iii)** cis-1,2-dichloroethene (cis-1,2-DCE) (CAS 156-59-2)
  - **(iv)** trans-1,2-dichloroethene (trans-1,2-DCE) (CAS 156-60-5)
  - **(v)** trichloroethene (trichloroethylene, TCE) (CAS 79-01-6)
  - **(vi)** tetrachloroethene (perchloroethylene, PCE) (CAS 127-18-4)

(l) halogenated methanes
- **(i)** bromodichloromethane (CAS 75-27-4)
- **(ii)** bromomethane (CAS 74-83-9)
- **(iii)** chloromethane (CAS 74-87-3)
- **(iv)** dichlorodifluoromethane (fluorocarbon-12) (CAS 75-71-8)
- **(v)** dichloromethane (methylene chloride) (CAS 75-09-2)
- **(vi)** tribromomethane (bromoform) (CAS 75-25-2)
- **(vii)** trichloromethane (chloroform) (CAS 67-66-3)
- **(viii)** tetrachloromethane (carbon tetrachloride) (CAS 56-23-5)
- **(ix)** trichlorofluoromethane (fluorocarbon-11) (CAS 75-69-4)

(m) hexachlorobutadiene (CAS 87-68-3)

(n) isophorone (CAS 78-59-1)

(o) methyl tertiary-butyl-ether (MTBE) (CAS 1634-04-4)

(p) nitroaromatics and high explosives (HE)
- **(i)** nitrobenzene (CAS 98-95-3)
- **(ii)** 2,4-dinitrotoluene (2,4-DNT) (CAS 121-14-2)
- **(iii)** 2,6-dinitrotoluene (2,6-DNT) (CAS 606-20-2)
- **(iv)** octrahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) (CAS 2691-41-0)
- **(v)** hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) (CAS 121-82-4)
- **(vi)** 2,4,6-trinitrotoluene (TNT) (CAS 118-96-7)
- **(vii)** 2,4-dinitro-o-cresol (CAS 534-52-1)
- **(viii)** dinitrophenols (CAS 51-28-5)

(q) nitrosamines
- **(i)** N-nitrosodiethylamine (CAS 55-18-5)
- **(ii)** N-nitrosodimethylamine (CAS 62-75-9)
- **(iii)** N-nitrosodibutylamine (CAS 924-16-3)
- **(iv)** N-nitrosodiphenylamine (CAS 86-30-6)
- **(v)** N-nitrosopyrrolidine (CAS 930-55-2)

(r) perchlorate (CAS 14797-73-0)

(s) perfluorinated-chemicals (PFCs)
- **(i)** perfluorohexane sulfonic acid (PHHxS) (CAS 355-46-4)
- **(ii)** perfluorooctane sulfonate (PFOS) (CAS 1763-23-1)
- **(iii)** perfluorooctanoic acid (PFOA) (CAS 335-67-1)

(t) pesticides
- **(i)** Aldrin (CAS 309-00-2)
- **(ii)** atrazine (CAS 1912-24-9)
- **(iii)** chlordane (CAS 57-74-9)
- **(iv)** DDT (CAS 50-29-3)
- **(v)** dieldrin (CAS 60-57-1)
- **(vi)** endosulfan (CAS 115-29-7)
- **(vii)** endrin (CAS 72-20-8)
- **(viii)** heptachlor (CAS 76-44-8)
- **(ix)** hexachlorocyclohexane (HCH, lindane): alpha-HCH (CAS 319-84-6); beta-HCH (CAS 319-85-7); gamma-HCH (CAS 58-89-9); and, technical-HCH (CAS 608-73-1)
- **(x)** hexachlorocyclopentadiene (CAS 77-47-4)
- **(xi)** prometon (CAS 1610-18-0)
- **(xii)** toxaphene (CAS 8001-35-2)

(u) phenol (CAS 108-95-2)

(v) phthalate esters
- **(i)** dibutyl phthalate (CAS 84-74-2)
- **(ii)** di-2-ethylhexyl phthalate (DEHP) (CAS 117-81-7)
- **(iii)** diethyl phthalate (DEP) (CAS 84-66-2)
- **(iv)** dimethyl phthalate (DMP) (CAS 131-11-3)

(w) polycyclic compounds
- **(i)** benzidine (CAS 92-87-5)

(ii) dichlorobenzidine (CAS 91-94-1)
(iii) diphenylhydrazine (CAS 122-66-7
(iv) polychlorinated biphenyls (PCBs) (CAS 1336-36-3)

(x) polynuclear aromatic hydrocarbons (PAHs)
(i) anthracne (CAS 120-12-7)
(ii) benzo(a)pyrene (CAS 50-32-8)
(iii) 3,4-benzofluoranthene (CAS 205-99-2)
(iv) benzo(k)fluoranthene (CAS 207-08-9)
(v) fluoranthene (CAS 206-44-0)
(vi) fluorene (CAS 86-73-7)
(vii) naphthalene (CAS 91-20-3)
(viii) 1-methylnaphthalene (CAS 90-12-0)
(ix) 2-methylnaphthalene (CAS 91-57-6)
(x) phenanthrene (CAS 85-01-8)
(xi) pyrene (CAS 129-00-0)

(y) thiolane 1,1 dioxide (sulfolane) (CAS 126-33-0)

U. Definitions that begin with the letter "U." [RESERVED]

V. Definitions that begin with the letter "V."

(1) **"vadose zone"** means earth material below the land surface and above ground water, or in between bodies of ground water

W. Definitions that begin with the letter "W."

(1) **"wastes"** means sewage, industrial wastes, or any other liquid, gaseous or solid substance which will pollute any waters of the state;

(2) **"water"** means all water including water situated wholly or partly within or bordering upon the state, whether surface or subsurface, public or private, except private waters that do not combine with other surface or subsurface water;

(3) **"water contaminant"** means any substance that could alter if discharged or spilled the physical, chemical, biological or radiological qualities of water; "water contaminant" does not mean source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954;

(4) **"watercourse"** means any river, creek, arroyo, canyon, draw, or wash, or any other channel having definite banks and beds with visible evidence of the occasional flow of water;

(5) **"water pollution"** means introducing or permitting the introduction into water, either directly or indirectly, of one or more water contaminants in such quantity and of such duration as may with reasonable probability injure human health, animal or plant life or property, or to unreasonably interfere with the public welfare or the use of property;

(6) **"well"** means: (1) A bored, drilled, or driven shaft; (2) A dug hole whose depth is greater than the largest surface dimension; (3) An improved sinkhole; or (4) A subsurface fluid distribution system;

(7) **"well stimulation"** means a process used to clean the well, enlarge channels, and increase pore space in the interval to be injected, thus making it possible for fluids to move more readily into the injection zone; well stimulation includes, but is not limited to, (1) surging, (2) jetting, (3) blasting, (4) acidizing, (5) hydraulic fracturing.

X. Definitions that begin with the letter "X." [RESERVED]

Y. Definitions that begin with the letter "Y." [RESERVED]

Z. Definitions that begin with the letter "Z." [RESERVED]

[1-4-68, 4-20-68, 11-27-70, 9-3-72, 4-11-74, 8-13-76, 2-18-77, 6-26-80, 7-2-81, 1-29-82, 9-20-82, 11-17-84, 3-3-86, 8-17-91, 8-19-93, 12-1-95; 20.6.2.7 NMAC - Rn, 20 NMAC 6.2.I.1101, 1-15-01; A, 1-15-01; A, 12-1-01; A, 9-15-02; A, 9-26-04; A, 7-16-06; A, 8-1-14; A, 12-21-18]

20.6.2.8 **SEVERABILITY:** If any section, subsection, individual standard or application of these standards or regulations is held invalid, the remainder shall not be affected.
[2-18-77, 12-1-95; 20.6.2.8 NMAC - Rn, 20 NMAC 6.2.I.1007, 1-15-01]

20.6.2.9 **DOCUMENTS:** Documents referenced in the part may be viewed at the New Mexico environment department, ground water quality bureau, Harold Runnels building, 1190 St. Francis Drive, Santa Fe, New Mexico 87503.
[12-1-95; 20.6.2.9 NMAC - Rn, 20 NMAC 6.2.I.1006, 1-15-01; A, 12-1-01]

20.6.2.10 LIMITATIONS: These regulations do not apply to the following:

A. Any activity or condition subject to the authority of the environmental improvement board pursuant to the Hazardous Waste Act, NMSA 1978, Sections 74-4-1 to -14, the Ground Water Protection Act, NMSA 1978, Sections 74-6B-1 to -14, or the Solid Waste Act, NMSA 1978, Sections 74-9-1 to -25, except to abate water pollution or to control the disposal or use of septage and sludge; or

B. Any activity or condition subject to the authority of the oil conservation commission pursuant to the provisions of the Oil and Gas Act, NMSA 1978, Section 70-2-12 and other laws conferring power on the oil conservation commission and the oil conservation division of the energy, minerals and natural resources department to prevent or abate water pollution.

[N, 12-21-18]

20.6.2.11[0] - 20.6.2.1199: [RESERVED]

[12-1-95; 20.6.2.10 - 20.6.2.1199 NMAC - Rn, 20 NMAC 6.2.I.1008-1100, 1102-1199, 1-15-01]

20.6.2.1200 PROCEDURES:

[12-1-95; 20.6.2.1200 NMAC - Rn, 20 NMAC 6.2.I.1200, 1-15-01]

20.6.2.1201 NOTICE OF INTENT TO DISCHARGE:

A. Except for the notices specified in paragraphs (1) and (2) of this subsection, any person intending to make a new water contaminant discharge or to alter the character or location of an existing water contaminant discharge, unless the discharge is being made or will be made into a community sewer system or subject to the Liquid Waste Disposal Regulations adopted by the New Mexico environmental improvement board, shall file a notice with the ground water quality bureau of the department for discharges that may affect ground water, and/ or the surface water quality bureau of the department for discharges that may affect surface water.

(1) Notices regarding discharges from facilities for the production, refinement, pipeline transmission of oil and gas or products thereof, the oil field service industry as related to oil and gas production activities, oil field brine production wells, and carbon dioxide facilities shall be filed with the oil conservation division of the energy, minerals and natural resources department,

(2) Notices regarding discharges related to geothermal resources, as defined in Section 71-9-3 of the Geothermal Resources Development Act, NMSA 1978, Sections 71-9-1 to -11 (2016) shall be filed with the energy conservation and management division of the energy, minerals and natural resources department.

B. Except for the notices specified in paragraphs (1) and (2) of this subsection any person intending to inject fluids into a well, including a subsurface distribution system, unless the injection is being made subject to the Liquid Waste Disposal Regulations adopted by the New Mexico environmental improvement board, shall file a notice with the ground water quality bureau of the department.

(1) Notices regarding injections to wells associated with oil and gas facilities as described in Paragraph (1) of Subsection A of 20.6.2.1201 NMAC shall be filed with the oil conservation division.

(2) Notices regarding injections to wells associated with exploration, development or production of geothermal resources, as described in Paragraph (2) of Subsection A of 20.6.2.1201 NMAC, shall be filed with the energy conservation and management division of the energy, minerals and natural resources department pursuant to the Geothermal Resources Development Act, NMSA 1978, Sections 71-9-1 to -11 (2016).

C. Notices shall state:

(1) the name of the person making the discharge;

(2) the address of the person making the discharge;

(3) the location of the discharge;

(4) an estimate of the concentration of water contaminants in the discharge; and

(5) the quantity of the discharge.

D. Based on information provided in the notice of intent, the department will notify the person proposing the discharge as to which of the following apply:

(1) a discharge permit is required;

(2) a discharge permit is not required;

(3) the proposed injection well will be added to the department's underground injection well inventory;

(4) the proposed injection activity or injection well is prohibited pursuant to 20.6.2.5004 NMAC.

[1-4-68, 9-5-69, 9-3-72, 2-17-74, 2-20-81, 12-1-95; 20.6.2.1201 NMAC - Rn, 20 NMAC 6.2.I.1201, 1-15-01; A, 12-1-01; A, 12-21-18]

20.6.2.1202 FILING OF PLANS AND SPECIFICATIONS--SEWERAGE SYSTEMS:

A. Any person proposing to construct a sewerage system or proposing to modify any sewerage system in a manner that will change substantially the quantity or quality of the discharge from the system shall file plans and specifications of the construction or modification with ground water quality bureau of the department for discharges that may affect ground water, and/or the surface water quality bureau of the department for discharges that may affect surface water. Modifications having a minor effect on the character of the discharge from sewerage systems shall be reported as of January 1 and June 30 of each year to the ground water quality bureau of the department for discharges that may affect ground water, or the surface water quality bureau of the department for discharges that may affect surface water.

B. Plans, specifications and reports required by this section, if related to facilities for the production, refinement and pipeline transmission of oil and gas, or products thereof, shall be filed instead with the oil conservation division.

C. Plans and specifications required to be filed under this section must be filed prior to the commencement of construction.

[1-4-68, 9-3-72, 2-20-81, 12-1-95; 20.6.2.1202 NMAC - Rn, 20 NMAC 6.2.I.1202, 1-15-01; A, 12-1-01]

20.6.2.1203 NOTIFICATION OF DISCHARGE-REMOVAL:

A. With respect to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, the following notifications and corrective actions are required:

(1) As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, any person in charge of the facility shall orally notify the chief of the ground water quality bureau of the department, or the appropriate counterpart in any constituent agency delegated responsibility for enforcement of these rules as to any facility subject to such delegation. To the best of that person's knowledge, the following items of information shall be provided:

(a) the name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;

(b) the name and address of the facility;

(c) the date, time, location, and duration of the discharge;

(d) the source and cause of discharge;

(e) a description of the discharge, including its chemical composition;

(f) the estimated volume of the discharge; and

(g) any actions taken to mitigate immediate damage from the discharge.

(2) When in doubt as to which agency to notify, the person in charge of the facility shall notify the chief of the ground water quality bureau of the department. If that department does not have authority pursuant to commission delegation, the department shall notify the appropriate constituent agency.

(3) Within one week after the discharger has learned of the discharge, the facility owner and/or operator shall send written notification to the same department official, verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

(4) The oral and written notification and reporting requirements contained in this Subsection A are not intended to be duplicative of discharge notification and reporting requirements promulgated by the oil conservation commission (OCC) or by the oil conservation division (OCD); therefore, any facility which is subject to OCC or OCD discharge notification and reporting requirements need not additionally comply with the notification and reporting requirements herein.

(5) As soon as possible after learning of such a discharge, the owner/operator of the facility shall take such corrective actions as are necessary or appropriate to contain and remove or mitigate the damage caused by the discharge.

(6) If it is possible to do so without unduly delaying needed corrective actions, the facility owner/operator shall endeavor to contact and consult with the chief of the ground water quality bureau of the department or appropriate counterpart in a delegated agency, in an effort to determine the department's views as to what further corrective actions may be necessary or appropriate to the discharge in question. In any event, no later

than fifteen (15) days after the discharger learns of the discharge, the facility owner/operator shall send to said Bureau Chief a written report describing any corrective actions taken and/or to be taken relative to the discharge. Upon a written request and for good cause shown, the bureau chief may extend the time limit beyond fifteen (15) days.

(7) The bureau chief shall approve or disapprove in writing the foregoing corrective action report within thirty (30) days of its receipt by the department. In the event that the report is not satisfactory to the department, the bureau chief shall specify in writing to the facility owner/operator any shortcomings in the report or in the corrective actions already taken or proposed to be taken relative to the discharge, and shall give the facility owner/operator a reasonable and clearly specified time within which to submit a modified corrective action report. The bureau chief shall approve or disapprove in writing the modified corrective action report within fifteen (15) days of its receipt by the department.

(8) In the event that the modified corrective action report also is unsatisfactory to the department, the facility owner/operator has five (5) days from the notification by the bureau chief that it is unsatisfactory to appeal to the department secretary. The department secretary shall approve or disapprove the modified corrective action report within five (5) days of receipt of the appeal from the bureau chief's decision. In the absence of either corrective action consistent with the approved corrective action report or with the decision of the secretary concerning the shortcomings of the modified corrective action report, the department may take whatever enforcement or legal action it deems necessary or appropriate.

(9) If the secretary determines that the discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within one hundred and eighty (180) days after notice is required to be given pursuant to Paragraph (1) of Subsection A of Section 20.6.2.1203 NMAC, the secretary may notify the facility owner/operator that he is a responsible person and that an abatement plan may be required pursuant to Section 20.6.2.4104 and Subsection A of Section 20.6.2.4106 NMAC.

B. Exempt from the requirements of this section are continuous or periodic discharges which are made:

(1) in conformance with regulations of the commission and rules, regulations or orders of other state or federal agencies; or

(2) in violation of regulations of the commission, but pursuant to an assurance of discontinuance or schedule of compliance approved by the commission or one of its duly authorized constituent agencies.

C. As used in this section and in Sections 20.6.2.4100 through 20.6.2.4115 NMAC, but not in other sections of this part:

(1) “discharge” means spilling, leaking, pumping, pouring, emitting, emptying, or dumping into water or in a location and manner where there is a reasonable probability that the discharged substance will reach surface or subsurface water;

(2) “facility” means any structure, installation, operation, storage tank, transmission line, motor vehicle, rolling stock, or activity of any kind, whether stationary or mobile;

(3) “oil” means oil of any kind or in any form including petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes;

(4) “operator” means the person or persons responsible for the overall operations of a facility; and

(5) “owner’ means the person or persons who own a facility, or part of a facility.

D. Notification of discharge received pursuant to this part or information obtained by the exploitation of such notification shall not be used against any such person in any criminal case, except for perjury or for giving a false statement.

E. Any person who has any information relating to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, is urged to notify the chief of the ground water quality bureau of the department. Upon such notification, the secretary may require an owner/operator or a responsible person to perform corrective actions pursuant to Paragraphs (5) and (9) of Subsection A of Section 20.6.2.1203 NMAC.

[2-17-74, 2-20-81, 12-24-87, 12-1-95; 20.6.2.1203 NMAC - Rn, 20 NMAC 6.2.I.1203, 1-15-01; A, 12-1-01; A, 12-21-18]

20.6.2.1204 - 20.6.2.1209 [RESERVED]

[12-1-95; 20.6.2.1204 - 20.6.2.1209 NMAC - Rn, 20 NMAC 6.2.I.1204-1209, 1-15-01]

20.6.2.1210 VARIANCE PETITIONS:

A. Any person seeking a variance pursuant to Section 74-6-4(H) NMSA 1978, shall do so by filing a written petition with the commission. The petitioner may submit with his petition any relevant documents or material which the petitioner believes would support his petition. Petitions shall:

(1) state the petitioner's name and address;

(2) state the date of the petition;

(3) describe the facility or activity for which the variance is sought;

(4) state the address or description of the property upon which the facility is located;

(5) describe the water body or watercourse affected by the discharge for which the variance is sought and provide information on uses of water that may be affected;

(6) identify the regulation of the commission from which the variance is sought;

(7) state in detail the extent to which the petitioner wishes to vary from the regulation;

(8) state why the petitioner believes that compliance with the regulation will impose an unreasonable burden upon his activity; and

(9) state in detail how any water pollution above standards will be abated; and

(10) state the period of time for which the variance is desired including all reasons, data, reports and any other information demonstrating that such time period is justified and reasonable.

B. The variance petition shall be reviewed in accordance with the adjudicatory procedures of 20 NMAC 1.3.

C. The commission may grant the requested variance, in whole or in part, may grant the variance subject to conditions, or may deny the variance. If the variance is granted in whole or in part, or subject to conditions, the commission shall specify the length of time that the variance shall be in place.

D. For variances associated with a discharge permit or abatement plan, the existence and nature of the variance shall be disclosed in all public notices applicable to the discharge permit or abatement plan.

E. For variances granted for a period in excess of five years, the petitioner shall provide to the department for review a variance compliance report at five year intervals to demonstrate that the conditions of the variance are being met, including notification of any changed circumstances or newly-discovered facts that are material to the variance. At such time as the department determines the report is administratively complete, the department shall post the report on its website, and mail or e-mail notice of its availability to those persons on a general and facility-specific list maintained by the department who have requested notice of discharge permit applications, and any person who participated in the variance process. If such conditions are not being met, or there is evidence indicating changed circumstances or newly-discovered facts or conditions that were unknown at the time the variance was initially granted, any person, including the department, may request a hearing before the commission to revoke, modify, or otherwise reconsider the variance within 90 days of the issuance of the notice of availability of the report.

F. An order of the commission is final and bars the petitioner from petitioning for the same variance without special permission from the commission. The commission may consider, among other things, the development of new information and techniques to be sufficient justification for a second petition. If the petitioner, or his authorized representative, fails to appear at the public hearing on the variance petition, the commission shall proceed with the hearing on the basis of the petition. A variance may not be extended or renewed unless a new petition is filed and processed in accordance with the procedures established by this section.

[7-19-68, 11-27-70, 9-3-72, 2-20-81, 11-15-96; 20.6.2.1210 NMAC - Rn, 20 NMAC 6.2.I.1210, 1-15-01; A, 12-21-18]

20.6.2.1211 - 20.6.2.1219: [RESERVED]

[12-1-95; 20.6.2.1211 - 20.6.2.1219 NMAC - Rn, 20 NMAC 6.2.I.1211-1219, 1-15-01]

20.6.2.1220 PENALTIES ENFORCEMENT, COMPLIANCE ORDERS, PENALTIES, ASSURANCE OF DISCONTINUANCE.: Failure to comply with the Water Quality Act, or any regulation or standard promulgated pursuant to the Water Quality Act is a prohibited act. If the secretary determines that a person has violated or is violating a requirement of the Water Quality Act or any regulation promulgated thereunder or is exceeding any water quality standard or ground water standard contained in commission regulations, or is not complying with a condition or provision of an approved or modified abatement plan, discharge plan, or permit issued pursuant to the Water Quality Act, the secretary may issue a compliance order, assess a penalty, commence a

civil action in district court, or accept an assurance of discontinuance in accordance with NMSA 1978, Section 74-6-10 of the Water Quality Act.
[12-1-95; 20.6.2.1220 NMAC - Rn, 20 NMAC 6.2.I.1220, 1-15-01]

20.6.2.1221 - 20.6.2.1999: [RESERVED]
[12-1-95; 20.6.2.1221 - 20.6.2.1999 NMAC - Rn, 20 NMAC 6.2.I.1221-2099, 1-15-01]

20.6.2.2000 SURFACE WATER PROTECTION:
[12-1-95; 20.6.2.2000 NMAC - Rn, 20 NMAC 6.2.II, 1-15-01]

20.6.2.2001 PROCEDURES FOR CERTIFICATION OF FEDERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS:

A. This section applies to the state certification of draft national pollutant discharge elimination system (NPDES) permits under Section 401 of the federal Clean Water Act. The purpose of such certification is to reasonably ensure that the permitted activities will be conducted in a manner that will comply with applicable water quality standards, including the antidegradation policy, and the statewide water quality management plan.

B. After review of a draft permit, the department will either: (1) certify that the discharge will comply with the applicable provisions of Sections 208(e), 301, 302, 303, 306 and 307 of the federal Clean Water Act and with appropriate requirements of state law; (2) certify that the discharge will comply with the applicable provisions of Sections 208(e), 301, 302, 303, 306 and 307 of the Clean Water Act and with appropriate requirements of state law upon inclusion of specified conditions in the permit and include the justification for the conditions; or (3) deny certification and include reasons for the denial. If the department does not act on the certification within the time prescribed by the federal permitting agency for such action, the authority to do so shall be waived.

C. Pursuant to federal regulations at 40 CFR 124.10(c), the U.S. environmental protection agency provides notice of draft NPDES permits to the applicant (except for general permits); various local, state, federal, tribal and pueblo government agencies; and other interested parties, and it allows at least 30 days of public comment. To the extent practicable, the department will provide public notice that the department is reviewing a draft NPDES permit for the purpose of preparing a state certification or denial pursuant to Section 401 of the federal Clean Water Act jointly with the notice provided by the U.S. environmental protection agency. The department will also post notice on its website.

D. When joint notice is impractical, the department shall provide notice that the department is reviewing a draft NPDES permit for purpose of preparing a state certification or denial pursuant to Section 401 of the federal Clean Water Act as follows:

(1) for general permits by:

(a) posting notice on the department's website;

(b) publishing notice in at least one newspaper of general circulation;

(c) mailing or e-mailing notice to those persons on the general mailing list maintained by the department who have requested such notice; and

(d) mailing or e-mailing notice to any affected local, state, federal, tribal, or pueblo government agency, as identified by the department; or

(2) for individual permits by:

(a) posting notice on the department's website;

(b) publishing notice in a newspaper of general circulation in the location of the discharge;

(c) mailing notice to the applicant;

(d) mailing or e-mailing notice to those persons on the general and facility-specific mailing list maintained by the department who have requested such notice; and

(e) mailing notice to any affected local, state, federal, tribal, or pueblo government agency, as identified by the department.

E. Public notices may describe more than one permit or permit action. The notice provided under Subsections C and D of 20.6.2.2001 NMAC shall include:

(1) for general permits:

(a) a statement that the department will accept written comments on the draft permit during the comment period including the address where comments may be submitted;

(b) a brief description of the activities that produce the discharge; and

(c) a description of the geographic area to be covered by the permit; or

(2) for individual permits:

(a) a statement that the department will accept written comments on the draft permit during the comment period including the address where comments may be submitted;

(b) the name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit;

(c) a brief description of the activities that produce the discharge; and

(d) a general description of the location of the discharge and the name of the receiving water.

F. Following the public notice provided under Subsections C or D of 20.6.2.2001 NMAC, there shall be a period of at least 30 days during which interested persons may submit written comments to the department. The 30-day comment period shall begin on the date of the public notice provided under Subsections C or D of 20.6.2.2001 NMAC. The department shall consider all pertinent comments.

G. Following the public comment period provided under Subsection F of 20.6.2.2001 NMAC, the department shall issue a final permit certification including any conditions that the department places on the certification, or issue a statement of denial including the reasons for the denial. The final certification will generally be issued within 45 days from the date a request to grant, deny or waive certification is received by the department, unless the department in consultation with the U.S. environmental protection agency regional administrator finds that unusual circumstances require a longer time. The department shall send a copy of the final permit certification or denial to the U.S. environmental protection agency, the applicant (except for general permits), and those members of the public who submitted comments to the department.

(1) The permit certification shall be in writing and shall include:

(a) the name of the applicant (except for general permits) and the NPDES permit number;

(b) a statement that the department has examined the application or other relevant information and bases its certification upon an evaluation of the information contained in such application or other information which is relevant to water quality considerations;

(c) a statement that there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards;

(d) a statement of any conditions which the department deems necessary or desirable with respect to the discharge of the activity;

(e) identification of any condition more stringent than that in the draft permit required to assure compliance with the applicable provisions of Sections 208(e), 301, 302, 303, 306 and 307 of the Clean Water Act and with appropriate requirements of state law citing the Clean Water Act or state law upon which the condition is based;

(f) a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of state law, including water quality standards; and

(g) such other information as the department may determine to be appropriate.

(2) With justification, including any of the reasons listed in the New Mexico Water Quality Act, NMSA 1978, Section 74-6-5(E), the department may deny permit certification. Denial of permit certification shall be in writing and shall include:

(a) the name of the applicant (except for general permits) and the NPDES permit number;

(b) a statement that the department has examined the application or other relevant information and bases its denial upon an evaluation of the information contained in such application or other information which is relevant to water quality considerations;

(c) a statement of denial including the reasons for the denial; and

(d) such other information as the department may determine to be appropriate.

H. Any person who is adversely affected by the certification or denial of a specific permit may appeal such certification or denial by filing a petition for review with the secretary within 30 days after the department issues the final permit certification or statement of denial. Such petition shall be in writing and shall include a concise statement of the reasons for the appeal and the relief requested. The secretary may hold a hearing on the appeal. In any such appeal hearing, the procedures of 20.1.4 NMAC shall not apply. The department shall give notice of the appeal hearing at least 30 days prior to the hearing. The notice shall state the date, time, and location of the appeal hearing and shall include the pertinent information listed in Subparagraphs (b), (c), and (d) of Paragraph (2) of Subsection E of 20.6.2.2001 NMAC. The secretary shall appoint a hearing officer to preside over the appeal hearing. Any person may present oral or written statements, data, technical information, legal arguments,

or other information on the permit certification or denial during the appeal hearing. Any person may present oral or written statements, data, technical information, legal arguments, or other information in rebuttal of that presented by another person. Reasonable time limits may be placed on oral statements, and the submission of written statements may be required. The hearing officer may question persons presenting oral testimony. Cross examination of persons presenting oral statements shall not otherwise be allowed. Within 30 days after the completion of the hearing, or such other time as the secretary may order given the complexities of the case, the hearing officer shall submit recommendations to the secretary. The secretary shall issue a final decision on the appeal within 30 days after receiving the recommendation, or such other time as the secretary may order given the complexities of the case.

I. Pursuant to the New Mexico Water Quality Act, NMSA 1978, Section 74-6-5(O), any person who is adversely affected by the secretary's final decision may file with the commission a petition for review of that decision based on the administrative record.

[20.6.2.2001 NMAC - N, 5-18-11]

20.6.2.2002 PROCEDURES FOR CERTIFICATION OF FEDERAL PERMITS FOR DISCHARGE OF DREDGED OR FILL MATERIAL:

A. This section applies to the state certification of draft permits or permit applications for the discharge of dredged or fill material under Section 401 of the federal Clean Water Act. The purpose of such certification is to reasonably ensure that the permitted activities will be conducted in a manner that will comply with applicable water quality standards, including the antidegradation policy, and the statewide water quality management plan.

B. After review of a draft permit or permit application, the department will either: (1) certify that the discharge will comply with the applicable provisions of Sections 301, 302, 303, 306 and 307 of the federal Clean Water Act and with appropriate requirements of state law; (2) certify that the discharge will comply with the applicable provisions of Sections 301, 302, 303, 306 and 307 of the Clean Water Act and with appropriate requirements of state law upon inclusion of specified conditions in the permit and include the justification for the conditions; or (3) deny certification and include reasons for the denial. If the department does not act on the certification within the time prescribed by the federal permitting agency for such action, the authority to do so shall be waived.

C. Pursuant to federal regulations at 33 CFR 325.3 and 33 CFR 330.5, the U.S. army corps of engineers provides notice of draft dredged or fill permits and permit applications to the applicant (except for general or nationwide permits); various local, state, federal, tribal and pueblo government agencies; and other interested parties, and it allows at least 15 days of public comment. To the extent practicable, the department will provide public notice that the department is reviewing a draft permit or permit application for the purpose of preparing a state certification or denial pursuant to Section 401 of the federal Clean Water Act jointly with the notice provided by the U.S. army corps of engineers. The department will also post notice on its website.

D. When joint notice is impractical, the department shall provide notice that the department is reviewing a draft dredged or fill permit or permit application for purpose of preparing a state certification or denial pursuant to Section 401 of the federal Clean Water Act as follows:

(1) for general permits by:

(a) posting notice on the department's website;

(b) publishing notice in at least one newspaper of general circulation;

(c) mailing or e-mailing notice to those persons on the general mailing list maintained by the department who have requested such notice; and

(d) mailing or e-mailing notice to any affected local, state, federal, tribal, or pueblo government agency, as identified by the department; or

(2) for individual permit applications by:

(a) posting notice on the department's website;

(b) publishing notice in a newspaper of general circulation in the location of the discharge;

(c) mailing notice to the applicant;

(d) mailing or e-mailing notice to those persons on the general and facility-specific mailing list maintained by the department who have requested such notice; and

(e) mailing notice to any affected local, state, federal, tribal, or pueblo government agency, as identified by the department.

E. Public notices may describe more than one permit or permit action. The notice provided under Subsections C and D of 20.6.2.2002 NMAC shall include:

(1) for general permits:

(a) a statement that the department will accept written comments on the draft permit during the comment period including the address where comments may be submitted;

(b) a brief description of the activities that produce the discharge; and

(c) a description of the geographic area to be covered by the permit; or

(2) for individual permit applications:

(a) a statement that the department will accept written comments on the permit application during the comment period including the address where comments may be submitted;

(b) the name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit;

(c) a brief description of the activities that produce the discharge; and

(d) a general description of the location of the discharge and the name of the receiving water.

F. Following the public notice provided under Subsections C or D of 20.6.2.2002 NMAC, there shall be a period of at least 30 days during which interested persons may submit written comments to the department. The 30-day comment period shall begin on the date of the public notice provided under Subsections C or D of 20.6.2.2002 NMAC. The department shall consider all pertinent comments.

G. The public notice provisions in Subsection C and D of Section 20.6.2.2002 NMAC and the public comment provisions in Subsection F of Section 20.6.2.2002 NMAC shall not apply to permits issued using emergency procedures under 33 CFR 325.2(e)(4). However, even in emergency situations, reasonable efforts shall be made to receive comments from interested state and local agencies and the affected public.

H. Following the public comment period provided under Subsection F of 20.6.2.2002 NMAC, the department shall issue a final permit certification including any conditions that the department places on the certification, or issue a statement of denial including the reasons for the denial. The final certification will generally be issued within 60 days from the date a request to grant, deny or waive certification is received by the department, unless the department in consultation with the U.S. army corps of engineers district engineer finds that unusual circumstances require a longer time. The department shall send a copy of the final permit certification or denial to the army corps of engineers, the applicant (except for general or nationwide permits), and those members of the public who submitted comments to the department.

(1) The permit certification or denial shall be in writing and shall include:

(a) the name of the applicant (except for general permits) and the permit number;

(b) a statement that the department has examined the application or other relevant information and bases its certification upon an evaluation of the information contained in such application or other information which is relevant to water quality considerations;

(c) a statement that there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards;

(d) a statement of any conditions which the department deems necessary or desirable with respect to the discharge of the activity; and

(e) such other information as the department may determine to be appropriate.

(2) With justification, including any of the reasons listed in the New Mexico Water Quality Act, NMSA 1978, Section 74-6-5(E), the department may deny permit certification. Denial of permit certification shall be in writing and shall include:

(a) the name of the applicant (except for general permits) and the permit number;

(b) a statement that the department has examined the application or other relevant information and bases its denial upon an evaluation of the information contained in such application or other information which is relevant to water quality considerations;

(c) a statement of denial including the reasons for the denial; and

(d) such other information as the department may determine to be appropriate.

I. Any person who is adversely affected by the certification or denial of a specific permit may appeal such certification or denial by filing a petition for review with the secretary within 30 days after the department issues the final permit certification or statement of denial. Such petition shall be in writing and shall include a concise statement of the reasons for the appeal and the relief requested. The secretary may hold a hearing on the appeal. In any such appeal hearing, the procedures of 20.1.4 NMAC shall not apply. The department shall give notice of the appeal hearing at least 30 days prior to the hearing. The notice shall state the date, time, and location

of the appeal hearing and shall include the pertinent information listed in Subparagraphs (b), (c), and (d) of Paragraph (2) of Subsection E of 20.6.2.2002 NMAC. The secretary shall appoint a hearing officer to preside over the appeal hearing. Any person may present oral or written statements, data, technical information, legal arguments, or other information on the permit certification or denial during the appeal hearing. Any person may present oral or written statements, data, technical information, legal arguments, or other information in rebuttal of that presented by another person. Reasonable time limits may be placed on oral statements, and the submission of written statements may be required. The hearing officer may question persons presenting oral testimony. Cross examination of persons presenting oral statements shall not otherwise be allowed. Within 30 days after the completion of the hearing, or such other time as the secretary may order given the complexities of the case, the hearing officer shall submit recommendations to the secretary. The secretary shall issue a final decision on the appeal within 30 days after receiving the recommendation, or such other time as the secretary may order given the complexities of the case.

J. Pursuant to the New Mexico Water Quality Act, NMSA 1978, Section 74-6-5(O), any person who is adversely affected by the secretary's final decision may file with the commission a petition for review of that decision based on the administrative record.

[20.6.2.2002 NMAC - N, 5-18-11]

20.6.2.2003 PROCEDURES FOR CERTIFICATION OF OTHER FEDERAL PERMITS:

A. This section applies to the state certification of draft federal permits, permit applications or licenses under Section 401 of the federal Clean Water Act, except for NPDES permits or permits for the discharge of dredged or fill material. For example, this section applies to certification of permits or licenses issued by the federal energy regulatory commission (FERC) and to permits or licenses issued under the Rivers and Harbors Act of 1899. The purpose of such certification is to reasonably ensure that the permitted activities will be conducted in a manner that will comply with applicable water quality standards, including the antidegradation policy, and the statewide water quality management plan.

B. After review of a draft permit, permit application or license, the department will either: (1) certify that the activity will comply with the applicable provisions of Sections 301, 302, 303, 306 and 307 of the federal Clean Water Act and with appropriate requirements of state law; (2) certify that the activity will comply with the applicable provisions of Sections 301, 302, 303, 306 and 307 of the Clean Water Act and with appropriate requirements of state law upon inclusion of specified conditions in the permit and include the justification for the conditions; or (3) deny certification and include reasons for the denial. If the department does not act on the certification within the time prescribed by the federal permitting agency for such action, the authority to do so shall be waived.

C. To the extent practicable, the department will provide public notice that the department is reviewing a draft federal permit, permit application or license for the purpose of preparing a state certification or denial jointly with the notice provided by the federal permitting or licensing agency. The department will also post notice on its website.

D. When joint notice is impractical, the department shall provide notice that the department is reviewing a draft federal permit, permit application or license for purpose of preparing a state certification or denial pursuant to Section 401 of the federal Clean Water Act as follows:

(1) for general permits or licenses by:

(a) posting notice on the department's website;

(b) publishing notice in at least one newspaper of general circulation;

(c) mailing or e-mailing notice to those persons on the general mailing list maintained by the department who have requested such notice; and

(d) mailing or e-mailing notice to any affected local, state, federal, tribal, or pueblo government agency, as identified by the department; or

(2) for individual permits or licenses by:

(a) posting notice on the department's website;

(b) publishing notice in a newspaper of general circulation in the location of the permitted or licensed activity;

(c) mailing notice to the applicant;

(d) mailing or e-mailing notice to those persons on the general and facility-specific mailing list maintained by the department who have requested such notice; and

(e) mailing notice to any affected local, state, federal, tribal, or pueblo government agency, as identified by the department.

E. Public notices may describe more than one license, permit or permit action. The notice provided under Subsections C and D of 20.6.2.2003 NMAC shall include:

(1) for general permits or licenses:

(a) a statement that the department will accept written comments on the permit or license during the comment period including the address where comments may be submitted; and

(b) a brief description of the permitted or licensed activities; and

(c) a description of the geographic area to be covered by the permit; or

(2) for individual permits or licenses:

(a) a statement that the department will accept written comments on the permit or license during the comment period including the address where comments may be submitted;

(b) the name and address of the licensee, permittee or permit or license applicant and, if different, of the facility or activity regulated by the permit or license;

(c) a brief description of the permitted or licensed activities; and

(d) a general description of the location of the permitted or licensed activities and the name of the receiving water.

F. Following the public notice provided under Subsections C or D of 20.6.2.2003 NMAC, there shall be a period of at least 30 days during which interested persons may submit written comments to the department. The 30-day comment period shall begin on the date of the public notice provided under Subsections C or D of 20.6.2.2003 NMAC. The department shall consider all pertinent comments.

G. Following the public comment period provided under Subsection F of 20.6.2.2003 NMAC, the department shall issue a final certification including any conditions that the department places on the certification, or issue a statement of denial including the reasons for the denial. The final certification will generally be issued within 60 days from the date a request to grant or deny certification is received by the department, unless the department in consultation with the federal permitting or licensing agency finds that unusual circumstances require a longer time. The department shall send a copy of the final certification or denial to the federal permitting or licensing agency, the applicant (except for general permits), and those members of the public who submitted comments to the department.

(1) The certification or denial shall be in writing and shall include:

(a) the name of the applicant (except for general permits) and the permit or license number;

(b) a statement that the department has examined the application or other relevant information and bases its certification upon an evaluation of the information contained in such application or other information which is relevant to water quality considerations;

(c) a statement that there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards;

(d) a statement of any conditions which the department deems necessary or desirable with respect to the discharge of the activity;

(e) identification of any condition more stringent than that in the draft permit or license required to assure compliance with the applicable provisions of Sections 301, 302, 303, 306 and 307 of the Clean Water Act and with appropriate requirements of state law citing the Clean Water Act or state law upon which the condition is based;

(f) a statement of the extent to which each condition of the draft permit or license can be made less stringent without violating the requirements of state law, including water quality standards; and

(g) Such other information as the department may determine to be appropriate.

(2) With justification, including any of the reasons listed in the New Mexico Water Quality Act, NMSA 1978, Section 74-6-5(E), the department may deny certification. Denial of certification shall be in writing and shall include:

(a) the name of the applicant (except for general permits) and the permit or license number;

(b) a statement that the department has examined the application or other relevant information and bases its denial upon an evaluation of the information contained in such application or other information which is relevant to water quality considerations;

(c) a statement of denial including the reasons for the denial; and

(d) such other information as the department may determine to be appropriate.

H. Any person who is adversely affected by the certification or denial of a specific permit or license may appeal such certification or denial by filing a petition for review with the secretary within 30 days after the

department issues the final certification or statement of denial. Such petition shall be in writing and shall include a concise statement of the reasons for the appeal and the relief requested. The secretary may hold a hearing on the appeal. In any such appeal hearing, the procedures of 20.1.4 NMAC shall not apply. The department shall give notice of the appeal hearing at least 30 days prior to the hearing. The notice shall state the date, time, and location of the appeal hearing and shall include the pertinent information listed in Subparagraphs (b), (c), and (d) of Paragraph (2) of Subsection E of 20.6.2.2003 NMAC. The secretary shall appoint a hearing officer to preside over the appeal hearing. Any person may present oral or written statements, data, technical information, legal arguments, or other information on the certification or denial during the appeal hearing. Any person may present oral or written statements, data, technical information, legal arguments, or other information in rebuttal of that presented by another person. Reasonable time limits may be placed on oral statements, and the submission of written statements may be required. The hearing officer may question persons presenting oral testimony. Cross examination of persons presenting oral statements shall not otherwise be allowed. Within 30 days after the completion of the hearing, or such other time as the secretary may order given the complexities of the case, the hearing officer shall submit recommendations to the secretary. The secretary shall issue a final decision on the appeal within 30 days after receiving the recommendation, or such other time as the secretary may order given the complexities of the case.

I. Pursuant to the New Mexico Water Quality Act, NMSA 1978, Section 74-6-5(O), any person who is adversely affected by the secretary's final decision may file with the commission a petition for review of that decision based on the administrative record.

[20.6.2.2003 NMAC - N, 5-18-11]

20.6.2.2004 - 20.6.2.2099: [RESERVED]

[12-1-95; 20.6.2.2001 - 20.6.2.2099 NMAC - Rn, 20 NMAC 6.2.I.1221-2099, 1-15-01; A, 5-18-11]

20.6.2.2100 APPLICABILITY: The requirements of Section 20.6.2.2101 and 20.6.2.2102 NMAC shall not apply to any discharge which is subject to a permit under the National Pollutant Discharge Elimination System of P. L. 92-500; provided that any discharger who is given written notice of National Pollutant Discharge Elimination System permit violation from the Administrator of the Environmental Protection Agency and who has not corrected the violation within thirty days of receipt of said notice shall be subject to Section 20.6.2.2101 and 20.6.2.2102 NMAC until in compliance with the National Pollution Discharge Elimination System permit conditions; provided further that nothing in this Part shall be construed as a deterrent to action under Section 74-6-11 NMSA, 1978.

[8-13-76; 20.6.2.2100 NMAC - Rn, 20 NMAC 6.2.II.2100, 1-15-01]

20.6.2.2101 GENERAL REQUIREMENTS:

A. Except as otherwise provided in Sections 20.6.2.2000 through 20.6.2.2201 NMAC, no person shall cause or allow effluent to discharge to a watercourse if the effluent as indicated by:

(1) any two consecutive daily composite samples;

(2) more than one daily composite sample in any thirty-day period (in which less than ten (10) daily composite samples are examined);

(3) more than ten percent (10%) of the daily composite samples in any thirty-day period (in which ten (10) or more daily composite samples are examined); or

(4) a grab sample collected during flow from an intermittent or infrequent discharge

does not conform to the following:

(a) Bio-chemical Oxygen Demand (BOD) Less than 30 mg/l

(b) Chemical Oxygen Demand (COD) Less than 125 mg/l

(c) Settleable Solids Less than 0.5 mg/l

(d) Fecal Coliform Bacteria Less than 500 organisms per 100 ml

(e) pH Between 6.6 and 8.6

B. Upon application, the secretary may eliminate the pH requirement for any effluent source that the secretary determines does not unreasonably degrade the water into which the effluent is discharged.

C. Subsection A of this Section does not apply to the weight of constituents in the water diverted.

D. Samples shall be examined in accordance with the most current edition of Standard Methods for the Examination of Water and Wastewater published by the American Public Health Association or the most current edition of Methods for Chemical Analysis of Water and Wastes published by the Environmental Protection Agency, where applicable.

[4-20-68, 3-14-71, 10-8-71, 8-13-76, 2-20-81, 12-1-95; 20.6.2.2101 NMAC - Rn, 20 NMAC 6.2.II.2101, 1-15-01]

20.6.2.2102 RIO GRANDE BASIN--COMMUNITY SEWERAGE SYSTEMS:

A. No person shall cause or allow effluent from a community sewerage system to discharge to a watercourse in the Rio Grande Basin between the headwaters of Elephant Butte Reservoir and Angostura Diversion Dam as described in Subsection E of this Section if the effluent, as indicated by:

(1) any two consecutive daily composite samples;

(2) more than one daily composite sample in any thirty-day period (in which less than ten (10) daily composite samples are examined);

(3) more than ten percent (10%) of the daily composite samples in any thirty-day period (in which ten (10) or more daily composite samples are examined); or

(4) a grab sample collected during flow from an intermittent or infrequent discharge

does not conform to the following:

(a)	Bio-chemical Oxygen Demand (BOD)	Less than 30 mg/l
(b)	Chemical Oxygen Demand (COD)	Less than 80 mg/l
(c)	Settleable Solids	Less than 0.1 mg/l
(d)	Fecal Coliform Bacteria	Less than 500 organisms per 100 ml
(e)	pH	Between 6.6 and 8.6

B. Upon application, the secretary may eliminate the pH requirement for any effluent source that the secretary determines does not unreasonably degrade the water into which the effluent is discharged.

C. Subsection A of this Section does not apply to the weight of constituents in the water diverted.

D. Samples shall be examined in accordance with the most current edition of Standard Methods for the Analysis of Water and Wastewater published by the American Public Health Association or the most current edition of Methods for Chemical Analysis of Water and Wastes published by the Environmental Protection Agency, where applicable.

E. The following is a description of the Rio Grande Basin from the headwaters of Elephant Butte Reservoir to Angostura Diversion Dam as used in this Section. Begin at San Marcial USGS gauging station, which is the headwaters of Elephant Butte Reservoir Irrigation Project, thence northwest to U.S. Highway 60, nine miles + west of Magdalena; thence west along the northeast edge of the San Agustin Plains closed basin; thence north along the east side of the north plains closed basin to the Continental Divide; thence northly along the Continental Divide to the community of Regina on State Highway 96; thence southeasterly along the crest of the San Pedro Mountains to Cerro Toledo Peak; thence southwesterly along the Sierra de Los Valles ridge and the Borrego Mesa to Bodega Butte; thence southerly to Angostura Diversion Dam which is the upper reach of the Rio Grande in this basin; thence southeast to the crest and the crest of the Manzano Mountains and the Los Pinos Mountains; thence southerly along the divide that contributes to the Rio Grande to San Marcial gauging station to the point and place of beginning; excluding all waters upstream of Jemez Pueblo which flow into the Jemez River drainage and the Bluewater Lake. Counties included in the basin are:

(1) north portion of Socorro County;

(2) northeast corner of Catron County;

(3) east portion of Valencia County;

(4) west portion of Bernalillo County;

(5) east portion of McKinley County; and

(6) most of Sandoval County.

[3-14-71, 9-3-72, 8-13-76, 2-20-81, 12-1-95; 20.6.2.2102 NMAC - Rn, 20 NMAC 6.2.II.2102, 1-15-01]

20.6.2.2103 - 20.6.2.2199: [RESERVED]

[12-1-95; 20.6.2.2103 - 20.6.2.2199 NMAC - Rn, 20 NMAC 6.2.II.2103-2199, 1-15-01]

20.6.2.2200 WATERCOURSE PROTECTION:

[12-1-95; 20.6.2.2200 NMAC - Rn, 20 NMAC 6.2.II.2200, 1-15-01]

20.6.2.2201 DISPOSAL OF REFUSE: No person shall dispose of any refuse in a natural watercourse or in a location and manner where there is a reasonable probability that the refuse will be moved into a natural watercourse by leaching or otherwise. Solids diverted from the stream and returned thereto are not subject to abatement under this Section.

[4-20-68, 9-3-72; 20.6.2.2201 NMAC - Rn, 20 NMAC 6.2.II.2201, 1-15-01]

20.6.2.2202 - 20.6.2.2999: [RESERVED]
[12-1-95; 20.6.2.2202 - 20.6.2.2999 NMAC - Rn, 20 NMAC 6.2.II.2202-3100, 1-15-01]

20.6.2.3000 PERMITTING AND GROUND WATER STANDARDS:
[12-1-95; 20.6.2.3000 NMAC - Rn, 20 NMAC 6.2.III, 1-15-01]

20.6.2.3001 - 20.6.2.3100: [RESERVED]
[12-1-95; 20.6.2.3001 - 20.6.2.3100 NMAC - Rn, 20 NMAC 6.2.II.2202-3100, 1-15-01]

20.6.2.3101 PURPOSE:

A. The purpose of Sections 20.6.2.3000 through 20.6.2.3114 NMAC controlling discharges onto or below the surface of the ground is to protect all ground water of the state of New Mexico which has an existing concentration of 10,000 mg/l or less TDS, for present and potential future use as domestic and agricultural water supply, and to protect those segments of surface waters which are gaining because of ground water inflow, for uses designated in the New Mexico Water Quality Standards. Sections 20.6.2.3000 through 20.6.2.3114 NMAC are written so that in general:

(1) if the existing concentration of any water contaminant in ground water is in conformance with the standard of 20.6.2.3103 NMAC, degradation of the ground water up to the limit of the standard will be allowed; and

(2) if the existing concentration of any water contaminant in ground water exceeds the standard of Section 20.6.2.3103 NMAC, no degradation of the ground water beyond the existing concentration will be allowed.

B. Ground water standards are numbers that represent the pH range and maximum concentrations of water contaminants in the ground water which still allow for the present and future use of ground water resources.

C. The standards are not intended as maximum ranges and concentrations for use, and nothing herein contained shall be construed as limiting the use of waters containing higher ranges and concentrations.
[2-18-77; 20.6.2.3101 NMAC - Rn, 20 NMAC 6.2.III.3101, 1-15-01]

20.6.2.3102: [RESERVED]
[12-1-95; 20.6.2.3102 NMAC - Rn, 20 NMAC 6.2.III.3102, 1-15-01]

20.6.2.3103 STANDARDS FOR GROUND WATER OF 10,000 mg/l TDS CONCENTRATION OR LESS: The following standards are the allowable pH range and the maximum allowable concentration in ground water for the contaminants specified unless the existing condition exceeds the standard or unless otherwise provided in Subsection E of Section 20.6.2.3109 NMAC. Regardless of whether there is one contaminant or more than one contaminant present in ground water, when an existing pH or concentration of any water contaminant exceeds the standard specified in Subsection A, B, or C of this section, the existing pH or concentration shall be the allowable limit, provided that the discharge at such concentrations will not result in concentrations at any place of withdrawal for present or reasonably foreseeable future use in excess of the standards of this section. These standards shall apply to the dissolved portion of the contaminants specified with a definition of dissolved being that given in the publication "*methods for chemical analysis of water and waste of the U.S. environmental protection agency*," with the exception that standards for mercury, organic compounds and non-aqueous phase liquids shall apply to the total nonfiltered concentrations of the contaminants. If the secretary determines that there is a reasonable probability of facilitated contaminant transport by colloids or organic macromolecules, or that proper filtration procedures are not being followed, the discharger may be required to test for both filtered and nonfiltered portions of inorganic contaminants to develop appropriate protocol for monitoring contaminants that have the potential to migrate through the aquifer.

