

GW - 001

**Facility-Wide GW
Monitoring Report
(2)**

2010 – Present

October 7, 2011

RECEIVED OCD

2011 OCT 11 P 11:45

John E. Kieling, Acting Bureau Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, NM 87505

Certified Mail #: 7009 2250 0002 3833 5032

Re: Response to September 29, 2011 APPROVAL
Facility-Wide Groundwater Monitoring Plan – June 2011
Western Refining Southwest, Inc., Bloomfield Refinery
EPA ID# NMD089416416
HWB-WRB-11-005

Dear Mr. Kieling:

Western Refining Southwest, Inc., Bloomfield Refinery has prepared the following response to your comment (dated September 29, 2011) on the above referenced facility-wide monitoring plan.

NMED's Comment – Appendix A (Facility Well Logs), MW-67

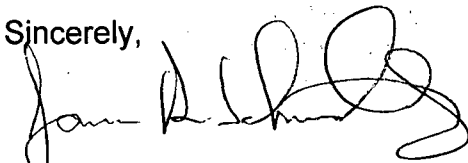
Well MW-67 is missing page 1 of 2 in the well logs. Provide replacement page(s) for the missing well information for MW-67 by October 14, 2011.

Western's Response

A copy of the complete well log for MW-67 is attached.

If you have questions or need any additional information, please feel free to contact me at (505) 632-4171.

Sincerely,



James R. Schmaltz
Health, Safety, Environmental, and Regulatory Director
Western Refining Southwest, Inc., Bloomfield Refinery

cc: D. Cobrain – NMED HWB
L. Tsinnajinnie – NMED HWB
C. Chavez - OCD
A. Hains - WNR



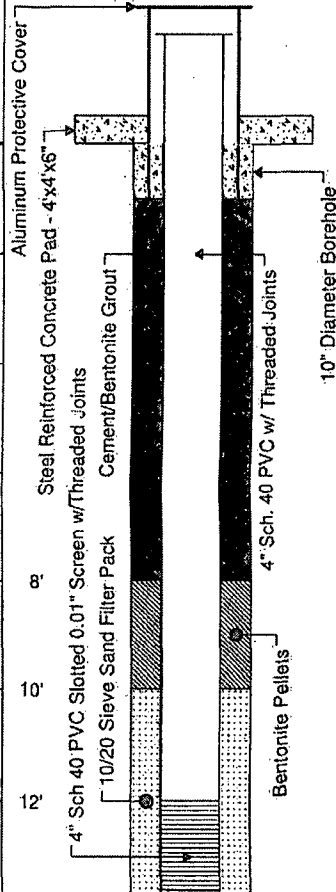
WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #4, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N 36°42.029' W 107°58.194'

Total Depth: 23' bgl
Ground Water: Saturated @ 18' bgl
Elev., TOC (ft. msl): 5523.312
Elev., PAD (ft. msl): 5520.676
Elev., GL (ft. msl): 5520.542
Site Coordinates:
 N 36°42'01.73369"
 W 107°58'11.54409"

Well No.: MW-67 (SWMU10-9)
Start Date: 8/26/2010 1230
Finish Date: 8/26/2010 1630

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
0								Ground Surface	
0.5	1345		G/4V/4E/6J		0.7		80	Silty Sand (SM) Very fine grain, loose, dry, brown	
1.5	1400		G/2V/2E/3J		0.7		80	Silty Sand (SM) Similar to above	
3					0.8		80		
5					1.0		90	Silty Sand (SM) Similar to above, no odor	
7					3.0		40	Gravelly Sand (SC) Fine to medium grain, loose, damp, gray, no odor	
9					0.7		20	Gravelly Sand (SW) Similar to above, no odor	
11					0.3		30	Gravelly Sand (SW) Similar to above, no odor	
13					0.5		80	Gravelly Sand (SW) Similar to above, no odor	



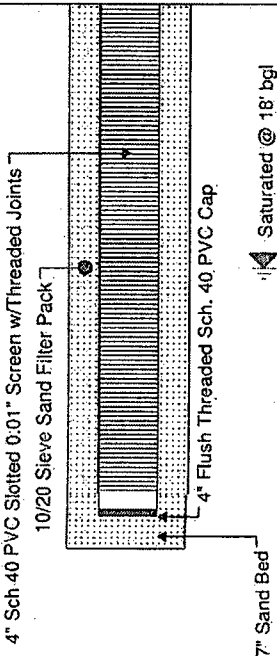


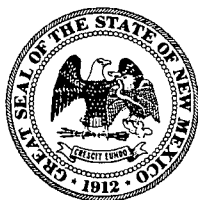
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Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
15					0.5		60	Gravelly Sand (SW) Fine to medium grain, loose, damp, gray, no odor	
17	16-18'	1410	G/2V/ 2E/3J	18'	1.0		10	Gravelly Sand (SW) Similar to above, no odor	
19					-		20	Gravelly Sand (SW) Similar to above, clayey, saturated, no odor	
21							20	Gravelly Sand (SW) Similar to above, saturated, no odor	
23								Clay (CH) High plasticity, very stiff, damp to dry, yellowish brown, no odor	
25								Total Depth = 23' BGL	
27									
29									



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us



DAVE MARTIN
Secretary

BUTCH TONGATE
Acting Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 29, 2011

Mr. Randy Schmaltz
Environmental Manager
Western Refining, Southwest, Inc.
Bloomfield Refinery
P.O. Box 159
Bloomfield, New Mexico 87413

**RE: APPROVAL
FACILITY-WIDE GROUNDWATER MONITORING PLAN – JUNE 2011
WESTERN REFINING SOUTHWEST INC., BLOOMFIELD REFINERY
EPA ID# NMD089416416
HWB-WRB-11-005**

Dear Mr. Schmaltz:

The New Mexico Environment Department (NMED) has received Western Refining Southwest, Inc., Bloomfield Refinery's (Western) *Facility-Wide Groundwater Monitoring Plan* (FWGMP) dated June 2011. NMED has reviewed the FWGMP and hereby issues this Approval with the following comment.

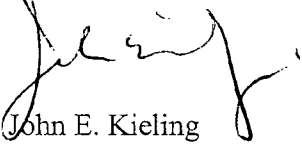
1. Appendix A (Facility Well Logs), MW-67:

NMED's Comment: Well MW-67 is missing page 1 of 2 in the well logs. Provide replacement page(s) for the missing well information for well MW-67 by **October 14, 2011**.

R. Schmaltz
September 29, 2011
Page 2 of 2

If you have any questions regarding this letter, please contact Leona Tsinnajinnie of my staff at (505) 476-6057.

Sincerely,



John E. Kielling
Acting Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
L. Tsinnajinnie, NMED HWB
C. Chavez, OCD
A. Hains, Western Refining Company, El Paso, Texas

File: HWB-WRB-11-005 and Reading 2011

Leona Tsinnajinnie
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Carl Chavez
NM Energy, Minerals & Natural Resources
Oil Conservation Division, Env Bureau
1220 South St. Francis Drive
Santa Fe, NM 87505

Certified Mail#: 7010 1870 0002 6760 0238

(NMED)

Certified Mail#: 7010 1870 0002 6760 0221

(OCD)

July 29, 2011

RE: Notification to Conduct Annual Groundwater Monitoring
Western Refining Southwest, Inc. - Bloomfield Refinery
EPA ID# NMD089416416
GW - 001

RECEIVED
2011 AUG - 1 A 11:00

Dear Ms. Tsinnajinnie and Mr. Chavez,

Western Refining Southwest, Inc. - Bloomfield Refinery (Western) would like to conduct the Annual Sampling Event at the Bloomfield Refinery starting the week of August 8th, 2011. Based on the number of sample locations included as part of the Annual Monitoring Event, we anticipate that sampling activities will be completed during the week of August 22, 2011.

Locations from which samples will be collected during this sampling event include the Refinery Complex, North Boundary Barrier, San Juan River Bluff, and from the San Juan River. All annual groundwater monitoring activities will be performed pursuant to the guidelines outlined in the approved Facility-Wide Groundwater Monitoring Plan dated June 2011.

Prior to collecting groundwater samples, depth-to-groundwater and separate phase hydrocarbon (SPH) thickness measurements will be collected. Pumps equipped in each active recovery well will be removed and groundwater levels will be allowed time to stabilize prior to collecting the depth-to-groundwater and SPH thickness measurements.

If any representatives from NMED and/or OCD would like to participate, please contact me so that safety orientation training can be scheduled for incoming personnel. If you have any questions or need additional information, please feel free to contact me at (505) 632-4166.

Sincerely,



Kelly Robinson
Environmental Supervisor
Western Refining Southwest, Inc. - Bloomfield Refinery

Cc: Randy Schmaltz - Environmental Manager - Bloomfield Refinery

June 29, 2011

John Kieling, Acting Bureau Chief
New Mexico Environmental Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Carl Chavez
NM Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South Saint Francis Drive
Santa Fe, NM 87505

UPS Tracking #: 1ZF9F6470199766022

UPS Tracking #: 1ZF9F6407095553232

Re: Facility-Wide Groundwater Monitoring Plan – June 2011
Giant Refining Company, Bloomfield Refinery Order No. HWB 07-34(CO)
EPA ID#: NMD089416416
NMOCD Discharge Permit #: GW-001

Dear Mr. Kieling and Mr. Chavez:

Western Refining Southwest Inc. - Bloomfield Refinery is submitting the above referenced Facility-Wide Groundwater Monitoring Plan (Plan) pursuant to the July 2007 HWB Order and the Bloomfield Refinery Facility Discharge Permit GW-001. The modifications made to the June 2011 version of the Plan include the following:

- Three additional RCRA investigation wells that were installed in 2010 as part of the on-going RCRA investigation activities have been added to the monitoring program as previously directed by NMED.
- Modifications to the River Terrace area groundwater sampling program as approved by NMED in the letter *Proposals to Modify Monitoring at the River Terrace Area* dated March 15, 2011 have been incorporated into the June 2011 Plan.
- Historic data summary tables included in previous Plan up-dates as Appendix A through Appendix G and Appendix E have been removed from the Plan.

The Facility-Wide Groundwater Monitoring Plan serves as a resource that outlines the groundwater monitoring activities conducted at the Bloomfield Refinery. The results and conclusions from these activities are included in the *Groundwater Remediation & Monitoring Annual Report* which is submitted to NMED and OCD by April 15th of each calendar year. Based on a previous phone conversation with NMED, it was agreed that that information pertaining to historic monitoring data would provide more value if it were included in the annual Groundwater Remediation and Monitoring Reports rather than as part of on-going Facility-Wide Groundwater Monitoring Plan up-dates. Therefore with this said, Appendix A through Appendix E and Appendix G originally included in prior Plan updates have since been removed from this submittal.

If you have any questions or would like to discuss the Investigation Work Plan, please contact me at (505) 632-4171 or Randy.Schmaltz@wnr.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Kelly Robinson". The signature is fluid and cursive, with the first name "Kelly" and last name "Robinson" clearly distinguishable.

Kelly Robinson
Environmental Supervisor

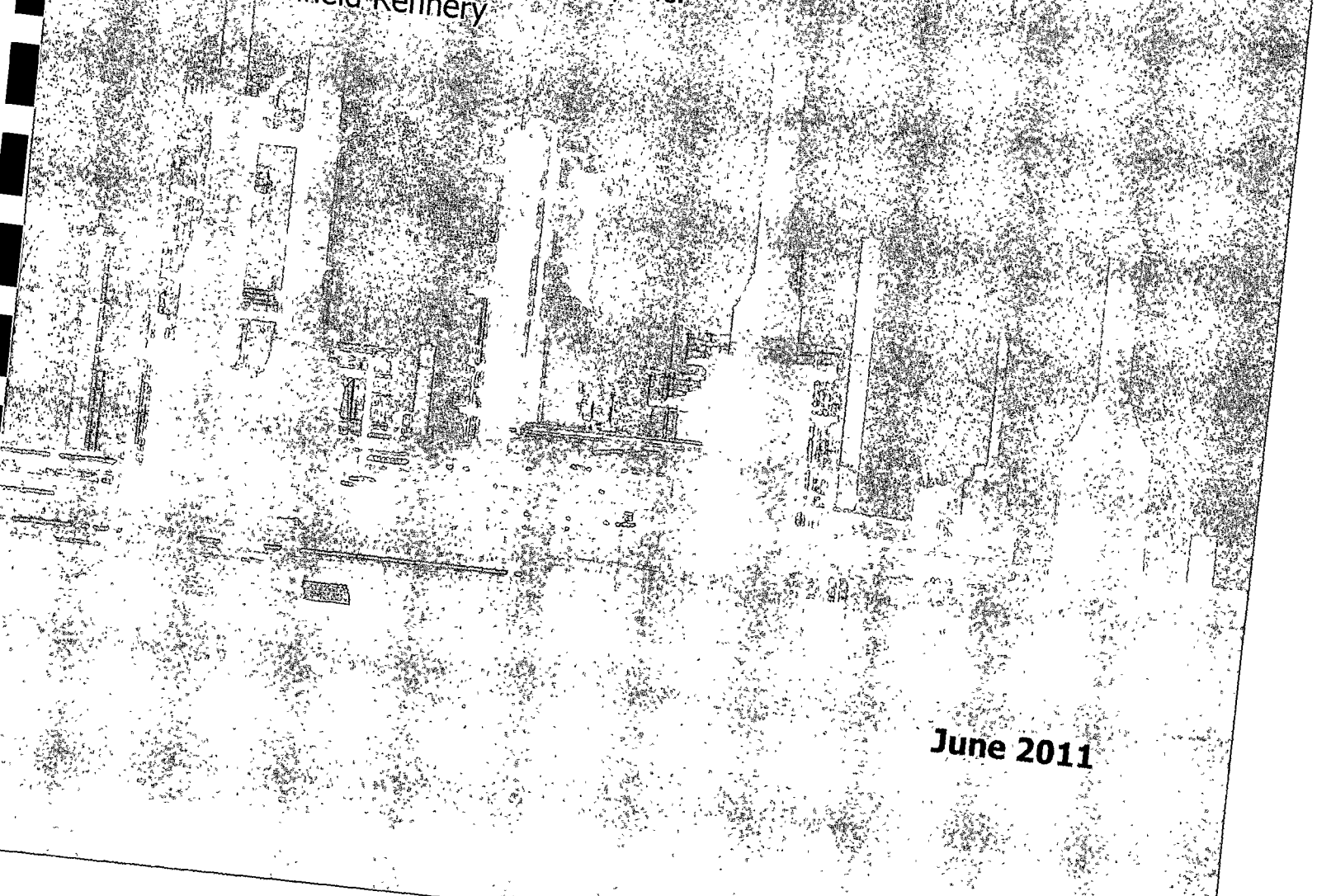
On behalf of James R. Schmaltz
Health, Safety, Environmental, and Regulatory Director
Western Refining Southwest, Inc. - Bloomfield Refinery

cc: D. Cobrain (NMED)
L. Tsinnajinnie (NMED)
A. Hains (WNR)



FACILITY-WIDE GROUNDWATER MONITORING PLAN

Western Refining Southwest, Inc.
Bloomfield Refinery



June 2011

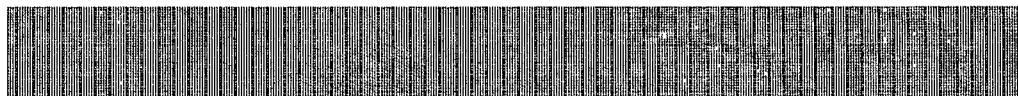


Western Refining

Bloomfield Refinery • #50 Road 4990 • Bloomfield, NM 87413

Facility-Wide Groundwater Monitoring Plan

June 2011



Report Prepared By:

Western Refining Southwest, Inc.

Bloomfield Refinery

50 Road 4990

Bloomfield, NM 87413

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Executive Summary

This Facility-Wide Groundwater Monitoring Plan (Plan) has been prepared pursuant to the terms and conditions of an Order issued on July 27, 2007 by the New Mexico Environment Department (NMED) to San Juan Refining Company and Giant Industries Arizona, Inc. This Plan also satisfies the requirement as stated in the facility's Discharge Permit GW-001 required by New Mexico Energy, Minerals, and Natural Resources Department Oil Conservation Division (OCD) for the Bloomfield Refinery.

This Plan has been prepared to collect data that will be used to characterize the nature and extent of potential impacts to groundwater at and migrating from the Bloomfield Refinery owned by San Juan Refining Company and operated by Western Refining Southwest, Inc. (Western). This Plan also includes monitoring the effectiveness of interim containment and remediation systems implemented at the Facility, specifically the North Boundary Barrier Wall and the River Terrace Bioventing System. Also included is sampling of San Juan River, existing outfall locations in the east portion of the Facility, and seeps located along the western portion of the Facility.

This Plan divides the Facility into four areas for periodic monitoring: the Refinery Complex, the North Boundary Barrier, San Juan River Bluff, and the San Juan River Terrace. The number of sampling locations, the target analytes, and monitoring frequencies vary by area. With exception of the River Terrace area and sump wells, designated monitoring wells and sample points in these areas will be monitored on a semi-annual frequency, with a more-comprehensive monitoring well network sampled on an annual frequency. Monitoring events following the procedures presented in this Plan will begin with the initial annual event in the third quarter of 2011. Monitoring wells in the River Terrace area will be sampled on a semi-annual or biannual basis as summarized in Table 3 of this Plan. Piping from Tank #38, which receives water from East Outfall #1, has been re-routed to discharge directly to the Refinery wastewater treatment system, upstream of the API; therefore no longer are samples collected at Tank #38 at this time.

Groundwater monitoring activities have been conducted at the Facility since the early 1990's in response to various directives issued by NMED and the OCD. It is Western's intent that this Plan be accepted by both agencies as the prevailing document for comprehensive groundwater monitoring at the Bloomfield Refinery.

Effectiveness of the North Boundary Barrier Wall, active pumping systems, and remedial actions at the River Terrace continue to be evaluated. Bloomfield Refinery will review historic facility-wide monitoring data each year, and assess the monitoring program presented in this Plan. Results of facility-wide monitoring activities, with the exception of

the River Terrace results, are included in the *Groundwater Remediation and Monitoring Annual Report*, which is submitted by April 15th of each year. Results of River Terrace monitoring are submitted separately as part of the *River Terrace Voluntary Corrective Measures Bioventing System Annual Report*, which is submitted by March of each year. Proposed revisions to the Facility-Wide Groundwater Monitoring Plan will be submitted to both NMED and OCD by June 30th of each year. These revisions may include, but not be limited to, a reduction or change in monitoring locations, monitoring frequency, and/or target analytes.

1. Introduction

This Facility-Wide Groundwater Monitoring Plan (Plan) has been prepared to optimize the on-going groundwater monitoring program at the Bloomfield Refinery in efforts to assess the nature and extent of potential impacts to groundwater from historic refinery operations. The monitoring program also allows assessment of the effectiveness of interim containment and remediation systems implemented at the Refinery.

The Plan follows the requirements of the July 2007 Order issued by the New Mexico Environment Department (NMED) and includes the following information:

- Site description
- Description of facility operations
- Summary of historic monitoring data
- Description of subsurface conditions
- Monitoring and sampling methods
- Monitoring and sampling locations and frequency
- Monitoring and sampling schedule

1.1. Facility Ownership and Operation

A Class I permit modification was approved on June 10, 2008 to reflect the change in ownership of the refinery to Western Refining Southwest, Inc. The operator is now Western Refining Southwest, Inc. – Bloomfield Refinery.

Owner: Western Refining, Inc.
123 W. Mills Avenue, Suite 200
El Paso, TX 79901

Operator: Western Refining Southwest, Inc. (Postal address)
P.O. Box 159
Bloomfield, New Mexico 87413

Facility Name: Bloomfield Refinery (Physical address)
#50 Rd 4990
Bloomfield, New Mexico 87413
Facility Status: Corrective Action/Compliance

US EPA ID: NMD089416416
SIC Code: 2911



2. Background

2.1. SITE LOCATION AND DESCRIPTION

The Bloomfield Refinery is a crude oil refining facility with a process capacity of 18,000 barrels per day. It is located approximately one mile south of Bloomfield, New Mexico, in San Juan County, latitude N36 41' 87", longitude W107 58' 70". It is further located approximately ½ mile east of State Route 550 on County Road 4990 (a.k.a. Sullivan Road). See Figure 1 for a site location map.

The Facility is located on the south side of the San Juan River and the Hammond Irrigation Ditch (Hammond Ditch) and situated on a bluff approximately 120 feet above the river. The top of the bluff is relatively flat and is at an elevation of 5,540 feet above sea level. Property managed by the Bureau of Land Management (BLM) borders the Facility to the south. Undeveloped company property and the San Juan River border the Facility to the north. Undeveloped private and public lands border the property to the east and several gravel pits border the property to the west. A large portion of the undeveloped land in the vicinity of the refinery is used for oil and gas production and as range for grazing. An unnamed arroyo flows toward the San Juan River on the southern and western edges of the site. East of the site, a well-defined arroyo cuts a small canyon from the bluff to the San Juan River. The Hammond Ditch lies on the bluff between the San Juan River and the Facility.

The portion of the Facility located north of County Road 4990 includes an office area that consists of buildings, warehouse space and a storage yard, parking lots, a heavy oil loading station, the petroleum process area, API separator and wastewater treatment surface impoundments, the raw water ponds, the tank farm, a fenced-in equipment lay-down area utilized to store refinery equipment prior to use, the fire training area, and the solid waste disposal area. The Facility south of County Road 4990 includes the terminal office and parking areas, terminals for loading product and off-loading crude oil and gas, a hazardous waste storage area (less than 90-day), a high-pressure bullet storage tank area, the regional office and parking area, the transportation maintenance facility and truck parking areas, the refinery evaporation ponds, and a Class I injection well. Figure 2 provides a Site Plan of the Facility.

Running southwest through the center of the Facility are four utility pipelines operated by El Paso Natural Gas, Enterprise, Conoco-Phillips, and Giant Industries Arizona, Inc. ("Giant"). The Enterprise and Giant pipelines are currently not in service.

Surface waters in the vicinity of the Facility include the San Juan River and the Hammond Irrigation Ditch. The San Juan River originates in the San Juan Mountains of

Colorado approximately 100 miles northeast of Bloomfield and is located north of the Facility flowing west/southwest. The San Juan River is controlled upstream by the Navajo Dam and is used for potable drinking water for the city of Bloomfield and surrounding areas. Hammond Ditch is located on the bluff between the river and the process area of the Facility, flowing east to west across the site. Hammond Ditch is a man-made canal, lined with concrete in 2002, which transports water used for irrigation and watering livestock only. In addition, manmade surface water features at the Facility includes the refinery evaporation ponds, raw water ponds, and the wastewater treatment surface impoundments.

2.2. FACILITY OPERATIONS

Kimball Campbell Corporation constructed the Facility as a crude topping unit in the late 1950's. Ownership of the refinery has changed hands over the years. The current Facility owner is Western Refining and the facility is operated by Western Refining Southwest, Incorporated.

The Facility has a capacity to receive and process over 18,000 barrels of crude oil per day (bcpd). The main source of crude oil supply comes from the Four Corners area, and is transported tanker truck. The process area of the Facility includes the following process units: crude distillation, reforming, fluidized catalytic cracking, sulfur recovery, merox treater, catalytic polymerization, and diesel hydrotreating. Current and past operations produce leaded and unleaded gasoline, diesel fuels, Jet-A fuel, JP-4 jet fuel, kerosene, propane, butane, naphtha, residual fuel, heavy fuel oils, and liquefied petroleum gas. Other operations at the Facility include crude and product storage, crude unloading and product loading, waste management (closed and existing facilities), and non-petroleum material storage.

2.3. Corporate Structure

On May 31, 2007, Giant Industries, Inc. became a wholly-owned subsidiary of Western Refining, Inc. of El Paso, Texas. Giant Industries, Inc. is the parent company of Giant Industries Arizona, Inc. San Juan Refining Company is a subsidiary of Giant Industries Arizona, Inc.

2.4. Historic Site-Wide Monitoring

2.4.1. Refinery Complex Groundwater Monitoring

Groundwater monitoring has occurred at the Facility since the early 1990s in support of various investigations to monitor potential impacts to groundwater quality associated with historic refinery operations. Figure 3 shows the locations of monitoring wells at the Facility within and near the Refinery Complex. Most of the Facility monitoring wells extend down to the top of the Nacimiento Formation surface. Table 1 provides a

summary of the groundwater monitoring network installed at the Facility to-date, including well construction information. A copy of the wells logs is provided in Appendix A.

Between 2003 and 2007, groundwater samples collected at selected monitoring wells within the Refinery complex were collected on a semi-annual basis. Samples were analyzed for volatile organic compounds (VOCs), dissolved and total metals, and general chemistry parameters. Sample analysis has been performed in compliance with the Corrective Measures Study and Corrective Measures Implementation letter dated January 6, 2003. Concurrently, OCD guidance had been followed per the Site Investigation and Abatement Plan letter dated December 30, 2002.

Between 2008 to present following conditional approval from NMED of the December 2007 Facility-Wide Groundwater Monitoring Plan, groundwater samples from selected monitoring wells were collected twice per year. Samples collected in April of each year (as part of the Semi-Annual Monitoring Event) are analyzed for target list VOCs, total petroleum hydrocarbons-diesel range organics (TPH-DRO), and total petroleum hydrocarbons-gasoline range organics (TPH-GRO). Samples collected from selected monitoring wells in August of each year (as part of the Annual Monitoring Event) are analyzed for VOCs (full suite), semi-volatile organic compounds (SVOCs), TPH-DRO, TPH-GRO, dissolved and total metals, carbon dioxide, and general chemistry. Results of each sampling event are reporting as part of the "Groundwater Remediation and Monitoring Annual Report" that is submitted by April 15th of each following year. Figure 4 provides a summary of the target VOCs detected in the Refinery Complex area during the August 2010 Sampling Event.

2.4.2. North Boundary Barrier Monitoring

Between 2005 and 2007 following the installation of the North Boundary Barrier and Collection System in April 2005, groundwater samples have been collected from the collection and observation wells and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tert butyl ether (MTBE), TPH-DRO, total metals, and general chemistry parameters. Results of groundwater monitoring along the North Boundary Barrier were included in the System Start-Up Six Month Report of the North Boundary Barrier Collection System Phase II (submitted January 5, 2006), and the Annual Report of the North Boundary Barrier Collection System Phase II May 2005 to May 2006 Report (submitted June 28, 2006).

Between 2008 to present following conditional approval from NMED of the December 2007 Facility-Wide Groundwater Monitoring Plan, groundwater samples are collected from each of the observation wells and selected collection wells on a semi-annual basis. Samples collected from the selected collection wells are analyzed for target list VOCs and TPH-DRO. Samples collected from the observation wells are analyzed for target list

VOCs, TPH-DRO, and TPH-GRO. Analytical results from the Semi-Annual and Annual Sampling Events are reported in the “Groundwater Remediation and Monitoring Annual Report” which is by April 15th of each year.

Figure 3 shows the locations of monitoring wells along the North Boundary Barrier.

2.4.3. Outfall Monitoring

Near the San Juan River bluff area, groundwater samples have been collected from East Outfall #2 and East Outfall #3 on a semi-annual basis since 2003. Samples have been analyzed for VOCs, total metals, dissolved metals, and general chemistry parameters. Tank #33 (which prior to 2010 received water from East Outfall #1 via Tank #38) was sampled monthly in 2005, and quarterly thereafter. Samples were analyzed for BTEX. Results of samples collected following conditional approval of the 2007 Facility-Wide Groundwater Monitoring Plan are submitted each year as part of the “Groundwater Remediation and Monitoring Annual Report.” The approximate location of the Outfalls is shown in Figure 2.

2.4.4. River Terrace Area Monitoring

Groundwater samples have been collected from two monitoring wells (MW-48 and MW-49), two dewatering wells (DW-1 and DW-2), and thirteen temporary piezometers (TP-1 thru TP-13) to monitor the River Terrace Sheet Pile Area groundwater quality on both sides of the sheet pile barrier. Figure 5 shows the locations of the wells at the River Terrace. Prior to the start of the Bioventing System in January 2006, groundwater data revealed that the highest impacts were observed in groundwater collected from piezometers installed in the western half of the River Terrace area. After the installation of the Bioventing System, on-going sampling at the River Terrace was conducted in accordance with the approved Bioventing System Monitoring Plan, dated October 28, 2006, and in accordance with an NMED comment letter dated April 18, 2007. Current and on-going River Terrace sampling is being conducted in accordance with the requirements established in NMED’s *Proposals to Modify Monitoring at the River Terrace Area* letter dated March 15, 2011 (NMED, 2011). Figure 6 provides a summary of target VOCs detected at the River Terrace during the July 2010 semi-annual sampling event.

In addition, San Juan River samples were collected monthly in 2004, and have been collected quarterly thru 2007, and then semi-annually thereafter. The river samples are currently analyzed for target list VOCs, TPH-DRO, TPH-GRO, total and dissolved metals, SVOCs, and general chemistry. Samples are collected from four locations: one upstream of the Facility, two immediately downstream of the River Terrace, and one downstream of the Facility. Analytical results from historic river sampling events have been reported in the annual groundwater reports submitted to NMED and OCD in April of each year.

3. Subsurface Conditions

3.1. Refinery Site

The Bloomfield Refinery is located within the San Juan Basin, a sub-province of the Colorado Plateau physiographic province, about 120 feet above the present San Juan River level and about 500 feet south of the river.

Groundwater at the Facility is present at depths ranging from approximately 6 to 40 feet below ground surface (bgs), increasing in depth from west to east across the site due to the change in surface elevation across the site. Groundwater flow direction is generally from the southeast to the northwest towards the Hammond Ditch. Figure 7 provides groundwater elevation contours recorded during the August 2010 monitoring event. The thickness of SPH detected in 2010 is summarized in Figure 8. The shallow groundwater consists of an aquifer where groundwater migrates through the permeable glacial outwash deposits designated as the Jackson Lake Terrace overlying the nearly impermeable Nacimientó Formation. A permanent shallow aquifer formed above the Nacimientó Formation likely as a result of site development, refinery operations, and leakage from the Hammond Ditch. This shallow aquifer is not currently used for drinking water. Below the Nacimientó Formation is the Ojo Alamo sandstone formation, a water-bearing unit used as a potable water source.

The geologic units that underlie the Facility are as follows: the uppermost unit consists of unconsolidated surface soils, silts, and fine windblown sands forming loess deposits. The silty fine sand is underlain by the Jackson Lake Terrace deposit, approximately 10 to 15 feet thick. The Jackson Lake Terrace consists of well-rounded boulders, cobbles, gravels and sands exhibiting moderate to high permeability. Below the Jackson Lake Terrace is the Nacimientó Formation. The Nacimientó Formation is composed of interbedded, black carbonaceous mudstone, siltstone, and argillaceous sandstones. The Nacimientó Formation has been investigated at the Facility to a depth of approximately 100 feet; however, literature suggests the formation ranges up to 900 feet in total thickness. The Nacimientó Formation demonstrates low permeability and acts as a confining unit for the Jackson Lake Terrace. Below the Nacimientó Formation is the Ojo Alamo Sandstone, a water-bearing unit consisting of tertiary sandstones. Directly below the Ojo Alamo are the Cretaceous Kirtland Shale and the Fruitland Formation.

The Nacimientó Formation acts as a confining layer to vertical migration of groundwater beneath the refinery, which does not infiltrate to the underlying Ojo Alamo Sandstone. The morphology of the contact between the Jackson Lake Terrace and the underlying Nacimientó Formation in the vicinity of the facility is important in that it influences the direction of the perched groundwater flow. Approximately 100 feet of the Nacimientó

Formation is exposed in the precipice (bluff) face north of the Facility adjacent to the San Juan River.

3.2. River Terrace Site

The River Terrace area is located adjacent to the San Juan River approximately 500 feet north of the refinery process areas, and is the location of the pumping station used to deliver river water to the refinery raw water ponds. Surface water in the vicinity of the River Terrace includes the San Juan River to the north and west. The San Juan River level is approximately 120 feet lower than the grade level of the refinery complex.

Recharge of the River Terrace groundwater is predominantly influenced by the flow of the San Juan River, which is typically higher in the summer months due to high irrigation water demands. Groundwater elevations at the River Terrace are typically approximately three to seven feet below ground surface (bgs), depending on the flow rate of the San Juan River and operation of the river terrace dewatering system.

The near surface soils in the River Terrace consist of one to two feet of silt underlain by one to two feet of fine grained sand. In some areas a six-inch clay lens exists beneath the silt layer. Beneath the fine grained sediments are medium to coarse grained sands that extend from approximately three or four feet bgs to approximately ten feet bgs. At ten feet bgs the sand transitions to coarser grained material with some gravel. Boring logs indicate that the Nacimiento Formation is present beneath the River Terrace at approximately 15 to 17 feet bgs.

4. Investigation Methods

4.1. Monitoring and Sampling Methods

4.1.1. Groundwater Levels

Depth-to-groundwater and SPH thickness measurements have been collected quarterly since 2008 to monitor groundwater elevation fluctuations over time. Since February 2010, fluid measurements were collected monthly at 47 monitoring wells for a period of five months per NMED's request to monitor groundwater elevation changes that may be influenced by the suspension of refinery process area operations which went into effect in November 2009. The three year summary data shows no significant change in groundwater elevation over time. Over the past three years, groundwater fluctuated less than one foot, with the exception of three locations within the Refinery Complex (MW-12, MW-40, and MW-39), and eight locations along the north boundary barrier.

Depth-to-groundwater and SPH thickness measurements will continue to be collected on a semi-annual basis to monitor groundwater elevation fluctuations over time. Field measurement data will be recorded on a site monitoring data sheet. The depth-to-groundwater and SPH thickness levels will be measured to the nearest 0.01 ft. The depth to groundwater and SPH thickness will be recorded relative to the surveyed well casing rim or other surveyed datum. A corrected water table elevation will be provided in wells containing SPH by adding 0.8 times the measured SPH thickness to the calculated water table elevation. Depth-to-groundwater and SPH thickness measurements will be collected using an oil/water interface probe. Prior to groundwater sampling activities, groundwater levels and SPH thickness measurements will be collected in all wells after the pumps have been removed and 48-hours has passed, allowing groundwater levels to have stabilized.

4.1.2. Groundwater Sampling

All monitoring wells scheduled for sampling during a groundwater sampling event will be sampled within 15 working days of the start of the monitoring and sampling event.

4.1.3. Well Purging

Each monitoring well will be purged by removing groundwater prior to sampling in order to ensure that formation water is being sampled. Total purge volume will be determined by monitoring groundwater pH, electrical conductance, temperature, dissolved oxygen (DO) concentrations, oxidation-reduction potential (ORP), and/or temperature after every two gallons or each well volume, whichever is less, has been purged from the well. Field parameters will be measured using an Ultrameter 6P hand-held instrument or equivalent, with the exception of dissolved oxygen (DO) which is monitored using a field probe.

Purging will continue, as needed, until the 6P hand-held instrument (or equivalent) field readings stabilize to within ten percent between readings for three consecutive measurements. Once the readings are within 10%, purging will stop and the well is ready for sample collection. The volume of groundwater purged, the instruments used, and the readings obtained at each interval will be recorded on the field-monitoring log. Well purging and sampling will be performed using disposable bailers and/or appropriate sampling pumps.

4.1.4. Groundwater Sample Collection

Groundwater samples will be obtained from each well within 24 hours of the completion of well purging. Sample collection methods will be documented in the field monitoring reports. The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory. Sample handling and chain-of-custody procedures are described in Section 4.3. Decontamination procedures for reusable water sampling equipment are described in Section 4.1.6.

All purged groundwater and decontamination water will be disposed in the refinery wastewater treatment system upstream of the API Separator. The procedures for disposable materials are described in Section 4.1.8.

Groundwater samples intended for metals analysis will be submitted to the laboratory as total metals samples, unless otherwise noted on Table 3 of this Plan. Groundwater samples obtained for dissolved metals analysis will be filtered using disposable filters with a 0.45 micrometers mesh size that are provided by the analytical laboratory.

4.1.5. Sample Handling

At a minimum, the following procedures will be used when collecting samples:

- Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample.
- All samples collected for chemical analysis will be transferred into clean sample containers supplied by the analytical laboratory. The sample container will be clearly marked. Sample container volumes and preservation methods will be in accordance with the most recent standard EPA and industry accepted practices for use by accredited analytical laboratories. Sufficient sample volume will be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis.
- Sample labels and documentation will be completed for each sample. Immediately after the samples are collected, they will be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described in Section 4.3 of this Plan, will be followed for all samples collected. All samples will be submitted to the laboratory to allow the laboratory to conduct the analyses within the

method holding times. At a minimum, all samples will be submitted to the laboratory within 48 hours after their collection.

The following shipping procedures will be performed during each sampling event:

- Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler will be sealed and secured in case of sample container leakage.
- Each cooler or other container will be delivered directly to the analytical laboratory.
- Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
- Plastic containers will be protected from possible puncture during shipping using cushioning material.
- The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
- Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.
- Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.

4.1.6. Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. The majority of field equipment used for groundwater sampling will be disposable and, therefore, not require decontamination. In order to prevent cross-contamination, field equipment that comes into contact with water or soil will be decontaminated between each sampling location. The decontamination procedure will consist of washing the equipment with a non-phosphate detergent solution (examples include Fantastik™, Liqui-Nox®), followed by two rinses of distilled water and air dried. Decontamination water and rinsate will be contained and disposed of the same way as purge water, as described in Section 4.1.8. Decontamination procedures and the cleaning agents used will be documented in the daily field log.

4.1.7. Field Equipment Calibration Procedures

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. Calibration checks will be conducted daily and the instruments will be recalibrated if necessary. Calibration measurements will be recorded in the daily field logs.

If field equipment becomes inoperable, its use will be discontinued until the necessary repairs are made. Instrumentation used during sampling events will be recorded in the daily field logs.

4.1.8. Collection and Management of Investigation Derived Waste

Investigation derived waste (IDW) generated during each groundwater sampling event may include purge water, decontamination water, excess sample material, and disposable sampling equipment. All water generated during sampling and decontamination activities will be temporarily stored in labeled 55-gallon drums until disposed in the refinery wastewater treatment system upstream of the API separator. All other solid waste generated during sampling activities (including sampling gloves, tubing, etc) will be disposed of with the Refinery's general municipal waste.

4.2. Analytical Methods

Groundwater and surface water samples collected during the monitoring events will be analyzed for one or more of the following constituents:

- Volatile Organic Compounds (VOCs) by EPA Method 8260B and EPA Method 8021B;
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270C;
- Total and Dissolved Metals by EPA Method 6010, except mercury which will be analyzed by EPA Method 7470.
- Total Petroleum Hydrocarbons (TPH) – Gasoline Range Organics (GRO) by EPA Method 8015B;
- TPH – diesel range organics (DRO) extended (which includes TPH-DRO and TPH-MRO) by EPA Method 8015B;
- Total Dissolved Solids (TDS) by EPA Method 160.1 or field measurement;
- Electrical Conductance by EPA Method 120.1 or field measurement;
- Carbon Dioxide by EPA Method 310.1;
- General Chemistry by EPA Method 310.1 and EPA Method 300.0.

4.2.1. Target Analytes

Table 2 provides a summary of target analytes for each analytical method.

4.3. Documentation of Field Activities

4.3.1. General

Daily field activities, including observations and field procedures, will be recorded using indelible ink on field sampling forms. The original field forms will be maintained at the

Bloomfield Refinery. The daily record of field activities will include the following information:

- Well ID
- Date
- Start and finish sampling time
- Field team members, including visitors
- Weather conditions
- Daily activities and times conducted
- Observations
- Record of samples collected with sample designations
- Photo log (if needed)
- Field monitoring data, including health and safety monitoring (if needed)
- Equipment used and calibration records, if appropriate
- List of additional data sheets and maps completed
- An inventory of the waste generated and the method of storage or disposal
- Signature of personnel completing the field record

4.3.2. Sample Custody

All samples collected for analysis will be recorded in the field report or data sheets. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site, and will accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the conditions of the samples will be recorded on the form. The original chain-of-custody form will remain with the laboratory. Bloomfield Refinery will maintain copies of all chain-of-custody forms generated as part of sampling activities. Copies of the chain-of-custody records will be included with all final laboratory reports submitted to NMED and OCD.

4.4. Quality Assurance Procedures

Contract analytical laboratories will maintain internal quality assurance programs in accordance with EPA and industry accepted practices and procedures. At a minimum, the laboratories will use a combination of standards, blanks, surrogates, duplicates, matrix spike/matrix spike duplicates (MS/MSD), blank spike/blank spike duplicates (BS/BSD), and laboratory control samples to demonstrate analytical QA/QC. The laboratories will establish control limits for individual chemicals or groups of chemicals based on the long-term performance of the test methods. In addition, the laboratories will establish

internal QA/QC that meets EPA's laboratory certification requirements. The specific procedures to be completed are identified in the following sections.

4.4.1. Equipment Calibration Procedures and Frequency

The laboratory's equipment calibration procedures, calibration frequency, and calibration standards will be in accordance with the EPA test methodology requirements and documented in the laboratory's quality assurance and SOP manuals. All instruments and equipment used by the laboratory will be operated, calibrated, and maintained according to manufacturers' guidelines and recommendations. Operation, calibration, and maintenance will be performed by personnel who have been properly trained in these procedures. A routine schedule and record of instrument calibration and maintenance will be kept on file at the laboratory.

4.4.2. Field QA/QC Samples

Field duplicates, field blanks, equipment rinsate blanks, and trip blanks will be obtained for quality assurance during sampling activities. The samples will be handled as described in Section 4.1.5.

Field duplicate water samples will be obtained at a frequency of ten percent of the total number of samples submitted for analysis. At a minimum, one duplicate sample per sampling event will be obtained.

Field blanks will be obtained at a minimum frequency of one per day. Field blanks will be generated by filling sample containers in the field with deionized water and submitting the samples, along with the groundwater samples, to the analytical laboratory for the appropriate analyses.

Equipment rinsate blanks will be obtained for chemical analysis at the rate of one per sampling day when using disposable sampling equipment. For sampling equipment that is used at more than one location (e.g., sampling pumps), an equipment rinsate blank will be collected at a frequency of 10 percent, or a minimum of one per sampling day. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample then will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses.

Trip blanks will accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks will consist of a sample of analyte-free deionized water prepared by the laboratory and placed in an appropriate sample container. The trip blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water

samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of samples.

4.4.3. Laboratory QA/QC Samples

Analytical procedures will be evaluated by analyzing reagent or method blanks, surrogates, matrix spike/matrix spike duplicates (MS/MSDs), blank spike/blank spike duplicates (BS/BSDs) and/or laboratory duplicates, as appropriate for each method. The laboratory QA/QC samples and frequency of analysis to be completed will be documented in the cited EPA or other test methodologies. At a minimum, the laboratory will analyze laboratory blanks, MS/MSDs, BS/BSDs and laboratory duplicates at a frequency of one in twenty for all batch runs requiring EPA test methods and a frequency of one in ten for non-EPA test methods. Laboratory batch QA/QC samples will be project specific.