A. Human Health Standards

(1) Numerical Standards

(a) Antimony (Sb) (CAS 7440-36-0)……..……..0.006 mg/1

(b) Arsenic (As) (CAS 7440-38-2)……..……..……0.01 mg/l

(c) Barium (Ba) (CAS 7440-39-3)……...……..…...2 mg/l

(d) Beryllium (be) (CAS 7440-41-7)……0.004 mg/l

(e) Cadmium (Cd) (CAS 7440-43-9)……..…...0.005 mg/l

(f) Chromium (Cr) (CAS 7440-47-3)…… …….0.05 mg/l

(g) Cyanide (CN) (CAS 57-12-5)……..0.2 mg/l
(h) Fluoride (F) (CAS 16984-48-8)…….1.6 mg/l
(i) Lead (Pb) (CAS 7439-92-1)…….0.015 mg/l
(j) Total Mercury (Hg) (CAS 7439-97-6)……...0.002 mg/l
(k) Nitrate (NO_3 as N) (CAS 14797-55-8)……...10.0 mg/l
(l) Nitrite (NO_2 as N) (CAS 10102-44-0)…….1.0 mg/l
(m) Selenium (Se) (CAS 7782-49-2)……..0.05 mg/l
(n) Silver (Ag) (CAS 7440-224)…….0.05 mg/l
(o) Thallium (Tl) (CAS 7440-28-0)……..0.002 mg/l
(p) Uranium (U) (CAS 7440-61-1)……0.03 mg/l
(q) Radioactivity: Combined Radium-226 (CAS 13982-63-3) and Radium-228 (CAS 15262-20-1)……5 pCi/l
(r) Benzene (CAS 71-43-2)……0.005 mg/l
(s) Polychlorinated biphenyls (PCB's) (CAS 1336-36-3).0.0005 mg/l
(t) Toluene (CAS 108-88-3)……...1 mg/l
(u) Carbon Tetrachloride (CAS 56-23-5)……..0.005 mg/l
(v) 1,2-dichloroethane (EDC) (CAS 107-06-2)……0.005 mg/l
(w) 1,1-dichloroethylene (1,1-DCE) (CAS 75-35-4)…….0.007 mg/l
(x) tetrachloroethylene (PCE) (CAS 127-18-4)……..0.005 mg/l
(y) trichloroethylene (TCE) (CAS 79-01-6)……...0.005 mg/l
(z) ethylbenzene (CAS 100-41-4)…….……0.7 mg/l
(aa) total xylenes (CAS 1330-20-7)…….…….....0.62 mg/l
(bb) methylene chloride (CAS 75-09-2)…….……0.005 mg/l
(cc) chloroform (CAS 67-66-3)…..……0.1 mg/l
(dd) 1,1-dichloroethane (CAS 75-34-3)…….……0.025 mg/l
(ee) ethylene dibromide (EDB) (CAS 106-93-4)……..…0.00005 mg/l
(ff) 1,1,1-trichloroethane (CAS 71-55-6)……..……...…0.2 mg/l
(gg) 1,1,2-trichloroethane (CAS 79-00-5)…….……...0.005 mg/l
(hh) 1,1,2,2-tetrachloroethane (CAS 79-34-5)…….…….0.01 mg/l
(ii) vinyl chloride (CAS 75-01-4)…..…….0.002 mg/l
(jj) PAHs: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes …0.03 mg/l
(kk) benzo-a-pyrene (CAS 50-32-8)…..……0.0002 mg/l
(ll) cis-1,2-dichloroethene (CAS 156-59-2)……0.07 mg/l
(mm) trans-1,2-dichloroethene (CAS 156-60-5)…….0.1 mg/l
(nn) 1,2-dichloropropane (PDC) (CAS 78-87-5)……0.005 mg/l
(oo) styrene (CAS 100-42-5)……...0.1 mg/l
(pp) 1,2-dichlorobenzene (CAS 95-50-1)……..0.6 mg/l
(qq) 1,4-dichlorobenzene (CAS 106-46-7)……..0.075 mg/l
(rr) 1,2,4-trichlorobenzene (CAS 120-82-1)……..0.07 mg/l
(ss) pentachlorophenol (CAS 87-86-5)……..0.001 mg/l
(tt) atrazine (CAS 1912-24-9)……0.003 mg/l

(2) Standards for Toxic Pollutants. A toxic pollutant shall not be present at a concentration shown by credible scientific data and other evidence appropriate under the Water Quality Act, currently available to the public, to have potential for causing one or more of the following effects upon exposure, ingestion, or assimilation either directly from the environment or indirectly by ingestion through food chains: (1) unreasonably threatens to injure human health, or the health of animals or plants which are commonly hatched, bred, cultivated or protected for use by man for food or economic benefit; as used in this definition injuries to health include death, histopathologic change, clinical symptoms of disease, behavioral abnormalities, genetic mutation, physiological malfunctions or physical deformations in such organisms or their offspring; or (2) creates a lifetime risk of more than one cancer per 100,000 exposed persons.

(3) Standards for Non-Aqueous Phase Liquids. Non-aqueous phase liquid shall not be present floating atop of or immersed within ground water, as can be reasonably measured.

B. Other Standards for Domestic Water Supply

(1) Chloride (Cl) (CAS 16887-00-6)…….……...250.0 mg/l
(2) Copper (Cu) (CAS 7440-50-8)…….……....1.0 mg/l
(3) Iron (Fe) (CAS 7439-89-6)…….……..…1.0 mg/l

(4) Manganese (Mn) (CAS 7439-96-5)……..……..…0.2 mg/l
(5) Phenols ……..……..…0.005 mg/l
(6) Sulfate (SO_4) (CAS 14808-79-8)……..……..600.0 mg/l
(7) Total Dissolved Solids (TDS) TDS…….…...……1000.0 mg/l
(8) Zinc (Zn) (CAS 7440-66-6)……..……...……10.0 mg/l
(9) pH…….……..…….between 6 and 9
(10) Methyl tertiary-butyl ether (MTBE) (CAS 1634-04-4)……0.1 mg/l

C. Standards for Irrigation Use - Ground water shall meet the standards of Subsection A, B, and C of this section unless otherwise provided.

(1) Aluminum (Al) (CAS 7429-90-5)……..……..…5.0 mg/l
(2) Boron (B) (CAS 7440-42-8)……..……...0.75 mg/l
(3) Cobalt (Co) (CAS 7440-48-4)……..…….0.05 mg/l
(4) Molybdenum (Mo) (CAS 7439-98-7)……..……...1.0 mg/l
(5) Nickel (Ni) (CAS 7440-02-0)……..……....0.2 mg/l

D. For purposes of application of the amended numeric standards for arsenic, cadmium, lead, combined radium-226 & radium-228; benzene, PCBs, carbon tetrachloride, EDC, PCE, TCE, ethylbenzene, methylene chloride, EDB, 1,1,2-trichloroethane and benzo-a-pyrene, to past and current water discharges (as of July 1, 2017), the new standards will not become effective until July 1, 2020. With regard to sites for which the secretary has approved an abatement completion report as of the effective date of this rule pursuant to 20.6.2.4112 NMAC, the amended numeric standards for arsenic, cadmium, lead, combined radium-226 & radium-228; benzene, PCBs, carbon tetrachloride, EDC, PCE, TCE, ethylbenzene, methylene chloride, EDB, 1,1,2-trichloroethane and benzo-a-pyrene shall not apply unless the secretary notifies the responsible person that the site is a source of these contaminants in ground water that pose a hazard to public health.

[2-18-77, 1-29-82, 11-17-83, 3-3-86, 12-1-95; 20.6.2.3103 NMAC - Rn, 20 NMAC 6.2.III.3103, 1-15-01; A, 9-26-04; A, 12-21-18]

[Note: For purposes of application of the amended numeric uranium standard to past and current water discharges (as of 9-26-04), the new standard will not become effective until June 1, 2007.]

20.6.2.3104 DISCHARGE PERMIT REQUIRED: Unless otherwise provided by this Part, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless he is discharging pursuant to a discharge permit issued by the secretary. When a permit has been issued, discharges must be consistent with the terms and conditions of the permit. In the event of a transfer of the ownership, control, or possession of a facility for which a discharge permit is in effect, the transferee shall have authority to discharge under such permit, provided that the transferee has complied with Section 20.6.2.3111 NMAC, regarding transfers.

[2-18-77, 12-24-87, 12-1-95; Rn & A, 20.6.2.3104 NMAC - 20 NMAC 6.2.III.3104, 1-15-01; A, 12-1-01]

20.6.2.3105 EXEMPTIONS FROM DISCHARGE PERMIT REQUIREMENT: Sections 20.6.2.3104 and 20.6.2.3106 NMAC do not apply to the following:

A. Effluent or leachate which conforms to all the standards in Subsections A, B, and C of Section 20.6.2.3103 NMAC and has a total nitrogen concentration of 10 mg/l or less. To determine conformance, samples may be taken by the agency before the effluent or leachate is discharged so that it may move directly or indirectly into ground water; provided that if the discharge is by seepage through non-natural or altered natural materials, the agency may take samples of the solution before or after seepage. If for any reason the agency does not have access to obtain the appropriate samples, this exemption shall not apply;

B. Effluent which is regulated pursuant to 20.7.3 NMAC, "Liquid Waste Disposal and Treatment" regulations;

C. Water used for irrigated agriculture, for watering of lawns, trees, gardens or shrubs, or for irrigation for a period not to exceed five years for the revegetation of any disturbed land area, unless that water is received directly from any sewerage system;

D. Discharges resulting from the transport or storage of water diverted, provided that the water diverted has not had added to it after the point of diversion any effluent received from a sewerage system, that the source of the water diverted was not mine workings, and that the secretary has not determined that a hazard to public health may result;

E. Effluent which is discharged to a watercourse which is naturally perennial; discharges to dry arroyos and ephemeral streams are not exempt from the discharge permit requirement, except as otherwise provided in this section;

F. Those constituents which are subject to effective and enforceable effluent limitations in a National Pollutant Discharge Elimination System (NPDES) permit, where discharge onto or below the surface of the ground so that water contaminants may move directly or indirectly into ground water occurs downstream from the outfall where NPDES effluent limitations are imposed, unless the secretary determines that a hazard to public health may result. For purposes of this subsection, monitoring requirements alone do not constitute effluent limitations;

G. Discharges resulting from flood control systems;

H. Leachate which results from the direct natural infiltration of precipitation through disturbed materials, unless the secretary determines that a hazard to public health may result;

I. Leachate which results entirely from the direct natural infiltration of precipitation through undisturbed materials;

J. Natural ground water seeping or flowing into conventional mine workings which re-enters the ground by natural gravity flow prior to pumping or transporting out of the mine and without being used in any mining process; this exemption does not apply to solution mining;

K. Effluent or leachate discharges resulting from activities regulated by permit issued by the mining and minerals division of the energy, minerals and natural resources department pursuant to the Surface Mining Act, NMSA 1978, Sections 69-25A-1 to 36, provided that this exemption shall not be construed as limiting the application of appropriate ground water protection requirements by the mining and minerals division and the New Mexico Coal Surface Mining Commission; or

L. Discharges resulting from activities regulated by the energy conservation and management division of the energy, minerals and natural resources department under the authority of the Geothermal Resources Development Act, NMSA 1978, Sections 71-9-1 to -11 (2016).

[2-18-77, 6-26-80, 7-2-81, 12-24-87, 12-1-95; 20.6.2.3105 NMAC - Rn, 20 NMAC 6.2.III.3105, 1-15-01; A, 12-1-01; A, 8-1-14; A, 12-21-18]

20.6.2.3106 APPLICATION FOR DISCHARGE PERMITS, RENEWALS, AND MODIFICATIONS:

A. Any person who, before or on June 18, 1977, is discharging any of the water contaminants listed in 20.6.2.3103 NMAC or any toxic pollutant so that they may move directly or indirectly into ground water shall, within 120 days of receipt of written notice from the secretary that a discharge permit is required, or such longer time as the secretary shall for good cause allow, submit a discharge plan to the secretary for approval; such person may discharge without a discharge permit until 240 days after written notification by the secretary that a discharge permit is required or such longer time as the secretary shall for good cause allow.

B. Any person who intends to begin, after June 18, 1977, discharging any of the water contaminants listed in 20.6.2.3103 NMAC or any toxic pollutant so that they may move directly or indirectly into ground water shall notify the secretary giving the information enumerated in Subsection B of 20.6.2.1201 NMAC; the secretary shall, within 60 days, notify such person if a discharge permit is required; upon submission of a discharge plan, the secretary shall review the discharge plan pursuant to 20.6.2.3108 and 20.6.2.3109 NMAC. For good cause shown the secretary may allow such person to discharge without a discharge permit for a period not to exceed 120 days.

C. Any person who intends to modify the discharge of any of the water contaminants listed in 20.6.2.3103 NMAC or any toxic pollutant in a manner that is a discharge permit modification as defined in this part shall submit a discharge plan for modification that contains the information required in Subsection D of 20.6.2.3106 NMAC; upon submission of a discharge plan for modification, the secretary shall review the discharge plan for modification pursuant to 20.6.2.3108 and 20.6.2.3109 NMAC.

D. A proposed discharge plan shall set forth in detail the methods or techniques the discharger proposes to use or processes expected to naturally occur which will ensure compliance with this part. At least the following information shall be included in the plan:

(1) quantity, quality and flow characteristics of the discharge;

(2) location of the discharge and of any bodies of water, watercourses and ground water discharge sites within one mile of the outside perimeter of the discharge site, and existing or proposed wells to be used for monitoring;

(3) depth to and TDS concentration of the ground water most likely to be affected by the discharge;

(4) flooding potential of the site;

(5) location and design of site(s) and method(s) to be available for sampling, and for measurement or calculation of flow;

(6) depth to and lithological description of rock at base of alluvium below the discharge site if such information is available;

(7) any additional information that may be necessary to demonstrate that the discharge permit will not result in concentrations in excess of the standards of 20.6.2.3103 NMAC at any place of withdrawal of water for present or reasonably foreseeable future use; detailed information on site geologic and hydrologic conditions may be required for a technical evaluation of the applicant's proposed discharge plan; and

(8) additional detailed information required for a technical evaluation of underground injection control wells as provided in 20.6.2.5000 through 20.6.2.5399 NMAC.

E. An applicant for a discharge permit shall pay fees as specified in 20.6.2.3114 and 20.6.2.5302 NMAC.

F. An applicant for a permit to dispose of or use septage or sludge, or within a source category designated by the commission, may be required by the secretary to file a disclosure statement as specified in 74-6-5.1 of the Water Quality Act.

G. If the holder of a discharge permit submits an application for discharge permit renewal at least 120 days before the discharge permit expires, and the discharger is not in violation of the discharge permit on the date of its expiration, then the existing discharge permit for the same activity shall not expire until the application for renewal has been approved or disapproved. A discharge permit continued under this provision remains fully effective and enforceable. An application for discharge permit renewal must include and adequately address all of the information necessary for evaluation of a new discharge permit. Previously submitted materials may be included by reference provided they are current, readily available to the secretary and sufficiently identified to be retrieved. [2-18-77, 6-26-80, 7-2-81, 9-20-82, 8-17-91, 12-1-95; 20.6.2.3106 NMAC - Rn, 20 NMAC 6.2.III.3106, 1-15-01; A, 12-1-01; A, 9-15-02; A, 8-31-15; A, 12-21-18]

20.6.2.3107 MONITORING, REPORTING, AND OTHER REQUIREMENTS:

A. Each discharge plan shall provide for the following as the secretary may require:

(1) the installation, use, and maintenance of effluent monitoring devices;

(2) the installation, use, and maintenance of monitoring devices for the ground water most likely to be affected by the discharge;

(3) monitoring in the vadose zone;

(4) continuation of monitoring after cessation of operations;

(5) periodic submission to the secretary of results obtained pursuant to any monitoring requirements in the discharge permit and the methods used to obtain these results;

(6) periodic reporting to the secretary of any other information that may be required as set forth in the discharge permit;

(7) the discharger to retain for a period of at least five years any monitoring data required in the discharge permit;

(8) a system of monitoring and reporting to verify that the permit is achieving the expected results;

(9) procedures for detecting failure of the discharge system;

(10) contingency plans to cope with failure of the discharge permit or system;

(11) a closure plan to prevent the exceedance of standards of 20.6.2.3103 NMAC in ground water after the cessation of operation which includes: a description of closure measures, maintenance and monitoring plans, post-closure maintenance and monitoring plans, financial assurance, and other measures necessary to prevent or abate such contamination; the obligation to implement the closure plan as well as the requirements of the closure plan, if any is required, survives the termination or expiration of the permit; a closure plan for any underground injection control well must also incorporate the applicable requirements of 20.6.2.5005, 20.6.2.5209, and 20.6.2.5361 NMAC.

B. Sampling and analytical techniques shall conform with the following references unless otherwise specified by the secretary:

(1) standard methods for the examination of water and wastewater, latest edition, American public health association; or

(2) methods for chemical analysis of water and waste, and other publications of the analytical quality laboratory, EPA; or

(3) techniques of water resource investigations of the U.S. geological survey; or

(4) annual book of ASTM standards; Part 31; water, latest edition, American society for testing and materials; or

(5) federal register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations; or

(6) national handbook of recommended methods for water-data acquisition, latest edition, prepared cooperatively by agencies of the United States government under the sponsorship of the U.S. geological survey.

C. The discharger shall notify the secretary of any facility expansion, production increase or process modification that would result in any significant modification in the discharge of water contaminants.

D. Any discharger of effluent or leachate shall allow any authorized representative of the secretary to:

(1) inspect and copy records required by a discharge permit;

(2) inspect any treatment works, monitoring and analytical equipment;

(3) sample any effluent before or after discharge;

(4) use monitoring systems and wells installed pursuant to a discharge permit requirement in order to collect samples from ground water or the vadose zone.

E. Each discharge permit for an underground injection control well shall incorporate the applicable requirements of 20.6.2.5000 through 20.6.2.5399 NMAC.

[2-18-77, 9-20-82, 11-17-83, 12-1-95; 20.6.2.3107 NMAC - Rn, 20 NMAC 6.2.III.3107, 1-15-01; A, 12-1-01; A, 8-31-15; A, 12-21-18]

20.6.2.3108 PUBLIC NOTICE AND PARTICIPATION:

A. Within 15 days of receipt of an application for a discharge permit, modification or renewal, the department shall review the application for administrative completeness. To be deemed administratively complete, an application shall provide all of the information required by Paragraphs (1) through (5) of Subsection F of 20.6.2.3108 NMAC and shall indicate, for department approval, the proposed locations and newspaper for providing notice required by Paragraphs (1) and (4) of Subsection B or Paragraph (2) of Subsection C of 20.6.2.3108 NMAC. The department shall notify the applicant in writing when the application is deemed administratively complete. If the department determines that the application is not administratively complete, the department shall notify the applicant of the deficiencies in writing within 30 days of receipt of the application and state what additional information is necessary.

B. Within 30 days of the department deeming an application for discharge permit or discharge permit modification administratively complete, the applicant shall provide notice, in accordance with the requirements of Subsection F of 20.6.2.3108 NMAC, to the general public in the locale of the proposed discharge in a form provided by the department by each of the methods listed below:

(1) for each 640 contiguous acres or less of a discharge site, prominently posting a synopsis of the public notice at least 2 feet by 3 feet in size, in English and in Spanish, at a place conspicuous to the public, approved by the department, at or near the proposed facility for 30 days; one additional notice, in a form approved by and may be provided by the department, shall be posted at a place located off the discharge site, at a place conspicuous to the public and approved by the department; the department may require a second posting location for more than 640 contiguous acres or when the discharge site is not located on contiguous properties;

(2) providing written notice of the discharge by mail or electronic mail, to owners of record of all properties within a 1/3 mile distance from the boundary of the property where the discharge site is located; if there are no properties other than properties owned by the discharger within a 1/3 mile distance from the boundary of property where the discharge site is located, the applicant shall provide notice to owners of record of the next nearest adjacent properties not owned by the discharger;

(3) providing notice by certified mail, return receipt requested, to the owner of the discharge site if the applicant is not the owner; and

(4) publishing a synopsis of the notice in English and in Spanish, in a display ad at least three inches by four inches not in the classified or legal advertisements section, in a newspaper of general circulation in the location of the proposed discharge.

C. Within 30 days of the department deeming an application for discharge permit renewal administratively complete, the applicant shall provide notice, in accordance with the requirements of Subsection F of 20.6.2.3108 NMAC, to the general public in the locale of the proposed discharge in a form provided by the department by each of the methods listed below:

(1) providing notice by certified mail to the owner of the discharge site if the applicant is not the owner; and

(2) publishing a synopsis of the notice, in English and in Spanish, in a display ad at least two inches by three inches, not in the classified or legal advertisements section, in a newspaper of general circulation in the location of the discharge.

D. Within 15 days of completion of the public notice requirements in Subsections B or C of 20.6.2.3108 NMAC, the applicant shall submit to the department proof of notice, including an affidavit of mailing(s) and the list of property owner(s), proof of publication, and an affidavit of posting, as appropriate.

E. Within 30 days of determining an application for a discharge permit, modification or renewal is administratively complete, the department shall post a notice on its website and shall mail notice to any affected local, state, federal, tribal or pueblo governmental agency, political subdivisions, ditch associations and land grants, as identified by the department. The department shall also mail or e-mail notice to those persons on a general and facility-specific list maintained by the department who have requested notice of discharge permit applications. The notice shall include the information listed in Subsection F of 20.6.2.3108 NMAC.

F. The notice provided under Subsection B, C and E of 20.6.2.3108 NMAC shall include:

(1) the name and address of the proposed discharger;

(2) the location of the discharge, including a street address, if available, and sufficient information to locate the facility with respect to surrounding landmarks;

(3) a brief description of the activities that produce the discharge described in the application;

(4) a brief description of the expected quality and volume of the discharge;

(5) the depth to and total dissolved solids concentration of the ground water most likely to be affected by the discharge;

(6) the address and phone number within the department by which interested persons may obtain information, submit comments, and request to be placed on a facility-specific mailing list for future notices; and

(7) a statement that the department will accept comments and statements of interest regarding the application and will create a facility-specific mailing list for persons who wish to receive future notices.

G. All persons who submit comments or statements of interest to the department or previously participated in a public hearing and who provide a mail or e-mail address shall be placed on a facility-specific mailing list and the department shall send those persons the public notice issued pursuant to Subsection J of 20.6.2.3108 NMAC, and notice of any public meeting or hearing scheduled on the application. All persons who contact the department to inquire about a specific facility shall be informed of the opportunity to be placed on the facility-specific mailing list.

H. Within 60 days after the department makes its administrative completeness determination and all required technical information is available, the department shall make available a draft permit or a notice of intent to deny an application for a discharge permit, modification or renewal. The draft permit shall include all proposed effluent limitations or other conditions on proposed discharge, and all proposed monitoring, recordkeeping, and reporting requirements. A draft permit for a permit modification shall only include those permit conditions proposed to be modified.

I. The department shall prepare a fact sheet for every draft permit for a discharge at a federal facility, except for discharges comprised solely of domestic liquid waste, and for other draft permits as determined by the Secretary. The fact sheet shall include:

(1) the information in Paragraphs 1 - 4 of Subsection F of 20.6.2.3108 NMAC;

(2) the information in Subsection J of 20.6.2.3108 NMAC; and

(3) a brief summary of the basis for the draft permit conditions, including references to applicable statutory or regulatory provisions and appropriate supporting references to the administrative record.

J. The department shall mail by certified mail a copy of the draft permit and fact sheet or notice of intent to deny to the applicant and shall provide notice of the draft permit or the notice of intent to deny by:

(1) posting on the department's website;

(2) publishing notice in a newspaper of general circulation in this state and a newspaper of general circulation in the location of the facility;

(3) mailing or e-mailing to those persons on a facility-specific mailing list;

(4) mailing to any affected local, state, or federal governmental agency, ditch associations and land grants, as identified by the department; and

(5) mailing to the governor, chairperson, or president of each Indian tribe, pueblo or nation within the state of New Mexico, as identified by the department.

K. The public notice issued under Subsection H shall include the information in Subsection F of 20.6.2.3108 NMAC and the following information:

(1) a brief description of the procedures to be followed by the secretary in making a final determination;

(2) a statement of the comment period and description of the procedures for a person to request a hearing on the application; and

(3) the address, telephone number, and email address at which interested persons may obtain a copy of the draft permit and fact sheet or the notice of intent to deny.

L. In the event that the draft permit or notice of intent to deny is available for review within 30 days of deeming the application administratively complete, the department may combine the public notice procedures of Subsections E and H of 20.6.2.3108 NMAC.

M. Following the public notice of the draft permit or notice of intent to deny, and prior to a final decision by the secretary, there shall be a period of at least 30 days during which written comments may be submitted to the department and/or a public hearing may be requested in writing. The 30-day comment period shall begin on the date of publication of notice in the newspaper. All comments will be considered by the department. Requests for a hearing shall be in writing and shall set forth the reasons why a hearing should be held. A public hearing shall be held if the secretary determines there is substantial public interest. The department shall notify the applicant and any person requesting a hearing of the decision whether to hold a hearing and the reasons therefore in writing.

N. If a hearing is held, pursuant to Subsection M of 20.6.2.3108 NMAC, notice of the hearing shall be given by the department at least 30 days prior to the hearing in accordance with Subsection H of 20.6.2.3108 NMAC. The notice shall include the information identified in Subsection F of 20.6.2.3108 NMAC in addition to the time and place of the hearing and a brief description of the hearing procedures. The hearing shall be held pursuant to 20.6.2.3110 NMAC.

[2-18-77, 12-24-87, 12-1-95, 11-15-96; 20.6.2.3108 NMAC - Rn, 20 NMAC 6.2.III.3108, 1-15-01; A, 12-1-01; A, 9-15-02; A, 7-16-06; A, 12-21-18]

20.6.2.3109 SECRETARY APPROVAL, DISAPPROVAL, MODIFICATION OR TERMINATION OF DISCHARGE PERMITS, AND REQUIREMENT FOR ABATEMENT PLANS:

A. The department shall evaluate the application for a discharge permit, modification or renewal based on information contained in the department's administrative record. The department may request from the discharger, either before or after the issuance of any public notice, additional information necessary for the evaluation of the application. The administrative record shall consist of the application, any additional information required by the department, any information submitted by the discharger or the general public, other information considered by the department, the proposed approval or disapproval of an application for a discharge permit, modification or renewal prepared pursuant to Subsection H of 20.6.2.3108 NMAC, and, if a public hearing is held, all of the documents filed with the hearing clerk, all exhibits offered into evidence at the hearing, the written transcript or tape recording of the hearing, any hearing officer report, and any post hearing submissions.

B. The secretary shall, within 30 days after the administrative record is complete and all required information is available, approve, approve with conditions or disapprove the proposed discharge permit, modification or renewal based on the administrative record. The Secretary shall issue a response to comments which shall specify which provisions, if any, in the draft permit were changed and the reasons for the change, and shall briefly describe and respond to all significant comments on the draft permit raised during the public comment period or at any hearing. The secretary shall notify the applicant or permittee by certified mail of the action taken and the reasons for such action and shall include a copy of the response to comments. Notice shall also be given by mail or email to persons who participated in the permitting action.

C. Provided that the other requirements of this part are met and the proposed discharge plan, modification or renewal demonstrates that neither a hazard to public health nor undue risk to property will result, the secretary shall approve the proposed discharge plan, modification or renewal if the following requirements are met:

(1) ground water that has a TDS concentration of 10,000 mg/l or less will not be affected by the discharge; or

(2) the person proposing to discharge demonstrates that approval of the proposed discharge plan, modification or renewal will not result in either concentrations in excess of the standards of 20.6.2.3103 NMAC at any place of withdrawal of water for present or reasonably foreseeable future use, except for contaminants in the water diverted as provided in Subsection E of 20.6.2.3109 NMAC; or

(3) the proposed discharge plan conforms to either Subparagraph (a) or (b) below and Subparagraph (c) below:

(a) municipal, other domestic discharges, and discharges from sewerage systems handling only animal wastes: the effluent is entirely domestic, is entirely from a sewerage system handling only animal wastes or is from a municipality and conforms to the following:

(i) the discharge is from an impoundment or a leach field existing on February 18, 1977 which receives less than 10,000 gallons per day and the secretary has not found that the discharge may cause a hazard to public health; or

(ii) the discharger has demonstrated that the total nitrogen in effluent that enters the subsurface from a leach field or surface impoundment will not exceed 200 pounds per acre per year and that the effluent will meet the standards of 20.6.2.3103 NMAC except for nitrates and except for contaminants in the water diverted as provided in Subsection E of 20.6.2.3109 NMAC; or

(iii) the total nitrogen in effluent that is applied to a crop which is harvested shall not exceed by more than 25 percent the maximum amount of nitrogen reasonably expected to be taken up by the crop and the effluent shall meet the standards of 20.6.2.3103 NMAC except for nitrates and except for contaminants in the water diverted as provided in Subsection E of 20.6.2.3109 NMAC;

(b) discharges from industrial, mining or manufacturing operations:

(i) the discharger has demonstrated that the amount of effluent that enters the subsurface from a surface impoundment will not exceed 0.5 acre-feet per acre per year; or

(ii) the discharger has demonstrated that the total nitrogen in effluent that enters the subsurface from a leach field or surface impoundment shall not exceed 200 pounds per acre per year and the effluent shall meet the standards of 20.6.2.3103 NMAC except for nitrate and contaminants in the water diverted as provided in Subsection E of 20.6.2.3109 NMAC; or

(iii) the total nitrogen in effluent that is applied to a crop that is harvested shall not exceed by more than 25 percent the maximum amount of nitrogen reasonably expected to be taken up by the crop and the effluent shall meet the standards of 20.6.2.3103 NMAC except for nitrate and contaminants in the water diverted as provided in Subsection D of 20.6.2.3109 NMAC;

(c) all discharges:

(i) the monitoring system proposed in the discharge plan includes adequate provision for sampling of effluent and adequate flow monitoring so that the amount being discharged onto or below the surface of the ground can be determined;

(ii) the monitoring data is reported to the secretary at a frequency determined by the secretary.

D. The secretary shall allow the following unless he determines that a hazard to public health may result:

(1) the weight of water contaminants in water diverted from any source may be discharged provided that the discharge is to the aquifer from which the water was diverted or to an aquifer containing a greater concentration of the contaminants than contained in the water diverted; and provided further that contaminants added as a result of the means of diversion shall not be considered to be part of the weight of water contaminants in the water diverted;

(2) the water contaminants leached from undisturbed natural materials may be discharged provided that:

(a) the contaminants were not leached as a product or incidentally pursuant to a solution mining operation; and

(b) the contaminants were not leached as a result of direct discharge into the vadose zone from municipal or industrial facilities used for the storage, disposal, or treatment of effluent;

(3) the water contaminants leached from undisturbed natural materials as a result of discharge into ground water from lakes used as a source of cooling water.

E. If data submitted pursuant to any monitoring requirements specified in the discharge permit or other information available to the secretary indicates that this part is being or may be violated or that the standards of 20.6.2.3103 NMAC are being or will be exceeded in ground water at any place of withdrawal for present or reasonably foreseeable future use, or that the water quality standards for interstate and intrastate streams in New Mexico are being or may be violated in surface water, due to the discharge, except as provided in Subsection D of 20.6.2.3109 NMAC.

(1) The secretary may require a discharge permit modification within the shortest reasonable time so as to achieve compliance with this part and to provide that any exceeding of standards in ground water at any place of withdrawal for present or reasonably foreseeable future use, or in surface water, due to the discharge except as provided in Subsection E of 20.6.2.3109 NMAC will be abated or prevented. If the secretary requires a discharge permit modification to abate water pollution:

(a) the abatement shall be consistent with the requirements and provisions of 20.6.2.4101, 20.6.2.4103, Subsections C and E of 20.6.2.4106, 20.6.2.4107, 20.6.2.4108 and 20.6.2.4112 NMAC; and

(b) the discharger may request of the secretary approval to carry out the abatement under 20.6.2.4000 through 20.6.2.4115 NMAC, in lieu of modifying the discharge permit; the discharger shall make the request in writing and shall include the reasons for the request.

(2) The secretary may terminate a discharge permit when a discharger fails to modify the permit in accordance with Paragraph (1) of Subsection E of 20.6.2.3109 NMAC.

(3) The secretary may require modification, or may terminate a discharge permit for a Class I well, a Class III well or other type of well specified in Subsection A of 20.6.2.5101 NMAC, pursuant to the requirements of Subsection I of 20.6.2.5101 NMAC.

(4) If a discharge permit is terminated, the secretary shall notify the permittee by certified mail of the action taken and the reasons for that action. Notice of the termination shall also be given by mail or electronic mail to persons who participated in the permitting action and to those persons on the facility-specific list maintained by the department.

F. If a discharge permit expires or is terminated for any reason and the standards of 20.6.2.3103 NMAC are being or will be exceeded in ground water, or that the water quality standards for interstate and intrastate streams in New Mexico are being or may be violated, the secretary may require the discharger to submit an abatement plan pursuant to 20.6.2.4104 and Subsection A of 20.6.2.4106 NMAC.

G. At the request of the discharger, a discharge permit may be modified in accordance with 20.6.2.3000 through 20.6.2.3114 NMAC.

H. The secretary shall not approve a proposed discharge plan, modification, or renewal for:

(1) any discharge for which the discharger has not provided a site and method for flow measurement and sampling;

(2) any discharge that will cause any stream standard to be violated;

(3) the discharge of any water contaminant which may result in a hazard to public health; or

(4) a period longer than five years, except that for new discharges, the term of the discharge permit approval shall commence on the date the discharge begins, but in no event shall the term of the approval exceed seven years from the date the permit was issued; for those permits expiring more than five years from the date of issuance, the discharger shall give prior written notification to the department of the date the discharge is to commence; the term of the permit shall not exceed five years from that date.

[2-18-77, 6-26-80, 9-20-82, 7-2-81, 3-3-86, 12-1-95, 11-15-96; 20.6.2.3109 NMAC - Rn, 20 NMAC 6.2.III.3109, 1-15-01; A, 12-1-01; A, 9-15-02; A, 7-16-06; A, 8-31-15; A, 12-21-18]

20.6.2.3110 PUBLIC HEARING PARTICIPATION:

A. The secretary may appoint an impartial hearing officer to preside over the hearing. The hearing officer may be a department employee other than an employee of the bureau evaluating the application.

B. The hearing shall be at a place in the area affected by the facility for which the discharge permit proposal, modification or renewal is sought.

C. Any person who wishes to present technical evidence at the hearing shall, no later than ten (10) days prior to the hearing, file with the department, and if filed by a person who is not the applicant, serve on the applicant, a statement of intent to present evidence. A person who does not file a statement of intent to present evidence may present a general non-technical statement in support of or in opposition to the proposed discharge plan, modification or renewal. The statement of intent to present technical evidence shall include:

(1) the name of the person filing the statement;

(2) indication of whether the person filing the statement supports or opposes the proposed discharge plan proposal, modification or renewal;

(3) the name of each witness;

(4) an estimate of the length of the direct testimony of each witness;

(5) a list of exhibits, if any, to be offered into evidence at the hearing; and

(6) a summary or outline of the anticipated direct testimony of each witness.

D. At the hearing, the New Mexico Rules of Civil Procedure, SCRA 1986, 1-001 to 1-102 and the New Mexico Rules of Evidence, SCRA 1986, 11-101 to 11-1102 shall not apply. At the discretion of the hearing officer, the rules may be used as guidance. Any reference to the Rules of Civil Procedure and the Rules of Evidence shall not be construed to extend or otherwise modify the authority and jurisdiction of the department under the Act.

E. The hearing officer shall conduct a fair and impartial proceeding, assure that the facts are fully elicited, and avoid delay. The hearing officer shall have authority to take all measures necessary for the maintenance of order and for the efficient, fair and impartial adjudication of issues arising in the proceedings.

F. At the hearing, all persons shall be given a reasonable chance to submit data, views or arguments orally or in writing and to examine witnesses testifying at the hearing.

G. Unless otherwise allowed by the hearing officer, testimony shall be presented in the following order:

(1) testimony by and examination of the applicant or permittee proving the facts relied upon to justify the proposed discharge plan, renewal or modification and meeting the requirements of the regulations;

(2) testimony by and examination of technical witnesses supporting or opposing approval, approval subject to conditions, or disapproval of the proposed discharge plan, renewal or modification, in any reasonable order;

(3) testimony by the general public; and

(4) rebuttal testimony, if appropriate.

H. The secretary may provide translation service at a public hearing conducted in a locale where the Department can reasonably expect to receive testimony from non-English speaking people.

I. If determined useful by the hearing officer, within thirty (30) days after conclusion of the hearing, or within such time as may be fixed by the hearing officer, the hearing officer may allow proposed findings of fact and conclusions of law and closing argument. All such submissions, if allowed, shall be in writing, shall be served upon the applicant or permittee, the department and all persons who request copies in advance in writing, and shall contain adequate references to the record and authorities relied on. No new evidence shall be presented unless specifically allowed by the hearing officer.

J. The department shall make an audio recording of the hearing. If the applicant or permittee, or a participant requests a written transcript or certified copy of the audio recording, the requestor shall pay the cost of the transcription or audio copying.

K. The hearing officer shall issue a report within thirty (30) days after the close of the hearing record. The report may include findings of fact, conclusions regarding all material issues of law or discretion, as well as reasons therefore. The report shall be served on the applicant or permittee, the department, and all persons who request copies in advance in writing. The report will be available for public inspection at the department's office in Santa Fe and at the field office closest to the point of the proposed discharge.

L. The secretary shall issue a decision in the matter no later than thirty (30) days of receipt of the hearing report. The decision shall be served and made available for inspection pursuant to Subsection K of this section.

M. Any person who testifies at the hearing or submits a written statement for the record will be considered a participant for purposes of Subsection 20.6.2.3113 NMAC and NMSA 1978, Section 74-6-5.N.
[2-18-77, 12-1-95, 11-15-96; 20.6.2.3110 NMAC - Rn, 20 NMAC 6.2.III.3110, 1-15-01; A, 12-1-01]

20.6.2.3111 TRANSFER OF DISCHARGE PERMIT: No purported transfer of any discharge permit shall be effective to create, alter or extinguish any right or responsibility of any person subject to this Part, unless the following transfer requirements are met:

A. Prior to any transfer of ownership, control, or possession (whether by lease, conveyance or otherwise) of a facility with a discharge permit, the transferor shall notify the transferee in writing of the existence of the discharge permit, and shall deliver or send by certified mail to the department a copy of such written notification, together with a certification or other proof that such notification has in fact been received by the transferee.

B. Upon receipt of such notification, the transferee shall have the duty to inquire into all of the provisions and requirements contained in such discharge permit, and the transferee shall be charged with notice of all such provisions and requirements as they appear of record in the department's file or files concerning such discharge permit.

C. Until both ownership and possession of the facility have been transferred to the transferee, the transferor shall continue to be responsible for any discharge from the facility.

D. Upon assuming either ownership or possession of the facility, the transferee shall have the same rights and responsibilities under the discharge permit as were applicable to the transferor.

E. Nothing in this section or in this part shall be construed to relieve any person of responsibility or liability for any act or omission which occurred while that person owned, controlled or was in possession of the facility.

[2-18-77, 12-24-87, 12-1-95, 11-15-96; 20.6.2.3111 NMAC - Rn, 20 NMAC 6.2.III.3111, 1-15-01; A, 12-1-01]

20.6.2.3112 APPEALS OF SECRETARY'S DECISIONS:

A. If the secretary approves, approves subject to conditions, or disapproves a proposed discharge plan, renewal or modification, or modifies or terminates a discharge permit, appeal therefrom shall be in accordance with the provisions of Sections 74-6-5(N), (O) and (P), NMSA 1978. The filing of an appeal does not act as a stay of any provision of the Act, the regulations, or any permit issued pursuant to the Act, unless otherwise ordered by the secretary or the commission.

B. If the secretary determines that a discharger is not exempt from obtaining a discharge permit, or that the material to be discharged contains any toxic pollutant listed in 20.6.2.7 NMAC, which is not included in the numerical standards of Paragraph (1) of Subsection A of 20.6.2.3103 NMAC, then the discharger may appeal such determination by filing with the commission's secretary a notice of appeal to the commission within thirty days after receiving the secretary's written determination, and the appeal therefrom and any action of the commission thereon shall be in accordance with the provisions of Sections 74-6-5(O), (P), (Q), (R) and (S) NMSA 1978.

C. Proceedings before the commission shall be conducted in accordance with the commission's adjudicatory procedures, 20 NMAC 1.3.

[2-18-77, 7-2-81, 12-1-95, 11-15-96; 20.6.2.3112 NMAC - Rn, 20 NMAC 6.2.III.3112, 1-15-01; A, 12-1-01; A, 7-16-06; A, 12-21-18]

20.6.2.3113 APPEALS OF COMMISSION DECISIONS: An applicant, permittee or a person who participated in a permitting action and who is adversely affected by such action may appeal the decision of the commission in accordance with the provisions of Section 74-6-7(A), NMSA 1978.

[2-18-77, 12-1-95, 11-15-96; 20.6.2.3113 NMAC - Rn, 20 NMAC 6.2.III.3113, 1-15-01; A, 12-1-01]

20.6.2.3114 FEES:

A. FEE AMOUNT AND SCHEDULE OF PAYMENT - Every facility submitting a discharge permit application for approval or renewal shall pay the permit fees specified in Table 1 of this section and shall pay a filing fee as specified in Table 2 of this section to the Water Quality Management Fund. Every facility submitting a request for temporary permission to discharge pursuant to Subsection B of Section 20.6.2.3106 NMAC, or financial assurance pursuant to Paragraph 11 of Subsection A of Section 20.6.2.3107 NMAC shall pay the fees specified in Table 2 of this section to the Water Quality Management Fund.

B. Facilities applying for discharge permits which are subsequently withdrawn or denied shall pay one-half of the permit fee at the time of denial or withdrawal.

C. Every facility submitting an application for discharge permit modification will be assessed a filing fee plus one-half of the permit fee. Applications for both renewal and modification will pay the filing fee plus the permit fee.

D. If the secretary requires a discharge permit modification as a component of an enforcement action, the facility shall pay the applicable discharge permit modification fee. If the secretary requires a discharge permit modification outside the context of an enforcement action, the facility shall not be assessed a fee.

E. The secretary may waive or reduce fees for discharge permit modifications or renewals which require little or no cost for investigation or issuance.

F. Facilities shall pay the filing fee at the time of discharge permit application. The filing fee is nonrefundable. The required permit fees may be paid in a single payment at the time of discharge permit approval or in equal installments over the term of the discharge permit. Installment payments shall be remitted yearly, with the first installment due on the date of discharge permit approval. Subsequent installment payments shall be remitted yearly thereafter. The discharge permit or discharge permit application review of any facility shall be suspended or terminated if the facility fails to submit an installment payment by its due date.

G. Every three years beginning in 2004, the department shall review the fees specified in Table 1 and 2 of this section and shall provide a report to the commission. The department shall revise the fees as necessary in accordance with Section 74-6-5(J), NMSA 1978.

20.6.2.3114 TABLE 1 (gpd=gallons per day)	**Permit Fee**
Agriculture <10,000 gpd	$ 1,150
Agriculture 10,000 to 49,999 gpd	$ 2,300
Agriculture 50,000 to 99,999 gpd	$ 3,450

Agriculture 100,000 gpd or greater	$ 4,600
Domestic Waste <10,000 gpd	$ 1,150
Domestic Waste 10,000 to 49,999 gpd	$ 2,300
Domestic Waste 50,000 to 99,999 gpd	$ 3,450
Domestic Waste 100,000 to 999,999 gpd	$ 4,600
Domestic Waste 1,000,000 to 9,999,999 gpd	$ 7,000
Domestic Waste 10,000,000 gpd or greater	$ 9,200
Food Processing <10,000 gpd	$ 1,150
Food Processing 10,000 to 49,999 gpd	$ 2,300
Food Processing 50,000 to 99,999 gpd	$ 3,450
Food Processing 100,000 to 999,999 gpd	$ 4,600
Food Processing 1,000,000 or greater	$ 7,000
Grease/Septage surface disposal <10,000 gpd	$ 1,725
Grease/Septage surface disposal 10,000 gpd or greater	$ 3,450
Industrial <10,000 gpd; or <10,000 yd^3 of contaminated solids	$ 1,725
Industrial 10,000 to 99,999 gpd; or 10,000 to 99,999 yd^3 of contaminated solids	$ 3,450
Industrial 100,000 to 999,999 gpd; or 100,000 to 999,999 yd^3 of contaminated solids or greater	$ 6,900
Industrial 1,000,000 gpd or greater; or 1,000,000 yd^3 of contaminated solids or greater	$10,350
Discharge of remediation system effluent - remediation plan approved under separate regulatory authority	$ 1,600
Mining dewatering	$ 3,250
Mining leach dump	$13,000
Mining tailings	$13,000
Mining waste rock	$13,000
Mining in-situ leach (except salt) and old stope leaching	$13,000
Mining other (mines with minimal environmental impact, post closure operation and maintenance, evaporation lagoons and land application at uranium mines)	$ 4,750
Gas Compressor Stations 0 to 1000 Horsepower	$ 400
Gas Compressor Stations >1001 Horsepower	$ 1,700
Gas Processing Plants	$ 4,000
Injection Wells: Class I (non-hazardous)	$ 4,500
Injection Wells: Class III and Geothermal	$ 1,700
Oil and Gas Service Companies	$ 1,700
Refineries	$ 8,400
Crude Pump Station	$ 1,200
Underground Gas Storage	$ 1,700
Abatement of ground water and vadose zone contamination	$ 2,600
General permit	$ 600

20.6.2.3114 Table 2

	Fee Amount
Filing fee	$100

Temporary permission	$50
Financial assurance: approval of instrument	greater of $250 or .01%
Financial assurance: annual review	greater of $100 or .001%

[8-17-91, 12-1-95; 20.6.2.3114, Rn & A, 20 NMAC 6.2.III.3114, 01-01-01; A, 12-21-18]

20.6.2.3115 - 20.6.2.3999: [RESERVED]
[12-1-95; 20.6.2.3115 - 20.6.2.3999 NMAC - Rn, 20 NMAC 6.2.III.3115-4100, 1-15-01]

20.6.2.4000 PREVENTION AND ABATEMENT OF WATER POLLUTION:
[12-1-95; 20.6.2.4000 NMAC - Rn, 20 NMAC 6.2.IV, 1-15-01]

20.6.2.4001 - 20.6.2.4100: [RESERVED]
[12-1-95; 20.6.2.4001 - 20.6.2.4100 NMAC - Rn, 20 NMAC 6.2.III.3115-4100, 1-15-01]

20.6.2.4101 PURPOSE:

A. The purposes of Sections 20.6.2.4000 through 20.6.2.4115 NMAC are to:

(1) Abate pollution of subsurface water so that all ground water of the State of New Mexico which has a background concentration of 10,000 mg/L or less TDS, is either remediated or protected for use as domestic and agricultural water supply, and to remediate or protect those segments of surface waters which are gaining because of subsurface water inflow, for uses designated in the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20.6.4 NMAC); and

(2) Abate surface water pollution so that all surface waters of the State of New Mexico are remediated or protected for designated or attainable uses as defined in the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20.6.4 NMAC).

B. If the background concentration of any water contaminant exceeds the standard or requirement of Subsections A, B, and C of Section 20.6.2.4103 NMAC, pollution shall be abated by the responsible person to the background concentration.

C. The standards and requirements set forth in Section 20.6.2.4103 NMAC are not intended as maximum ranges and concentrations for use, and nothing herein contained shall be construed as limiting the use of waters containing higher ranges and concentrations.

[12-1-95; 20.6.2.4101 NMAC - Rn, 20 NMAC 6.2.IV.4101, 1-15-01; A, 12-21-18]

20.6.2.4102: [RESERVED]
[12-1-95; 20.6.2.4102 NMAC - Rn, 20 NMAC 6.2.IV.4102, 1-15-01]

20.6.2.4103 ABATEMENT STANDARDS AND REQUIREMENTS:

A. The vadose zone shall be abated as follows:

(1) water contaminants in the vadose zone shall not be capable of contaminating ground water or surface water, in excess of the standards in Subsections B and C below, through leaching, percolation or as the water table elevation fluctuates; and

(2) any constituent listed in 20.6.2.3103 NMAC or any toxic pollutant in the vadose zone shall be abated so that it is not capable of endangering human health due to inhalation of vapors that may accumulate in structures, utility infrastructure, or construction excavations.

B. Ground water pollution at any place of withdrawal for present or reasonably foreseeable future use, where the TDS concentration is 10,000 mg/L or less, shall be abated to meet the standards of Subsections A, B, and C of Section 20.6.2.3103 NMAC.

C. Surface water pollution shall be abated to conform to the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20.6.4 NMAC).

D. Subsurface water and surface water abatement shall not be considered complete until a minimum of eight (8) consecutive sampling events collected from all compliance sampling stations approved by the secretary, with a minimum of ninety (90) days between sampling events spanning a time period no greater than four (4) years, meet the abatement standards of Subsections A, B, and C of this section. Abatement of water contaminants measured in solid-matrix samples of the vadose zone shall be considered complete after one-time sampling from compliance stations approved by the secretary.

E. Alternative Abatement Standards: If the person abating water pollution pursuant to an approved abatement plan, or pursuant to the exemptions of 20.6.2.4105 NMAC, is unable to fully meet an abatement standard set forth in Subsections A and C of this section, the person may file a petition with the commission seeking approval of an alternative abatement standard.

(1) A petition for an alternative abatement standard shall demonstrate at least one of the following criteria:

(a) compliance with the standard set forth in Subsections A and B of this section would not be feasible by the maximum use of commercially accepted abatement technology;

(b) compliance with the standard set forth in Subsections A and B of this section would not be feasible by the maximum use of technology within the economic capability of the person;

(c) there is no reasonable relationship between the economic and social costs and benefits of attainment of the standard set forth in Subsections A and B of this section; or

(d) compliance with the standard set forth in Subsections A and B of this section is technically infeasible following the maximum use of commercially accepted abatement technology, as demonstrated by a statistically valid extrapolation of the decrease in concentration of any water contaminant over a twenty (20) year period, such that projected future reductions during that time would be less than 20 percent of the concentration at the time technical infeasibility is proposed. Technical infeasibility proposals that involved the use of experimental abatement technology shall be considered at the discretion of the commission. A statistically valid decrease cannot be demonstrated by fewer than eight (8) consecutive sampling events. Sampling events demonstrating a statistically valid decrease shall be collected with a minimum of ninety (90) days between sampling events and shall not span a time period greater than four (4) years.

(2) A petition for alternative abatement standards shall specify, in addition to the information required by Subsection A of 20.6.2.1210 NMAC the following:

(a) the water contaminant for which the alternative abatement standard is proposed;

(b) the alternative abatement standard proposed;

(c) the three-dimensional body of water pollution for which approval is sought;

(d) a summary of all actions taken to abate water pollution to standards; and

(e) other information as deemed necessary, which may include a transport, fate and risk assessment in accordance with accepted methods.

(3) The commission may approve an alternative abatement standard if the petitioner demonstrates that:

(a) at least one of the criteria set forth in Paragraph 1 of Subsection E of this Section has been met;

(b) the proposed alternative abatement standard is technically achievable and cost benefit justifiable; and

(c) compliance with the proposed alternative abatement standard will not create a present or future hazard to public health or undue damage to property.

(4) An alternative abatement standard shall only be granted after a public hearing, as required by NMSA 1978, Section 74-6-4(H) of the water Quality Act.

(5) The commission shall review petitions for alternative abatement standards in accordance with the procedures for review of variance petitions provided in the commission's adjudicatory procedures, 20.1.3 NMAC.

F. For a site where abatement activities include post-completion monitoring, maintenance of engineering controls, remediation systems, affirmation of non-residential use, or port-closure care, institutional controls such as well drilling restrictions under 19.27.5 NMAC, deed restrictions, easements or other legal restrictions binding on successors in interest to the site may be required by the secretary.

[12-1-95, 11-15-96; 20.6.2.4103 NMAC - Rn, 20 NMAC 6.2.IV.4103, 1-15-01; A, 12-21-18]

20.6.2.4104 ABATEMENT PLAN REQUIRED:

A. Unless otherwise provided by this Part, all responsible persons who are abating, or who are required to abate, water pollution in excess of the standards and requirements set forth in Section 20.6.2.4103 NMAC of this Part shall do so pursuant to an abatement plan approved by the secretary. When an abatement plan has been approved, all actions leading to and including abatement shall be consistent with the terms and conditions of the abatement plan.

B. In the event of a transfer of the ownership, control or possession of a facility for which an abatement plan is required or approved, where the transferor is a responsible person, the transferee also shall be

considered a responsible person for the duration of the abatement plan, and may jointly share the responsibility to conduct the actions required by this Part with other responsible persons. The transferor shall notify the transferee in writing, at least thirty (30) days prior to the transfer, that an abatement plan has been required or approved for the facility, and shall deliver or send by certified mail to the secretary a copy of such notification together with a certificate or other proof that such notification has in fact been received by the transferee. The transferor and transferee may agree to a designated responsible person who shall assume the responsibility to conduct the actions required by this Part. The responsible persons shall notify the secretary in writing if a designated responsible person is agreed upon. If the secretary determines that the designated responsible person has failed to conduct the actions required by this Part, the secretary shall notify all responsible persons of this failure in writing and allow them thirty (30) days, or longer for good cause shown, to conduct the required actions before issuing a compliance order pursuant to Section 20.6.2.1220 NMAC.

C. The secretary may require the responsible person(s) to submit a financial assurance plan which covers the estimated costs to conduct the actions required by the abatement plan. Such a financial assurance plan shall be consistent with any financial assurance requirements adopted by the commission.