4.4.4. Laboratory Deliverables

The analytical data package will be prepared in accordance with EPA-established Level II analytical support protocol. As stated in the Order, the following will be included in the analytical laboratory reports:

- Transmittal letter, including information about the receipt of samples, the testing methodology performed, any deviations from the required procedures, any problems encountered in the analysis of the samples, any data quality exceptions, and any corrective actions taken by the laboratory relative to the quality of the data contained in the report;
- Sample analytical results, including sampling date; date of sample extraction or preparation; date of sample analysis; dilution factors and test method identification; water sample results in consistent units (milligrams per liter or micrograms per liter ($\mu\text{g/L}$)); and detection limits for undetected analytes. Results will be reported for all field samples, including field duplicates and blanks, submitted for analysis;
- Method blank results, including reporting limits for undetected analytes;
- Surrogate recovery results and corresponding control limits for samples and method blanks (organic analyses only);
- MS/MSD and/or BS/BSD spike concentrations, percent recoveries, relative percent differences (RPDs), and corresponding control limits;
- Laboratory duplicate results for inorganic analyses, including relative percent differences and corresponding control limits;
- Sample chain-of-custody documentation;
- Holding times and conditions;
- Conformance with required analytical protocol(s);

- Instrument calibration;
- Blanks;
- Detection/quantitation limits;
- Recoveries of surrogates and/or matrix spikes (MS/MSDs);
- Variability for duplicate analyses;
- Completeness;
- Data report formats;

Data deliverables provided by the laboratory that include analysis of organic compounds will also include the following:

- A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications, including signature from authority representative certifying to the quality and authenticity of data as reported;
- A report of sample collection, extraction, and analysis dates, including sample holding conditions,
- Tabulated results for samples in units as specified, including data qualification in conformance with EPA protocol, and definition of data descriptor codes;
- Reconstructed ion chromatograms for gas chromatograph/mass spectrometry (GC/MS) analyses for each sample and standard calibration;
- Selected ion chromatograms and mass spectra of detected target analytes (GCMS) for each sample and calibration with associated library/reference spectra;
- Gas Chromatograph/electron capture device (GC/ECD and/or gas chromatograph/flame ionization detector (GC/FID) chromatograms for each sample and standard calibration;
- Raw data quantification reports for each sample and calibrations, including areas and retention times for analytes, surrogates, and internal standards;
- A calibration data summary reporting calibration range used and a measure of linearity [include decafluorotriphenylphosphine (DFTPP) and p-bromofluorobenzene (BFB) spectra and compliance with tuning criteria for GC/MS],
- Final extract volumes (and dilutions required), sample size, wet-to-dry weight ratios, and instrument practical detection/quantitation limit for each analyte,
- Analyte concentrations with reporting units identified, including data qualification in conformance with the contract laboratory program Statement of Work (SOW) (include definition of data descriptor codes),
- Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample,

- Recovery assessments and a replicate sample summary, including all surrogate spike recovery data with spike levels/concentrations for each sample and all MS/MSD results (recoveries and spike amounts), and
- Report of tentatively identified compounds with comparison of mass spectra to library/reference spectra.

Data deliverables provided by the laboratory that include analysis of inorganic compounds will include the following:

- A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications; including signature from authority representative certifying to the quality and authenticity of data as reported,
- Report of sample collection, digestion, and analysis dates, with sample holding conditions,
- Tabulated results for samples in units as specified, including data qualification in conformance with the contract laboratory program (CLP) statement of work (including definition of data descriptor codes),
- Results of all method QA/QC checks, including inductively coupled plasma (ICP) Interference Check Sample and ICP serial dilution results,
- Tabulation of instrument and method practical detection/quantitation limits,
- Raw data quantification report for each sample,
- A calibration data summary reporting calibration range used and a measure of linearity, where appropriate,
- Final digestate volumes (and dilutions required), sample size, and wet-to-dry weight ratios,
- Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample, and
- Recovery assessments and a replicate sample summary, including post-digestate spike analysis; all MS data (including spike concentrations) for each sample, if accomplished; all MS results (recoveries and spike amounts); and laboratory control sample analytical results).

Bloomfield Refinery will present summary tables of these data in the formats described in Section X of the NMED July 2007 Order. The raw analytical data, including calibration curves, instrument calibration data, data calculation work sheets, and other laboratory support data for groundwater monitoring samples, will be compiled and kept on file locally at Bloomfield Refinery for reference. The data will be available to NMED upon request.

4.4.5. Review of Field and Laboratory QA/QC Data

The sample data, field, and laboratory QA/QC results will be evaluated for acceptability with respect to the data quality objectives (DQOs). Each group of samples will be compared with the DQOs and evaluated using data validation guidelines contained in EPA guidance documents: *Guidance Document for the Assessment of RCRA Environmental Data Quality*, *National Functional Guidelines for Organic Data Review*, and *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, and the most recent version of SW-846, and industry-accepted QA/QC methods and procedures. The laboratory will notify the Bloomfield Refinery Project Manager of data quality exceptions within one business day of identifying the data quality exception in order to allow for sample re-analysis, if possible.

4.4.6. Blanks, Field Duplicates, Reporting Limits and Holding Times

4.4.6.1. Blanks

The analytical results of field blanks and field rinsate blanks will be reviewed to evaluate the adequacy of the equipment decontamination procedures and the possibility of cross-contamination caused by decontamination of sampling equipment. The analytical results of trip blanks will be reviewed to evaluate the possibility for contamination resulting from the laboratory-prepared sample containers or the sample transport containers. The analytical results of laboratory blanks will be reviewed to evaluate the possibility of contamination caused by the analytical procedures. If contaminants are detected in field or laboratory blanks, the sample data will be qualified, as appropriate.

4.4.6.2. Field Duplicates

Field duplicates will consist of two samples either split from the same sample device or collected sequentially. Field duplicate samples will be collected at a minimum frequency of ten percent of the total number of samples submitted for analysis. Relative percent differences for field duplicates will be calculated. The analytical DQO for precision will be used for water duplicates.

4.4.6.3. Method Reporting Limits

Method reporting limits for sample analyses will be established at the lowest level practicable for the method and analyte concentrations and will not exceed groundwater or surface water cleanup standards and screening levels. Detection limits that exceed established standards or screening levels and are reported as “not detected” will be considered data quality exceptions and an explanation for the exceedance and its acceptability for use will be provided.

4.4.6.4. Holding Times

The sampling, extraction, and analysis dates will be reviewed to confirm that extraction and analyses were completed within the recommended holding times, as specified by EPA protocol. Appropriate data qualifiers will be noted if holding times were exceeded.

4.4.7. Representativeness and Comparability

4.4.7.1. Representativeness

Representativeness is a qualitative parameter related to the degree to which the sample data represent the relevant specific characteristics of the media sampled. Procedures will be implemented to assure representative samples are collected and analyzed, such as repeated measurements of the same parameter at the same location over several distinct sampling events. Any procedures or variations that may affect the collection or analysis of representative samples will be noted and the data will be qualified.

4.4.7.2. Comparability

Comparability is a qualitative parameter related to whether similar sample data can be compared. To assure comparability, analytical results will be reported in appropriate units for comparison with other data (past studies, comparable sites, screening levels, and cleanup standards), and standard collection and analytical procedures will be implemented. Any procedure or variation that may affect comparability will be noted and the data will be qualified.

4.4.8. Laboratory Reporting, Documentation, Data Reduction, and Corrective Action

Upon receipt of each laboratory data package, data will be evaluated against the criteria outlined in the previous sections. Any deviation from the established criteria will be noted and the data will be qualified. A full review and discussion of analytical data QA/QC and all data qualifiers will be submitted as appendices or attachments to the groundwater monitoring reports. Data validation procedures for all samples will include checking the following, when appropriate:

- Holding times
- Detection limits
- Field equipment rinsate blanks
- Field blanks
- Field Duplicates
- Trip blanks
- Reagent blanks
- Laboratory duplicates

- Laboratory blanks
- Laboratory matrix spikes
- Laboratory matrix spike duplicates
- Laboratory blank spikes
- Laboratory blank spike duplicates
- Surrogate recoveries

If significant quality assurance problems are encountered, appropriate corrective action will be implemented. All corrective action will be reported and the corrected data will be qualified.

5. Monitoring and Sampling Program

The primary objective of groundwater monitoring is to collect data which will be used to assess groundwater quality at and near the Facility. Groundwater elevation data will also be collected to evaluate groundwater flow conditions. The groundwater monitoring program for the Facility will consist of sample collection and analysis from a series of monitoring wells, sump wells, recovery wells, piezometers, seeps, outfalls, and river locations. The monitoring network is divided into four investigation areas (Refinery Complex; North Boundary Barrier Wall; San Juan River Bluff; and San Juan River Terrace). The sampling frequency, analyses and target analytes will vary for each investigation area. The combined data from these investigation areas will be used to establish background groundwater quality, assess groundwater quality beneath and immediately downgradient of the Facility, and evaluate local groundwater flow conditions.

Samples will not be collected from monitoring wells that have measurable SPH. For wells that are purged dry, samples will be collected if recharge volume is sufficient for sample collection within 24 hours. Wells not sampled due to insufficient recharge will be documented in the field log. A summary of the Facility-Wide Monitoring Plan is provided in Table 3.

The following sections outline the monitoring program for each investigation area.

5.1. Refinery Complex

5.1.1. Sampling Locations

The following wells will be sampled within the Refinery Complex (NMED, 2007):

Background Wells

MW-3, MW-5, and MW-6

Cross-gradient Wells

MW-1, MW-13, MW-26, MW-27, MW-32, and MW-33

Refinery Area Wells

RW-1, MW-4, MW-8, RW-9, RW-15, RW-18, MW-20, MW-21, RW-23, RW-28, MW-29, MW-30, MW-31, MW-40, RW-42, RW-43, and MW-44

Downgradient Wells

MW-11, MW-12, MW-34, MW-35, MW-37, and MW-38

RCRA Investigation Wells

MW-50, MW-51, MW-52, MW-53, MW-54, MW-55, MW-56, MW-57, MW-58, MW-59, MW-60, MW-61, MW-62, MW-63, MW-64, MW-65, MW-66, MW-67, MW-68, and MW-69

The RCRA Investigation wells will be sampled for two years annual as required by NMED (NMED, 2009). After two years, Western may propose adjusting the network of monitoring wells based on the data collected during the two sampling events. The location of the Refinery Complex monitor wells are shown in Figure 9. Information regarding the construction details of the monitor wells, including total well depth, screen interval, and top-of-casing elevation, is provided in Table 1.

Depth-to-groundwater and SPH thickness measurements will be collected from the seven sump wells (SW-1 through SW-7) following every major precipitation event. Any sump well where SPH is present will be evacuated to prevent releases along the river bluff. Sump well monitoring activities will be included in the annual groundwater monitoring reports (NMED, 2008).

5.1.2. Sampling Frequency and Analyses

During each Annual Sampling Event (conducted in August of each year), groundwater samples will be collected from each selected well and analyzed for the following chemical constituents:

- VOCs;
- SVOCs (*RCRA Investigation Wells Only for two years*)
- TPH-DRO extended;
- TPH-GRO;
- Dissolved and Total Metals;
- Carbon Dioxide;
- Alkalinity (total, bicarbonate, and carbonate);
- Anions

In addition to the annual groundwater sampling, SVOCs will be collected from selected Facility perimeter wells (MW-38, MW-11, and MW-12) every two years. Analyses and target analytes are listed in Table 2. The list of sample locations and monitoring frequency is provided in Table 3.

As part of each Semi-Annual Sampling Event (conducted in April of each year), groundwater samples will be collected from monitoring well MW-1, MW-6, MW-8, MW-12, MW-13, MW-20, MW-30, MW-33, MW-35, MW-37, and MW-38. Samples will be analyzed for the target VOCs (target list). In addition, samples collected from MW-1, MW-33, MW-12, MW-37, and MW-38 will be analyzed for TPH-GRO and TPH-DRO extended.

During each sampling event, field parameters will be collected and recorded on the field data sheets. Field parameters will collected include the following:

- Electrical Conductivity
- Temperature
- pH
- Oxidation Reduction Potential
- Total dissolved solids
- Dissolved Oxygen

5.2. North Boundary Barrier

5.2.1. Sampling Locations

The following wells will be sampled within the North Boundary Barrier area:

Collection Wells

CW 0+60 and CW 25+95.

Observation Wells

OW 0+60, OW 1+50, OW 3+85, OW 5+50, OW 6+70, OW 8+10, OW 11+15, OW 14+10, OW 16+60, OW 19+50, OW 22+00, OW 23+10, OW 23+90, and OW 25+70.

Data collected from collection wells CW 0+60 and CW 25+95 will be used to monitor groundwater quality at each end of the barrier wall. The remaining collection wells along the refinery side of the North Boundary Barrier will be monitored for change in groundwater elevation and the presence of SPH, but will not be sampled. Sample collection from the observation wells eliminates the need for sampling at MW-45, MW-46, and MW-47. These wells will continue to be monitored for groundwater elevation data and the presence of SPH. Figure 10 shows the monitoring well network for the North Boundary Barrier. Information regarding the construction details of the monitor wells, including total well depth, screen interval, and top-of-casing elevation, is provided in Table 1.

5.2.2. Sampling Frequency and Analyses

On a semi-annual basis, groundwater samples collected from collection wells CW 0+60 and CW 25+95, and from each observation well will be analyzed for the following chemical constituents, unless otherwise noted:

- VOCs (target list);
- TPH – DRO;
- TPH – GRO (Observation wells only)

Analyses and target analytes are listed in Table 2.

During each sampling event, field parameters will be collected and recorded on the field data sheets. Field parameters will collected include the following:

- Electrical Conductivity
- Temperature
- pH
- Oxidation Reduction Potential
- Total Dissolved Solids
- Dissolved Oxygen

5.3. San Juan River Bluff

5.3.1. Monitoring and Sampling Locations

Groundwater and surface water samples will be collected from the following locations along the Bluff, if water is present:

Outfalls

East Outfall #2, and East Outfall #3

Seeps

Seep 1, Seep 2, Seep 3, Seep 4, Seep 5, Seep 6, Seep 7, Seep8, and Seep 9

In February 2010, piping modifications were completed that now allows total fluid from East Outfall #1 via Tank #38 to discharge directly to the Refinery Wastewater Treatment System upstream of the API separator. Since fluids from East Outfall #1 no longer discharge into the Raw Water Ponds, quarterly monitoring at Tank #33 is not longer needed. If in the future Western requests and receives NMED approval to return to normal operation of Tank #38 (i.e. routing the tank discharge to the Raw Water ponds), Bloomfield will follow the required sampling activities set by NMED. Figure 11 and Figure 2 show the locations of the outfalls and seeps, respectively.

Seep North of MW-45, Seep North of MW-46, and Seep North of MW-47 are general locations identified during the initial discovery of hydrocarbon releases to the river bluff several years prior. Since remedial activities began, nine specific locations have been identified as Seep 1 through Seep 9. Seep 3 and Seep 4 are secondary catchments to Seep 1. Seep 2 and Seep 5 have had historic flows, but groundwater discharge at these locations has ceased since the installation of the north boundary barrier. Currently, Seep 2, 3, 4 and Seep 5 have no current discharges of groundwater. All seep location will be visually inspected weekly to monitor active groundwater discharge along the bluff (NMED, 2008). Groundwater will be removed from any seep where analytical BTEX results exceed any of the respective screening levels.

5.3.2. Sampling Frequency and Analyses

On a semi-annual basis, samples will be collected from East Outfall #2 and East Outfall #3, and analyzed for the following chemical constituents:

- VOCs (target list);
- Total and Dissolved Metals (target list);
- Carbon Dioxide;
- Alkalinity (total, bicarbonate, and carbonate);
- Anions.

In addition, samples will be collected from Seep 1, 6, 7, 8, and 9, if sufficient water is present, on a semi-annual basis and analyzed for the following chemistry constituents:

- VOCs (target list);
- Carbon Dioxide;
- Alkalinity (total, bicarbonate, and carbonate);
- Anions.

If active discharges are present at Seep 2, 3, 4, or 5, a sample will be collected during the semi-annual sampling event and analyzed for the above parameters (NMED, 2008).

During each sampling event, field parameters will be collected and recorded on the field data sheets. Field parameters will collected include the following:

- Electrical Conductivity
- Temperature
- pH
- Oxidation Reduction Potential
- Total Dissolved Solids

Analyses and target analytes are listed in Table 2.

5.4. San Juan River Terrace

5.4.1. Sampling Locations

Groundwater and surface water samples will be collected from the following locations in the vicinity of the River Terrace:

Monitoring Wells

MW-49 and DW-1

Piezometers

TP-1, TP-2, TP-3, TP-5, TP-6, TP-7, TP-8, TP-9, TP-10, TP-11, TP-12, and TP-13.

Figure 12 shows the groundwater sampling locations at the River Terrace.

San Juan River

Upstream (approximately 1,000 feet upstream of the River Terrace), River Bank north of MW-45, River Bank north of MW-46, and Downstream (approximately 300 feet downstream of the River Terrace). Figure 13 shows the sample locations for the San Juan River.

Information regarding the construction details of the monitor wells, including total well depth, screen interval, and top-of-casing elevation, is provided in Table 1.

5.4.2. Sampling Frequency and Analyses

The sampling program detailed below has been developed to be compliant with the Final July 2007 NMED Order and is consistent with the Bioventing Monitoring Plan (Revised) River Terrace Voluntary Corrective Measures dated October 28, 2005 and the *Proposals to Modify Monitoring at the River Terrace Area* letter from NMED dated March 15, 2011 (NMED, 2011). If modifications to the Bioventing Monitoring Plan are approved by NMED that result in a change to the groundwater sampling frequency or analysis, then those approved changes will supersede the following specified activities.

On a semi-annual basis groundwater samples will be collected from MW-49, TP-1, TP-2, TP-5, TP-6, TP-8, and TP-9. On a biannual basis, groundwater samples will be collected from DW-1, TP-3, TP-7, TP-10, TP-11, TP-12, and TP-13. Groundwater samples will be analyzed for the following chemical constituents:

- VOCs (target list)
- TPH-GRO
- TPH-DRO extended

■ Total Recoverable Metals (target list)

The semi-annual sampling events will be scheduled such that one sampling event is conducted during San Juan River low flow conditions, and the other sampling event will be conducted during San Juan River high flow conditions each year. Biannual sampling event will occur every two years (starting in 2011) and will be conducted during San Juan River low flow conditions.

On a semi-annual basis (twice per year), samples will be collected from the San Juan River and analyzed for the following chemical constituents:

- VOCs (target list)
- TPH-GRO
- TPH-DRO extended
- Total and Dissolved Metals (target list)
- Alkalinity (total, carbonate and bicarbonate)
- Anions (target list).

Analyses and target analytes for the River Terrace and San Juan River samples are listed in Table 2. The analytes and sample frequency for the River Terrace monitoring wells is in compliance with NMED's letter *"Proposals to Modify Monitoring at the River Terrace Area"* dated March 15, 2011 (NMED, 2011).

During each sampling event, field parameters will be collected and recorded on the field data sheets. Field parameters that will be collected from the river terrace monitoring wells and piezometer wells include the following:

- Conductivity
- Temperature
- pH
- Oxidation Reduction Potential
- Dissolved Oxygen

Field parameters collected from the San Juan River samples include the following:

- Total Dissolved Solids
- Conductivity

Refer to Table 3 for the list of sample locations and analyses.

5.5. Monitoring Program Revisions

Upon review of the analytical results, historic facility-wide monitoring data, available soil boring data, and Nacimiento Formation elevation data, Western Refining will assess the monitoring program presented in this Plan. Revisions to the Plan, as necessary, will then be presented for agency review and approval on an annual basis prior to June 30th of each year. These revisions may include, but not be limited to, a reduction or change in monitoring locations, monitoring frequency, and/or target analytes.

6. Schedule

As discussed in Section 5.0, groundwater and surface water sampling events at the Facility have been assigned varying sampling frequencies including quarterly, semi-annual and annual. Sampling events within each site investigation area (i.e., Refinery Complex, North Boundary Barrier, Bluff Outfalls, and River Terrace) will be completed within 15 working days of the start of the event. The initial annual sampling event conducted under this Plan will occur in the third quarter of 2010.

7. References

- NMED, 2007. New Mexico Environment Department (NMED) Hazardous Waste Bureau, *Notice of Disapproval Facility-Wide Groundwater Monitoring Plan dated October 22, 2007.*
- NMED, 2008. New Mexico Environment Department (NMED) Hazardous Waste Bureau, *Approval with Direction Facility-Wide Groundwater Monitoring Plan dated March 25, 2008.*
- NMED, 2009. New Mexico Environment Department (NMED) Hazardous Waste Bureau, *SPH Recovery at Observation Wells and Routine Facility-Wide Groundwater Monitoring dated December 21, 2009.*
- NMED, 2011. New Mexico Environment Department (NMED) Hazardous Waste Bureau, *Proposals to Modify Monitoring at the River Terrace Area dated March 15, 2011.*

Table 1
Facility-Wide Monitoring Program
Bloomfield Refinery- Bloomfield, New Mexico

Well Type	Well ID	Installation Date	Well Diameter (in)	Measuring Point Elevation (Before 2006) (ft)	Measuring Point Elevation (After 2006) (ft)	Grade Elevation ⁽¹⁾ (before 2006) (ft)	Grade Elevation ⁽¹⁾ (2006) (ft)	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Depth to Nacimiento Formation (ft bgs)	Elevation of Nacimiento Surface (ft above msl)
Refinery Complex											
Monitoring Well	MW-1	2/8/84	4	5515.78	5519.21	5514.08	5517.54	22.95	2.9-22.9	22	5492.08
Monitoring Well	MW-3	2/9/84	4	5535.88	5539.27	5534.88	5538.61	38.35	18.4-38.4	40	5494.88
Monitoring Well	MW-4	2/9/84	6	5524.46	5527.78	5523.06	5526.56	31.1	11.1-31.1	32	5491.06
Monitoring Well	MW-5	2/6/84	4	5545.13	5548.56	5544.13	5547.97	50.61	30.6-50.6	47	5497.13
Monitoring Well	MW-6	2/7/84	4	5551.2	5554.61	5549.6	5553.32	48.03	28-48	49	5500.6
Monitoring Well	MW-7	2/25/86	6	5524.25	5527.66	5523.15	5526.34	61.01	49-59	32	5491.15
Monitoring Well	MW-8	2/28/86	6	5531.17	5534.58	5530.17	5533.84	33.94	11.9-31.9	34	5496.17
Monitoring Well	MW-11	7/31/87	4	5506.89	5510.31	5503.29	5507.12	21.13	6.1-16.1	10	5493.29
Monitoring Well	MW-12	8/1/87	4	5498.42	5501.61	5495.92	5499.5	11.72	1.7-11.7	10	5485.92
Monitoring Well	MW-13	9/3/88	4	5538.54	5542.04	5535.24	5539.12	49.7	28.7-44.5	45	5490.24
Refinery Side Source Well (east-end)	MW-20	9/13/91	4	5516.46	5519.9	5514.66	5517.91	25.38	8.4-23.4	24	5490.66
Refinery Side Source Well (east-end)	MW-21	9/16/91	4	5518.62	5521.99	5517.02	5520.75	29.33	12.3-27.3	24.5	5492.52
Monitoring Well	MW-25	5/11/94	6	5530.45	5533.99	5527.35	5530.92	21.31	22-36	35	5492.35
Monitoring Well	MW-26	5/12/94	6	5514.54	5517.88	5512.44	5515.73	23.15	7-21	20	5492.44
Monitoring Well	MW-27	5/18/94	4	5515.26	5518.67	5512.46	5515.78	21.69	5-20	17	5495.46
Monitoring Well	MW-29	5/12/94	4	5521.55	5524.97	5518.55	5522.07	25.74	10-24	23	5495.55
Monitoring Well	MW-30	5/13/94	4	5533.42	5536.83	5531.42	5534.81	38.16	21-36	35	5496.42
Monitoring Well	MW-31	5/15/94	4	5532.17	5536.24	5530.57	5534.66	37.62	21-35	34	5496.57
Monitoring Well	MW-32	2/23/95	4	5522.22	5525.64	5521.42	5524.95	26.74	10.7-24.7	25	5496.42
Monitoring Well	MW-33	2/23/95	4	5518.46	5521.79	5515.86	5519.85	22.95	6.9-20.9	20	5495.86
Monitoring Well	MW-34	2/23/95	4	5508.23	5511.63	5505.53	5509.21	18.32	2.3-16.3	14	5491.53
Monitoring Well	MW-35	4/29/97	2	5512.39	5518.95	N/A	5516.25	23.1	13.1-23.1	21.5	5494.75
Monitoring Well	MW-36	4/29/97	2	5510.56	5516.95	N/A	5514.16	21	11-21.2	21.5	5492.66
Monitoring Well	MW-37	5/1/97	2	5513.04	5519.62	N/A	5516.89	25	15-25	22	5494.89
Monitoring Well	MW-38	4/29/97	2	5512.87	5519.19	N/A	5516.65	23.5	13.5-23.5	22	5494.65
Refinery Side Source Well (central)	MW-39	9/28/98	2	5522	5520.83	N/A	5519.1	36	N/A	22	5497.1
Monitoring Well	MW-40	3/11/97	2	5526.21	5527.31	5521.45	5527.86	34.5	N/A	31.5	5496.36
Monitoring Well	MW-41	3/12/97	2	5525.13	5526.41	5529.88	5527.07	33.00	N/A	30.00	5497.07
Monitoring Well	MW-44	10/1/98	2	5536.00	5535.44	5535.94	5532.27	47.50	N/A	33.50	5498.77
Monitoring Well	MW-45	1/15/03	4	5506.36	5506.36	5496.33	5504.40	17.80	4.0-14.0	N/A	N/A
Monitoring Well	MW-46	1/16/03	4	5504.65	5504.65	5496.43	5503.03	10.39	3.2-8.2	10.50	5492.53
Monitoring Well	MW-47	3/6/03	2	5506.77	5506.77	5501.30	5504.15	12.80	6.1-11.1	11.30	5492.85
Piezometers	P-01	8/30/88	4	5524.49	N/A	5523.69	N/A	41.65	20.5-36.5	36.50	5487.19
Piezometers	P-02	8/29/88	4	5523.86	N/A	5523.06	N/A	37.53	16.9-32.2	31.50	5491.56
Piezometers	P-03	9/1/88	4	5507.31	5510.77	5506.51	5510.34	22	6.2-16.6	14	5492.51
Recovery Well	RW-1	8/31/88	4	5526.01	5529.34	5524.61	5527.93	39.58	17.4-33	32.6	5492.01
Recovery Well	RW-2	8/29/88	4	5523.61	5526.94	5523.11	5526.42	25.4	16.5-32.2	32	5491.11
Recovery Well	RW-3	3/4/86	6	5516.96	5520.35	5515.56	5519.28	32.53	10.5-30.5	23	5492.56
Recovery Well	RW-9	3/3/86	6	5519.77	5523.21	5518.07	5521.23	32.29	10.3-30.3	28.3	5489.77
Recovery Well	RW-14	8/6/90	4	5534.13	5537.5	5532.23	5535.19	41.1	21.1-39.1	38.5	5493.73
Recovery Well	RW-15	8/7/90	4	5533.44	5536.83	5531.74	5534.56	41.7	21.7-39.7	35	5496.74
Recovery Well	RW-16	8/7/90	4	5532.09	5535.45	5530.29	5533.22	41.3	21.3-39.3	37.5	5492.79
Recovery Well	RW-17	8/7/90	4	5530.46	5533.84	5528.86	5532.01	39.95	19.9-35.3	35.3	5493.56
Recovery Well	RW-18	8/9/90	4	5526.08	N/A	5523.48	N/A	N/A	17.3-35.3	29	5494.48

Table 1
Facility-Wide Monitoring Program
Bloomfield Refinery- Bloomfield, New Mexico

Well Type	Well ID	Installation Date	Well Diameter (in)	Measuring Point Elevation (Before 2006) (ft)	Measuring Point Elevation (After 2006) (ft)	Grade Elevation ⁽¹⁾ (before 2006) (ft)	Grade Elevation ⁽¹⁾ (2006) (ft)	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Depth to Nacimiento Formation (ft bgs)	Elevation of Nacimiento Surface (ft above msl)
Recovery Well	RW-19	8/8/90	4	5527.27	5530.51	5525.77	5528.75	35.2	15.2-33.2	33	5492.77
Recovery Well	RW-22	7/19/93	6	5521.06	5524.44	5518.05	5521.44	35.6	14.7-30.7	27	5491.05
Recovery Well	RW-23	7/19/93	6	5517.74	5521.38	5515.74	5519.13	35.53	15.4-31.4	29	5486.74
Recovery Well	RW-28	5/13/94	4	5524.52	5527.93	5522.52	5525.69	35.15	18-33	32	5490.52
Recovery Well	RW-42	3/11/97	2	5527.48	5527.48	5529.80	5526.98	35.00	25-35	31.50	5495.98
Recovery Well	RW-43	9/25/98	2	NA	5515.74	5522.18	5519.44	25.00	15-25	22.80	5492.94
Monitoring Well	MW-50	9/25/08	4	NA	5518.79	NA	5515.87	20.00	8-18	18.50	5497.37
Monitoring Well	MW-51	9/25/08	4	NA	5515.58	NA	5512.88	20.00	8-18	18.50	5494.38
Monitoring Well	MW-52	10/14/08	4	NA	5538.63	NA	5535.91	41.00	23-38	38.00	5497.91
Monitoring Well	MW-53	9/23/08	4	NA	5541.32	NA	5538.46	41.50	25-40	39.00	5499.46
Monitoring Well	MW-54	9/26/08	4	NA	5530.08	NA	5527.35	38.00	22-37	34.00	5493.35
Monitoring Well	MW-55	4/2/09	4	NA	5519.84	NA	5519.94	27.25	11-26	26.00	5493.94
Monitoring Well	MW-56	4/1/09	4	NA	5519.31	NA	5516.74	23.75	7-22	20.00	5496.74
Monitoring Well	MW-57	3/31/09	4	NA	5521.17	NA	5518.46	24.25	8-23	23.00	5495.46
Monitoring Well	MW-58	4/3/09	4	NA	5520.29	NA	5520.47	27.00	10.75-25.75	25.75	5494.72
Monitoring Well	MW-59	4/6/09	4	NA	5545.20	NA	5542.37	44.25	28-43	42.50	5499.87
Monitoring Well	MW-60	4/5/09	4	NA	5543.71	NA	5544.01	45.50	28.75-43.75	43.75	5500.26
Monitoring Well	MW-61	4/15/09	4	NA	5539.41	NA	5539.59	10.25	24-39	38.00	5501.59
Monitoring Well	MW-62	4/21/09	4	NA	5561.32	NA	5558.56	58.25	42-57	55.50	5503.06
Monitoring Well	MW-63	4/14/09	4	NA	5547.26	NA	5544.49	46.00	29.75-44.75	44.75	5499.74
Monitoring Well	MW-64	4/7/09	4	NA	5552.29	NA	5549.11	50.25	34-49	48.00	5501.11
Monitoring Well	MW-65	4/16/09	4	NA	5539.52	NA	5539.90	44.25	28-43	42.00	5497.90
Monitoring Well	MW-66	4/20/09	4	NA	5544.63	NA	5541.98	43.25	27-42	41.00	5500.98
Monitoring Well	MW-67	8/26/10	4	NA	5523.31	NA	5520.54	23.00	12-22	21.25	5499.29
Monitoring Well	MW-68	8/27/10	4	NA	5517.37	NA	5514.30	18.00	7-17	17.00	5497.30
Monitoring Well	MW-69	8/31/10	4	NA	5508.51	NA	5505.20	9.75	3.5-8.5	8.00	5497.20
North Barrier Wall											
Observation Well	OW 0+60	4/2005	2	5508.75	5506.62	5505.97	5506.75	12	4-12	12	5494.62
Observation Well	OW 1+50	4/2005	2	5508	5508.03	5504.6	5505.63	12	7-12	12	5496.03
Observation Well	OW 3+85	4/2005	2	5506.81	5507.31	5503.87	5505.09	14	7.5-12.5	12.5	5494.81
Observation Well	OW 5+50	4/2005	2	5507.14	5507.59	5503.87	5504.84	10.7	5.7-10.7	9.5	5498.09
Observation Well	OW 6+70	4/2005	2	5504.23	5504.78	5501.32	5502.14	13.5	7.5-13.5	13	5491.78
Observation Well	OW 8+10	4/2005	2	5506	5506.53	5503.15	5504.27	13	7-13	7	5499.53
Observation Well	OW 11+15	4/2005	2	5506.77	5506.7	5503.67	5504.07	13.5	6-13.5	9	5497.7
Observation Well	OW 14+10	4/2005	2	5507.36	5508.14	5504.51	5505.73	10	5-10	9	5499.14
Observation Well	OW 16+60	4/2005	2	5507.8	5508.43	5504.21	5505.42	12.5	7.5-12.5	12	5496.43
Observation Well	OW 19+50	4/2005	2	5507.24	5508.03	5504.14	5505.25	10	5-10	10	5498.03
Observation Well	OW 22+00	4/2005	2	5506.32	5506.91	5506.32	5506.97	14	9-14	12	5494.91
Observation Well	OW 23+10	4/2005	2	5510.66	5514.12	5510.16	5511.24	15	5-15	14	5500.12
Observation Well	OW 23+90	4/2005	2	5511.15	5515.18	5511.15	5512.17	15	10-15	13.5	5501.68
Observation Well	OW 25+70	4/2005	2	5508.56	5509	5508.01	5506.88	11	6-11	10	5499
Collection Well	CW 0+60	4/2005	6	5507.04	5506.68	5506.08	5507.01	14	4-14	12	5494.68
Collection Well	CW 1+50	4/2005	6	5505	5505.13	5504.4	5505.47	13	3-13	11	5494.13
Collection Well	CW 3+85	4/2005	6	5504.94	5503.87	5503.25	5504.11	13.5	3.5-13.5	11	5492.87
Collection Well	CW 5+50	4/2005	6	5503.23	5503.76	5504.17	5503.16	12.5	3.5-12.5	10	5493.76

Table 1
Facility-Wide Monitoring Program
Bloomfield Refinery- Bloomfield, New Mexico

Well Type	Well ID	Installation Date	Well Diameter (in)	Measuring Point Elevation (Before 2006) (ft)	Measuring Point Elevation (After 2006) (ft)	Grade Elevation ⁽¹⁾ (before 2006) (ft)	Grade Elevation ⁽¹⁾ (2006) (ft)	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Depth to Nacimiento Formation (ft bgs)	Elevation of Nacimiento Surface (ft above msl)
Collection Well	CW 6+70	4/2005	6	5504.21	5503.84	5503.26	5504.11	12	4-12	9	5494.84
Collection Well	CW 8+10	4/2005	6	5503.96	5504.02	5503.33	5504.14	12	4-12	9.5	5494.52
Collection Well	CW 8+45	4/2005	6	5504.77	5503.8	5503.67	5504.09	13.3	3.3-13.3	9.5	5494.3
Collection Well	CW 11+15	4/2005	6	5504.69	5503.95	5503.73	5504.34	12.5	2.5-12.5	9	5494.95
Collection Well	CW 14+10	4/2005	6	5505.68	5504.39	5503.97	5504.69	13.5	3.5-13.5	9.5	5494.89
Collection Well	CW 16+60	4/2005	6	5505.72	5504.32	5504.02	5504.59	13.5	3.5-13.5	10	5494.32
Collection Well	CW 19+50	4/2005	6	5507.48	5504.52	5509.23	5504.75	11	3-11	8	5496.52
Collection Well	CW 22+00	4/2005	6	5510.82	5508.04	5510.16	5508.26	13.5	3.5-13.5	8	5500.04
Collection Well	CW 23+10	4/2005	6	5507.65	5510.04	5506.72	5510.27	15	5-15	13	5497.04
Collection Well	CW 23+90	4/2005	6	5507.65	5507.32	5506.72	5507.71	12	4-12	13	5494.32
Collection Well	CW 25+95	4/2005	6	5507	5505.9	5505.19	5505.89	11	3-11	13	5492.9
San Juan River Bluff											
Sump Well	SW1-0206	2/20/06	4	N/A	5508.27	N/A	5505.87	53	21-51	13.5	5494.77
Sump Well	SW2-0206	2/6/06	4	N/A	5507.75	N/A	5505.25	27	5-25	10	5497.75
Sump Well	SW3-0206	2/17/06	4	N/A	5505.29	N/A	5503.18	51.5	20-50	7.75	5497.54
Sump Well	SW4-0206	2/16/06	4	N/A	5504.45	N/A	5502.13	42	9.5-39.5	11	5493.45
Sump Well	SW5-0206	2/15/06	4	N/A	5514.34	N/A	5511.94	52	19-49	27.25	5487.09
Sump Well	SW6-0206	2/13/06	4	N/A	5519.72	N/A	5517.63	40	15-45	31.75	5487.97
Sump Well	SW7-0206	2/22/06	4	N/A	5508.42	N/A	5505.78	30	4-24	11	5497.42
San Juan River Terrace											
Monitoring Well	MW-48	10/28/04	4	5421.37	5424.83	5418.48	5422.21	15	5-15	N/A	N/A
Monitoring Well	MW-49	10/28/04	4	5421.22	5425.2	5418.07	5422.52	15	4-14	N/A	N/A
Dewatering Well	DW-1	8/16/05	4	5423.80	5422.97	N/A	5420.73	15.62	5-14	N/A	N/A
Dewatering Well	DW-2	8/18/05	4	N/A	5423.81	N/A	5422.67	14	4-14	N/A	N/A
Temporary Piezometer	TP-1	10/28/04	2	5422.03	5422.03	5421.13	N/A	9	4-9	N/A	N/A
Temporary Piezometer	TP-2	10/28/04	2	N/A	N/A	N/A	N/A	9	4-9	N/A	N/A
Temporary Piezometer	TP-3	10/28/04	2	5423.88	5423.88	5422.66	N/A	9	4-9	N/A	N/A
Temporary Piezometer	TP-5	10/28/04	2	5422.83	5422.83	5422.00	N/A	8	N/A	N/A	N/A
Temporary Piezometer	TP-6	10/28/04	2	5422.56	5422.55	5421.40	N/A	10	5-10	N/A	N/A
Temporary Piezometer	TP-7	10/28/04	2	5422.00	5421.99	5420.90	N/A	10	5-10	N/A	N/A
Temporary Piezometer	TP-8	10/28/04	2	5422.52	5422.52	5421.13	N/A	10	5-10	N/A	N/A
Temporary Piezometer	TP-9	4/5/05	2	5422.14	5422.14	5421.55	N/A	10	5-10	N/A	N/A
Temporary Piezometer	TP-10	4/5/05	2	5422.56	5422.56	5422.56	N/A	8.5	3.5-8.5	N/A	N/A
Temporary Piezometer	TP-11	4/5/05	2	N/A	N/A	N/A	N/A	9.5	4.5-9.5	N/A	N/A
Temporary Piezometer	TP-12	4/5/05	2	5424.97	5424.97	5424.97	N/A	12	7-12	N/A	N/A
Temporary Piezometer	TP-13	4/5/05	2	5423.88	5423.88	5423.88	N/A	14.5	4.5-14.5	N/A	N/A

Notes:

ft = feet

in = inches

bgs = below grade surface

msl = mean sea level

N/A = not available

(1) Top of casing elevations well resurveyed in 2006

Western Refining Southwest, Inc.

Bloomfield Refinery

TABLE 2.
Analytical Methods and Target Analytes
Facility-Wide Groundwater Monitoring Plan - June 2011
Western Refining Southwest, Inc. - Bloomfield Refinery

VOCs (EPA Method 8260B) ⁽¹⁾
- Target List
<i>Benzene</i>
<i>Toluene</i>
<i>Ethylbenzene</i>
<i>Xylenes</i>
<i>Methyl tert butyl ether (MTBE)</i>
SVOCs - (EPA Method 8270)
- Method List
TPH-GRO (EPA Method 8015B)
- Gasoline Range Organics
TPH-DRO (EPA Method 8015B)
- Diesel Range Organics
- Motor Oil Range Organics
Total Carbon Dioxide (Laboratory Calculated)
- Dissolved CO ₂
Specific Conductivity (EPA Method 120.1 or field measurement)
- Specific conductance
TDS (EPA Method 160.1 or field measurement)
- Total dissolved solids
General Chemistry - Anions (EPA Method 300.0)
<i>Fluoride</i>
<i>Chloride</i>
<i>Bromide</i>
<i>Nitrogen, Nitrite (as N)</i>
<i>Nitrogen, Nitrate (as N)</i>
<i>Phosphorous, Orthophosphate (As P)</i>
<i>Sulfate</i>
General Chemistry - Alkalinity (EPA Method 310.1)
<i>Alkalinity, Total</i>
<i>Carbonate</i>
<i>Bicarbonate</i>

Total Recoverable Metals (EPA Method 6010B/7470)
- Target List (not applicable to River Terrace Sampling Events)
<i>Arsenic</i>
<i>Barium</i>
<i>Cadmium</i>
<i>Chromium</i>
<i>Lead</i>
<i>Mercury</i>
<i>Selenium</i>
<i>Silver</i>
- Target List (for River Terrace Sampling Events Only)
<i>Lead</i>
<i>Mercury (DW-1 ONLY)</i>
Dissolved Metals (EPA Method 6010B / 7470)
- Target List (for Refinery Complex, Outfalls, and River)
<i>Arsenic</i>
<i>Barium</i>
<i>Cadmium</i>
<i>Calcium</i>
<i>Chromium</i>
<i>Copper</i>
<i>Iron</i>
<i>Lead</i>
<i>Magnesium</i>
<i>Manganese</i>
<i>Mercury</i>
<i>Potassium</i>
<i>Selenium</i>
<i>Silver</i>
<i>Sodium</i>
<i>Uranium</i>
<i>Zinc</i>

TPH = total petroleum hydrocarbons
GRO = gasoline range organics
VOCs = volatile organic compounds
DRO = diesel range organics
TDS = total dissolved solids

NOTES:

- (1) VOCs Target List for River Terrace samples are analyzed by EPA Method 8021B per NMED's letter Approval with Direction dated June 16, 2009.
- (2) Target List for San Juan River Terrace Monitoring Wells and Piezometer Wells only, per the River Terrace Bioventing System Monitoring Plan.

TABLE 3
Facility-Wide Monitoring Plan - June 2011
Western Refining Southwest, Inc. - Bloomfield Refinery

Well ID	Sampling Event	VOCs (EPA Method 8260)	VOCs - Target List (EPA Method 8260) ⁽¹⁾⁽²⁾	SVOCs (EPA Method 8270)	TPH - Diesel Range Organics Extended (EPA Method 8015B)	TPH - Gasoline Range Organics (EPA Method 8015B)	Total Recoverable Metals - Target List (EPA Method 6010/7470)	Total Dissolved Metals - Target List (EPA Method 6010/7470)	General Chemistry - Alkalinity (EPA Method 310.1)	General Chemistry - Anions (EPA Method 300.0)	Carbon Dioxide (EPA Method 310.1)	Total Dissolved Solids (TDS) (EPA Method 160.1 or Field Measurement)	Specific Conductance (EPA Method 120.1 or Field Measurement)	Temperature, pH, ORP (Field Measurement)	Dissolved Oxygen (Field Measurement)
REFINERY COMPLEX															
Background Wells															
MW-3	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-5	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-6	Semi-Annual Event (April)		X									X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
Refinery Wells															
RW-1	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-4	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-8	Semi-Annual Event (April)		X									X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
RW-9	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
RW-15	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
RW-18	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-20	Semi-Annual Event (April)		X									X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-21	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
RW-23	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
RW-28	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-29	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-30	Semi-Annual Event (April)		X									X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-31	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-40	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
RW-42	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
RW-43	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-44	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
Cross-Gradient Wells															
MW-1	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-13	Semi-Annual Event (April)		X									X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-26	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-27	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-32	Semi-Annual Event (April)														
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-33	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X

TABLE 3
Facility-Wide Monitoring Plan - June 2011
Western Refining Southwest, Inc. - Bloomfield Refinery

Well ID	Sampling Event	VOCs (EPA Method 8260)	VOCs - Target List ⁽¹⁾⁽²⁾ (EPA Method 8260)	SVOCs (EPA Method 8270)	TPH - Diesel Range Organics Extended (EPA Method 8015B)	TPH - Gasoline Range Organics (EPA Method 8015B)	Total Recoverable Metals - Target List (EPA Method 60107470)	Total Dissolved Metals - Target List (EPA Method 60107470)	General Chemistry - Alkalinity (EPA Method 310.1)	General Chemistry - Anions (EPA Method 300.0)	Carbon Dioxide (EPA Method 310.1)	Total Dissolved Solids (TDS) (EPA Method 160.1 or Field Measurement)	Specific Conductance (EPA Method 120.1 or Field Measurement)	Temperature, pH, ORP (Field Measurement)	Dissolved Oxygen (Field Measurement)
Downgradient Wells															
MW-11	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X***	X	X	X	X	X	X	X	X	X	X	X
MW-12	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)	X		X***	X	X	X	X	X	X	X	X	X	X	X
MW-34	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-35	Semi-Annual Event (April)		X									X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-37	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)	X			X	X	X	X	X	X	X	X	X	X	X
MW-38	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)	X		X***	X	X	X	X	X	X	X	X	X	X	X
RCRA Investigation Wells															
MW-50 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-51 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-52 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-53 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-54 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-55 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-56 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-57 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-58 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-59 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-60 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-61 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-62 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-63 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-64 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-65 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-66 *	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-67 **	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-68 **	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X
MW-69 **	Semi-Annual Event (April)	Not Sampled													
	Annual Event (August)	X		X	X	X	X	X	X	X	X	X	X	X	X

TABLE 3
Facility-Wide Monitoring Plan - June 2011
Western Refining Southwest, Inc. - Bloomfield Refinery

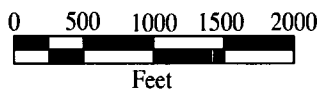
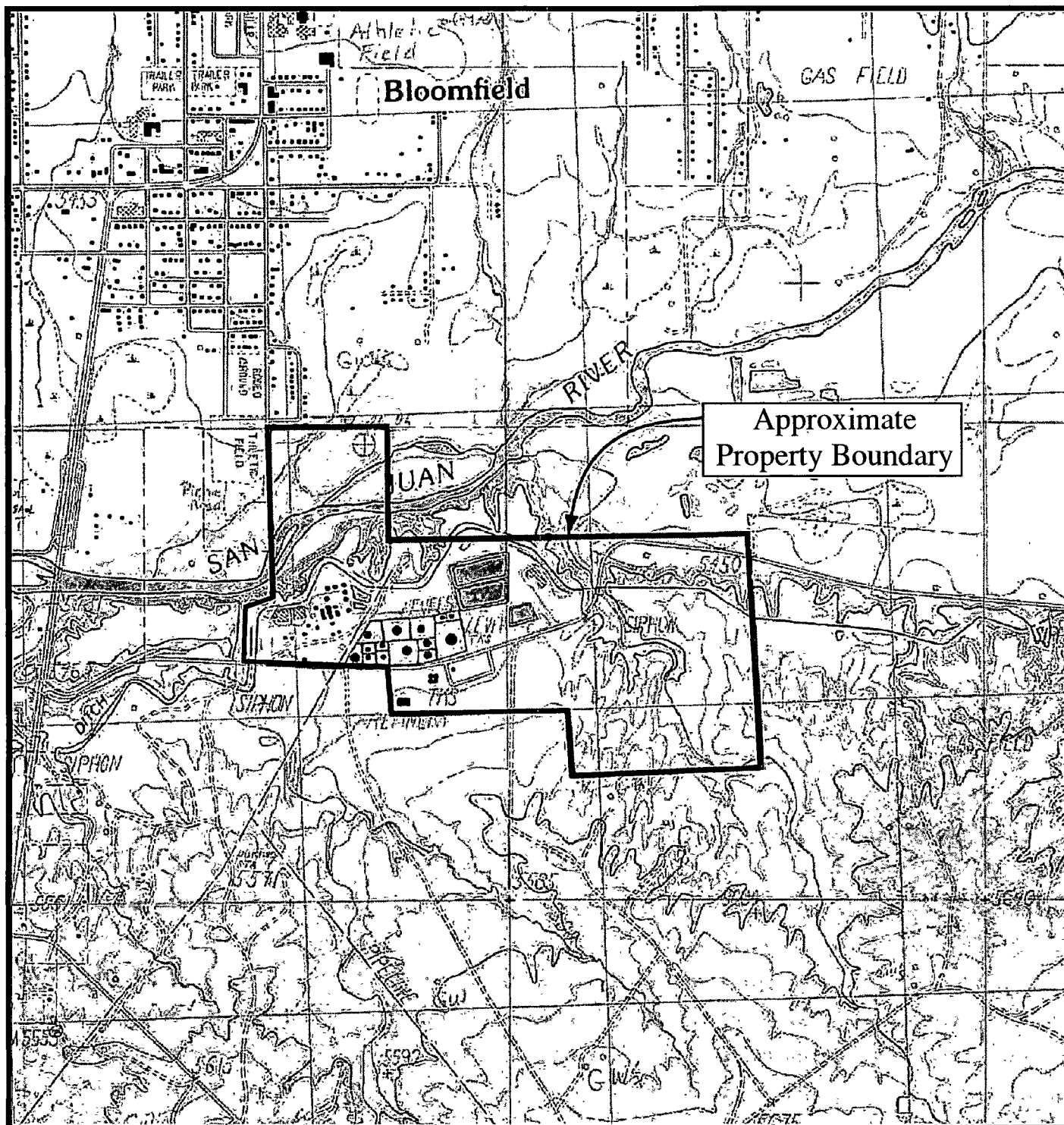
Well ID	Sampling Event	VOCs (EPA Method 8260)	VOCs - Target List ⁽¹⁾⁽²⁾ (EPA Method 8260)	SVOCs (EPA Method 8270)	TPH - Diesel Range Organics Extended (EPA Method 8015B)	TPH - Gasoline Range Organics (EPA Method 8015B)	Total Recoverable Metals - Target List (EPA Method 6010/7470)	Total Dissolved Metals - Target List (EPA Method 6010/7470)	General Chemistry - Alkalinity (EPA Method 310.1)	General Chemistry - Anions (EPA Method 300.0)	Carbon Dioxide (EPA Method 310.1)	Total Dissolved Solids (TDS) (EPA Method 160.1 or Field Measurement)	Specific Conductance (EPA Method 120.1 or Field Measurement)	Temperature, pH, ORP (Field Measurement)	Dissolved Oxygen (Field Measurement)
NORTH BOUNDARY BARRIER															
Collection Wells															
CW 0+60	Semi-Annual Event (April)		X		X							X	X	X	X
	Annual Event (August)		X		X							X	X	X	X
CW 25+95	Semi-Annual Event (April)		X		X							X	X	X	X
	Annual Event (August)		X		X							X	X	X	X
Observation Wells															
OW 0+60	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 1+50	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 3+85	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 5+50	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 6+70	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 8+10	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 11+15	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 14+10	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 16+60	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 19+50	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 22+00	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 23+10	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 23+90	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
OW 25+70	Semi-Annual Event (April)		X		X	X						X	X	X	X
	Annual Event (August)		X		X	X						X	X	X	X
Sump Wells⁽³⁾															
SW-1	Major Precipitation Event														(No Sampling; Collection of Groundwater and SPH Levels Only)
SW-2	Major Precipitation Event														(No Sampling; Collection of Groundwater and SPH Levels Only)
SW-3	Major Precipitation Event														(No Sampling; Collection of Groundwater and SPH Levels Only)
SW-4	Major Precipitation Event														(No Sampling; Collection of Groundwater and SPH Levels Only)
SW-5	Major Precipitation Event														(No Sampling; Collection of Groundwater and SPH Levels Only)
SW-6	Major Precipitation Event														(No Sampling; Collection of Groundwater and SPH Levels Only)
SW-7	Major Precipitation Event														(No Sampling; Collection of Groundwater and SPH Levels Only)
SAN JUAN RIVER BLUFF															
Outfalls															
East Outfall #2	Semi-Annual Event (April)		X				X	X	X	X	X	X	X	X	
	Annual Event (August)		X				X	X	X	X	X	X	X	X	
East Outfall #3	Semi-Annual Event (April)		X				X	X	X	X	X	X	X	X	
	Annual Event (August)		X				X	X	X	X	X	X	X	X	
Seeps															
Seep 1	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
Seep 2 ⁽⁴⁾	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
Seep 3 ⁽⁴⁾	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	

TABLE 3
Facility-Wide Monitoring Plan - June 2011
Western Refining Southwest, Inc. - Bloomfield Refinery

Well ID	Sampling Event	VOCs (EPA Method 8260)	VOCs - Target List ⁽¹⁾⁽²⁾ (EPA Method 8260)	SVOCs (EPA Method 8270)	TPH - Diesel Range Organics Extended (EPA Method 8015B)	TPH - Gasoline Range Organics (EPA Method 8015B)	Total Recoverable Metals - Target List (EPA Method 6010/7470)	Total Dissolved Metals - Target List (EPA Method 6010/7470)	General Chemistry - Alkalinity (EPA Method 310.1)	General Chemistry - Anions (EPA Method 300.0)	Carbon Dioxide (EPA Method 310.1)	Total Dissolved Solids (TDS) (EPA Method 160.1 or Field Measurement)	Specific Conductance (EPA Method 120.1 or Field Measurement)	Temperature, pH, ORP (Field Measurement)	Dissolved Oxygen (Field Measurement)
Seep 4 ⁽⁴⁾	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
Seep 5 ⁽⁴⁾	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
Seep 6	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
Seep 7	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
Seep 8	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
Seep 9	Semi-Annual Event (April)		X						X	X	X	X	X	X	
	Annual Event (August)		X						X	X	X	X	X	X	
SAN JUAN RIVER TERRACE															
Monitoring Wells															
MW-49 ⁵	High Flow Event		X		X	X	X						X	X	X
	Low Flow Event		X		X	X	X						X	X	X
DW-1	Bi-Annually (Starting 2011)		X		X	X	X						X	X	X
Piezometers															
TP-1 ⁵	High Flow Event		X		X	X	X						X	X	X
	Low Flow Event		X		X	X	X						X	X	X
TP-2 ⁵	High Flow Event		X		X	X	X						X	X	X
	Low Flow Event		X		X	X	X						X	X	X
TP-3 ⁶	Bi-Annually (Starting 2011)		X		X	X	X						X	X	X
TP-5 ⁵	High Flow Event		X		X	X	X						X	X	X
	Low Flow Event		X		X	X	X						X	X	X
TP-6 ⁵	High Flow Event		X		X	X	X						X	X	X
	Low Flow Event		X		X	X	X						X	X	X
TP-7 ⁶	Bi-Annually (Starting 2011)		X		X	X	X						X	X	X
TP-8 ⁵	High Flow Event		X		X	X	X						X	X	X
	Low Flow Event		X		X	X	X						X	X	X
TP-9 ⁵	High Flow Event		X		X	X	X						X	X	X
	Low Flow Event		X		X	X	X						X	X	X
TP-10 ⁶	Bi-Annually (Starting 2011)		X		X	X	X						X	X	X
TP-11 ⁶	Bi-Annually (Starting 2011)		X		X	X	X						X	X	X
TP-12 ⁶	Bi-Annually (Starting 2011)		X		X	X	X						X	X	X
TP-13 ⁶	Bi-Annually (Starting 2011)		X		X	X	X						X	X	X
San Juan River															
Upstream	Semi-Annual Event (April)		X		X	X	X	X	X	X		X	X		
	Annual Event (August)		X		X	X	X	X	X	X		X	X		
North of MW#46	Semi-Annual Event (April)		X		X	X	X	X	X	X		X	X		
	Annual Event (August)		X		X	X	X	X	X	X		X	X		
North of MW#45	Semi-Annual Event (April)		X		X	X	X	X	X	X		X	X		
	Annual Event (August)		X		X	X	X	X	X	X		X	X		
Downstream	Semi-Annual Event (April)		X		X	X	X	X	X	X		X	X		
	Annual Event (August)		X		X	X	X	X	X	X		X	X		

Notes:

1. Refer to Table 2 for respective Target Analyte Lists.
 2. VOC target list analytes for River Terrace sample are analyzed by EPA Method 8021B, as stated in Table 1 of NMED's letter dated April 18, 2007.
 3. Groundwater and SPH levels are monitored in each sump well following each major precipitation event (NMED, 2008).
 4. A sample will be collected at this location during a semi-annual sampling event if an active groundwater discharge is present (NMED, 2008)
 5. Samples will be collected during San Juan River low flow and high flow conditions.
 6. Biannual sampling events (occurring once every two years) will be conducted during San Juan River low flow conditions.
- * = Wells were recently installed and therefore require sampling for two years on an annual basis (i.e. included in the 2010 and 2011 annual sampling event).
- ** = Wells were installed in 2010 and therefore require sampling for two years on an annual basis (i.e. included in the 2011 and 2012 annual sampling events.)
- *** = Samples for SVOC analysis will be collected every two years.

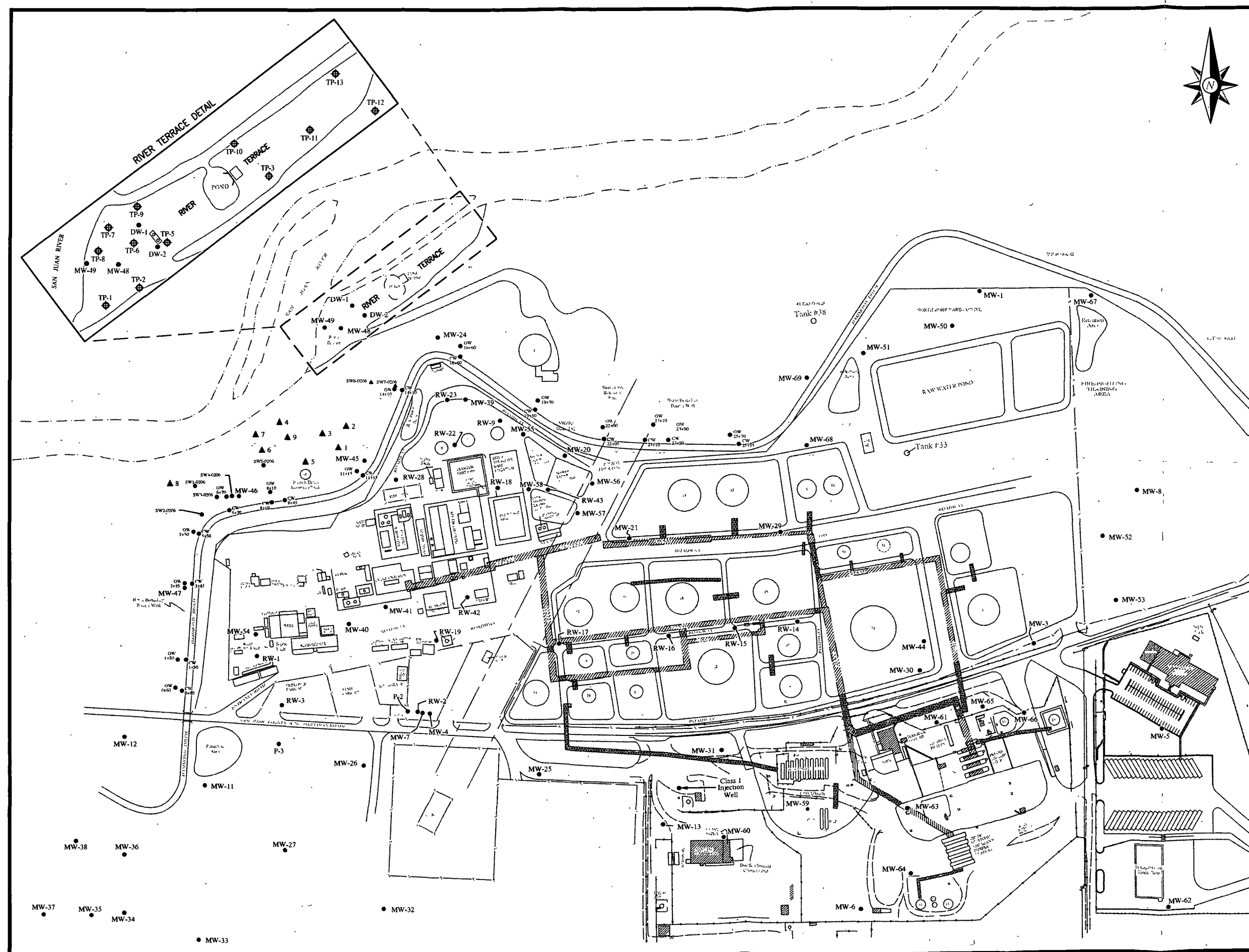


Site Location Map

Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

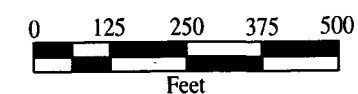
June 2011

Figure 1



Legend

- Site Well
- Injection Well
- ▲ Seep
- ⊕ Temporary Piezometer
- ↗ Discharge Location
- Approximate Property Line

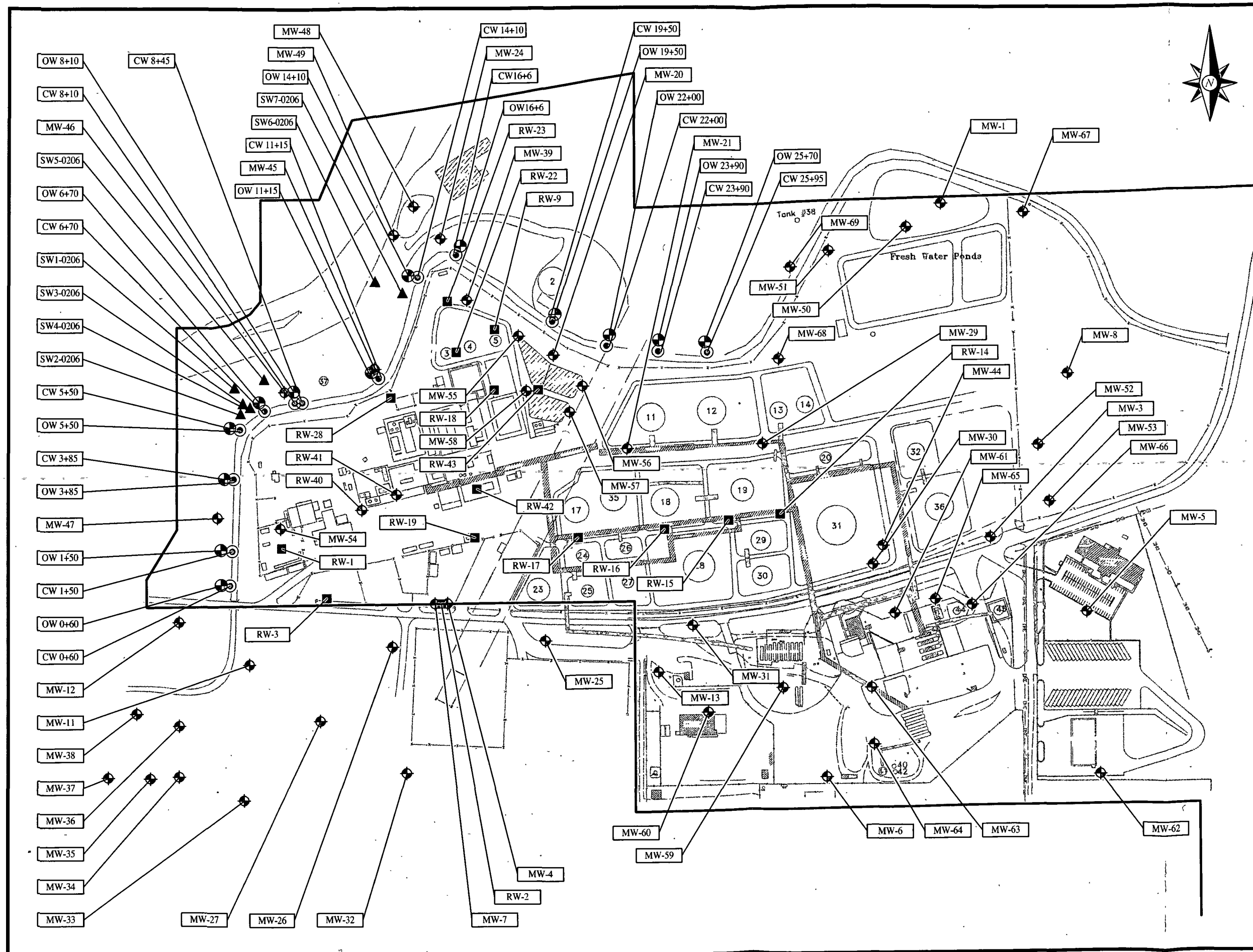


Site Plan

Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

June 2011

Figure 2



Legend

- ◆ Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- ▲ Sump Well
- Site
- Approximate Property Line
- RW-14 - Well ID

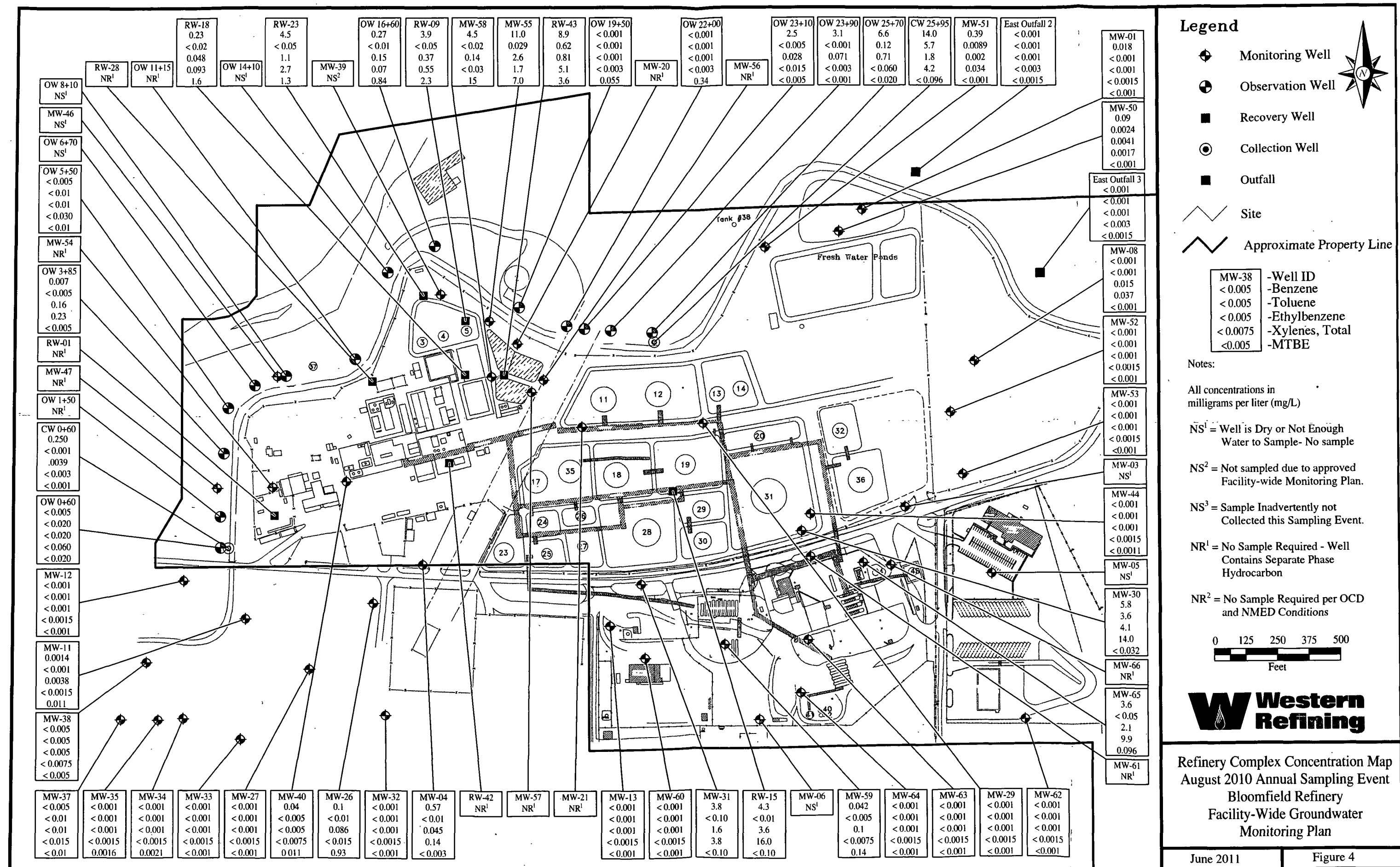
0 125 250 375 500
Feet



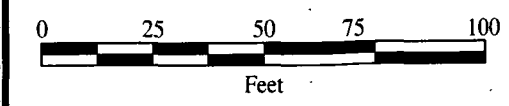
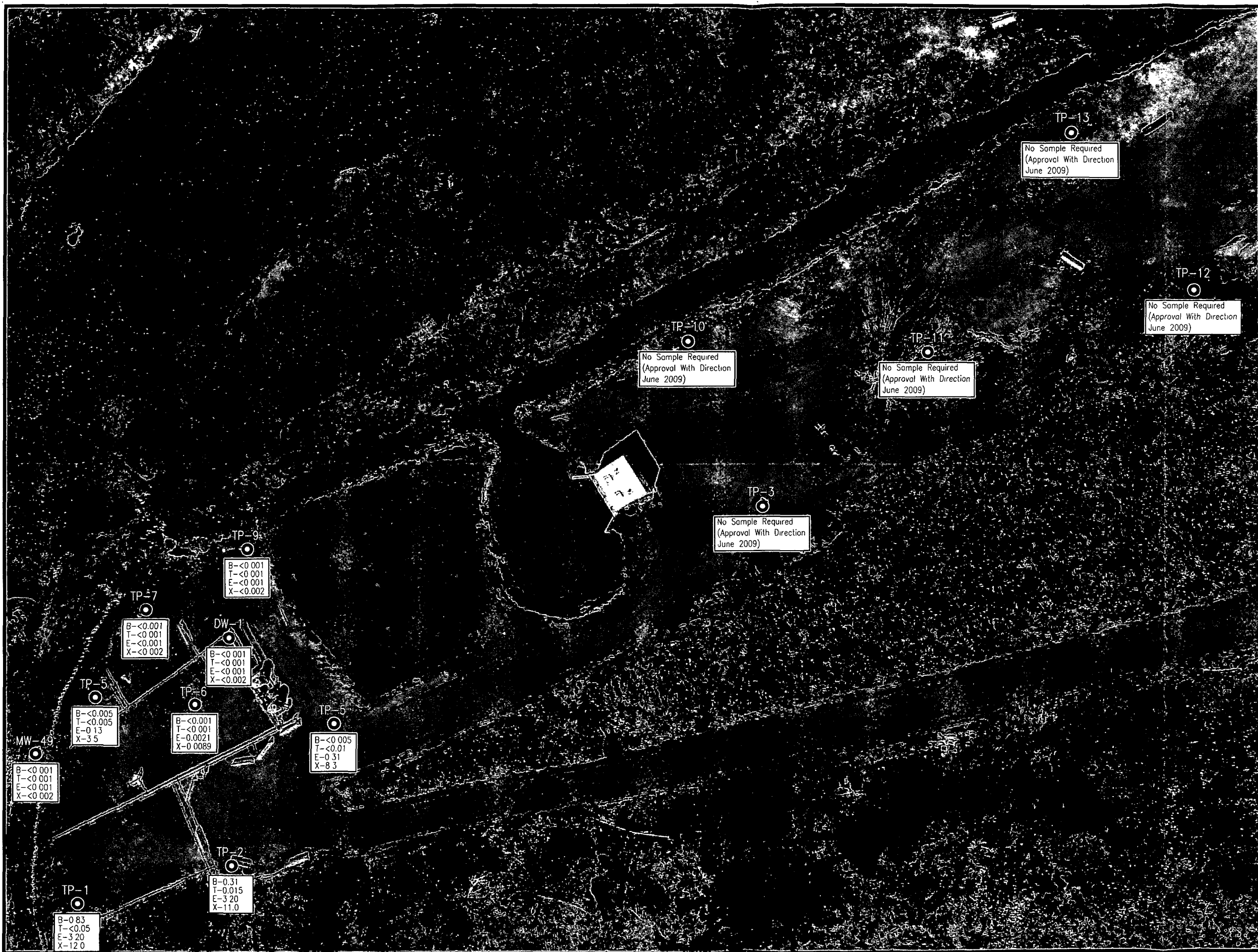
Refinery Complex, North Boundary
Barrier, and San Juan River Bluff
Well Location Map
Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

June 2011

Figure 3







LEGEND

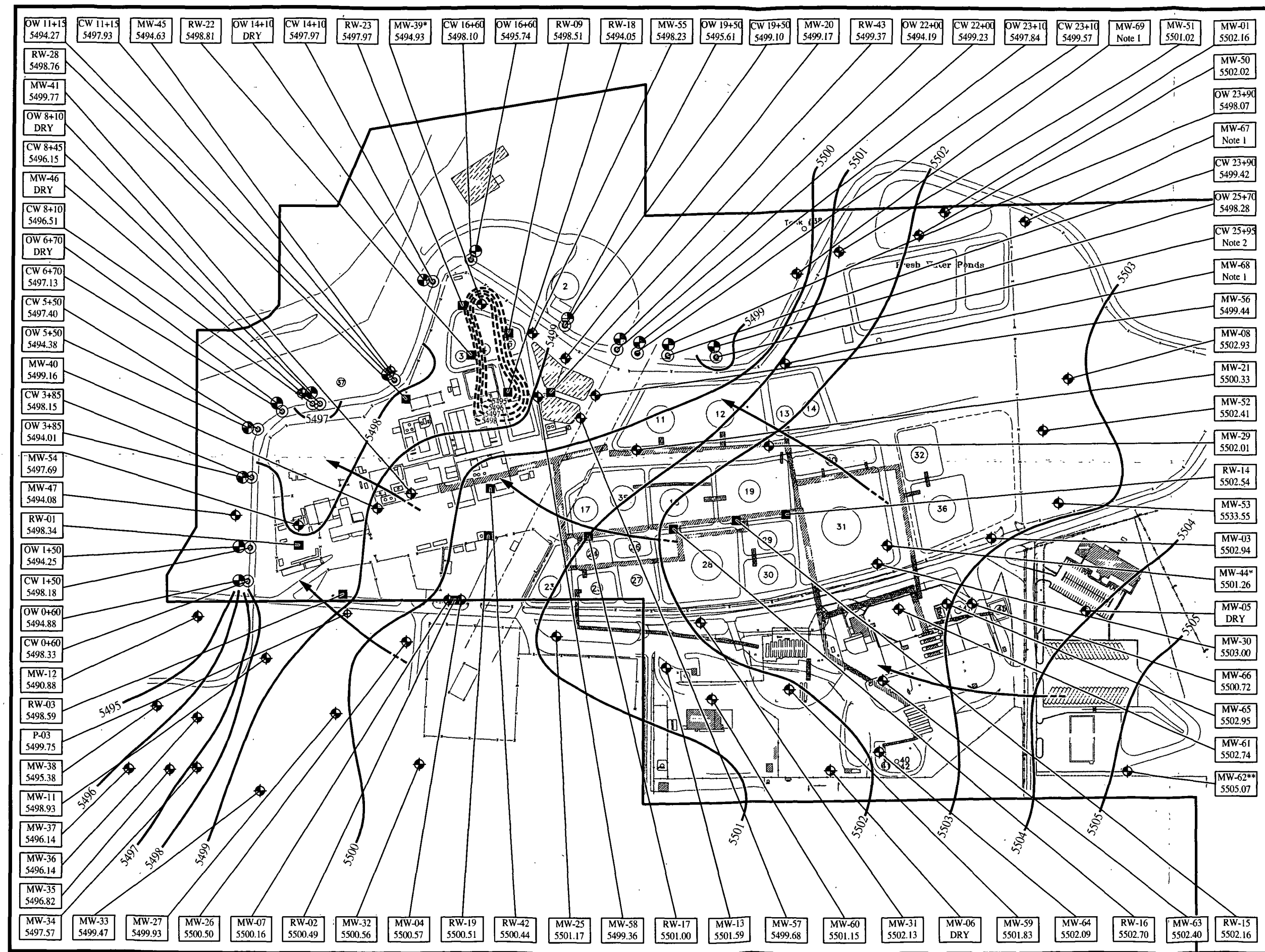
- MW - Monitoring Well
- TP - Temporary Piezometer
- DW - Dewatering Well

- B - Benzene
- T - Toluene
- E - Ethylbenzene
- X - Xylene

All Concentrations in Milligrams per liter (mg/l)



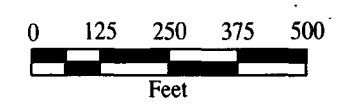
River Terrace Groundwater BTEX
Concentration Map July 2010
Sampling Event (3rd QTR 2010)
Bloomfield Refinery Facility-Wide
Groundwater Monitoring Plan



Legend

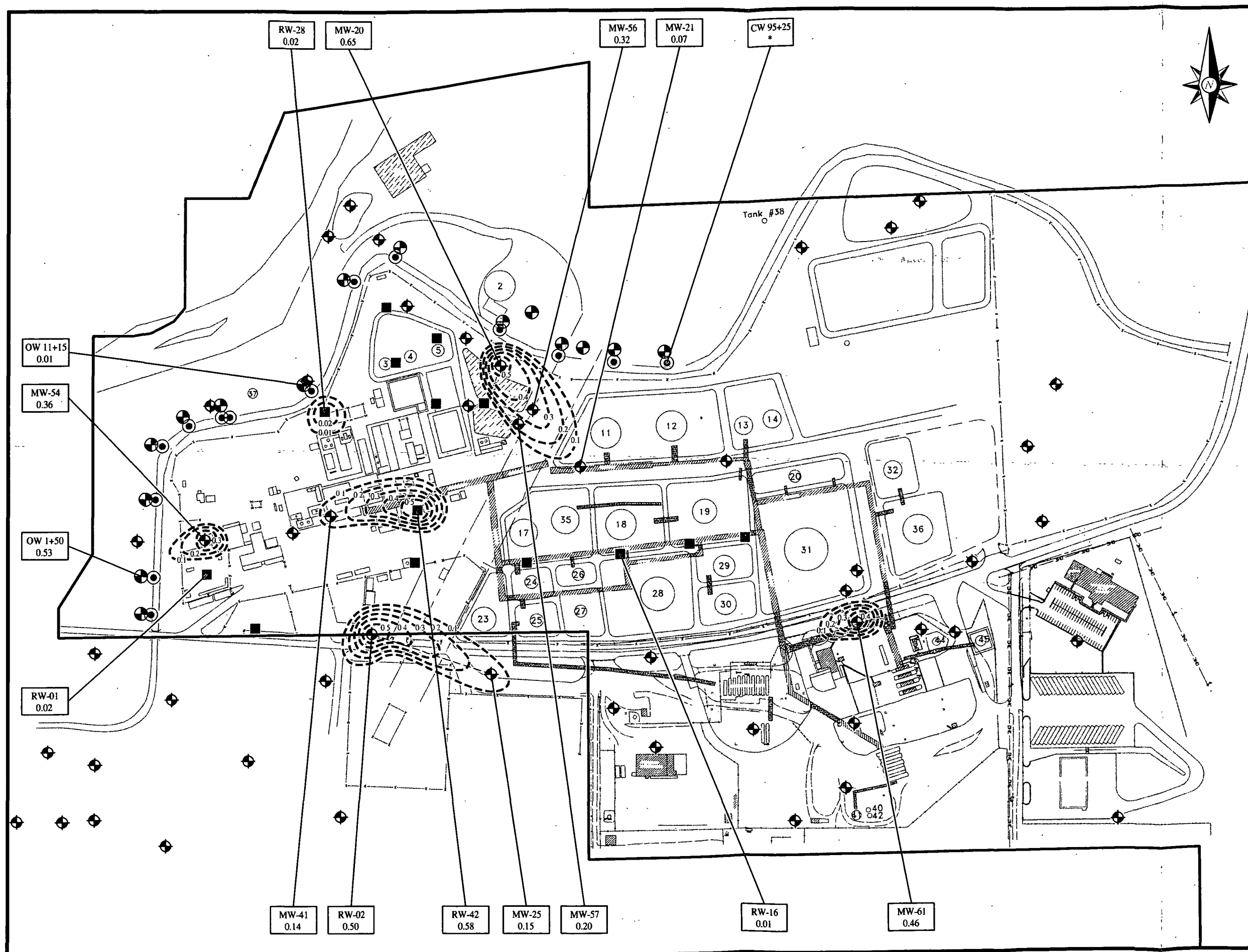
- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- Piezometer
- Seep
- Site
- Approximate Property Line
- Groundwater Elevation Contours
- Inferred Groundwater Elevation
- Groundwater Flow Direction - Dashed where inferred
- MW-47
5494.08 = Well ID
-Groundwater Elevation (ft amsl)

Notes:
* Deeper Well; data not used to contour.
** Well data questionable, will re-survey.
1. MW-67 thru MW-69 are not part of facility wide monitoring plan.
2. CW-25+95 is being used for recovery service, no measurements taken.



Groundwater Elevation
Contours August 2010

Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

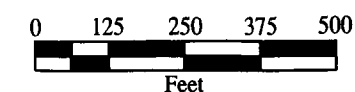


Legend

- ◆ Monitoring Well
- ⊕ Observation Well
- Recovery Well
- ⊙ Collection Well
- August 2009 Product Thickness
- Site
- Approximate Property Line
- MW-21 - Well ID
0.14 - Product Thickness (feet)

Note:
Free product measured in observation wells located outside the barrier wall were not contoured.