D. The Secretary may require an oversight funding agreement with the responsible person for abatement plans which compensates the department for reasonable costs associated with the oversight of activities. [12-1-95; 20.6.2.4104 NMAC - Rn, 20 NMAC 6.2.IV.4104, 1-15-01; A, 12-21-18]

20.6.2.4105 EXEMPTIONS FROM ABATEMENT PLAN REQUIREMENTS:

A. Except as provided in Subsection B of this Section, Sections 20.6.2.4104 and 20.6.2.4106 NMAC do not apply to a person who is abating water pollution:

(1) from a storage tank, under the authority of the Petroleum Storage Tank Regulations (20.5 NMAC) adopted by the New Mexico Environmental Improvement Board, or in accordance with the New Mexico Ground Water Protection Act;

(2) under the authority of the U.S. Environmental Protection Agency pursuant to either the federal Comprehensive Environmental Response, Compensation and Liability Act, and amendments, or the Resource Conservation and Recovery Act;

(3) under the authority of the secretary pursuant to the Hazardous Waste Management Regulations (20.4.1 NMAC) adopted by the New Mexico Environmental Improvement Board;

(4) under the authority of the U.S. Nuclear Regulatory Commission or the U.S. Department of Energy pursuant to the Atomic Energy Act;

(5) from a solid waste landfill, under the authority of the secretary pursuant to the Solid Waste Management Regulations (20.9.1 NMAC) adopted by the N.M. Environmental Improvement Board;

(6) under the authority of a ground water discharge plan approved by the secretary, provided that such abatement is consistent with the requirements and provisions of Sections 20.6.2.4101, 20.6.2.4103, Subsections C and E of Section 20.6.2.4106, Sections 20.6.2.4107 and 20.6.2.4112 NMAC;

(7) under the authority of a Letter of Understanding, Settlement Agreement or Administrative Order on Consent signed by the secretary prior to December 1, 1995, provided that abatement is being performed in full compliance with the terms of the Letter of Understanding, Settlement Agreement or Administrative Order on Consent; and

(8) on an emergency basis, or while abatement plan approval is pending, or in a manner that will result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within one hundred and eighty (180) days after notice is required to be given pursuant to Paragraph (1) of Subsection A of Section 20.6.2.1203 NMAC, provided that the delegated agency does not object to the abatement action pursuant to Paragraphs (6) and (7) of Subsection A of Section 20.6.2.1203 NMAC.

B. If the secretary determines that abatement of water pollution subject to Subsection A of this section will not meet the standards of Subsections A, B, and C of Section 20.6.2.4103 NMAC, or that additional action is necessary to protect health, welfare, environment or property, the secretary may notify a responsible person, by certified mail, to submit an abatement plan pursuant to Section 20.6.2.4104 and Subsection A of Section 20.6.2.4106 NMAC. The notification shall state the reasons for the secretary's determination. In any appeal of the secretary's determination under this Section, the secretary shall have the burden of proof.

C. Sections 20.6.2.4104 and 20.6.2.4106 NMAC do not apply to the following activities:

(1) Discharges subject to an effective and enforceable National Pollutant Discharge Elimination System (NPDES) permit;

(2) Land application of ground water contaminated with nitrogen originating from human or animal waste and not otherwise exceeding the standards of Subsection A of Section 20.6.2.3103 NMAC, provided that it is done in compliance with a discharge plan approved by the secretary;

(3) Abatement of water pollution resulting from the withdrawal and decontamination or blending of polluted water for use as a public or private drinking-water supply, by any person other than a responsible person, unless the secretary determines that a hazard to public health may result; and

(4) Reasonable operation and maintenance of irrigation and flood control facilities.

[12-1-95; 20.6.2.4105 NMAC - Rn, 20 NMAC 6.2.IV.4105, 1-15-01; A, 10-15-03; A, 12-21-18]

20.6.2.4106 ABATEMENT PLAN PROPOSAL:

A. Except as provided for in Section 20.6.2.4105 NMAC, a responsible person shall, within sixty (60) days of receipt of written notice from the secretary that an abatement plan is required, submit an abatement plan proposal to the secretary for approval. For good cause shown, the secretary may allow for a total of one hundred and twenty (120) days to prepare and submit the abatement plan proposal.

B. Voluntary Abatement:

(1) Any person wishing to abate water pollution in excess of the standards and requirements set forth in Section 20.6.2.4103 NMAC may submit a Stage 1 abatement plan proposal to the secretary for approval. Following approval by the secretary of a final site investigation report prepared pursuant to Stage 1 of an abatement plan, any person may submit a Stage 2 abatement plan proposal to the secretary for approval.

(2) Following approval of a Stage 1 or Stage 2 abatement plan proposal under Paragraph (1) of Subsection B of this Section, the person submitting the approved plan shall be a responsible person under Sections 20.6.2.4000 through 20.6.2.4115 NMAC for the purpose of performing the approved Stage 1 or Stage 2 abatement plan. Nothing in this Section shall preclude the secretary from applying Paragraph (9) of Subsection A of Section 20.6.2.1203 NMAC to a responsible person if applicable.

C. Stage 1 Abatement Plan: The purpose of Stage 1 of the abatement plan shall be to design and conduct a site investigation that will adequately define site conditions, and provide the data necessary to select and design an effective abatement option. Stage 1 of the abatement plan may include, but not necessarily be limited to, the following information depending on the media affected, and as reasonably needed to select and implement an expeditious abatement option:

(1) Descriptions of the site, including a site map, and of site history including the nature of the discharge that caused the water pollution, and a summary of previous investigations;

(2) Site investigation workplan to define:

(a) site geology and hydrogeology, the vertical and horizontal extent and magnitude of vadose-zone and ground water contamination, subsurface hydraulic parameters including hydraulic conductivity, transmissivity, storativity, and rate and direction of contaminant migration, inventory of water wells inside and within one (1) mile from the perimeter of the three-dimensional body where the standards set forth in Subsection B of Section 20.6.2.4103 NMAC are exceeded, and location and number of such wells actually or potentially affected by the pollution; and

(b) surface water hydrology, seasonal stream flow characteristics, ground water/surface water relationships, the vertical and horizontal extent and magnitude of contamination and impacts to surface water and stream sediments. The magnitude of contamination and impacts on surface water may be, in part, defined by conducting a biological assessment of fish, benthic macroinvertebrates and other wildlife populations. Seasonal variations should be accounted for when conducting these assessments.

(3) Monitoring program, including sampling stations and frequencies, for the duration of the abatement plan that may be modified, after approval by the secretary, as additional sampling stations are created;

(4) Quality assurance plan, consistent with the sampling and analytical techniques listed in Subsection B of Section 20.6.2.3107 NMAC and with Section 20.6.4.10 NMAC of the Water Quality Standards for Interstate and Intrastate Streams in New Mexico (20.6.4 NMAC), for all work to be conducted pursuant to the abatement plan;

(5) Site health and safety plan for all work to be performed pursuant to the abatement plan;

(6) A schedule for all Stage 1 abatement plan activities, including the submission of summary quarterly progress reports, and the submission, for approval by the secretary, of a detailed final site investigation report; and

(7) Any additional information that may reasonably be required to design and perform an adequate site investigation.

D. **Stage 2 Abatement Plan**: Any responsible person shall submit a Stage 2 abatement plan proposal to the secretary for approval within sixty (60) days after approval by the secretary of the final site investigation report prepared pursuant to Stage 1 of the abatement plan. The secretary may grant approval for an extension of time to submit a State 2 abatement plan for good cause shown.

E. The purpose of Stage 2 of the abatement plan shall be to select and design, if necessary, an abatement option that, when implemented, will result in attainment of the abatement standards and requirements set forth in Section 20.6.2.4103 NMAC, including post-closure maintenance activities. Stage 2 of the abatement plan should include, at a minimum, the following information:

(1) Brief description of the current situation at the site;

(2) Development and assessment of abatement options;

(3) Description, justification and design, if necessary, of preferred abatement option;

(4) Modification, if necessary, of the monitoring program approved pursuant to Stage 1 of the abatement plan, including the designation of pre and post abatement-completion sampling stations and sampling frequencies to be used to demonstrate compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC;

(5) Site maintenance activities, if needed, proposed to be performed after termination of abatement activities;

(6) A schedule for the duration of abatement activities, including the submission of summary quarterly progress reports;

(7) A public notification proposal designed to satisfy the requirements of Subsections B and C of Sections 20.6.2.4108 and 20.6.2.4108 NMAC; and

(8) Any additional information that may be reasonably required to select, describe, justify and design an effective abatement option.

[12-1-95; 20.6.2.4106 NMAC - Rn, 20 NMAC 6.2.IV.4106, 1-15-01; A, 12-21-18]

20.6.2.4107 OTHER REQUIREMENTS:

A. Any responsible person shall allow any authorized representative of the secretary to:

(1) upon presentation of proper credentials, enter the facility at reasonable times;

(2) inspect and copy records required by an abatement plan;

(3) inspect any treatment works, monitoring and analytical equipment;

(4) sample any wastes, ground water, surface water, stream sediment, plants, animals, or vadose-zone material including vadose-zone vapor;

(5) use monitoring systems and wells under such responsible person's control in order to collect samples of any media listed in Paragraph (4) of Subsection A of this section; and

(6) gain access to off-site property not owned or controlled by such responsible person, but accessible to such responsible person through a third-party access agreement, provided that it is allowed by the agreement.

B. Any responsible person shall provide the secretary, or a representative of the secretary, with at least four (4) working days advance notice of any sampling to be performed pursuant to an abatement plan, or any well plugging, abandonment or destruction at any facility where an abatement plan has been required.

C. Any responsible person wishing to plug, abandon or destroy a monitoring or water supply well within the perimeter of the 3-dimensional body where the standards set forth in Subsection B of Section 20.6.2.4103 NMAC are exceeded, at any facility where an abatement plan has been required, shall propose such action by certified mail to the secretary for approval, unless such approval is required from the State Engineer. The proposed action shall be designed to prevent water pollution that could result from water contaminants migrating through the well or borehole. The proposed action shall not take place without written approval from the secretary, unless written approval or disapproval is not received by the responsible person within thirty (30) days of the date of receipt of the proposal.

[12-1-95; 20.6.2.4107 NMAC - Rn, 20 NMAC 6.2.IV.4107, 1-15-01]

20.6.2.4108 PUBLIC NOTICE AND PARTICIPATION:

A. Within thirty (30) days of filing of a Stage 1 abatement plan proposal, the secretary shall issue a news release summarizing:

(1) the source, extent, magnitude and significance of water pollution, as known at that time;

(2) the proposed Stage 1 abatement plan investigation; and

(3) the name and telephone number of an agency contact who can provide additional information.

B. Any person proposing a Stage 2 abatement plan, a significant modification to a Stage 2 abatement plan, or an alternative abatement standard shall provide notice of the proposal to the following persons:

(1) the public, who shall be notified through publication of a notice in newspapers of general circulation in this state and in the county where the abatement will occur or where the water body that would be affected by a proposed alternative abatement standard is located, and, in areas with large percentages of non-English speaking people, through the mailing of the public notice in English to a bilingual radio station serving the area where the abatement will occur with a request that it be aired as a public service announcement in the predominant non-English language of the area;

(2) those persons, as identified by the secretary, who have requested notification, who shall be notified by mail or email;

(3) the New Mexico Trustee for Natural Resources, and any other local, state or federal governmental agency affected, as identified by the secretary, which shall be notified by certified mail;

(4) owners and residents of surface property located inside, and within one (1) mile from, the perimeter of the geographic area where the standards and requirements set forth in Section 20.6.2.4103 NMAC are exceeded who shall be notified by a means approved by the secretary; and

(5) the Governor or President of each Indian Tribe, Pueblo or Nation within the state of New Mexico, as identified by the secretary, who shall be notified by mail or email.

C. The public notice proposal for a Stage 2 abatement plan proposal or significant modification of a Stage 2 abatement plan shall be submitted to the secretary for approval with a proposed Stage 2 abatement plan, or significant modification of a Stage 2 abatement plan, and shall include:

(1) name and address of the responsible person;

(2) location of the proposed abatement;

(3) brief description of the nature of the water pollution and of the proposed abatement action;

(4) brief description of the procedures followed by the secretary in making a final determination;

(5) statement on the comment period;

(6) statement that a copy of the abatement plan can be viewed by the public at the department's main office or at the department field office for the area in which the discharge occurred;

(7) statement that written comments on the abatement plan, and requests for a public meeting or hearing that include the reasons why a meeting or hearing should be held, will be accepted for consideration if sent to the secretary within sixty (60) days after the date of public notice; and

(8) address and phone number at which interested persons may obtain further information.

D. The public notice proposal for a proposed alternative abatement standard shall be submitted to the secretary for approval thirty (30) days prior to the filing of a petition for alternative abatement standards, and shall include:

(1) name and address of the responsible person;

(2) location of the proposed alternative abatement standards;

(3) brief description of the nature of the water pollution and of the proposed alternative abatement standards;

(4) brief description of the procedures followed by the commission in making a final determination on a petition for alternate abatement standards;

(5) statement that a copy of the petition for alternate abatement standards petition can be viewed by the public at the department's main office or at the department field office for the area in which the affected water body is occurring;

(6) statement on how the public can request to be placed on a facility-specific mailing list for notification of any hearing conducted on the petition for alternate abatement standards pursuant to 20.1.3 NMAC; and

(7) address and phone number at which interested persons may obtain further information.

E. Within thirty (30) days of the secretary’s approval of a Stage 2 abatement plan public notice proposal, any responsible person shall provide to the secretary proof of public notice to the persons listed in Subsection B of 20.6.2.4108 NMAC.

F. For a proposed Stage 2 abatement plan or significant modification of a Stage 2 abatement plan, a public meeting or hearing may be held if the secretary determines there is significant public interest. Notice of the

time and place of the meeting or hearing shall be given at least thirty (30) days prior to the meeting or hearing pursuant to Subsections A and B above. The secretary may appoint a meeting facilitator or hearing officer. The secretary may require the responsible person to prepare for approval by the secretary a fact sheet, to be distributed at the public meeting or hearing and afterwards upon request, written in English and Spanish, describing site history, the nature and extent of water pollution, and the proposed abatement. The record of the meeting or hearing, requested under this Section, consists of a tape recorded or transcribed session, provided that the cost of a court recorder shall be paid by the person requesting the transcript. If requested by the secretary, the responsible person will provide a translator approved by the secretary at a public meeting or hearing conducted in a locale where testimony from non-English speaking people can reasonably be expected. At the meeting or hearing, all interested persons shall be given a reasonable chance to submit data, views or arguments orally or in writing, and to ask questions of the secretary or the secretary's designee and of the responsible person, or their authorized representatives.

G. An alternative abatement standard shall only be granted after a public hearing before the commission, as required by NMSA 1978, Section 74-6-4(H) of the Water Quality Act. The commission shall review petitions for alternative abatement standards in accordance with the procedures for review of variance petitions provided in the commission's adjudicatory procedures, 20.1.3 NMAC.

[12-1-95; 20.6.2.4108 NMAC - Rn, 20 NMAC 6.2.IV.4108, 1-15-01; A, 12-21-18]

20.6.2.4109 SECRETARY APPROVAL OR NOTICE OF DEFICIENCY OF SUBMITTALS:

A. The secretary shall, within sixty (60) days of receiving a Stage 1 abatement plan proposal, a site investigation report, or an abatement completion report, approve the document, or notify the responsible person of the document's deficiency, based upon the information available.

B. The secretary shall, within thirty (30) days of receiving a fact sheet, or Stage 2 abatement plan public notice proposal, approve or notify the responsible person of the document's deficiency, based upon the information available.

C. If no public meeting or hearing is held pursuant to Subsection E of Section 20.6.2.4108 NMAC, then the secretary shall, within 120 days of receiving a Stage 2 abatement plan proposal, approve the plan, or notify the responsible person of the plan's deficiency, based upon the information available.

D. If a public meeting or hearing is held pursuant to Subsection E of Section 20.6.2.4108, then the secretary shall, within sixty (60) days of receipt of all required information, approve Stage 2 of the abatement plan proposal, or notify the responsible person of the plan's deficiency, based upon the information contained in the plan and information submitted at the meeting or hearing.

E. If the secretary notifies a responsible person of any deficiencies in a site investigation report, or in a Stage 1 or Stage 2 abatement plan proposal, the responsible person shall submit a modified document to cure the deficiencies specified by the secretary within thirty (30) days of receipt of the notice of deficiency. The responsible person shall be in violation of Sections 20.6.2.4000 through 20.6.2.4115 NMAC if he fails to submit a modified document within the required time, or if the modified document does not make a good faith effort to cure the deficiencies specified by the secretary.

F. Provided that the other requirements of this Part are met and provided further that Stage 2 of the abatement plan, if implemented, will result in the standards and requirements set forth in Section 20.6.2.4103 NMAC being met within a schedule that is reasonable given the particular circumstances of the site, the secretary shall approve the plan.

[12-1-95; 20.6.2.4109 NMAC - Rn, 20 NMAC 6.2.IV.4109, 1-15-01; A, 12-21-18]

20.6.2.4110 INVESTIGATION AND ABATEMENT: Any responsible person who receives approval for Stage 1 and/or Stage 2 of an abatement plan shall conduct all investigation, abatement, monitoring and reporting activity in full compliance with Sections 20.6.2.4000 through 20.6.2.4115 NMAC and according to the terms and schedules contained in the approved abatement plans.

[12-1-95; 20.6.2.4110 NMAC - Rn, 20 NMAC 6.2.IV.4110, 1-15-01]

20.6.2.4111 ABATEMENT PLAN MODIFICATION:

A. Any approved abatement plan may be modified, at the written request of the responsible person, in accordance with Sections 20.6.2.4000 through 20.6.2.4115 NMAC, and with written approval of the secretary.

B. If data submitted pursuant to any monitoring requirements specified in the approved abatement plan or other information available to the secretary indicates that the abatement action is ineffective, or is creating unreasonable injury to or interference with health, welfare, environment or property, the secretary may require a

responsible person to modify an abatement plan within the shortest reasonable time so as to effectively abate water pollution which exceeds the standards and requirements set forth in Section 20.6.2.4103 NMAC, and to abate and prevent unreasonable injury to or interference with health, welfare, environment or property.
[12-1-95; 20.6.2.4111 NMAC - Rn, 20 NMAC 6.2.IV.4111, 1-15-01]

20.6.2.4112 COMPLETION AND TERMINATION:

A. Abatement shall be considered complete when the standards and requirements set forth in Section 20.6.2.4103 NMAC are met. At that time, the responsible person shall submit an abatement completion report, documenting compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC, to the secretary for approval. The abatement completion report also shall propose any changes to long term monitoring and site maintenance activities, if needed, to be performed after termination of the abatement plan.

B. Provided that the other requirements of this Part are met and provided further that the standards and requirements set forth in Section 20.6.2.4103 NMAC have been met, the secretary shall approve the abatement completion report. When the secretary approves the abatement completion report, he shall also notify the responsible person in writing that the abatement plan is terminated.
[12-1-95; 20.6.2.4112 NMAC - Rn, 20 NMAC 6.2.IV.4112, 1-15-01]

20.6.2.4113 DISPUTE RESOLUTION: In the event of any technical dispute regarding the requirements of Paragraph (9) of Subsection A and Subsection E of Section 20.6.2.1203, Sections 20.6.2.4103, 20.6.2.4105, 20.6.2.4106, 20.6.2.4111 or 20.6.2.4112 NMAC, including notices of deficiency, the responsible person may notify the secretary by certified mail that a dispute has arisen, and desires to invoke the dispute resolution provisions of this Section, provided that such notification must be made within thirty (30) days after receipt by the responsible person of the decision of the secretary that causes the dispute. Upon such notification, all deadlines affected by the technical dispute shall be extended for a thirty (30) day negotiation period, or for a maximum of sixty (60) days if approved by the secretary for good cause shown. During this negotiation period, the secretary or his/her designee and the responsible person shall meet at least once. Such meeting(s) may be facilitated by a mutually agreed upon third party, but the third party shall assume no power or authority granted or delegated to the secretary by the Water Quality Act or by the commission. If the dispute remains unresolved after the negotiation period, the decision of secretary shall be final.
[12-1-95; 20.6.2.4113 NMAC - Rn, 20 NMAC 6.2.IV.4113, 1-15-01]

20.6.2.4114 APPEALS FROM SECRETARY'S DECISIONS:

A. If the secretary determines that an abatement plan is required pursuant to Paragraph (9) of Subsection A of 20.6.2.1203, Subsection F of 20.6.2.3109, or Subsection B of 20.6.2.4105 NMAC, approves or provides notice of deficiency of a proposed abatement plan, or abatement completion report, or modifies or terminates an approved abatement plan, he shall provide written notice of such action by certified mail to the responsible person and any person who participated in the action.

B. Any person who participated in the action before the secretary and who is adversely affected by the action listed in Subsection A of 20.6.2.4114 NMAC may file a petition requesting a review before the commission.

C. The petition shall be made in writing to the commission and shall be filed with the commission's secretary within thirty (30) days after receiving notice of the secretary's action. The petition shall specify the portions of the action to which the petitioner objects, certify that a copy of the petition has been mailed or hand-delivered to the secretary, and to the applicant or permittee if the petitioner is not the applicant or permittee, and attach a copy of the action for which review is sought. Unless a timely petition for hearing is made, the secretary's action is final.

D. The proceedings before the commission shall be conducted as provided in the commission’s adjudicatory procedures, 20 NMAC 1.3.

E. The cost of the court reporter for the hearing shall be paid by the petitioner.

F. The appeal provisions do not relieve the owner, operator or responsible person of their obligations to comply with any federal or state laws or regulations.
[12-1-95, 11-15-96; 20.6.2.4114 NMAC - Rn, 20 NMAC 6.2.IV.4114, 1-15-01; A, 7-16-06; A, 12-21-18]

20.6.2.4115 COURT REVIEW OF COMMISSION DECISIONS: Court review of commission decisions shall be as provided by law.
[12-1-95; 20.6.2.4115 NMAC - Rn, 20 NMAC 6.2.IV.4115, 1-15-01]

20.6.2.4116 - 20.6.2.4999: [RESERVED]
[12-1-95; 20.6.2.4116 - 20.6.2.4999 NMAC - Rn, 20 NMAC 6.2.IV.4116-5100, 1-15-01]

20.6.2.5000 UNDERGROUND INJECTION CONTROL:
[12-1-95; 20.6.2.5000 NMAC - Rn, 20 NMAC 6.2.V, 1-15-01]

20.6.2.5001 PURPOSE: The purpose of 20.6.2.5000 through 20.6.2.5399 NMAC controlling discharges from underground injection control wells is to protect all ground water of the state of New Mexico which has an existing concentration of 10,000 mg/l or less TDS, for present and potential future use as domestic and agricultural water supply, and to protect those segments of surface waters which are gaining because of ground water inflow for uses designated in the New Mexico water quality standards. 20.6.2.5000 through 20.6.2.5399 NMAC include notification requirements, and requirements for discharges directly into the subsurface through underground injection control wells.
[20.6.2.5001 NMAC - N, 12-1-01; A, 8-31-15]

20.6.2.5002 UNDERGROUND INJECTION CONTROL WELL CLASSIFICATIONS:

A. Underground injection control wells include the following.

(1) Any dug hole or well that is deeper than its largest surface dimension, where the principal function of the hole is emplacement of fluids.

(2) Any septic tank or cesspool used by generators of hazardous waste, or by owners or operators of hazardous waste management facilities, to dispose of fluids containing hazardous waste.

(3) Any subsurface distribution system, cesspool or other well which is used for the injection of wastes.

B. Underground injection control wells are classified as follows:

(1) Class I wells inject fluids beneath the lowermost formation that contains 10,000 milligrams per liter or less TDS. Class I hazardous or radioactive waste injection wells inject fluids containing any hazardous or radioactive waste as defined in 74-4-3 and 74-4A-4 NMSA 1978 or 20.4.1.200 NMAC (incorporating 40 C.F.R. Section 261.3), including any combination of these wastes. Class I non-hazardous waste injection wells inject non-hazardous and non-radioactive fluids, and they inject naturally-occurring radioactive material (NORM) as provided by 20.3.1.1407 NMAC.

(2) Class II wells inject fluids associated with oil and gas recovery;

(3) Class III wells inject fluids for extraction of minerals or other natural resources, including sulfur, uranium, metals, salts or potash by in situ extraction. This classification includes only in situ production from ore bodies that have not been conventionally mined. Solution mining of conventional mines such as stopes leaching is included in Class V.

(4) Class IV wells inject fluids containing any radioactive or hazardous waste as defined in 74-4-3 and 74-4A-4 NMSA 1978, including any combination of these wastes, above or into a formation that contains 10,000 mg/l or less TDS.

(5) Class V wells inject a variety of fluids and are those wells not included in Class I, II, III or IV. Types of Class V wells include, but are not limited to, the following:

(a) domestic liquid waste injection wells:

(i) domestic liquid waste disposal wells used to inject liquid waste volumes greater than that regulated by 20.7.3 NMAC through subsurface fluid distribution systems or vertical wells;

(ii) septic system wells used to emplace liquid waste volumes greater than that regulated by 20.7.3 NMAC into the subsurface, which are comprised of a septic tank and subsurface fluid distribution system;

(iii) large capacity cesspools used to inject liquid waste volumes greater than that regulated by 20.7.3 NMAC, including drywells that sometimes have an open bottom or perforated sides;

(b) industrial waste injection wells:

(i) air conditioning return flow wells used to return to the supply aquifer the water used for heating or cooling;

(ii) dry wells used for the injection of wastes into a subsurface formation;

(iii) injection wells associated with the recovery of geothermal energy for heating, aquaculture and production of electrical power;

(iv) stormwater drainage wells used to inject storm runoff from the surface into the subsurface;

(v) motor vehicle waste disposal wells that receive or have received fluids from vehicular repair or maintenance activities;

(vi) car wash waste disposal wells used to inject fluids from motor vehicle washing activities;

(c) mining injection wells:

(i) stopes leaching wells used for solution mining of conventional mines;

(ii) brine injection wells used to inject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts;

(iii) backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines whether water injected is a radioactive waste or not;

(iv) injection wells used for in situ recovery of lignite, coal, tar sands, and oil shale;

(d) ground water management injection wells:

(i) ground water remediation injection wells used to inject contaminated ground water that has been treated to ground water quality standards;

(ii) in situ ground water remediation wells used to inject a fluid that facilitates vadose zone or ground water remediation.

(iii) recharge wells used to replenish the water in an aquifer, including use to reclaim or improve the quality of existing ground water;

(iv) barrier wells used to inject fluids into ground water to prevent the intrusion of saline or contaminated water into ground water of better quality;

(v) subsidence control wells (not used for purposes of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water;

(vi) wells used in experimental technologies;

(e) agricultural injection wells - drainage wells used to inject fluids into ground water to prevent the intrusion of saline or contaminated water into ground water of better quality.

[20.6.2.5002 NMAC - N, 12-1-01; A, 8-1-14; A, 8-31-15; A, 12-21-18]

20.6.2.5003 NOTIFICATION AND GENERAL OPERATION REQUIREMENTS FOR ALL UNDERGROUND INJECTION CONTROL WELLS: All operators of underground injection control wells, except those wells regulated under the Oil and Gas Act, the Geothermal Resources Development Act, and the Surface Mining Act, shall:

A. for existing underground injection control wells, submit to the secretary the information enumerated in Subsection C of 20.6.2.1201 NMAC of this part; provided, however, that if the information in Subsection C of 20.6.2.1201 NMAC has been previously submitted to the secretary and acknowledged by him, the information need not be resubmitted; and

B. operate and continue to operate in conformance with 20.6.2.1 through 20.6.2.5399 NMAC;

C. for new underground injection control wells, submit to the secretary the information enumerated in Subsection C of 20.6.2.1201 NMAC of this part at least 120 days prior to well construction.

[9-20-82, 12-1-95; 20.6.2.5300 NMAC - Rn, 20 NMAC 6.2.V.5300, 1-15-01; 20.6.2.5003 NMAC - Rn, 20.6.2.5300 NMAC, 12-1-01; A, 12-1-01; A, 9-15-02; A, 8-31-15; A, 12-21-18]

20.6.2.5004 PROHIBITED UNDERGROUND INJECTION CONTROL ACTIVITIES AND WELLS:

A. No person shall perform the following underground injection activities nor operate the following underground injection control wells.

(1) The injection of fluids into a motor vehicle waste disposal well is prohibited. Motor vehicle waste disposal wells are prohibited. Any person operating a new motor vehicle waste disposal well (for which construction began after April 5, 2000) must close the well immediately. Any person operating an existing motor vehicle waste disposal well must cease injection immediately and must close the well by December 31, 2002, except as provided in this subsection.

(2) The injection of fluids into a large capacity cesspool is prohibited. Large capacity cesspools are prohibited. Any person operating a new large capacity cesspool (for which construction began after

April 5, 2000) must close the cesspool immediately. Any person operating an existing large capacity cesspool must cease injection immediately and must close the cesspool by December 31, 2002.

(3) The injection of any hazardous or radioactive waste into a well is prohibited, except as provided in 20.6.2.5300 through 20.6.2.5399 NMAC or this subsection.

(a) Class I radioactive waste injection wells are prohibited, except naturally-occurring radioactive material (NORM) regulated under 20.3.1.1407 NMAC is allowed as a Class I non-hazardous waste injection well pursuant to Paragraph (1) of Subsection B of 20.6.2.5002 NMAC.

(b) Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action if the injection has prior approval from the environmental protection agency (EPA) or the department under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Resource Conservation and Recovery Act (RCRA).

(4) Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited, except when the discharger can demonstrate that the discharge will not adversely affect the health of persons, and

(a) the injection fluid does not contain a constituent or exhibit a physical parameter (which could include pH, redox condition or temperature) which may cause an exceedance at any place of present or reasonable foreseeable future use of any primary state drinking water maximum contaminant level as specified in the water supply regulations, "Drinking Water" (20.7.10 NMAC), adopted by the environmental improvement board under the Environmental Improvement Act or the standard of 20.6.2.3103 NMAC, whichever is more stringent;

(b) the discharger can demonstrate that the injection will result in an overall or net improvement in water quality as determined by the secretary.

B. Closure of prohibited underground injection control wells shall be in accordance with 20.6.2.5005 and 20.6.2.5209 NMAC.

[20.6.2.5004 NMAC - N, 12-1-01; A, 8-31-15; A, 12-21-18]

20.6.2.5005 PRE-CLOSURE NOTIFICATION AND CLOSURE REQUIREMENTS:

A. Any person proposing to close a Class I, III, IV or V underground injection control well must submit pre-closure notification to the department at least 30 days prior to closure. Pre-closure notification must include the following information:

(1) Name of facility.
(2) Address of facility.
(3) Name of Owner/Operator.
(4) Address of Owner/Operator.
(5) Contact Person.
(6) Phone Number.
(7) Type of Well(s).
(8) Number of Well(s).
(9) Well Construction (e.g. drywell, improved sinkhole, septic tank, leachfield, cesspool, other…).
(10) Type of Discharge.
(11) Average Flow (gallons per day).
(12) Year of Well Construction.
(13) Proposed Well Closure Activities (e.g. sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type well, ground water and vadose zone investigation, other).
(14) Proposed Date of Well Closure.
(15) Name of Preparer.
(16) Date.
(17) Well plugging plan as submitted to the Office of the State Engineer pursuant to 19.27.4 NMAC.

B. Proposed well closure activities must be approved by the department prior to implementation.

[20.6.2.5005 NMAC - N, 12-1-01; A; 12-21-18]

20.6.2.5006 DISCHARGE PERMIT REQUIREMENTS FOR CLASS V INJECTION WELLS: Class V injection wells must meet the requirements of Sections 20.6.2.3000 through 20.6.2.3999 NMAC and Sections

20.6.2.5000 through 20.6.2.5006 NMAC. Class V injection wells or surface impoundments constructed as recharge basins used to replenish the water in an aquifer, including use to reclaim or improve the quality of existing water must additionally provide documentation of compliance with 19.25.8 NMAC (Underground Storage and Recovery) and shall not be subject to the exemptions of 20.6.2.3105 NMAC.
[20.6.2.5006 NMAC - N, 12-1-01; A, 12-21-18]

20.6.2.5007 - 20.6.2.5100: [RESERVED]
[12-1-95; 20.6.2.5001 - 20.6.2.5100 NMAC - Rn, 20 NMAC 6.2.IV.4116-5100, 1-15-01; 20.6.2.5007 -20.6.2.5100 NMAC - Rn 20.6.2.5001 - 20.6.2.5100 NMAC, 12-1-01]

20.6.2.5101 DISCHARGE PERMIT AND OTHER REQUIREMENTS FOR CLASS I WELLS AND CLASS III WELLS:

A. Class I wells and Class III wells must meet the requirements of 20.6.2.5000 through 20.6.2.5399 NMAC in addition to other applicable requirements of the commission regulations. The secretary may also require that some Class IV and Class V wells comply with the requirements for Class I wells in 20.6.2.5000 through 20.6.2.5399 NMAC if the secretary determines that the additional requirements are necessary to prevent the movement of water contaminants from a specified injection zone into ground water having 10,000 mg/l or less TDS. No Class I well or Class III well may be approved which allows for movement of fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to 20.6.2.5103 NMAC, or pursuant to a temporary designation as provided in Paragraph (2) of Subsection C of 20.6.2.5101 NMAC.

B. Operation of a Class I well or Class III well must be pursuant to a discharge permit meeting the requirements of 20.6.2.3000 through 20.6.2.3999 NMAC and 20.6.2.5000 through 20.6.2.5399 NMAC.

C. Discharge permits for Class I wells, or Class III wells affecting ground water of 10,000 mg/l or less TDS submitted for secretary approval shall:

(1) receive an aquifer designation if required in 20.6.2.5103 NMAC prior to discharge permit issuance; or

(2) for Class III wells only, address the methods or techniques to be used to restore ground water so that upon final termination of operations including restoration efforts, ground water at any place of withdrawal for present or reasonably foreseeable future use will not contain either concentrations in excess of the standards of 20.6.2.3103 NMAC or any toxic pollutant; issuance of a discharge permit or project discharge permit for Class III wells that provides for restoration of ground water in accordance with the requirements of this subsection shall substitute for the aquifer designation provisions of 20.6.2.5103 NMAC; the approval shall constitute a temporary aquifer designation for a mineral bearing or producing aquifer, or portion thereof, to allow injection as provided for in the discharge permit; such temporary designation shall expire upon final termination of operations including restoration efforts.

D. The exemptions from the discharge permit requirement listed in 20.6.2.3105 NMAC do not apply to underground injection control wells except as provided below:

(1) wells regulated by the energy conservation management division of the energy, minerals and natural resources department under the “Geothermal Resources Development Act”;

(2) wells regulated by the mining and minerals division of the energy, minerals and natural resources department under the “Surface Mining Act”;

(3) wells for the disposal of effluent from systems which are regulated under the "Liquid Waste Disposal and Treatment” regulations (20.7.3 NMAC) adopted by the environmental improvement board under the “Environmental Improvement Act”.

E. Project permits for Class III wells.

(1) The secretary may consider a project discharge permit for Class III wells, if the wells are:

(a) within the same well field, facility site or similar unit;

(b) within the same aquifer and ore deposit;

(c) of similar construction;

(d) of the same purpose; and

(e) operated by a single owner or operator.

(2) A project discharge permit does not allow the discharger to commence injection in any individual operational area until the secretary approves an application for injection in that operational area (operational area approval).

(3) A project discharge permit shall:

(a) specify the approximate locations and number of wells for which operational area approvals are or will be sought with approximate time frames for operation and restoration (if restoration is required) of each area; and

(b) provide the information required under the following sections of this part, except for such additional site-specific information as needed to evaluate applications for individual operational area approvals: Subsection C of 20.6.2.3106, 20.6.2.3107, 20.6.2.5204 through 20.6.2.5209, and Subsection B of 20.6.2.5210 NMAC.

(4) Applications for individual operational area approval shall include the following:

(a) site-specific information demonstrating that the requirements of this part are met; and

(b) information required under 20.6.2.5202 through 20.6.2.5210 NMAC and not previously provided pursuant to Subparagraph (b) of Paragraph (3) of Subsection E of this section.

(5) Applications for project discharge permits and for operational area approval shall be processed in accordance with the same procedures provided for discharge permits under 20.6.2.3000 through 20.6.2.3114 NMAC, allowing for public notice on the project discharge permit and on each application for operational area approval pursuant to 20.6.2.3108 NMAC with opportunity for public hearing prior to approval or disapproval.

(6) The discharger shall comply with additional requirements that may be imposed by the secretary pursuant to this part on wells in each new operational area.

F. If the holder of a discharge permit for a Class I well, or Class III well submits an application for discharge permit renewal at least 120 days before discharge permit expiration, and the discharger is in compliance with his discharge permit on the date of its expiration, then the existing discharge permit for the same activity shall not expire until the application for renewal has been approved or disapproved. An application for discharge permit renewal must include and adequately address all of the information necessary for evaluation of a new discharge permit. Previously submitted materials may be included by reference provided they are current, readily available to the secretary and sufficiently identified to be retrieved.

G. Discharge permit signatory requirements: No discharge permit for a Class I well or Class III well may be issued unless:

(1) the application for a discharge permit has been signed as follows:

(a) for a corporation: by a principal executive officer of at least the level of vice-president, or a representative who performs similar policy-making functions for the corporation who has authority to sign for the corporation; or

(b) for a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(c) for a municipality, state, federal, or other public agency: by either a principal executive officer who has authority to sign for the agency, or a ranking elected official; and

(2) all reports required by Class I hazardous waste injection well permits and other information requested by the director pursuant to a Class I hazardous waste injection well permit shall be signed by a person described in Paragraph (1) of this subsection, or by a duly authorized representative of that person; a person is a duly authorized representative only if:

(a) the authorization is made in writing by a person described in Paragraph (1) of this subsection;

(b) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility; (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and

(c) the written authorization is submitted to the director.

(3) *Changes to authorization.* If an authorization under Paragraph (2) of this subsection is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Paragraph (2) of this subsection must be submitted to the director prior to or together with any reports, information, or applications to be signed by an authorized representative.

(4) The signature on an application, report or other information requested by the director must be directly preceded by the following certification: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information

is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment."

H. Transfer of Class I non-hazardous waste injection well and Class III well discharge permits.

(1) The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class I non-hazardous waste injection well or Class III well.

(2) A Class I non-hazardous waste injection well or Class III well discharge permit may be transferred if:

(a) the secretary receives written notice 30 days prior to the transfer date; and

(b) the secretary does not object prior to the proposed transfer date; the secretary may require modification of the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

(3) The written notice required by Subparagraph (a) of Paragraph (2) of Subsection H above shall:

(a) have been signed by the discharger and the succeeding discharger, including an acknowledgement that the succeeding discharger shall be responsible for compliance with the discharge permit upon taking possession of the facility; and

(b) set a specific date for transfer of discharge permit responsibility, coverage and liability; and

(c) include information relating to the succeeding discharger's financial responsibility required by Paragraph (17) of Subsection B of 20.6.2.5210 NMAC.

I. Modification or termination of a discharge permit for a Class I well or Class III well: If data submitted pursuant to any monitoring requirements specified in the discharge permit or other information available to the secretary indicate that this part are being or may be violated, the secretary may require modification or, if it is determined by the secretary that the modification may not be adequate, may terminate a discharge permit for a Class I well, or Class III well or well field, that was approved pursuant to the requirements of this under 20.6.2.5000 through 20.6.2.5399 NMAC for the following causes:

(1) noncompliance by the discharger with any condition of the discharge permit; or

(2) the discharger's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or the discharger's misrepresentation of any relevant facts at any time; or

(3) a determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge permit modification or termination.

[9-20-82, 12-1-95, 11-15-96; 20.6.2.5101 NMAC - Rn, 20 NMAC 6.2.V.5101, 1-15-01; A, 12-1-01; A, 9-15-02; A, 8-1-14; A, 8-31-15; A, 12-21-18]

20.6.2.5102 PRE-CONSTRUCTION REQUIREMENTS FOR CLASS I WELLS AND CLASS III WELLS:

A. Discharge permit requirement for Class I wells.

(1) Prior to construction of a Class I well or conversion of an existing well to a Class I well, an approved discharge permit is required that incorporates the requirements of 20.6.2.5000 through 20.6.2.5399 NMAC, except Subsection C of 20.6.2.5210 NMAC. As a condition of discharge permit issuance, the operation of the Class I well under the discharge permit will not be authorized until the secretary has:

(a) reviewed the information submitted for his consideration pursuant to Subsection C of 20.6.2.5210 NMAC; and

(b) determined that the information submitted demonstrates that the operation will be in compliance with this part and the discharge permit.

(2) If conditions encountered during construction represent a substantial change which could adversely impact ground water quality from those anticipated in the discharge permit, the secretary shall require a discharge permit modification or may terminate the discharge permit pursuant to Subsection I of 20.6.2.5101 NMAC, and the secretary shall publish public notice and allow for comments and hearing in accordance with 20.6.2.3108 NMAC.

B. Notification requirement for Class III wells.

(1) The discharger shall notify the secretary in writing prior to the commencement of drilling or construction of wells which are expected to be used for in situ extraction, unless the discharger has previously received a discharge permit or project discharge permit for the Class III well operation.

(a) Any person proposing to drill or construct a new Class III well or well field, or convert an existing well to a Class III well, shall file plans, specifications and pertinent documents regarding such construction or conversion, with the ground water quality bureau of the environment department.

(b) Plans, specifications, and pertinent documents required by this section, if pertaining to carbon dioxide facilities, or facilities for the exploration, production, refinement or pipeline transmission of oil and natural gas, shall be filed instead with the oil conservation division of the energy, minerals and natural resources department.

(c) Plans, specifications and pertinent documents required to be filed under this section must be filed 90 days prior to the planned commencement of construction or conversion.

(d) The following plans, specifications and pertinent documents shall be provided with the notification:

(i) information required in Subsection C of 20.6.2.3106 NMAC;

(ii) a map showing the Class III wells which are to be constructed; the map must also show, in so far as is known or is reasonably available from the public records, the number, name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features, including residences and roads, that are within the expected area of review (20.6.2.5202 NMAC) of the Class III well or well field perimeter;

(iii) maps and cross-sections indicating the general vertical and lateral limits of all ground water having 10,000 mg/l or less TDS within one mile of the site, the position of such ground water within this area relative to the injection formation, and the direction of water movement, where known, in each zone of ground water which may be affected by the proposed injection operation;

(iv) maps and cross-sections detailing the geology and geologic structure of the local area, including faults, if known or suspected;

(v) the proposed formation testing program to obtain an analysis or description, whichever the secretary requires, of the chemical, physical, and radiological characteristics of, and other information on, the receiving formation;

(vi) the proposed stimulation program;

(vii) the proposed injection procedure;

(viii) schematic or other appropriate drawings of the surface and subsurface construction details of the well;

(ix) proposed construction procedures, including a cementing and casing program, logging procedures, deviation checks, and a drilling, testing, and coring program;

(x) information, as described in Paragraph (17) of Subsection B of 20.6.2.5210 NMAC, showing the ability of the discharger to undertake measures necessary to prevent ground water contamination; and

(xi) a plugging and abandonment plan showing that the requirements of Subsections B, C and D of 20.6.2.5209 NMAC will be met.

(2) Prior to construction, the discharger shall have received written notice from the secretary that the information submitted under item 10 of Subparagraph (d) of Paragraph (1) of Subsection B of 20.6.2.5102 NMAC is acceptable. Within 30 days of submission of the above information the secretary shall notify the discharger that the information submitted is acceptable or unacceptable.

(3) Prior to construction, the secretary shall review said plans, specifications and pertinent documents and shall comment upon their adequacy of design for the intended purpose and their compliance with pertinent sections of this part. Review of plans, specifications and pertinent documents shall be based on the criteria contained in 20.6.2.5205, Subsection E of 20.6.2.5209, and Subparagraph (d) of Paragraph (1) of Subsection B of 20.6.2.5102 NMAC.

(4) Within 30 days of receipt, the secretary shall issue public notice, consistent with Subsection B of 20.6.2.3108 NMAC, that notification was submitted pursuant to Subsection B of 20.6.2.5102 NMAC. The secretary shall allow a period of at least 30 days during which comments may be submitted. The public notice shall include:

(a) name and address of the proposed discharger;

(b) location of the discharge;

(c) brief description of the proposed activities;

(d) statement of the public comment period; and

(e) address and telephone number at which interested persons may obtain further information.

(5) The secretary shall comment in writing upon the plans and specifications within 60 days of their receipt by the secretary.

(6) Within 30 days after completion, the discharger shall submit written notice to the secretary that the construction or conversion was completed in accordance with submitted plans and specifications, or shall submit as-built plans detailing changes from the originally submitted plans and specifications.

(7) In the event a discharge permit application is not submitted or approved, all wells which may cause ground water contamination shall be plugged and abandoned by the applicant pursuant to the plugging and abandonment plan submitted in the notification; these measures shall be consistent with any comments made by the secretary in his review. If the wells are not to be permanently abandoned and the discharger demonstrates that plugging at this time is unnecessary to prevent ground water contamination, plugging pursuant to the notification is not required. Financial responsibility established pursuant to 20.6.2.5000 through 20.6.2.5299 NMAC will remain in effect until the discharger permanently abandons and plugs the wells in accordance with the plugging and abandonment plan.

[9-20-82, 12-24-87, 12-1-95; 20.6.2.5102 NMAC - Rn, 20 NMAC 6.2.V.5102, 1-15-01; A, 12-1-01; A, 8-31-15; A, 12-21-18]

20.6.2.5103 DESIGNATED AQUIFERS FOR CLASS I WELLS AND CLASS III WELLS:

A. Any person may file a written petition with the secretary seeking commission consideration of certain aquifers or portions of aquifers as "designated aquifers". The purpose of aquifer designation is:

(1) for Class I wells, to allow as a result of injection, the addition of water contaminants into ground water, which before initiation of injection has a concentration between 5,000 and 10,000 mg/l TDS; or

(2) for Class III wells, to allow as a result of injection, the addition of water contaminants into ground water, which before initiation of injection has a concentration between 5,000 and 10,000 mg/l TDS, and not provide for restoration or complete restoration of that ground water pursuant to Paragraph (2) of Subsection C of 20.6.2.5101 NMAC.

B. The applicant shall identify (by narrative description, illustrations, maps or other means) and describe such aquifers, in geologic and geometric terms (such as vertical and lateral limits and gradient) which are clear and definite.

C. An aquifer or portion of an aquifer may be considered for aquifer designation under Subsection A of this section, if the applicant demonstrates that the following criteria are met:

(1) it is not currently used as a domestic or agricultural water supply; and

(2) there is no reasonable relationship between the economic and social costs of failure to designate and benefits to be obtained from its use as a domestic or agricultural water supply because:

(a) it is situated at a depth or location which makes recovery of water for drinking or agricultural purposes economically or technologically impractical at present and in the reasonably foreseeable future; or

(b) it is already so contaminated that it would be economically or technologically impractical to render that water fit for human consumption or agricultural use at present and in the reasonably foreseeable future.

D. The petition shall state the extent to which injection would add water contaminants to ground water and why the proposed aquifer designation should be approved. For Class III wells, the applicant shall state whether and to what extent restoration will be carried out.

E. The secretary shall either transmit the petition to the commission within 60 recommending that a public hearing be held, or refuse to transmit the petition and notify the applicant in writing citing reasons for such refusal.

F. If the secretary transmits the petition to the commission, the commission shall review the petition and determine to either grant or deny a public hearing on the petition. If the commission grants a public hearing, it shall issue a public notice, including the following information:

(1) name and address of the applicant;

(2) location, depth, TDS, areal extent, general description and common name or other identification of the aquifer for which designation is sought;

(3) nature of injection and extent to which the injection will add water contaminants to ground water; and

(4) address and telephone number at which interested persons may obtain further information.

G. If the secretary refuses to transmit the petition to the commission, then the applicant may appeal the secretary's disapproval of the proposed aquifer designation to the commission within 30 days, and address the issue of whether the proposed aquifer designation meets the criteria of Subsections A, B, C, and D of this section.

H. If the commission grants a public hearing, the hearing shall be held in accordance with the provisions of Section 74-6-6 NMSA 1978.

I. If the commission does not grant a public hearing on the petition, the aquifer designation shall not be approved.

J. After public hearing and consideration of all facts and circumstances included in Section 74-6-4(D) NMSA 1978, the commission may authorize the secretary to approve a proposed designated aquifer if the commission determines that the criteria of Subsections A, B, C, and D of this section are met.

K. Approval of a designated aquifer petition does not alleviate the applicant from complying with other sections of 20.6.2.5000 through 20.6.2.5399 NMAC, or of the responsibility for protection, pursuant to this part, of other nondesignated aquifers containing ground water having 10,000 mg/l or less TDS.

L. Persons other than the petitioner may add water contaminants as a result of injection into an aquifer designated for injection, provided the person receives a discharge permit pursuant to the requirements of 20.6.2.5000 through 20.6.2.5399 NMAC. Persons, other than the original petitioner or his designee, requesting addition of water contaminants as a result of injection into aquifers previously designated only for injection with partial restoration shall file a petition with the commission pursuant to the requirements of Subsections A, B, C, and D of this section.

[9-20-82, 12-1-95; 20.6.2.5103 NMAC - Rn, 20 NMAC 6.2.V.5103, 1-15-01; A, 12-1-01; A, 8-31-15]

20.6.2.5104 WAIVER OF REQUIREMENT BY SECRETARY FOR CLASS I WELLS AND CLASS III WELLS:

A. Where a Class I well or a Class III well or well field, does not penetrate, or inject into or above, and which will not affect, ground water having 10,000 mg/l of less TDS, the secretary may:

(1) issue a discharge permit for a well or well field with less stringent requirements for area of review, construction, mechanical integrity, operation, monitoring, and reporting than required by 20.6.2.5000 through 20.6.2.5399 NMAC; or

(2) for Class III wells only, issue a discharge permit pursuant to the requirements of 20.6.2.3000 through 20.6.2.3114 NMAC.

B. Authorization of a reduction in requirements under Subsection A of this section shall be granted only if injection will not result in an increased risk of movement of fluids into ground water having 10,000 mg/l or less TDS, except for fluid movement approved pursuant to 20.6.2.5103 NMAC.

[9-20-82, 12-1-95; 20.6.2.5104 NMAC - Rn & A, 20 NMAC 6.2.V.5104, 1-15-01; A, 12-1-01; A, 8-31-15]

20.6.2.5105 - 20.6.2.5199: [RESERVED]

[12-1-95; 20.6.2.5105 - 20.6.2.5199 NMAC - Rn, 20 NMAC 6.2.V.5105-5199, 1-15-01]

20.6.2.5200 TECHNICAL CRITERIA AND PERFORMANCE STANDARDS FOR CLASS I WELLS AND CLASS III WELLS:

[12-1-95; 20.6.2.5200 NMAC - Rn, 20 NMAC 6.2.V.5200, 1-15-01; A, 12-1-01; A, 8-31-15]

20.6.2.5201 PURPOSE: 20.6.2.5200 through 20.6.2.5210 NMAC provide the technical criteria and performance standards for Class I wells and Class III wells. (20.6.2.5300 through 20.6.2.5399 NMAC provide certain additional technical and performance standards for Class I hazardous waste injection wells.)

[9-20-82; 20.6.2.5201 NMAC - Rn, 20 NMAC 6.2.V.5201, 1-15-01; A, 12-1-01; A, 8-31-15; A, 12-21-18]

20.6.2.5202 AREA OF REVIEW:

A. The area of review is the area surrounding a Class I non-hazardous waste injection well or Class III well or the area within and surrounding a well field that is to be examined to identify possible fluid conduits, including the location of all known wells and fractures which may penetrate the injection zone.

B. The area of review for each Class I non-hazardous waste injection well, or each Class III well or well field shall be an area which extends:

(1) two and one half (2 1/2) miles from the well, or well field; or

(2) one-quarter (1/4) mile from a well or well field where the area of review is calculated to be zero pursuant to Paragraph (3) of Subsection B below, or where the well field production at all times exceeds injection to produce a net withdrawal; or

(3) a suitable distance, not less than one-quarter (1/4) mile, proposed by the discharger and approved by the secretary, based upon a mathematical calculation to determine the area of review; computations to determine the area of review may be based upon the parameters listed below and should be calculated for an injection time period equal to the expected life of the Class I non-hazardous waste injection well, or Class III well or well field; the following modified Theis equation illustrates one form which the mathematical model may take to compute the area of review; the discharger must demonstrate that any equation or simulation used to compute the area of review applies to the hydrogeologic conditions in the area of review.

$$r = \left(\frac{2.25\,K\,H\,t}{S\,10^{x}} \right)^{1/2}$$

Where:

$4BKH\,(H_w - H_{bo})x\,S_pG_b$

r = Radius of the area of review for a Class I non-hazardous waste injection well or Class III well (length)

K = Hydraulic conductivity of the injection zone (length/time)

H = Thickness of the injection zone (length)

t = Time of injection (time)

S = Storage coefficient (dimensionless)

Q = Injection rate (volume/time)

H_{bo} = Observed original hydrostatic head of injection zone (length) measured from the base of the lowest aquifer containing ground water of 10,000 mg/l or less TDS

H_w = Hydrostatic head of underground source of drinking water (length) measured from the base of the lowest aquifer containing ground water of 10,000 mg/l or less TDS

S_pG_b = Specific gravity of fluid in the injection zone (dimensionless)

B = 3.142 (dimensionless)

(4) The above equation is based on the following assumptions:

(a) the injection zone is homogenous and isotropic;

(b) the injection zone has infinite areal extent;

(c) the Class I non-hazardous waste injection well or Class III well penetrates the entire thickness of the injection zone;

(d) the well diameter is infinitesimal compared to "r" when injection time is longer than a few minutes; and

(e) the emplacement of fluid into the injection zone creates an instantaneous increase in pressure.

C. The secretary shall require submittal by the discharger of information regarding the area of review including the information to be considered by the secretary in Subsection B of Section 20.6.2.5210 NMAC.
[9-20-82, 12-1-95; 20.6.2.5202 NMAC - Rn, 20 NMAC 6.2.V.5202, 1-15-01; A, 12-1-01; A, 12-21-18]

20.6.2.5203 CORRECTIVE ACTION FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS AND CLASS III WELLS:

A. Persons applying for approval of a Class I non-hazardous waste injection well, or a Class III well or well field shall identify the location of all known wells, drill holes, shafts, stopes and other conduits within the area of review which may penetrate the injection zone, in so far as is known or is reasonably available from the public records. For such wells or other conduits which are improperly sealed, completed, or abandoned, or otherwise provide a pathway for the migration of contaminants, the discharger shall address in the proposed discharge plan such steps or modifications (corrective action) as are necessary to prevent movement of fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC.

B. Prior to operation, or continued operation of a well for which corrective action is required pursuant to Subsections A or D of Section 20.6.2.5203 NMAC, the discharger must demonstrate that:

(1) all required corrective action has been taken; or

(2) injection pressure is to be limited so that pressure in the injection zone does not cause fluid movement through any well or other conduit within the area of review into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC; this pressure limitation may be removed after all required corrective action has been taken.

C. In determining the adequacy of corrective action proposed in the discharge permit application, the following factors will be considered by the secretary:

(1) chemical nature and volume of the injected fluid;

(2) chemical nature of native fluids and by-products of injection;

(3) geology and hydrology;

(4) history of the injection and production operation;

(5) completion and plugging records;

(6) abandonment procedures in effect at the time a well, drill hole, or shaft was abandoned; and

(7) hydraulic connections with waters having 10,000 mg/l or less TDS

D. In the event that, after approval for a Class I non-hazardous waste injection well or Class III well has been granted, additional information is submitted or it is discovered that a well or other conduit within the applicable area of review might allow movement of fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC, the secretary may require action in accordance with Subsection I of Section 20.6.2.5101 and Subsection B Section 20.6.2.5203 NMAC.
[9-20-82, 12-1-95; 20.6.2.5203 NMAC - Rn, 20 NMAC 6.2.V.5203, 1-15-01; A, 12-1-01]

20.6.2.5204 MECHANICAL INTEGRITY FOR CLASS I WELLS AND CLASS III WELLS:

A. A Class I well or Class III well has mechanical integrity if there is no detectable leak in the casing, tubing or packer which the secretary considers to be significant at maximum operating temperature and pressure; and no detectable conduit for fluid movement out of the injection zone through the well bore or vertical channels adjacent to the well bore which the secretary considers to be significant.

B. Prior to well injection and at least once every five years or more frequently as the secretary may require for good cause during the life of the well, the discharger must demonstrate that a Class I well or Class III well has mechanical integrity. The demonstration shall be made through use of the following tests:

(1) for evaluation of leaks:

(a) monitoring of annulus pressure (after an initial pressure test with liquid or gas before operation commences); or

(b) pressure test with liquid or gas;

(2) for determination of conduits for fluid movement:

(a) the results of a temperature or noise log; or

(b) where the nature of the casing used for Class III wells precludes use of these logs, cementing records and an appropriate monitoring program as the secretary may require which will demonstrate the presence of adequate cement to prevent such movement;

(3) other appropriate tests as the secretary may require.

C. The secretary may consider the use by the discharger of equivalent alternative test methods to determine mechanical integrity. The discharger shall submit information on the proposed test and all technical data supporting its use. The secretary may approve the request if it will reliably demonstrate the mechanical integrity of wells for which its use is proposed. For Class III wells this demonstration may be made by submission of adequate monitoring data after the initial mechanical integrity tests.

D. In conducting and evaluating the tests enumerated in this section or others to be allowed by the secretary, the discharger and the secretary shall apply methods and standards generally accepted in the affected industry. When the discharger reports the results of mechanical integrity tests to the secretary, he shall include a description of the test(s), the method(s) used, and the test results. In making an evaluation, the secretary's review shall include monitoring and other test data submitted since the previous evaluation.

[9-20-82, 12-1-95; 20.6.2.5204 NMAC - Rn, 20 NMAC 6.2.V.5204, 1-15-01; A, 12-1-01; A, 8-31-15]

20.6.2.5205 CONSTRUCTION REQUIREMENTS FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS AND CLASS III WELLS:

A. General Construction Requirements Applicable to Class I non-hazardous waste injection wells and Class III wells.

(1) Construction of all Class I non-hazardous waste injection wells and all new Class III wells shall include casing and cementing. Prior to well injection, the discharger shall demonstrate that the construction and operation of:

(a) Class I non-hazardous waste injection wells will not cause or allow movement of fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC;

(b) Class III wells will not cause or allow movement of fluids out of the injection zone into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC.

(2) The construction of each newly drilled well shall be designed for the proposed life expectancy of the well.

(3) In determining if the discharger has met the construction requirements of this section and has demonstrated adequate construction, the secretary shall consider the following factors:

(a) depth to the injection zone;

(b) injection pressure, external pressure, annular pressure, axial loading, and other stresses that may cause well failure;

(c) hole size;

(d) size and grade of all casing strings, including wall thickness, diameter, nominal weight, length, joint specification, and construction material;

(e) type and grade of cement;

(f) rate, temperature, and volume of injected fluid;

(g) chemical and physical characteristics of the injected fluid, including corrosiveness, density, and temperature;

(h) chemical and physical characteristics of the formation fluids including pressure and temperature;

(i) chemical and physical characteristics of the receiving formation and confining zones including lithology and stratigraphy, and fracture pressure; and

(j) **d**epth, thickness and chemical characteristics of penetrated formations which may contain ground water.

(4) To demonstrate adequate construction, appropriate logs and other tests shall be conducted during the drilling and construction of new Class I non-hazardous waste injection wells or Class III wells or during work-over of existing wells in preparation for reactivation or for change to injection use. A descriptive report interpreting the results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the secretary for review prior to well injection. The logs and tests appropriate to each type of injection well shall be based on the intended function, depth, construction and other characteristics of the well, availability of similar data in the area of the drilling site and the need for additional information that may arise from time to time as the construction of the well progresses.

(a) The discharger shall demonstrate through use of sufficiently frequent deviation checks, or another equivalent method, that a Class I non-hazardous waste injection well or Class III well drilled

using a pilot hole then enlarged by reaming or another method, does not allow a vertical avenue for fluid migration in the form of diverging holes created during drilling.

(b) The secretary may require use by the discharger of the following logs to assist in characterizing the formations penetrated and to demonstrate the integrity of the confining zones and the lack of vertical avenues for fluid migration:

(i) for casing intended to protect ground water having 10,000 mg/l or less TDS: resistivity, spontaneous potential, and caliper logs before the casing is installed; and a cement bond, or temperature log after the casing is set and cemented.

(ii) **f**or intermediate and long strings of casing intended to facilitate injection: resistivity, spontaneous potential, porosity, and gamma ray logs before the casing is installed; and fracture finder or spectral logs; and a cement bond or temperature log after the casing is set and cemented.

(5) In addition to the requirements of Section 20.6.2.5102 NMAC, the discharger shall provide notice prior to commencement of drilling, cementing and casing, well logging, mechanical integrity tests, and any well work-over to allow opportunity for on-site inspection by the secretary or his representative.

B. Additional construction requirements for Class I non-hazardous waste injection wells.

(1) All Class I non-hazardous waste injection wells shall be sited in such a manner that they inject into a formation which is beneath the lowermost formation containing, within one quarter mile of the well bore, ground water having 10,000 mg/l TDS or less except as approved pursuant to Section 20.6.2.5103 NMAC.

(2) All Class I non-hazardous waste injection wells shall be cased and cemented by circulating cement to the surface.

(3) All Class I non-hazardous waste injection wells, except those municipal wells injecting noncorrosive wastes, shall inject fluids through tubing with a packer set in the annulus immediately above the injection zone, or tubing with an approved fluid seal as an alternative. The tubing, packer, and fluid seal shall be designed for the expected length of service.

(a) The use of other alternatives to a packer may be allowed with the written approval of the secretary. To obtain approval, the operator shall submit a written request to the secretary which shall set forth the proposed alternative and all technical data supporting its use. The secretary may approve the request if the alternative method will reliably provide a comparable level of protection to ground water. The secretary may approve an alternative method solely for an individual well or for general use.

(b) In determining the adequacy of the specifications proposed by the discharger for tubing and packer, or a packer alternative, the secretary shall consider the following factors:

(i) depth of setting;

(ii) characteristics of injection fluid (chemical nature or characteristics, corrosiveness, and density);

(iii) injection pressure;

(iv) annular pressure;

(v) rate, temperature and volume of injected fluid; and

(vi) size of casing.

C. Additional construction requirements for Class III wells.

(1) Where injection is into a formation containing ground water having 10,000 mg/l or less TDS, monitoring wells shall be completed into the injection zone and into the first formation above the injection zone containing ground water having 10,000 mg/l or less TDS which could be affected by the extraction operation. If ground water having 10,000 mg/l or less TDS below the injection zone could be affected by the extraction operation, monitoring of such ground water may be required. These wells shall be of sufficient number, located and constructed so as to detect any excursion of injection fluids, process byproducts, or formation fluids outside the extraction area or injection zone. The requirement for monitoring wells in aquifers designated pursuant to Section 20.6.2.5103 NMAC may be waived by the secretary, provided that the absence of monitoring wells does not result in an increased risk of movement of fluids into protected ground waters having 10,000 mg/l or less TDS.

(2) Where injection is into a formation which does not contain ground water having 10,000 mg/l or less TDS, no monitoring wells are necessary in the injection zone. However, monitoring wells may be necessary in adjoining zones with ground water having 10,000 mg/l or less TDS that could be affected by the extraction operation.

(3) In an area that the secretary determines is subject to subsidence or collapse, the required monitoring wells may be required to be located outside the physical influence of that area.

(4) In determining the adequacy of monitoring well location, number, construction and frequency of monitoring proposed by the discharger, the secretary shall consider the following factors:

(a) the local geology and hydrology;

(b) the operating pressures and whether a negative pressure gradient to the monitor well is being maintained;

(c) the nature and volume of injected fluid, formation water, and process by-products; and

(d) the number and spacing of Class III wells in the well field.

[9-20-82, 12-1-95; 20.6.2.5205 NMAC - Rn, 20 NMAC 6.2.V.5205, 1-15-01; A, 12-1-01]

20.6.2.5206 OPERATING REQUIREMENTS FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS AND CLASS III WELLS:

A. General operating requirements applicable to Class I non-hazardous waste injection wells and Class III wells.

(1) The maximum injection pressure at the wellhead shall not initiate new fractures or propagate existing fractures in the confining zone, or cause the movement of injection or formation fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC.

(2) Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone.

B. Additional operating requirements for Class I non-hazardous waste injection wells.

(1) Except during well stimulation, the maximum injection pressure shall not initiate new fractures or propagate existing fractures in the injection zone.

(2) Unless an alternative to a packer has been approved under Subparagraph (c) of Paragraph (3) of Subsection B of Section 20.6.2.5205 NMAC, the annulus between the tubing and the long string of casing shall be filled with a fluid approved by the secretary and a pressure, also approved by the secretary shall be maintained on the annulus.

C. Additional operating requirements for Class III wells: Initiation of new fractures or propagation of existing fractures in the injection zone will not be approved by the secretary as part of a discharge permit unless it is done during well stimulation and the discharger demonstrates:

(1) that such fracturing will not cause movement of fluids out of the injection zone into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC; and

(2) that the provisions of Subsection D of Section 20.6.2.3109 and Subsection C of Section 20.6.2.5101 NMAC for protection of ground water are met.

[9-20-82, 12-1-95; 20.6.2.5206 NMAC - Rn, 20 NMAC 6.2.V.5206, 1-15-01; A, 12-1-01; A, 12-21-18]

20.6.2.5207 MONITORING REQUIREMENTS FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS AND CLASS III WELLS:

A. The discharger shall demonstrate mechanical integrity for each Class I non-hazardous waste injection well or Class III well at least once every five years during the life of the well pursuant to Section 20.6.2.5204 NMAC.

B. Additional monitoring requirements for Class I non-hazardous waste injection wells.

(1) The discharger shall provide analysis of the injected fluids at least quarterly or, if necessary, more frequently to yield data representative of their characteristics.

(2) Continuous monitoring devices shall be used to provide a record of injection pressure, flow rate, flow volume, and pressure on the annulus between the tubing and the long string of casing.

(3) The discharger shall provide wells within the area of review as required by the discharge permit to be used by the discharger to monitor pressure in, and possible fluid movement into, ground water having 10,000 mg/l or less TDS except for such ground waters designated pursuant to Section 20.6.2.5103 NMAC. This Section does not require monitoring wells for Class I non-hazardous waste injection wells unless monitoring wells are necessary due to possible flow paths within the area of review.

C. Additional monitoring requirements for Class III wells.

(1) The discharger shall provide an analysis or description, whichever the secretary requires, of the injected fluids at least quarterly or, if necessary, more frequently to yield representative data.

(2) The discharger shall perform:

(a) appropriate monitoring of injected and produced fluid volumes by whichever of the following methods the secretary requires:

(i) recording injection pressure and either flow rate or volume every two weeks; or

(ii) metering and daily recording of fluid volumes;

(b) monitoring every two weeks, or more frequently as the secretary determines, of the monitor wells, required in Subsection C of Section 20.6.2.5205 NMAC for:

(i) water chemistry parameters used to detect any migration from the injection zone;

(ii) fluid levels adjacent to the injection zone; and

(c) other necessary monitoring as the secretary for good cause may require to detect movement of fluids from the injection zone into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103 NMAC.

(3) With the approval of the secretary, all Class III wells may be monitored on a well field basis by manifold monitoring rather than on an individual well basis. Manifold monitoring to determine the quality, pressure, and flow rate of the injected fluid may be approved in cases of facilities consisting of more than one Class III well, operating with a common manifold, provided that the discharger demonstrates that manifold monitoring is comparable to individual well monitoring.

[9-20-82, 12-1-95; 20.6.2.5207 NMAC - Rn, 20 NMAC 6.2.V.5207, 1-15-01; A, 12-1-01]

20.6.2.5208 REPORTING REQUIREMENTS FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS AND CLASS III WELLS:

A. Reporting requirements for Class I non-hazardous waste injection wells.

(1) If a Class I non-hazardous waste injection well is found to be discharging or is suspected of discharging fluids into a zone or zones other than the permitted or authorized injection zone, the discharger shall within 24 hours notify the secretary of the circumstances and action taken. The discharger shall provide subsequent written reports as required by the secretary.

(2) The discharger shall provide reports quarterly to the secretary on:

(a) the physical, chemical and other relevant characteristics of injection fluids;

(b) monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure; and

(c) the results of monitoring prescribed under Subsection B of Section 20.6.2.5207 NMAC.

(3) The discharger shall report, no later than the first quarterly report after completion, the results of:

(a) periodic tests of mechanical integrity as required in Sections 20.6.2.5204 and 20.6.2.5207 NMAC;

(b) any other test of the Class I non-hazardous waste injection well conducted by the discharger if required by the secretary;

(c) any well work-over; and

(d) any changes within the area of review which might impact subsurface conditions.

B. Reporting requirements for Class III wells.

(1) The discharger shall notify the secretary within 48 hours of the detection or suspected detection of a leachate excursion, and provide subsequent reports as required by the secretary.

(2) The discharger shall provide to the secretary:

(a) reports on required monitoring quarterly, or more frequently as required by the secretary; and

(b) results of mechanical integrity testing as required in Sections 20.6.2.5204 and 20.6.2.5207 NMAC and any other periodic tests required by the secretary; these results are to be reported no later than the first regular report after the completion of the test.

(3) Where manifold monitoring is permitted, monitoring results may be reported on a well field basis, rather than individual well basis.

C. Report signatory requirements.

(1) All reports submitted pursuant to this section shall be signed and certified as provided in Subsection G of Section 20.6.2.5101 NMAC, or by a duly authorized representative.

(2) For a person to be a duly authorized representative, authorization must:

(a) be made in writing by a signatory described in Paragraph (1) of Subsection G of Section 20.6.2.5101 NMAC;

(b) specify either an individual or a position having responsibility for the overall operation of that regulated facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, or position of equivalent responsibility; and

(c) have been submitted to the secretary.

[9-20-82, 12-1-95; 20.6.2.5208 NMAC - Rn, 20 NMAC 6.2.V.5208, 1-15-01; A, 12-1-01]

20.6.2.5209 PLUGGING AND ABANDONMENT FOR CLASS I WELLS AND CLASS III WELLS:

A. The discharger shall submit as part of the discharge permit application, a plan for plugging and abandonment of a Class I well or a Class III well that meets the requirements of Subsection D of 20.6.2.3109, Subsection C of 20.6.2.5101, and 20.6.2.5005 NMAC for protection of ground water. If requested, a revised or updated abandonment plan shall be submitted for approval prior to closure. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of the permit.

B. Prior to abandonment of a well used in a Class I well or Class III well operation, the well shall be plugged in a manner which will not allow the movement of fluids through the well bore out of the injection zone or between other zones of ground water. Cement plugs shall be used unless a comparable method has been approved by the secretary for the plugging of Class III wells at that site.

C. Prior to placement of the plugs, the well to be abandoned shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method approved by the secretary.

D. Placement of the plugs shall be accomplished by one of the following:

(1) the balance method; or

(2) the dump bailer method; or

(3) the two-plug method; or

(4) an equivalent method with the approval of the secretary.

E. The following shall be considered by the secretary in determining the adequacy of a plugging and abandonment plan:

(1) the type and number of plugs to be used;

(2) the placement of each plug, including the elevation of the top and bottom;

(3) the type, grade and quantity of cementing slurry to be used;

(4) the method of placement of the plugs;

(5) the procedure to be used to plug and abandon the well; and

(6) such other factors that may affect the adequacy of the plan.

F. The discharger shall retain all records concerning the nature and composition of injected fluids until five years after completion of any plugging and abandonment procedures.

[9-20-82, 12-1-95; 20.6.2.5209 NMAC - Rn, 20 NMAC 6.2.V.5209, 1-15-01; A, 12-1-01; A, 8-31-15; A, 12-21-18]

20.6.2.5210 INFORMATION TO BE CONSIDERED BY THE SECRETARY FOR CLASS I WELLS AND CLASS III WELLS:

A. This section sets forth the information to be considered by the secretary in authorizing construction and use of a Class I well or Class III well or well field. Certain maps, cross-sections, tabulations of all wells within the area of review, and other data may be included in the discharge permit application submittal by reference provided they are current, readily available to the secretary and sufficiently identified to be retrieved.

B. Prior to the issuance of a discharge permit or project discharge permit allowing construction of a new Class I well, operation of an existing Class I well, or operation of a new or existing Class III well or well field, or conversion of any well to injection use, the secretary shall consider the following:

(1) information required in Subsection C of 20.6.2.3106 NMAC;

(2) a map showing the Class I well, or Class III well or well fields, for which approval is sought and the applicable area of review; within the area of review, the map must show, in so far as is known or is reasonably available from the public records, the number, name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features, including residences and roads;

(3) a tabulation of data on all wells within the area of review which may penetrate into the proposed injection zone; such data shall include, as available, a description of each well's type, the distance and

direction to the injection well or well field, construction, date drilled, location, depth, record of plugging or completion, and any additional information the secretary may require;

(4) for wells within the area of review which penetrate the injection zone, but are not properly completed or plugged, the corrective action proposed to be taken under 20.6.2.5203 NMAC;

(5) maps and cross-sections indicating the general vertical and lateral limits of all ground water having 10,000 mg/l or less TDS within the area of review, the position of such ground water within the area of review relative to the injection formation, and the direction of water movement, where known, in each zone of ground water which may be affected by the proposed injection operation;

(6) maps and cross-sections detailing the geology and geologic structure of the local area, including faults, if known or suspected;

(7) generalized maps and cross-sections illustrating the regional geologic setting;

(8) proposed operating data, including:

(a) average and maximum daily flow rate and volume of the fluid to be injected;

(b) average and maximum injection pressure;

(c) source of injection fluids and an analysis or description, whichever the secretary requires, of their chemical, physical, radiological and biological characteristics;

(9) results of the formation testing program to obtain an analysis or description, whichever the secretary requires, of the chemical, physical, and radiological characteristics of, and other information on, the receiving formation, provided that the secretary may issue a conditional approval of a discharge permit if he finds that further formation testing is necessary for final approval;

(10) expected pressure changes, native fluid displacement, and direction of movement of the injected fluid;

(11) proposed stimulation program;

(12) proposed or actual injection procedure;

(13) schematic or other appropriate drawings of the surface and subsurface construction details of the well;

(14) construction procedures, including a cementing and casing program, logging procedures, deviation checks, and a drilling, testing, and coring program;

(15) contingency plans to cope with all shut-ins or well failures so as to prevent movement of fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to 20.6.2.5103 NMAC;

(16) plans, including maps, for meeting the monitoring requirements of 20.6.2.5207 NMAC; and

(17) the ability of the discharger to undertake measures necessary to prevent contamination of ground water having 10,000 mg/l or less TDS after the cessation of operation, including the proper closing, plugging and abandonment of a well, ground water restoration if applicable, and any post-operational monitoring as may be needed; methods by which the discharger shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the secretary, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the state of New Mexico, with the state as beneficiary; (3) a non-renewable letter of credit made out to the state of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance; such bond or materials shall be approved and executed prior to discharge permit issuance and shall become effective upon commencement of construction; if an adequate bond is posted by the discharger to a federal or another state agency, and this bond covers all of the measures referred to above, the secretary shall consider this bond as satisfying the bonding requirements of 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the discharger will fully perform the measures required hereinabove.

C. Prior to the secretary's approval that allows the operation of a new or existing Class I well or Class III well or well field, the secretary shall consider the following:

(1) update of pertinent information required under Subsection B of 20.6.2.5210 NMAC;

(2) all available logging and testing program data on the well;

(3) the demonstration of mechanical integrity pursuant to 20.6.2.5204 NMAC;

(4) the anticipated maximum pressure and flow rate at which the permittee will operate;

(5) the results of the formation testing program;

(6) the physical, chemical, and biological interactions between the injected fluids and fluids in the injection zone, and minerals in both the injection zone and the confining zone; and

(7) the status of corrective action on defective wells in the area of review.
[9-20-82, 12-24-87, 12-1-95; 20.6.2.5210 NMAC - Rn, 20 NMAC 6.2.V.5210, 1-15-01; A, 12-1-01; A, 8-31-15]

20.6.2.5211 - 20.6.2.5299: [RESERVED]
[12-1-95; 20.6.2.5211 - 20.6.2.5299 NMAC - Rn, 20 NMAC 6.2.V.5211-5299, 1-15-01]

20.6.2.5300 REQUIREMENTS FOR CLASS I HAZARDOUS WASTE INJECTION WELLS:

A. Except as otherwise provided for in 20.6.2.5300 through 20.6.2.5399 NMAC, Class I hazardous waste wells are subject to the minimum permit requirements for all Class I wells in 20.6.2.5000 through 20.6.2.5299 NMAC, in addition to the requirements of 20.6.2.5300 through 20.6.2.5399 NMAC. To the extent any requirement in 20.6.2.5300 through 20.6.2.5399 NMAC conflicts with a requirement of 20.6.2.5000 through 20.6.2.5299 NMAC, Class I hazardous waste injection wells must comply with 20.6.2.5300 through 20.6.2.5399 NMAC.

B. Class I hazardous waste injection wells are only authorized for use by petroleum refineries for the waste generated by the refinery ("generator").

C. The New Mexico energy, minerals and natural resources department, oil conservation division will administer and oversee all permitting of Class I hazardous waste wells pursuant to 20.6.2.5300 through 20.6.2.5399 NMAC.
[20.6.2.5300 NMAC - N, 8-31-15]

20.6.2.5301 DEFINITIONS: As used in 20.6.2.5300 through 20.6.2.5399 NMAC:

A. "**cone of influence**" means that area around the well within which increased injection zone pressures caused by injection into the hazardous waste injection well would be sufficient to drive fluids into groundwater of the state of New Mexico;

B. "**director**" means the director of the New Mexico energy, minerals and natural resources department, oil conservation division or his/her designee;

C. "**existing well**" means a Class I hazardous waste injection well which has become a Class I hazardous waste injection well as a result of a change in the definition of the injected waste which would render the waste hazardous under 20.4.1.200 NMAC (incorporating 40 C.F.R. Section 261.3);

D. "**ground water of the state of New Mexico**" means, consistent with 20.6.2.5001 NMAC, an aquifer that contains ground water having a TDS concentration of 10,000 mg/l or less;

E. "**injection interval**" means that part of the injection zone in which the well is screened, or in which the waste is otherwise directly emplaced;

F. "**new well**" means any Class I hazardous waste injection well which is not an existing well;

G. "**transmissive fault or fracture**" is a fault or fracture that has sufficient permeability and vertical extent to allow fluids to move between formations.
[20.6.2.5301 NMAC - N, 8-31-15]

20.6.2.5302 FEES FOR CLASS I HAZARDOUS WASTE INJECTION WELLS: For the purposes of Class I hazardous waste wells, this section shall apply to the exclusion of 20.6.2.3114 NMAC.

A. *Filing Fee.* Every facility submitting a discharge permit application for approval of a Class I hazardous waste injection well shall pay a filing fee of $100 to the water quality management fund at the time the permit application is submitted. The filing fee is nonrefundable.

B. *Permit fee.*

(1) Every facility submitting a discharge permit application for approval of a Class I hazardous waste injection well shall pay a permit fee of $30,000 to the water quality management fund. The permit fee may be paid in a single payment at the time of permit approval or in equal installments over the term of the permit. Installment payments shall be remitted yearly, with the first installment due on the date of permit approval. Subsequent installments shall be remitted yearly thereafter. The permit or permit application review of any facility shall be suspended or terminated if the facility fails to submit an installment payment by its due date.

(2) Facilities applying for permits which are subsequently withdrawn or denied shall pay one-half of the permit fee at the time of denial or withdrawal.

C. *Annual administration fee.* Every facility that receives a Class I hazardous waste injection well permit shall pay an annual administrative fee of $20,000 to the water quality management fund. The initial administrative fee shall be remitted one year after commencement of disposal operations pursuant to the permit. Subsequent administrative fees shall be remitted annually thereafter.

D. *Renewal fee.*

(1) Every facility submitting a discharge permit application for renewal of a Class I hazardous waste injection well shall pay a renewal fee of $10,000 to the water quality management fund. The renewal fee may be paid in a single payment at the time of permit renewal or in equal installments over the term of the permit. Installment payments shall be remitted yearly, with the first installment due on the date of permit renewal. Subsequent installments shall be remitted yearly thereafter. The permit or permit renewal review of any facility shall be suspended or terminated if the facility fails to submit an installment payment by its due date.

(2) The director may waive or reduce fees for discharge permit renewals which require little or no cost for investigation or issuance.

E. *Modification fees.*

(1) Every facility submitting an application for a discharge permit modification of a Class I hazardous waste injection well will be assessed a filing fee plus a modification fee of $10,000 to the water quality management fund.

(2) Every facility submitting an application for other changes to a Class I hazardous waste injection well discharge permit will be assessed a filing fee plus a minor modification fee of $1,000 to the water quality management fund.

(3) Applications for both renewal and modification shall pay a filing fee plus renewal fee.

(4) If the director requires a discharge permit change as a component of an enforcement action, the facility shall pay the applicable modification fee. If the director requires a discharge permit change outside the context of an enforcement action, the facility shall not be assessed a fee.

(5) The director may waive or reduce fees for discharge permit changes which require little or no cost for investigation or issuance.

F. *Financial assurance fees.*

(1) Facilities with approved Class I hazardous waste injection well permits shall pay the financial assurance fees specified in Table 2 of 20.6.2.3114 NMAC.

(2) Facilities relying on the corporate guarantee for financial assurance shall pay an additional fee of $5,000 to the water quality management fund.

[20.6.2.5302 NMAC - N, 8-31-15]

20.6.2.5303 CONVERSION OF EXISTING INJECTION WELLS: An existing Class I non-hazardous waste injection well may be converted to a Class I hazardous waste injection well provided the well meets the modeling, design, compatibility, and other requirements set forth in 20.6.2.5300 through 20.6.2.5399 NMAC and the permittee receives a Class I hazardous waste permit pursuant to those sections.

[20.6.2.5303 NMAC - N, 8-31-15]

20.6.2.5304 - 20.6.2.5309: [RESERVED]

20.6.2.5310 REQUIREMENTS FOR WELLS INJECTING HAZARDOUS WASTE REQUIRED TO BE ACCOMPANIED BY A MANIFEST:

A. *Applicability*. The regulations in this section apply to all generators of hazardous waste, and to the owners or operators of all hazardous waste management facilities, using any class of well to inject hazardous wastes accompanied by a manifest. (See also Subparagraph (b) of Paragraph (3) of Subsection A of 20.6.2.5004 NMAC.)

B. *Authorization*. The owner or operator of any well that is used to inject hazardous waste required to be accompanied by a manifest or delivery document shall apply for authorization to inject as specified in 20.6.2.5102 NMAC within six months after the approval or promulgation of the state UIC program.

C. *Requirements*. In addition to complying with the applicable requirements of this part, the owner or operator of each facility meeting the requirements of Subsection B of this section, shall comply with the following.

(1) *Notification*. The owner or operator shall comply with the notification requirements of 42 U.S.C. Section 6930.

(2) *Identification number*. The owner or operator shall comply with the requirements of 20.4.1.500 NMAC (incorporating 40 CFR Section 264.11).

(3) *Manifest system*. The owner or operator shall comply with the applicable recordkeeping and reporting requirements for manifested wastes in 20.4.1.500 NMAC (incorporating 40 CFR Section 264.71).

(4) *Manifest discrepancies*. The owner or operator shall comply with 20.4.1.500 NMAC (incorporating 40 CFR Section 264.72).

(5) *Operating record*. The owner or operator shall comply with 20.4.1.500 NMAC (incorporating 40 CFR Sections 264.73(a), (b)(1), and (b)(2)).

(6) *Annual report*. The owner or operator shall comply with 20.4.1.500 NMAC (incorporating 40 CFR Section 264.75).

(7) *Unmanifested waste report*. The owner or operator shall comply with 20.4.1.500 NMAC (incorporating 40 CFR Section 264.75).

(8) *Personnel training*. The owner or operator shall comply with the applicable personnel training requirements of 20.4.1.500 NMAC (incorporating 40 CFR Section 264.16).

(9) *Certification of closure*. When abandonment is completed, the owner or operator must submit to the director certification by the owner or operator and certification by an independent registered professional engineer that the facility has been closed in accordance with the specifications in 20.6.2.5209 NMAC.

[20.6.2.5310 NMAC - N, 8-31-15]

20.6.2.5311 - 20.6.2.5319: [RESERVED]

20.6.2.5320 ADOPTION OF 40 CFR PART 144, SUBPART F (FINANCIAL RESPONSIBILITY: CLASS I HAZARDOUS WASTE INJECTION WELLS): Except as otherwise provided, the regulations of the United States environmental protection agency set forth in 40 CFR Part 144, Subpart F are hereby incorporated by reference.

[20.6.2.5320 NMAC - N, 8-31-15]

20.6.2.5321 MODIFICATIONS, EXCEPTIONS, AND OMISSIONS: Except as otherwise provided, the following modifications, exceptions, and omissions are made to the incorporated federal regulations.

A. The following term defined in 40 CFR Section 144.61 has the meaning set forth herein, in lieu of the meaning set forth in 40 CFR Section 144.61: "plugging and abandonment plan" means the plan for plugging and abandonment prepared in accordance with the requirements of 20.6.2.5341 NMAC.

B. The following terms not defined in 40 CFR Part 144, Subsection F have the meanings set forth herein when the terms are used in this part:

(1) "administrator," "regional administrator" and other similar variations means the director of the New Mexico energy, minerals and natural resources department, oil conservation division or his/her designee;

(2) "United States environmental protection agency" or "EPA" means New Mexico energy, minerals and natural resources department, oil conservation division or OCD, except when used in 40 CFR Section 144.70(f).

C. The following provisions of 40 CFR Part 144, Subpart F are modified in 20.6.2.5321 NMAC:

(1) cross references to 40 CFR Part 144 shall be replaced by cross references to 20.6.2.5300 through 20.6.2.5399 NMAC;

(2) the cross reference to Sections 144.28 and 144.51 in Section 144.62(a) shall be replaced by a cross reference to 20.6.2.5341 NMAC;

(3) the cross references to 40 CFR Parts 264, Subpart H and 265, Subpart H shall be modified to include cross references to 40 CFR Parts 264, Subpart H and 265, Subpart H and 20.4.1.500 and 20.4.1.600 NMAC;

(4) references to EPA identification numbers in financial assurance documents shall be replaced by references to API well numbers (US well numbers);

(5) the first sentence of 40 CFR Section 144.63(f)(1) shall be replaced with the following sentence: "An owner or operator may satisfy the requirements of this section by obtaining a guarantee from a corporate parent that meets the requirements of 40 CFR Section 144.63(f)(10), including the guarantor meeting the requirements for the owner or operator under the financial test specified in this paragraph.";

(6) trust agreements prepared in accordance with 40 CFR Section 144.70(a) must state that they will be administered, construed, and enforced according to the laws of New Mexico;

(7) surety companies issuing bonds prepared in accordance with 40 CFR Section 144, Subpart F must be registered with the New Mexico office of superintendent of insurance;

D. The following provisions of 40 CFR Part 144, Subpart F are omitted from 20.6.2.5320 NMAC:

(1) Section 144.65;

(2) Section 144.66;

(3) the third sentence in 40 CFR Section 144.63(h).

[20.6.2.5321 NMAC - N, 8-31-15]

20.6.2.5322 - 20.6.2.5340 [RESERVED]

20.6.2.5341 CONDITIONS APPLICABLE TO ALL PERMITS: The following conditions apply to all Class I hazardous permits. All conditions applicable to all permits shall be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to these regulations must be given in the permit.

A. *Duty to comply.* The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the New Mexico Water Quality Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application; except that the permittee need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in a variance issued under 20.6.2.1210 NMAC.

B. *Duty to reapply.* If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a permit renewal pursuant to Subsection F of 20.6.2.3106 NMAC.

C. *Need to halt or reduce activity not a defense.* It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. *Duty to mitigate.* The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

E. *Proper operation and maintenance.* The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

F. *Permit actions.* This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

G. *Property rights.* This permit does not convey any property rights of any sort, or any exclusive privilege.

H. *Duty to provide information.* The permittee shall furnish to the director, within a time specified, any information which the director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the director, upon request, copies of records required to be kept by this permit.

I. *Duty to provide notice.* Public notice, when required, shall be provided as set forth in 20.6.2.3108 NMAC except that the following notice shall be provided in lieu of the notice required by Paragraph (2) of Subsection B of 20.6.2.3108 NMAC: a written notice must be sent by certified mail, return receipt requested, to all surface and mineral owners of record within a ½ mile radius of the proposed well or wells.

J. *Inspection and entry.* The permittee shall allow the director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

(1) enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(2) have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(3) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(4) sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the 20.6.2.5300 through 20.6.2.5399 NMAC, any substances or parameters at any location.

K. *Monitoring and records.*

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(2) The permittee shall retain records of all monitoring information, including the following:

(a) calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report, or application; this period may be extended by request of the director at any time; and

(b) the nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under 20.6.2.5351 through 20.6.2.5363 NMAC; the director may require the owner or operator to deliver the records to the director at the conclusion of the retention period.

(3) Records of monitoring information shall include:

(a) the date, exact place, and time of sampling or measurements;

(b) the individual(s) who performed the sampling or measurements;

(c) the date(s) analyses were performed;

(d) the individual(s) who performed the analyses;

(e) the analytical techniques or methods used; and

(f) the results of such analyses.

L. *Signatory requirement.* All applications, reports, or information submitted to the director shall be signed and certified. (See Subsection G of 20.6.2.5101 NMAC.)

M. *Reporting requirements.*

(1) *Planned changes.* The permittee shall give notice to the director as soon as possible of any planned physical alterations or additions to the permitted facility.

(2) *Anticipated noncompliance.* The permittee shall give advance notice to the director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(3) *Monitoring reports.* Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(4) *Compliance schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 30 days following each schedule date.

(5) *Twenty-four hour reporting*. The permittee shall report any noncompliance which may endanger health or the environment, including:

(a) any monitoring or other information which indicates that any contaminant may cause an endangerment to ground water of the state of New Mexico; or

(b) any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between ground water of the state of New Mexico; any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances; a written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances; the written submission shall contain a description of the noncompliance and its cause; the area affected by the noncompliance, including any ground water of the state of New Mexico; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; the date and time the permittee became aware of the noncompliance; and steps taken or planned to reduce, remediate, eliminate, and prevent reoccurrence of the noncompliance.

(6) *Other noncompliance.* The permittee shall report all instances of noncompliance not reported under Paragraphs (3), (4), and (5) of Subsection M of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph (5) of Subsection M of this section.

(7) *Other information.* Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the director, it shall promptly submit such facts or information.

N. *Requirements prior to commencing injection.* A new injection well may not commence injection until construction is complete; and

(1) the permittee has submitted notice of completion of construction to the director; and

(2) the director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or the permittee has not received notice from the director of his or her intent to inspect or otherwise review the new injection well within 13 days of the date of the notice in Paragraph (1) of Subsection N of this section, in which case prior inspection or review is waived and the permittee may commence injection; the director shall include in his notice a reasonable time period in which he shall inspect the well.

O. The permittee shall notify the director at such times as the permit requires before conversion or abandonment of the well.

P. The permittee shall meet the requirements of 20.6.2.5209 NMAC.

Q. *Plugging and abandonment report.* Within 60 days after plugging a well or at the time of the next quarterly report (whichever is less) the owner or operator shall submit a report to the director. If the quarterly report is due less than 15 days before completion of plugging, then the report shall be submitted within 60 days. The report shall be certified as accurate by the person who performed the plugging operation. Such report shall consist of either:

(1) a statement that the well was plugged in accordance with the plan previously submitted to the director; or

(2) where actual plugging differed from the plan previously submitted, and updated version of the plan on the form supplied by the director, specifying the differences.

R. *Duty to establish and maintain mechanical integrity.*

(1) The permittee shall meet the requirements of 20.6.2.5204 NMAC.

(2) When the director determines that a Class I hazardous well lacks mechanical integrity pursuant to 20.6.2.5204 NMAC, the director shall give written notice of the director's determination to the owner or operator. Unless the director requires immediate cessation, the owner or operator shall cease injection into the well within 48 hours of receipt of the director's determination. The director may allow plugging of the well pursuant to the requirements of 20.6.2.5209 NMAC or require the permittee to perform such additional construction, operation, monitoring, reporting and corrective action as is necessary to prevent the movement of fluid into or between ground water of the state of New Mexico caused by the lack of mechanical integrity. The owner or operator may resume injection upon written notification from the director that the owner or operator has demonstrated mechanical integrity pursuant to 20.6.2.5204 and 20.6.2.5358 NMAC.

(3) The director may allow the owner or operator of a well which lacks mechanical integrity pursuant to Subsection A of 20.6.2.5204 NMAC to continue or resume injection, if the owner or operator has made a satisfactory demonstration that there is no movement of fluid into or between groundwater of the state of New Mexico.

S. *Transfer of a permit.* The operator shall not transfer a permit without the director's prior written approval. A request for transfer of a permit shall identify officers, directors and owners of 25% or greater in the transferee. Unless the director otherwise orders, public notice or hearing are not required for the transfer request's approval. If the director denies the transfer request, it shall notify the operator and the proposed transferee of the denial by certified mail, return receipt requested, and either the operator or the proposed transferee may request a hearing with 10 days after receipt of the notice. Until the director approves the transfer and the required financial assurance is in place, the director shall not release the transferor's financial assurance.

[20.6.2.5341 NMAC - N, 8-31-15]

20.6.2.5342 ESTABLISHING PERMIT CONDITIONS:

A. In addition to conditions required in 20.6.2.5341 NMAC, the director shall establish conditions, as required on a case-by-case basis under Subsection I of 20.6.2.3109 NMAC, Subsection A of 20.6.2.5343 NMAC, and 20.6.2.5344 NMAC. Permits for owners or operators of hazardous waste injection wells shall also include conditions meeting the requirements of 20.6.2.5310 NMAC, Paragraphs (1) and (2) of Subsection A of this section, and 20.6.2.5351 through 20.6.2.5363 NMAC.

(1) *Financial responsibility.*

(a) The permittee, including the transferor of a permit, is required to demonstrate and maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner prescribed by the director until:

(i) the well has been plugged and abandoned in accordance with an approved plugging and abandonment plan pursuant to Subsection P of 20.6.2.5341 NMAC, and 20.6.2.5209 NMAC, and submitted a plugging and abandonment report pursuant to Subsection Q of 20.6.2.5341 NMAC; or

(ii) the well has been converted in compliance with the requirements of Subsection O of 20.6.2.5341 NMAC; or

(iii) the transferor of a permit has received notice from the director that the transfer has been approved and that the transferee's required financial assurance is in place.

(b) The owner or operator of a well injecting hazardous waste must comply with the financial responsibility requirements of 20.6.2.5320 NMAC.

(2) *Additional conditions.* The director shall impose on a case-by-case basis such additional conditions as are necessary to prevent the migration of fluids into ground water of the state of New Mexico.

B. *Applicable requirements.*

(1) In addition to conditions required in all permits the director shall establish conditions in permits as required on a case-by-case basis, to provide for and assure compliance with all applicable requirements of this part.

(2) An applicable requirement is a state statutory or regulatory requirement which takes effect prior to final administrative disposition of the permit. An applicable requirement is also any requirement which takes effect prior to the modification or revocation and reissuance of a permit.

(3) New or renewed permits, and to the extent allowed under 20.6.2.3109 NMAC modified or terminated permits, shall incorporate each of the applicable requirements referenced in 20.6.2.5342 NMAC.

C. *Incorporation.* All permit conditions shall be incorporated either expressly or by reference. If incorporated by reference, a specific citation to the applicable regulations or requirements must be given in the permit.

[20.6.2.5342 NMAC - N, 8-31-15]

20.6.2.5343 SCHEDULE OF COMPLIANCE:

A. *General.* The permit may, when appropriate, specify a schedule of compliance leading to compliance with this part.

(1) *Time for compliance.* Any schedules of compliance shall require compliance as soon as possible, and in no case later than three years after the effective date of the permit.

(2) *Interim dates.* Except as provided in Subparagraph (b) of Paragraph (1) of Subsection B of this section, if a permit establishes a schedule of compliance which exceeds one year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement.

(a) The time between interim dates shall not exceed one year.

(b) If the time necessary for completion of any interim requirement is more than one year and is not readily divisible into stages for completion, the permit shall specify interim dates for the submission of reports of progress toward completion of the interim requirements and indicate a projected completion date.

(3) *Reporting.* The permit shall be written to require that if Paragraph (1) of Subsection A of this section is applicable, progress reports be submitted no later than 30 days following each interim date and the final date of compliance.

B. *Alternative schedules of compliance.* A permit applicant or permittee may cease conducting regulated activities (by plugging and abandonment) rather than continue to operate and meet permit requirements as follows.

(1) If the permittee decides to cease conducting regulated activities at a given time within the term of a permit which has already been issued:

(a) the permit may be modified to contain a new or additional schedule leading to timely cessation of activities; or

(b) the permittee shall cease conducting permitted activities before noncompliance with any interim or final compliance schedule requirement already specified in the permit.

(2) If the decision to cease conducting regulated activities is made before issuance of a permit whose term will include the termination date, the permit shall contain a schedule leading to termination which will ensure timely compliance with applicable requirements.

(3) If the permittee is undecided whether to cease conducting regulated activities, the director may issue or modify a permit to contain two schedules as follows:

(a) both schedules shall contain an identical interim deadline requiring a final decision on whether to cease conducting regulated activities no later than a date which ensures sufficient time to comply with applicable requirements in a timely manner if the decision is to continue conducting regulated activities;

(b) one schedule shall lead to timely compliance with applicable requirements;

(c) the second schedule shall lead to cessation of regulated activities by a date which will ensure timely compliance with applicable requirements;

(d) each permit containing two schedules shall include a requirement that after the permittee has made a final decision under Subparagraph (a) of Paragraph (3) of Subsection B of this section it shall follow the schedule leading to compliance if the decision is to continue conducting regulated activities, and follow the schedule leading to termination if the decision is to cease conducting regulated activities.

(4) The applicant's or permittee's decision to cease conducting regulated activities shall be evidenced by a firm public commitment satisfactory to the director, such as a resolution of the board of directors of a corporation.
[20.6.2.5343 NMAC - N, 8-31-15]

20.6.2.5344 REQUIREMENTS FOR RECORDING AND REPORTING OF MONITORING RESULTS: All permits shall specify:

A. requirements concerning the proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods (including biological monitoring methods when appropriate);

B. required monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity including when appropriate, continuous monitoring;

C. applicable reporting requirements based upon the impact of the regulated activity and as specified in 20.6.2.5359 NMAC; reporting shall be no less frequent than specified in the above regulations.
[20.6.2.5344 NMAC - N, 8-31-15]

20.6.2.5345 - 20.6.2.5350: [RESERVED]

20.6.2.5351 APPLICABILITY: 20.6.2.5351 through 20.6.2.5363 NMAC establish criteria and standards for underground injection control programs to regulate Class I hazardous waste injection wells. Unless otherwise noted, these sections supplement the requirements of 20.6.2.5000 through 20.6.2.5299 NMAC and apply instead of any inconsistent requirements for Class I non-hazardous waste injection wells.
[20.6.2.5351 NMAC - N, 8-31-15]

20.6.2.5352 MINIMUM CRITERIA FOR SITING:

A. All Class I hazardous waste injection wells shall be sited such that they inject into a formation that is beneath the lowermost formation containing within one quarter mile of the well bore groundwater of the state of New Mexico.

B. The siting of Class I hazardous waste injection wells shall be limited to areas that are geologically suitable. The director shall determine geologic suitability based upon:

(1) an analysis of the structural and stratigraphic geology, the hydrogeology, and the seismicity of the region;

(2) an analysis of the local geology and hydrogeology of the well site, including, at a minimum, detailed information regarding stratigraphy, structure and rock properties, aquifer hydrodynamics and mineral resources; and

(3) a determination that the geology of the area can be described confidently and that limits of waste fate and transport can be accurately predicted through the use of models.

C. Class I hazardous waste injection wells shall be sited such that:

(1) the injection zone has sufficient permeability, porosity, thickness and areal extent to prevent migration of fluids into ground water of the state of New Mexico; and

(2) the confining zone:

(a) is laterally continuous and free of transecting, transmissive faults or fractures over an area sufficient to prevent the movement of fluids into ground water of the state of New Mexico; and

(b) contains at least one formation of sufficient thickness and with lithologic and stress characteristics capable of preventing vertical propagation of fractures.

D. The owner or operator shall demonstrate to the satisfaction of the director that:

(1) the confining zone is separated from the base of the lowermost ground water of the state of New Mexico by at least one sequence of permeable and less permeable strata that will provide an added layer of protection for ground water of the state of New Mexico in the event of fluid movement in an unlocated borehole or transmissive fault; or

(2) within the area of review, the piezometric surface of the fluid in the injection zone is less than the piezometric surface of the lowermost groundwater of the state of New Mexico, considering density effects, injection pressures and any significant pumping in the overlying ground water of the state of New Mexico; or

(3) there is no ground water of the state of New Mexico present.

(4) The director may approve a site which does not meet the requirements in Paragraphs (1), (2), or (3) of Subsections D of this section if the owner or operator can demonstrate to the director that because of

the geology, nature of the waste, or other considerations, abandoned boreholes or other conduits would not cause endangerment of ground water of the state of New Mexico.
[20.6.2.5352 NMAC - N, 8-31-15]

20.6.2.5353 AREA OF REVIEW: For the purposes of Class I hazardous waste wells, this section shall apply to the exclusion of 20.6.2.5202 NMAC. The area of review for Class I hazardous waste injection wells shall be a two-mile radius around the well bore. The director may specify a larger area of review based on the calculated cone of influence of the well.
[20.6.2.5353 NMAC - N, 8-31-15]

20.6.2.5354 CORRECTIVE ACTION FOR WELLS IN THE AREA OF REVIEW: For the purposes of Class I hazardous waste wells, this section shall apply to the exclusion of 20.6.2.5203 NMAC.

A. The owner or operator of a Class I hazardous waste well shall as part of the permit application submit a plan to the director outlining the protocol used to:

(1) identify all wells penetrating the confining zone or injection zone within the area of review; and

(2) determine whether wells are adequately completed or plugged.

B. The owner or operator of a Class I hazardous waste well shall identify the location of all wells within the area of review that penetrate the injection zone or the confining zone and shall submit as required in Subsection A of 20.6.2.5360 NMAC:

(1) a tabulation of all wells within the area of review that penetrate the injection zone or the confining zone; and

(2) a description of each well or type of well and any records of its plugging or completion.

C. For wells that the director determines are improperly plugged, completed, or abandoned, or for which plugging or completion information is unavailable, the applicant shall also submit a plan consisting of such steps or modification as are necessary to prevent movement of fluids into or between groundwater of the state of New Mexico. Where the plan is adequate, the director shall incorporate it into the permit as a condition. Where the director's review of an application indicates that the permittee's plan is inadequate (based at a minimum on the factors in Subsection E of this section), the director shall:

(1) require the applicant to revise the plan;

(2) prescribe a plan for corrective action as a condition of the permit; or

(3) deny the application.

D. Requirements.

(1) Existing injection wells. Any permit issued for an existing Class I hazardous waste injection well requiring corrective action other than pressure limitations shall include a compliance schedule requiring any corrective action accepted or prescribed under Subsection C of this section. Any such compliance schedule shall provide for compliance no later than two years following issuance of the permit and shall require observance of appropriate pressure limitations under Paragraph (3) of Subsection D until all other corrective action measures have been implemented.

(2) New injection wells. No owner or operator of a new Class I hazardous waste injection well may begin injection until all corrective actions required under this section have been taken.

(3) The director may require pressure limitations in lieu of plugging. If pressure limitations are used in lieu of plugging, the director shall require as a permit condition that injection pressure be so limited that pressure in the injection zone at the site of any improperly completed or abandoned well within the area of review would not be sufficient to drive fluids into or between groundwater of the state of New Mexico. This pressure limitation shall satisfy the corrective action requirement. Alternatively, such injection pressure limitation may be made part of a compliance schedule and may be required to be maintained until all other required corrective actions have been implemented.

E. In determining the adequacy of corrective action proposed by the applicant under Subsection C of this section and in determining the additional steps needed to prevent fluid movement into and between groundwater of the state of New Mexico, the following criteria and factors shall be considered by the director:

(1) nature and volume of injected fluid;

(2) nature of native fluids or byproducts of injection;

(3) geology;

(4) hydrology;

(5) history of the injection operation;

(6) completion and plugging records;

(7) closure procedures in effect at the time the well was closed;

(8) hydraulic connections with groundwater of the state of New Mexico;

(9) reliability of the procedures used to identify abandoned wells; and

(10) any other factors which might affect the movement of fluids into or between ground water of the state of New Mexico.

[20.6.2.5354 NMAC - N, 8-31-15]

20.6.2.5355 CONSTRUCTION REQUIREMENTS:

A. *General.* All existing and new Class I hazardous waste injection wells shall be constructed and completed to:

(1) prevent the movement of fluids into or between ground water of the state of New Mexico or into any unauthorized zones;

(2) permit the use of appropriate testing devices and workover tools; and

(3) permit continuous monitoring of injection tubing and long string casing as required pursuant to Subsection F of 20.6.2.5357 NMAC.

B. *Compatibility.* All well materials must be compatible with fluids with which the materials may be expected to come into contact. A well shall be deemed to have compatibility as long as the materials used in the construction of the well meet or exceed standards developed for such materials by the American petroleum institute, ASTM, or comparable standards acceptable to the director.

C. *Casing and cementing of new wells.*

(1) Casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well, including the post-closure care period. The casing and cementing program shall be designed to prevent the movement of fluids into or between ground water of the state of New Mexico, and to prevent potential leaks of fluids from the well. In determining and specifying casing and cementing requirements, the director shall consider the following information as required by 20.6.2.5360 NMAC:

(a) depth to the injection zone;

(b) injection pressure, external pressure, internal pressure and axial loading;

(c) hole size;

(d) size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification and construction material);

(e) corrosiveness of injected fluid, formation fluids and temperature;

(f) lithology of injection and confining zones;

(g) type or grade of cement; and

(h) quantity and chemical composition of the injected fluid.

(2) One surface casing string shall, at a minimum, extend into the confining bed below the lowest formation that contains ground water of the state of New Mexico and be cemented by circulating cement from the base of the casing to the surface, using a minimum of 120% of the calculated annual volume. The director may require more than 120% when the geology or other circumstances warrant it.

(3) At least one long string casing, using a sufficient number of centralizers, shall extend to the injection zone and shall be cemented by circulating cement to the surface in one or more stages:

(a) of sufficient quantity and quality to withstand the maximum operating pressure; and

(b) in a quantity no less than 120% of the calculated volume necessary to fill the annular space; the director may require more than 120% when the geology or other circumstances warrant it.