* Well is in Recovery Service
No Measurement

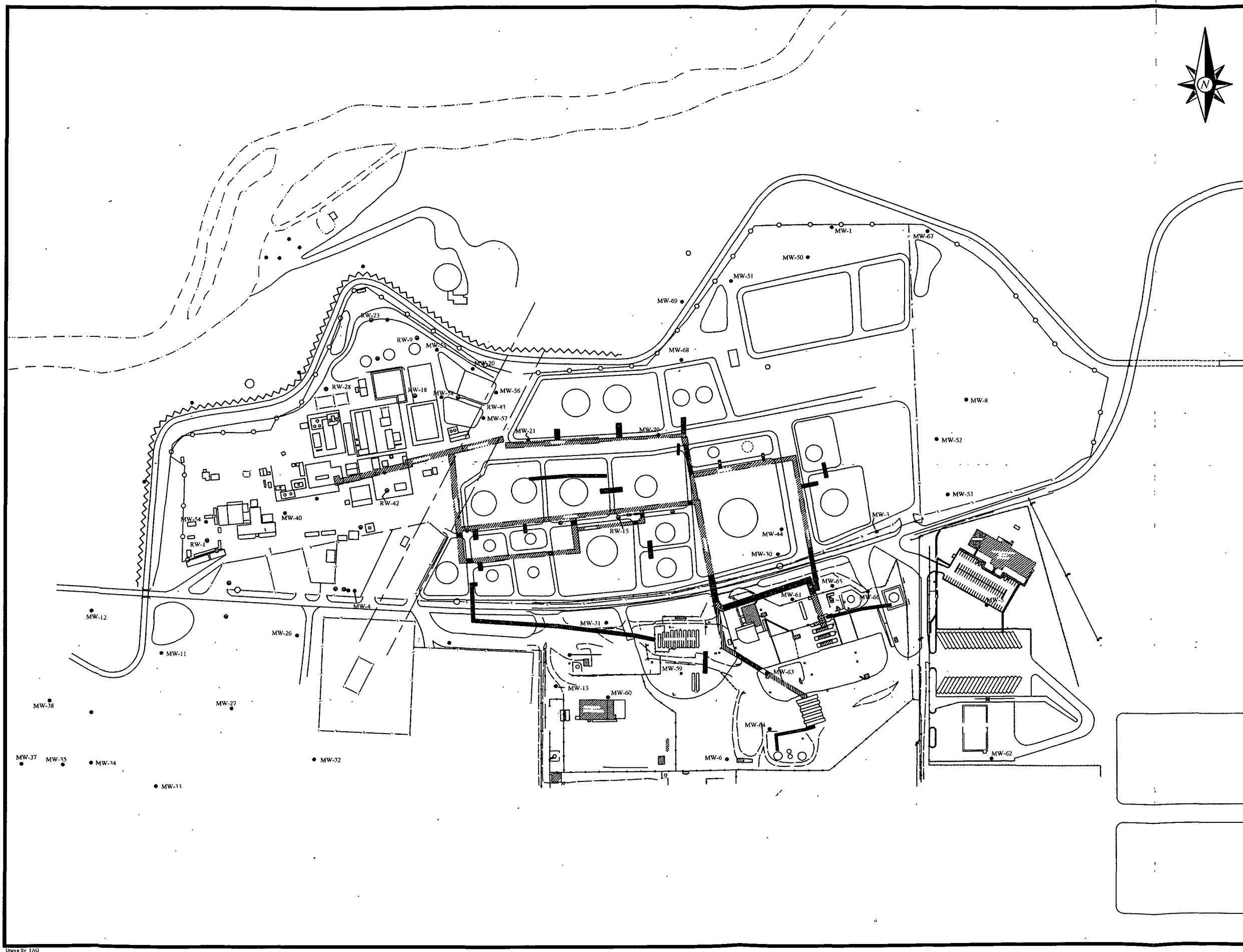


Western Refining

Separate Phase Hydrocarbon
Thickness Summary Map
August 2010
Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

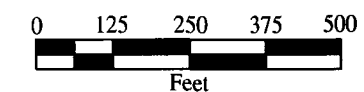
June 2011

Figure 8



Legend

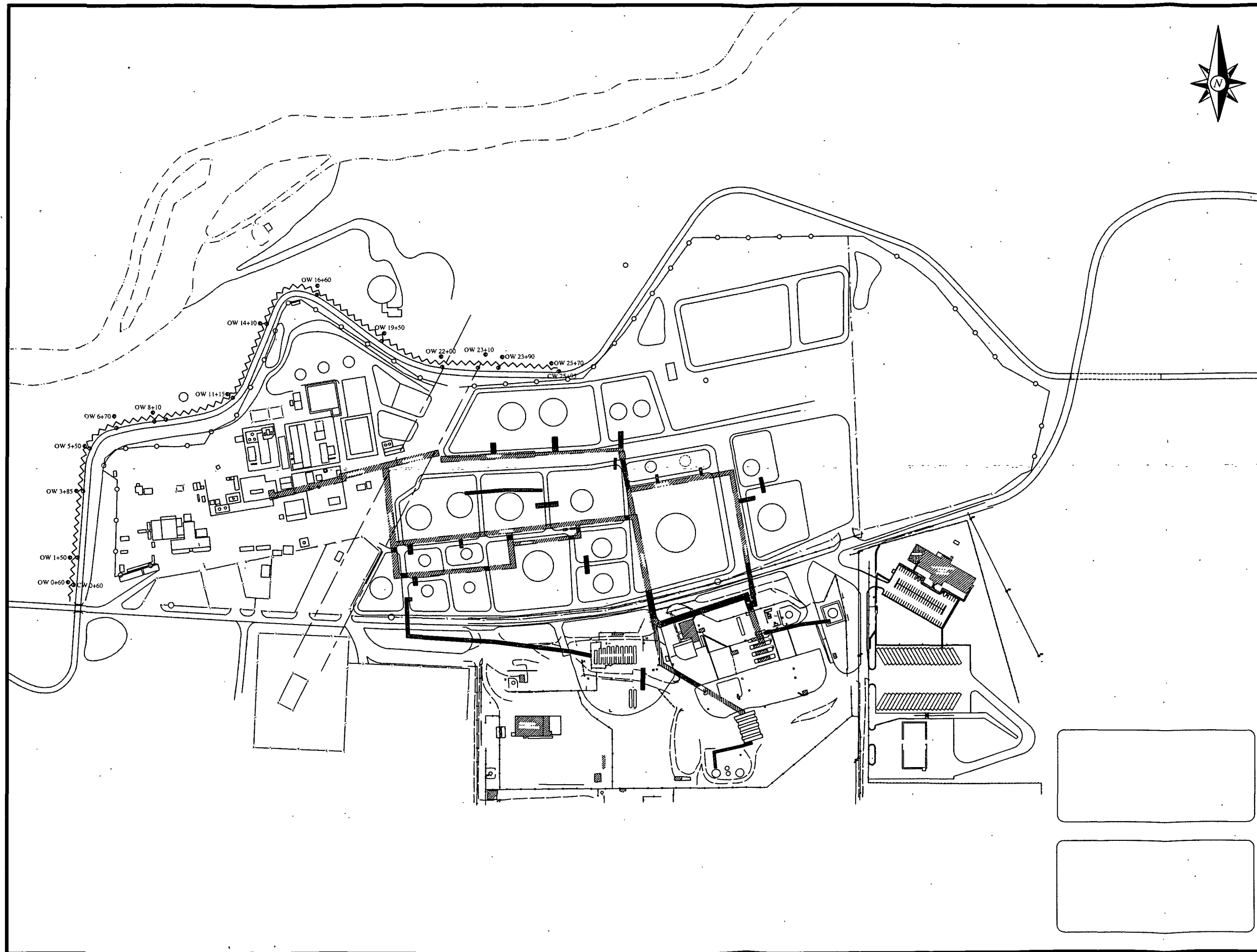
- Monitor Well
- Recovery Well
- Underground Pipeway
- ▨ Above Ground Pipeway
- ~ Slurry Wall Barrier
- Fence



Refinery Complex
Monitoring Well Location
Map Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

June 2011

Figure 9



Legend

- OW 0+60 ● Observation Well
- CW 0+60 ● Collection Well
- Underground Pipeway
- ▨ Above Ground Pipeway
- ~ Slurry Wall Barrier
- +— Fence

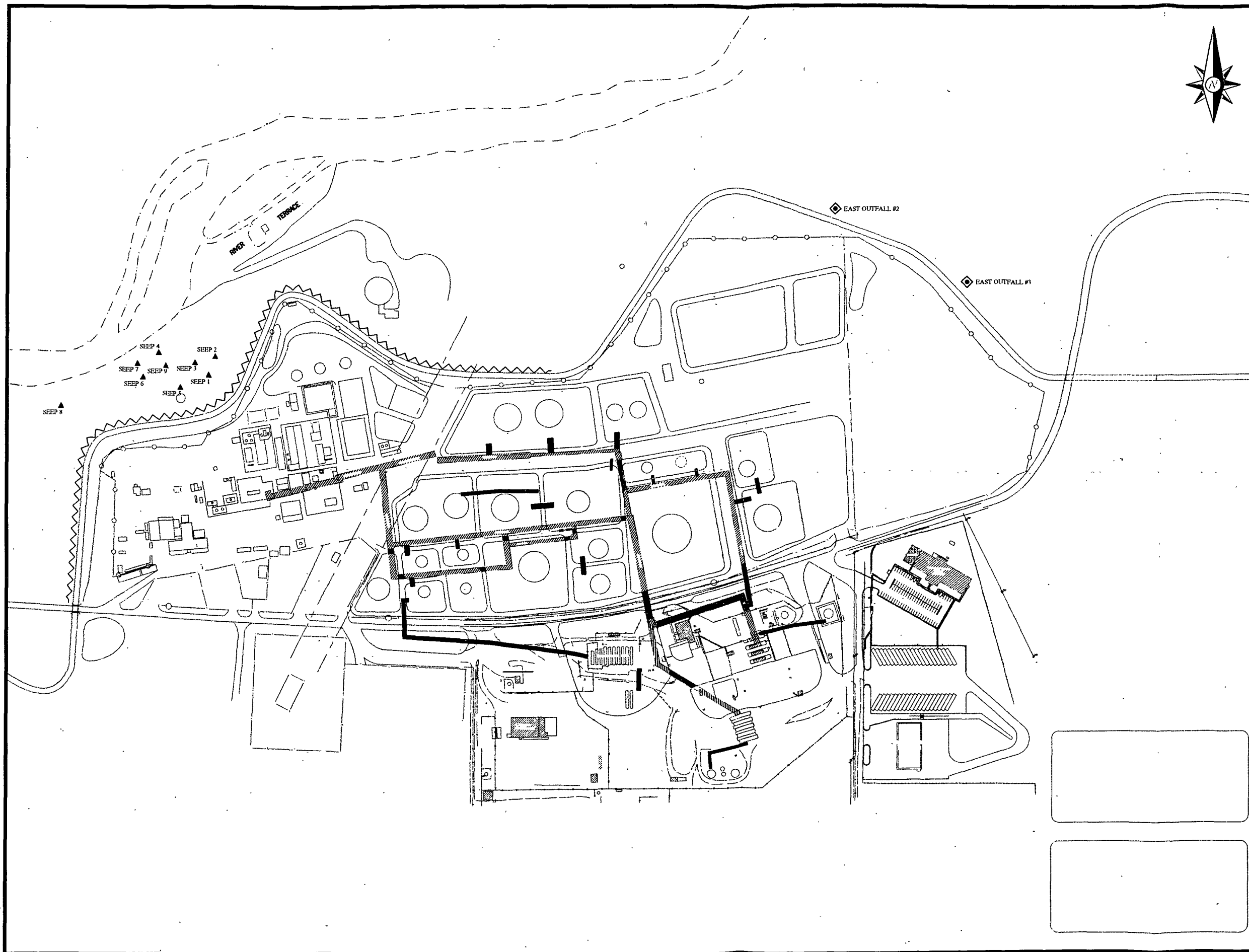
0 125 250 375 500
Feet



North Boundary Barrier
Monitoring Well Location Map
Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

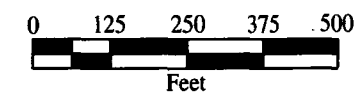
June 2011

Figure 10



Legend

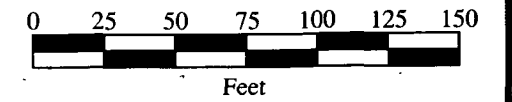
- Outfall Location
- Seep
- Underground Pipeway
- Above Ground Pipeway
- Slurry Wall Barrier
- Fence



San Juan River Bluff
Location Map
Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan

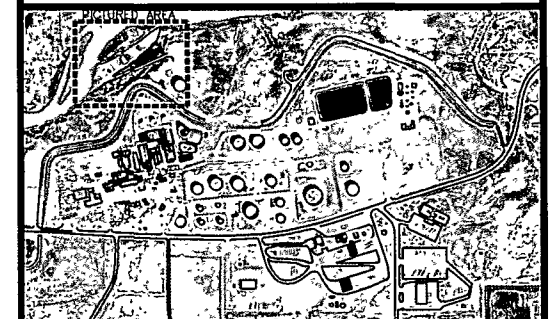
June 2011

Figure 11



LEGEND

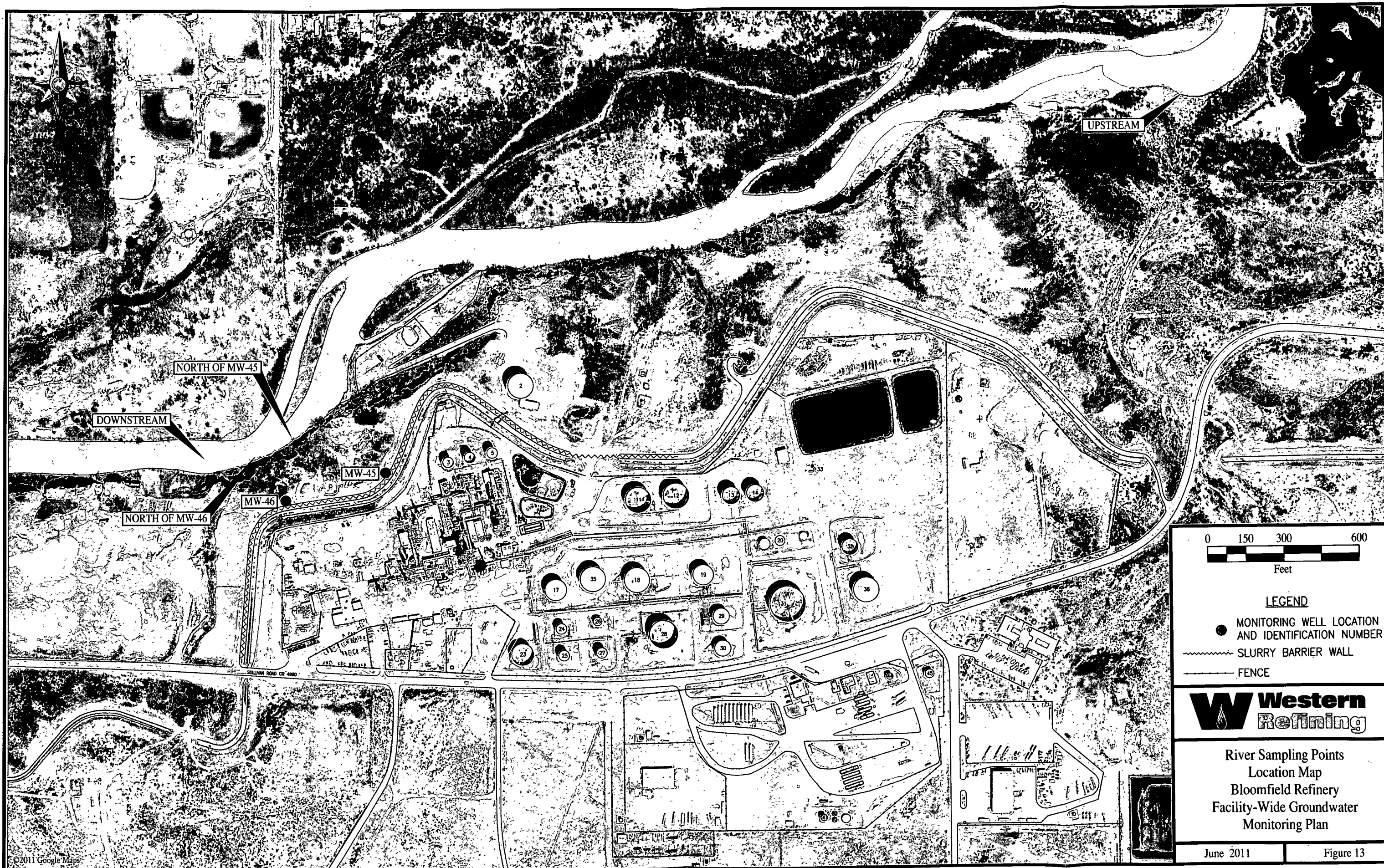
- MW-1 ● MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
- DW-1 ○ DEWATERING WELL LOCATION AND IDENTIFICATION NUMBER
- TP-1 ⊕ TEMP PIEZOMETER LOCATION AND IDENTIFICATION NUMBER
- ~~~~~ SLURRY BARRIER WALL
- FENCE



Area Location Map



River Terrace Monitoring Well
Location Map
Bloomfield Refinery
Facility-Wide Groundwater
Monitoring Plan



mw-1

WELL NUMBER: 1
DATE: 8 February 1984
LOCATION: 29.11.27.24221

DEPTH
IN FEET

DESCRIPTION

0-5	Light brown clayey sand, coarse, poorly sorted, quartzose and slightly calcareous
5-10	Yellowish gray sandy pebbles and cobbles, poorly sorted, rounded to subrounded
10-12	Yellowish gray pebbly sand, very coarse, poorly sorted, feldspathic and noncalcareous
12-22	Dark gray pebbly and sandy cobbles, some quartz pebbles, most are volcanic, subrounded cobbles and pebbles, some clay, a little water at about 15 feet
22-25	Gray-green clayey sand becoming light yellow clayey sandstone and sandy claystone

mw-3

WELL NUMBER: 3
DATE: 8 February 1984
LOCATION: 29.11.27.24442

DEPTH IN FEET	DESCRIPTION
0-5	Yellow brown sandy silt and clay, very calcareous, quartzose
5-10	yellow brown sand, calcareous, silty and clayey, quartzose
10-15	Yellow brown sand, silty and clayey, fine-grained, very calcareous, quartzose
15-27	Light brown clay, sandy, very calcareous, becoming pebbly with depth
27-35	Gray yellow brown cobbly sand, coarse, poorly sorted, silty and clayey, volcanic pebbles small amount of water at about 35 feet
35-40	Gray cobbles, pebbly and sandy, coarse sand, yellow gray clayey sandstone at about 40 feet

mw-4
WELL NUMBER: 4
DATE: 9 February 1984
LOCATION: 29.11.27.23344

O = 5522.90

Sand 15 =

DEPTH IN FEET	DESCRIPTION
0-5	Yellow gray-brown sandy silt and clay, calcareous
5-10	Yellow brown silty sandy clay and clayey silt, very slightly calcareous
10-15	Reddish yellow-brown clayey sandy silt, silty clay, fine-grained quartzose sand, noncalcareous
15-19	Light brown coarse sand with clay and pebbles, calcareous
19-25	Gray pebbly sand, very coarse, poorly sorted, some clay and silt, subrounded to subangular, quartzose, pebbles rounded, slightly calcareous
25-30	Gray cobbles and pebbles, subrounded to rounded, volcanic; at about 28 feet, hydrocarbon smell and color
30-32	Gray cobbly sand, with hydrocarbon smell and color, coarse grained, sand is quartzose and feldspathic, subrounded and subangular quartz grains are clear
32	Yellow gray clayey sandstone

WELL NUMBER: 5
DATE: 6 February 1934
LOCATION: 29.11.26.31112

DEPTH IN FEET	DESCRIPTION
0-5	Pale yellow brown clay, silty, some sand, calcareous
5-10	Pale yellow brown clayey sand and quartzose silt, poorly sorted, calcareous.
10-15	Yellow brown sand, subrounded quartzose sand slightly calcareous
15-20	Yellow brown sand, clayey, moderately coarse grained, very slightly calcareous
20-25	Yellow brown sand, clayey, silty, fine to medium grained, moderately sorted, noncalcareous
25-35	Yellow brown sand, silty and slightly clayey, fine-to-medium grained, well sorted, subangular, noncalcareous, becoming more clayey with depth
35-37	Yellow brown pebbly and cobbly sand, clayey, calcareous
37-47	Dark gray sandy and clayey cobbles and pebbles, water at 42 feet
47-50	Dark gray cobbles with greenish clay
50-54	Green-gray pebbly clay

TABLE 3.1

WELL LOG FOR MONITORING WELL NUMBER 7

Drilling Date: February 25 1986

<u>Depth in Feet</u>	<u>Description</u>
0-1	Gravel fill
1-5	Brown sandy silt and clay with small gravels
5-10	Brown sandy silt and clay, more firm and sticky
10-15	Lighter brown sandy silt and sticky clay
15-20	Lighter brown sandy silt and clay, larger cobbles and pebbles
20-25	Sand with cobbles and pebbles
25-30	Sand
30-35	Greenish clay with pebbles, top of Nacimiento estimated at 32 feet
35-40	Greenish clay, few pebbles
40-45	Green to gray clay, smooth drilling
45-50	Green to gray clay, smooth drilling
50-65	Sticky gray to green clay

Elevation of Top of Pipe: 5524.09 feet

Total Depth of Casing: 62.11 feet.

Description of Casing: Bottom of casing has a 2 foot stainless steel blank section for a silt trap, followed by a 10 foot section of 6" I.D. stainless steel screen, in turn followed by 6" I.D. schedule 40 PVC casing to the top of pipe. Sand was added to 45 feet below grade, bentonite to 41 feet below grade, and grout to the surface.

MW-6

WELL NUMBER: 6
DATE: 7 February 1984
LOCATION: 29.11.27.42144 or 42233

DEPTH IN FEET	DESCRIPTION
0-15	Pale yellow brown sand, clayey and silty, subangular, poorly sorted, quartzose, very calcareous, becoming more clayey with depth
15-20	Pale yellow brown silt, sandy and clayey, silt is coarse, sand is very fine, moderate sorting, quartzose and calcareous
20-25	Pale yellow sand, slightly clayey, subrounded, well sorted, quartzose, noncalcareous
25-35	Pale yellow sand, coarse to medium grained, quartzose, noncalcareous
35-41	Pale yellow sand, clayey, fine grained, silty, quartzose, slightly calcareous
41-49	Gray-black cobbles and pebbles, volcanic
49-52	Gray-green clayey sandstone and sandy claystone

TABLE 3.2

WELL LOG FOR MONITORING WELL NUMBER 8

Drilling Date: February 28, 1986

<u>Depth in Feet</u>	<u>Description</u>
0-20	Light brown sandy clay, similar to that found on the ground surface
20-34	Cobbles and pebbles
34	Green-gray clay and sandstone, intermixed with small pebbles and sand. Top of Nacimiento.

Elevation of Top of Casing: 5531.12 feet

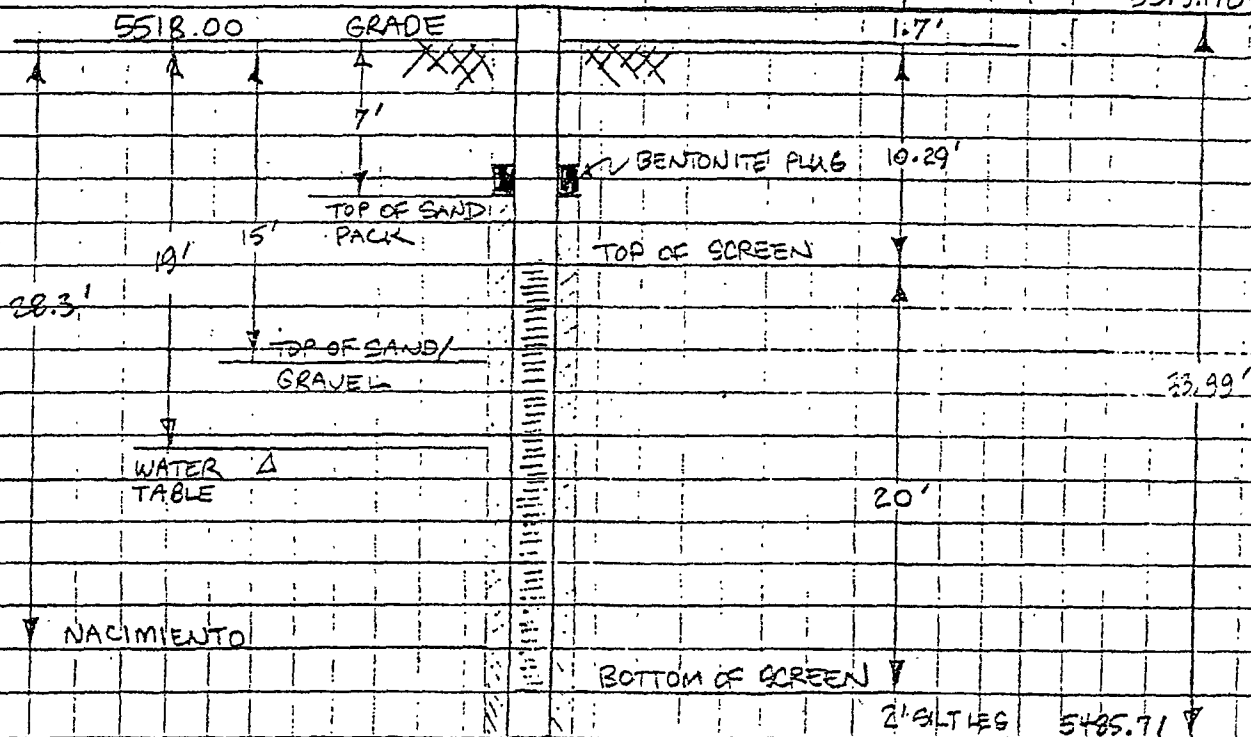
Total Depth of Casing: 34.94 feet

Description of Casing: Bottom of casing has a 2 foot stainless steel blank section for a silt trap, followed by 20 feet of 6" I.D. stainless steel screen, followed by 6" I.D. schedule 40 PVC to the surface. The screened section of the hole was sanded to within 7 feet of the surface, a bentonite seal (1/2 bucket) was added and concrete was used for a surface seal.

CALCULATION SHEET

MW-9

CONSTRUCTION COMMENTS: DRILLED UTILIZING DRILLING MUD THEN THOROUGHLY DEVELOPED. BOTTOM OF CASING TO THE TOP OF SCREEN IS 6" I.D. STAINLESS STEEL, REST OF CASING TO SURFACE IS 6" SCH. 40 PVC. TOP OF CASING HAS CONCRETE SURFACE SEAL AND STEEL PIPE WITH LOCKING WD, CASING PROTECTOR (NOT SHOWN).



INITIALS MA PROJECT NO. GROUNDWATER MONITORING - SCWP & NOWP
 DATE 9-17-91 SUBJECT MW-9
 DATE OF INSTALLATION: 3-3-86 SHEET 1 OF 1

TABLE 3.3

WELL LOG FOR MONITORING WELL NUMBER 9

Drilling Date: March 3, 1986

<u>Depth in Feet</u>	<u>Description</u>
0-5	Fill material, some rock
5-10	Sticky reddish brown silty clay
10-15	Lighter color silty clay, some pebbles
15-20	Lighter color silty clay, some pebbles
20-25	Cobbles, pebbles, sand
25-30	Cobbles, greenish clay, top of Nacimiento

Elevation of Top of Casing: 5519.70 feet

Total Depth of Casing: 33.99 feet

Description of Casing: Bottom of casing has a 2 foot stainless steel blank section for a silt trap followed by 20 feet of 6" I.D. stainless steel screen, followed by 6" I.D. schedule 40 PVC to the surface. The screened section of the hole was sanded to within 7 feet of the surface, a bentonite seal (1/2 bucket) was added and concrete was used for a surface seal.

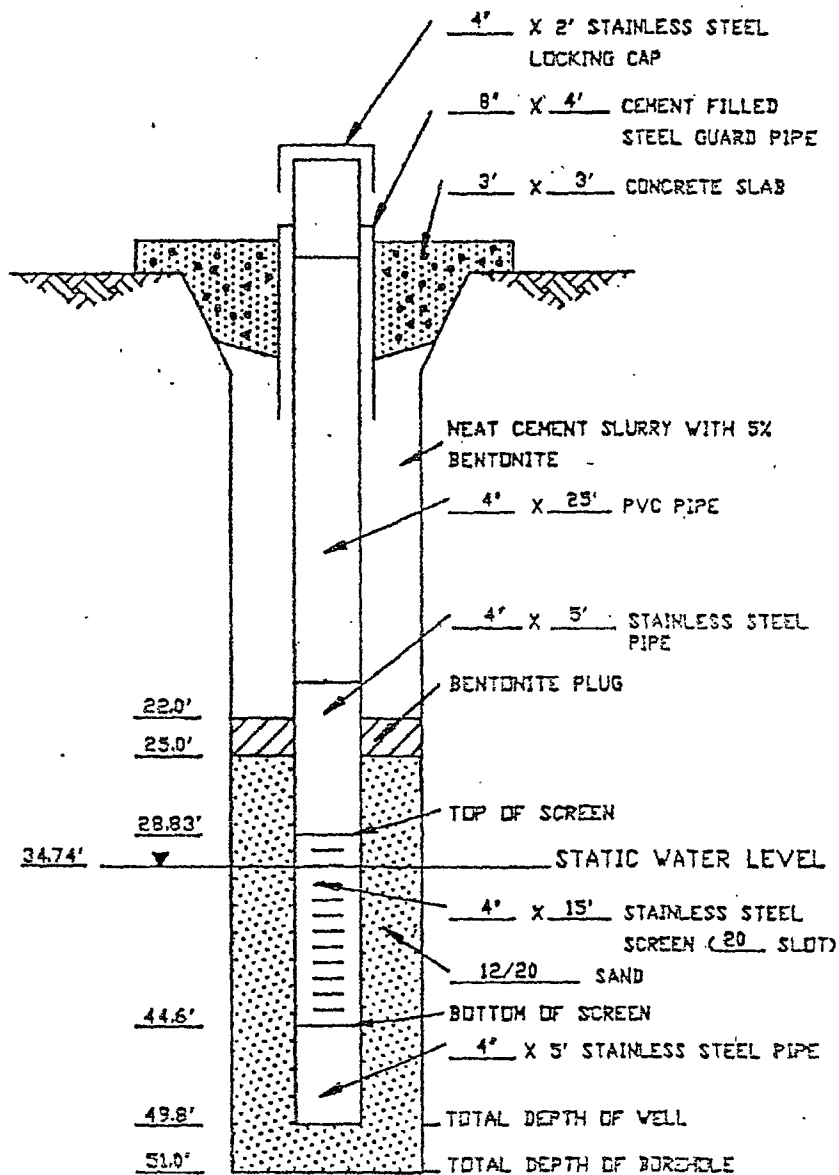


FIGURE B-7

COMPLETION DIAGRAM
PIEZOMETER P-4

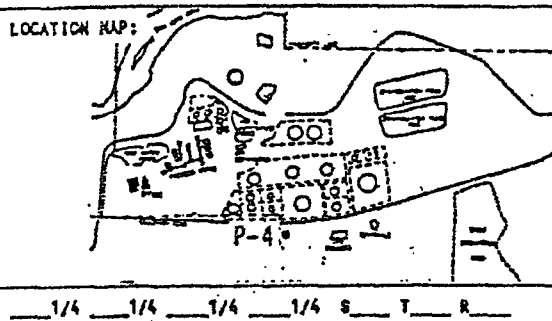
(MW-13)

FIGURE B-14

LITHOLOGIC LOG (SOIL)

PIEZOMETER P-4 (MW-13)

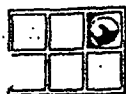
Page 1 of 1



SITE ID: BRC LOCATION ID: P-4 (MW-13)
 SITE COORDINATES (ft.): _____
 N _____ E _____
 GROUND ELEVATION (ft. MSL): 5538.42
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: Casing Driver
 DRILLING CONTR.: Beeman Brothers
 DATE STARTED: 2 September 1988 DATE COMPLETED: 3 September 1988
 FIELD REP.: V.S. Dubyk
 COMMENTS: Static on September 9, 1988; 37.91' from TOC.

LOCATION DESCRIPTION:

Depth	Visual %	Lith	Drilling Time Scales	Sample Type and Interval	Lithologic Description
5					0'-27' Silt and Clay - Moderate brown (5 YR 4/4) to light brown (5 YR 5/6).
10					
15					
20					
25			1233		27'-30' Sand - Very pale or (5 YR 8/2) fine to coarse grained, angular to subangular predominantly quartz.
30					30'-40' Gravel and Sand - Light gray (N7). Sand is medium to coarse grained, subrounded to rounded. Gravel is subangular to rounded, up to 3" diameter.
35					
40			1415		41'-43' Clay - Pale olive (10 Y 6/2), plastic.
					43'-45' Gravel and Sand - As above.
45			1420		45'-51' Sand: Macimiento Formation - light bluish gray (5B7/1) Fine grained, silty.
50			1455		
		T.D. 51'			



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-25

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5527.45 Total Hole Depth 38 ft. Diameter 11 in.
Top of Casing 5520.45 Water Level Initial 28 ft. Static _____
Screen: Dia 6 in. Length 14 ft. Type/Size FRE 0.020 in.
Casing: Dia 6 in. Length 24 1/2 ft. Type FRE
Fill Material 10/20 Co. Silica Rig/Core Drill Systems 180
Drill Co. Layne Method Air Percussion
Driller Gabby Rodriguez Log By Jerry May Date 05/11/94 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 1000 hrs. 2 ft. silty leg installed
from 36 feet to 38 feet.

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ X Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0							Brown clayey SILT (dry-moist)
2						ML	
4							
6		0					
8						SM SC	Brown fine poorly-graded silty/clayey SAND (moist)
10		0					
12							Tan fine poorly-graded SAND (moist)
14		0					
16							
18						SP	
20		0					
22							
24							



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-25

Project BRC

Owner Bloomfield Refining Co.

Location 50 County Road 4990, Bloomfield, New Mexico

Proj. No. 023353014

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24					SP	
26		120			GP	Tan fine-coarse, poorly-graded SAND with gravel and cobbles (moist)
28						Dark gray-stained at 28 feet. Groundwater encountered at 28 feet 5/11/94
30		550			GP	Dark gray-stained cobbles (little fines)
32						
34					CL	Brown silty clay lens at 34 feet (moist)
36					SP	Tan very fine poorly-graded SAND (dry) Encountered weathered limestone at 35 feet (dry)
38						End of boring at 38 feet (1110 hrs.). Installed well screened from 22 to 36 feet on 5/11/94.
40						
42						
44						
46						
48						
50						
52						
54						
56						



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-26

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5512.54 Total Hole Depth 23 ft. Diameter 15 in.
Top of Casing 5514.54 Water Level Initial 15 ft. Static _____
Screen: Dia 6 in. Length 14 ft. Type/Size FRE 0.020 in.
Casing: Dia 6 in. Length 9/2 ft. Type FRE
Fill Material 10/20 Co. Silica Rig/Core Drill Systems 180
Drill Co. Layne Method Air Percussion
Driller Gabby Rodriguez Log By Jerry May Date 05/12/94 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 0730 hrs. Silt leg installed from
21 feet to 23 feet.

Depth (ft.)	Well Completion	PTD (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0							Tan fine poorly-graded silty SAND (moist)
2						SH	
4							
6		22				SP	Tan fine poorly-graded SAND (moist)
8							Tan fine-coarse SAND with a little pea gravel and cobbles (dry)
10		37				SP	
12						GP	Cobbles with some fines (dry)
14						SP	Tan fine-coarse poorly-graded SAND (dry)
16							Gray-stained cobbles with some fines dry-wet Groundwater encountered at 15 feet on 5/12/94 Dark gray-stained silty clay lens at 16 feet
18						GP	
20							Dark gray-stained silty clay lens at 19 feet Encountered weathered limestone (moist)
22							Dry at 22 feet
24							End of boring at 23 feet (0820 hrs.). Installed well screened from 7 to 21 feet on 5/12/94.



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-28

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5521.52 Total Hole Depth 33 ft. Diameter 10 in.
Top of Casing 5514.52 Water Level Initial 25 ft. Static _____
Screen: Dia 4 in. Length 15 ft. Type/Size FRE 0.020 in.
Casing: Dia 4 in. Length 20 1/2 ft. Type FRE
Fill Material 10/20 Co. S&G Rig/Core Drill Systems 180
Drill Co. Layne Method Air Percussion
Driller Gabby Rodriguez Log By Jerry May Date 05/13/94 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 1020 hrs. Installed silt leg from
33 to 35 feet.

Depth (ft.)	Well Completion	PTD (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Traces < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0							Tan fine poorly-graded silty SAND (dry-moist)
2						SM	
4							
6		124				SM	Gray-stained/tan fine poorly-graded silty SAND (moist)
8							
10		452				CL	Black-stained silty CLAY (moist)
12							
14							
16		365				SM	Tan fine poorly-graded silty SAND (moist)
18							
20		333				GP	Tan fine-coarse poorly-graded SAND with gravel and cobbles
22							
24		2507					



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-28

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		2507			GM	(Dark gray-stained at 24 feet)
		3226				Groundwater encountered at 25 feet on 5/13/94
26						
28						
30						
32						Encountered weathered limestone
34		174				
36						End of boring at 35 feet (1100 hrs). Installed well screened from 18 to 33 feet on 5/13/94.
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-29

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5518.55 Total Hole Depth 28 ft. Diameter 10 in.
Top of Casing 5521.55 Water Level Initial 20 ft. Static _____
Screen: Dia 4 in. Length 14 ft. Type/Size FRE 0.020 in.
Casing: Dia 4 in. Length 12/2 ft. Type FRE
Fill Material 10/20 Co. Silica Rig/Core Drill Systems 180
Drill Co. Layne Method Air Percussion
Driller Gabby Rodriguez Log By Jerry May Date 05/12/94 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 1445 hrs. Installed silt leg 24 to 26 feet.

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ x Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0						SM	Tan fine poorly-graded silty SAND (moist)
2						CL	Tan silty CLAY (moist)
4							Tan fine poorly-graded SAND (moist)
6		0				SP	
8							
10		0					
12							Tan fine-coarse poorly-graded SAND with gravel and cobbles
14		9				GM	
16							
18							
20		38				GP	Groundwater encountered at 20 feet on 5/12/94 Cobbles with some fines (wet)
22							Encountered weathered limestone (dry)
24							



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-29

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24						End of boring at 28 feet (1510 hrs). Installed well screened from 10 to 24 feet.
26						
28						
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-30

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5520.42 Total Hole Depth 38 ft. Diameter 10 in.
Top of Casing 5533.42 Water Level Initial 31 ft. Static _____
Screen: Dia 4 in. Length 15 ft. Type/Size FRE 0.020 in.
Casing: Dia 4 in. Length 23 1/2 ft. Type FRE
Fill Material 10/20 Co. Silica Rig/Core Drill Systems 180
Drill Co. Layne Method Air Percussion
Driller Gabby Rodriguez Log By Jerry May Date 05/13/94 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 0720 hrs. Installed silt leg from
36 to 38 feet.

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						Tan fine poorly-graded silty SAND (moist)
2						
4						
6		22				(Same as above)
8						
10		15				(Same as above)
12					SM	
14						
16		30				(Same as above)
18						
20						
22						Tan fine-coarse poorly-graded SAND with pea gravel and cobbles
24					SP SC	



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-30

Project BRC

Owner Bloomfield Refining Co.

Location 50 County Road 4990, Bloomfield, New Mexico

Proj. No. 023353014

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ X Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24		62				SP M	(Same as above)
26							
28							
30							620
32		203				GP	(Some clay and silt at 34 feet) Encountered weathered limestone (dry)
34							
36							
38							End of boring at 38 feet (0800 hrs). Installed well screened from 21 to 36 feet.
40							
42							
44							
46							
48							
50							
52							
54							
56							



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-31

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5530.17 Total Hole Depth 37 ft. Diameter 10 in.
Top of Casing 5532.17 Water Level Initial 30 ft. Static _____
Screen: Dia 4 in. Length 14 ft. Type/Size FRE 0.020 in.
Casing: Dia 4 in. Length 23 1/2 ft. Type FRE
Fill Material 10/20 Co. Silica Rig/Core Drill Systems 180
Drill Co. Layne Method Air Percussion
Driller Gabby Rodriguez Log By Jerry May Date 05/12/94 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 1200 hrs.

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ X Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0							Tan fine poorly-graded silty SAND (moist)
2							
4							
6		NA				SM	
8							
10		0					
12							
14		0					Tan fine poorly-graded SAND (moist)
16							
18						SP	
20		119					
22							
24							



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-31

Project BRC Owner Bloomfield Refining Co.
Location 50 County Road 4990, Bloomfield, New Mexico Proj. No. 023353014

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24						
26		85			SP	Fine-coarse poorly-graded SAND with gravel and cobbles (moist)
28					SP GM	
30		91				Groundwater encountered at 30 feet on 5/12/94
32		2026			GP	Gray-stained cobbles with a little fines (wet) (Dark gray-stained at 32 feet)
34						Encountered weathered limestone (moist-dry)
36		539				
38						End of boring at 37 feet (1225 hrs). Installed well screened from 21 to 35 feet on 5/12/94.
40						
42						
44						
46						
48						
50						
52						
54						
56						



GROUNDWATER
TECHNOLOGY

Drilling Log

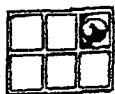
Monitoring Well MW-32

Project Bloomfield Refining Company Owner Bloomfield Refining Company
 Location 50 County Road 4990, Bloomfield, NM Proj. No. 023353014
 Surface Elev. 5524.42 Total Hole Depth 27.5 ft. Diameter 9 in.
 Top of Casing 5522.22 Water Level Initial 23 ft. Static _____
 Screen: Dia 4 in. Length 14 ft. Type/Size FRE/0.020 in.
 Casing: Dia 4 in. Length 13.9 ft. Type FRE
 Fill Material 10/20 Silica Sand Rig/Core Drill Systems 180
 Drill Co. Layne Method Air Hammer Percussion
 Driller B. Morris Log By E. Shannon Date 02/23/85 Permit # _____
 Checked By ES 3-14-95 License No. _____

See Site Map
For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	P10 (ppm)	Sample ID Blow Count/ X Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						
2		0			SH	0-7 ft: Brown medium to fine poorly-graded SAND, little coarse to fine gravel, occasional rounded cobbles (up to 4" dia.), dry.
4						
6						
8		3			SP SH	7-10 ft: Grades to grayish brown coarse to fine well-graded SAND, trace silt, little coarse to fine grained gravel, occasional rounded cobbles.
10						
12						
14					SP SH	10-18 ft: Brown coarse to fine SAND, and coarse to fine GRAVEL/COBBLES (up to 8" dia.), little silt.
16						
18						
20						
22					SP SH	18-25 ft: Coarse to fine GRAVEL/COBBLES and coarse to fine SAND, trace silt.
24						Damp at 23 feet.



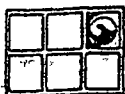
GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-32

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location 50 County Road 4990, Bloomfield, NM Proj. No. 023353014

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ x Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24							
26							25-26 ft.: Yellowish brown weathered silty LIMESTONE.
28							28-27.5 ft.: Gray LIMESTONE.
30							End of boring at 27.5 feet.
32							Set MW-32 with screened interval from 11-25 feet below grade.
34							
36							
38							
40							
42							
44							
46							
48							
50							
52							
54							
56							



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-33

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location 50 County Road 4990, Bloomfield, NM Proj. No. 023353014
Surface Elev. 5515.86 Total Hole Depth 23 ft. Diameter 9 in.
Top of Casing 5518.46 Water Level Initial 19 ft. Static Dry ft.
Screen: Dia 4 in. Length 14 ft. Type/Size FRE/0.020 in.
Casing: Dia 4 in. Length 11.6 ft. Type FRE
Fill Material 10/20 Silica Sand Rig/Core Drill Systems 180
Drill Co. Layne Method Air Hammer Percussion
Driller G. Rodriguez Log By E. Shannon Date 02/23/95 Permit #
Checked By ELS 3-14-95 License No.

See Site Map
For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure): Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						
2						
4					SM	0-7 ft.: Brown medium to fine SAND, little silt, little coarse to fine gravel, occasional cobbles; dry.
6						
8						7-20 ft.: Coarse to fine GRAVEL/COBBLES, some coarse to fine well graded sand, trace silty, dry.
10					GP SP	
12						
14						
16						
18						
20						Cuttings damp at 19'
22						20-22.8 ft.: Tanish brown SILT/weathered LIMESTONE, dry.
24						22.8-23 ft.: Gray LIMESTONE, weathered, dry. End of boring at 23 feet. Set MW-33 with screened interval from 6.9-20.9 feet below grade.



GROUNDWATER
TECHNOLOGY

Drilling Log

Monitoring Well MW-34

Project Bloomfield Refining Company Owner Bloomfield Refining Company
Location 50 County Road 4990, Bloomfield, NM. Proj. No. 023353014
Surface Elev. 5505.53 Total Hole Depth 19 ft. Diameter 10 in.
Top of Casing 5508.23 Water Level Initial 12 ft. Static _____
Screen: Dia 4 in. Length 14 ft. Type/Size FRE/0.020 in.
Casing: Dia 4 in. Length 7.8 ft. Type FRE
Fill Material 10/20 Silica Sand Rig/Core Drill Systems 180
Drill Co. Layne Method Air Hammer Percussion
Driller G. Rodriguez Log By E. Shannon Date 02/23/95 Permit # _____
Checked By ES 3-14-95 License No. _____

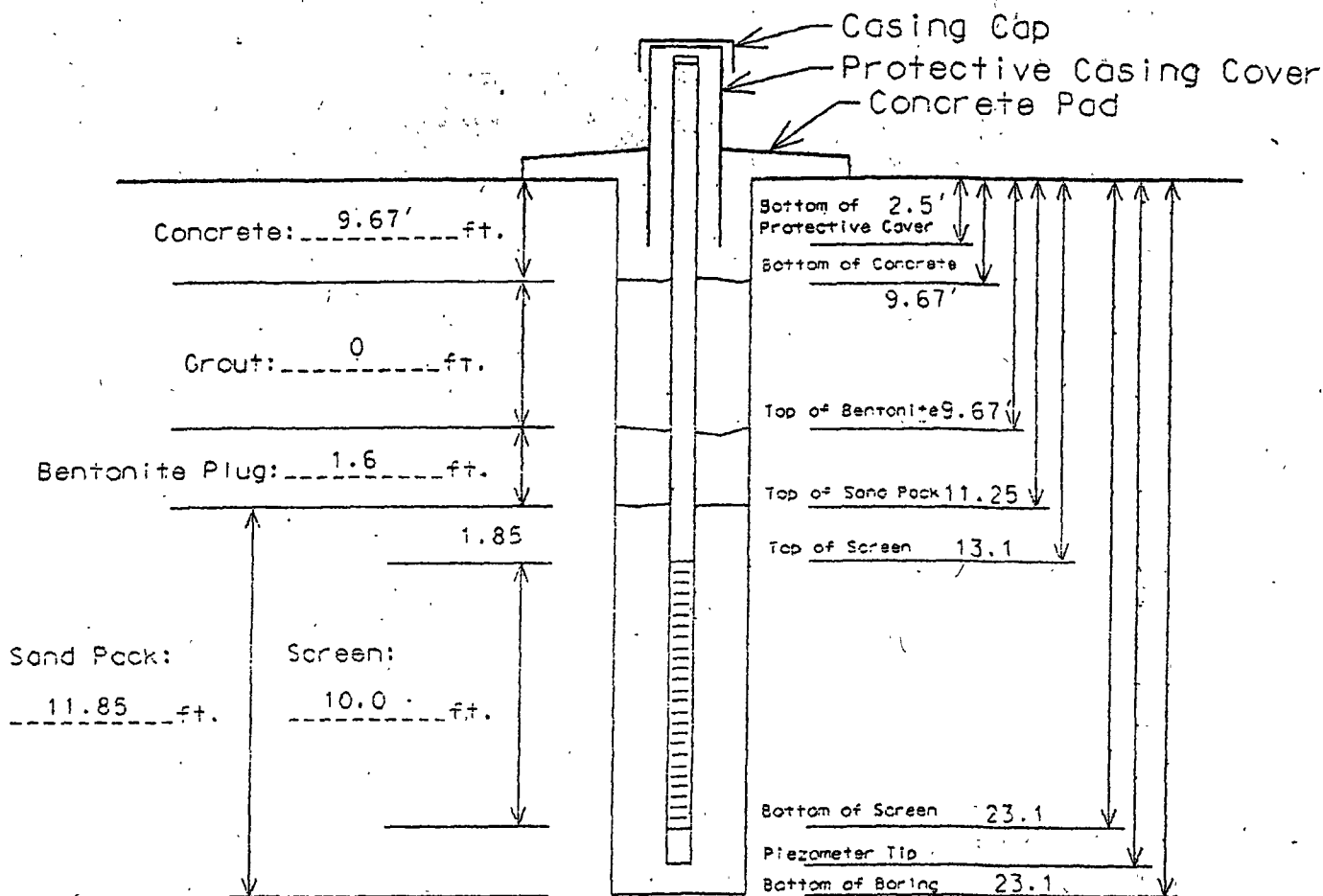
See Site Map
For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ x Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0							
2							0-9 ft.: Brown coarse to fine poorly graded SAND, little coarse to fine gravel, little silt, occasional cobbles.
4						SM	
6							
8							
10						GP	9-14 ft.: Coarse to fine GRAVEL/COBBLES, some coarse to fine sand, trace silt, dry.
12							Wet at 12'; gray-staining.
14							Yellowish brown SILT/weathered LIMESTONE, dry.
16							14.7-19 ft.: Gray LIMESTONE.
18							
20							End of boring at 19 feet
22							Set MW-34 with screened interval from 2.5-16.5 feet below grade
24							

Installation Diagram

Monitoring Well No. MW-35



Boring Diameter: 8-5/8"

Sand Type: 16-40

Bollards, Type/Size: 3" STEEL

Bentonite: 3/8 CHIPS

Screen Type/Size: 0.010

Cement/Grout:

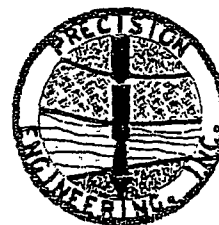
Riser Type/Size: 2" SCH 40, PVC

Water:

Locking Expandable Casing Plug? YES

Other:

Bottom Cap Used? YES



505-523-7674

Site Northing: 4392.54

Site Easting: 1723.01

Project #: 97-028

Project Name: BLOOMFIELD REFINING

Elevation: 5512.39

```
FILE #: 97-028
ELEVATION: 5512.39
TOTAL DEPTH: 23.1'
LOGGED BY: TH
DATE: 4-29-97
STATIC WATER: 20.5
BORING ID: MW-35
PAGE: 1
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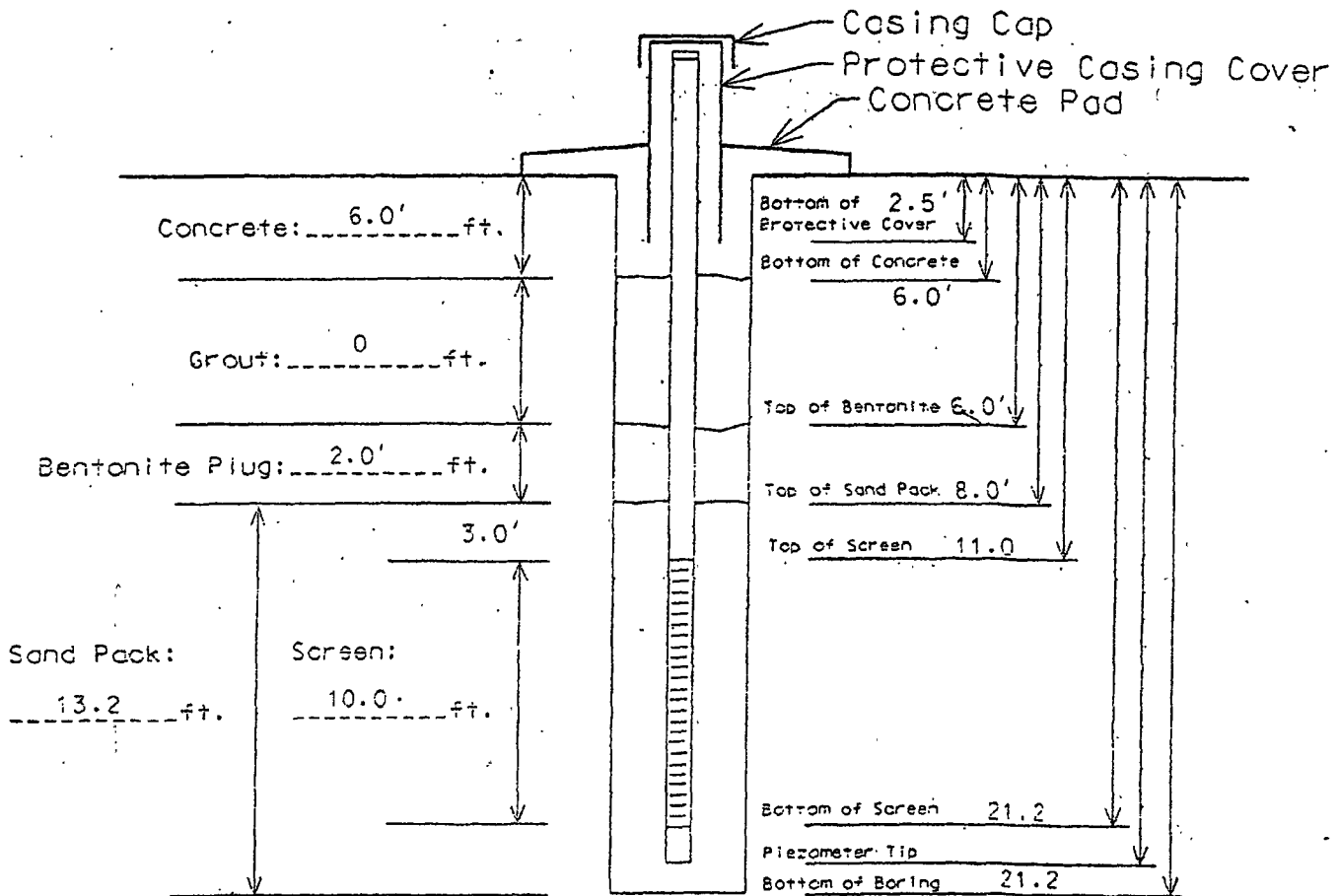
ELEVATION: 5512.39
TOTAL DEPTH: 23.1'
LOGGED BY: TM
DATE: 4-29-97
STATIC WATER: 20.5
BORING ID: MW-35
PAGE: 1

[illegible]

AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT ECU

Installation Diagram

Monitoring Well No. MW-36



Boring Diameter: 8-5/8"

Sand Type: 16-40

Bollards, Type/Size: 3" STEEL

Bentonite: 3/8 CHIPS

Screen Type/Size: 0.010

Cement/Grout: _____

Riser Type/Size: 2" SCH 40, PVC

Water: _____

Locking Expandable Casing Plug? YES

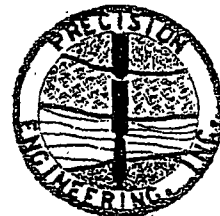
Other: _____

Bottom Cap Used? YES

Project #: 97-028

Project Name: BLOOMFIELD REFINING

Elevation: 5510.56



505-523-7674

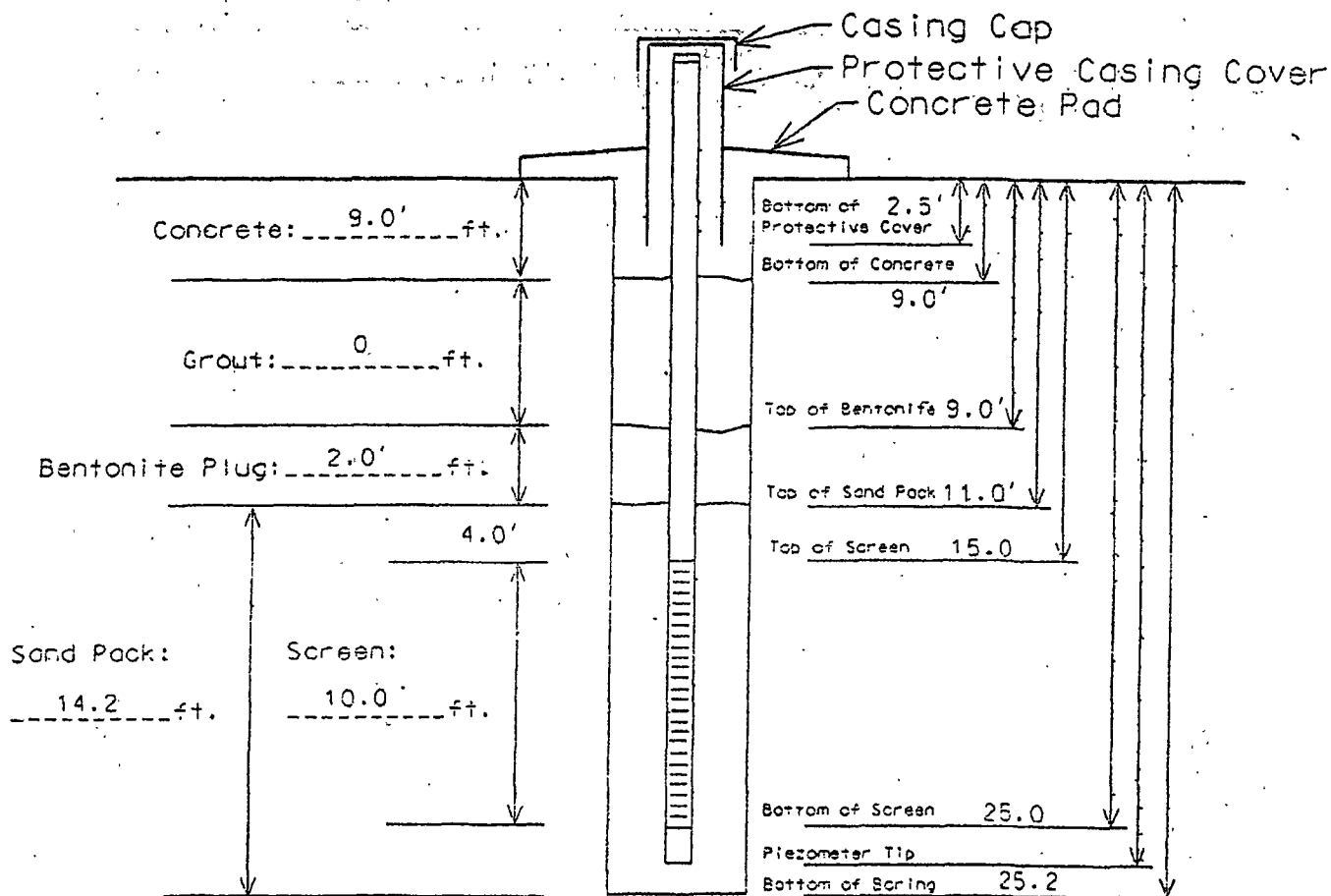
Site Northing: 4652.99

Site Easting: 1779.57

AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT RSA

Installation Diagram

Monitoring Well No. MW-37



Boring Diameter: 8-5/8"

Sand Type: 16-40

Ballards, Type/Size: 3" STEEL

Bentonite: 3/8 CHIPS

Screen Type/Size: 0.010

Cement/Grout:

Riser Type/Size: 2" SCH 40, PVC

Water:

Locking Expandable Casing Plug? YES

Other:

Bottom Cap Used? YES



505-523-7674

Site Northing: 4413.84

Site Easting: 1496.01

Project #: 97-028

Project Name: BLOOMFIELD REFINING

Elevation: 5513.04

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #:

ELEVATION:

TOTAL DEPTH:

LOGGED BY:

DATE:

STATIC WATER:

BORING ID:

PAGE:

LOCATION: BLOOMFIELD REFINERY

SEE BORING PLAN

S	A	C	A	P	L	L	R
25.0							
22.0-25.0							
MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)							
MACMINISTO FORMATION GREEN, FISSILE, DAMP, NO ODOR, NOT WATER BEARING							
TOTAL DEPTH							

97-028

5513.04

25.0'

TM

5-1-97

21.0

MM-17

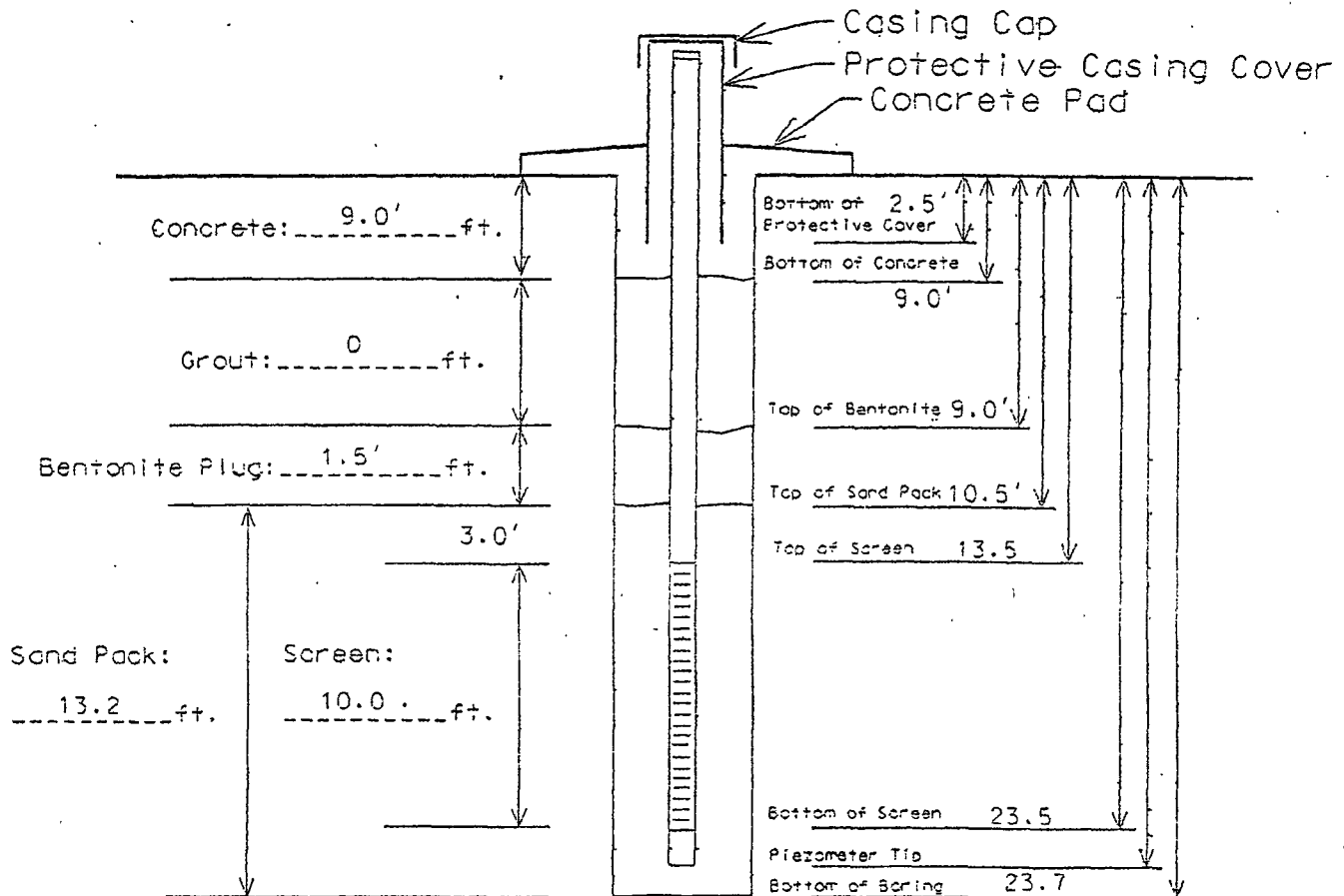
2

LOGGED BY: TM

AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

Installation Diagram

Monitoring Well No. MW-38



Boring Diameter: 8-5/8"

Sand Type: 16-40

Bollards, Type/Size: 3" STEEL

Bentonite: 3/8 CHIPS

Screen Type/Size: 0.010

Cement/Grout:

Riser Type/Size: 2" SCH 40, Pyc

Water:

Locking Expandable Casing Plug? YES

Other:

Bottom Cap Used? YES

Project #: 97-028

Project Name: BLOOMFIELD REFINING

Elevation: 5512.87



505-523-7674

Site Northing: 4674.24

Site Easting: 1587.4

LOCATION: BLCONFIELD REFINERY
SEE BORING PLAN

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-028
ELEVATION: 5512.87
TOTAL DEPTH: 23.5'
LOGGED BY: TM
DATE: 4-29-97
STATIC WATER: 21.0
BORING ID: MH-38
PAGE: 1

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (pg)
0.0-7.5	***-00**		C	SAND, FINE, SILTY, DAMP, BROWN, LOOSE, SOME FINE GRAVEL	0
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**	5.0	C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
	***-00**		C		
7.5-11.5	***000**		C	SAND, FINE, GRAVELLY, COARSE, SOME FINE, LIGHT BROWN, DAMP, MODERATELY DENSE, NO ODOR	0
	***000**		C		
	***000**		C		
	***000**		C		
	***000**	10	C		
	***000**		C		
	***000**		C		
11.5	***000**		C		
11.5-22.0	00000000		C	COBBLES, GRAVELLY, COARSE, VERY HARD, SLOW DRILLING, NO ODOR, DAMP	0
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000	15	C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000		C		
	00000000	20	C		
	00000000		C		
	00000000		C		
	00000000		C		
22.0	00000000		C	NEARLY WATER BEARING 21.0	0
22.0-23.5	*****		C	MACINIZITO FORMATION	0
TOTAL DEPTH	*****		C	SHALE, VERY SANDY, DAMP, NOT WATER BEARING, DENSE	0

LOGGED BY: TM

AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT HSA

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

PROJECT: Bloomfield Refinery
CNS Wells & Borings

FILE #: 98-149-
ELEVATION: 5522 ft
TOTAL DEPTH: 36 ft
LOGGED BY: MEK
DATE: 9-28-98
STATIC WATER: 18 ft
BORING ID: MW-39
PAGE: 1 of 5

DEPTH		S		C		M		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L		R		S		P		L	
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FILE #: 97-028

ELEVATION: 5526.21

TOTAL DEPTH: 34.5'

LOGGED BY: TM

DATE: 3-11-97

STATIC WATER: NGT FOUND

BORING ID: CMW-40-215

PAGE: 1

LOG. OF TEST BORINGS

[illegible]

LOGGED BY: IM

SIZE AND TYPE OF BORING: 4 1/4" 1' CONTINUOUS LIGHT USA

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-028

ELEVATION: 5526.21

TOTAL DEPTH: 34.5'

LOGGED BY: TM

DATE: 3-11-97

STATIC WATER: NOT FOUND

BCRING ID: MW-40

PAGE: 2

LOGGED BY:		DATE:		3-11-97	
STATIC WATER:		NOT FOUND		BORING ID:	
MW-40		PAGE:		2	
DEPTH		MATERIAL CHARACTERISTICS		PID	
(MOISTURE, CONDITION, COLOR, GRAINSIZE ETC.)		(deg)			
0	S	A			
P	C	M			
L	A	P			
O	L	L			
T	E	E			
00000000	C	COBBLES, GRAVELLY, (FINE TO COARSE), SOME SMALL BOULDERS, NO ODOR, VERY SLOW			
00000000	C	DRILLING			
00000000	C				
00000000	C				
00000000	C				
00000000	C				
00000000	C				
00000000	C				
00000000	C	EASIER DRILLING, LESS AUGER SCRAPING			
00000000	C				
00000000	C				
31.5	30	C			
31.5-33.5	S	NACIMIENTO FORMATION			
	S	DENSE, AUGER NOT SCRAPING			
	S				
	S				
	S				
	S				
	S				
33.5-34.5	S	NACIMIENTO FORMATION			
	S	BLACKISH COLOR, TURNING MORE WHITE 36.0 FEET, NO WATER IN HOLE OR SAMPLE AS OF			
34.5	35	S	4:40 PM SLIGHT ODOR IN SAMPLE		
TOTAL DEPTH			10-12-97		
			DISCOVERED 2.5 FEET OF WATER IN HOLE AFTER PULLING AUGER		

LOGGED BY: IM

SIZE AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT PSA

FILE #: 97-028

ELEVATION: 5525.13

TOTAL DEPTH: 33.0'

LOGGED BY: TM

DATE: 3-12-97

STATIC WATER: NOT FOUND

BORING ID: MW-41

PAGE: 1

LOG OF TEST BORINGS

[illegible]

LOGGED BY 18

15171 AND TYPE OF BORING: 4 1/4" ID CONTINUOUS FLIGHT USA

LOCATION: SEE SITE PLAN

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 97-028
 ELEVATION: 5525.13
 TOTAL DEPTH: 33.0'
 LOGGED BY: TM
 DATE: 3-12-97
 STATIC WATER: NOT FOUND
 BORING ID: MW-41
 PAGE: 2

DEPTH	S S A M P L E				MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (DDM)
	P	L	O	T		
	00000000				COBBLES, VERY SLOW DRILLING, SOME SMALL BOULDERS	
	00000000					
	00000000					
	00000000	25				
	00000000					
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	00000000					
	00000000					
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	00000000					
	00000000					
	00000000					
	00000000					
30.0	00000000	30				
30.0-33.0	SSSSSSSS				NACIMIENTO, GREYISH BROWN, DAMP, VERY SLIGHT ODOR	
	SSSSSSSS					
	SSSSSSSS					
	SSSSSSSS					
	SSSSSSSS					
33.0	SSSSSSSS					
FINAL DEPTH						

LOGGED BY: TM

SIZE AND TYPE OF BORING: 4 1/4" TO CONTINUOUS FLIGHT USA

PRECISION ENGINEERING, INC.

LOCATION: SEE SITE PLAN

LOG OF TEST BORINGS

FILE #: 97-020
 ELEVATION: 5525.91
 TOTAL DEPTH: 35.5'
 LOGGED BY: TM
 DATE: 3-11-97
 STATIC WATER: 30.0'
 BORING ID: MW-42
 PAGE: 1

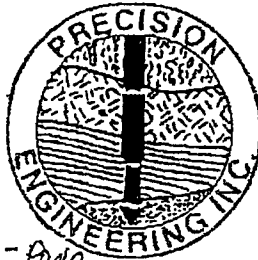
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SHEET ____ OF ____

Boring Location: _____

Hole Number: 3

MW-413

File No. N 56 62.87Location E 3346.15Surface Elevation 5522Water Level 18.0 Date 9-25

LAB #	SAC#	DEPTH	BLOWS/IN	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)		IM	LL	PI	CLASS
		0-5		CLAY, SILTY, WET, BROWN No odor * SOFT					
		5.0-6.5		CLAY → SAND FINE Grey No odor(?) MOIST, SOFT					
		7.5							
		7.5-9.0		GRAVEL <u>2-0</u> PUMICE, Silty sand Medium. loose dry					
		9.0-10.5		SAND GRAVEL - COARSE SAND Dense slight odor dry Grey (natural)					
		10.5-11.5		SAND coarse, SMALL GRAVEL damp Dense slight odor Grey (Discolored)					
		11.0		COBBLE					
		14.5-16.0		SAND, MEDIUM → COARSE, dry GRAVEL, Grey (Discolored) Red Dens = NO odor Water 18 FT					
		19-20.5		GRAVEL SAND, COARSE, water bearing, dark grey, odor med dense					
		22.8							
		27.8		NACIMIENTO ! - SS, DENSE, poorly poorly sorted, light to yellow					
		25.0 TD							

PRECISION LAKE
TERRACE

compacted

PROJECT: Bloomfield Refinery
CNS Wells & Borings

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 98-149
ELEVATION: 5522 ft
TOTAL DEPTH: 25 ft
LOGGED BY: NS
DATE: 9-25-98
STATIC WATER: 19 ft
BORING ID: NW-43
PAGE: 2 of 5

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	FID (ppm)
0.0-5.0	/-//--//-/			Clay, silty, wet, soft, brown	
5.0-5.5	/-//--//-/		5.0	sandy(fine), moist, soft, gray	
7.5	/-//--//-/				
9.0-10.5	000000000		10	Gravel, dry, medium dense, purple, silicified, JACKSON LAKE TERRACE	
10.5-11.5	*0*0*0*0*			Sand-Gravel, coarse sand, dry, dense, gray(natural)	
	*0*0*0*0*			Sand(coarse), gravelly, damp, dense, gray	
	*0*0*0*0*			cobbly at 11'	
14.5-16.0	*0*0*0*0*		15	Sand(medium to coarse), dry, medium dense, gray	

19.0-20.5	*0*0*0*0*		20	water bearing at 18'	
	*0*0*0*0*			Gravel, sandy(coarse), medium dense, dark gray	
	*0*0*0*0*				
22.5	*0*0*0*0*				
25.0	SSSSSSSSSS		25	Sandstone, dense, poorly consolidated, poorly sorted, gray to yellow, NACMIZENTO	
total depth	SSSSSSSSSS				
			30		
			35		
			40		
			45		

SIZE AND TYPE OF BORING: 4.25" ID TSA

LOGGED BY: NS

PROJECT: Bloomfield Refinery
CMS Wells & Borings

PRECISION ENGINEERING, INC.

LOG OF TEST BORINGS

FILE #: 98-149
ELEVATION: 5536 ft
TOTAL DEPTH: 47.5 ft
LOGGED BY: WEX
DATE: 10-01-98
STATIC WATER: 34 ft
BORING ID: MW-44*
PAGE: 3 of 5

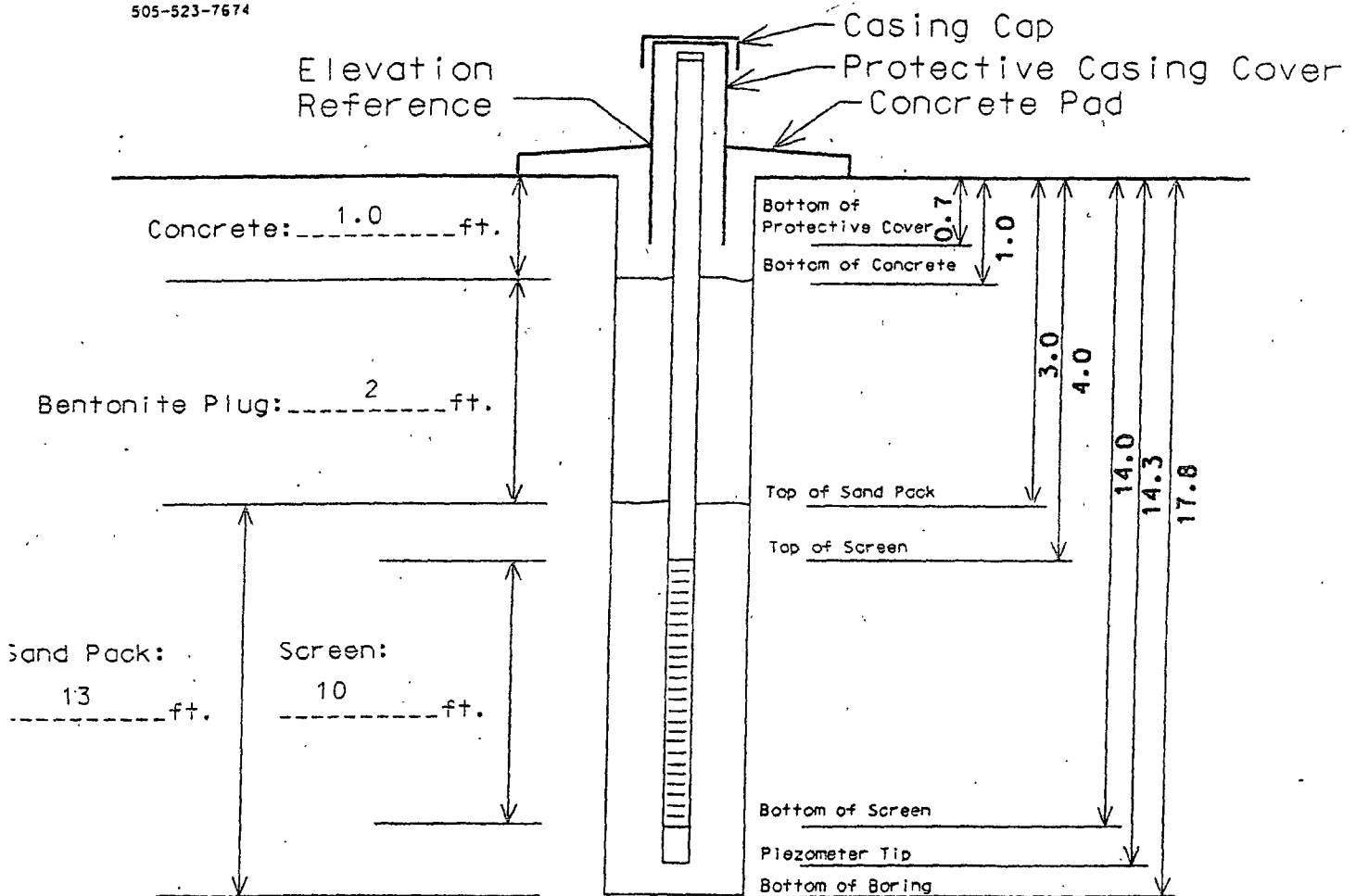
				DATE: 10-01-98	
				STATIC WATER: 34 ft	
				BORING ID: MW-44*	
				PAGE: 3 of 5	
				MATERIAL CHARACTERISTICS	
				(MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	
				PID	
				(ppm)	
DEPTH	P L O T	S C A L E	S A M P L E		
0.0 - 5.0	+/-/+/-/+ +/-/+/-/+ +/-/+/-/+ +/-/+/-/+ +/-/+/-/+ +/-/+/-/+ +/-/+/-/+ +/-/+/-/+ +/-/+/-/+	5.0		Sand, fine, silty, slightly clayey, moist-wet, loose, light brown, Qe	
9.0					
9.0-10.0	/-/-/-/-/	10		Clay, silty, sandy(fine), wet, soft, brown	
10.0-15.0	+.....+ +.....+ +.....+ +.....+ +.....+ +.....+ +.....+ +.....+ +.....+	15		Sand, fine, slightly silty, damp, loose, brown	
20.2	+.../+...+	20		some clay at 19'	
	0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0 0*00*00*0	25 30		Gravel (up to 3"), sandy, damp, moderately dense, interbeds of sand (medium-coarse) brown to grey no odor appears to be natural color some cobble or boulder material	
33.5					
	SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS SSSSSSSS	35 40 45		Sandstone, argillaceous, liesgaing banded, dense, yellow brown orange banded in random patern, fine to medium, NACIMIENTO water bearing at 34'	
47.5					
total depth				LOGGED BY: WEX	
SIZE AND TYPE OF BORING: 4.25" FSA					



505-523-7674

Installation Diagram

Monitoring Well No. MW - 45



Boring Diameter: 11-5/8" $R = 5.8125$

Sand Type: 10-20 Silica

Bollards, Type/Size: Steel, 3" min.

Bentonite: 3/8" Chip

Screen Type/Size: 4" PVC Sch. 40, 0.010" Slotted

Cement/Grout: -----

Riser Type/Size: 4" PVC Sch. 40 = 1.9745

Water: Potable

Locking Expandable Casing Plug? Yes Site Northing: 5790.85

Other: N/A

Bottom Cap Used? Yes Site Easting: 2837.78

Project #: 03-015 Project Name: Bloomfield Wells

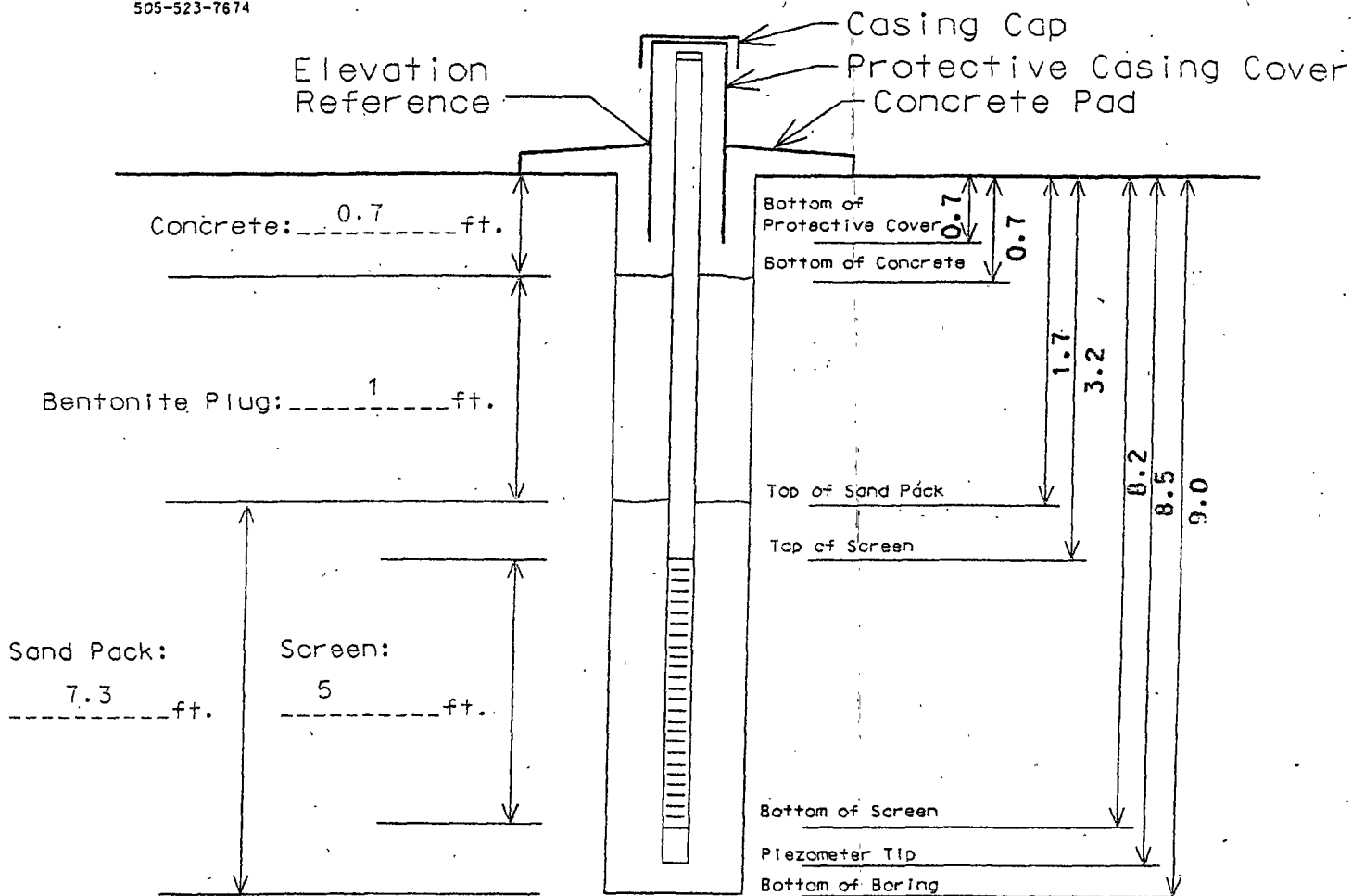
Elevation: 5496.33



505-523-7674

Installation Diagram

Monitoring Well No. MW - 46



Boring Diameter: 11-5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: Steel, 3" min.

Bentonite: 3/8" Chip

Screen Type/Size: 4" PVC Sch. 40, 0.010" Slotted

Cement/Grout: -----

Riser Type/Size: 4" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 5560.48

Other: N/A

Bottom Cap Used? Yes

Site Easting: 2576.06

Project #: 03-015

Project Name: Bloomfield Wells

Elevation: 5496.43

Sheet: 1 of 1

PRECISION ENGINEERING, INC.

File #:03-015

Bore Point: N5560.48'

LOG OF TEST BORINGS

Site: Giant Refinery

82576.06

Bloomfield, NM

Water Elev:

Elevation: 5496.43

Boring No.: MW 46

Date: 1-16-03

Water Elev: 5496.43			Elevation: 5496.43										
Boring No.: MH 46			Date: 1-16-03										
LAB #	DEPTH	BLOW COUNT	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS				%M	L	PI	CLASS.
						(MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)							
	0-1.0	Grab	**0**0		G	SAND, VERY GRAVELLY, COBBLY, LIGHT BROWN, LOOSE							
			00		G								
			00										
			00										
			00	2.5									
			00										
			00										
			00										
			00										
			00										
			00										
			00	5.0									
	5.0-6.5	3-4-4	**0**0		S	SAME							
			00		S								
			00		S	NACIMIENTO FORMATION							
	6.5-8.0	13-18-18	---		S	MUDSTONE, SILTY, HARD, DRY, LIGHT GREEN							
			---	7.5	S								
			---		S								

	9.0		---										
	TOTAL DEPTH												
				10.0									
				15.0									
				20.0									

Size & Type of Boring: 4 1/4" ID HOLLOW STEMMED AUGER

Logged By: WZK

MW#47 3

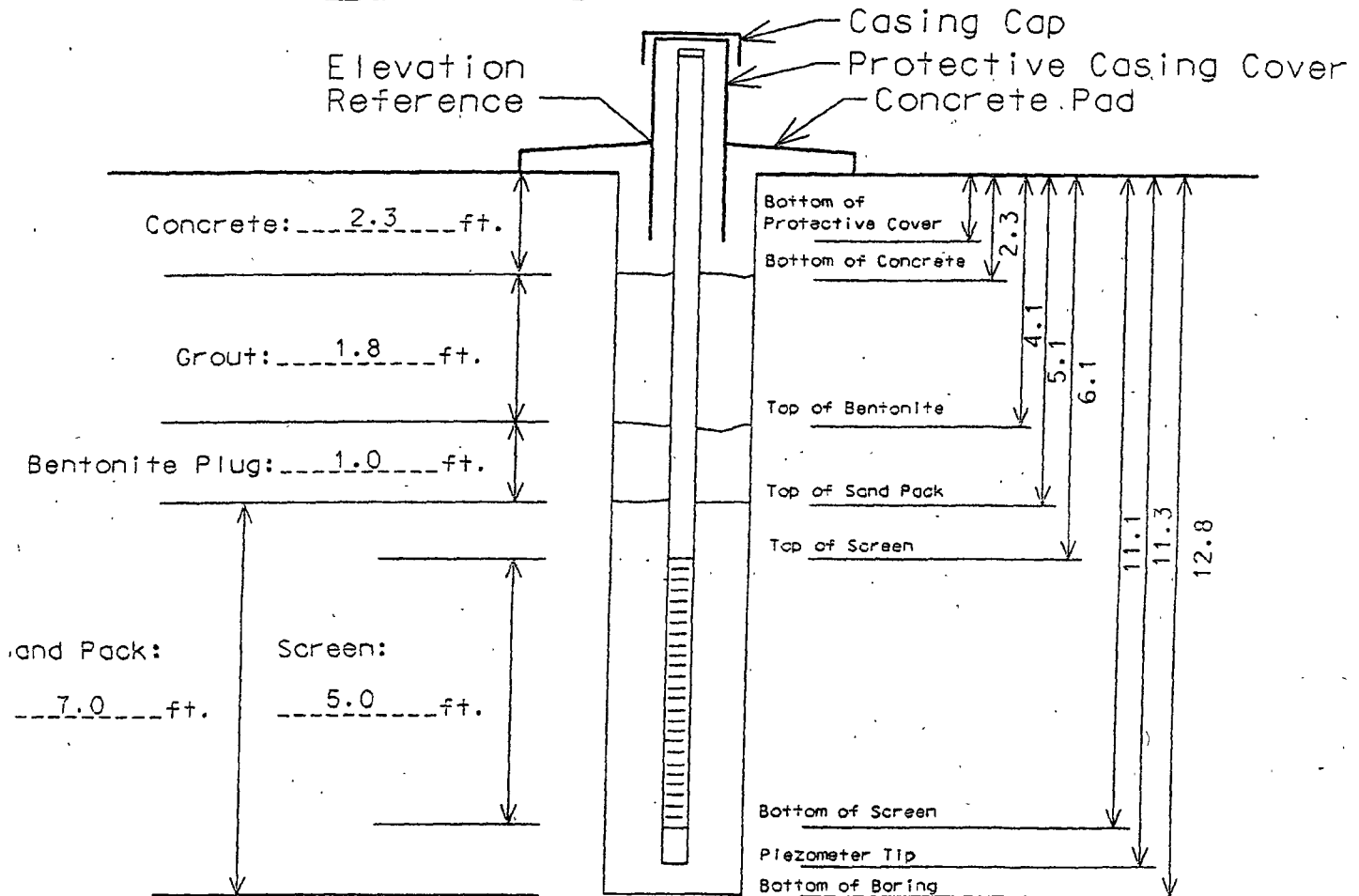


505-523-7674

Installation Diagram

Monitoring Well No. Seep 5

STA 4+25



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: Steel, 3"

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: 6% Bentonite

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: 5413.57

Other: N/A

Bottom Cap Used? Yes

Site Easting: 2220.90

Project #: 03-015

Project Name: Giant Refining Co. Bloomfield Wells

Elevation: TBD

Bore Point: PLANT COORDINATES
N5413.7 E2220.90
Water Elev: 7.49'

LOG OF TEST BORINGS

Site: Bloomfield
Refinery
Elevation: TO BE DETERMINED

Log No.: Seep 5

Date: 3-6-03

LAB #	DEPTH	BLOW COUNT	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	WM	LL	PI	CLASS.
	0.0-5.0	GRAB	00**00		G	GRAVEL, MEDIUM SANDY, LIGHT BROWN, SOME				
			00**00		G	COBBLES TO BOULDER SIZE, DENSE				
			00**00		G					
			00**00		G					
			00**00	2.5	G					
			00**00		G					
			00**00		G					
			00**00		G					
			00**00		G					
			00**00	5.0	G					
	5.0-6.5	8-18-18	00**00		S	GRAVEL, MEDIUM SANDY, LIGHT BROWN, SOME				
			00**00		S	COBBLES TO BOULDER SIZE, DENSE				
			00**00		S					
			00**00							
			00**00	7.5						
			00**00							
			00**00							
	9.0-9.7	9-100(1)	00**00							
			00**00	10						
	10.7-11.3		-----		S	MACINIENTO FORMATION				
			-----		S	MUDSTONE, SILTSTONE, FISSILE, BLACK, HARD, WET				
			-----		S					
	11.3-12.8	13-37-60	-----							

	12.8		-----							
	TOTAL DEPTH									
				15						
				20						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WEI

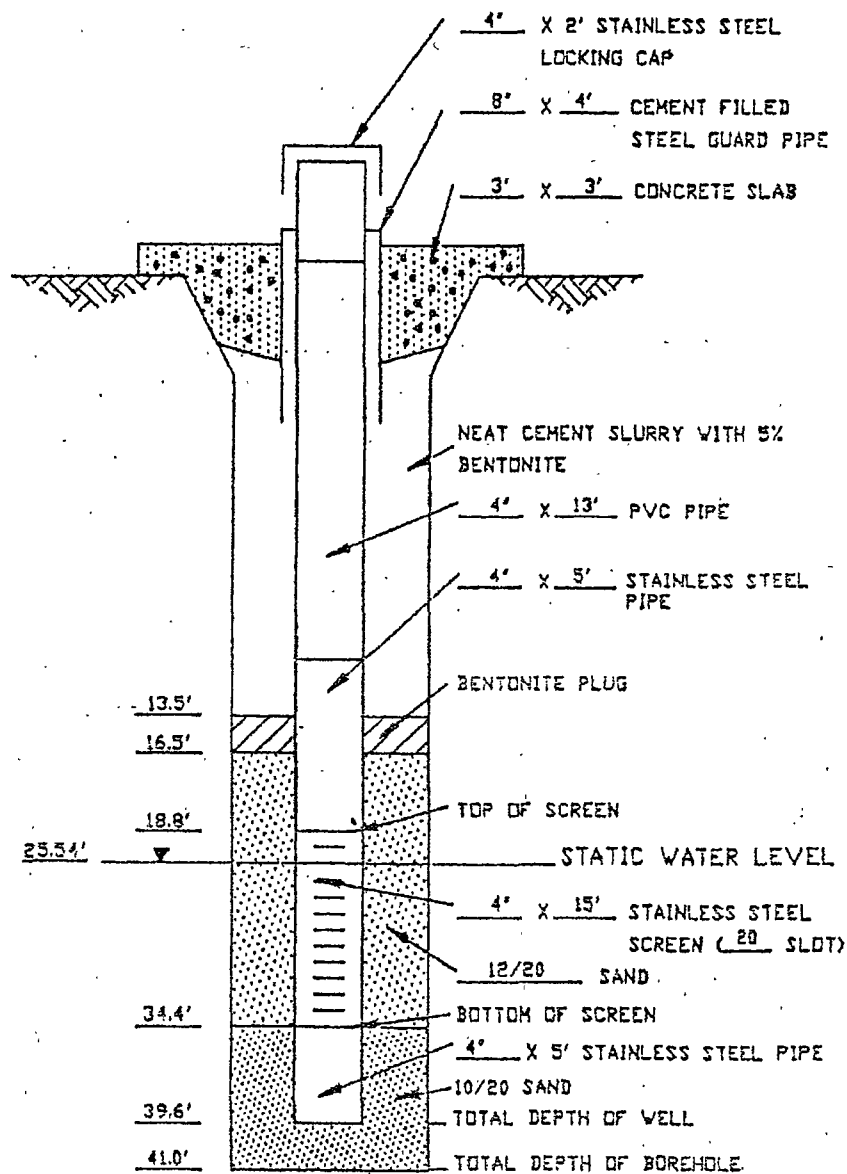


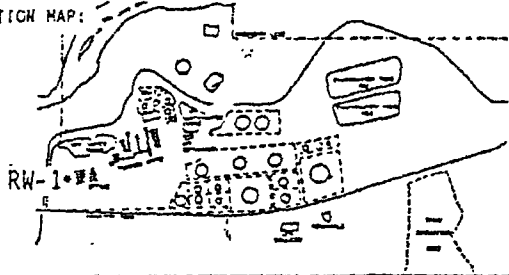
FIGURE B-1
COMPLETION DIAGRAM
RECOVERY WELL RW-1

FIGURE C-8

LITHOLOGIC LOG (SOIL) RECOVERY WELL RW-1

Page 1 of 1

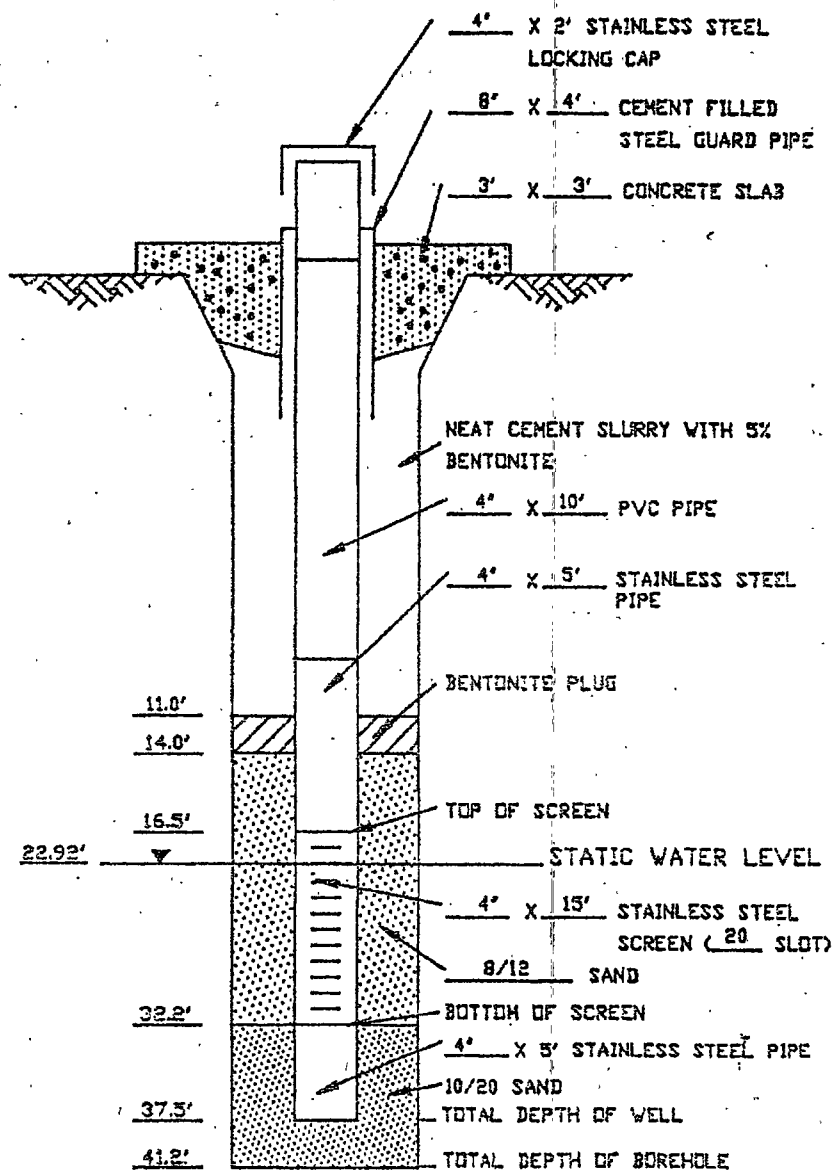
LOCATION MAP:



SITE ID: BRC LOCATION ID: RW-1
 SITE COORDINATES (ft.): _____
 N _____ E _____
 GROUND ELEVATION (ft. MSL): 5524.52
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: Casing Driver
 DRILLING CONTR.: Beeman Brothers
 DATE STARTED: 30 August 1988 DATE COMPLETED: 31 August 1988
 FIELD REP.: W.S. Dobyk
 COMMENTS: Static on September 2, 1988: 26.45 from TOC.