(4) Circulation of cement may be accomplished by staging. The director may approve an alternative method of cementing in cases where the cement cannot be recirculated to the surface, provided the owner or operator can demonstrate by using logs that the cement is continuous and does not allow fluid movement behind the well bore.

(5) Casings, including any casing connections, must be rated to have sufficient structural strength to withstand, for the design life of the well:

(a) the maximum burst and collapse pressures which may be experienced during the construction, operation and closure of the well; and

(b) the maximum tensile stress which may be experienced at any point along the length of the casing during the construction, operation, and closure of the well.

(6) At a minimum, cement and cement additives must be of sufficient quality and quantity to maintain integrity over the design life of the well.

D. *Tubing and packer*.

(1) All Class I hazardous waste injection wells shall inject fluids through tubing with a packer set at a point specified by the director.

(2) In determining and specifying requirements for tubing and packer, the following factors shall be considered:

(a) depth of setting;

(b) characteristics of injection fluid (chemical content, corrosiveness, temperature and density);

(c) injection pressure;

(d) annular pressure;

(e) rate (intermittent or continuous), temperature and volume of injected fluid;

(f) size of casing; and

(g) tubing tensile, burst, and collapse strengths.

(3) The director may approve the use of a fluid seal if he determines that the following conditions are met:

(a) the operator demonstrates that the seal will provide a level of protection comparable to a packer;

(b) the operator demonstrates that the staff is, and will remain, adequately trained to operate and maintain the well and to identify and interpret variations in parameters of concern;

(c) the permit contains specific limitations on variations in annular pressure and loss of annular fluid;

(d) the design and construction of the well allows continuous monitoring of the annular pressure and mass balance of annular fluid; and

(e) a secondary system is used to monitor the interface between the annulus fluid and the injection fluid and the permit contains requirements for testing the system every three months and recording the results.

[20.6.2.5355 NMAC - N, 8-31-15]

20.6.2.5356 LOGGING, SAMPLING, AND TESTING PRIOR TO NEW WELL OPERATION:

A. During the drilling and construction of a new Class I hazardous waste injection well, appropriate logs and tests shall be run to determine or verify the depth, thickness, porosity, permeability, and rock type of, and the salinity of any entrained fluids in, all relevant geologic units to assure conformance with performance standards in 20.6.2.5355 NMAC, and to establish accurate baseline data against which future measurements may be compared. A descriptive report interpreting results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the director. At a minimum, such logs and tests shall include:

(1) deviation checks during drilling on all holes constructed by drilling pilot holes which are enlarged by reaming or another method; such checks shall be at sufficiently frequent intervals to determine the location of the borehole and to assure that vertical avenues for fluid movement in the form of diverging holes are not created during drilling; and

(2) such other logs and tests as may be needed after taking into account the availability of similar data in the area of the drilling site, the construction plan, and the need for additional information that may arise from time to time as the construction of the well progresses; at a minimum, the following logs shall be required in the following situations:

(a) upon installation of the surface casing:

(i) resistivity, spontaneous potential, and caliper logs before the casing is installed; and

(ii) a cement bond and variable density log, and a temperature log after the casing is set and cemented;

(b) upon installation of the long string casing:

(i) resistivity, spontaneous potential, porosity, caliper, gamma ray, and fracture finder logs before the casing is installed; and

(ii) a cement bond and variable density log, and a temperature log after the casing is set and cemented;

(c) the director may allow the use of an alternative to the above logs when an alternative will provide equivalent or better information; and

(3) a mechanical integrity test consisting of:

(a) a pressure test with liquid or gas;

(b) a radioactive tracer survey;

(c) a temperature or noise log;

(d) a casing inspection log, if required by the director; and

(e) any other test required by the director.

B. Whole cores or sidewall cores of the confining and injection zones and formation fluid samples from the injection zone shall be taken. The director may accept cores from nearby wells if the owner or operator can demonstrate that core retrieval is not possible and that such cores are representative of conditions at the well. The director may require the owner or operator to core other formations in the borehole.

C. The fluid temperature, pH, conductivity, pressure and the static fluid level of the injection zone must be recorded.

D. At a minimum, the following information concerning the injection and confining zones shall be determined or calculated for Class I hazardous waste injection wells:

(1) fracture pressure;

(2) other physical and chemical characteristics of the injection and confining zones; and

(3) physical and chemical characteristics of the formation fluids in the injection zone.

E. Upon completion, but prior to operation, the owner or operator shall conduct the following tests to verify hydrogeologic characteristics of the injection zone:

(1) a pump test; or

(2) injectivity tests.

F. The director shall have the opportunity to witness all logging and testing required by 20.6.2.5351 through 20.6.2.5363 NMAC. The owner or operator shall submit a schedule of such activities to the director 30 days prior to conducting the first test.

[20.6.2.5356 NMAC - N, 8-31-15]

20.6.2.5357 OPERATING REQUIREMENTS:

A. Except during stimulation, the owner or operator shall assure that injection pressure at the wellhead does not exceed a maximum which shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. The owner or operator shall assure that the injection pressure does not initiate fractures or propagate existing fractures in the confining zone, nor cause the movement of injection or formation fluids into ground water of the state of New Mexico.

B. Injection between the outermost casing protecting ground water of the state of New Mexico and the well bore is prohibited.

C. The owner or operator shall maintain an annulus pressure that exceeds the operating injection pressure, unless the director determines that such a requirement might harm the integrity of the well. The fluid in the annulus shall be noncorrosive, or shall contain a corrosion inhibitor.

D. The owner or operator shall maintain mechanical integrity of the injection well at all times.

E. Permit requirements for owners or operators of hazardous waste wells which inject wastes which have the potential to react with the injection formation to generate gases shall include:

(1) conditions limiting the temperature, pH or acidity of the injected waste; and

(2) procedures necessary to assure that pressure imbalances which might cause a backflow or blowout do not occur.

F. The owner or operator shall install and use continuous recording devices to monitor: the injection pressure; the flow rate, volume, and temperature of injected fluids; and the pressure on the annulus between the tubing and the long string casing, and shall install and use:

(1) automatic alarm and automatic shut-off systems, designed to sound and shut-in the well when pressures and flow rates or other parameters approved by the director exceed a range or gradient specified in the permit; or

(2) automatic alarms, designed to sound when the pressures and flow rates or other parameters approved by the director exceed a rate or gradient specified in the permit, in cases where the owner or operator certifies that a trained operator will be on-site at all times when the well is operating.

G. If an automatic alarm or shutdown is triggered, the owner or operator shall immediately investigate and identify as expeditiously as possible the cause of the alarm or shutoff. If, upon such investigation, the well appears to be lacking mechanical integrity, or if monitoring required under Subsection F of this section otherwise indicates that the well may be lacking mechanical integrity, the owner or operator shall:

(1) cease injection of waste fluids unless authorized by the director to continue or resume injection;

(2) take all necessary steps to determine the presence or absence of a leak; and

(3) notify the director within 24 hours after the alarm or shutdown.

H. If a loss of mechanical integrity is discovered pursuant to Subsection G of this section or during periodic mechanical integrity testing, the owner or operator shall:

(1) immediately cease injection of waste fluids;

(2) take all steps reasonably necessary to determine whether there may have been a release of hazardous wastes or hazardous waste constituents into any unauthorized zone;

(3) notify the director within 24 hours after loss of mechanical integrity is discovered;

(4) notify the director when injection can be expected to resume; and

(5) restore and demonstrate mechanical integrity to the satisfaction of the director prior to resuming injection of waste fluids.

I. Whenever the owner or operator obtains evidence that there may have been a release of injected wastes into an unauthorized zone:

(1) the owner or operator shall immediately case injection of waste fluids, and:

(a) notify the director within 24 hours of obtaining such evidence;

(b) take all necessary steps to identify and characterize the extent of any release;

(c) comply with any remediation plan specified by the director;

(d) implement any remediation plan approved by the director; and

(e) where such release is into ground water of the state of New Mexico currently serving as a water supply, place a notice in a newspaper of general circulation.

(2) The director may allow the operator to resume injection prior to completing cleanup action if the owner or operator demonstrates that the injection operation will not endanger groundwater of the state of New Mexico.

J. The owner or operator shall notify the director and obtain his approval prior to conducting any well workover.

[20.6.2.5357 NMAC - N, 8-31-15]

20.6.2.5358 TESTING AND MONITORING REQUIREMENTS: Testing and monitoring requirements shall at a minimum include.

A. Monitoring of the injected wastes.

(1) The owner or operator shall develop and follow an approved written waste analysis plan that describes the procedures to be carried out to obtain a detailed chemical and physical analysis of a representative sample of the waste, including the quality assurance procedures used. At a minimum, the plan shall specify:

(a) the parameters for which the waste will be analyzed and the rationale for the selection of these parameters;

(b) the test methods that will be used to test for these parameters; and

(c) the sampling method that will be used to obtain a representative sample of the waste to be analyzed.

(2) The owner or operator shall repeat the analysis of the injected wastes as described in the waste analysis plan at frequencies specified in the waste analysis plan and when process or operating changes occur that may significantly alter the characteristics of the waste stream.

(3) The owner or operator shall conduct continuous or periodic monitoring of selected parameters as required by the director.

(4) The owner or operator shall assure that the plan remains accurate and the analyses remain representative.

B. Hydrogeologic compatibility determination. The owner or operator shall submit information demonstrating to the satisfaction of the director that the waste stream and its anticipated reaction products will not alter the permeability, thickness or other relevant characteristics of the confining or injection zones such that they would no longer meet the requirements specified in 20.6.2.5352 NMAC.

C. Compatibility of well materials.

(1) The owner or operator shall demonstrate that the waste stream will be compatible with the well materials with which the waste is expected to come into contact, and submit to the director a description of the methodology used to make that determination. Compatibility for purposes of this requirement is established if contact with injected fluids will not cause the well materials to fail to satisfy any design requirement imposed under Subsection B of 20.6.2.5355 NMAC.

(2) The director shall require continuous corrosion monitoring of the construction materials used in the well for wells injecting corrosive waste, and may require such monitoring for other waste, by:

(a) placing coupons of the well construction materials in contact with the waste stream; or

(b) routing the waste stream through a loop constructed with the material used in the well; or

(c) using an alternative method approved by the director.

(3) If a corrosion monitoring program is required:

(a) the test shall use materials identical to those used in the construction of the well, and such materials must be continuously exposed to the operating pressures and temperatures (measured at the well head) and flow rates of the injection operation; and

(b) the owner or operator shall monitor the materials for loss of mass, thickness, cracking, pitting and other signs of corrosion on a quarterly basis to ensure that the well components meet the minimum standards for material strength and performance set forth in Subsection B of 20.6.2.5355 NMAC.

D. Periodic mechanical integrity testing. In fulfilling the requirements of 20.6.2.5204 NMAC, the owner or operator of a Class I hazardous waste injection well shall conduct the mechanical integrity testing as follows:

(1) the long string casing, injection tube, and annular seal shall be tested by means of an approved pressure test with a liquid or gas annually and whenever there has been a well workover;

(2) the bottom-hole cement shall be tested by means of an approved radioactive tracer survey annually;

(3) an approved temperature, noise, or other approved log shall be run at least once every five years to test for movement of fluid along the borehole; the director may require such tests whenever the well is worked over;

(4) casing inspection logs shall be run whenever the owner or operator conducts a workover in which the injection string is pulled, unless the director waives this requirement due to well construction or other factors which limit the test's reliability, or based upon the satisfactory results of a casing inspection log run within the previous five years; the director may require that a casing inspection log be run every five years, if he has reason to believe that the integrity of the long string casing of the well may be adversely affected by naturally-occurring or man-made events;

(5) any other test approved by the director in accordance with the procedures in 40 CFR Section 146.8(d) may also be used.

E. Ambient monitoring.

(1) Based on a site-specific assessment of the potential for fluid movement from the well or injection zone, and on the potential value of monitoring wells to detect such movement, the director shall require the owner or operator to develop a monitoring program. At a minimum, the director shall require monitoring of the pressure buildup in the injection zone annually, including at a minimum, a shut down of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve.

(2) When prescribing a monitoring system the director may also require:

(a) continuous monitoring for pressure changes in the first aquifer overlying the confining zone; when such a well is installed, the owner or operator shall, on a quarterly basis, sample the aquifer and analyze for constituents specified by the director;

(b) the use of indirect, geophysical techniques to determine the position of the waste front, the water quality in a formation designated by the director, or to provide other site specific data;

(c) periodic monitoring of the ground water quality in the first aquifer overlying the injection zone;

(d) periodic monitoring of the ground water quality in the lowermost ground water of the state of New Mexico; and

(e) any additional monitoring necessary to determine whether fluids are moving into or between ground water of the state of New Mexico.

F. The director may require seismicity monitoring when he has reason to believe that the injection activity may have the capacity to cause seismic disturbances.
[20.6.2.5358 NMAC - N, 8-31-15]

20.6.2.5359 REPORTING REQUIREMENTS: Reporting requirements shall, at a minimum, include:

A. quarterly reports to the director containing:

(1) the maximum injection pressure;

(2) a description of any event that exceeds operating parameters for annulus pressure or injection pressure as specified in the permit;

(3) a description of any event which triggers an alarm or shutdown device required pursuant to Subsection F of 20.6.2.5357 NMAC and the response taken;

(4) the total volume of fluid injected;

(5) any change in the annular fluid volume;

(6) the physical, chemical and other relevant characteristics of injected fluids; and

(7) the results of monitoring prescribed under 20.6.2.5358 NMAC;

B. reporting, within 30 days or with the next quarterly report whichever comes later, the results of:

(1) periodic tests of mechanical integrity;

(2) any other test of the injection well conducted by the permittee if required by the director; and

(3) any well workover.

[20.6.2.5359 NMAC - N, 8-31-15]

20.6.2.5360 INFORMATION TO BE EVALUATED BY THE DIRECTOR: This section sets forth the information which must be evaluated by the director in authorizing Class I hazardous waste injection wells. For a new Class I hazardous waste injection well, the owner or operator shall submit all the information listed below as part of the permit application. For an existing or converted Class I hazardous waste injection well, the owner or operator shall submit all information listed below as part of the permit application except for those items of information which are current, accurate, and available in the existing permit file. For both existing and new Class I hazardous waste injection wells, certain maps, cross-sections, tabulations of wells within the area of review and other data may be included in the application by reference provided they are current and readily available to the director (for example, in the permitting agency's files) and sufficiently identifiable to be retrieved.

A. Prior to the issuance of a permit for an existing Class I hazardous waste injection well to operate or the construction or conversion of a new Class I hazardous waste injection well, the director shall review the following to assure that the requirements of 20.6.2.5000 through 20.6.2.5399 NMAC are met:

(1) information required in 20.6.2.5102 NMAC;

(2) a map showing the injection well for which a permit is sought and the applicable area of review; within the area of review, the map must show the number or name and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features, including residences and roads; the map should also show faults, if known or suspected;

(3) a tabulation of all wells within the area of review which penetrate the proposed injection zone or confining zone; such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging or completion and any additional information the director may require;

(4) the protocol followed to identify, locate and ascertain the condition of abandoned wells within the area of review which penetrate the injection or the confining zones;

(5) maps and cross-sections indicating the general vertical and lateral limits of all ground water of the state of New Mexico within the area of review, their position relative to the injection formation and the direction of water movement, where known, in each groundwater of the state of New Mexico which may be affected by the proposed injection;

(6) maps and cross-sections detailing the geologic structure of the local area;

(7) maps and cross-sections illustrating the regional geologic setting;

(8) proposed operating data:

(a) average and maximum daily rate and volume of the fluid to be injected; and

(b) average and maximum injection pressure;

(9) proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection formation and the confining zone;

(10) proposed stimulation program;

(11) proposed injection procedure;

(12) schematic or other appropriate drawings of the surface and subsurface construction details of the well;

(13) contingency plans to cope with all shut-ins or well failures so as to prevent migration of fluids into any ground water of the state of New Mexico;

(14) plans (including maps) for meeting monitoring requirements of 20.6.2.5358 NMAC;

(15) for wells within the area of review which penetrate the injection zone or the confining zone but are not properly completed or plugged, the corrective action to be taken under 20.6.2.5354 NMAC;

(16) construction procedures including a cementing and casing program, well materials specifications and their life expectancy, logging procedures, deviation checks, and a drilling, testing and coring program; and

(17) a demonstration pursuant to 20.6.2.5320 NMAC, that the applicant has the resources necessary to close, plug or abandon the well and for post-closure care.

B. Prior to the director's granting approval for the operation of a Class I hazardous waste injection well, the owner or operator shall submit and the director shall review the following information, which shall be included in the completion report:

(1) all available logging and testing program data on the well;

(2) a demonstration of mechanical integrity pursuant to 20.6.2.5358 NMAC;

(3) the anticipated maximum pressure and flow rate at which the permittee will operate;

(4) the results of the injection zone and confining zone testing program as required in Paragraph (9) of Subsection A of 20.6.2.5360 NMAC;

(5) the actual injection procedure;

(6) the compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone and with the materials used to construct the well;

(7) the calculated area of review based on data obtained during logging and testing of the well and the formation, and where necessary revisions to the information submitted under Paragraphs (2) and (3) of Subsection A of 20.6.2.5360 NMAC;

(8) the status of corrective action on wells identified in Paragraph (15) of Subsection A of 20.6.2.5360 NMAC; and

(9) evidence that the permittee has obtained an exemption under 40 C.F.R. Part 148, Subpart C for the hazardous wastes permitted for disposal through underground injection.

C. Prior to granting approval for the plugging and abandonment (*i.e.*, closure) of a Class I hazardous waste injection well, the director shall review the information required in Paragraph (4) of Subsection A of 20.6.2.5361 NMAC and Subsection A of 20.6.2.5362 NMAC.

D. Any permit issued for a Class I hazardous waste injection well for disposal on the premises where the waste is generated shall contain a certification by the owner or operator that:

(1) the generator of the hazardous waste has a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable; and

(2) injection of the waste is that practicable method of disposal currently available to the generator which minimizes the present and future threat to human health and the environment.

[20.6.2.5360 NMAC - N, 8-31-15]

20.6.2.5361 CLOSURE:

A. *Closure plan.* The owner or operator of a Class I hazardous waste injection well shall prepare, maintain, and comply with a plan for closure of the well that meets the requirements of Subsection D of this section and is acceptable to the director. The obligation to implement the closure plan survives the termination of a permit or the cessation of injection activities. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.

(1) The owner or operator shall submit the plan as a part of the permit application and, upon approval by the director, such plan shall be a condition of any permit issued.

(2) The owner or operator shall submit any proposed significant revision to the method of closure reflected in the plan for approval by the director no later than the date on which notice of closure is required to be submitted to the director under Subsection B of this section.

(3) The plan shall assure financial responsibility as required in Paragraph (1) of Subsection A of 20.6.2.5342 NMAC.

(4) The plan shall include the following information:

(a) the type and number of plugs to be used;

(b) the placement of each plug including the elevation of the top and bottom of each plug;

(c) the type and grade and quantity of material to be used in plugging;

(d) the method of placement of the plugs;

(e) any proposed test or measure to be made;

(f) the amount, size, and location (by depth) of casing and any other materials to be left in the well;

(g) the method and location where casing is to be parted, if applicable;

(h) the procedure to be used to meet the requirements of Paragraph (5) of Subsection D of this section;

(i) the estimated cost of closure; and

(j) any proposed test or measure to be made.

(5) The director may modify a closure plan following the procedures of 20.6.2.3109 NMAC.

(6) An owner or operator of a Class I hazardous waste injection well who ceases injection temporarily, may keep the well open provided he:

(a) has received authorization from the director; and

(b) has described actions or procedures, satisfactory to the director, that the owner or operator will take to ensure that the well will not endanger ground water of the state of New Mexico during the period of temporary disuse; these actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the director.

(7) The owner or operator of a well that has ceased operations for more than two years shall notify the director 30 days prior to resuming operation of the well.

B. *Notice of intent to close.* The owner or operator shall notify the director at least 60 days before closure of a well. At the discretion of the director, a shorter notice period may be allowed.

C. *Closure report.* Within 60 days after closure or at the time of the next quarterly report (whichever is less) the owner or operator shall submit a closure report to the director. If the quarterly report is due less than 15 days after completion of closure, then the report shall be submitted within 60 days after closure. The report shall be certified as accurate by the owner or operator and by the person who performed the closure operation (if other than the owner or operator). Such report shall consist of either:

(1) a statement that the well was closed in accordance with the closure plan previously submitted and approved by the director; or

(2) where actual closure differed from the plan previously submitted, a written statement specifying the differences between the previous plan and the actual closure.

D. *Standards for well closure.*

(1) Prior to closing the well, the owner or operator shall observe and record the pressure decay for a time specified by the director. The director shall analyze the pressure decay and the transient pressure observations conducted pursuant to Paragraph (1) of Subsection E of 20.6.2.5358 NMAC and determine whether the injection activity has conformed with predicted values.

(2) Prior to well closure, appropriate mechanical integrity testing shall be conducted to ensure the integrity of that portion of the long string casing and cement that will be left in the ground after closure. Testing methods may include:

(a) pressure tests with liquid or gas;

(b) radioactive tracer surveys;

(c) noise, temperature, pipe evaluation, or cement bond logs; and

(d) any other test required by the director.

(3) Prior to well closure, the well shall be flushed with a buffer fluid.

(4) Upon closure, a Class I hazardous waste well shall be plugged with cement in a manner that will not allow the movement of fluids into or between groundwater of the state of New Mexico.

(5) Placement of the cement plugs shall be accomplished by one of the following:

(a) the balance method;

(b) the dump bailer method;

(c) the two-plug method; or

(d) an alternate method, approved by the director, that will reliably provide a comparable level of protection.

(6) Each plug used shall be appropriately tagged and tested for seal and stability before closure is completed.

(7) The well to be closed shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method prescribed by the director, prior to the placement of the cement plug(s).

[20.6.2.5361 NMAC - N, 8-31-15]

20.6.2.5362 POST-CLOSURE CARE:

A. The owner or operator of a Class I hazardous waste well shall prepare, maintain, and comply with a plan for post-closure care that meets the requirements of Subsection B of this section and is acceptable to the director. The obligation to implement the post-closure plan survives the termination of a permit or the cessation of injection activities. The requirement to maintain an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.

(1) The owner or operator shall submit the plan as a part of the permit application and, upon approval by the director, such plan shall be a condition of any permit issued.

(2) The owner or operator shall submit any proposed significant revision to the plan as appropriate over the life of the well, but no later than the date of the closure report required under Subsection C of 20.6.2.5361 NMAC.

(3) The plan shall assure financial responsibility as required in 20.6.2.5363 NMAC.

(4) The plan shall include the following information:

(a) the pressure in the injection zone before injection began;

(b) the anticipated pressure in the injection zone at the time of closure;

(c) the predicted time until pressure in the injection zone decays to the point that the well's cone of influence no longer intersects the base of the lowermost ground water of the state of New Mexico;

(d) predicted position of the waste front at closure;

(e) the status of any cleanups required under 20.6.2.5354 NMAC; and

(f) the estimated cost of proposed post-closure care.

(5) At the request of the owner or operator, or on his own initiative, the director may modify the post-closure plan after submission of the closure report following the procedures in 20.6.2.3109 NMAC.

B. The owner or operator shall:

(1) continue and complete any cleanup action required under 20.6.2.5354 NMAC, if applicable;

(2) continue to conduct any ground water monitoring required under the permit until pressure in the injection zone decays to the point that the well's cone of influence no longer intersects the base of the lowermost ground water of the state of New Mexico; the director may extend the period of post-closure monitoring if he determines that the well may endanger ground water of the state of New Mexico;

(3) submit a survey plat to the local zoning authority designated by the director; the plat shall indicate the location of the well relative to permanently surveyed benchmarks; a copy of the plat shall be submitted to the director;

(4) provide appropriate notification and information to such state and local authorities as have cognizance over drilling activities to enable such state and local authorities to impose appropriate conditions on subsequent drilling activities that may penetrate the well's confining or injection zone;

(5) retain, for a period of three years following well closure, records reflecting the nature, composition and volume of all injected fluids; the director shall require the owner or operator to deliver the records to the director at the conclusion of the retention period, and the records shall thereafter be retained at a location designated by the director for that purpose.

C. Each owner of a Class I hazardous waste injection well, and the owner of the surface or subsurface property on or in which a Class I hazardous waste injection well is located, must record a notation on the deed to the facility property or on some other instrument which is normally examined during title search that will in perpetuity provide any potential purchaser of the property the following information:

(1) the fact that land has been used to manage hazardous waste;

(2) the name of the state agency or local authority with which the plat was filed, as well as the address of the director;

(3) the type and volume of waste injected, the injection interval or intervals into which it was injected, and the period over which injection occurred.

[20.6.2.5362 NMAC - N, 8-31-15]

20.6.2.5363 FINANCIAL RESPONSIBILITY FOR POST-CLOSURE CARE: The owner or operator shall demonstrate and maintain financial responsibility for post-closure by using a trust fund, surety bond, letter of credit, financial test, insurance or corporate guarantee that meets the specifications for the mechanisms and instruments revised as appropriate to cover closure and post-closure care in 20.6.2.5320 NMAC. The amount of the funds available shall be no less than the amount identified in Subparagraph (f) of Paragraph (4) of Subsection A of 20.6.2.5362 NMAC. The obligation to maintain financial responsibility for post-closure care survives the termination of a permit or the cessation of injection. The requirement to maintain financial responsibility is enforceable regardless of whether the requirement is a condition of the permit.
[20.6.2.5363 NMAC - N, 8-31-15]

20.6.2.5364 - 20.6.2.5399: [RESERVED]

HISTORY of 20.6.2 NMAC:
Pre-NMAC History:
Material in this Part was derived from that previously filed with the commission of public records - state records center and archives:
WQC 67-2, Regulations Governing Water Pollution Control in New Mexico, filed 12-5-67, effective 1-4-68
WQC 72-1, Water Quality Control Commission Regulations, filed 8-4-72, effective 9-3-72
WQC 77-1, Amended Water Quality Control Commission Regulations, filed 1-18-77, effective 2-18-77
WQC 81-2, Water Quality Control Commission Regulations, filed 6-2-81, effective 7-2-81
WQC 82-1, Water Quality Control Commission Regulations, filed 8-19-82, effective 9-20-82

History of Repealed Material: [Reserved]

Other History:
20 NMAC 6.2, Water Quality - Ground and Surface Water Protection, filed 10-27-95, effective 12-1-95
20 NMAC 6.2, Water Quality - Ground and Surface Water Protection, filed 10-15-96, effective 11-15-96
20 NMAC 6.2, Water Quality - Ground and Surface Water Protection, filed 11-30-00, effective 1-15-01
20 NMAC 6.2, Water Quality - Ground and Surface Water Protection, filed 9-16-01, effective 12-1-01
20 NMAC 6.2, Water Quality - Ground and Surface Water Protection, filed 8-1-02, effective 9-15-02
20 NMAC 6.2, Water Quality – Ground and Surface Water Protection, filed 11-21-18, effective 12-21-18

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, September 13, 2019 5:05 PM
To: 'Smith, Nelly'; Ogden, Sarah, NMENV
Cc: Garman, Mark, NMENV; Ortelli, Angelo, NMENV; l1thomas@blm.gov; Griswold, Jim, EMNRD; Wade, Gabriel, EMNRD
Subject: RE: Lee Acres -] Background Concentrations for COCs at GBR
Attachments: Maps.pdf

Nelly:

Good afternoon.

The New Mexico Oil Conservation Division (OCD) is in receipt of your e-mail msg. below.

First, please find attached a USGS Map displaying the OCD "GW-40" Site relative to Lee Acres.

Based on GW-40 contaminant geology groundwater data, i.e., piezometric surface monitoring, collected to date, it appears that there is an upgradient source of contamination. OCD is in touch with consultants for the owner and there are questions about the GW-40 site and constituents of concern that also need to be addressed by the owner.

OCD is studying your e-mail in its entirety and is working to respond to your questions soon.

Thank you for following up with the OCD in this matter. Your e-mail msg. appears to be timely.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Friday, September 13, 2019 4:38 PM
To: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>; Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: [EXT] Lee Acres -] Background Concentrations for COCs at GBR

Mr. Chavez,

Just to follow-up on your questions posted below. There are not groundwater monitoring wells (EPA Superfund program) located further downgradient "BLM-68".

The results of the Remedial Investigation (RI) indicated that the plume was not migrating downgradient BLM-68 . There is a well located downgradient: GBR-17 (Refinery well – see Page 40 of attachment) that was used during the RI and Record of Decision, but it shows not detections. What is the location of OCD GW-40?

We (NMED, EPA, and BLM) are in the process of reviewing the remedy for the site. Every five years, EPA (or the lead Agency, BLM is this case) reviews and evaluates the remedy to determine whether it remains protective of human health and the environment.

I appreciate if you share the data/concentrations encountered for Cl, Cr, Fe, Mn, SO4 and TDS at OCD GW-40 with us, in addition to any information about OCD GW-40 (depth of sampling), historical data, sampling location, and sampling methodology.

Thanks,

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

From: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Sent: Wednesday, June 19, 2019 2:01 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith, Nelly <Smith.Nelly@epa.gov>; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Mr. Chavez:

EPA is the lead regulatory agency on this superfund site and they will be able to coordinate with the responsible party (BLM) to better address your inquiries. Feel free to communicate directly with EPA – I believe Ms. Nelly Smith (EPA RPM) is out of office through this week. Her contact information is below.

Nelly Smith
Remedial Project Manager
U.S. Environmental Protection Agency - Region 6
ph: 214-665-7109
email: Smith.Nelly@epa.gov

Thanks,

SMO

From: Chavez, Carl J, EMNRD
Sent: Tuesday, June 18, 2019 5:12 PM
To: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith.Nelly@epa.gov; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Re: Lee Acres Landfill Superfund Site

Ms. Ogden, good afternoon.

The New Mexico Oil Conservation Division (OCD) is in receipt of the New Mexico Environment Department (NMED) reply to the OCD communiqué below.

OCD has reviewed the constituents of concern coincident to those inorganic constituents monitored at the OCD "GW-40" site located hydrogeologically downgradient from the Lee Acres Landfill.

The elevated detections at upgradient MWs associated with the "GW-40" Site may be from hydrogeologic contaminant migration away from the Lee Acres Landfill Superfund Site as the history of the site and the potential for contaminant migration over time may explain the OCD detections.

OCD requests to know if any MWs were installed further downgradient than "BLM-68" from the Lee Acres Landfill Site toward the OCD "GW-40" Site? Perhaps MWs exist or a historical investigation of the GW contamination associated with Lee Acres was conducted to eliminate the possibility of undetected plume migration over time further toward the south.

Thank you for the reply and information.

From: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Sent: Tuesday, June 18, 2019 4:32 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith.Nelly@epa.gov; l1thomas@blm.gov
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Mr. Carl J. Chavez,

Thank you for contacting us about the Lee Acres Landfill Superfund Site. I am the NMED project manager for the site.

I attached the most recent 2017 laboratory results from Site monitoring wells that was provided from BLM. Below is also a table of the cleanup goals for the Site contaminants of concern—it includes a reference list of historical max Site contaminant concentrations. The selected groundwater remedy is institutional controls and monitored natural attenuation.

Groundwater is monitored at the Site in eight wells on an annual basis. The downgradient-most wells are BLM -68, BLM-75, and BLM-77 (see the attached Site map). Of the seven contaminants of concern identified at the site, fluctuating Manganese concentrations continue to be of primary concern in the downgradient monitoring wells at the Site.

In the 2018 GW-040 Annual Report (from the link you provided), Manganese concentrations at the former Giant Bloomfield Refinery ranged from 130 ug/L (GBR-50) to 1900 ug/L (GBR-32) in the four designated upgradient wells that were sampled in October 2018. For comparison, in March 2017, dissolved Manganese concentrations in Lee Acres downgradient-most wells were 4,800 ug/L (BLM-62), 1.8* ug/L (BLM-75 & BLM-77), and 0.62* ug/L (BLM-68). Lee Acres upgradient well (BLM-39) was 120 ug/L. Lee Acres dissolved Nickel concentrations were all below MCL of 200 ug/L. Concentrations ranged from 14 ug/L (BLM- 62) to 53 ug/L (BLM-80 and BLM 68). One of the upgradient refinery wells (GBR-49) had an exceeding Nickel concentration of 390 ug/L in 2018.

I am forwarding your inquiry regarding Site contaminants and off-site plume migration to the Nelly Smith, EPA Remedial Project Manager and Whitney Thomas, the BLM interim project manager for the Lee Acres landfill Superfund Site.

Thank you,
SMO

Table 2 Remedial Goals (Clean-up Levels)

Constituent	Site Historic Maximum Concentration (µg/L)	Risk-Based Preliminary Remediation Goal (µg/L)	SDWA MCL (µg/L)	NMWQCC Standards (µg/L)	Site Background Mean[a] (µg/L)	Cleanup Levels (µg/L)
Manganese	6,335	176	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-*cis*-Dichloroethene	77	NA	70	per part 101.z.z[g]	NA	70
1,2-*trans*-Dichloroethene	120	NA	100	per part 101.z.z[g]	NA	100
Tetrachloroethylene (PCE)	10	NA	5	20	NA	5
Trichloroethylene (TCE)	11	NA	5	100	NA	5
Vinyl Chloride	3.1	NA	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL)
c Standard for domestic supply.
d NMWQCC regulation Part 3-101.Z does not require cleanup level below site background level.
e Highest value of 12,500 µg/L occurred during the May 1993 sampling period and was determined to be a statistical anomaly for the purposes of this table, the next highest value is specified.
f Standard for irrigation use.
g No NMWQCC specific to 1,2-DCE exists, therefore Part 101.z.z. is referenced for State ARAR
NA - not applicable.
NOTE: Dichloromethene was detected once in 95 samples at a concentration level of 27 µg/L, however, this concentration was considered a statistical anomaly and is not presented

- 52 -

From: Kieling, Martyne, NMENV
Sent: Monday, June 17, 2019 8:22 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Cc: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Carl,
I am out of the office, family commitments in Kansas. I will forward this to Mark Garman the Superfund Oversight Section Program Manager and the state Project Manager Maggie (Sarah) Ogden. They will be able to address your questions.

Thank you for being this to our attention.
All the best

Martyne Kieling

New Mexico Environment Department
Ground Water Quality Bureau – Superfund Oversight Section
1190 S. St. Francis Drive
P.O. Box 5496
Santa Fe, NM 87502-5469
martyne.kieling@state.nm.us
Ph. 505-827-2340
www.env.nm.gov
Innovation|Science|Collaboration|Compliance

From: Chavez, Carl J, EMNRD
Sent: Friday, June 14, 2019 5:04 PM
To: Kieling, Martyne, NMENV <Martyne.Kieling@state.nm.us>
Cc: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: FW: [EXT] Background Concentrations for COCs at GBR

Martyne:

Good afternoon.

I'm contacting NMED to let you know OCD believes migrating contamination from the Lea Acres Superfund Site located hydrogeologically upgradient from the OCD GW-40 site is present at our site of contamination.

OCD observes on the above NMED Website, it lists the OCD "GW-40" site as a site of interest in the map on the webpage.

While we are addressing organic contamination at the GW-40 site, we are noticing elevated levels of Cl, Cr, Fe, Mn, SO4 and TDS at the far upgradient MWs at our site, and the Lea Acres Superfund Site appears to be located hydrogeologically upgradient based on consistent piezometric monitoring.

Can you tell OCD is there is a remedial system in place at Lea Acres? Is NMED observing the above listed constituents migrating off-property?

OCD would appreciate it if you could contact me to communicate on this matter at your convenience.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us

"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

From: Devin Hencmann <dhencmann@ltenv.com>
Sent: Monday, June 10, 2019 3:13 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>
Subject: [EXT] Background Concentrations for COCs at GBR

Carl,

Attached are the tables you had requested in your email dated 5/9/2019 for establishing background concentrations for constituents of concern at the former Giant Bloomfield Refinery. Statistics have been rerun replacing all Non-Detects with the PQLs. We presented results from the various statistical runs in one table to make comparing the different results easier. Explanations are also presented in the table.
I have also attached a table containing the historical data that was used in the stats, and the bio of the LTE data analyst that ran the statistics. Paloma Lang can be reached at **plang.ltenv.com** if you have any questions. Please cc myself on any correspondence so I can follow through and sure you receive an answer in a timely manner.

Thank you,
Devin

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

Devin Hencmann
Project Geologist
(970) 385-1096 office
(970) 403-6023 cell
848 East 2nd Avenue, Durango CO 81301
www.ltenv.com

Think before you print. Click for our email disclosure.

Chavez, Carl J, EMNRD

From: Smith, Nelly <Smith.Nelly@epa.gov>
Sent: Friday, September 13, 2019 4:38 PM
To: Ogden, Sarah, NMENV; Chavez, Carl J, EMNRD
Cc: Garman, Mark, NMENV; Ortelli, Angelo, NMENV; l1thomas@blm.gov; Griswold, Jim, EMNRD
Subject: [EXT] Lee Acres -] Background Concentrations for COCs at GBR
Attachments: ROD.pdf

Mr. Chavez,

Just to follow-up on your questions posted below. There are not groundwater monitoring wells (EPA Superfund program) located further downgradient "BLM-68".

The results of the Remedial Investigation (RI) indicated that the plume was not migrating downgradient BLM-68 . There is a well located downgradient: GBR-17 (Refinery well – see Page 40 of attachment) that was used during the RI and Record of Decision, but it shows not detections. What is the location of OCD GW-40?

We (NMED, EPA, and BLM) are in the process of reviewing the remedy for the site. Every five years, EPA (or the lead Agency, BLM is this case) reviews and evaluates the remedy to determine whether it remains protective of human health and the environment.

I appreciate if you share the data/concentrations encountered for Cl, Cr, Fe, Mn, SO4 and TDS at OCD GW-40 with us, in addition to any information about OCD GW-40 (depth of sampling), historical data, sampling location, and sampling methodology.

Thanks,

Nelly Smith
Remedial Project Manager
Superfund and Emergency Division – Remedial Branch (6SEDRL)
U.S. Environmental Protection Agency - Region 6
Tel: 214-665-7109

From: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Sent: Wednesday, June 19, 2019 2:01 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith, Nelly <Smith.Nelly@epa.gov>; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Mr. Chavez:

EPA is the lead regulatory agency on this superfund site and they will be able to coordinate with the responsible party (BLM) to better address your inquiries. Feel free to communicate directly with EPA – I believe Ms. Nelly Smith (EPA RPM) is out of office through this week. Her contact information is below.

Nelly Smith
Remedial Project Manager
U.S. Environmental Protection Agency - Region 6
ph: 214-665-7109
email: Smith.Nelly@epa.gov

Thanks,

SMO

From: Chavez, Carl J, EMNRD
Sent: Tuesday, June 18, 2019 5:12 PM
To: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith.Nelly@epa.gov; l1thomas@blm.gov; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Re: Lee Acres Landfill Superfund Site

Ms. Ogden, good afternoon.

The New Mexico Oil Conservation Division (OCD) is in receipt of the New Mexico Environment Department (NMED) reply to the OCD communiqué below.

OCD has reviewed the constituents of concern coincident to those inorganic constituents monitored at the OCD "GW-40" site located hydrogeologically downgradient from the Lee Acres Landfill.

The elevated detections at upgradient MWs associated with the "GW-40" Site may be from hydrogeologic contaminant migration away from the Lee Acres Landfill Superfund Site as the history of the site and the potential for contaminant migration over time may explain the OCD detections.

OCD requests to know if any MWs were installed further downgradient than "BLM-68" from the Lee Acres Landfill Site toward the OCD "GW-40" Site? Perhaps MWs exist or a historical investigation of the GW contamination associated with Lee Acres was conducted to eliminate the possibility of undetected plume migration over time further toward the south.

Thank you for the reply and information.

From: Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Sent: Tuesday, June 18, 2019 4:32 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ortelli, Angelo, NMENV <Angelo.Ortelli@state.nm.us>; Smith.Nelly@epa.gov; l1thomas@blm.gov
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Mr. Carl J. Chavez,

Thank you for contacting us about the Lee Acres Landfill Superfund Site. I am the NMED project manager for the site.

I attached the most recent 2017 laboratory results from Site monitoring wells that was provided from BLM. Below is also a table of the cleanup goals for the Site contaminants of concern—it includes a reference list of historical max Site contaminant concentrations. The selected groundwater remedy is institutional controls and monitored natural attenuation.

Groundwater is monitored at the Site in eight wells on an annual basis. The downgradient-most wells are BLM -68, BLM-75, and BLM-77 (see the attached Site map). Of the seven contaminants of concern identified at the site, fluctuating Manganese concentrations continue to be of primary concern in the downgradient monitoring wells at the Site.

In the 2018 GW-040 Annual Report (from the link you provided), Manganese concentrations at the former Giant Bloomfield Refinery ranged from 130 ug/L (GBR-50) to 1900 ug/L (GBR-32) in the four designated upgradient wells that were sampled in October 2018. For comparison, in March 2017, dissolved Manganese concentrations in Lee Acres downgradient-most wells were 4,800 ug/L (BLM-62), 1.8* ug/L (BLM-75 & BLM-77), and 0.62* ug/L (BLM-68). Lee Acres upgradient well (BLM-39) was 120 ug/L. Lee Acres dissolved Nickel concentrations were all below MCL of 200 ug/L. Concentrations ranged from 14 ug/L (BLM- 62) to 53 ug/L (BLM-80 and BLM 68). One of the upgradient refinery wells (GBR-49) had an exceeding Nickel concentration of 390 ug/L in 2018.

I am forwarding your inquiry regarding Site contaminants and off-site plume migration to the Nelly Smith, EPA Remedial Project Manager and Whitney Thomas, the BLM interim project manager for the Lee Acres landfill Superfund Site.

Thank you,
SMO

Table 2 Remedial Goals (Clean-up Levels)

Constituent	Site Historic Maximum Concentration (µg/L)	Risk-Based Preliminary Remediation Goal (µg/L)	SDWA MCL (µg/L)	NMWQCC Standards (µg/L)	Site Background Mean[a] (µg/L)	Cleanup Levels (µg/L)
Manganese	6,335	176	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-*cis*-Dichloroethene	77	NA	70	per part 101z.z[g]	NA	70
1,2-*trans*-Dichloroethene	120	NA	100	per part 101z.z[g]	NA	100
Tetrachloroethylene (PCE)	10	NA	5	20	NA	5
Trichloroethylene (TCE)	11	NA	5	100	NA	5
Vinyl Chloride	3.1	NA	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL)
c Standard for domestic supply.
d NMWQCC regulation Part 3-101.2 does not require cleanup level below site background level.
e Highest value of 12,500 µg/L occured during the May 1993 sampling period and was determined to be a statistical anomaly for the purposes of this table, the next highest value is specified.
f Standard for irrigation use.
g No NMWQCC specific to 1,2-DCE exists, therefore Part 101.z.z. is referenced for State ARAR
NA - not applicable
NOTE: Dichloromethene was detected once in 95 samples at a concentration level of 27 µg/L, however, this concentration was considered a statistical anomaly and is not presented

From: Kieling, Martyne, NMENV
Sent: Monday, June 17, 2019 8:22 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Garman, Mark, NMENV <Mark.Garman@state.nm.us>; Ogden, Sarah, NMENV <Sarah.Ogden@state.nm.us>
Cc: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Subject: RE: [EXT] Background Concentrations for COCs at GBR

Carl,
I am out of the office, family commitments in Kansas. I will forward this to Mark Garman the Superfund Oversight Section Program Manager and the state Project Manager Maggie (Sarah) Ogden. They will be able to address your questions.

Thankyou for being this to our attention.
All the best

Martyne Kieling

New Mexico Environment Department
Ground Water Quality Bureau – Superfund Oversight Section
1190 S. St. Francis Drive
P.O. Box 5496
Santa Fe, NM 87502-5469
martyne.kieling@state.nm.us
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New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

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Sent: Monday, June 10, 2019 3:13 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: McCartney, Gregory J. <gjmccartney@marathonpetroleum.com>
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Thank you,
Devin

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

Devin Hencmann
Project Geologist
(970) 385-1096 office
(970) 403-6023 cell
848 East 2nd Avenue, Durango CO 81301
www.ltenv.com

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RECORD OF DECISION
FOR THE
LEE ACRES LANDFILL SUPERFUND SITE,
FARMINGTON, NEW MEXICO

U.S. Environment Protection Agency
Region 6 Superfund Division

MAY 2004

171035

LEE ACRES LANDFILL SUPERFUND SITE
RECORD OF DECISION

CONCURRENCE

Petra Sanchez
Remedial Project Manager

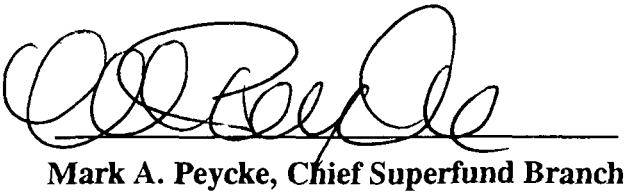
Don Williams, Team Leader
New Mexico/ Technical Section

Wren Stenger, Branch Chief
Louisiana / New Mexico/Oklahoma Branch

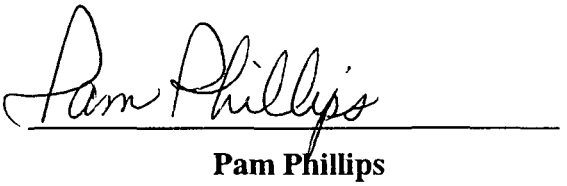
Michael C. Barra
Site Attorney, Office of Regional Counsel

LEE ACRES LANDFILL SUPERFUND SITE
RECORD OF DECISION

CONCURRENCE



Mark A. Peycke, Chief Superfund Branch
Office of Regional Counsel



Pam Phillips
Deputy Director, Superfund Division

The United States Department of the Interior

Bureau of Land Management

Lee Acres Landfill
Farmington, New Mexico

Record of Decision

June 2004

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Declaration

Site Name and Location

This decision document presents the selected remedy for the Lee Acres Landfill National Priorities List (NPL) Site near Farmington, New Mexico, which comprises 60 acres owned by the United States, and is commonly known as the Lee Acres Landfill. The site is approximately 4.5 miles east of Farmington, New Mexico. Lee Acres is listed in the Environmental Protection Agency's (EPA) National Superfund Database, identification number NMD980750020.

Statement of Basis and Purpose

This decision document presents the selected remedy for the Lee Acres Landfill near Farmington, New Mexico, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601, et seq., as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the Administrative Record file for this site.

EPA and the State of New Mexico Environmental Department (NMED) have reviewed the Administrative Record for the Lee Acres Landfill and concur with the selected remedy. The Department of the Interior, Bureau of Land Management (BLM), is the lead agency for response action at the Lee Acres Landfill.

The selected remedy is protective of human health and the environment, and complies with Federal and State requirements that are legally applicable or relevant and appropriate requirements (ARARs) for the remedial action. The selected remedy also is cost effective.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in the ROD, may present an imminent and substantial endangerment to public health and the environment.

Description of Selected Remedy

The selected remedy will consist of closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory. Surface water run-on and run-off controls will be constructed to divert run-on and maximize run-off. Because contaminant concentrations, for which clean-up levels are listed in Table 2, have been decreasing, and the plume is not migrating, the selected remedy for ground water is monitored natural attenuation. Institutional controls will ensure the long-term effectiveness of the remedy. This response action is comprehensive, and will address all actual or potential risk at the site. No additional response actions are anticipated.

BLM will continue to monitor ground water to ensure the effectiveness of the capillary barrier cap and natural attenuation remedy. If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with applicable or relevant and appropriate requirements (ARARs). Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance. This approach was selected to ensure that any contaminant increases that may occur are in fact a long-term trend rather than a short-term event.

Institutional controls will be utilized to prevent access to contaminated ground water and to hazardous substances encapsulated in the landfill. An area of 134.68 acres of public land, which

includes the Lee Acres Landfill and a buffer area around it, was withdrawn by BLM from surface entry and mining for a period of 50 years (see 62 FR 2177, Public Land Order No. 7234). The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could disturb the integrity of the containment system, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill site.

The landfill contents at the former Lee Acres Landfill are the source materials at this site, and are not considered principal threat wastes (i.e., highly toxic or highly mobile waste that generally cannot be reliably contained). The landfill contents consist of common household waste, various types of construction debris, and industrial wastes such as paint thinners, grease and oil strippers and cleaners, pesticides, and general cleaning chemicals. The lagoons, which formerly contained liquid waste, were drained and covered with clean soil in 1986. In addition, the contaminated ground water is not considered a principal threat waste because it is not considered a source of contamination. The selected remedy will significantly reduce the mobility of remaining sources in the former landfill; however, the selected remedy will not actively reduce the existing toxicity and volume. Light non-aqueous phase liquids (LNAPLS) and dense non-aqueous phase liquids (DNAPLS) were not found in concentrations that exceed EPA action levels during the Remedial Investigation (RI), and therefore were not considered further in the RI/FS process. The same reasoning was used for landfill gases, which were not measured in elevated concentrations during the RI.

The major components of the selected remedy are:

- landfill cover (capillary barrier cover) with lysimeters;
- surface water run-on and run-off controls;
- monitored natural attenuation of ground water; and

- institutional controls, in the form of withdrawal of site by BLM, and implemented through the District Resource Management Plan/Final Environmental Impact Statement.

Statutory Determination

The selected remedy is protective of human health and the environment. The selected remedy for the soil pathway will attain State and Federal ARARs. The selected remedy for the ground-water pathway will attain ARARs within a reasonable time frame not to exceed the ground-water monitoring period of 30 years.

The selected remedy does not satisfy the statutory preference for treatment as a principle element of the remedy because the landfill waste is high-volume, low-risk waste that can be reliably contained, and would not be cost-effective to treat. The selected remedy is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than each five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

Data Certification Checklist

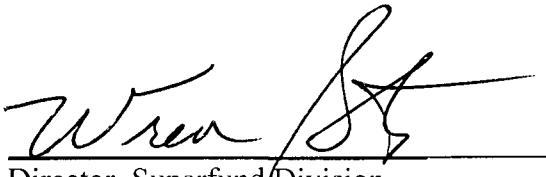
The following information has been included in the ROD.

- The chemicals of concern (COCs) and their respective concentrations.
- Baseline risk represented by the COCs.
- Current and future land and ground water assumptions used in the baseline risk assessment and ROD.
- Land and ground-water use that will be available at the site as a result of the selected remedy.

- Estimated capital, operation and maintenance (O&M), and total present worth costs; discount rate and number of years over which cost estimates are projected.
- Factors that led to selecting the remedy.
- Clean-up levels established for COCs and the basis for these levels.
- How source materials constituting principal threats are addressed.

Authorizing Signatures

Assistant Secretary — Date
Policy, Management and Budget
Department of the Interior



6/24/04

Director, Superfund Division — Date
Region 6
U.S. Environmental Protection Agency

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- How source materials constituting principal threats are addressed.

Authorizing Signatures

P J Sz 7/22/04

Assistant Secretary — Date
Policy, Management and Budget
Department of the Interior

Director, Superfund Division — Date
Region 6
U.S. Environmental Protection Agency

1.0 INTRODUCTION

This Record of Decision presents the selected remedy for the remediation of soil and ground-water contamination at the Lee Acres Landfill Superfund Site. In an effort to promote technology advancement, the Bureau of Land Management (BLM), the Environmental Protection Agency (EPA), and the New Mexico Environment Department (NMED) have worked together to select a comprehensive remedy that is appropriate for the climate conditions at the site. The remedy selection is based on the potential risk presented by the site, the most current data available, ease of implementation, public support, and cost effectiveness. Data collected subsequent to the finalization of the Proposed Plan (PP) up through November 1999, have been incorporated into and evaluated for the remedy selection in this ROD.

The technology selected for the closure and capping of the landfill soils is a capillary barrier cover designed by the Department of Energy's (DOE) Sandia National Laboratory in Albuquerque NM, the University of New Mexico, and BLM's Farmington Field Office. Both EPA and NMED have been involved in the development of the plan, and have received copies of the September 1998, January 1999, March 1999, and June 2000 pilot study reports from UNM in order to review the results of the project collected to date. The results of the data collected during the pilot project monitoring period were interpreted by the designers at Sandia and UNM. Success of the pilot was defined as "no measurable infiltration at the bottom of the cap; failure of the cap would have been the detection of measurable infiltration at the bottom of the cap". The results have shown that the capillary barrier performed as originally expected. However, there was an unexpected increase, followed by decreases, in some VOCs in two monitoring wells within the landfill boundary, BLM 56 and 57. It is suspected that the increases in concentrations were temporary spikes caused by the installation of the pilot project. In order to more closely monitor this situation, sampling frequency was increased to quarterly for wells BLM 57, 56, and 49.

Because the contaminant concentrations have been decreasing in all wells located outside the landfill cells, and the plume has not been moving, the selected remedy for the contaminated ground water is monitored natural attenuation. BLM will continue to monitor ground water to

ensure the continued effectiveness of the monitored natural attenuation remedy. If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with ARARs. Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance.

The total estimated cost of the preferred alternatives for soil and ground water is $2.2 million. The total future cost for remediation of the Lee Acres Landfill is not expected to exceed $3.5 million over 30 years.