LOCATION DESCRIPTION:

Depth	Visual %	Lith	Drilling Time Scale:	Sample Type and Interval	Lithologic Description
5			1642		0'-18' <u>Silt and Sand</u> - Dark yellowish brown (10 YR 4/2) to grayish brown (5 YR 3/2). Minor to strong hydrocarbon odor.
10			1646		
15			1710		
20			1720		18'-34' <u>Sand and Gravel</u> - Medium dark gray (N4). Sand is medium to very coarse grained, subangular to subrounded. Gravel is subrounded to well rounded, to 2" diameter. Strong hydrocarbon odor.
25			1725		
30			1730		
35			1738		34'-41' <u>Shale</u> - <u>Nacimiento Formation</u> - Dusky yellow (5 YR 6/4) to light olive gray (5 Y 6/1) shale.
40			1753		
45					
50					
		T.O. 41'			

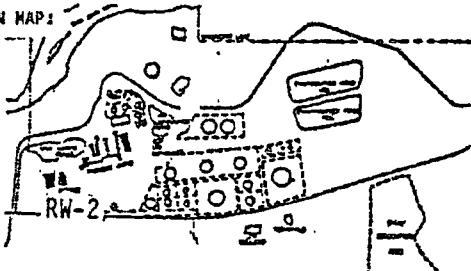


COMPLETION DIAGRAM
RECOVERY WELL RV-2

LITHOLOGIC LOG (SOIL)

Page 1 of 1

LOCATION MAP:



SITE ID: BRC LOCATION ID: RW-2
 SITE COORDINATES (ft.): _____
 N _____ E _____
 GROUND ELEVATION (ft. MSL): 5523.48
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: Casing Driver
 DRILLING CONTR.: Beeman Brothers
 DATE STARTED: 29 August 1988 DATE COMPLETED: 29 August 1988
 FIELD REP.: W.S. Dubyk
 COMMENTS: Static on September 2, 1988; 23.42 from TOC.

LOCATION DESCRIPTION:

Depth	Visual X	Lith	Drilling Time Scale:	Sample Type and Interval	Lithologic Description
5			0943		0'-10' Silt and Clay - Medium dark gray (M4) to brownish gray (5 YR 4/1). Slightly effervescent in HCl. Faint hydrocarbon odor.
10			0953		10'-15' Sand and Silt - Moderate brown (5 YR 4/4), very fine grained and well sorted.
15			0958		15'-32' Sand and Gravel - Olive gray (5 Y 4/1) to brownish gray (5 YR 4/1). Sand is medium to very coarse grained, subangular to subrounded. Gravel is subangular to well rounded, to 2" diameter. Noticeable hydrocarbon odor below 25'.
20			1024		
25			1029		
30			1033		
35			1050		
40			1100		
43		T.D. 41.2'			32'-41.2' Shale - <u>Nacimiento Formation</u> - Dusky yellow (5 Y 6/4) to olive gray (5 Y 3/2).
50					

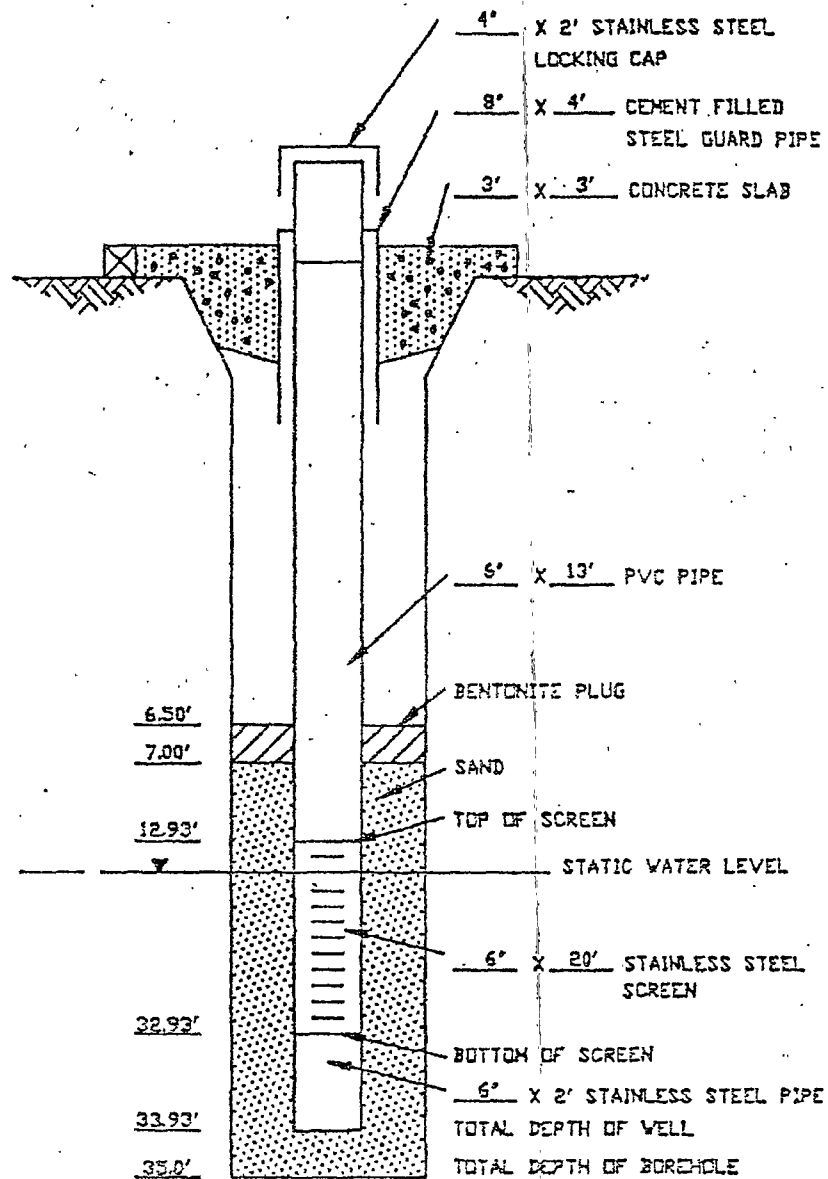


FIGURE B-3

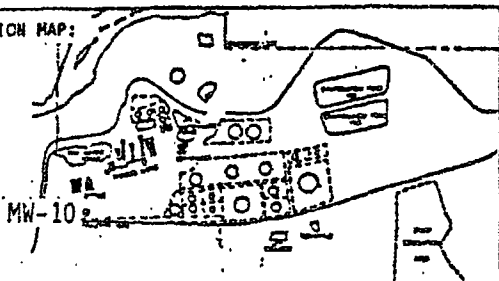
COMPLETION DIAGRAM
RECOVERY WELL MW-10 (RV-3)
(RECONSTRUCTED FROM VERBAL DESCRIPTION
SUPPLIED BY ENGINEERING-SCIENCE, 1987)

← Currently Constructed
as RW-3

LITHOLOGIC LOG (SOIL)

Page 1 of 1

LOCATION MAP:



SITE ID: BRC LOCATION ID: MW-10 (RW-3)
 SITE COORDINATES (ft.): _____
 N _____ E _____
 GROUND ELEVATION (ft. MSL): -5516
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: Auger
 DRILLING CONTR.: Earl & Sons, Inc.
 DATE STARTED: 4 March 1986 DATE COMPLETED: 4 March 1986
 FIELD REP.: Engineering-Science, Inc.
 COMMENTS: _____

LOCATION DESCRIPTION:

Depth	Visual %	Lith	Drilling Time Scale:	Sample Type and Interval	Lithologic Description
0					0'-5' <u>Topsoil, Roadbase, Sandy Clay</u>
5					5'-10' <u>Silty, Sandy Clay</u>
10					10'-15' <u>Cobbles and Pebbles</u>
15					15'-20' <u>Gravel, Cobbles, and Pebbles</u>
20					20'-30' <u>Green Clay: Nacimiento Formation</u>
25					30'-35' <u>Nacimiento Formation - Yellow-green to blue-gray.</u>
30					
35					
40					
45					
50					

T.D. 35'

TABLE 3.4

WELL LOG FOR MONITORING WELL NUMBER 10 (RW-3)

Drilling Date: March 4, 1986

<u>Depth in Feet</u>	<u>Description</u>
0-5	Topsoil, roadbase, reddish brown sandy clay
5-10	Reddish brown silty, sandy clay
10-15	Cobbles, pebbles
15-20	Gravel, cobbles, pebbles
20-25	Greenish clay at 23 feet, top of Nacimiento
25-30	Greenish clay, Nacimiento
30-35	Nacimiento, color changed from yellow-green to blue-gray

Elevation of Top of Casing: 5516.86 feet

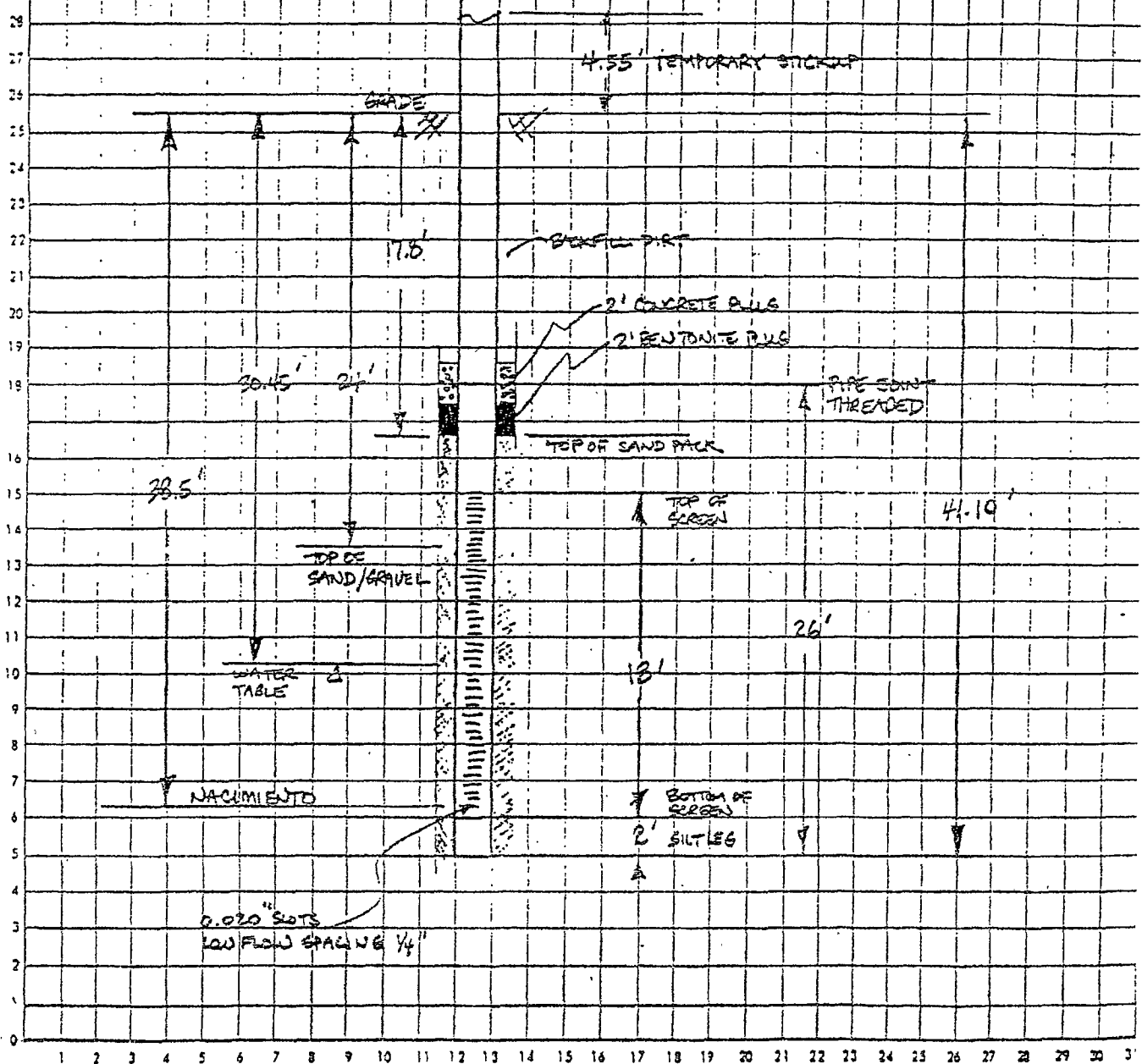
Total Depth of Casing: 33.93 feet

Description of Casing: Bottom of casing has a 2 foot stainless steel blank section for a silt trap, followed by 20 feet of 6" I.D. stainless steel screen, followed by 6" I.D. schedule 40 PVC to the surface. The screened section of the hole was sanded to within 7 feet of the surface, a bentonite seal (1/2 bucket) was added and concrete was used for a surface seal.

RW-14

CALCULATION SHEET

CONSTRUCTION COMMENTS: DRILLED BY CASING DRIVER, 8" BIT; 4.5" O.D. FIBERGLAS CASING SET TO DEPTH INSIDE DRIVEN CASING, ANNULAR SPACE FILLED WITH 10/20 SAND AS DRIVEN CASING REMOVED. LOCATION: END OF ROAD BETWEEN TANKS 19 & 29. 50 LBS. OF BENTONITE DRILLING MUD & 100 LBS. OF CONCRETE PLACED ON TOP OF SAND PACK, BACKFILLED WITH DIRT TO SURFACE.



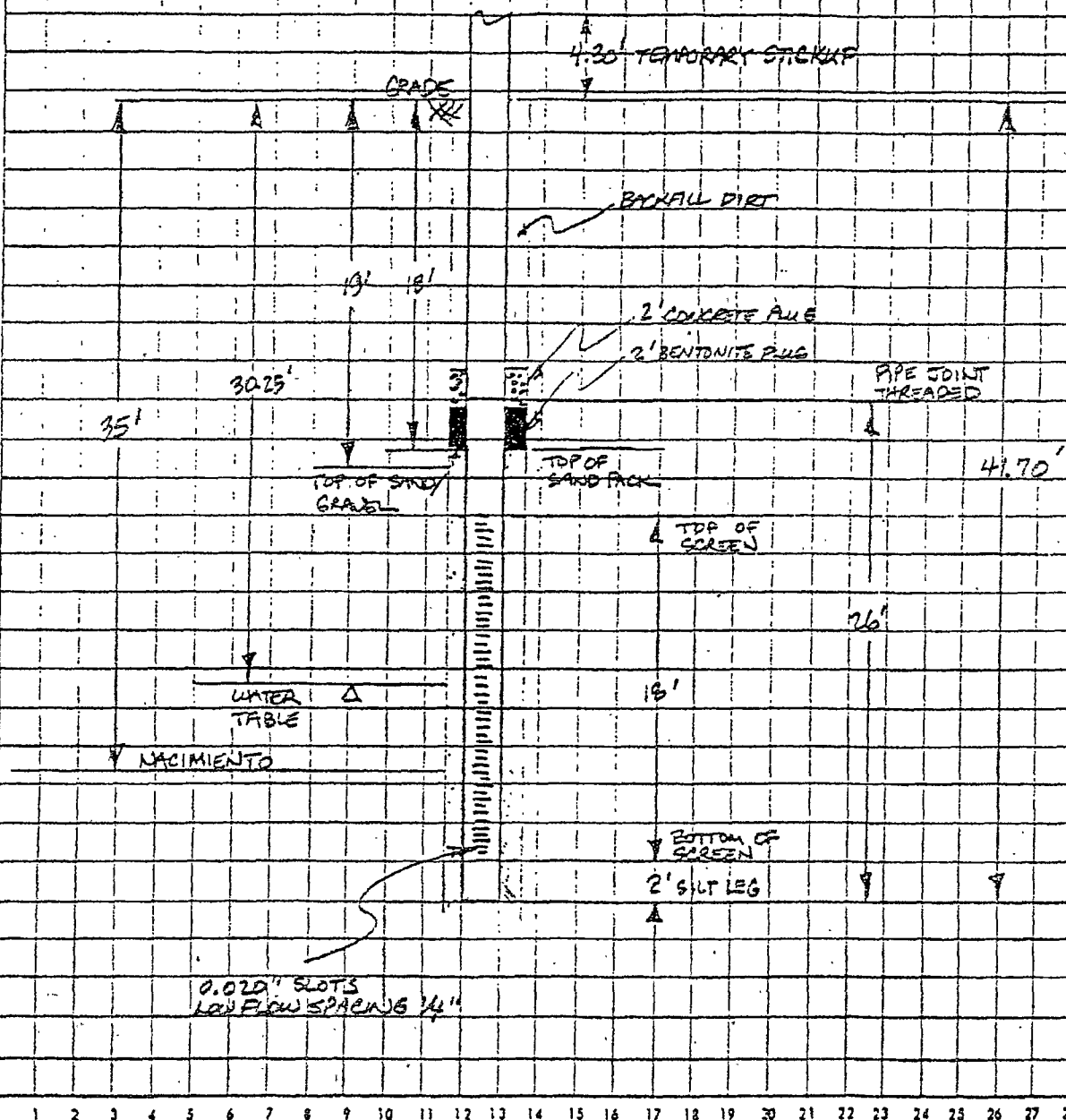
INITIALS CH PROJECT NO. GROUNDWATER RECOVERY - PHASE II, AFE 9146
 DATE 8-9-90 SUBJECT RECOVERY WELL 14
 DATE OF INSTALLATION: 8-6-90 SHEET 1 OF 6

CALCULATION SHEET

RW-15

CONSTRUCTION COMMENTS: SAME AS RW-14

LOCATION: ROADWAY BETWEEN TANKS 18 & 28



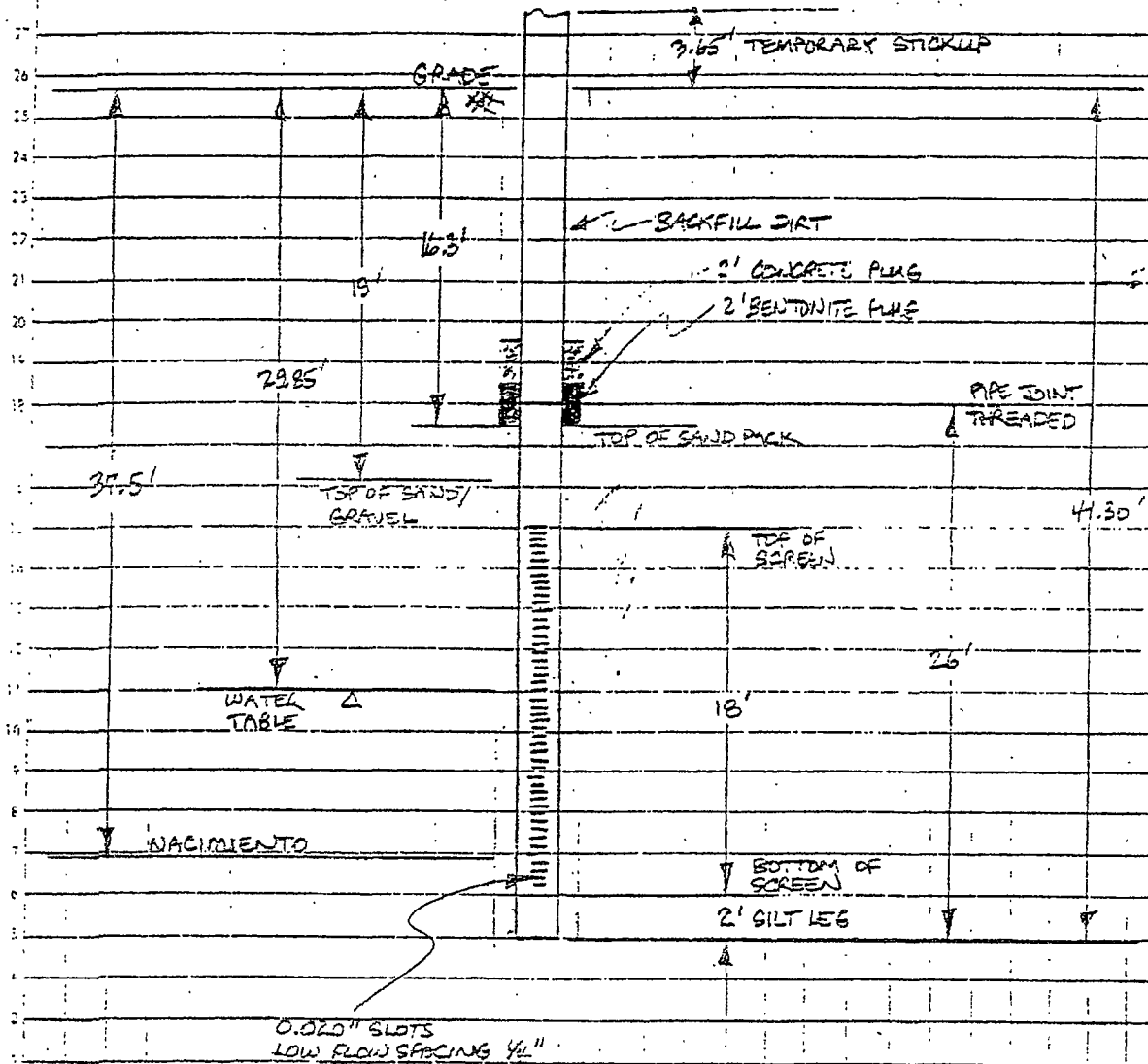
INITIALS CH PROJECT NO. GROUNDWATER RECOVERY-PHASE II, AFE 9146
 DATE 8-9-90 SUBJECT RECOVERY WELL 15
 DATE OF INSTALLATION: 8-7-90 SHEET 2 OF 10

RW-16

CALCULATION SHEET

CONSTRUCTION COMMENTS: SAME AS RW-14

LOCATION: ROADWAY BETWEEN TANKS 26 & 18



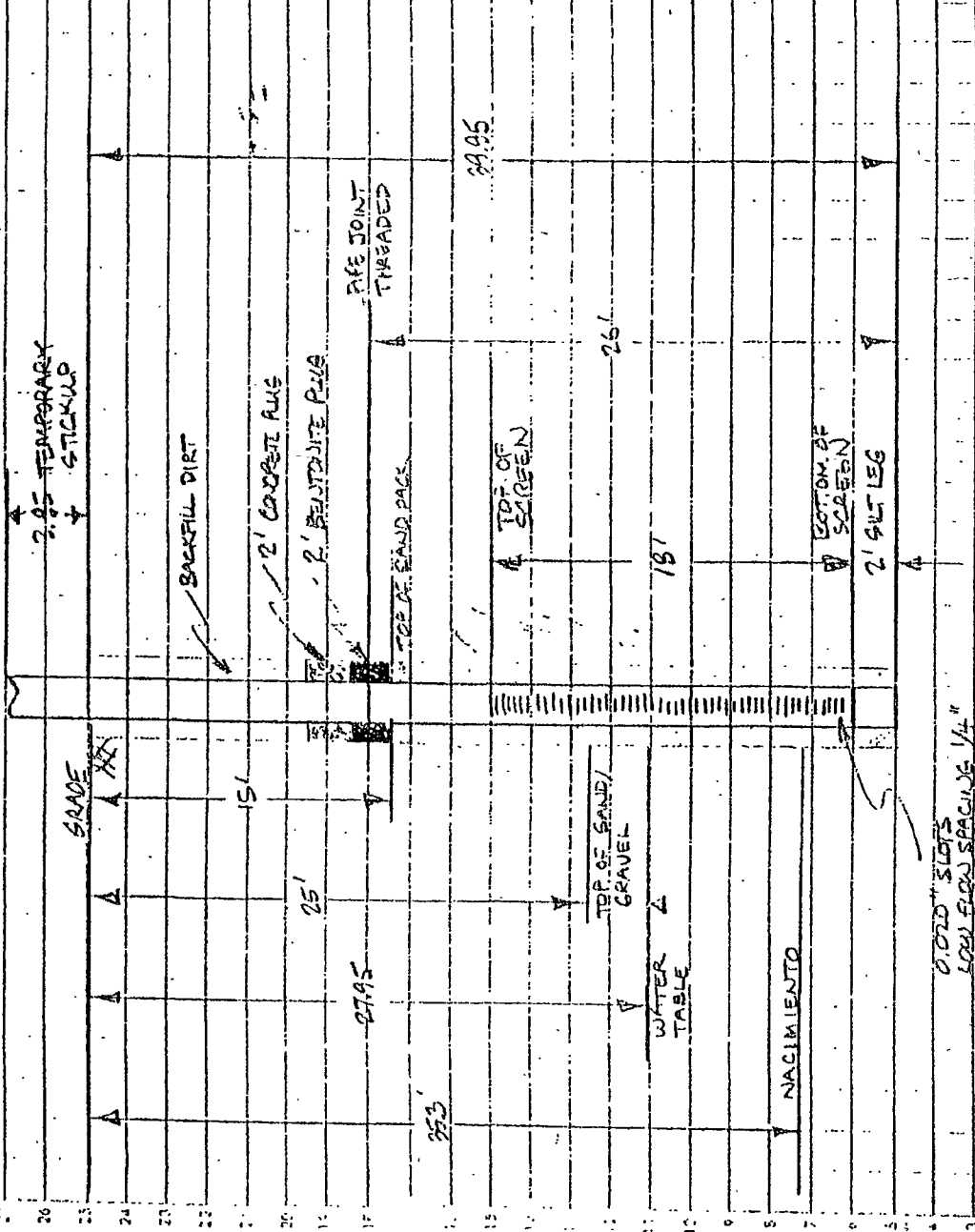
INITIALS GH PROJECT NO. GROUNDWATER RECOVERY - PHASE II, AFE 9144
 DATE 8-8-90 SUBJECT RECOVERY WELL 16
 DATE OF INSTALLATION: 8-7-90 SHEET 3 OF 6

RW-17

CALCULATION SHEET

CONSTRUCTION COMMENTS: SAME AS RW-14

LOCATION: ROAD BETWEEN TANK 17 & 24

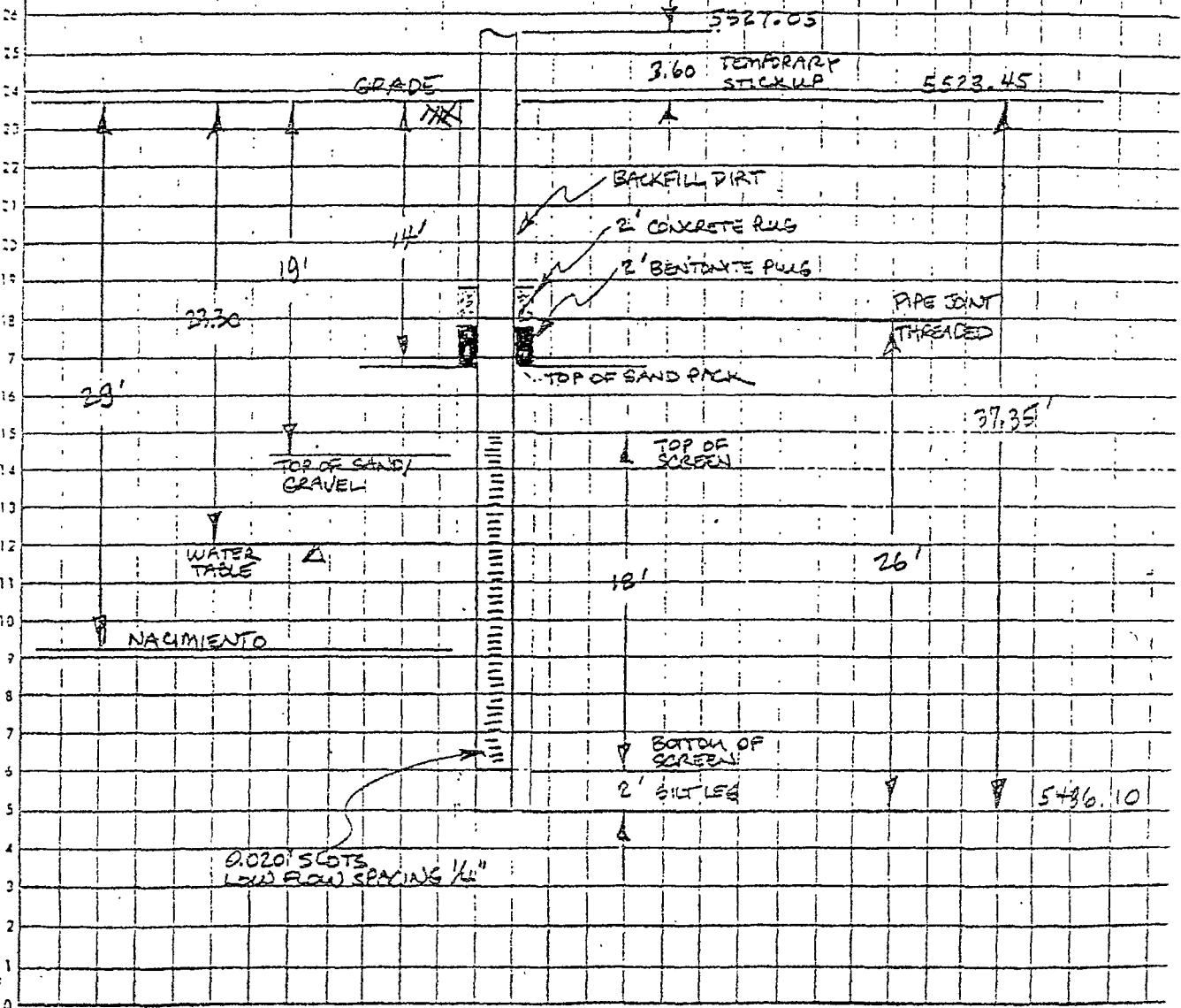


INITIALS: Oct PROJECT NO. GROUNDWATER RECOVERY - PACE II AFE 914
 DATE: 8-9-90 SUBJECT: RECOVERY WELL 17
 DATE OF INSTALLATION: 8-7-90 SHEET 4 OF 6

CALCULATION SHEET

RW-18

CONSTRUCTION COMMENTS: DRILLED BY CASING DRIVER, 8" BIT, 4.5" O.D. FIBERGLASS CASING SET TO DEPTH INSIDE DRIVEN CASING;
 LOCATION: WEST OF SOWP & NOWP, NORTH OF CAT/POLY
 ANNULAR SPACE FILLED WITH 10/20 SAND AS DRIVE CASING REMOVED; 50 LBS OF BENTONITE DRILLING MUD & 100 LBS OF CONCRETE PLACED ON TOP OF SAND PACK; BACKFILLED WITH DIRT TO SURFACE
 CONCRETE PAD SURFACE SEAL (NOT SHOWN)



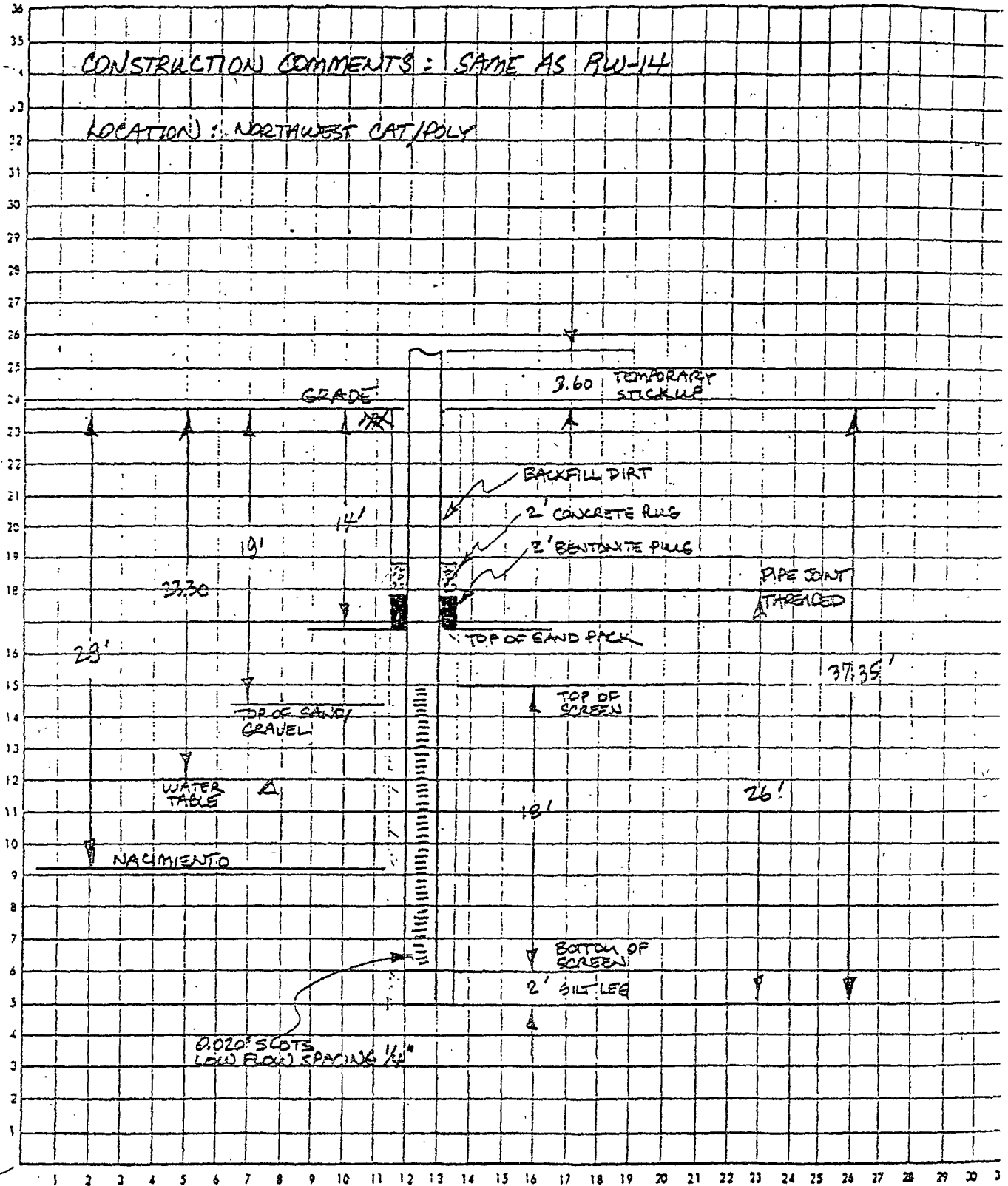
INITIALS CM PROJECT NO. GROUNDWATER MONITORING - SOWP & NOWP
 DATE 8-9-90 SUBJECT GROUNDWATER RECOVERY - OVERALL FACILITY
 DATE OF INSTALLATION: 8-8-90 SHEET 5 OF 6

CALCULATION SHEET

RW-18

CONSTRUCTION COMMENTS: SAME AS RW-14

LOCATION: NORTHWEST CAT/POLY

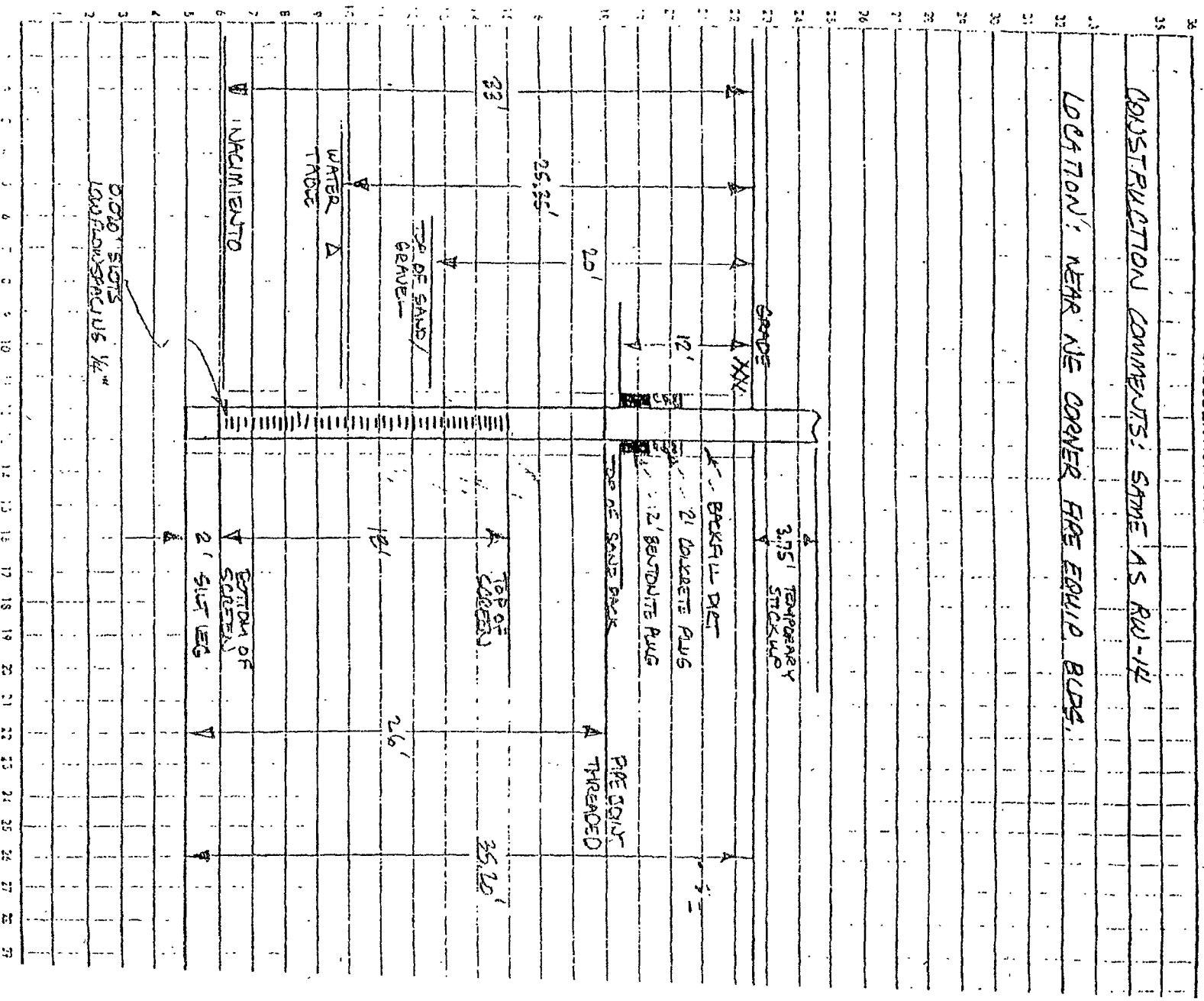


INITIALS CH PROJECT NO. GROUNDWATER RECOVERY-PHASE II, AFE 9146
 DATE 8-9-90 SUBJECT RECOVERY WELL 18
 DATE OF INSTALLATION: 8-8-90 SHEET 5 OF 6

RU-19

CONSTRUCTION COMMENTS: SAME AS RUD-14

LOCATION: NEAR NE CORNER FIVE EQUID. BUDS.



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GROUNDWATER RECOVERY - PHASE II A/E 9/14/65

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RECOVER WELL 19

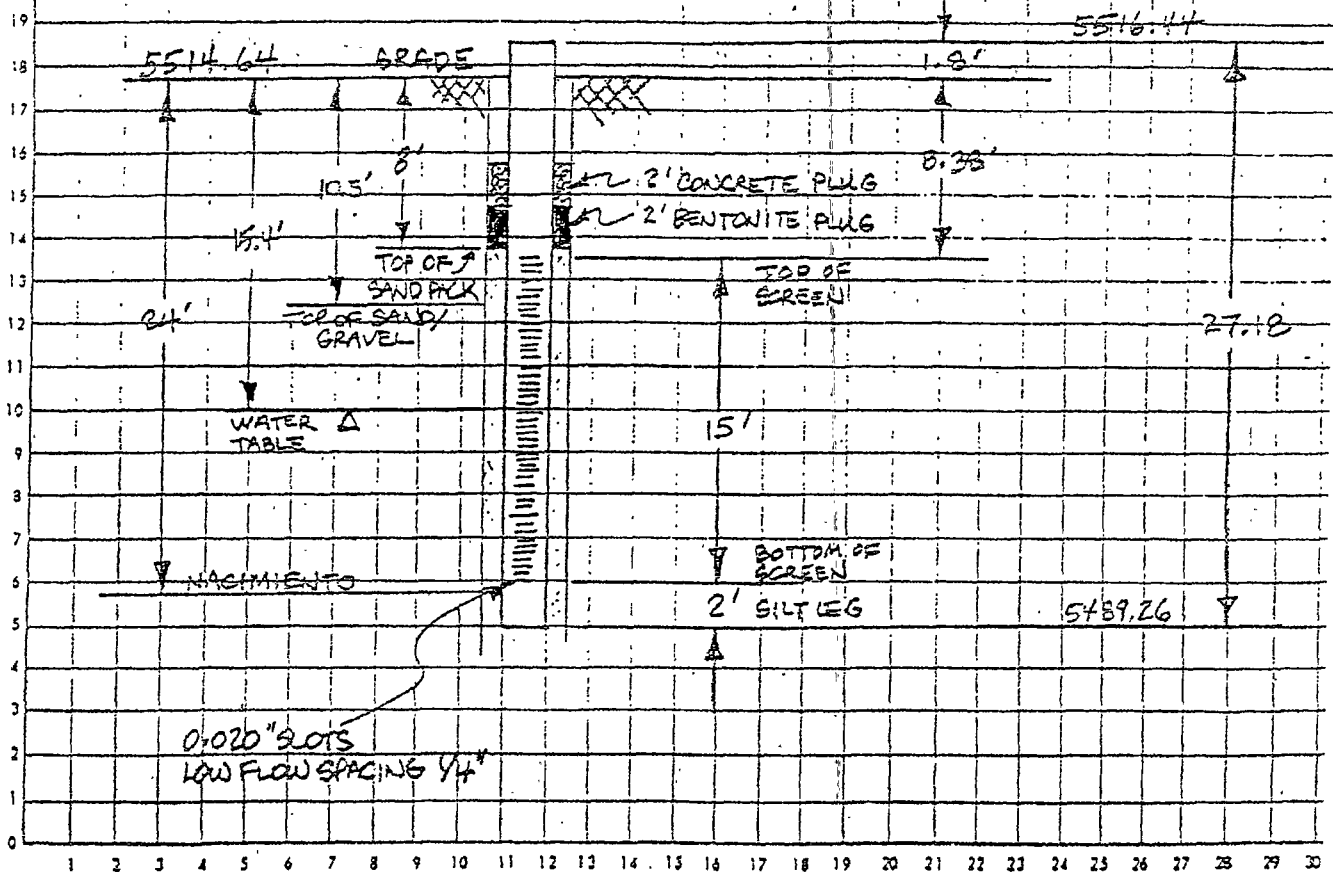
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CALCULATION SHEET

MW-20

CONSTRUCTION COMMENTS: DRILLED BY CASING DRIVER 8" BIT. 4.5" O.D. FIBERGLASS CASING SET TO DEPTH INSIDE DRIVE LOCATION: NORTH SIDE OF CASING; ANNULAR SPACE FILLED WITH 30/40 S. NOWP-CENTERED. AS DRIVEN CASING REMOVED. 50 LBS OF BENTON. DRILLING MUD & 100 LBS OF CONCRETE PLUG ON TOP OF SAND PACK; BACKFILLED WITH DIRT TO SURFACE.

CONCRETE PAD SURFACE SEAL (NOT SHOWN)



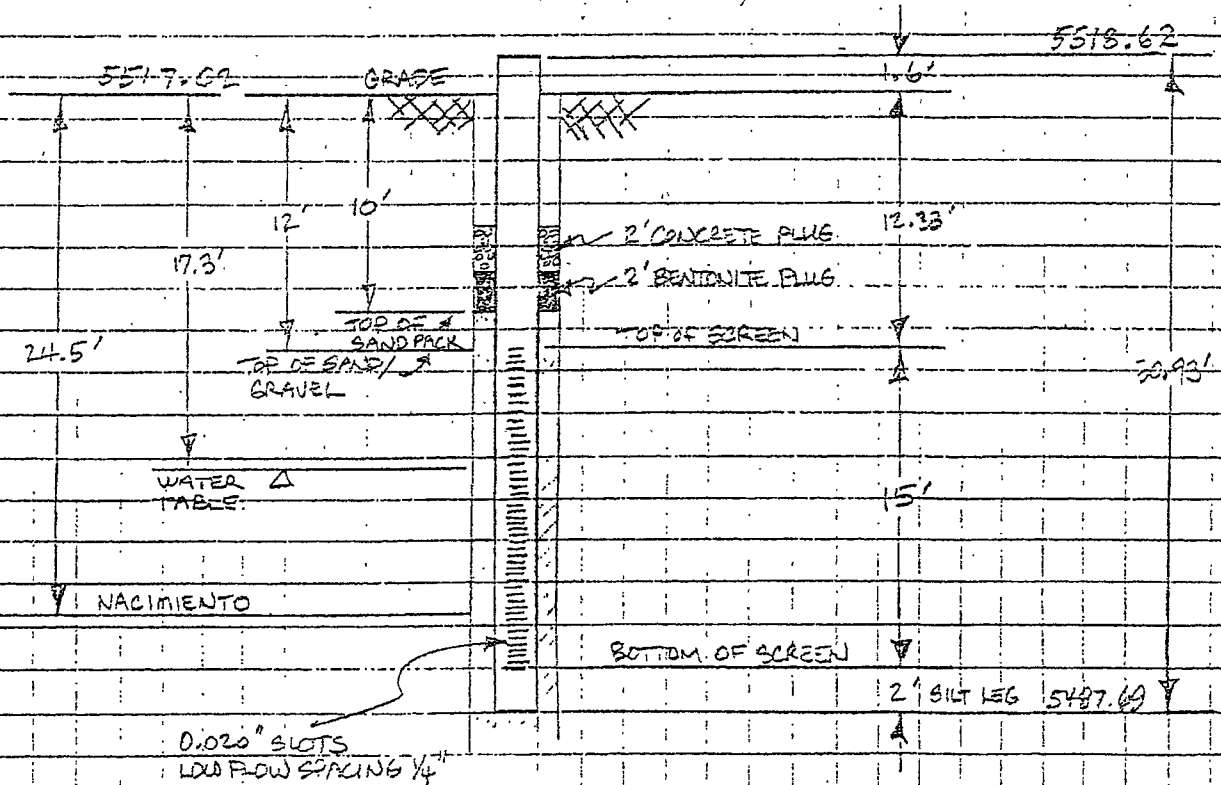
INITIALS MA PROJECT NO. GROUNDWATER MONITORING - SQWP & NOWP
 DATE 9-16-91 SUBJECT MW-20
 DATE OF INSTALLATION: 9-13-91 SHEET 1 OF 2

CALCULATION SHEET

MW-21

CONSTRUCTION COMMENTS: DRILLED BY CASING DRIVER, 8" BIT, 4.5" O.D. FIBERGLASS CASING SET TO DEPTH INSIDE DRIVEN CASING, ANNULAR SPACE FILLED WITH 30/40 SAND AS DRIVEN CASING REMOVED, 50 LBS OF BENTONITE DRILLING MUD & 100 LBS OF CONCRETE PLACED ON TOP OF SAND PACK, BACKFILLED WITH DIRT TO SURFACE.

CONCRETE PAD SURFACE SEAL (NOT SHOWN)



INITIALS: CH PROJECT NO. GROUNDEWATER MONITORING - SOWP & NOWP
 DATE: 9-16-91 SUBJECT: MW-21, UPGRADEMENT FROM SOWP & NOWP
 DATE OF INSTALLATION: 9-16-91 SHEET: 2 OF 2



GROUNDWATER
TECHNOLOGY

Drilling Log

Recovery Well RW-22

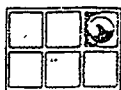
Project Bloomfield/50 CR4990 Owner Bloomfield Refining Co.
Location Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5518.05 ft. Total Hole Depth 34 ft. Diameter 10 in.
Top of Casing 5521.05 ft. Water Level Initial 19 ft. Static _____
Screen: Dia 6 in. Length 16 ft. Type/Size FRE/0.020 in.
Casing: Dia 6 in. Length 17 1/2 ft. Type FRE
Fill Material 12/20 Co. Silica Rig/Core Speedstar 15-THH
Drill Co. Beeman Bros. Method Air Percussion
Driller Leo Beeman Log By Jerry May Date 07/19/93 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 1230 hrs. 2 ft silt leg installed
from 31 to 33 feet

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ X Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						Tan SILT (moist)
2						
4						Same as above
6		214			ML	
8						
10		46				Same as above
12						Gray COBBLES (trace or no fines)
14						
16		NA			GW	
18						Light gray-stained poorly-graded fine SAND with trace of gravel (moist-wet)
20		1450			SP	Groundwater encountered at 19' on 7/19/93
22						Dark-gray-stained COBBLES with trace fines (moist)
24					GW	



GROUNDWATER
TECHNOLOGY

Drilling Log

Recovery Well RW-22

Project Bloomfield/50 CR4990

Owner Bloomfield Refining Co.

Location Bloomfield, New Mexico

Proj. No. 023353014

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ X Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24						
26		1,145			GW	
28						Encountered weathered limestone (moist) (Dry at 28 feet)
30		858				
32						
34		98				End of boring at 34 feet (1355 hrs.). Installed recovery well screened from 15 to 31 feet on 7/19/93.
36						
38						
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GROUNDWATER
TECHNOLOGY

Drilling Log

Recovery Well RW-23

Project Bloomfield/50 CR4990 Owner Bloomfield Refining Co.
Location Bloomfield, New Mexico Proj. No. 023353014
Surface Elev. 5515.74 ft. Total Hole Depth 33 ft. Diameter 10 in.
Top of Casing 5517.74 ft. Water Level Initial 19 ft. Static _____
Screen: Dia 6 in. Length 16 ft. Type/Size FRE/0.020 in.
Casing: Dia 6 in. Length 15/2 ft. Type FRE
Fill Material 12/20 Co. Silica Rig/Core Speedstar 15-THH
Drill Co. Beeman Bros. Method Air Percussion
Driller Leo Beeman Log By Jerry May Date 07/19/93 Permit # _____
Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

Start @ 1630 hrs. 2 ft. silt leg installed
from 31 to 33 feet

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2							
0						GW	Gravel with fines (dry)
2							Brown silty CLAY (moist, medium plasticity)
4						CL	
6		0					
8							Gravel and COBBLES (no fines)
10		32					
12							Same as above with little fines
14						GW	
16		54					Gravel and COBBLES with trace of fines (dry)
18		74					Gray-stained, same as above
20		2,914					Black-stained GRAVEL with some fines (moist)
22							Groundwater encountered at 19 feet on 7/19/93
24		105				GM	

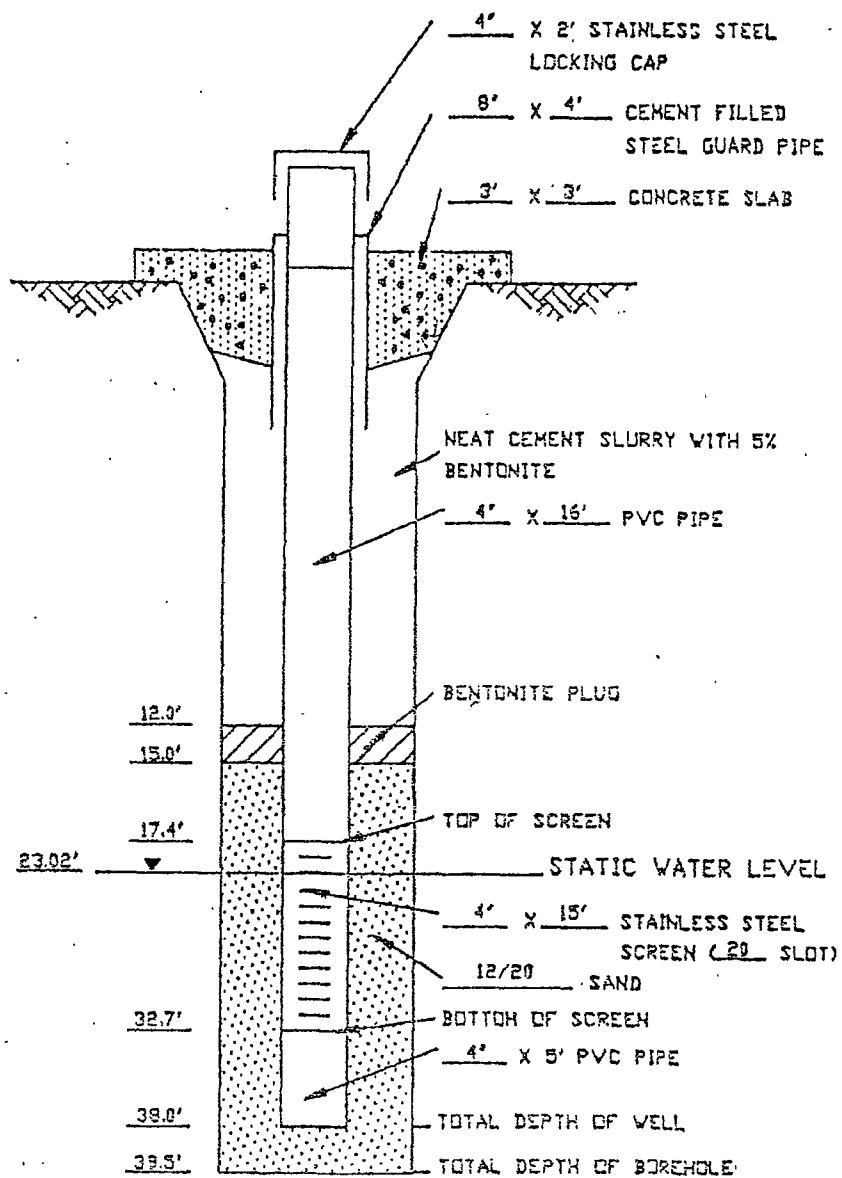
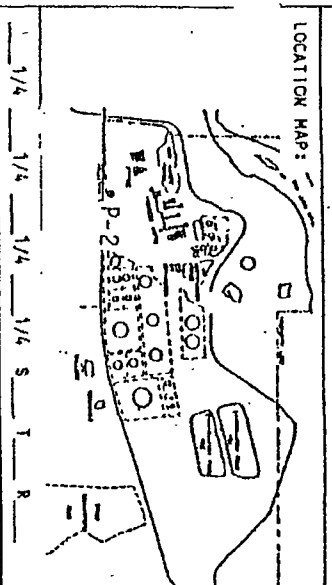


FIGURE B-5
COMPLETION DIAGRAM
PIEZOMETER P-2

LITHOLOGIC LOG (SOIL)
PIEZOMETER P-2

Page 1 of 1



SITE ID: BRC LOCATION ID: P-2
 SITE COORDINATES (T.C.): N E
 GROUND ELEVATION (T.C. MSL): 5522.93
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: Casing Driller
 DRILLING CONTR.: Seeman Brothers
 DATE STARTED: 29 AUGUST 1988 DATE COMPLETED: 29 AUGUST 1989
 FIELD REP.: N.S. Dubyk
 COMMENTS: This well replaced by P-2a. Static on September 2, 1988: 23.75 from TOC.

LOCATION DESCRIPTION:

Depth	Visual %	Lith	Drilling Time Scale:	Sample Type and Interval	Lithologic Description
5	100	100	1650		0'-13' Silty and Clay - Dark gray (N3) to grayish black (N2) to dark yellowish brown (10 YR 4/2). Intense hydrocarbon odor.
10	100	100	1656		
15	100	100	1710		
20	100	100	1720		
25	100	100	1730		13'-31.5' Sand and Gravel - Moderate yellowish brown (10 YR 5/4) to medium gray (N5). Sand is medium to very coarse grained, subangular to subrounded. Gravel is subangular to well rounded, to 2" diameter. Strong hydrocarbon odor below 25'.
30	100	100	1734		
35	100	100	1752		
40	100	100	1808		
45	100	100			31.5'-39.5' Shale - Macmillenite Formation - Dusky yellow (5 Y 6/4) to olive gray (5 Y 3/2).
50	100	100			

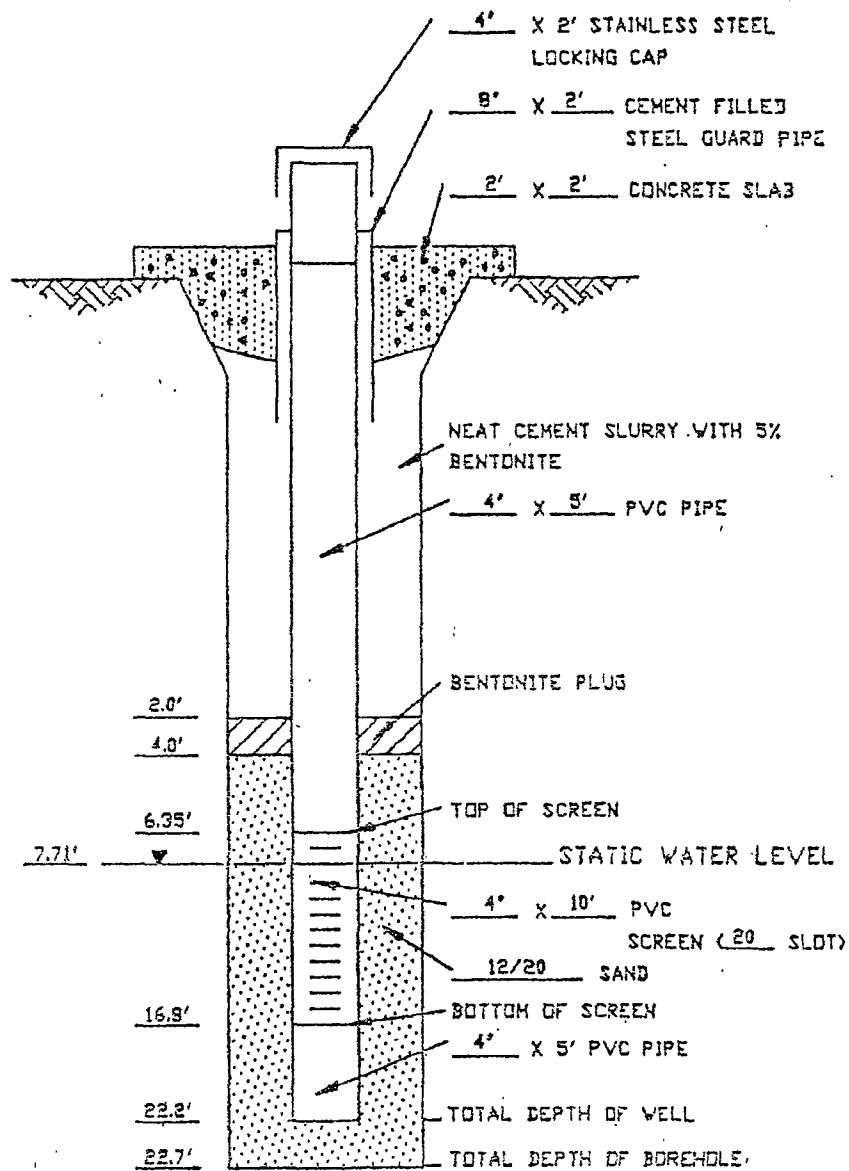


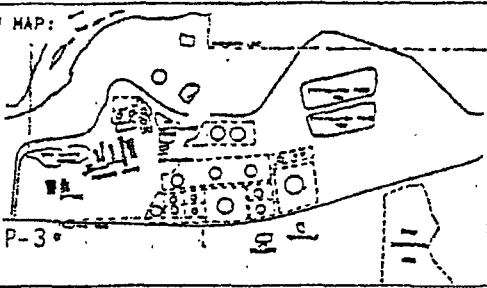
FIGURE 2-5
COMPLETION DIAGRAM
PIEZOMETER P-3

FIGURE D-13

LITHOLOGIC LOG (SOIL) PIEZOMETER P-3

Page 1 of 1

LOCATION MAP:



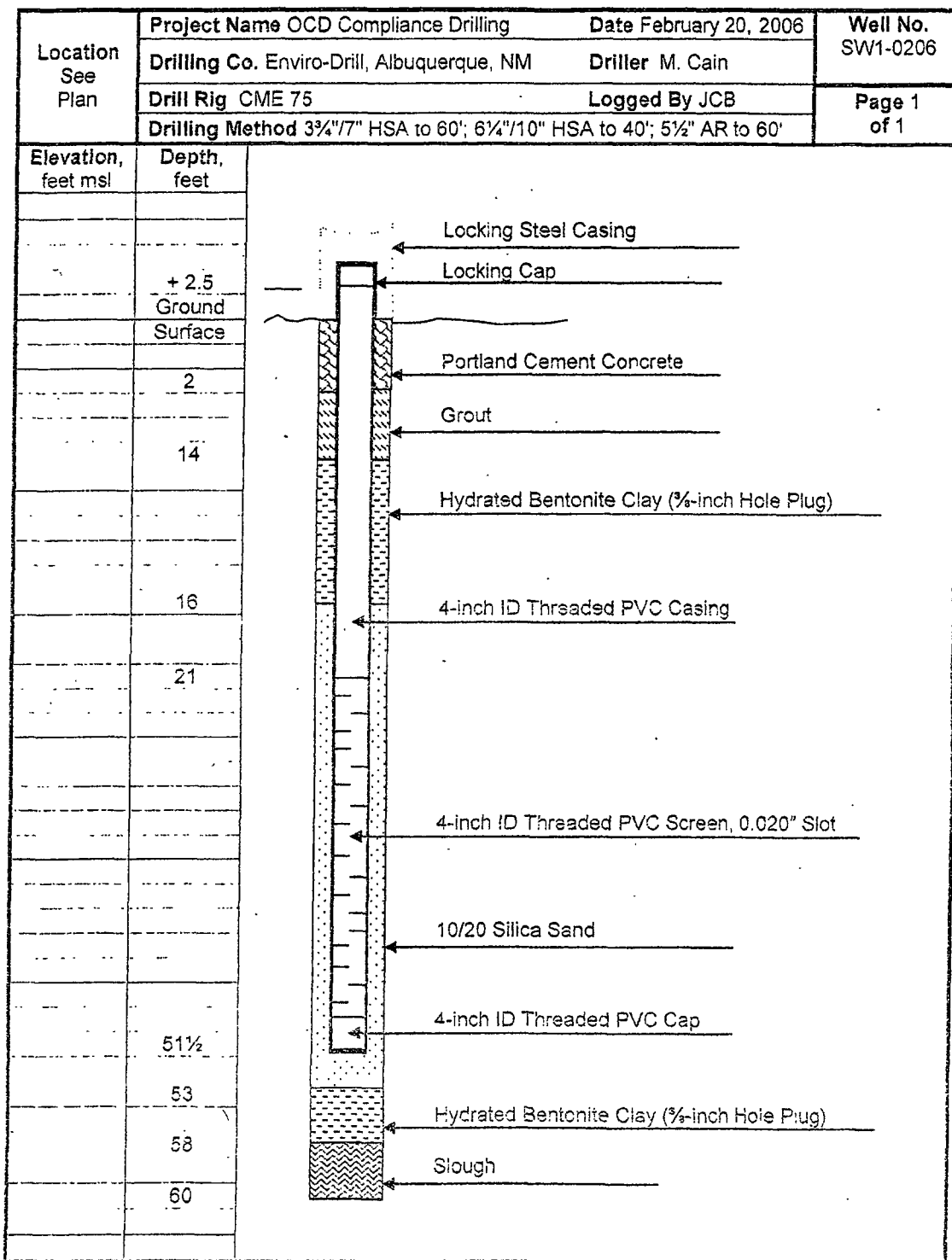
SITE ID: BRC LOCATION ID: P-3
 SITE COORDINATES (ft.): _____
 N _____ E _____
 GROUND ELEVATION (ft. MSL): 5505.40
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: Casing Driver
 DRILLING CONTR.: Seenan Brothers
 DATE STARTED: 1 September 1988 DATE COMPLETED: 1 September 1988
 FIELD REP.: W.S. Dubyk
 COMMENTS: Static on September 2, 1988: 8.30' from TOC.

_____ 1/4 _____ 1/4 _____ 1/4 _____ 1/4 S _____ T _____ R _____

LOCATION DESCRIPTION: _____

Depth	Visual %	Lith	Drilling Time Scale:	Sample Type and Interval	Lithologic Description
5	• • • • •	• • • • •	0902		0'-14' Sand and Gravel - Medium gray (N5) to dark gray (N3). Sand is medium to coarse grained, subangular to subrounded. Gravel is subrounded to rounded, to 2" diameter. Strong hydrocarbon odor.
10	• • • • •	• • • • •	0913		
15	• • • • •	• • • • •	0920		14'-22.7' Shale: <u>Waciminto Formation</u> - Dusky yellow (5 YR 6/4) to light olive gray (5 Y 6/1) shale.
20	• • • • •	• • • • •	0925		
25	• • • • •	• • • • •	1000		
30	• • • • •	• • • • •			
35	• • • • •	• • • • •			
40	• • • • •	• • • • •			
45	• • • • •	• • • • •			
50	• • • • •	• • • • •			

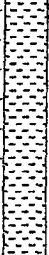
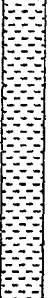
Well Installation Summary



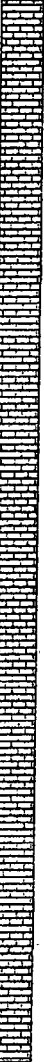
Log of SW1-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 40'; 5 1/2" AR to 60'			Date February 20, 2006 Driller M. Cain Logged By JCB		Page 1 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
					Surface Condition: Fill Soil		
1						Sand Fill	fine to medium, trace coarse, little fine to coarse gravel, few clayey silt, brown, medium dense, dry
2							
3							
4	S-1 Grab	—	—	0.0		Gravel Jackson Lake Terrace	fine to coarse, some fine to coarse sand, trace clayey silt, scattered cobbles, gray-brown, very dense, dry
5							
6							
7							
8							
9						Sand	fine to medium, trace coarse, few fine gravel, trace clayey silt, brown, dense, dry
10	S-2 SPT	12	0	—			
11		17					
12		12					
13							
14						Claystone Nacimiento Formation	Silty Clay; medium plasticity, brown, very hard, dry, faint laminated bedding, silt partings on approx. 1" to 2" spacing, oxidized reddish-brown 1/4" to 1/2" nodules, lightly fractured, moderately cemented
15	S-3	13	100	0.0			
16	SPT	26					
17		46					
18							
19							
20							

Log of SW1-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 40'; 5 1/2" AR to 60'			Date February 20, 2006 Driller M. Cain Logged By JCB		Page 2 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm'	Description		
20	S-4	18	100	>10		Claystone	continued, laminated bedding, highly fractured
21	SPT	19					
22		50					
23		5 1/2"					
24							
25	S-5	29	100	0.0			laminated with gray-brown clayey silt
26	SPT	50					
27		4"					
28							
29							
30	S-6	50	0				Silty Clay; medium plasticity, light gray, very hard, brown, very hard, dry, fissured bedding, moderately cemented
31	SPT	4"					
32							
33							
34							
35	S-7	31	100	0.0			Silty Clay; medium plasticity, dark gray, very hard, dry, highly fractured, slickensides on fractures, moderately cemented
36	SPT	49					
37							
38							
39							
40						Siltstone	Clayey Silt; trace fine sand, low plasticity, light gray, very hard, moist, laminated bedding, laminated with gray-brown clayey silt, moderately cemented

Log of SW1-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3¾"/7" HSA to 60'; 6¼"/10" HSA to 40'; 5½" AR to 60'			Date February 20, 2006 Driller M. Cain Logged By JCB		Page 3 of 4 Elevation	
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description			
40	S-8 SPT	50	100	0.0		Siltstone	continued	
41		5"						
42								
43						Sandstone	Sand; fine, few clayey silt, light gray, very dense, moist, faint laminated bedding, weakly cemented	
44								
45	S-9 SPT	50	100	0.0				
46		5"						
47								
48								
49								
50	S-10 SPT	40	20	0.0			no bedding observed	
51		50						
52		5"						
53								
54								
55	S-11 SPT	35	100	0.0		little clayey silt, laminated bedding		
56		50						
57		5"						
58								
59								
60								

Log of SW1-0206

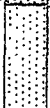
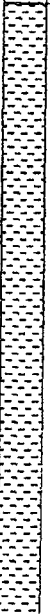
Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3¾"/7" HSA to 60'; 6¼"/10" HSA to 40'; 5½" AR to 60'			Date February 20, 2006 Driller M. Cain Logged By JCB		Page 4 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
60	S-12 SPT	36	100	0.0		Sandstone continued, few clayey silt	
61		50 4"				Bottom of boring at approximately 60¾ feet. Boring completed on February 20, 2006. No groundwater observed during drilling. No groundwater measured in well on March 2, 2006.	
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							

Well Installation Summary

Location See Plan	Project Name OCD Compliance Drilling		Date February 16, 2006	Well No. SW2-0206
	Drilling Co. Enviro-Drill, Albuquerque, NM		Driller M. Cain	
	Drill Rig CME 75		Logged By JCB	Page 1 of 1
	Drilling Method 3¾"/7" HAS to 35'			

Elevation, feet msl	Depth, feet	
	+ 2.4	
	Ground Surface	
	1	
	4	
	5	

Log of SW2-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4" / 7" HAS to 35'			Date February 16, 2006 Driller M. Cain Logged By JCB		Page 1 of 2 Elevation	
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description			
Surface Condition: Soil, Shoulder of Hammond Ditch Road								
1						Sand Fill	fine to coarse, little fine to coarse gravel, trace clayey silt, brown, medium dense, dry	
2	S-1			1.3			Sand Jackson Lake Terrace	fine to coarse, little fine to coarse gravel, trace clayey silt, scattered cobbles, brown, dense, dry
3	Grab							
4						Gravel	fine to coarse, some fine to coarse sand, trace clayey silt, scattered cobbles, gray-brown, dense, dry	
5								
6								
7								
8						Sand	fine to medium, trace coarse, trace clayey silt, gray-brown, medium dense, moist, dark gray/black petroleum staining	
9	S-2	11	100	>10				
10	SPT	17 22						
11						Claystone Nacimienta Formation	Silty Clay; trace fine sand, medium plasticity, brown, very hard, moist, faint laminated bedding, silt partings on approx. 1" spacing, lightly fractured with occasional reddish-brown oxidization on fractures, moderately cemented, 10' to 10.1' dark gray/black petroleum staining	
12								
13								
14								
15	S-3	20	100	3.5				
16	SPT	21 30						
17								
18								
19								
20								

Log of SW2-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3¾"/7" HAS to 35'			Date February 16, 2006 Driller M. Cain Logged By JCB		Page 2 of 2 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
20	S-4	18	100	0.3		Claystone continued	
21	SPT	33					
22		50					
		3"					
23							
24							
25	S-5	30	100	0.6		Silty Clay; low plasticity, medium gray, laminated bedding, occasional laminations of clayey silt, moderately fractured, faint slickensides on fractures, moderately cemented	
26	SPT	50					
		4"					
27							
28							
29							
30	S-6	40	25	0.3		occasional silt partings	
31	SPT	50					
		5"					
32							
33							
34							
35	S-7	50	100	0.4			
36	SPT	5½"			Bottom of boring at approximately 35½ feet. Boring completed on February 16, 2006. No groundwater observed during drilling. No groundwater measured in well on March 2, 2006.		
37							
38							
39							
40							

Log of SW3-0206

Location See Plan		Project Name		Date		Page 1 of 4	
		OCD Compliance Drilling		February 17, 2006			
		Drilling Co. Enviro-Drill, Albuquerque, NM		Driller M. Cain			
		Drill Rig CME 75		Logged By JCB			
		Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 58'				Elevation	
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
					Surface Condition: Soil, Shoulder of Hammond Ditch Road		
1					Sand Fill	fine to medium, trace coarse, few fine gravel, trace clayey silt, brown, medium dense, moist	
2							
3							
4							
5	S-1	—	—	0.1			
6	Grab						
7							
8					Claystone Nacimiento Formation	Silty Clay; trace fine sand, medium plasticity, brown, hard, dry, laminated bedding, silt partings on approx. 1" to 2 1/2" spacing, moderately cemented moderately fractured with reddish-brown oxidization on fractures	
9	S-2 SPT	7 8 10	100	0.2			
10							
11							
12							
13							
14							
15	S-3 SPT	11 12 11	100	0.2			
16							
17							
18							
19							
20							

Log of SW3-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3¾"/7" HSA to 60'; 6¼"/10" HSA to 58'		Date February 17, 2006 Driller M. Cain Logged By JCB		Page 2 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description	
20					Claystone continued	
21						
22						
23						
24						
25						
26						
27						
28					Silty Clay; medium plasticity, dark gray, laminated bedding, highly fractured, slickensided fractures, moderately cemented	
29						
30	S-4	38	100	0.2		
31	SPT	50 3"				
32						
33						
34						
35	S-5	13	100	0.2		
36	SPT	33 50 4"				
37						
38						
39						
40					Siltstone Clayey Silt; trace fine sand, low plasticity, light gray, very hard, dry, laminated bedding, laminated with medium gray clayey silt, moderately cemented	

Log of SW3-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 58'			Date February 17, 2006 Driller M. Cain Logged By JCB		Page 3 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
40	S-6	34	100	0.7		Siltstone	continued
41	SPT	50 4"					
42							
43							
44							
45						Sandstone	Clayey Sand; fine, low plasticity, light gray, very dense, moist, faint laminated bedding, laminated with medium gray clayey silt, moderately cemented
46							
47							
48							
49							
50	S-7	50	100	0.2			
51	SPT	5"					
52							
53							
54							
55							
56							
57							
58							
59							
60							

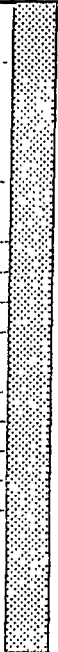
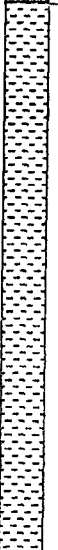
Log of SW3-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 58'			Date February 17, 2006 Driller M. Cain Logged By JCB		Page 4 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
60	S-8	50	100	0.2	Sandstone continued		
61	SPT	3"			Bottom of boring at approximately 60 1/4 feet. Boring completed on February 17, 2006. No groundwater observed during drilling. No groundwater measured in well on March 2, 2006.		
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							

Well Installation Summary

[illegible]

Log of SW4-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3¾"/7" HSA to 60'; 6¼"/10" HSA to 10'; 5½" AR to 60'			Date February 16, 2006 Driller M. Cain Logged By JCB		Page 1 of 4 Elevation	
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description			
Surface Condition: Soil, Shoulder of Hammond Ditch Road								
1						Sand Fill	fine to medium, trace coarse, few fine gravel, few clayey silt, brown, loose, moist	
2								
3								
4	S-1 Grab	—	—	0.1				
5								medium dense
6								
7								
8								
9								
10	S-2 SPT	3 4 4	50	3.6				
11								
12								
13								
14								
15	S-3 SPT	17 24 50 5"	100	0.4				
16					very hard			
17								
18								
19								
20								

Log of SW4-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 10'; 5 1/2" AR to 60'			Date February 16, 2006 Driller M. Cain Logged By JCB		Page 2 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
20	S-4	14	100	0.0	Claystone continued		
21		34					
		38					
22							
23							
24							
25	S-5	24	100	0.2			
		50					
26		4"					
27							
28					Silty Clay, medium plasticity, light gray, very hard, dry, laminated bedding, silt partings on approx. 1" spacing, moderately cemented		
29							
30	S-6	50	50	0.0			
31	SPT	4"					
32							
33					Silty Clay: medium plasticity, dark gray, very hard, dry, faint laminated bedding, highly fractured, slickensided fractures, moderately cemented		
34							
35	S-7	18	100	0.8			
36	SPT	38					
		50					
37		5 1/2"			Siltstone Clayey Silt; low plasticity, light gray, very hard, dry, laminated bedding, silt partings on approx. 3/8" to 5/8" spacing, moderately cemented		
38							
39							
40							

Log of SW4-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 10'; 5 1/2" AR to 60'			Date February 16, 2006 Driller M. Cain Logged By JCB		Page 3 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
40	S-8	50	100	0.2		Siltstone	continued
41	SPT	6"					
42							
43						Sandstone	Clayey Sand; fine, low plasticity, light gray, very dense, moist, faint laminated bedding, laminated with medium gray clayey silt, moderately cemented
44							
45	S-9	46	80	0.0			
46	SPT	50					
47		4"					
48							
49							
50	S-10	50	100	0.0			
51	SPT	5 1/2"					
52							
53							
54							
55	S-11	50	100	0.0			laminated bedding, little clayey silt
56	SPT	5 1/2"					
57							
58							
59							
60							

Log of SW4-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4"/7" HSA to 60'; 6 1/4"/10" HSA to 10'; 5 1/2" AR to 60'		Date February 16, 2006 Driller M. Cain Logged By JCB		Page 4 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description	
60	S-12	50	100	0.0	 Sandstone continued Bottom of boring at approximately 60 1/2 feet. Boring completed on February 16, 2006. No groundwater observed during drilling. No groundwater measured in well on March 2, 2006.	
61	SPT	5"				
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
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75						
76						
77						
78						
79						
80						

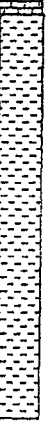
Well Installation Summary

Location See Plan	Project Name OCD Compliance Drilling		Date February 15, 2006	Well No. SW5-0206
	Drilling Co. Enviro-Drill, Albuquerque, NM		Driller M. Cain	
	Drill Rig CME 75		Logged By JCB	Page 1 of 1
	Drilling Method 6¼"/10" HSA to 14'; 5½" AR 14' to 60'			
Elevation, feet msl	Depth, feet			
	+ 2.3	Locking Steel Casing		
	Ground Surface	Locking Cap		
	2½	Portland Cement Concrete		
		Slough		
	10			
		Hydrated Bentonite Clay (¾-inch Hole Plug)		
	14			
		4-inch ID Threaded PVC Casing		
	19			
		4-inch ID Threaded PVC Screen, 0.020" Slot		
		10/20 Silica Sand		
		4-inch ID Threaded PVC Cap		
	49½			
	52			
		Hydrated Bentonite Clay (¾-inch Hole Plug)		
	60			

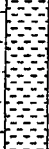
Log of SW5-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 6¼"/10" HSA to 14'; 5½" AR 14' to 60'			Date February 15, 2006 Driller M. Cain Logged By JCB		Page 1 of 4 Elevation	
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description			
Surface Condition: Fill Soil								
1						Sand Fill	fine to coarse, little fine to coarse gravel, trace clayey silt, brown, loose, dry	
2								
3								scattered cobbles
4								
5								medium dense
6								
7								
8						Gravel Jackson Lake Terrace	fine to coarse, some fine to coarse sand, trace clayey silt, scattered cobbles, gray-brown, medium dense, dry	
9								
10	S-1 Grab			0.3		Sand	fine to coarse, some fine to coarse gravel, trace clayey silt, brown, dense, dry	
11								
12						Gravel	some cobbles, few fine to coarse sand, trace clayey silt, dense, dry	
13								
14								
15								
16								
17						Sand	fine to medium, trace coarse, few clayey silt, yellowish brown, very dense, dry, oxidized ¼" lenses	
18	S-2 SPT	50 5"	100	0.3				
19								
20								

Log of SW5-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 6¼"/10" HSA to 14'; 5½" AR to 60'			Date February 15, 2006 Driller M. Cain Logged By JCB		Page 2 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
20	S-3	38	50	0.3		Sand	continued
21		29 1"					
22							
23	S-4	27 44	100	0.2			
24		45					
25						Sandstone <i>Nacimiento</i> Formation	laminated bedding stratified with 1" to 1½" thick light gray clayey fine sand
26	S-5	15	100	0.1			
27		24					
28		27					
29							
30	S-6	11	100	0.0		Claystone	Clayey Sand; fine, low plasticity, light gray, very dense, moist, moderately cemented
31	SPT	26 29					
32							
33							
34							
35	S-7	24	100	0.1		Claystone	Silty Clay; medium plasticity, medium gray, very hard, moist, laminated bedding, laminated with light brown and dark brown silty clay, lightly fractured, moderately cemented
36	SPT	50 5"					
37							
38							
39							
40							Silty Clay; trace fine sand, medium plasticity light gray, very hard, dry, faint laminated bedding, silt partings on approx. ¼" to ½" spacing, moderately cemented

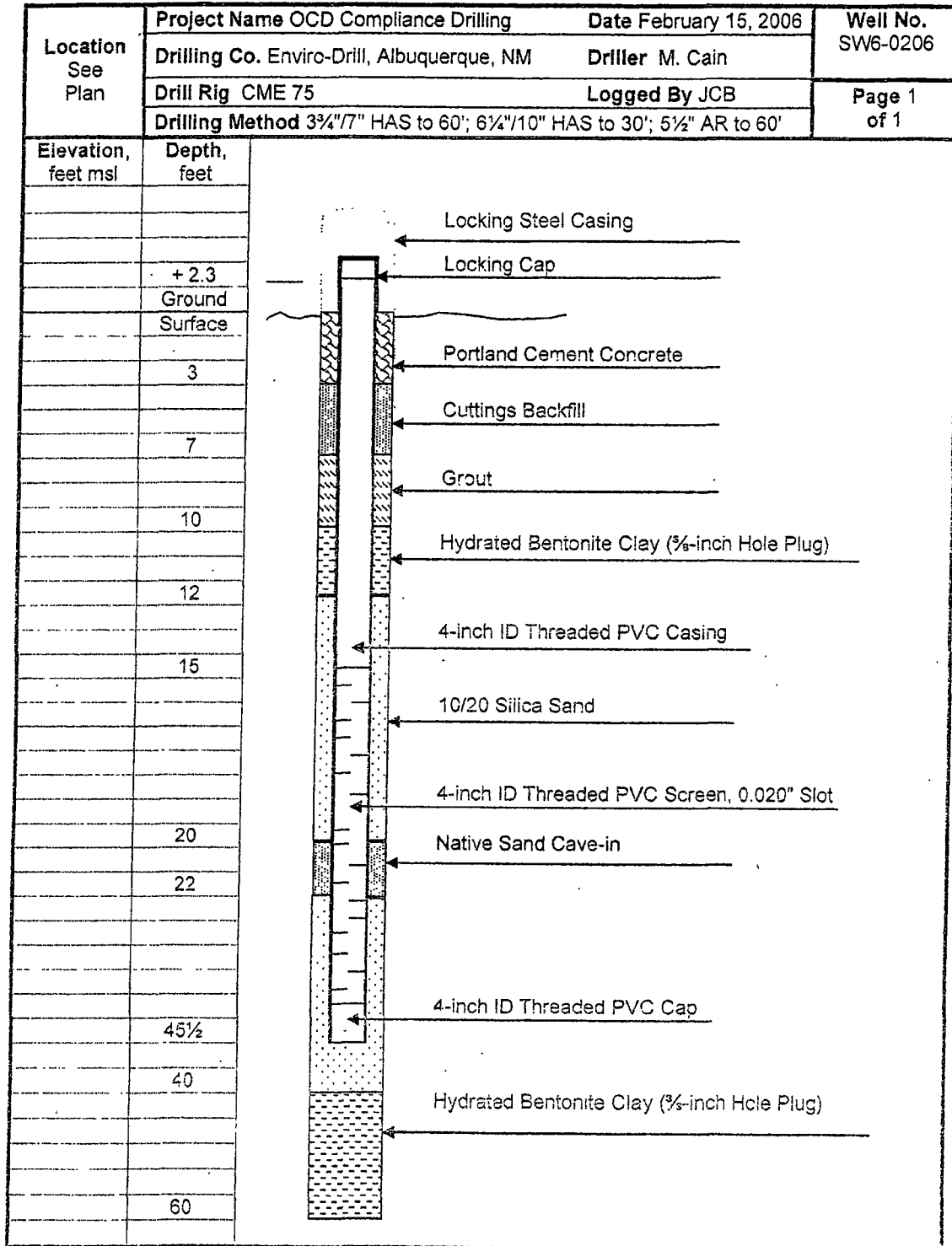
Log of SW5-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 6 3/4"/10" HSA to 14'; 5 1/2" AR to 60'			Date February 15, 2006 Driller M. Cain Logged By JCB		Page 3 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
40	S-8	40	100	0.3		Claystone continued	
41	SPT	50 5"					
42							
43							
44							
45	S-9	21	80	0.3		Silty Clay; medium plasticity, dark gray, very hard, moist, laminated bedding, highly fractured, faint slickensides on fractures, moderately cemented	
46	SPT	50 2"					
47							
48							
49							
50	S-10	50	100	0.2		Siltstone Clayey Silt; trace fine sand, low plasticity, light gray, very hard, moist, laminated bedding, laminated with medium gray clayey silt, moderately cemented	
51	SPT	5 1/2"					
52							
53							
54							
55	S-11	50	100	0.3		Sandstone Sand; fine, few clayey silt, light gray, very dense, moist, faint laminated bedding, laminated with medium gray clayey silt, weakly cemented	
56	SPT	5"					
57							
58							
59							
60							