2.0 SITE LOCATION AND DESCRIPTION

The Lee Acres Landfill is located approximately 4.5 miles east of Farmington, New Mexico (Figure 1), on federal land managed by the BLM. In May 1962, San Juan County leased 20 acres (W1/2NW1/4SW1/4 of Section 22, T29N, R12W). Another 40 acres was leased in 1980 (S1/2SW1/4NW1/4; NW1/4NE1/4SW1/4; and NE14NW1/4SW1/4 of Section 22, T29N, R12W) (BLM 1981). All 60 acres are contained in a fenced area as one site (see Figure 1).

3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Lee Acres Landfill was operated by San Juan County through leases dating from 1962 until April 1993. The original lease was approved by BLM in 1962 for use of the property as a municipal solid waste landfill. In 1980, San Juan County, with the knowledge of both the State and BLM, expanded the use of the landfill to allow the disposal of liquid waste. Containment berms were built, and lagoons were established in the northwest and southwest quadrants of the landfill. These are referred to as the "northern lagoon" and "southern lagoon" respectively. Figures 2 through 4, based on photogrammetric data, illustrate landfill use and development history. Section 16 presents a chronological summary of the regulatory events at the landfill.

In 1985, the berm of the northern lagoon was breached during routine maintenance activities, releasing both the liquid contents and hydrogen sulfide gas. A resident that was present at the landfill, and several emergency response team members were hospitalized due to inhalation of the gas. New Mexico Environmental Improvement Division (NMEID), the predecessor of the NMED, responded to the release, aerated the lagoon, and treated the lagoon contents with ferric chloride to neutralize the hydrogen sulfide and stabilize other chemicals that might be present in the liquid contents of the lagoon. The landfill was closed to liquid waste disposal in 1985 and was closed to solid waste disposal in 1986. It was covered with 4 to 15 feet of clean soil in 1986. A Preliminary Investigation was performed by BLM in 1988. The Lee Acres Landfill was placed on the National Priorities List (NPL) by the Environmental Protection Agency (EPA) in 1990.

During the period of operation of the landfill, the Giant-Bloomfield Refinery (GBR), located immediately south of the landfill, was also in full operation, refining mainly diesel and unleaded gasoline. It has been discovered that the refinery lost approximately 45,000 barrels of refined product into the soils and ground water from about 1975 to 1984. In their efforts to recover the product and remediate the contaminated ground water, GBR installed numerous recovery wells and an air stripping system under the regulatory authority of New Mexico Oil and Gas Division.

In 1986, volatile organic compounds (VOCs) were found at concentrations greater than the associated maximum contaminant levels (MCLs) in samples collected from three domestic water supply wells in the Lee Acres subdivision located down-gradient from the landfill and refinery. The BLM agreed to connect the 13 residents in the subdivision who were using private drinking water wells to a municipal water supply. During the construction of the connections, BLM provided those residents with at least 8,700 gallons of bottled water. The hookups were completed in 1987.

In January 1993, EPA, NMED, and BLM entered into a technical Memorandum of Understanding (MOU) that developed a technical working group to complete the Remedial

Investigation (RI), the Feasibility Study (FS), and the Proposed Plan (PP). The RI was approved by EPA and NMED in May 1995, and the FS was approved by the two agencies in May 1996. Subsequently, the PP was approved by the EPA and NMED in September 1996. The public review and response period was completed in November 1996 with no comments received.

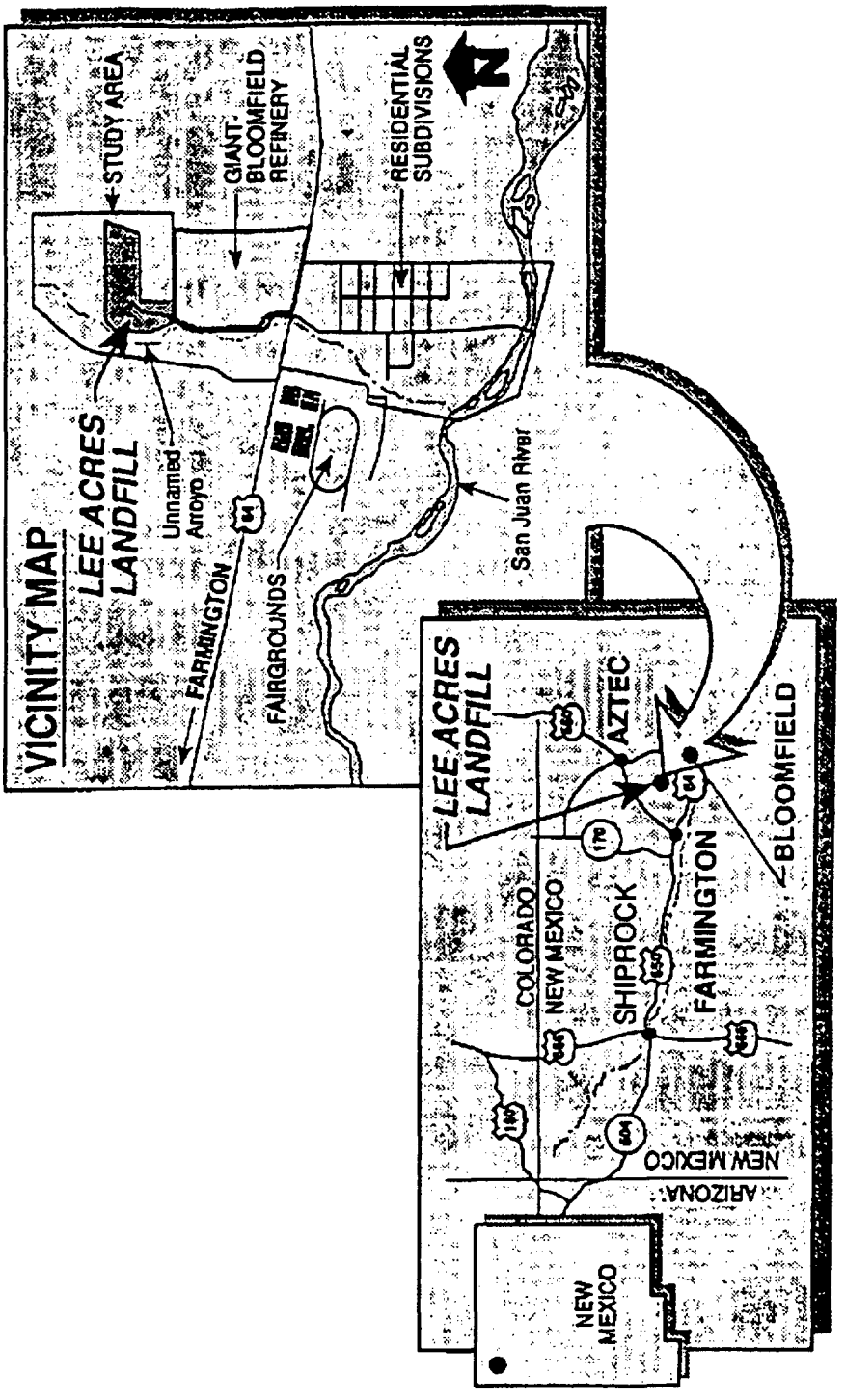

Figure 1 Lee Acres Landfill Location

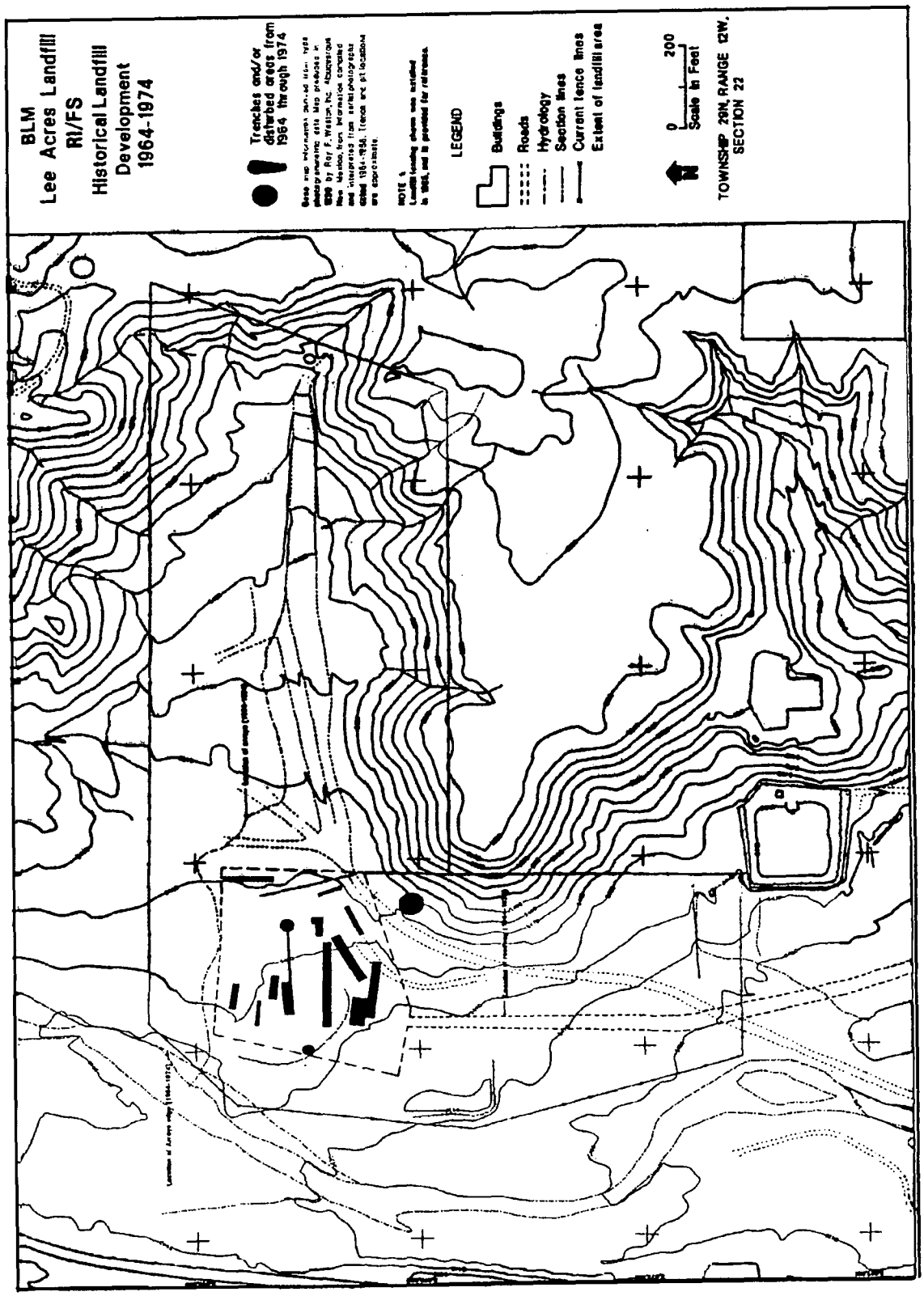

Figure 2 Historical Landfill Development, 1964-1974

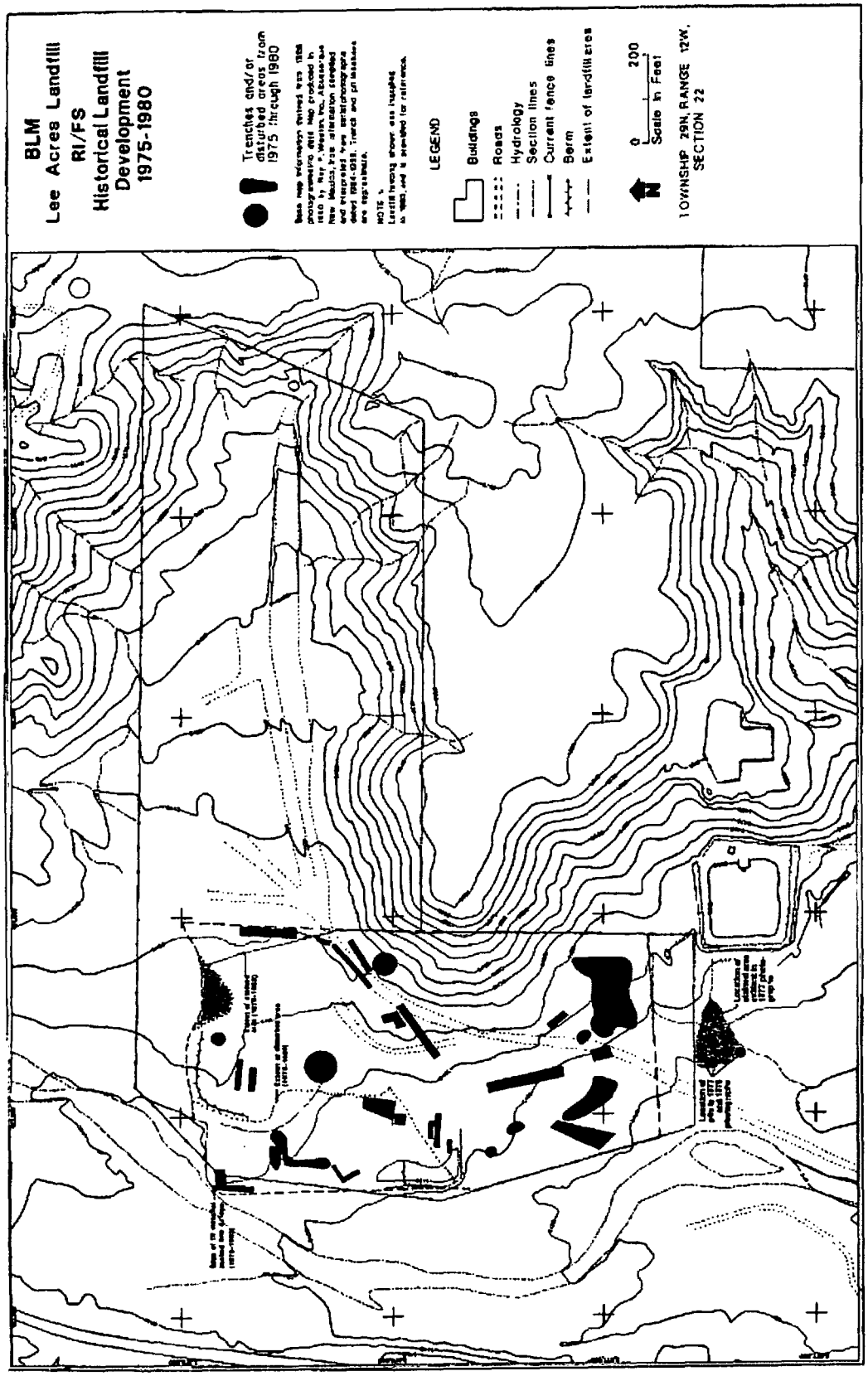

Figure 3 Historical Landfill Development, 1975-1980

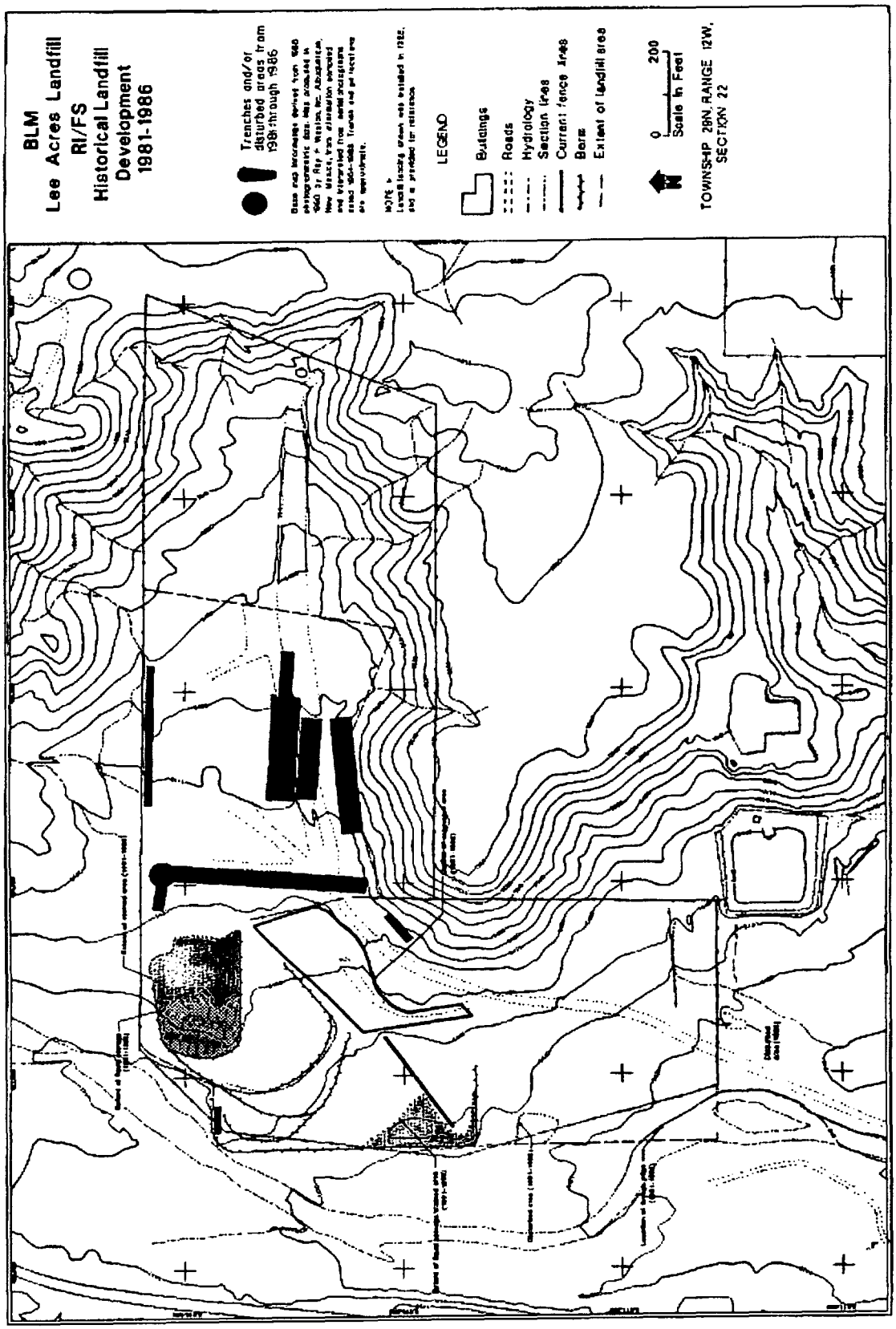

Figure 4 Historical Landfill Development, 1981-1986

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

BLM began a public participation program in 1990 regarding the Lee Acres Landfill, in fulfillment of the public participation requirements in CERCLA and section 300.430(f)(3) of the NCP. Scoping meetings were held in Santa Fe, Albuquerque and Farmington. Two Open Houses were held in 1993 and 1994 at the Farmington District Office. Fact Sheets and newsletters were published periodically during the RI/FS process as well. No comments, input or public response were received during these outreach efforts.

Responsiveness Summary

The RI/FS Report and the PP for the Lee Acres Landfill were released to the public on September 16, 1996. These documents were made available to the public in both the Administrative Record and the information repositories listed in Table 1. The notice of availability of the documents was published in the Farmington Times, Durango Herald, and the Albuquerque Journal. A public comment period was held from September 16, 1996 through November 16, 1996. In addition, a public meeting was held at San Juan College in Farmington, New Mexico on September 26, 1996. At this meeting, representatives of the BLM, EPA Region VI, NMED, Sandia National Laboratory and Department of Energy (DOE) were present to answer questions from the public. No members of the public attended the meeting, and no comments were received on the RI/FS and PP during the public comment period. The public response is part of the Administrative Record. The decisions in the ROD are based on the data included in the Administrative Record.

Lee Acres Landfill RI/FS Information Repositories

Bureau Of Land Management Contact: Mr. Joel Farrell 1235 La Plata Highway Farmington, New Mexico 87401 505-599-6311
Alturian Public Library Contact: Ms. Suzy Horvath 201 W. Chaco Aztec, New Mexico 87410 505-334-9456
New Mexico Environment Department Ground Water Protection and Remediation Bureau Contact: Ms. Robin Brown 1190 St. Francis Drive Santa Fe, New Mexico 87503 505-827-2434
Environmental Protection Agency Library Contact: Mr. Sairam Appaji 1445 Ross Avenue Dallas, Texas 75202 214-665-3126
Farmington Public Library Contact: Ms. Nancy Gorman 100 W. Broadway Farmington, New Mexico 87401 505-599-1270

Table 1 Administrative Record Repository Locations

5.0 SCOPE AND ROLE OF OPERABLE UNITS

Two environmental media are being addressed by this ROD for the Lee Acres Landfill: soil within and beneath the landfill, and contaminated shallow alluvia ground water beneath and south of the landfill. With this remedy, all potential risk from the site is being addressed. No additional response actions are anticipated.

The primary concern for remediation of the soils within the landfill is the potential for the leaching of the residual contamination from the landfill soils into the ground water. This ROD presents alternatives designed to prevent future leaching of contaminants by percolation of surface moisture into the ground water through the contaminated trash layers and the lagoon sediments that are still in place in the landfill. Although contaminated soils exist within the landfill, the most highly contaminated soils have been covered with clean soil. This reduction of percolation and natural degradation of the contaminants has been occurring within the soil since the landfill's closure.

The primary concern for the ground-water pathway is potential ingestion of manganese, nickel, and chlorinated volatile organic compounds (VOCs) that are present in the ground water. These contaminants pose a potential risk to human health because the EPA's Hazard Index (HI) for noncarcinogenic risk is exceeded, and the concentrations of some chlorinated VOCs exceed ARARs.

Ground-water contamination forms a plume in the alluvial aquifer. The plume extends from the landfill south onto the adjacent property owned by GBR. Three concentrated areas of ground-water contamination remain. Two of the concentrated areas correspond to the locations of the former liquid waste lagoons at the landfill. The third concentrated area of ground-water contamination is south of the landfill located near wells GBR-32, GBR-48, and GBR-49. The source of the third center of contamination has not been identified. Identifying the source of the third center of contamination is not necessary because long-term ground-water monitoring data (March 1990 to November 1999) demonstrate that the ground-water contamination levels are decreasing and the contaminant plume is receding. The decrease in the contaminant concentrations and plume size is attributed to closing the liquid waste lagoons to use, allowing the contents to evaporate, backfilling the lagoons with clean soil, and closing the landfill. Under

favorable conditions, natural physical, chemical, or biological processes can act to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or ground water. These processes include biodegradation; dispersion; dilution; sorption; volatilization; and chemical or biological stabilization, transformation, or destruction of contaminants. (Monitored Natural Attenuation of Chlorinated Solvents, U.S. EPA Remedial Technology Fact Sheet).

To protect public health, welfare, and the environment from hazardous substances that will remain at the landfill following the completion of remedial action, BLM has withdrawn 134.68 acres of public land, within which the landfill is located, from settlement, sale, location, and entry, as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). In light of this withdrawal, the current and reasonably foreseeable future uses of the withdrawn land, including the ground water beneath the land, will not include any use that will result in an unacceptable risk to human health or the environment due to exposure to hazardous substances remaining at the landfill. Pursuant to the authority vested in the Secretary of the Interior by Section 104 of CERCLA, 42 U.S.C. 9604, and Section 204 of the Federal Land Policy and Management Act, 43 U.S.C. 1714, this withdrawal, and the resulting restriction on use, will remain in effect until January 15, 2047, unless the Secretary determines that the withdrawal should be extended.

6.0 SUMMARY OF SITE CHARACTERISTICS

The Lee Acres Landfill is in the eastern portion of San Juan County, a dissected high plateau within the Navajo Section of the Colorado Plateau physiographic province. This high plateau is dissected by the San Juan and Animas Rivers that originate in the San Juan Mountains of southern Colorado, coalesce near Farmington, and flow west to the Colorado River. The landfill is located in the southern drainage basin of the interfluvial ridge between the two rivers. The intermittent surficial waters from the area drain through an unnamed arroyo system that joins the San Juan River south of the Lee Acres subdivision.

In this part of San Juan County, much of the land is publicly owned, open rangeland. Several governmental agencies, industries, developers, and private citizens own or lease land within the original study area for the site (Figure 5). The original study area (circa 1986) was significantly

larger than the site is now. It was re-defined in 1993 for the RI. No Indian reservations, tribal lands, or railroad land grants are within the study area. Residential, commercial, and industrial developments are concentrated in the incorporated municipalities of Aztec, Bloomfield, and Farmington, and adjacent to the transportation corridors between these towns. The majority of the residential development in the area is considered low income housing. The major vehicular transportation route in the vicinity of the former landfill is U.S. Highway 64, also known as the Bloomfield Highway. The highway is located approximately ½ mile south of the landfill boundary.

Figure 5 is a general land use map of the study area prepared on the basis of 1988 aerial photographs and surface reconnaissance. Land use has not changed significantly since 1988.

The land in the region of the study area is used predominantly as open rangeland for livestock and wildlife. It is also used for: 1) industrial purposes by the Giant-Bloomfield Refinery (GBR), and by the El Paso Natural Gas Substation, which is north of the study area; 2) residential purposes south of the study area and north of the San Juan River; and 3) public recreational purposes at the San Juan County Fairgrounds southwest of the study area.

The rangeland vegetation in the area is not well suited to supporting large numbers of livestock; approximately 12 acres are required to feed one mature cow and calf for one month (one animal-unit-month). Oil and natural gas wells are present near the landfill. A north to south trending natural gas pipeline is located approximately 500 feet west of the landfill site. No public schools, prisons, or hospitals are within three miles of the site. The nearest educational facility is a private school operated by the Mennonite community approximately one mile north of the landfill. Future use of this area is expected to remain much the same as it is now, with the exception of a possible county road expansion.

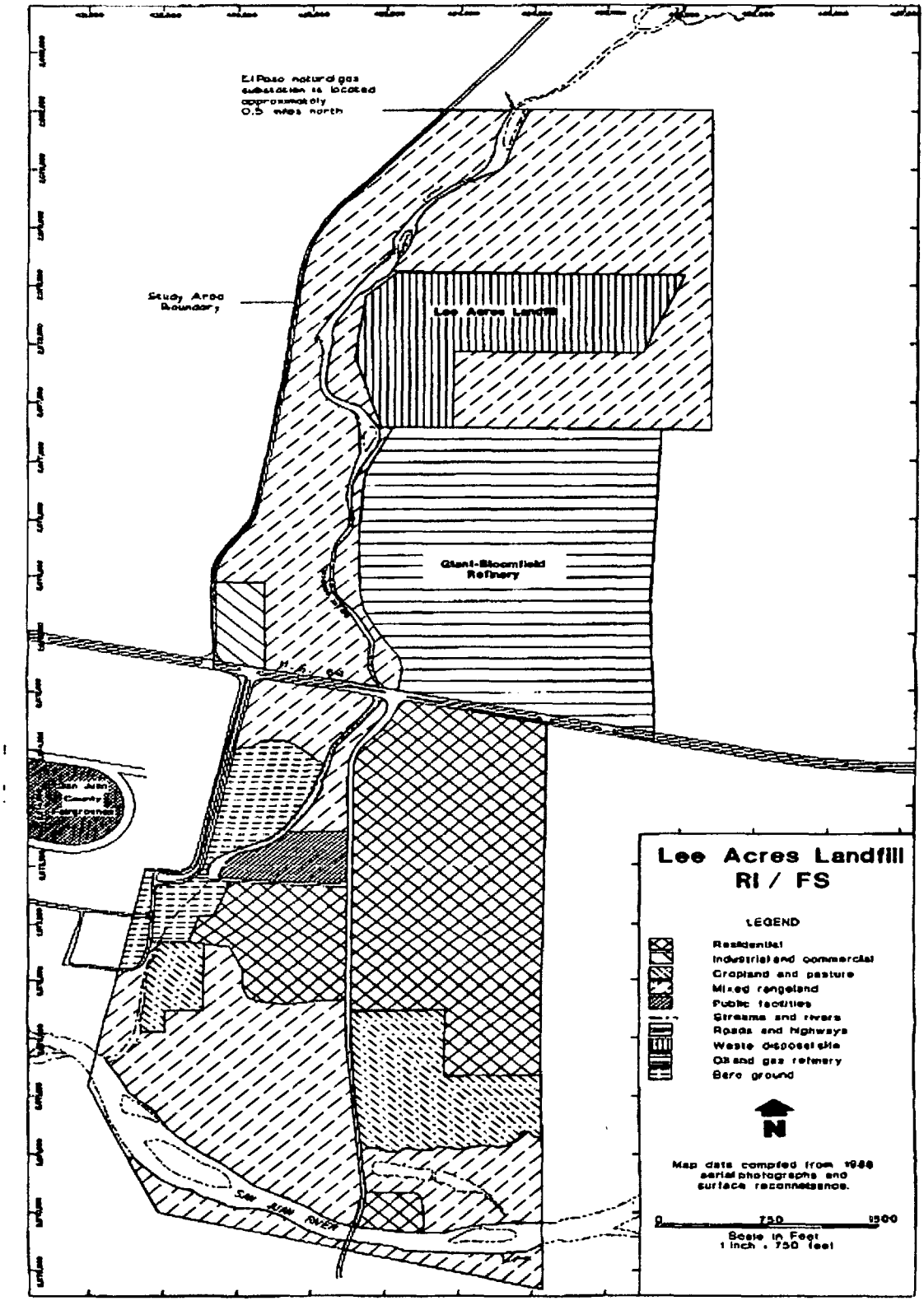

Figure 5 Lee Acres Landfill Vicinity Land Use Map

The 60-acre landfill can be divided into two portions. The eastern 40 acres is sublain by tertiary Nacimiento Formation claystone/siltstone facies interfingered with Nacimiento sandstone facies that forms the low permeable barrier to bedrock aquifers. This portion of the landfill was generally used for solid waste disposal and dead animal pits. The western 20 acres of the landfill is underlain by quaternary alluvium classified as unconsolidated silty sand to sandy gravel. The thickness of the alluvium, from ground surface to bedrock, is up to 60 feet near the center of the channel and the depth to water is 34 to 47 feet. Alluvial ground water is present beneath approximately 8 acres along the western edge of the landfill (Figure 6), but not the eastern portion of the landfill.

The western edge of the landfill is underlain by an unconfined alluvial aquifer. The aquifer is bound on both sides by the margins of an incised bedrock channel which is approximately 600 feet wide in the area near the landfill. Ground water in the alluvial aquifer moves southward at a rate of approximately 0.17 feet per day (62 feet/year), based on the hydraulic data collected in 1993. Farther south, the saturated alluvium interfingers with the San Juan River deposits and is not bound by the bedrock channel. The alluvium is comprised of poor to moderately sorted, fine to medium sands with some gravel and cobbles. Unconsolidated silt and clay lenses are common. The underlying regional bedrock aquifer is unaffected by the contamination from the Lee Acres Landfill site.

Based on historical records and field sampling, soil investigations at the landfill identified four major areas that are either known or potential contaminant source areas that pose a threat to ground water. The former northern and southern liquid waste lagoons have been identified as known contaminant source areas.

The areas of the site identified as potential sources, based on analytical results, include the southern region of the landfill, which may have been either a lagoon area or solid waste disposal area, and an area south of the landfill fence that includes the GBR firewater storage ponds.

The landfill is surrounded on the north, east and west by undeveloped property. GBR is located south of the landfill, and the GBR property is bounded on the south by Highway 64. South of Highway 64, there is a residential area, the Lee Acres Subdivision, which extends to the San Juan

River. The San Juan River is about one mile south of the Lee Acres Landfill. It was this subdivision that required the domestic water supply in 1986, due to contamination from sources that were not specifically identified. Ground water in the study area is not currently used for municipal, domestic, or agricultural water supplies. The landfill has been withdrawn from public use until at least 2047.

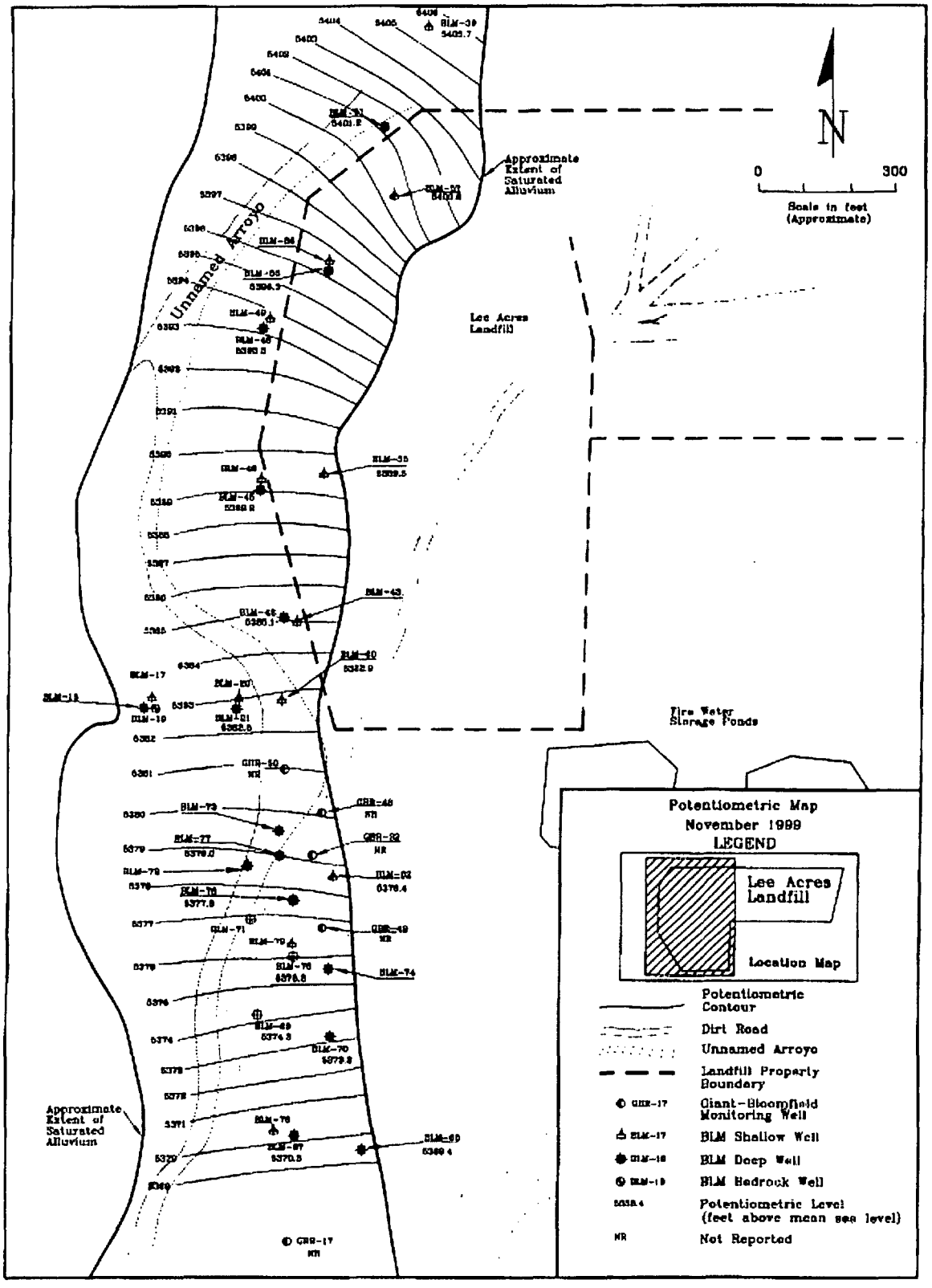

Figure 6 Saturated Alluvium Extent and Potentiometric Surface Map, November 1999

6.1 Field Investigation and Data Collection Activities

Following the lagoon treatment by NMEID in 1985, AEPCO, a BLM contractor, completed a site inspection at the landfill in 1986.

In February 1987 under agreement with BLM, the United States Geological Survey (USGS) installed 12 ground-water monitoring wells/piezometers in the adjacent arroyo. Several geophysical surveys were conducted.

In March 1987, GBR announced the implementation of ground-water remediation to remove petroleum products.

During the fall of 1988, DOI held RI scoping meetings in Farmington, Santa Fe and Albuquerque, New Mexico to initiate public involvement in the project and to begin to collect historical data.

In September 1993, field data collection for use in the RI Report was completed and USGS took over the semi-annual monitoring program at Lee Acres Landfill. This monitoring program is ongoing. The data used in the FS and PP to determine appropriate actions on the site were current through the date of the release of those documents (from 1993 through May 1996). Data collected through November 1999 are presented and discussed in this ROD.

6.2 Nature and Extent of Soil Contamination, Lee Acres Study Area

Soil samples were collected from both the vadose and saturated zones during the initial stage of the RI. Details of the soil sampling programs are found in the RI. The landfill is estimated to contain approximately 800,000 cubic yards of contaminated soil and waste. Waste types encountered within the landfill consist of common household waste and various types of construction debris. Typical types of household and industrial wastes that contain many of the chemicals listed below include paint thinners, grease and oil strippers and cleaners, pesticides, general cleaning chemicals, dry cleaning chemicals, carburetor cleaners, used oil from automotive and heavy equipment, kitchen and restaurant cleaners and grease, oil field wastes,

spent copier and toner cartridges, and many other types of materials. It is probable that many of these products or their containers were placed in both lagoons, as well as other parts of the landfill during the period from 1974 through 1986.

The following methods for soil testing at the Lee Acres Landfill were used during the RI in 1993 and earlier. Samples were collected during borehole installation and from well installation. Soil samples from boreholes BH 01 through BH 39 and wells BLM 39 through BLM 66 were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/PCBs and metals using EPA methods 8010, 8020, 8270, 8080 and TCLP. Soil samples from boreholes BH 40 through BH 53 and well bores BLM 67 through BLM 79 were analyzed for VOCs, metals, chloride, and sulfate.

Soil samples collected for the RI in 1990 identified chlorinated and non-chlorinated VOCs, SVOCs, and pesticides in the subsurface above the method detection limits (MDLs). Chlorinated VOCs, common in solvents, were found in soil samples including 1,2-*trans*-dichloroethene (1,2-*trans*-DCE), tetrachloroethane (PCE), trichloroethene (TCE), trichloromethane, dichloromethane, and other constituents in very low concentrations. During the 1990 sampling event, 1,2-*trans*-DCE was detected in one soil sample collected in the landfill and in two samples collected off-site. Other VOC contaminants detected in vadose zone soils on and south of the landfill included TCE, PCE, and petroleum, gasoline, and oil field wastes such as benzene, toluene, ethylene and xylene (BTEX) compounds. On the site, the highest concentrations of BTEX were found in the region of the former northern liquid waste lagoon and east of the northern lagoon. The majority of the VOC compounds are indicative of solvent and stripper well wastes, while the BTEX compounds are related to petroleum hydrocarbon wastes. Chlorinated VOCs were found in relatively low concentrations (<10 μg/kg) in the landfill. The highest concentration (252,600μg/kg) was found in the northern lagoon. Areas outside the lagoon, but adjacent to it ranged in concentration from 30 to 51 μg/kg.

Pesticide concentrations ranged from 5.7 μg/kg to 405 μg/kg. These sites were very localized in the borehole grid, predominantly in the southwestern portion of the landfill. SVOCs, predominantly *bis*(2-ethylhexyl)phthalate and dichlorobenzene were detected in landfill soils in concentrations at or near MDLs. The highest concentrations of SVOCs in the soils were found

just inside the south landfill entrance, near the former southern liquid waste lagoon, and in the eastern 40-acre portion of the landfill. The highest concentrations of pesticides were at or near MDLs. They were located in soil samples from the eastern and southern portions of the landfill.

The soil investigations within the landfill boundary identified four areas that are either known or potential contaminant source areas. The former lagoons are considered to have acted as a source of manganese found in ground water, because manganese concentrations in ground water samples collected from beneath the former lagoons were the highest measured, and the lysimeter samples collected from beneath the former lagoons reveal remnants of past leachate migration. The southern region of the landfill has been identified as a potential source area based on analytical results from soils in the region near BH 13.

6.3 Nature and Extent of Ground Water Contamination, Lee Acres Study Area

Quaternary alluvium forms an unconfined aquifer. It is poorly to moderately sorted, fine-grained to coarse-grained sands, with some gravels and cobbles. Unconsolidated silt and clay lenses are common south of U.S. 64 , where the unnamed arroyo channel alluvium mixes with San Juan River deposits. The extent of the saturated alluvium at the site is demonstrated in Figure 6. The unconfined aquifer was defined during the RI because it is bounded on the east by bedrock and the saturated zone ends with no confining feature on the west or above the ground water. This type of configuration is, by geologic definition, an unconfined aquifer. There are no known beneficial uses of this aquifer; however, it is a potential drinking water source. Pursuant to Section 7.28 of the Rules and Regulations Governing Drilling of Wells and Appropriation and Use of Ground Water in New Mexico, the unconfined alluvial aquifer is part of the San Juan Underground Water Basin. The New Mexico Water Quality Control Commission Regulations 3101.A classify all ground water with an existing total dissolved solids concentration less than 10,000 milligrams per liter as protected.

Ground water in the unnamed arroyo alluvial aquifer flows from north to south toward the San Juan River within a paleochannel in the bedrock. South of U.S. 64, ground water is no longer contained within the incised unnamed arroyo bedrock channel where the alluvium interfingers with San Juan River terrace and flood plain deposits. In this area, ground water from the

unnamed arroyo alluvium discharges and mixes with the ground water of the San Juan River Valley. Most of the domestic, municipal, and agricultural water in the San Juan Basin comes from wells completed in the Quaternary surficial valley deposits or underlying sandstones. Recharge is derived from upstream alluvial aquifer flow and infiltration from meteoric precipitation. Infiltration from the fire water storage ponds southeast of the landfill and the landfill liquid waste lagoons contributed to alluvial aquifer recharge in the past. These sources were later drained, and no longer impact the alluvial aquifer.

Horizontal gradients in the alluvial aquifer range from 0.004 feet per foot (feet/ft) to 0.014 feet/ft. The gradients are steeper in the northern portion of the study area and generally decrease toward the south, the direction of the ground water movement as shown in Figure 6.

The method for determining the background manganese concentrations was developed and agreed upon by EPA, NMED and BLM. The concentration of 346 μg/l manganese was determined by averaging data collected during the RI from three wells located up-gradient of the landfill that were determined to be unaffected by activities at the landfill.

Manganese above the background concentration forms a plume in the alluvial aquifer extending from beneath the Lee Acres Landfill to the south. Figure 7 shows the extent of the manganese plume as of May 1994. Figure 8 shows the extent of the manganese plume as of November 1999. The highest concentrations of manganese are found in BLM-57, located beneath the northern liquid waste disposal lagoon, with an initial concentration in 1990 of 7880 μg/l, and 7100 μg/l in November 1999.

In BLM-55, located beneath the southern lagoon, the initial concentration in 1990 was 3560 μg/l and was reported as below detection limits in November of 1999. Also in November 1999, the alluvial aquifer manganese concentrations measured in 9 of the 13 wells sampled south of the landfill were below the average background concentration of 346 μg/l (Figure 8). The total volume of the manganese plume was approximately 5.3 million gallons. The manganese in the ground water is attributed to either past disposal of liquid in the former liquid waste lagoons or the interaction between the native soils and reducing agents in the lagoons. Since the cessation of activity in the landfill, the migration of the manganese plume appears to have halted. Figures 7

through 10 demonstrate the halting of plume migration, as well as declining concentrations over time.

Nickel is also identified as a contaminant of concern (COC) based on New Mexico Water Quality Control Commission (NMWQCC) criteria. Currently, there is no Federal MCLG or MCL for nickel. In February 1995, EPA remanded the MCLG and MCL for nickel, and has not identified a new value. The State of New Mexico's promulgated standard of 200 µg/L is the clean-up level for the Lee Acres Landfill. With the exception of GBR-48, nickel concentrations have been and continue to be below the ARAR of 200 µg/l (Figure 9).

Figure 7, based on May 1994 data, shows that the VOC plume concentrations detected beneath the landfill are below ARARs but were above ARARs in the portion of the plume south of the landfill and west of the firewater ponds. Since May 1994, the 1,2-*cis*-DCE levels have decreased and are equal to or less than the MCL for 1,2-*cis*-DCE, (i.e., 70 µg/l). For example GBR 49 has gone from 90 µg/l to 19 µg /l in November 1999. The highest 1,2-*cis*-DCE concentration in November 1999 was 19 µg/l, in well GBR 49.

As shown in Figure 7, the highest concentrations of VOCs are found centered in the area around wells GBR 32, GBR-48 and BLM 68. The VOC plume, consisting mainly of 1,2-DCE, is about 300-feet long and 60-feet wide. In 1999, the estimated volume of VOC contaminated ground water was 600,000 gallons. The 1,2-DCE concentration in this plume ranges from below Method Detection Limit (MDL) up to 19 µg/l as of November 1999. PCE and TCE also exist within the VOC plume, with concentrations ranging from below MDL to 7.9 µg/l (PCE) and below MDL to 3.5 µg/l (TCE). Figures 10 through 12 show 1,2-DCE, TCE, and PCE aerial distribution in the aquifer. Figures 13 through 15 show concentration trends versus time for three representative wells (GBR-48, GBR-32, and BLM-68) in the chlorinated VOC plume. Overall, the chlorinated VOCs in these wells all show generally stable or declining concentrations for each constituent over time. As of November 1999, only two ground-water samples collected from monitoring wells at the site contained VOC concentrations greater than the associated clean-up levels listed in Table 2. The concentration of PCE measured in a water

sample collected from well BLM-68 was 5.3 μg/l and the clean-up level is 5.0 μg/l. The concentration of vinyl chloride measured in a sample collected from well BLM-57 contained 2.6 μg/l and the associated clean-up level is 1.0 μg/l.

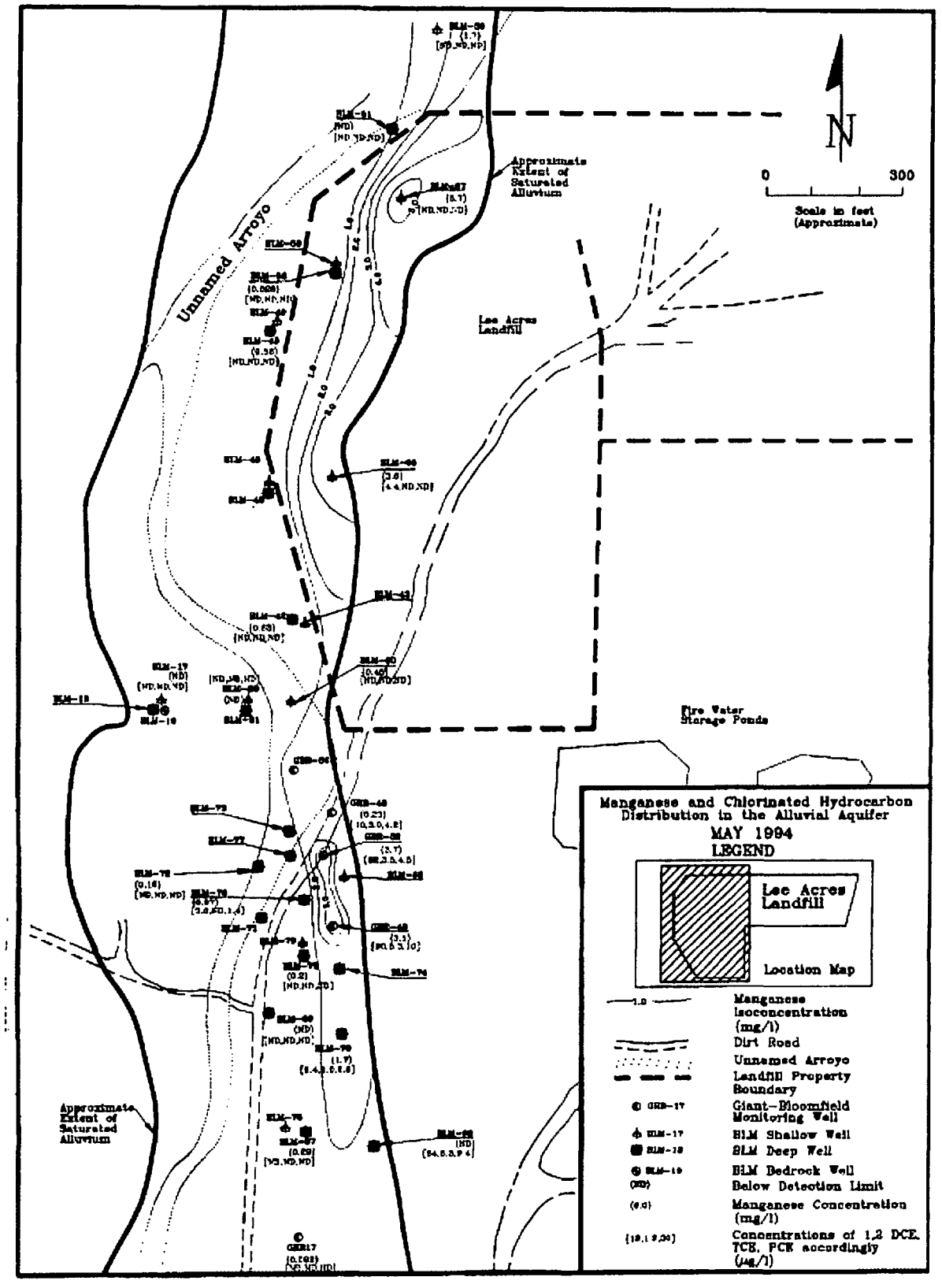

Figure 7 Multi-contaminant Map, May 1994

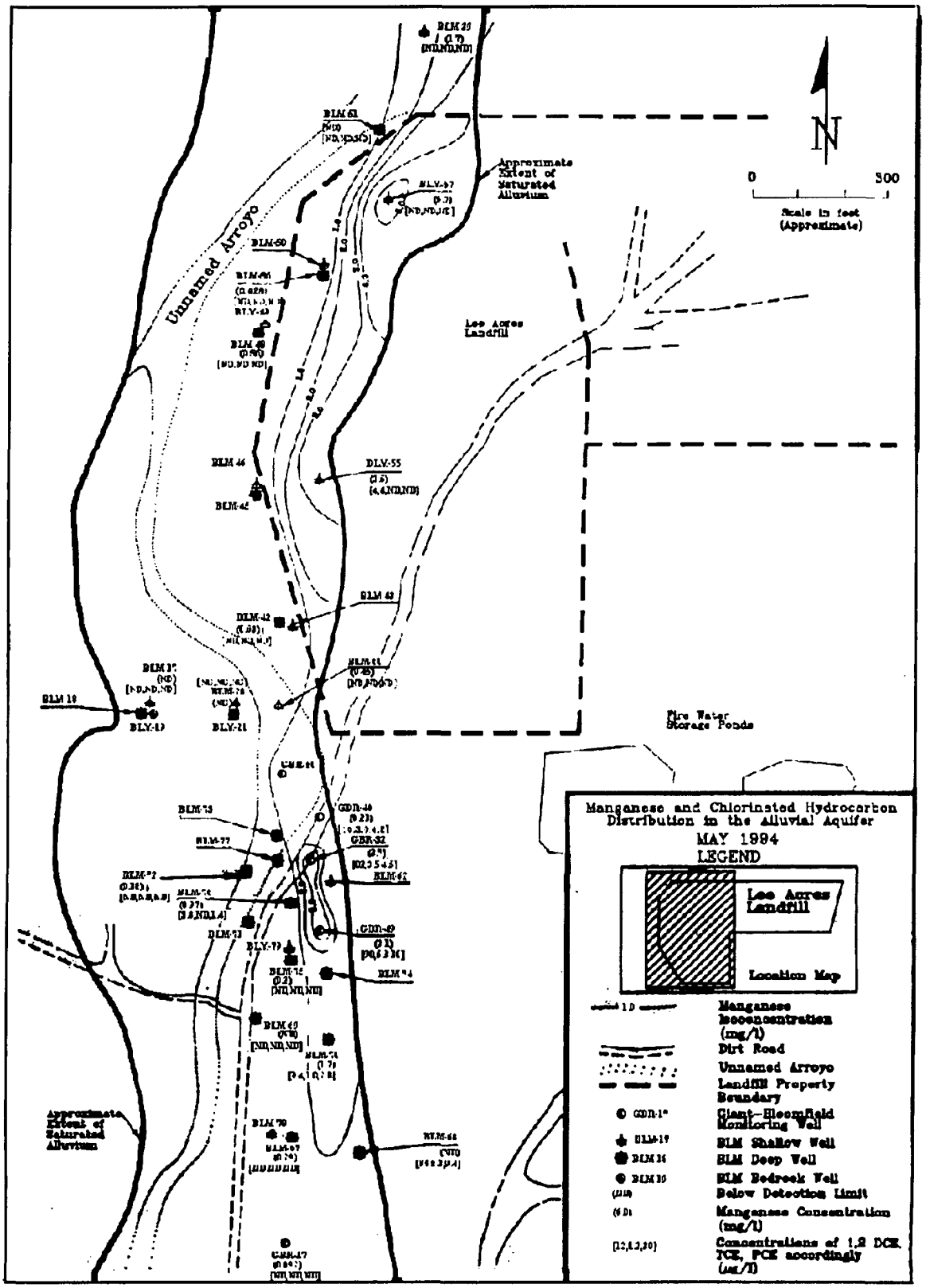

Figure 8 Manganese Distribution Map - November 1999

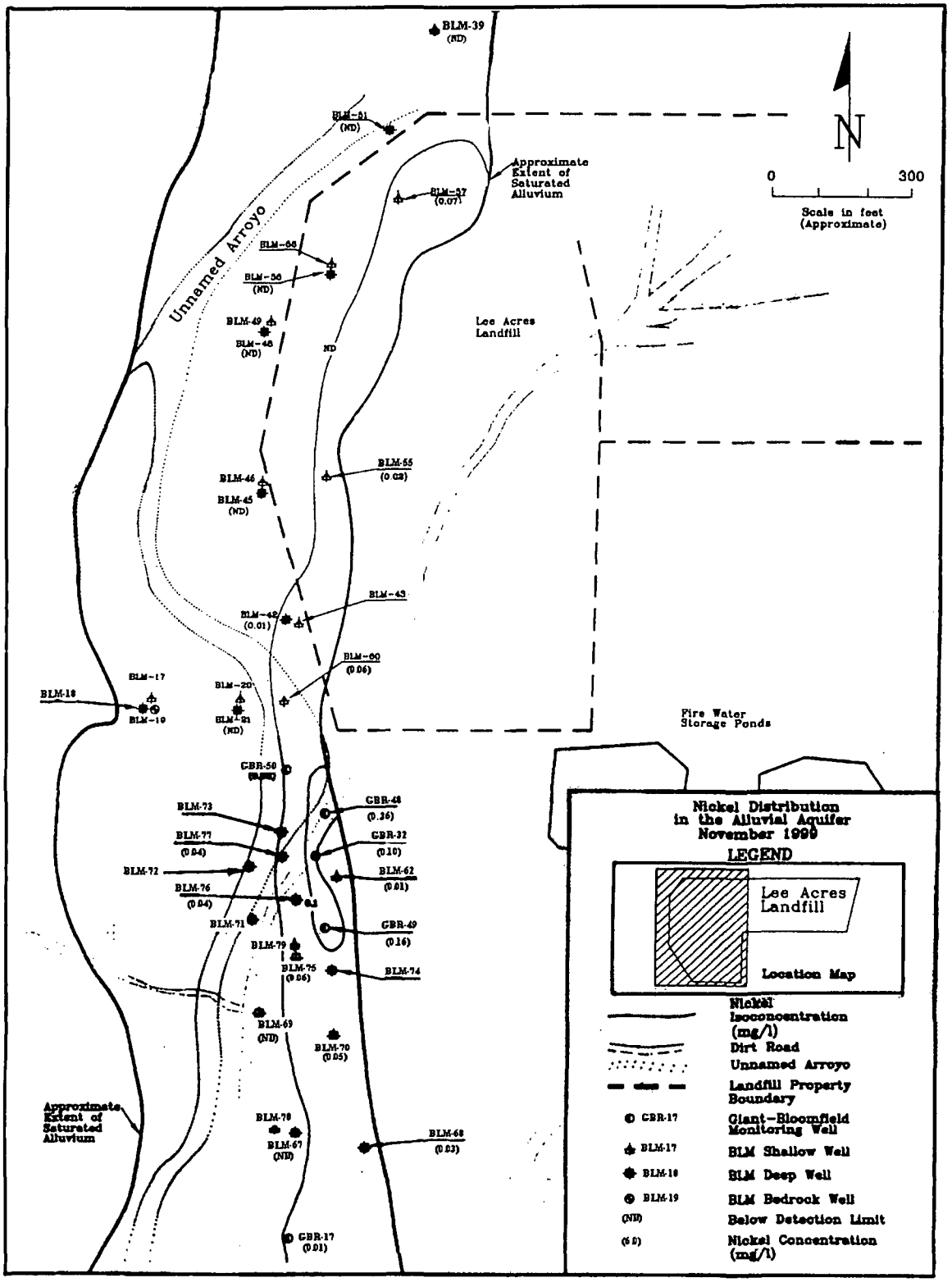

Figure 9 Nickel Distribution Map - November 1999

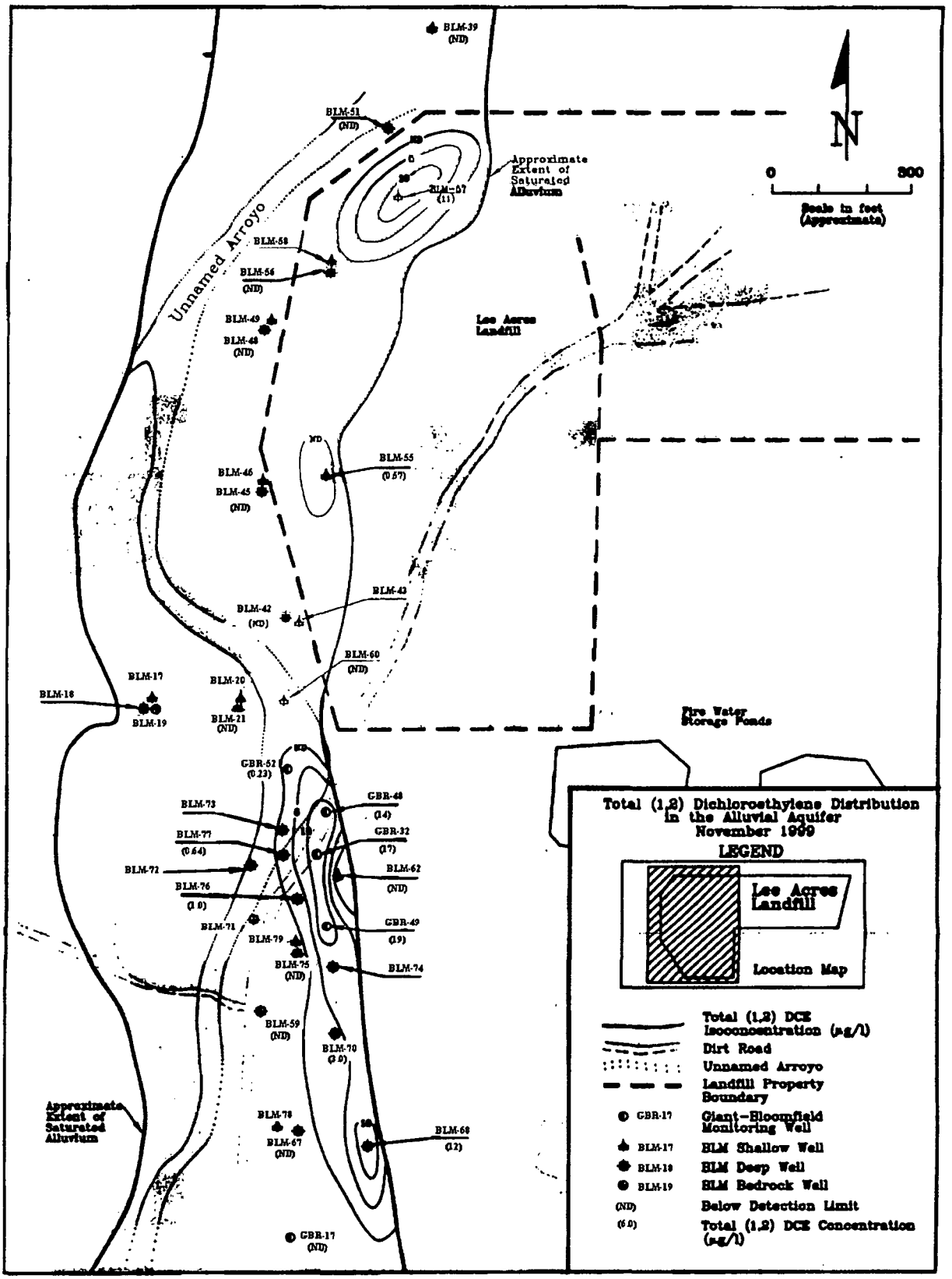

Figure 10 1,2-DCE Distribution Map - November 1999

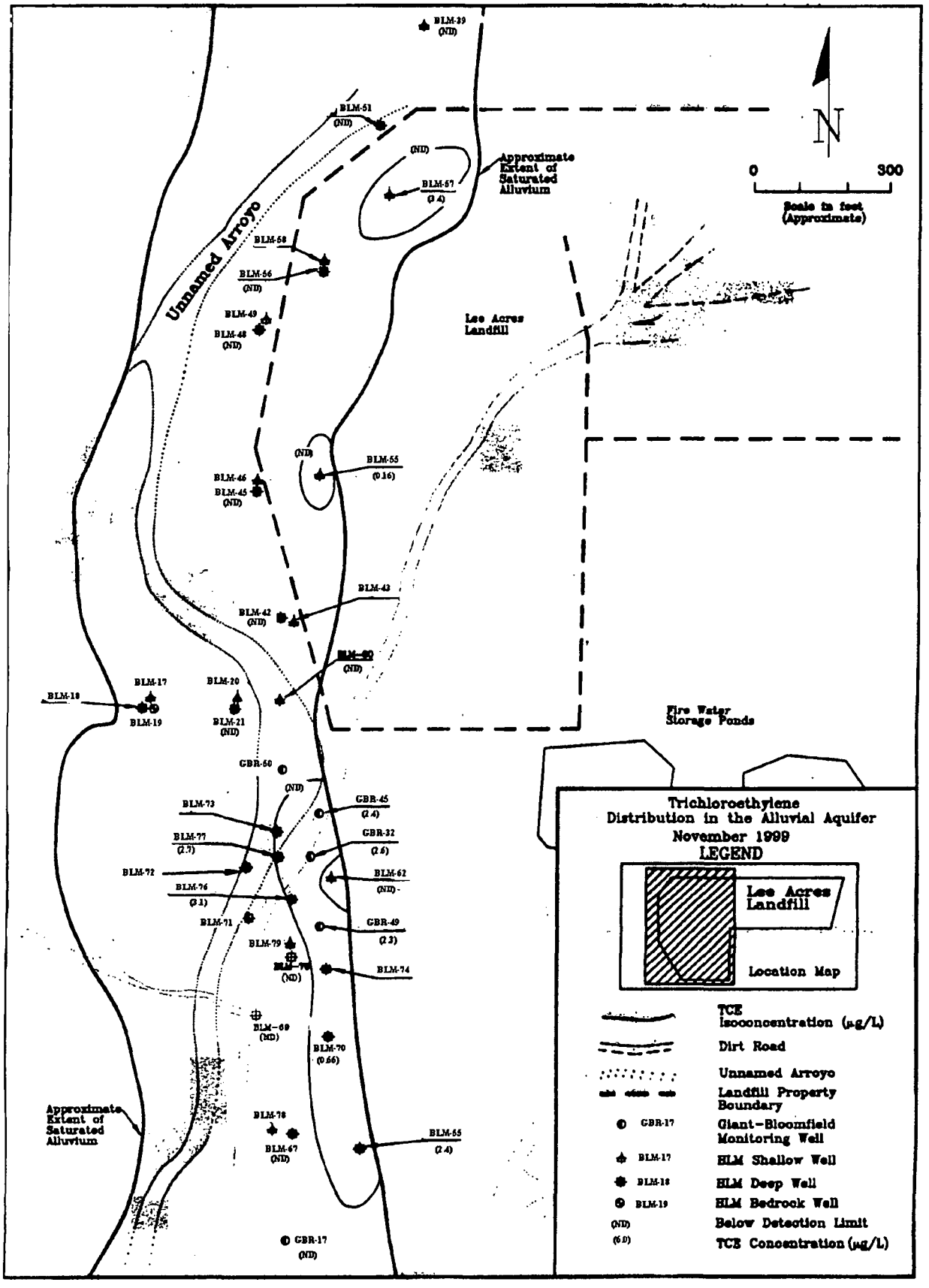

Figure 11 TCE Distribution Map - November 1999

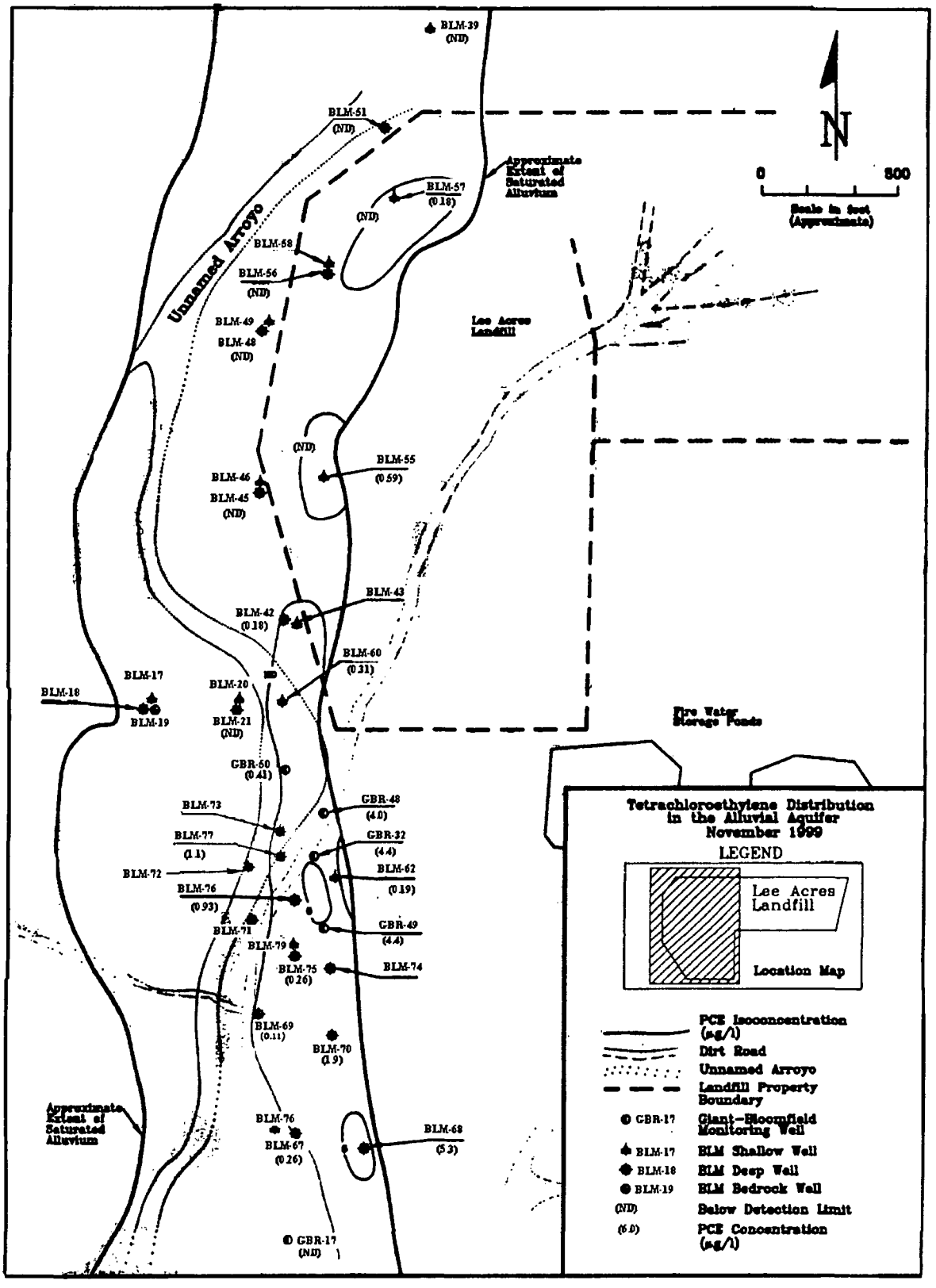

Figure 12 PCE Distribution Map - November 1999

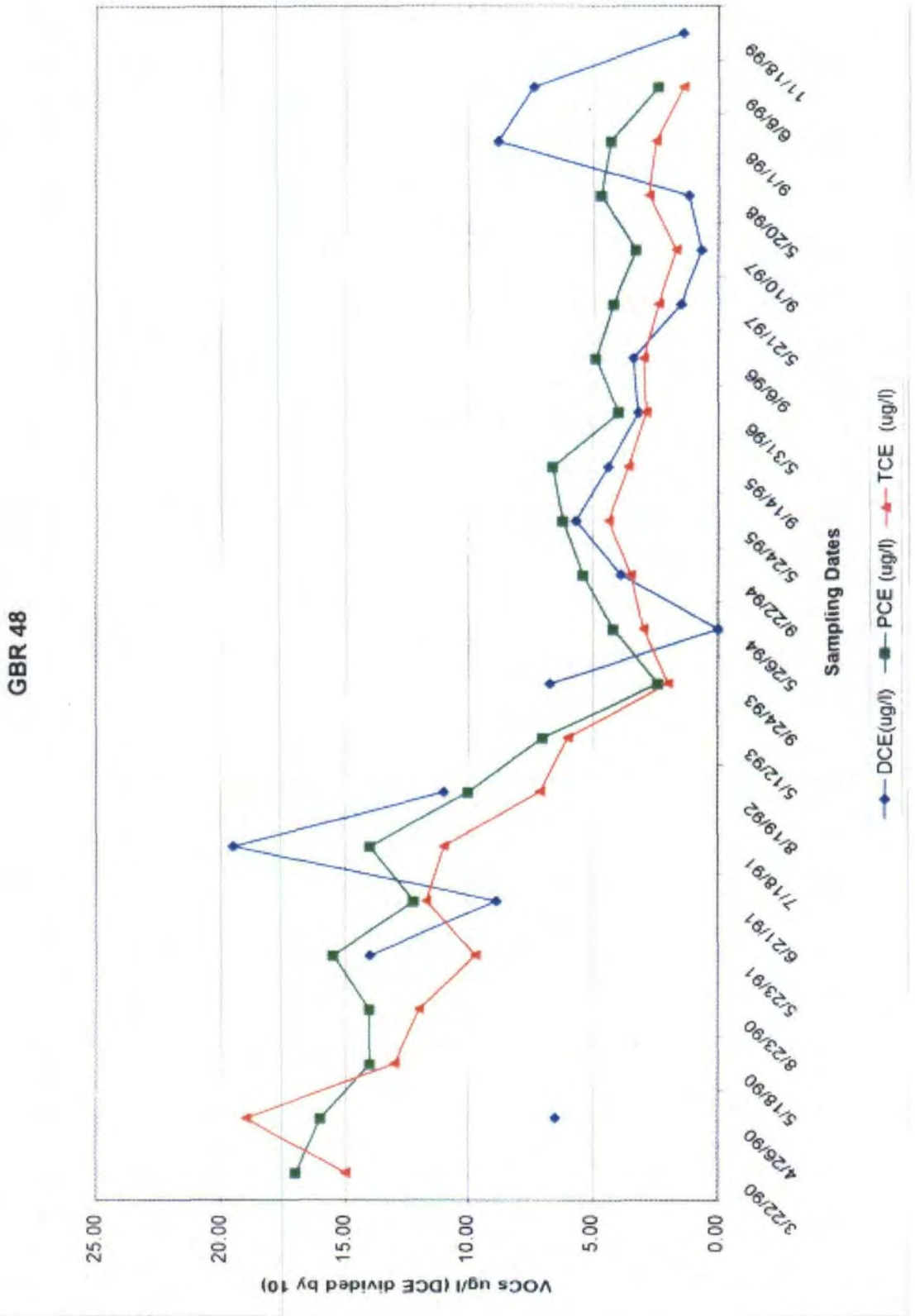

Figure 13 1,2-DCE, PCE and TCE Concentrations vs. Time, GBR-48

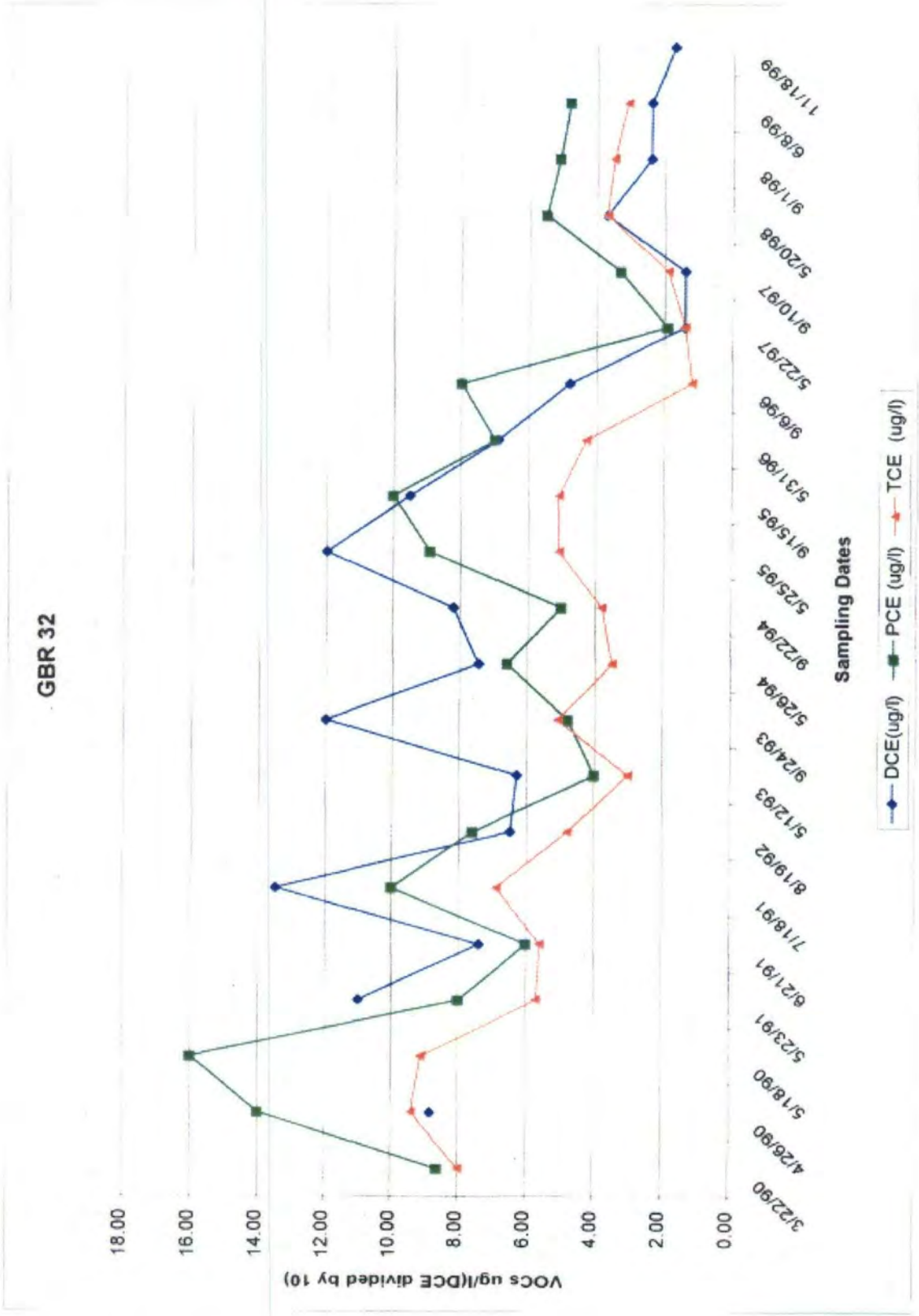

Figure 14 1,2-DCE, PCE and TCE Concentrations vs. Time, GBR-32

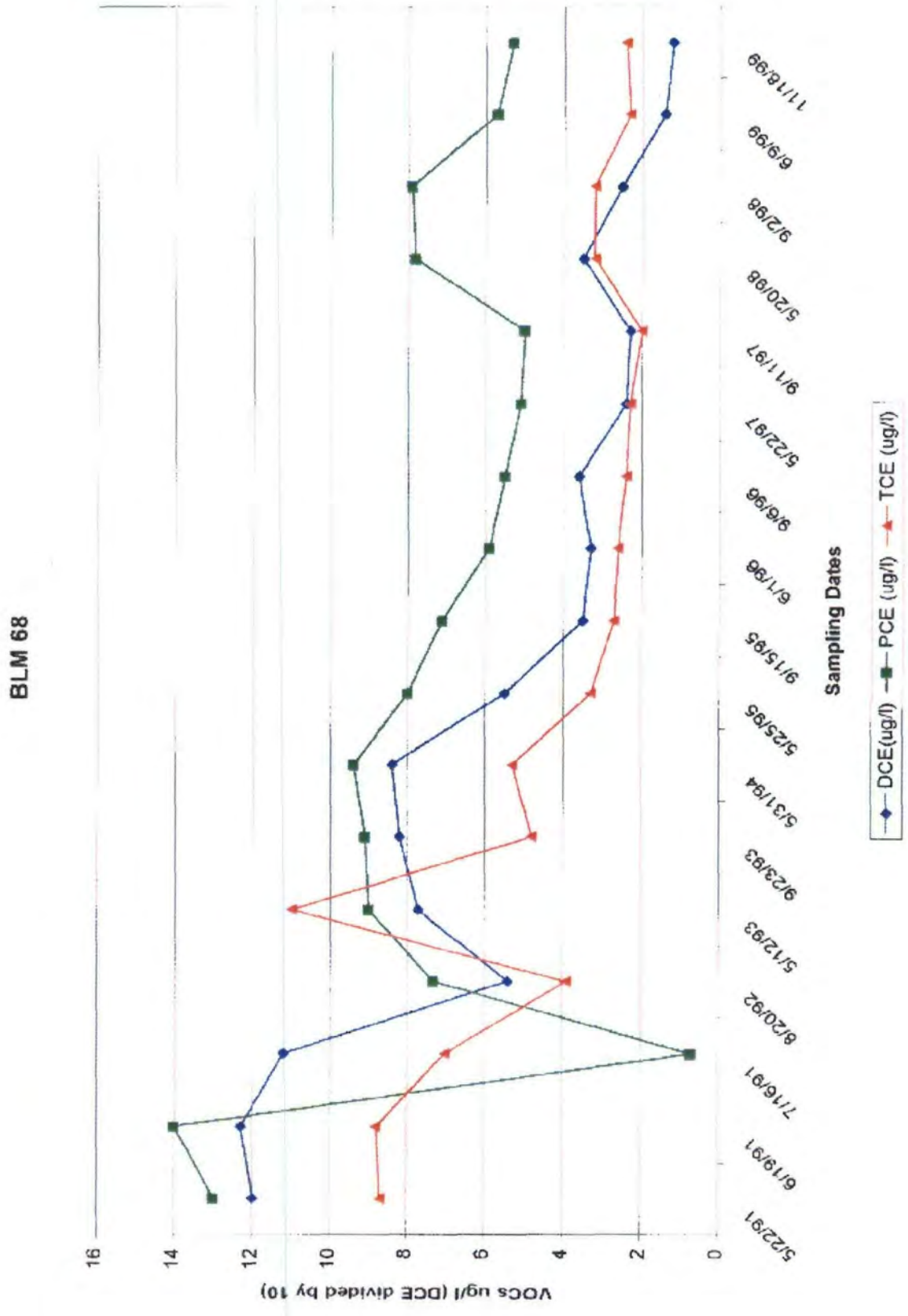

Figure 15 1,2-DCE, PCE and TCE Concentrations vs. Time, BLM 68

7.0 SUMMARY OF SITE RISKS

7.1 Human Health Risk Assessment Summary

The human health and ecological risk assessments were completed in September 1994. The Contaminants of Potential Concern (COPCs) are defined as those chemicals present within the former Lee Acres Landfill resulting from past activities, and include only those chemicals above reportable limits or at concentrations above naturally occurring levels that have been determined not to be sampling or laboratory artifacts. (Weston RIR 1995).

The Contaminants of Concern (COCs) are a subset of the COPCs, and were derived from the COPCs. COCs include contaminants contributing to the risk, and contaminants that exceed State or Federal ARARs. Clean-up levels for the COCs are listed in Table 2.

Manganese was found to be the only non-carcinogenic COC with a Hazard Index (HI) exceeding the EPA non-carcinogenic target of 1. On-site resident drinking water ingestion was the only ingestion pathway evaluated because preliminary findings showed that risk scenario to be an order of magnitude higher than any others during the preliminary risk assessment.

The risk assessment was for a child living on the site, weighing 16 kg for 6 years (350 days per year) drinking 1 liter per day of water containing 6,340 μg/l Manganese. The child would have to be living this scenario for 2,190 days before any toxic effects would occur. Toxic effects of manganese include: delusions, hallucinations, insomnia, depression and some symptoms of Parkinson's Disease.

No landfill gases were recorded during the RI, and therefore are not included in the risk assessment.

The primary pathways of concern at the Lee Acres Landfill are:

- potential future leaching of contaminants through the vadose zone to the alluvial aquifer; and
- ingestion of manganese and VOC-contaminated ground water.

The RI eliminates ingestion, inhalation, and contact with contaminated soil or waste within the former landfill as a pathway of concern because the fill material is covered with an average of 4.5-feet of clean soil. Information collected during the RI also indicated that liquid in the former liquid waste lagoons created a hydraulic head and provided the moisture needed to push the contaminated liquid downward and forced the leachate of the lagoon contaminants into the alluvial ground-water aquifer. The landfill and adjoining public lands have been withdrawn by the BLM (Federal Register, December 9, 1995), and the lagoons will never be re-activated. Also, the lagoons were drained and covered with clean soil in 1986. These actions have impacted the leachate pathway and mitigated much of the possibility of future contamination from the lagoon sediments due to leaching.

Ground-water data obtained between August 1992 and September 1993 were used in the development of the contaminants of potential concern (COPCs). COPCs were developed with two methods: 1) frequency of detection analysis; and 2) statistical comparison of data to study area background data the Shapiro-Wilks "goodness-of-fit" test, D'Agostino's "goodness-of-fit" test, and the Coefficient-of-Variation Test.

The following are the COPCs identified in the human health risk assessment:

1,1,1-trichloroethane (1,1,1-TCA)
1,1-dichloroethane (1,1-DCA)
1,1-dichloroethene (1,1-DCE)
1,2-*trans*-dichloroethene (1,2-*trans*-DCE)
1,2-*cis*-dichloroethene (1,2-*cis*-DCE)
carbon disulfide,
dichloromethane
tetrachloroethene (PCE)
trichloroethene (TCE)
vinyl chloride (VC)

chloride
cobalt
manganese
molybdenum
nickel

Although chloride is identified as a COPC, it is not a CERCLA hazardous substance and has no toxicity factors. Therefore, the risks associated with chloride in the alluvial aquifer were not quantitatively assessed.

The COCs are those contaminants contributing to the risk, which are listed in Table 2 with clean-up levels identified. The COCs for the Lee Acres Landfill are:

manganese;
nickel;
1,2-*cis*-dichoroethene (1,2-*cis*-DCE);
1,2-*trans*-dichloroethene (1,2-*trans*-DCE);
tetrachloroethylene (PCE);
trichloroethylene (TCE), and
vinyl chloride.

For purposes of consideration, the human health risk calculation is based on the scenario of a hypothetical on-site resident. This assumption was used to assess the potential exposures to materials containing COCs. Exposure pathways considered included inhalation and dermal exposure, as well as ingestion. Inhalation and dermal exposure pathways were discounted because the landfill has been covered with clean soil. The scenario for ingestion used was that of an on-site resident who uses the ground water from the most highly contaminated well within the landfill as the primary drinking water supply. This scenario provides the worst case human health exposure potential. The carcinogenic health risk calculation is less that one in 100,000. This places the carcinogenic risk factor within the NMED and EPA acceptable risk ranges. The actual carcinogenic risk is much lower and is not further considered.

Manganese contamination in the alluvial aquifer poses the most significant non-carcinogenic risk with Hazard Index values (HI) ranging from 20 to 40 based on ground-water concentrations in wells beneath the landfill cells. An HI ranking of greater than one (1) indicates that there is the potential for non-carcinogenic health effects from exposure. Exposure to manganese contamination in ground water may result in adverse health effects, including delusions, hallucinations, insomnia, depression, and some symptoms of Parkinson's Disease.

7.2 Ecological Risk Assessment Summary

The study area addressed by the ecological risk assessment is somewhat unique because the waste cells and lagoons associated with landfilling and disposal activities have been covered by an average of 4.5 ft of clean material. Consequently, a majority of the chemicals detected in the RI are associated with deep subsurface soil and ground water and do not pose a risk to biological receptors either incidentally or routinely inhabiting the former Lee Acres Landfill.

By virtue of their presence in the upper 5 ft of soil (before it was covered with 4.5 ft of clean soil) and their relative hazard, dieldrin and DDT were identified as COPCs. The effects of both occur most strongly at upper trophic levels through alteration of biochemical pathways and impairment of reproductive potential. Most common effects in mammals such as mice, vole and rats, are hyperactivity and increased liver mass. In birds, thinning of the egg shell walls impairs reproductivity.

The estimated exposure dosages were compared to the toxicological endpoint dosages for dieldrin and DDT as well as for a simultaneous exposure to both chemicals. The results suggest that there is no risk to biological indicators associated with the former Lee Acres Landfill and additional concern is not warranted.

A screening-level ecological risk assessment was conducted to evaluate the potential threat to the environment posed by existing levels of contamination in soil at the Lee Acres Landfill. The risk characterization is an integration of the exposure and toxicity assessment results. Relative toxicity of individual COPCs and cumulative toxicity were determined. Ecological receptors were identified and an uncertainty analysis performed.

Data indicated that there was no ecological risk to the flora in the vicinity of the Lee Acres Landfill. The San Juan River is located 1.5 miles south of the site, and its fauna and flora were not impacted.

Dieldrin and DDT were identified through the selection process outlined in the RI Section 9.2. (Weston 1995). The risk assessment focused on the movement of COPCs detected in the upper soil layers through a food chain consisting of:

- vegetation, exposure from soil;
- soil macro invertebrates, exposure from soil;
- kangaroo rat, exposure from ingestion of vegetation and invertebrates; and
- red-tailed hawk, exposure from ingestion of small mammals.

Results of the exposure assessment suggest that very low concentrations of dieldrin and DDT are accumulated by receptors. The toxicity assessment identified numerous laboratory studies that exposed mice, rats and various avian species to dieldrin and DDT. The estimated exposure concentrations were compared to the toxicological endpoint concentrations for dieldrin and DDT, as well as for a simultaneous exposure to both chemicals. The results suggest that adverse effects for biological receptors associated with the landfill are unlikely.

8.0 REMEDIAL ACTION OBJECTIVES (RAOs)

8.1 Development of Remedial Action Objectives for the Soil Pathway

At present, the landfill site contains heterogeneous solid waste and variably contaminated soils. The liquid waste lagoons have been abandoned and covered with soil. Contaminants and their concentrations were described earlier in this ROD.

The RAOs for the potential soil pathway are:

-Reduce or eliminate the potential for future leaching of contaminants from the landfill to ground water by preventing moisture infiltration.

-Reduce or eliminate the potential for future direct exposure to contaminated soil and waste.

-Reduce or eliminate the potential for future migration of contaminants through storm water run-off or erosion.

The potential migration and exposure pathways from the landfill soil source areas include the production of leachate, human or ecological direct contact exposure, and migration of soil contaminants through storm water run-off or erosion. However, none of these pathways is currently contributing contamination. The potential for direct exposure to contaminated soil was dismissed in the RI because waste cells and landfill trenches are covered with an average of 4.5 feet of clean soil, the landfill would not be able to sustain a house or industrial structure because of the uneven settling that is characteristic of landfills (Davis and Cornwell 1991), and the post-closure care of landfills does not permit disturbance of the soil cap (40 CFR 258 Subpart D). Furthermore, BLM has withdrawn the Lee Acres Landfill from public use to ensure that the site will never be sold, leased, or used for public purposes for a minimum of 50 years, and to restrict access to contaminated ground water.

The possible activation of the leaching pathway is a potential threat at the Lee Acres Landfill. The leachate would result primarily from infiltration of meteoric water from the former liquid waste disposal lagoons or contaminated subsurface soils. The lagoon sediments, which are contaminated with BTEX compounds, present the highest potential for leachate production at the site. Therefore, elimination or reduction of the potential leachate pathway is considered as an RAO.

The possible leaching of contaminants from the landfill soils will be resolved by placing a cap over the western portion of the landfill. The selected capping alternative has been tested and demonstrated to be effective through a pilot project, directed by Sandia National Laboratory, DOE, and BLM, which lasted two years. The pilot project involved development and testing of an arid climate-specific capillary barrier on a portion of the landfill. The success of the pilot project was determined by no infiltration of surface water through the lowest layer in the cap and thus the trash layer of the landfill. Based on the final pilot project report results, the capillary barrier cap will be expanded to include the balance of the western portion of the landfill. If the

installed capillary barrier does not continue to perform as expected, an evaluation will be performed to determine the cause, and appropriate corrective actions will be taken, if needed. As previously stated, the RAOs are designed to prevent exposure to landfill soils, to prevent leachate production, and to contain/remediate contaminated ground water.

8.2 Development of Remedial Action Objectives for the Ground Water Pathway

Infiltration of meteoric water into the subsurface has caused movement of some contaminants into the ground-water system. Although there is no current domestic ground-water use downgradient from the landfill or upgradient of the refinery, installation of new domestic/industrial ground-water wells in the future could result in unacceptable risk due to manganese exposure.

The RAOs for ground water are:

- Elimination or significant reduction of the risk posed by elevated manganese levels in ground water by eliminating access to the ground water.

- Reduction of levels of manganese, nickel, 1,2-DCE, PCE, TCE, and VC to comply with ARARs.

Table 2 presents the clean-up levels for the COCs which were detected with concentration levels in excess of acceptable risk levels or ARARs, and which also exceeded site background concentrations within alluvial ground-water wells. The ARARs presented in Table 3 consist of maximum contaminant levels (MCLs) set by the Federal Safe Drinking Water Act (SDWA) and the ground-water standards listed in the NMWQCC Regulations.

For most of the COCs (1,2-DCE, PCE, and TCE), the chemical-specific ARARs, which are the Federal SDWA MCLs, are the clean-up levels for the alluvial aquifer. For nickel, the clean-up level is the New Mexico Water Quality Control Commission (NMWQCC) standard. For manganese, the elevated background level of manganese indicates that ground water at the landfill is unsuitable for drinking water. As a consequence, the federal MCL for manganese is

neither relevant nor appropriate for purposes of establishing cleanup levels at the landfill. New Mexico Water Quality Control Commission (NMWQCC) Regulations, section 4101 (B), provide that if background levels of any water contaminant exceed state standards established pursuant to section 4103 of the NMWQCC Regulations, then cleanup standards for such pollution shall be the background concentration. Accordingly, the clean-up level for manganese contamination in the ground water at the site is the state ARAR, or the background concentration, which is 346μg/L. This background concentration was determined by averaging data collected in three background wells, BLM 14, 15 and BLM 39 during the RI. The clean-up level for vinyl chloride (1 μg/L) is based on NMWQCC Section 4101(B) standards. This clean-up level is more stringent than the Federal MCL of 2μg/L, and so is the ARAR since it is a more stringent promulgated standard.

The remedial action objectives for the Lee Acres Landfill are to prevent further contamination of ground water from leaching of contaminants that may exist in the landfill soils, and to eliminate all possibility of human and ecological exposure to contaminated soils and ground water emanating from the landfill while utilizing the most cost-effective remedial technologies available.

To prevent human exposure to contaminated soils and ground water, BLM has withdrawn 134.68 acres of public land, within which the landfill is located, from settlement, sale, location, and entry, as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). As a result of this withdrawal, ground water beneath the landfill will not be used as a drinking water source for the 50 year duration of the withdrawal. In the event that potential exposure to hazardous substances in such ground water poses an unacceptable risk to human health at the end of this period, BLM may extend the withdrawal, take other necessary steps, or fulfill all requirements of section 120(h) of CERCLA, as appropriate, to ensure that public health and the environment is protected from contaminated soils and ground water at and beneath the landfill.

Table 2 Remedial Goals (Clean-up Levels)

Constituent	Site Historic Maximum Concentration (µg/L)	Risk-Based Preliminary Remediation Goal (µg/L)	SDWA MCL (µg/L)	NMWQCC Standards (µg/L)	Site Background Mean[a] (µg/L)	Cleanup Levels (µg/L)
Manganese	6,335	176	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-*cis*-Dichloroethene	77	NA	70	per part 101z.z[g]	NA	70
1,2-*trans*-Dichloroethene	120	NA	100	per part 101z.z[g]	NA	100
Tetrachloroethylene (PCE)	10	NA	5	20	NA	5
Trichloroethylene (TCE)	11	NA	5	100	NA	5
Vinyl Chloride	3.1	NA	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL)
c Standard for domestic supply.
d NMWQCC regulation Part 3-101.2 does not require cleanup level below site background level.
e Highest value of 12,500 µg/L occurred during the May 1993 sampling period and was determined to be a statistical anomaly for the purposes of this table, the next highest value is specified.
f Standard for irrigation use.
g No NMWQCC specific to 1,2-DCE exists, therefore Part 101.z.z. is referenced for State ARAR
NA - not applicable.
NOTE: Dichloromethene was detected once in 95 samples at a concentration level of 27 µg/L; however, this concentration was considered a statistical anomaly and is not presented

State Chemical-Specific ARARs for Lee Acres Landfill Groundwater Contaminants of Potential Concern

Chemical	Citation	Requirement	Maximum Concentration Detected (µg/L)	Status	Comments
METALS					
Manganese	NMAC 20.6.2.4101(b)	Water quality standard = background Below 1 x 10^{-5} risk	6,335	ARAR	Average background concentration for manganese (346 µg/L) is the ARAR
Nickel	NMAC 20.6.2.4103(b)	Water quality standard = 200 µg/L Below 1 x 10^{-5} risk	12,500	ARAR	12,500 µg/L was one time occurrence and was determined to be a statistical anomaly. Next highest value is 578 µg/L.
ORGANICS					
1,2-*cis*-Dichloroethylene 1,2-*cis* DCE	NMAC 20.6.2.4103(b)	Below 1 x 10^{-5} risk	77	ARAR	New Mexico has established health-based numerical groundwater standard applicable to all water containing less than 10,000 mg/L total dissolved solids which apply to all groundwater, whether used for domestic, commercial, or agricultural purposes. Groundwater of quality better than the standards is allowed to deteriorate to the standards. Groundwater of worse quality than the standards may not be degraded further.
1,2-*trans*-Dichloroethylene 1,2-*trans* DCE	NMAC 20.6.2.4103(b)	Below 1 x 10^{-5} risk	120	ARAR	
Tetrachloroethylene (PCE)	NMAC 20.6.2.4103(b)	Water quality standard = 20 µg/L Below 1 x 10^{-5} risk	10	ARAR	
Trichloroethylene (TCE)	NMAC 20.6.2.4103(b)	Water quality standard = 100 µg/L Below 1 x 10^{-5} risk	11	ARAR	
Vinyl Chloride (VC)	NMAC 20.6.2.4103(b)	Water quality standard = 1 µg/L Below 1 x 10^{-5} risk	3.1	ARAR	

Table 3a Federal Applicable or Relevant and Appropriate Requirements (ARARs)

Federal Chemical Specific ARARs for Lee Acres Landfill Groundwater Contaminants of Potential Concern

Chemical	Citation	Requirement	Maximum Concentration Detected (µg/L)	Status	Comments
METALS					
Nickel		NONE	12,500	ARAR	12,500 (µg/L) was one time occurrence, and was determined to be a statistical anomaly. Next highest value is 578 µg/L
ORGANICS					
1,2-*cis*-Dichloroethylene 1,2-*cis* DCE	SDWA	Water quality standard = 70 µg/L	77	ARAR	Groundwater remedial actions will need to ensure that drinking water quality water supplies do not exceed ARAR concentrations
1,2-*trans*-Dichloroethylene 1,2-*trans* DCE	SDWA	Water quality standard = 100 µg/L	120	ARAR	
Tetrachloroethylene (PCE)	SDWA	Water quality standard = 5 µg/L	10	ARAR	
Trichloroethylene (TCE)	SDWA	Water quality standard = 5 µg/L Below 1 x 10^{-5}	11	ARAR	
Vinyl Chloride (VC)	SDWA	Water quality standard = 2 µg/L	3.1	ARAR	

ARAR - applicable or relevant and appropriate requirements

µg/L - micrograms per Liter

SDWA - Safe Drinking Water Act

9.0 DISCUSSION OF EVALUATED ALTERNATIVES AND BALANCING CRITERIA

After an initial screening of 34 different soil remedial options and 50 ground-water options, five soil and five ground-water technologies and process options were evaluated in greater detail with respect to effectiveness, implementability and approximate cost. The technologies and process options were then combined into remedial alternatives.

These alternatives were screened against the two threshold criteria and five balancing criteria identified in CERCLA. The final remedies selected for the ground-water and soil pathways are Alternatives S-5(a) and G-2(a), which are modified versions of Alternatives S-5 and G-2. Selection of the alternatives was based on a comparative analysis of the alternatives with respect to the threshold and balancing criteria and two modifying criteria (i.e., State acceptance and community acceptance). These two criteria were evaluated based on comments to the RI/FS, responses to the PP, and participation in public meetings/hearings. The nine criteria are defined as follows:

The two threshold criteria are:

Overall Protection of Human Health and the Environment–Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment, and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls. The RAOs were developed, using the results of the risk assessment, to be protective of human health and the environment. The initial screening of alternatives retained only those options and technologies that were either required by the National Contingency Plan (NCP) or were determined to be effective in meeting the RAOs.

Compliance with ARARs–Section 121(d) of CERCLA and NCP Section 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are

collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

ARARs were considered in the development of the RAOs, and include chemical-specific, location-specific, and action-specific ARARs. The ARARs for ground water were used to develop the remediation goals, or clean-up levels, which are the concentration levels that the proposed alternatives must meet. RAOs for soil require reducing the potential for exposure to contaminated soils and migration of contaminants through the surface water pathway.

The five balancing criteria are:

Long-Term Effectiveness and Permanence--Under this criterion, an alternative is assessed in terms of its long-term effectiveness in maintaining protection of human health and the environment after response objectives have been met. The magnitude of residual risk and adequacy and reliability of controls are taken into consideration, as well as comparison of effectiveness to similar technologies.

Short-Term Effectiveness--Under this criterion, an alternative is assessed in terms of its effectiveness in protecting human health and the environment during the construction and implementation of a remedy before response objectives have been met. The time until the response objectives have been met is also factored into this criterion.

Implementability--Under this criterion, an alternative is assessed in terms of its technical and administrative feasibility and the availability of required goods and services. Also considered is the reliability of the technology, the ability to monitor the effectiveness of the remedy, ease of undertaking additional remedial actions (if necessary), need for regulatory permits, and availability of land to implement the option.

Reduction of toxicity, mobility, or volume (TMV)--Under this criterion, an alternative is assessed in terms of the anticipated performance of the specific treatment technologies it employs. Factors such as the volume of materials destroyed or treated, the degree of expected reduction, the degree

to which treatment is irreversible, and the type and quantity of remaining residuals are taken into consideration.

Cost--Under this criterion, an alternative is assessed in terms of its present worth, capital, and operation and maintenance (O&M) costs, and these costs relative to similar technologies.

The two modifying criteria are:

State Acceptance- Under this criterion, an alternative is evaluated in terms of the technical and administrative issues and concerns the state may have. Frequently, state acceptance is closely related to compliance with state ARARs.

Community Acceptance - Under this criterion, an alternative is evaluated in terms of the issues and concerns the public may have had.

10.0 SOIL PATHWAY ALTERNATIVES

The five alternatives considered for soil remediation were:

- S-1 No Action
- S-2 Institutional and Surface Controls
- S-3 Institutional and Surface Controls and Capping with Flexible Membrane Liner (FML)
- S-4 Institutional and Surface Controls, Hot Spot Bioremediation, and Capping with Low Permeability Cap
- S-5 Institutional and Surface Controls, Hot Spot Bioremediation, and Engineered Low Permeability Soil Cap on the West Half of the Landfill, Installation of Lysimeters to Monitor Possible Leachate Generation

All of the proposed alternatives for the soil pathway (except for the No Action Alternative) would require long-term monitoring and maintenance to ensure that the remedial action continues to be effective, and the use of institutional controls as described in Alternative S-2.

Alternative S-1 - No Action

No cost is associated with this alternative.

Years to Implement: 0

Under this alternative, no further action would be taken at the site. The current fence would not be maintained, and there would be no sampling or monitoring to evaluate the level of leachate production. Consideration of this alternative is required by the NCP.

Alternative S-2 - Institutional and Surface Controls

Total Capital Cost: $80,400

Total Operation & Maintenance (O & M) Cost: $0

Additional Cost: $21,200

Additional costs include remedial design ($4,300), inflation escalation, 5% contingency, and 3% internal project management.

Total Alternative S-2 Cost: $101,600

Years to Implement: 0.8

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production by limiting the amount of infiltration, and would limit the potential for contaminant migration through storm water run-off or erosion. Specific surface water controls will be identified in the remedial design. This alternative would include restricting access to the site by maintaining the current fencing.

In addition, an area of 135 acres of public land, which includes the Lee Acres Landfill and a buffer area around it, was withdrawn by BLM from surface entry and mining for a period of 50 years (see 62 FR 2177, Public Land Order No. 7234). The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities, and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could

disturb the integrity of the containment system, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill Site. Discretionary restrictions on the use of the land at the Lee Acres Landfill site that are in compliance with the current withdrawal will be implemented in accordance with BLM's current resource management plan. The prevailing management plan for the Lee Acres Landfill Site is the 1991 Albuquerque District Resource Management Plan/Final Environmental Impact Statement for Oil and Gas Leasing and Development. The Farmington Field Office is currently revising the Plan, which is expected to be finalized in May 2003. In addition, long-term ground-water monitoring would be used to determine whether contaminant leaching from the landfill material to the ground water is occurring.

Alternative S-3 - Institutional and Surface Controls and Capping with Flexible Membrane Liner (FML)

Total Capital Cost: $9,568,700

Total O & M Cost: $176,800

Additional costs include remedial design ($360,600), inflation escalation, 5% contingency, and 3% internal project management.

Additional Costs: $2,519,000

Total Alternative S-3 Cost: $12,264,500

Years to Implement 1.5

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production by limiting the amount of infiltration, and would limit the potential for contaminant migration through storm water run-off or erosion. The amount of infiltration would be further reduced by placing an FML cap over the entire landfill (an estimated 60 acres), including the lagoons and all solid waste disposal areas. This alternative would include restricting access to the site by maintaining the current fencing and placing an administrative withdrawal on the property as discussed in Alternative S-2. Long-term ground-water monitoring would be used to determine if additional contaminants were leaching from the landfill material and contributing to the existing ground-water contamination.

Alternative S-4 - Institutional and Surface Controls, Hot Spot Bioremediation, and Capping with Engineered, Low Permeability Cap

Total Capital Cost: $4,923,800

Total O&M Cost: $300,000

Additional costs include remedial design ($0.2 million), inflation escalation, 5% contingency, and 3% internal project management

Additional Costs: $1,367,300

Total Alternative S-4 Cost: $6,588,400

Years to Implement: 1.0

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production by limiting the amount of infiltration and would limit the potential for contaminant migration through storm water run-off or erosion. The amount of infiltration would be further reduced by placing a low permeability cap over the western portion of the landfill (an estimated 20-30 acres), including the lagoons and all solid waste disposal areas. Two types of caps were considered: a conventional compacted clay cap; and an innovative capillary barrier cap developed by Sandia National Laboratory (FS, Appendix G-2, BLM, 1996). This alternative would include restricting access to the site by maintaining the current fencing and continuing the administrative withdrawal on the property as discussed in Alternative S-2. Long-term ground-water monitoring would be used to determine if additional contaminants were leaching from the landfill material and contributing to the existing ground-water contamination.

The effectiveness of the low permeability soil cap would be increased by treating or excavating the BTEX-contaminated lagoon area sediments, which are expected to be the contaminants most likely to produce leachate. For purposes of analysis of this alternative, the proposed method for reducing BTEX contamination is *in-situ* bioremediation. If determined to be ineffective during the remedial design phase, pilot-scale studies, or through evaluation of the implemented alternative, the method will be adjusted to reduce BTEX concentrations through excavation and *ex-situ* treatment, which may include on-site bioremediation (landfarming) or shipment to an off-

site facility. Also, further sampling may prove that the BTEX compounds are being naturally degraded, which would eliminate the necessity for bioremediation.

Alternative S-5 - Institutional and Surface Controls, Hot Spot Remediation, and Engineered Low Permeability Soil Cap on the West Half of the Landfill, Installation of Lysimeters to Monitor Possible Leachate Generation

Total Capital Cost (approximate): $1.9 million for a conventional clay cap, or approximately $1.2 million for the capillary barrier.
Total O&M Cost: $300,000
Additional costs include remedial design ($0.2 million), inflation escalation, 5% contingency and 3% internal project management
Additional Costs: $1.4 million
Total Alternative S-5 Cost (approximate): $3.6 million
Years to Implement: 1

Under this alternative, surface water run-on and run-off control structures would be constructed to divert run-on and maximize run-off. This would help to reduce leachate production from the west half of the landfill by limiting the amount of infiltration and would limit the potential for contaminant migration through storm water run-off or erosion. The amount of infiltration would be further reduced by placing a capillary barrier cap over the western half of the landfill (an estimated 25 acres), including the lagoons and most of the solid waste disposal areas. Two types of caps were considered: a conventional compacted clay cap; and an innovative capillary barrier cap being developed by Sandia National Laboratory. A system of lysimeters would be installed in the landfill to monitor leachate generation (see Figure 17). If leachate does occur, a collection system could be installed or the area could be capped at a later time. This alternative would also include restricting access to the site by maintaining the current fencing and placing an administrative withdrawal on the property, as discussed in Alternative S-2. Long-term ground-water monitoring would be used to determine if additional contaminants were leaching from the landfill material and contributing to the existing ground-water contamination.

The effectiveness of the low permeability soil cap would be increased by treating or excavating

the BTEX-contaminated lagoon area sediments, which are expected to be the contaminants most likely to produce leachate. For purposes of analysis of this alternative, the proposed method for reducing BTEX contamination is *in-situ* bioremediation. If this is determined to be ineffective during the remedial design phase, pilot-scale studies, or through evaluation of the implemented alternative, the method can be adjusted to reduce BTEX concentrations through excavation and *ex-situ* treatment, which may include on-site bioremediation (landfarming) or shipment to an off-site facility. Also, further sampling may prove that the BTEX compounds are being naturally degraded, which would eliminate the necessity for bioremediation.

Selected Soil Pathway Alternative

Based on the results of the pilot study conducted at the Lee Acres Landfill, EPA, BLM, and the State of New Mexico concluded that the cap is performing as expected, and that hot spot bioremediation of the lagoon area sediments is not necessary to improve the long-term performance of the remedy. Accordingly, Alternative S-5 was modified by eliminating the hot spot treatment, and is presented below as Alternative S-5(a). Alternative S-5(a) is the selected alternative based on the successful outcome of the pilot project results.

Alternative S-5(a) - Institutional and Surface Controls, Capping with Capillary Barrier Cover on the Western Portion of the Landfill, and Installation of Lysimeters to Monitor Possible Leachate Generation

Total Capital Cost (approximately): $1.2 million for the capillary barrier
Total O&M Cost: $300,000
Additional costs include remedial design ($0.2 million), inflation escalation, 5% contingency and 3% internal project management
Additional Costs: $0.5 million
Total Alternative S-5 Cost (approximate): $1.9 million
Years to Implement: 1

This alternative is a modified version of Alternative S-5. Alternative S-5(a) does not include the hot spot bioremediation of BTEX-contaminated lagoon sediments included in Alternative S-5.

The purpose of the hot spot remediation included in Alternative S-5 was to increase the effectiveness of the low permeability cap. However, based on the results of the pilot study conducted at the Lee Acres Landfill, EPA, BLM, and the State of New Mexico concluded that the cap is performing as expected, and that hot spot bioremediation of the lagoon area sediments is not necessary to improve the performance of the remedy. The performance of the cap will be monitored, and if monitoring data indicate that the cap is not performing as anticipated, an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken if needed.

Overall Protection of Human Health and the Environment

Alternative S-5(a) will protect human health and the environment by limiting access to the contaminated soils, by using surface water run-on and run-off controls to limit the amount of run-on infiltration and protect the landfill from erosion, and by capping with low permeability soil to eliminate other infiltration.

Compliance with ARARs

This alternative will include an engineered low permeability cap that will meet the minimum requirements of 40 CFR Part 258, to comply with ARARs. Although there is slight risk of leachate production, the entire site has been fenced and withdrawn from use. There is no risk to human health or the environment from the east half of the landfill. Lysimeter installation and monitoring will further ensure that no risk develops from this area. The performance of the cap will be monitored, and if monitoring data indicate that the cap is not performing as anticipated, an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken if needed.

Long-Term Effectiveness and Permanence

The long-term effectiveness of this alternative depends on continued maintenance of the low permeability cap and surface controls, and no leachate occurring beneath the eastern portion of the landfill. The permanence and level of residual risk for this alternative will be the same as S-4, and the residual risk will be lower than that for alternatives S-1, S-2, and S-3. Lysimeter installation and ground-water monitoring will provide information regarding leachate generation

and contaminant characteristics throughout the entire landfill. The number and placement of lysimeters will be determined in the design phase.

Short-Term Effectiveness

The short-term effectiveness for this alternative is the same as that for S-4. The possibility of a release during installation of the lysimeters also exists, making the risk the same as S-4. Therefore, this alternative is expected to present a greater level of short-term risk to workers and residents during overall implementation than S-1, S-2 and S-3.

Implementability

None of the soil pathway alternatives would require permits, and none would require the use of additional property that is not controlled by BLM. This makes the administrative implementability of these alternatives equal. Alternative S-5(a) would be easily implemented with readily available materials and technology and is expected to be reliable in meeting its objective of elimination of the production of leachate by both limiting infiltration and reducing leachable contaminant concentrations. The installation of the low permeability cap will be much easier to implement than the FML cap. Installation of lysimeters in the landfill will be easily implementable, and will monitor for possible leachate production. These activities make this alternative more difficult to implement than Alternatives S-1 and S-2 but easier to implement than Alternative S-3. In addition, because the low permeability cap requires only compaction, this alternative is expected to be more flexible in allowing additional soil or ground-water remedial actions than Alternative S-3, which would require re-welding of the FML. Overall, this alternative is expected to be much more easily implemented than Alternative S-3, and slightly less easily than Alternative S-4.

Reduction of Toxicity, Mobility, or Volume of Contaminants

Overall, this alternative provides a greater reduction of mobility than Alternatives S-1 and S-2 and the same reduction as Alternatives S-3 and S-4. Installation of the low-permeability cap, lysimeters and site monitoring will not actively reduce contaminant toxicity or volume, but it will reduce the mobility of the contamination. In addition, reduction of ground-water contaminant concentrations through natural attenuation is expected to continue, thereby reducing toxicity and

volume of contaminants in ground water. Lysimeters will be used to monitor the effectiveness and integrity of the cap.

Cost

The estimated cost for this alternative is $1.9 million of which about half ($1.2 million) is the capital cost for installing the low permeability cap. The cost for the cap assumes a 25-acre low permeability cap covered with soil and vegetated, and 30-year O&M period. It is expected that a minimum of six lysimeters will need to be installed and checked quarterly. The lysimeters are expected to cost approximately $34,000. The overall cost is more than the cost of Alternatives S-1 and S-2, but less than the cost of Alternatives S-3 and S-4.

11.0 GROUND-WATER PATHWAY ALTERNATIVES

The five alternatives considered for ground-water remediation were:

G-1 No Action
G-2 Institutional Controls and Monitoring
G-3 Extraction Well System, Sheet Piling Containment, Precipitation/Flocculation Treatment, and Subsurface Disposal
G-4 Permeable Treatment Wall using Sheet Piling Containment
G-5 Permeable Treatment Wall using Sheet Piling Containment and Extraction and Reinjection of Manganese Hot Spots

Alternative G-1 - No Action

There is no cost associated with this alternative.
Years to Implement: 0

Under this alternative, no further action would be taken at the site. Ground-water contaminant levels would not be monitored, and no institutional actions would be taken to ensure that residents do not become exposed to contaminated ground water resulting from landfill operations. Retention of this alternative is required by the NCP.

Alternative G-2 - Institutional Controls and Monitoring

Total Capital Cost: $ 40,000

Total O&M Cost: $235,000

Additional Costs: $32,000

Total Alternative G-2 Cost: $ 307,000

Years to Implement: 0.5

This alternative would include restricted access to, and long-term monitoring of, areas with ground-water contamination exceeding clean-up levels. Access would be restricted by fencing and withdrawal of the landfill site from public uses to limit future use of the property as discussed in Soil Alternative S-2. In order to implement monitoring of ground-water contamination south of the landfill, BLM will seek the cooperation of Giant Industries (Giant) in allowing access for installing and taking samples from wells on Giant Property. Absent such cooperation, BLM will exercise its authorities under CERCLA to obtain access to Giant property for the purpose of taking samples and otherwise implementing this response action. Ground water would be monitored on the south of the landfill to evaluate changes in the plume geometry and contaminant concentrations. For purposes of cost analysis, it is assumed that a minimum of 18 wells would be monitored. Five new wells would be sampled quarterly for three years, semi-annually for two years, and then annually for 25 years. The existing wells would be monitored semi-annually for five years and annually for 25 years, as required by CERCLA. The wells would be monitored for the COCs identified in Table 2.

Alternative G-3 - Extraction Well System, Sheet Piling Containment, Precipitation/Flocculation Treatment and On-site Subsurface Disposal

Total Capital Cost: $552,200

Total O&M Cost: $899,000

Additional costs include remedial design ($72,600), inflation escalation, 5% contingency, and 10% internal project management.

Additional Costs: $859,200

Total Alternative G-3 Cost: $2,310,400

Years to Implement: 1.5

This alternative would meet the RAOs by withdrawing the contaminated ground water through an extraction well system, removing the contaminants in an on-site treatment system, and reinjecting the treated ground water into the subsurface. Based on the capture zone modeling presented in Appendix E of the Feasibility Study Report (FS, BLM, 1996), it is assumed that a total of 26 extraction wells would be required, oriented north-south, to capture the entire manganese plume. This alternative includes the installation of sheet piling along the western side of the plume. This containment structure is expected to increase the effectiveness of the extraction well system and decrease the remediation time by limiting the volume of uncontaminated ground water extracted. The withdrawn ground water would be treated in an on-site precipitation and flocculation system. The treated ground water would be returned to the aquifer through one of two subsurface disposal options, either an infiltration gallery or shallow injection wells. A specific treatment option for VOCs is not included because the VOC clean-up levels are expected to have been met through degradation in the aquifer, extraction, and handling on the surface. Influent concentrations would be monitored to verify that VOC concentrations remain below clean-up levels. If it is determined that VOC clean-up levels are not met by this system, a specific VOC treatment option can be added to the manganese treatment train. The exact number and locations of the extraction wells and disposal wells or infiltration gallery would be determined during the remedial design phase. However, the subsurface disposal locations must be designed to return ground water to the aquifer in locations that would not adversely affect the extraction system on GBR property south of the landfill. Metal-bearing sludge produced in the precipitation and flocculation system would be sent off-site for recovery or for disposal in a RCRA-permitted facility. For purposes of cost analysis, it is assumed that five wells, all currently in place, would be monitored quarterly for five years, semi-annually for five years, and then annually for the remainder of the 30-year O&M period to verify the effectiveness of the system. The monitoring frequency may be changed as necessary if EPA, BLM, and the State concur that site conditions have changed sufficiently to warrant a change in monitoring frequency. These frequencies are the expected level of activity at the site and thus were used for cost estimation purposes for the ROD. The wells would be monitored for VOCs, manganese, nickel, and general chemistry.

Alternative G-4 - Permeable Treatment Wall using Sheet Piling Containment

Total Capital Cost: $788,000

Total O&M Cost: $493,600

Additional costs include remedial design ($31,300), inflation escalation, 5% contingency, and 10% internal project management,

Additional Costs: $552,200

Total Alternative G-4 Cost: $1,833,800

Years to Implement: 1.5

This alternative would meet the RAOs by treating both VOCs and manganese in a "funnel and gate" system. The "gate" or treatment wall would be located at the down-gradient end of the plume. The containment walls, the "funnel," would be constructed of sealable sheet piling. The type of reactive material in the treatment wall (iron-based material or limestone) would be chosen during the design phase and would require further testing of both the iron-based material and the limestone (FS, Appendix G-1, BLM, 1996). A pilot test of this technology using iron as the reactive media resulted in a 99% reduction in VOCs and an 86% reduction in manganese. This system would not require removal of water from the aquifer or disposal of treated water and, therefore, would have no adverse affect on GBR's remedial efforts. However, it would require periodic replacement of the reactive material in the gate, and the spent material would be shipped off-site for either regeneration or disposal. The efficiency of the system would be monitored by wells placed down-gradient of the reactive wall. For purposes of cost analysis, it is assumed that five wells (two newly installed down-gradient of the treatment wall) would be monitored quarterly for five years, semi-annually for five years, and then annually for the remainder of the 30 year O&M period to verify the effectiveness of the system. The monitoring frequency may be changed as necessary if EPA, BLM, and the State concur that site conditions have changed sufficiently to warrant a change in monitoring frequency. These frequencies are the expected level of activity at the site and thus were used for cost estimation purposes for the ROD. The wells would be monitored for VOCs, manganese, nickel and general chemistry.

Alternative G-5 - Permeable Treatment Wall using Sheet Piling Containment and Extraction-and -Reinjection of Ground Water in Manganese Hot Spots

Total Capital Cost: $891,000

Total O&M Cost: $524,300

Additional costs include remedial design ($42,500), inflation escalation, 5% contingency, and 10% internal project management.

Additional Costs: $611,500

Total Alternative G-5 Cost: $2,026,900

Years to Implement: 1.5

This alternative would meet the RAOs by treating both VOCs and manganese in a funnel and reactive wall system. The manganese concentrations in the northern and southern lagoon hot spots would also be reduced by limited extraction and reinjection of ground water within those two areas. The extracted water would be reinjected in front of the treatment wall and would then pass through the treatment system. The wall's hydraulic conductivity would be engineered to accommodate the additional hydraulic head without interrupting the natural hydraulic gradient of the system. The treatment wall would be located at the down-gradient end of the plume. The containment walls would be constructed of sealable sheet piling. The type of reactive material in the reactive wall (iron-based material or limestone) would be chosen during the design phase and would require further testing of both the iron-based material and the limestone (FS, Appendix G-1, BLM, 1996). This system would not require net removal of water from the aquifer or disposal of treated water and therefore would have no adverse affect on GBR's remediation effort. However, it would require periodic replacement of the reactive material in the wall. Spent material would be shipped off-site for regeneration or disposal. The extraction and reinjection portion of the alternative would include a withdrawal well located in each lagoon area. The exact number and location of wells would be determined during the remedial design phase. The withdrawn ground water would be transported over the surface to the treatment reactive wall, and reinjected upgradient of the reactive wall so the water would be treated as it flows through the reactive wall. This would combine the advantages of short-term reduction of hot spot concentrations with the advantages of *in-situ* treatment, eliminating the need for surface treatment and subsurface disposal facilities. For purposes of cost analysis, it is assumed that five wells (two

newly installed down-gradient of the wall) would be monitored quarterly for five years, semi-annually for five years, and then annually for the remainder of the 30-year O&M period to verify the effectiveness of the system. The monitoring frequency may be changed as necessary if EPA, BLM, and the State concur that site conditions have changed sufficiently to warrant a change in monitoring frequency. These frequencies are the expected level of activity at the site and thus were used for cost estimation purposes for the ROD. The wells would be monitored for VOCs, manganese, nickel and general chemistry.

Selected Ground-Water Pathway Alternatives

Long-term ground-water monitoring data collected at the Lee Acres Landfill from March 1990 to November 1999 indicate that ground-water contamination levels are decreasing and the contaminant plume is receding. The decrease in the contaminant concentrations and plume size likely is attributable to closing the liquid waste lagoons to use, to closing the landfill, and to the process of natural attenuation of contaminants in the ground water. Due to the decreasing ground-water contamination levels, Alternative G-2 was modified by adding monitored natural attenuation as an element of the alternative, which is presented as Alternative G-2(a). Alternative G-2(a) is the selected remedy for the ground-water pathway.

Alternative G-2(a) - Institutional Controls, Natural Attenuation and Monitoring

Total Capital Cost: $0.00
Total O&M Cost: $235,000
Additional Costs: $32,000
Total Alternative G-2(a) Cost: $267,000
Years to Implement: 0.5

This alternative would include restricted access to, and long-term monitoring of, areas with ground-water contamination exceeding clean-up levels identified in Table 2. Reduction in concentration levels of COCs would be achieved through natural attenuation. Data indicate that natural attenuation is occurring for all COCs at the site, and MCLs have been met in most ground-water monitoring wells located outside the landfill cells area. Access would be restricted by

fencing and deed restrictions to limit future use of the property. To implement monitoring of ground-water contamination south of the landfill, BLM will seek the cooperation of Giant Industries (Giant) in allowing access for installing and taking samples from wells on Giant property. Absent such cooperation, BLM will exercise its authorities under CERCLA to obtain access to Giant property for the purpose of taking samples and otherwise implementing this response action. Ground-water monitoring on and south of the landfill would be conducted to evaluate changes in the plume geometry and contaminant concentrations. For purposes of cost analysis, it is assumed that a minimum of 14 wells would be monitored. The wells would be monitored for VOCs, manganese, nickel and general chemistry. Monitoring frequency will be determined during the remedy design.

If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with ARARs. Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance. This approach was selected to ensure that any contaminant increases that may occur are in fact a long-term trend rather than a short-term event.

Overall Protection of Human Health and the Environment

Alternative G-2(a) will protect human health and the environment by limiting access to contaminated ground water. Evaluation of current data (post 1993) indicates that the VOC plume concentrations are decreasing. For almost all sampling locations, the results are below MCLs for VOCs. The manganese plume has decreased in concentration, with the exception of BLM 57 in September 1997, which is under the landfill cells. No migration has been detected since 1993. BLM will continue to monitor ground water to ensure the continued effectiveness of the monitored natural attenuation remedy. BLM cannot limit access to ground water south of the landfill. However, it is expected that the GBR remedial project will be continuing. Since the VOC and manganese plumes have stopped moving, long-term monitoring would enable action to

be taken if migration occurs. This alternative would be protective of human health and the environment as long as contaminants continue to be attenuated in the subsurface.

Compliance with ARARs

VOC concentrations are expected to decrease below ARARs through the process of natural attenuation. Based on data collected through November 1999, it appears that the migration of manganese and nickel has halted and concentrations of manganese and nickel are also expected to decrease below ARARs through natural attenuation. Clean-up levels will be achieved in monitoring wells, the locations of which will be determined during remedy design.

Long-Term Effectiveness and Permanence

This alternative would maintain protection of human health after the remedial objectives have been met. This alternative would have less residual risk than Alternative G-1, because potential migration will be monitored. Natural attenuation will occur under either alternative. The other ground-water alternatives (G-3, G-4, and G-5) would actively decrease contaminant concentrations and may result in less residual risk than this alternative.

Short-Term Effectiveness

Implementation of this alternative would include no construction requiring exposure to contaminated media. Some of the monitoring wells required to continue to monitor the ground water are already in place, but additional monitoring wells may be required. Because this alternative relies on natural attenuation rather than treatment to reduce ground-water contamination, it may be less effective in the short-term than other alternatives.

Implementability

Additional monitoring wells on property adjacent to the landfill will require the cooperation of the adjacent property owner, or access pursuant to CERCLA authorities. The need to obtain such cooperation or access is not expected to limit the implementability of this alternative. This alternative would not preclude the undertaking of additional remedial actions at a later time. This alternative is expected to be more easily implemented than Alternatives G-3, G-4, and G-5.

Reduction of Toxicity, Mobility, or Volume of Contaminants

There would be no active reduction of TMV by this alternative, although the TMV of the VOCs and manganese is expected to continue to decrease due to natural attenuation. Based on data collected through November 1999, ground-water monitoring indicates that overall, manganese concentrations are declining, indicating that it is being naturally attenuated. Alternatives G-3 through G-5 will actively treat the contaminants and will reduce the TMV of all of the contaminants more than Alternatives G-1 or G-2.

Cost

The cost associated with this alternative is $267,000 almost all due to O&M costs associated with monitoring wells for 30 years. The total cost is much less than the costs associated with Alternatives G-3 through G-5.

12.0 SELECTED REMEDIAL ALTERNATIVES

12.1 Selected Soil Alternative

The selection of the remedy for the soil pathway was based on the five balancing, two threshold and two modifying criteria. Table 4 presents each alternative in relation to each criterion.

The selected alternative for landfill soil remediation is Alternative S-5(a) - Institutional and Surface Controls, Engineered Low Permeability Cap (Capillary Barrier) on the Western Portion of the Landfill, and Installation of Lysimeters to Monitor Possible Leachate Generation. The cap will minimize leaching of contamination from the soil by reducing or eliminating water infiltration. The effectiveness of the system in minimizing leachate will be monitored by lysimeters. Institutional and surface controls will be used to protect the integrity of the cap and monitoring system, and to prevent exposure to contamination. This alternative provides long-term protection of human health and the environment with a cost-effective remedy that was selected on the basis of site-specific, long-term monitoring data.

The engineered low permeability cap was developed at Sandia National Laboratories (Appendix G-2, BLM FS, 1996) and tested on-site in a pilot plot. It is an innovative technology consisting of a capillary barrier specifically designed for arid climate landfills. An 18-month large-scale test of the capping technology was conducted at the northern lagoon at the Lee Acres Landfill. The results of the test demonstrated that the cap should be effective at the Lee Acres Landfill Site. The EPA and NMED, by their concurrence in this ROD, approve installation of the capillary barrier cap at the Lee Acres Landfill.

BLM will continue to monitor ground water to ensure the effectiveness of the capillary barrier cap and natural attenuation remedy. If monitoring data indicate a long-term (i.e., two years) trend of significantly increasing contaminant concentrations (for contaminants listed in Table 2), then an evaluation of the remedy performance will be conducted to determine the cause, and appropriate corrective actions will be taken, if needed. Specific monitoring well locations outside the landfill (waste containment) boundary will be determined during remedy design for the purpose of monitoring compliance with ARARs. Monitoring well locations within the landfill boundary also will be determined during remedy design for the purpose of monitoring cap performance. Figures 16, 17 and 18 illustrate the location of the pilot project and the recommended cap location.

Surface water run-on and run-off control structures will be constructed to divert run-on and maximize run-off. Specific surface water control features will be determined during remedy design, and their ongoing performance ensured through long-term monitoring and maintenance.

An area of 134.68 acres of public land, which includes the Lee Acres Landfill and a buffer area around it, was withdrawn by BLM from surface entry and mining for a period of 50 years (see 62 FR 2177, Public Land Order No. 7234). At the end of the 50 year period of the withdrawal, if hazardous substances remain at the Lee Acres Landfill above levels that prevent unrestricted use, the withdrawal will be extended or other controls will be implemented.

The area withdrawn is described as follows (see Figure 19 for a map of the withdrawn area):

New Mexico Principal Meridian
T. 29N., R. 12W.,
Sec. 21, lots 6 and 7 (everything southeast of County Road No. 5569);
Sec. 22, lot 5 (everything southeast of County Road No. 5569);
lot 6 W\1/2\, lot 11 W\1/2\, and lot 12;
Sec. 28, lot 2.

The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could disturb the integrity of the containment system, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill Site.

Discretionary restrictions on the use of the land at the Lee Acres Landfill Site that are in compliance with the current withdrawal, will be implemented in accordance with BLM's current resource management plan. Resource management plans enable BLM to manage public lands and resources in a balanced manner, as directed by the Federal Land Policy and Management Act (FLPMA) of 1976. Resource management plans also allow BLM to analyze impacts to public lands, as prescribed under the National Environmental Policy Act (NEPA) of 1969.

The prevailing resource management plan for the Lee Acres Landfill Site is the Farmington Resource Management Plan and Final Environmental Impact Statement, dated September 2003. The Final RMP/EIS does not contain any changes to current management of the established Lee Acres withdrawal. The restrictions of this withdrawal will remain to protect public health, welfare and the environment from the hazardous materials that remain onsite, for a period of fifty years. At the end of the 50 year period of the withdrawal, if hazardous substances remain at the Lee Acres Landfill above levels that prevent unrestricted use, the withdrawal will be extended or other controls will be implemented.

All future proposals for Lee Acres Landfill Site will have to be in accordance with the current withdrawal as well as the current resource management plan. Any person or entity proposing an activity within the Lee Acres Landfill site would do so through an application to the Farmington Field Office. This application would be reviewed for conformance with the withdrawal and the current resource management plan, which refers to this Record of Decision. Only those applications that are in conformance with the provisions of these documents will be subject to further NEPA review and analysis. Final determination on any future proposed actions at the Lee Acres Landfill Site will be made by the Farmington Field Office, following a proposal-specific NEPA analysis that will include consultation with the appropriate governmental entities.

BLM is responsible for implementing, maintaining, and monitoring of the surface and institutional controls for the duration of the remedies selected in the ROD and for as long as hazardous substances remain on site above levels that prevent unrestricted use. BLM will submit to EPA a monitoring report on the status of the surface and institutional controls at least annually. The report, at a minimum, will contain an evaluation of whether all of the surface and institutional controls requirements of the ROD are being met, including the results of a visual field inspection of all areas subject to surface and institutional controls, and a description of any deficiencies in the surface and institutional controls and measures that have been or will be taken to correct the deficiencies. BLM will notify EPA in writing within 72 hours of discovery of any activity that is inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least 45 days in advance of any proposals for major land use changes inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least six months prior to any transfer, sale, or lease of any property subject to surface or institutional controls under the terms of this ROD and consult with EPA on specific wording for property transfer or lease documents. BLM will notify EPA of any activities that violate the restrictions in the land use plan described above, the effect of the activities on the protectiveness of the remedy, and any proposed actions to address the violation of the restrictions. BLM also will consult with EPA prior to proposing any changes in the restrictions in the land use plan described above.

12.2 Selected Ground Water Alternative

Selection of the remedy for the ground-water pathway was based on the five balancing, two threshold and two modifying criteria. Table 5 presents each alternative in relation to the nine criteria.

The selected remedial alternative for ground water is G-2(a) - Institutional Controls, Natural Attenuation with Monitoring. Natural attenuation will be relied upon to achieve clean-up levels for ground water. Ground water will be monitored to document that natural attenuation is occurring. Institutional controls will be used to prevent exposure to ground-water contamination until cleanup levels are achieved. The institutional controls include the withdrawal discussed in Section 12.1 above, which will be implemented in accordance with the finalized Resource Management Plan/Final Environmental Impact Statement, expected to be finalized in May 2003.

Monitored natural attenuation was selected for the Lee Acres Landfill based on ground-water monitoring data collected from 1993 through 1999. These data indicate that the VOC plume concentrations are decreasing. For almost all sampling locations, the results are below MCLs for VOCs. The manganese plume has decreased in concentration, with the exception of BLM 57 in September 1997, which is under the landfill cells. No migration has been detected since 1993. BLM will continue to monitor ground water to ensure the continued effectiveness of the monitored natural attenuation remedy. Monitoring frequency will be determined during the remedy design.

13.0 STATUTORY DETERMINATION

Under CERCLA Section 121, BLM and EPA must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), are cost-effective, utilize permanent solutions, and use alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that

permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element.

The selected remedies protect human health and the environment through capping the landfill to prevent leachate production from the soils, and monitoring future movement or chemical changes in the ground water.

The selected remedies of capping and monitored natural attenuation will comply with all applicable or relevant and appropriate requirements (ARARs). The ARARs are presented in Table 3, and clean-up levels are presented in Table 2.

The selected remedy is cost-effective in terms of its long-term effectiveness and permanence, reduction in toxicity and mobility, and short-term effectiveness. The selected remedy is consistent with EPA's presumptive remedy for landfills (i.e., containment), and the cover design takes into consideration the expected performance of landfill covers in an arid climate such as the area in which the site is located. In addition, based on years of ground-water monitoring data, natural attenuation of the ground-water contamination is expected to continue, and clean-up levels achieved within a reasonable timeframe.

The selected remedy provides the best balance of trade-offs with respect to the balancing criteria set out in section 300.436(f)(1) of the NCP, such that it represents the maximum extent to which permanence and treatment can be utilized at this site. While treatment is not being utilized at the site, the containment remedy provides permanent reduction of low-level risk from the landfill contents. Monitored natural attenuation will provide a permanent reduction in risk from the ground-water pathway. The contaminant source at the Lee Acres Landfill is not considered principal threat waste, but rather is high-volume, low-risk waste such as is discussed in the NCP as appropriate for engineering controls (see section 300.430(a)(1)(iii)(B) of the NCP, which states, that...."EPA expects to use engineering controls, such as containment, for waste that poses a relatively low long-term threat or where treatment is impracticable.")
Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will

be conducted no less often than each five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

14.0 DOCUMENTATION OF SIGNIFICANT CHANGES

In the Proposed Plan, Soil Alternatives S-4 and S-5 included a provision for hot spot bioremediation of BTEX-contaminated lagoon sediments in the event it was needed to increase the effectiveness of the low-permeability cap. Based on the results of the capillary barrier pilot study conducted by the Department of Energy's Sandia National Laboratory, EPA, BLM, and the State of New Mexico concluded that the cap is performing as expected, and that hot spot bioremediation of the lagoon area sediments is not necessary. Accordingly, Alternative S-5 was modified by eliminating the hot spot bioremediation element, and presented as Alternative S-5(a), which is the selected remedy for the soil pathway.

As a result of the ground-water monitoring data, Alternative G-2 from the Proposed Plan also was modified by adding monitored natural attenuation as an element of the remedy, and is presented as Alternative G-2(a) in this Record of Decision. Data collected through November 1999 support the conclusion that contamination levels are continuing to decline through natural attenuation, with the exception of BLM 57, which is located directly beneath the landfill cell. The concentrations of 1,2-DCE increased through May 1999, and the November 1999 sampling indicates reduction in concentrations. A report being prepared by UNM will evaluate these conditions. It is suspected that these data are related to the installation of the capillary barrier pilot cap. Because of the increase in concentrations, monitoring frequency has been increased to quarterly and piezometers have been installed and sampled until trends can be verified.

BLM and EPA believe that these changes to the alternatives outlined in the Proposed Plan could have been reasonably anticipated by the public from the time the Proposed Plan and RI/FS Report were released for public comment to the final selection of the remedy. For the soil alternative, the Proposed Plan stated that "...further sampling may prove that the BTEX compounds are being naturally degraded, which would eliminate the necessity for bioremediation." The possibility that

bioremediation might not be implemented was noted in the Proposed Plan, and sampling data confirm that the treatment option is not needed.

For the ground-water pathway, Alternative G-2(a) includes a monitored natural attenuation element rather than ground-water monitoring only (Alternative G-2), which was the preferred alternative in the Proposed Plan. By identifying monitored natural attenuation as a remedial action for the ground-water, clean-up levels are identified and must be attained. While inclusion of monitored natural attenuation in the remedy does not change in any way the technical approach to cleaning up the ground water, it does result in the identification of site-specific remediation objectives within a specified timeframe. BLM and EPA believe that identifying clean-up levels for ground-water contaminants provides a more comprehensive remedy than Alternative G-2, but, from a technical standpoint, it does not significantly differ from the preferred alternative identified in the Proposed Plan.

Finally, in the proposed plan, Alternative S-5 was described to cover 62 acres. Upon further study, BLM, EPA and NMED have agreed that the cap size for Alternative S-5(a) will be reduced from 62 acres to about 25 acres. This cap size reduction necessitates the installation of lysimeters to monitor for potential leachate production.

Table 4 Alternative Criteria Evaluation Comparison Table for Soil Page 1

Alternative	Long-term effective-ness	Short-term effective-ness	Implementability	Reduction of TMV	Cost	Overall Protection of Human Health and the Environment	Compliance with ARARs	State Acceptance	Public Acceptance
S-1 No Action	Not Effective	Not Effective	Easily implemented	Will not reduce TMV	$0.00	Does not eliminate the potential for leaching so will not be protective of human health and the environment	Does not comply with ARARs		
S-2 Institutional and Surface controls	Not Effective	Not Effective	Easily implemented	Will not reduce TMV	$0.1 million	Will limit access, but not eliminate the potential for leaching, therefore is not completely protective of human health and the environment	Does not comply with ARARs		
S-3 Institutional and Surface Controls and Capping with Flexible Membrane Liner	Expected to be fully effective for the long-term	Fully effective	Installation and maintenance is more complicated than the other alternatives, however managerial implementation is similar to the other capping options	Fully complies	$12.26 million	Expected to be fully protective of human health and the environment	Fully complies with ARARs for soil		
S-4 Institutional and Surface Controls, and Capping with an Engineered, Low Permeability Cap(as defined in the New Mexico Solid Waste Regulations) over the Western Portion of the Landfill, with Lysimeters to Monitor Possible Leachate Production	Expected to be fully effective for the long-term	Fully effective	Easily implemented, moderate level of difficulty in installation and maintenance	Fully complies	$2.7 million	Expected to be fully protective of human health and the environment	Fully complies with ARARs for soil		

Table 4 Alternative Criteria Evaluation Comparison Table for Soil Page 2

S-5 Institutional and Surface Controls, and Capping with Engineered Low Permeability Cap (Capillary Barrier Cap) on the Western Portion of Landfill, Lysimeters to Monitor Possible Leachate Production	Expected to be fully effective for the long-term	Fully	Easily implemented	Fully complies	$1.9 million	Expected to be fully protective of human health and the environment	Fully complies with ARARs for soil		

Table 5 Alternative Criteria Evaluation Comparison Table for Ground Water

Alternative	Long-term effectiveness	Short-term effectiveness	Implementability	Reduction of TMV	Cost	Overall Protection of Human Health and the Environment	Compliance with ARARs	State Acceptance	Public Acceptance
G-1 No Action	Not Effective	Not Effective	Easily Implementable	Does not reduce TMV	$0.00	Not protective of human health or the environment	Does not comply with ARARs		
G-2 Institutional Controls, Natural Attenuation with Monitoring	Effective as long as site ground water conditions do not change	Effective as long as site ground water conditions do not change	Land ownership may present some difficulty in obtaining agreements	Does not actively reduce TMV, but will passively reduce TMV	$0.31 million	Protective of human health and the environment providing no site ground water conditions change	Expected to fully comply		
G-3 Extraction Well System, Sheet Piling Containment, Precipitation/ Flocculation Treatment and On-site Subsurface Disposal	Fully effective, however will dewater alluvial aquifer, potentially affecting down-gradient recovery program	Fully effective	Land ownership may present some difficulty in obtaining agreements	Actively reduces TMV	$2.3 million	Protective of human health and the environment	Expected to fully comply with ARARs		
G-4 Permeable Treatment Wall using Sheet Piling Containment	Full effective, will not dewater alluvial ground water	Fully effective	Land ownership may present some difficulty in obtaining agreements	Actively reduces TMV	$1.8 million	Protective of human health and the environment	Expected to fully comply with ARARs		
G-5 Permeable Treatment Wall using Sheet Piling Containment and Extraction-and-Re-injection of Ground water in Manganese Hot Spots	Fully effective, however will dewater alluvial aquifer, potentially affecting down-gradient recovery program	Fully effective	Land ownership may present some difficulty in obtaining agreements	Actively reduces TMV	$2.0 million	Protective of human health and the environment	Expected to fully comply with ARARs		

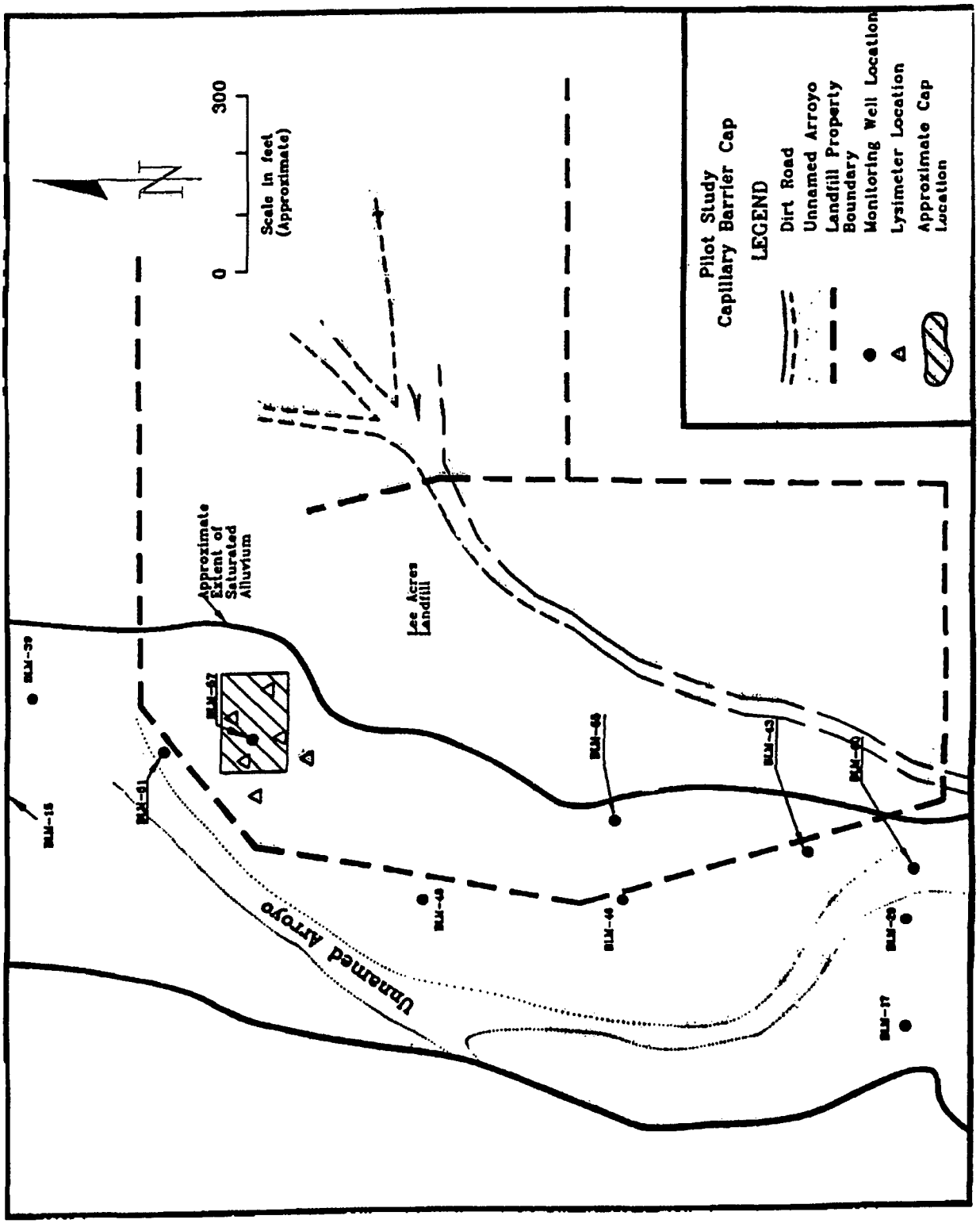

Figure 16 Location of Capillary Barrier Pilot Project

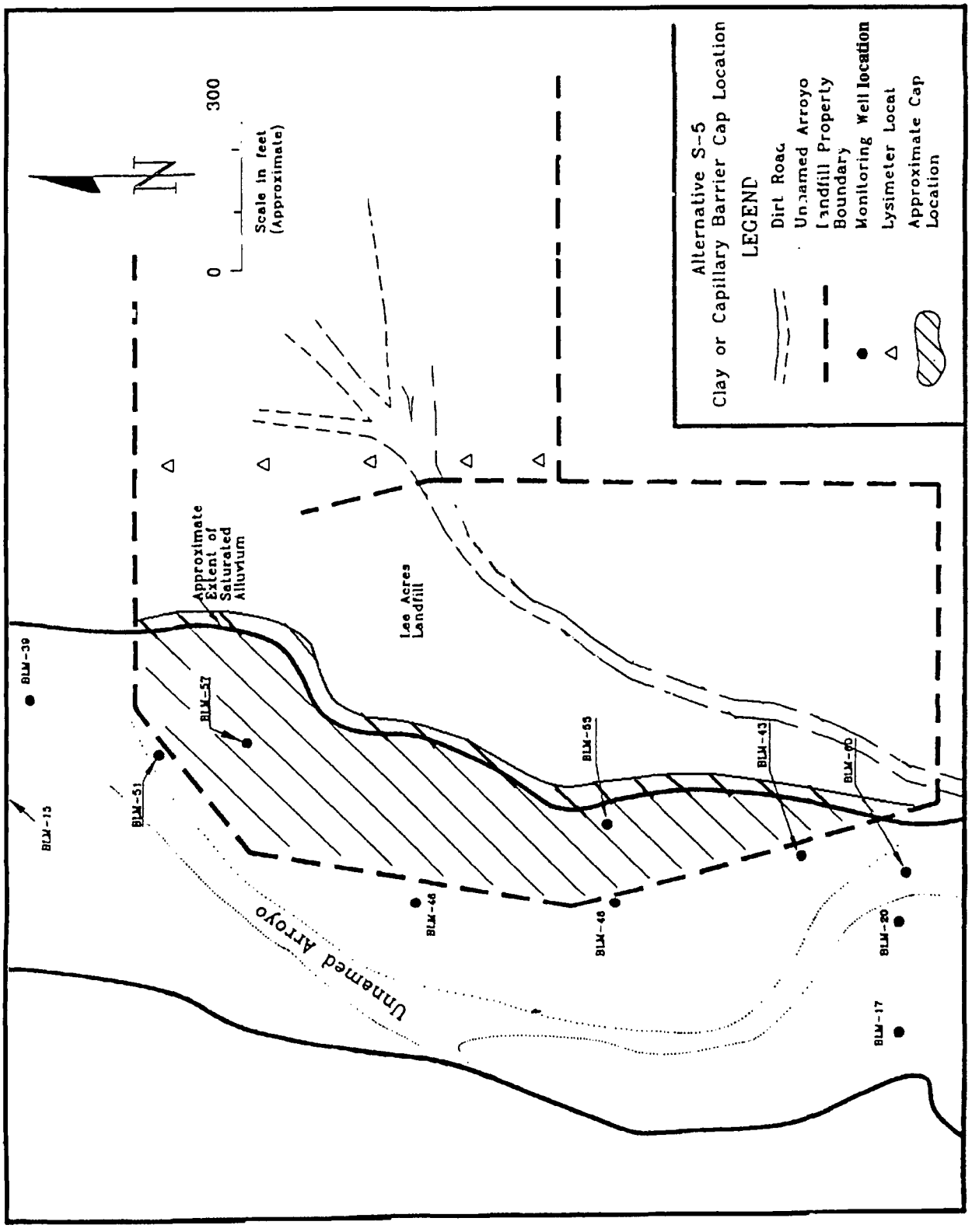

Figure 17 Landfill Cap and Possible Lysimeter Location Alternative

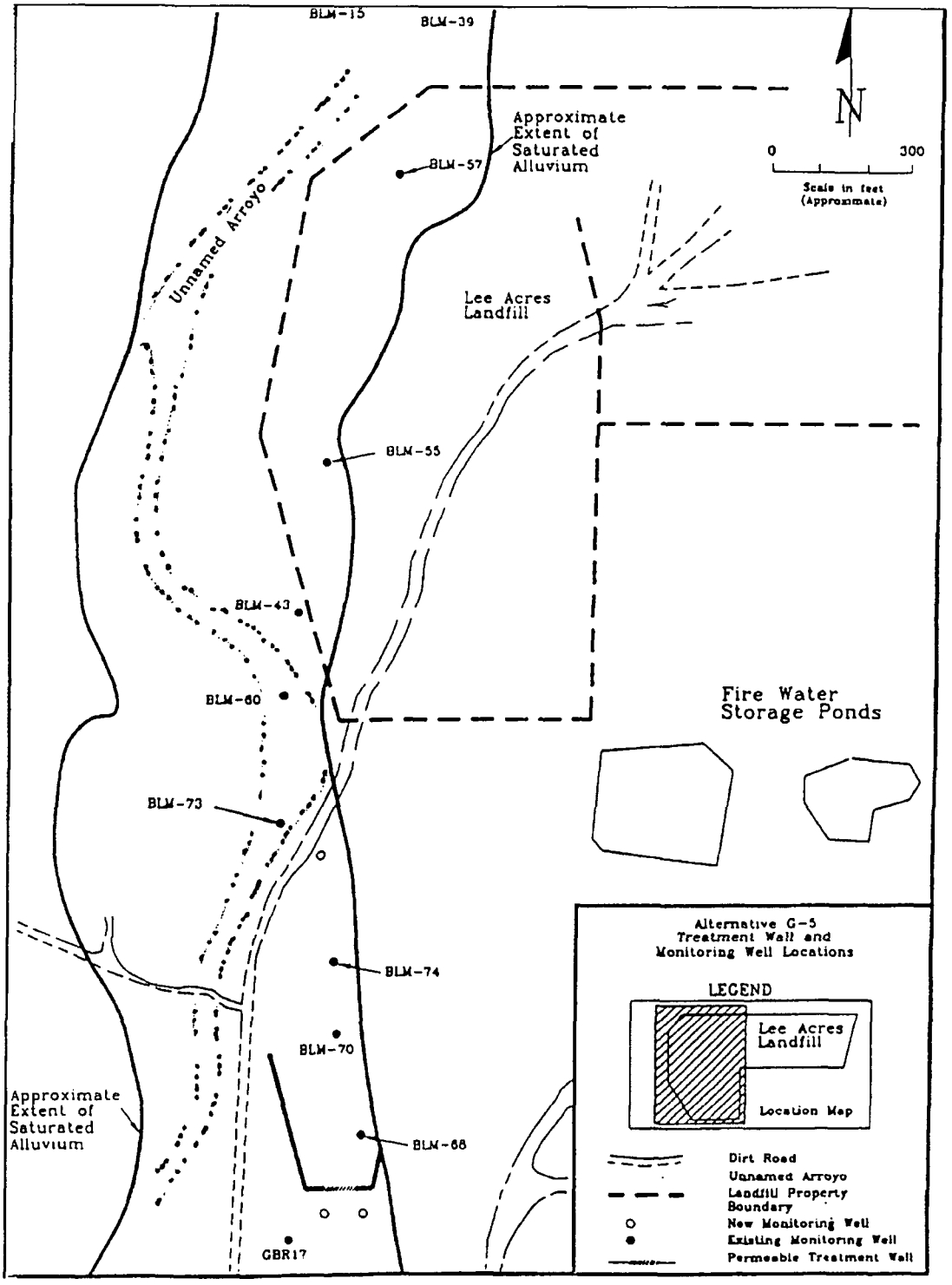

Figure 18 Alternative G-5, Sheet Piling and Reactive Wall Location

Lee Acres Landfill

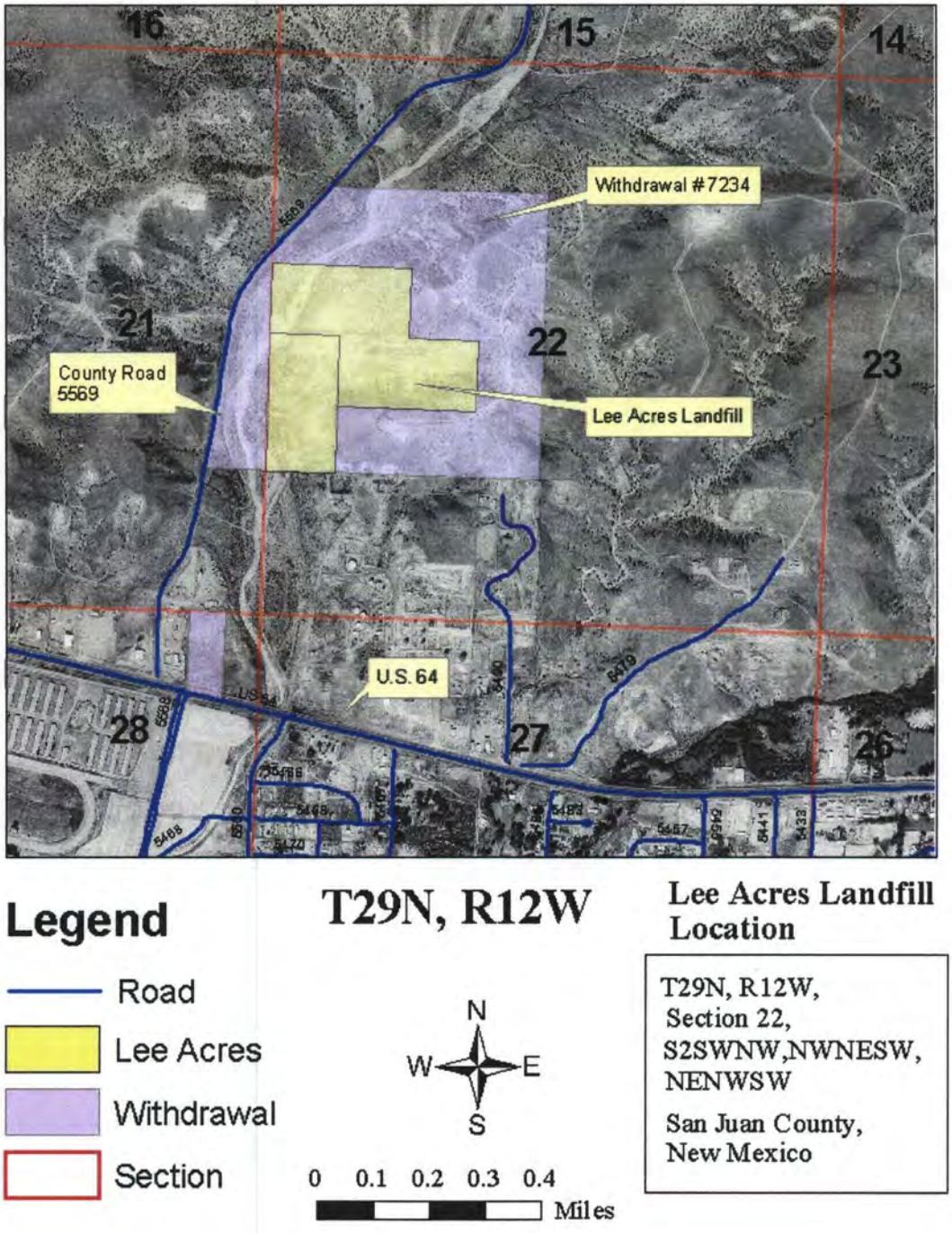

Figure 19 Lee Acres Landfill and Land Withdrawal Location

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15.0 GLOSSARY OF TERMS

ARARS.....Applicable or Relevant and Appropriate Requirements

BH.....Borehole

BLM.....Bureau of Land Management

BTEX.....Benzene, Toluene, Ethyl benzene, Xylene

CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act

COC.....Contaminants of Concern

COPC.....Contaminants of Potential Concern

DCE.....Dichloroethene

DOI.....Department of the Interior

EPA..... Environmental Protection Agency

ES.....Executive Summary

FML.....Flexible Membrane Liner

FS .....Feasibility Study

GBR.....Giant Bloomfield Refinery

MCL.....Maximum Contaminant Level

MDL.....Minimum Detection Level

mg/l.....Milligrams per liter (parts per million)

MOU..... Memorandum of Understanding

NCP.....National Contingency Plan

NMED..... New Mexico Environment Department

NMEID.....New Mexico Environmental Improvement Department

NMOCD.....New Mexico Oil Conservation Department

NMWQCC.....New Mexico Water Quality Control Commission

NPL.....National Priorities List

O & M.....Operation and Maintenance

PCE.....Tetrachloroethene

PRG.....Preliminary Remediation Goals

RAO.....Remedial Action Objectives

RI..... Remedial Investigation

RIR.....Remedial Investigation Report

SARA.....Superfund Amendments and Reauthorization Act

SDWA.....Safe Drinking Water Act

SVOC .....Semi-volatile Organic Compounds

TCE.....Trichloroethene

TMV.....Toxicity, Mobility, and Volume

:g/l.....micrograms per liter (parts per billions)

VOC.....Volatile Organic Compounds

16.0 LEE ACRES REGULATORY CHRONOLOGY

Date	Event
May 1, 1962	Lee Acres officially opened
Apr. 25, 1980	San Juan County Development Plan for landfill includes provisions for combined sludge and dead animal pit.
Nov. 10, 1980	NMEID found refuse pit almost full and not compacted or covered at required frequency. Suggested either additional land for expansion or new location.
Aug. 24, 1981	NMEID submits to EPA Potential Hazardous Waste Site Inspection Report, reporting surface impoundment with liquids, sludge, oily wastes, drilling fluids and drilling muds.
Sept. 9, 1981	NMEID reported noncompliance regarding required 2 feet of final cover over original landfill area.
Apr. 18, 1985	Lagoon breach and vapor release incident occurred. Eleven people treated for hydrogen sulfide poisoning.
May 8, 1985	BLM compliance exam reported sludge pit was fenced and a "No Dumping" sign posted.
Jan. 14, 1986	NMEID inspection reported the liquid waste lagoon was 96 to 97% evaporated
Apr. 24, 1986	NMEID inspection reported the liquid waste lagoon was completely covered with soil.
Apr. 25, 1986	Lee Acres Landfill officially closed by BLM suspending leases, except for a 5 acre transfer station.
Oct. 21, 1986	NMEID Administrative Order issued for BLM to provide water to residents, and prepare plans to investigate, cleanup, and monitor ground water.
Nov. 5, 1986	BLM begins bottled water delivery to 13 identified residents.
Dec. 1986	BLM fenced landfill to prevent direct contact.
Dec. 24, 1986	BLM and Lee Acres Water Users Assoc. enter agreement to permanently hook up Lee Acres residents to the community supply system.
1987	Lee Acres residents hooked up to community water system.
March 1989	BLM conducts preliminary investigation.

Dec. 19, 1989	Clean Water Act Sec. 404 nationwide permit received for arroyo erosion control construction.
Aug. 28, 1990	Lee Acres Landfill placed on the National Priorities List by EPA.
Sept. 13, 1991	CERCLA 107 letters issued by EPA to BLM, San Juan County and Giant Bloomfield Refinery.
Jan. 1993	BLM, EPA and NMED enter into a technical MOU for completion of the Remedial Investigation.
Sept. 1993	Final Remedial Investigation Report.
May 19, 1995	EPA and NMED approve Remedial Investigation.
May 8, 1996	EPA and NMED approve Feasibility Study.
Sept. 1996	EPA and NMED approve Proposed Plan
Nov. 16, 1996	Public review and comment period completed.