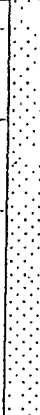
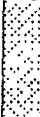
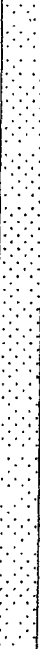
Log of SW5-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 6 1/4"/10" HSA to 14'; 5 1/2" AR to 60'			Date February 15, 2006 Driller M. Cain Logged By JCB	Page 4 of 4 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description	
60	S-12	50	100	0.3	Sandstone continued Bottom of boring at approximately 60 1/4 feet. Boring completed on February 15, 2006. No groundwater observed during drilling. Perched groundwater measured in well at approximately 33 1/4 feet on March 2, 2006.	
61	SPT	4"				
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						

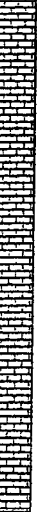
Well Installation Summary



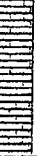
Log of SW6-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4" / 7" HAS to 60'; 6 1/4" / 10" HAS to 30'; 5 1/2" AR to 60'			Date February 13 & 14, 2006 Driller M. Cain Logged By JCB		Page 1 of 3 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Graphic	Description	
						Surface Condition: Fill Soil, Weeds	
1						Sand Fill	fine to coarse, little fine to coarse gravel, trace clayey silt, gray-brown, loose, dry medium dense
2							
3							
4							
5							
6							
7							
8						Silt Loess	little fine sand, brown, loose, dry
9							
10							
11						Sand Jackson Lake Terrace	fine to coarse, some fine to coarse gravel, trace clayey silt, scattered cobbles, gray-brown, medium dense, dry, stratified with 2" to 12" thick fine to coarse sand, few clayey silt, trace fine to coarse gravel very dense
12							
13							
14							
15							
16							
17							
18							
19							
20							

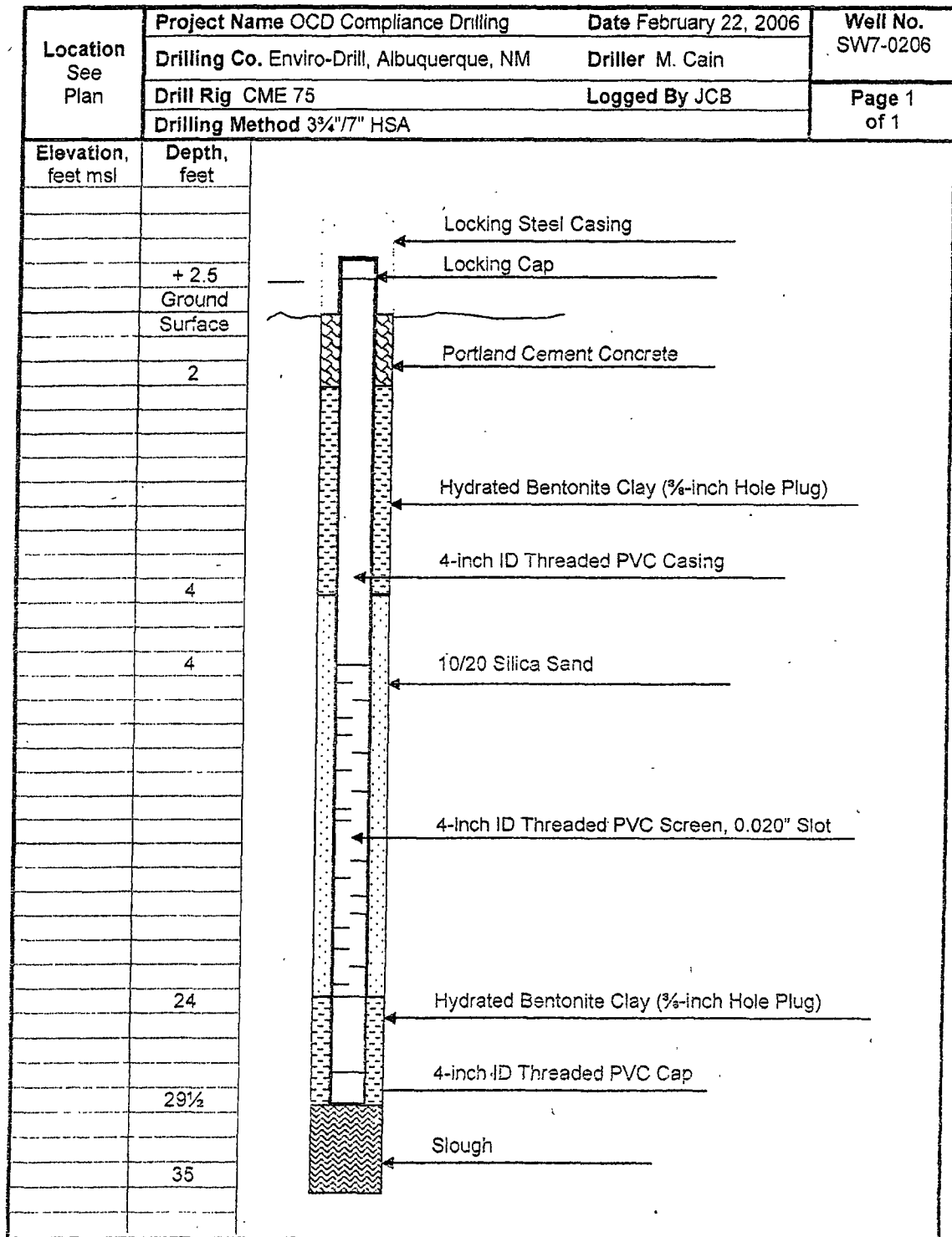
Log of SW6-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3¾"/7" HAS to 60'; 6¼"/10" HAS to 30'; 5½" AR to 60'			Date February 13 & 14, 2006 Driller M. Cain Logged By JCB		Page 2 of 3 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Graphic	Description	
20						Sand continued	
21							
22							
23	S-1 MC	39 50 4"	100	0.8		Sand; fine, few clayey silt, yellowish brown, very dense, moist, stratified with ¼" to ½" thick clayey fine sand	
24							
25							
26							
27						dark gray/black petroleum staining, petroleum odor	
28	S-2 MC	21 50 4"	100	>10 5.2		PID reading of >10 on slough	
29							
30							
31						Sandstone Naciminto Formation	
32						Clayey Sand; fine, low plasticity, light gray, very dense, moist, moderately cemented	
33	S-3 MC	50 4"	0				
34							
35							
36							
37							
38	S-4 SPT	25 51	100	4.7		laminated bedding PID reading of 4.7 on slough	
39							
40							

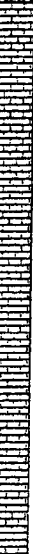
Log of SW6-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3¾"/7" HAS to 60'; 6¼"/10" HAS to 30'; 5½" AR to 60'				Date February 13 & 14, 2006 Driller M. Cain Logged By JCB		Page 3 of 3 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Graphic	Description		
40						Sandstone	continued	
41								
42								
43	S-5 SPT	31 50 4"	100	0.8			Sand; fine, few clayey silt, light gray, very dense, moist, laminated with medium gray clayey silt, moderately cemented	
44						Claystone	Silty Clay; trace fine sand, medium plasticity, light gray, very hard, moist, faint laminated bedding, laminated with medium gray clayey silt, moderately cemented	
45								
46								
47								
48	S-6 SPT	40 50 2"	100	0.9		Siltstone	Silt; few fine sand, light gray, very dense, moist, laminated bedding, laminated with medium gray clayey silt, weakly cemented	
49								
50								
51								
52						Sandstone	Clayey Sand; fine, low plasticity, light gray, very dense, moist, laminated bedding, laminated with medium gray clayey silt, moderately cemented	
53	S-7 SPT	50 5"	100	0.7				
54								
55								
56							PID reading of 4.4 on slough	
57								
58	S-8 SPT	20 50 5"	100	4.4				
59								
60						Bottom of boring at approximately 58½ feet. Boring completed on February 14, 2006. No groundwater observed during drilling. No groundwater measured in well on March 2, 2006.		

Well Installation Summary

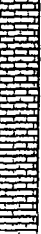


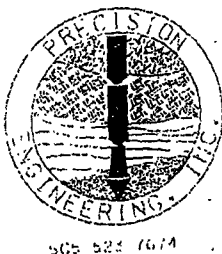
Log of SW7-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4" 7" HSA			Date February 22, 2006 Driller M. Cain Logged By JCB		Page 1 of 2 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Graphic	Description	
						Surface Condition: Soil, Shoulder of Hammond Ditch Road	
1						Sand Fill	fine to medium, few clayey silt, brown, loose, moist
2							
3	S-1 Grab	—	—	5.1			
4						Gravel Jackson Lake Terrace	fine to coarse, little fine to coarse sand, trace clayey silt, scattered cobbles, gray-brown, very dense, dry
5							
6							
7							
8							
9	S-2 Grab	—	—	>10			
10	S-3 SPT	27	80	>10			
11		50 5 1/2"					
12						Sandstone Nacimiento Formation	Sand; fine to medium, little clayey silt, light gray, very dense, moist, laminated with medium gray clayey silt, dark gray petroleum stained layers approx. 1/2" to 1 1/2" thick, weakly cemented
13							
14							
15	S-4 SPT	18	100	>10			
16		50 5"					
17							
18							
19							
20							

▽ 3.2.06

Log of SW7-0206

Location See Plan		Project Name OCD Compliance Drilling Drilling Co. Enviro-Drill, Albuquerque, NM Drill Rig CME 75 Drilling Method 3 3/4" / 7" HSA			Date February 22, 2006 Driller M. Cain Logged By JCB		Page 2 of 2 Elevation
Depth, feet	Sample No./Type	Blow Counts	Recovery, %	PID, ppm	Description		
20	S-5 SPT	45	25	>10		Sandstone	continued
21		50					
22		5 1/2"					
23							
24							
25	S-6 SPT	29	90	>10		Sandstone	
26		50					
		5"					
27						Claystone	Clay; high plasticity, medium gray, very hard, moist, moderately cemented
28							
29							
30	S-7 SPT	50	90	>10		Sandstone	Clayey Sand; fine, low plasticity, light gray, very dense, moist, laminated bedding, laminated with medium gray silty clay, moderately cemented
31		5"					
32							
33							
34							
35	S-8 SPT	35	90	>10		Sandstone	
36		25					
		1"					
37					Bottom of boring at approximately 35 1/2 feet. Boring completed on February 22, 2006. Perched groundwater observed at approximately 15 feet during drilling. Perched groundwater measured in well at approximately 15 3/4 feet on March 2, 2006.		
38							
39							
40							



Temporary Piezometer Installation - Typical See Logs for Depth Details

Elevation Reference
(Top of Pipe)

Ground Surface

Casing Cap

Screen:

5.0 ft.

Top of Screen

Bottom of Screen

Piezometer Tip

Bottom of Boring

Boring Diameter: $8\frac{5}{8}"$

Soil Type: Native Backfill

Ballards, Type/Size: None

Gravel: None

Screen Type/Size: 2" PVC Sen. 40, 0.060" and
Slotted @ 3" Int. Dia.

Gravel: None

Riser Type/Size: 2" PVC Sen. 40

Water: Potable

Locking Expandable Casing Plug? No
(Slip Cap)

Bottom Cap Used? Yes

Giant Refining Co.

Project Name: Blomfield Wells

File #: 03-122
Site: Bloomfield
Giant Refining
Elevation: unsurveyed
Date: 10/27/2004

File #: 03-122
Site: Bloomfield
Giant Refining
Elevation: unsurveyed
Date: 10/27/2004

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File #: 03-122
Site: Bloomfield
Giant Refining
Elevation: unsurveyed
Date: 10/28/2004

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File #: 03-122
Site: Bloomfield
Giant Refining
Elevation: unsurveyed
Date: 10/28/2004

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File #: 03-122
Site: Bloomfield
Giant Refining
Elevation: unsurveyed
Date: 10/28/2004

File #: 03-122
Site: Bloomfield
C Giant Refining
Elevation: unsurveyed
Date: 10/28/2004

Log of Test Borings

[illegible]

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Sheet: 1 of 1
 Bore Point: See plan
 Water Elevation: 5.7' below ground surface
 Boring No.: TP7-1004

Precision Engineering, Inc.
 P.O. Box 422
 Las Cruces, NM 88004
 505-523-7674

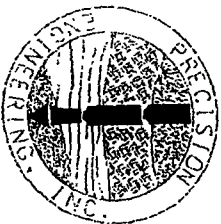
File #: 03-122
 Site: Bloomfield
 Giant Refining
 Elevation: unsurveyed
 Date: 10/28/2004

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS.
	0-2		O*-O* O*-O* O*-O* O*-O*		Silt, sand, very fine to fine, cobbles, gravel, brown, moist				
	2-5.0		*-*O* *-*O* *-*O* *-*O* *-*O* *-*O*	2.5 5.0	Sand, silty, very fine, cobbly, brown				
	5-10.0		***** ***** ***** ***** ***** ***** ***** ***** *****	7.5 10.0	Sand, fine to medium, dark brown, moist slight hydrocarbon odor, black				
				15.0 20.0	T.D. 10.0 Placed 2" PVC, 5' hand slotted screen Backfilled with clean cuttings				
SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER C:\btl\Projects\2004\hammond ditch correspondence\ditchlogsasof11105\TF									
						LOGGED BY: KM			

File #: 03-122
Site: Bloomfield
Giant Refining
Elevation:
Date: 10/28/2004

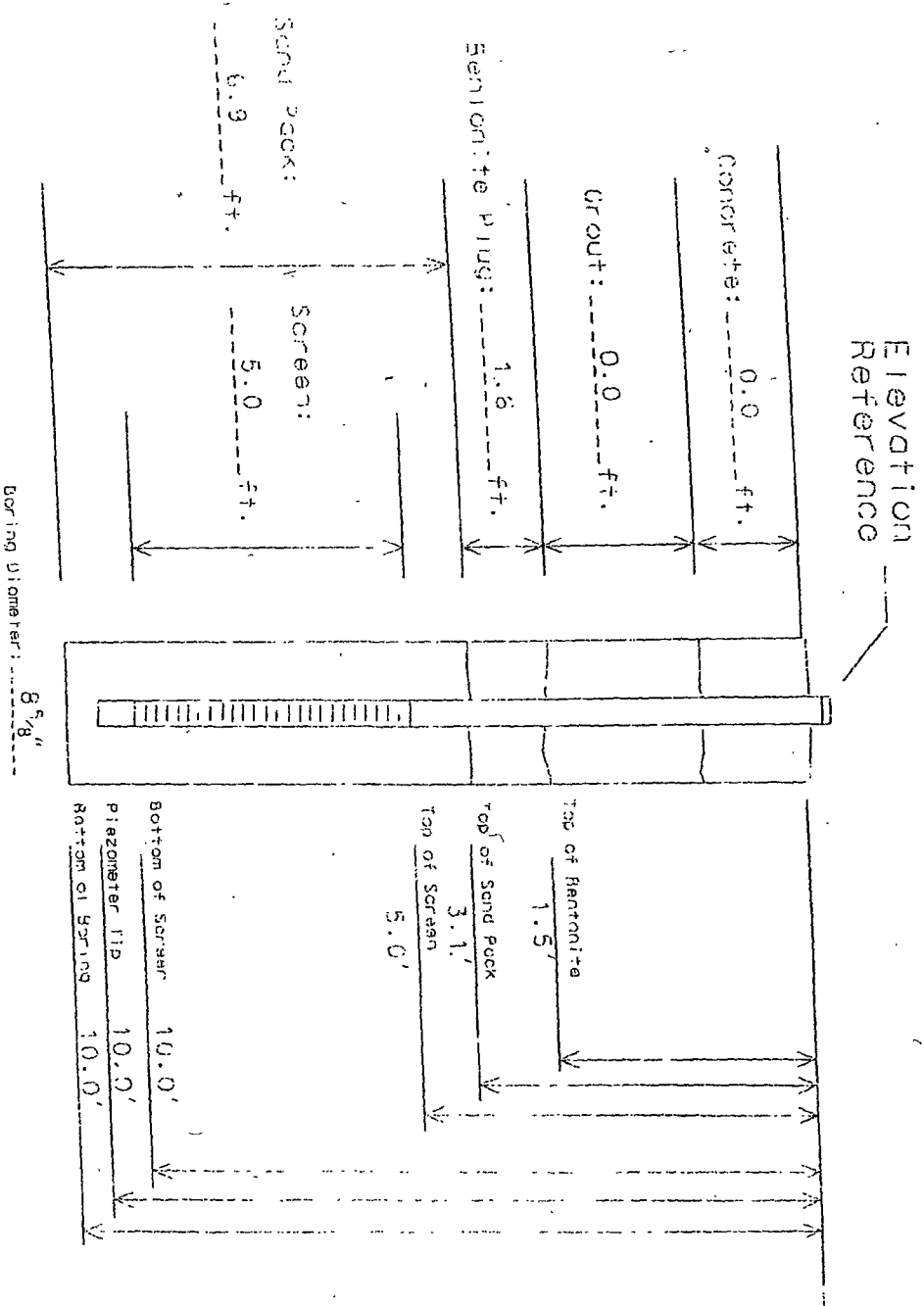
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505-522-7674

Installation Diagram

Monitoring Well No. 1P9



---10-20 SILLION

Boilards, type/size: NA NA

Quantum to: 3/4" chips

Screen Type/S: 23 2" PVC Sch. 40, 0.010" 3.2746C

NE
100-1400

1100' - 1600' 2" 20' 50" 40'

NC 121 100-0016

Looking Forward, Getting Paid? ----- Yes

5172 Nov. 11 1955

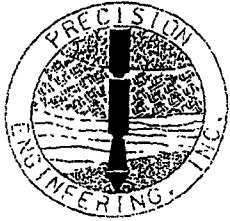
Bottom: Cop Used? ----- Yes

543-19

05-078 Page: 1 10/07/2017

0-038

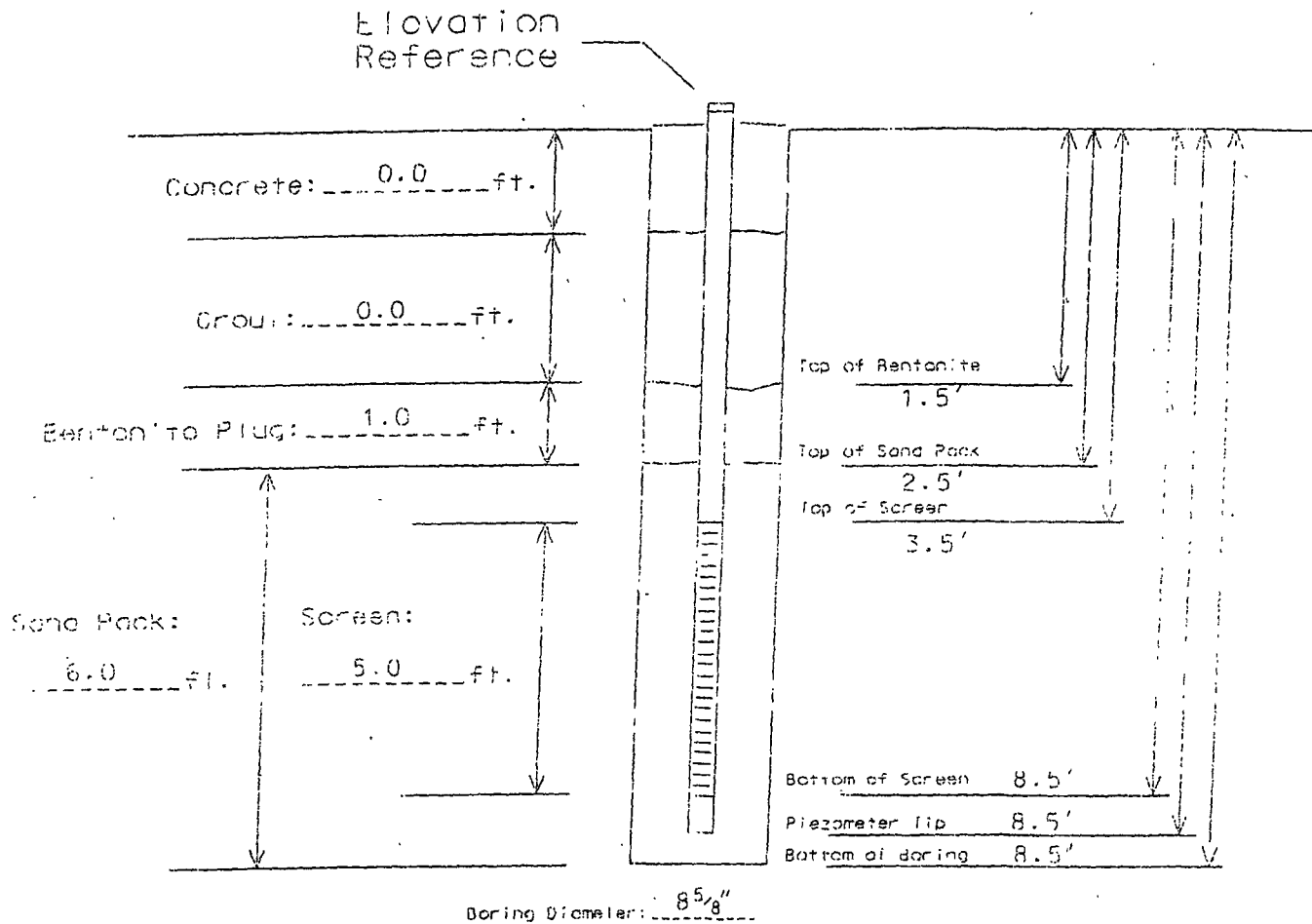
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905-523-7674

Installation Diagram

Monitoring Well No. TP 10



Gravel Type: 10-20 Silica

Ballards Type/Size: NA

Bentonite: 1/2" chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" slot

Casing Type/Size: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? YES

Site Number: 185

Bottom Cap Used? YES

Site Number: 185

Object #: 05-038

Project Name: Bloomfield Refinery

Sheet: 2 OF 5
Bore Point: River Terrace
Water Elevation: 4'2"
Boring No.: TP-10

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

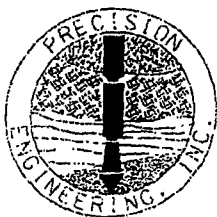
File #: 05-038
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/5/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS.
	0.0-2.0		*—*		Silt, Sandy, Very Fine, Brown, Gravel, Cobbles Moist				
	2.0-8.5		***_*** ***_*** ***_*** ***_*** ***_***	<u>2.5</u>	Sand, Very Fine to Fine, Silty, Brown, Gravel, Cobbles, Damp				
			_ ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_***	<u>5.0</u> <u>7.5</u>	Water				
	8.5			<u>10.0</u> <u>15.0</u> <u>20.0</u>	TD Set 2" Well @ 8.5' 5' of Screen, 5' of Riser Top of Sand 2.5' Top of Bentonite 1.5'				
SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER						LOGGED BY: KMM			

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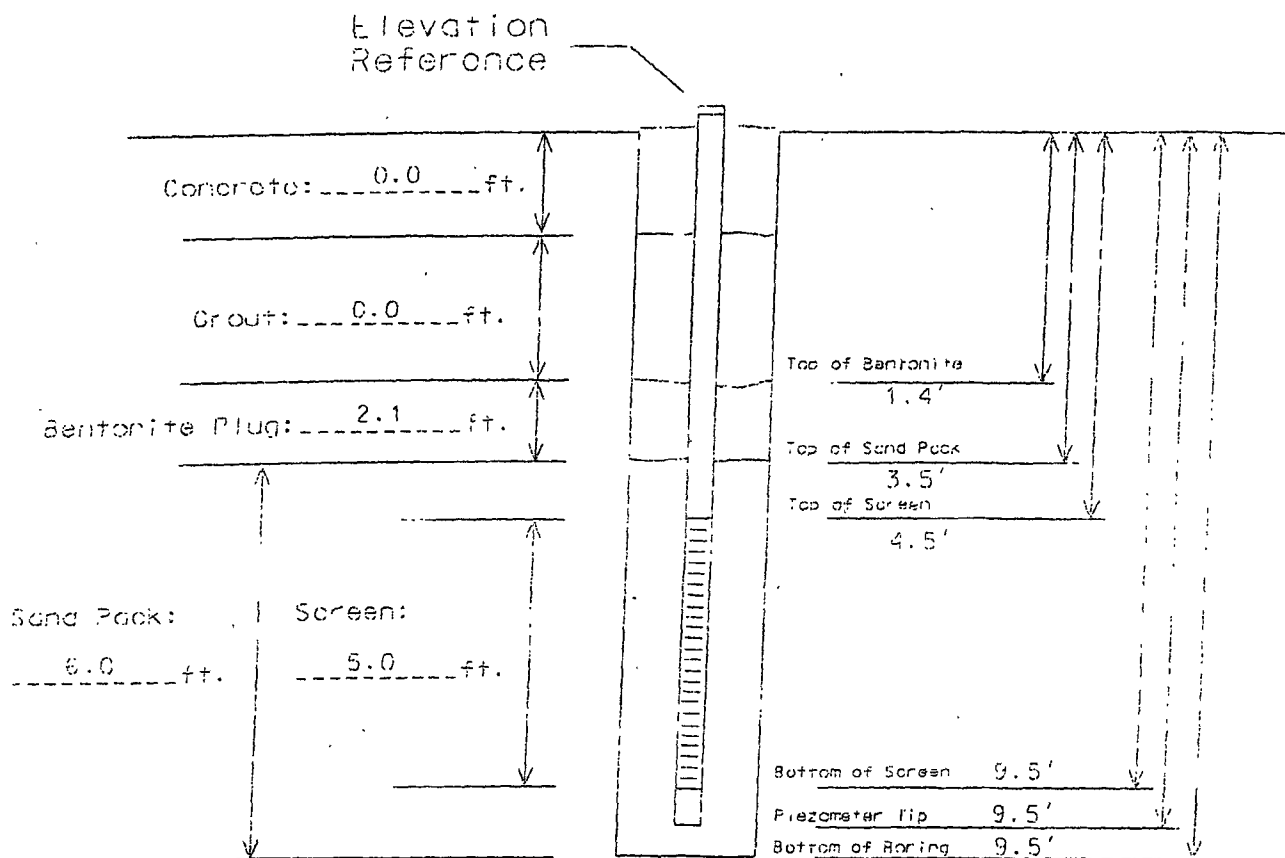
LOGGED BY: KMM



305-523 7674

Installation Diagram

Monitoring Well No. TP 11



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Ballards Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Water/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Corrosive

Locking Expandable Casing Plug? Yes with Non-Flammable Yes

Bottom Cap Used? Yes

Site and Date: 10/15

Other:

Project # 05-038

Project Name: Bloomfield Refinery

Elevation: 95

File #: 05-038
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/5/2005

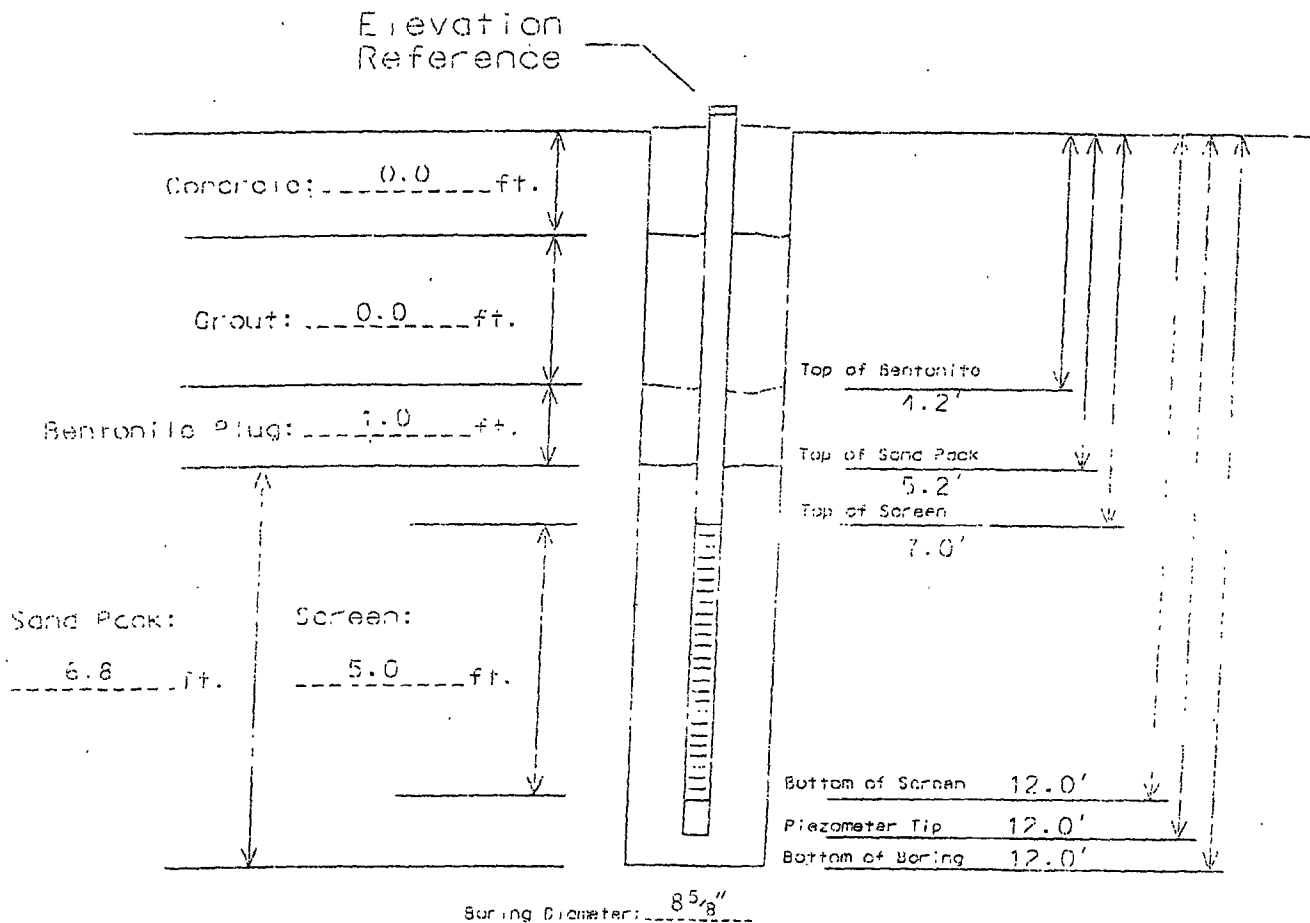
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505-523-7674

Installation Diagram

Monitoring Well No. TP 12



Sand Type: 10-20 Silica

Ballards, type/size: NA

Reinforcement: 3/8" Chips

Screen type/size: 2" PVC Sch. 40, 0.010" Slotted

Location: NA

Screen type/size: 2" PVC Sch. 40

Notes: LOOSE

Locking Expandable Casing Plug: Yes

Site No.: 151

Bottom Cap used: Yes

Site Name: 155

Drawn: NA

Project # 05-038 Project Name: Bloomfield Refinery Date: 7/0

Sheet: 4 OF 5
 Bore Point: RiverTerrace
 Water Elevation: 7.5'
 Boring No.: TP-12

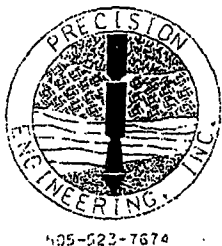
Precision Engineering, Inc.
 P.O. Box 422
 Las Cruces, NM 88004
 505-523-7674

File #: 05-038
 Site: Bloomfield
 Giant Refining
 Elevation: EXISTING
 Date: 4/5/2005

Log of Test Borings

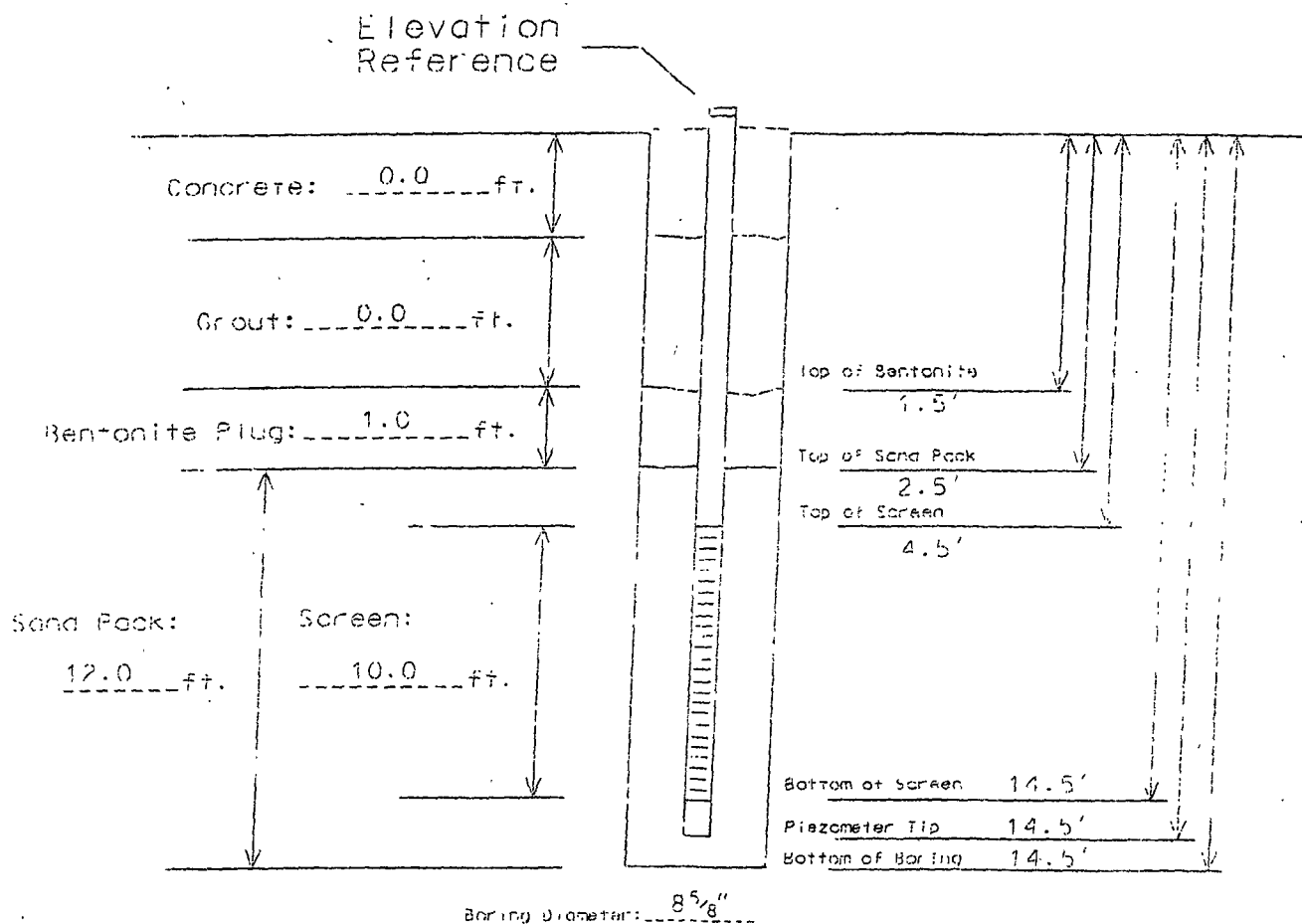
LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS:
	0.0-3.0		***_*** ***_*** ***_*** ***_*** ***_***	2.5	<u>Sand</u> , Very Fine to Fine, Slightly Silty, Brown, Gravel, Cobbles, Moist				
	3.0-4.5		////**// ////**// ////**//		<u>Clay</u> , Sandy, Very Fine, Brown, Some Gravel/ Cobbles, Moist				
	4.5-9.0		***//*** ***//*** ***//*** ***//*** ***//*** ***//*** ***//***	5.0 7.5	<u>Sand</u> , Very Fine to Fine, Clayey, Brown, Moist, Some Gravel				
	9.0-13.0		***** ***** ***** ***** ***** ***** ***** ***** ***** *****	10.0	Water <u>Sand</u> , Fine to Coarse, Tan, Water Bearing				
	13.0			15.0 20.0	TD Set 2" Well @ 12.0' 5' of Screen, 8' of Riser Top of Sand 5'2" Top of Bentonite 4'2"				
SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER						LOGGED BY: KMM			

M:\5127003\River Terrace VCM\River Terrace Work Plan\Work Plan Amendn



Installation Diagram

Monitoring Well No. TP 13



Sand Type: 10-20 Silica

Ballards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Scr. 40, 0.010" Slotted

Grout/Grout: NA

Riser Type/Size: 2" PVC Scr. 40

Marker: Barcode

Locking Expansion Boring Plug? Yes

Site North: AS

Bottom Cap Used? Yes

Site East: CS

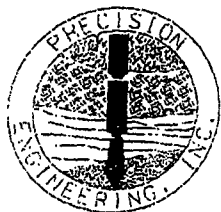
Grout: NA

Project #: 05-035

Project Name: Boonfield Refinery

File #: 100

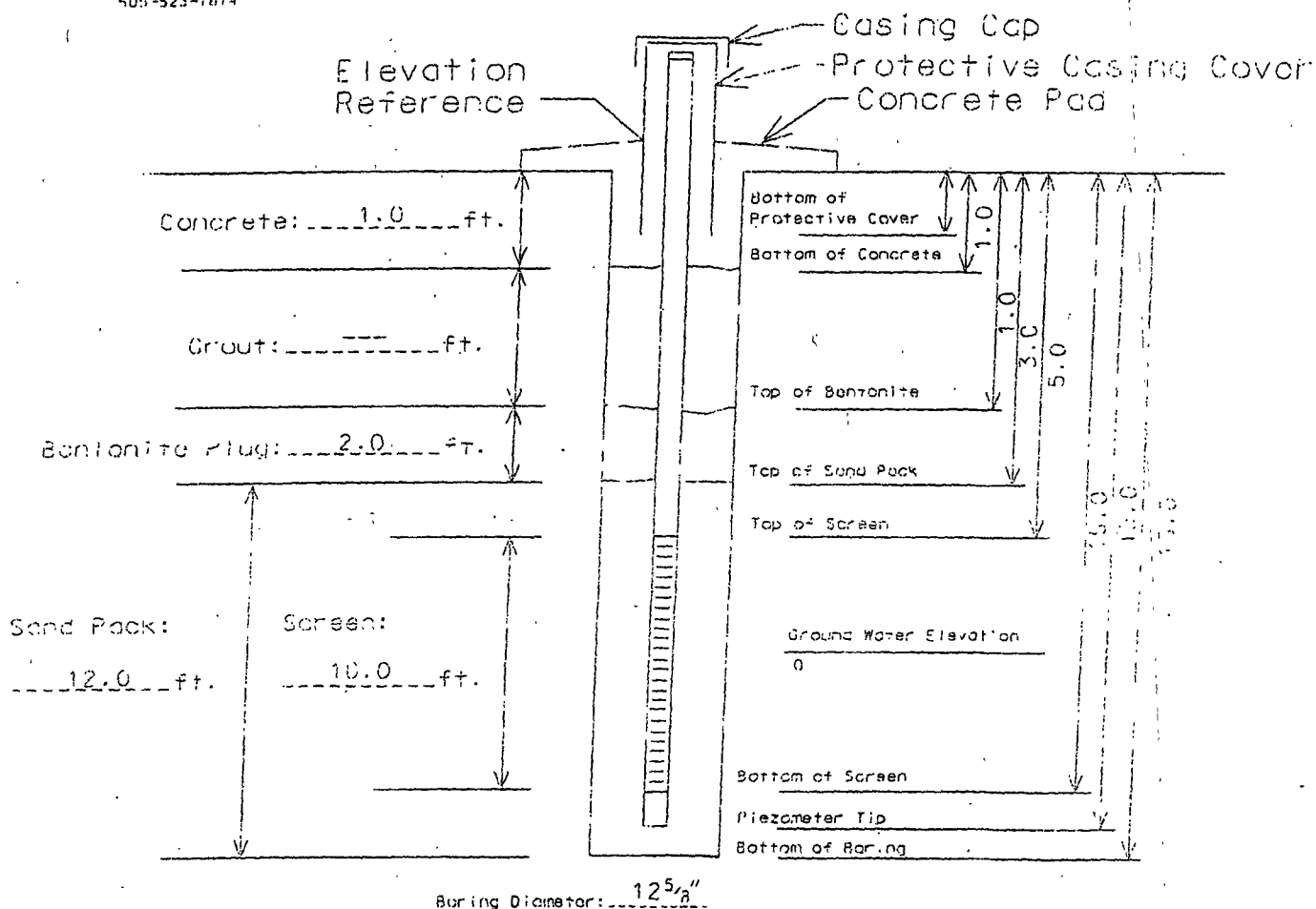
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405-523-7674

Installation Diagram

Monitoring Well No. MW 48



Boring Diameter: 12 5/8"

Sand Type: 8-12 Silica

Ballistics Type/Size: Steel, 3"

Bentonite: 3/8" Chips

Screen Type/Size: 4" PVC Sch. 40, 0.020" Slotted

Grout/Grout

Riser Type/Size: 4" PVC Sch. 40

Water: 24-00-0

Locking Expandable Casing Plug? Yes

Site North ing: 6404.65

Other: N/A

Bottom Cap Used? Yes

Site Easting: 2700.70

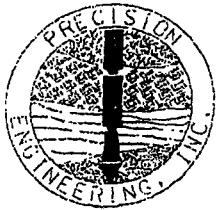
Client: Giant Refining Co.

Project No: 93-42

Project Name: Bloomfield Wells

Elevation: not surveyed

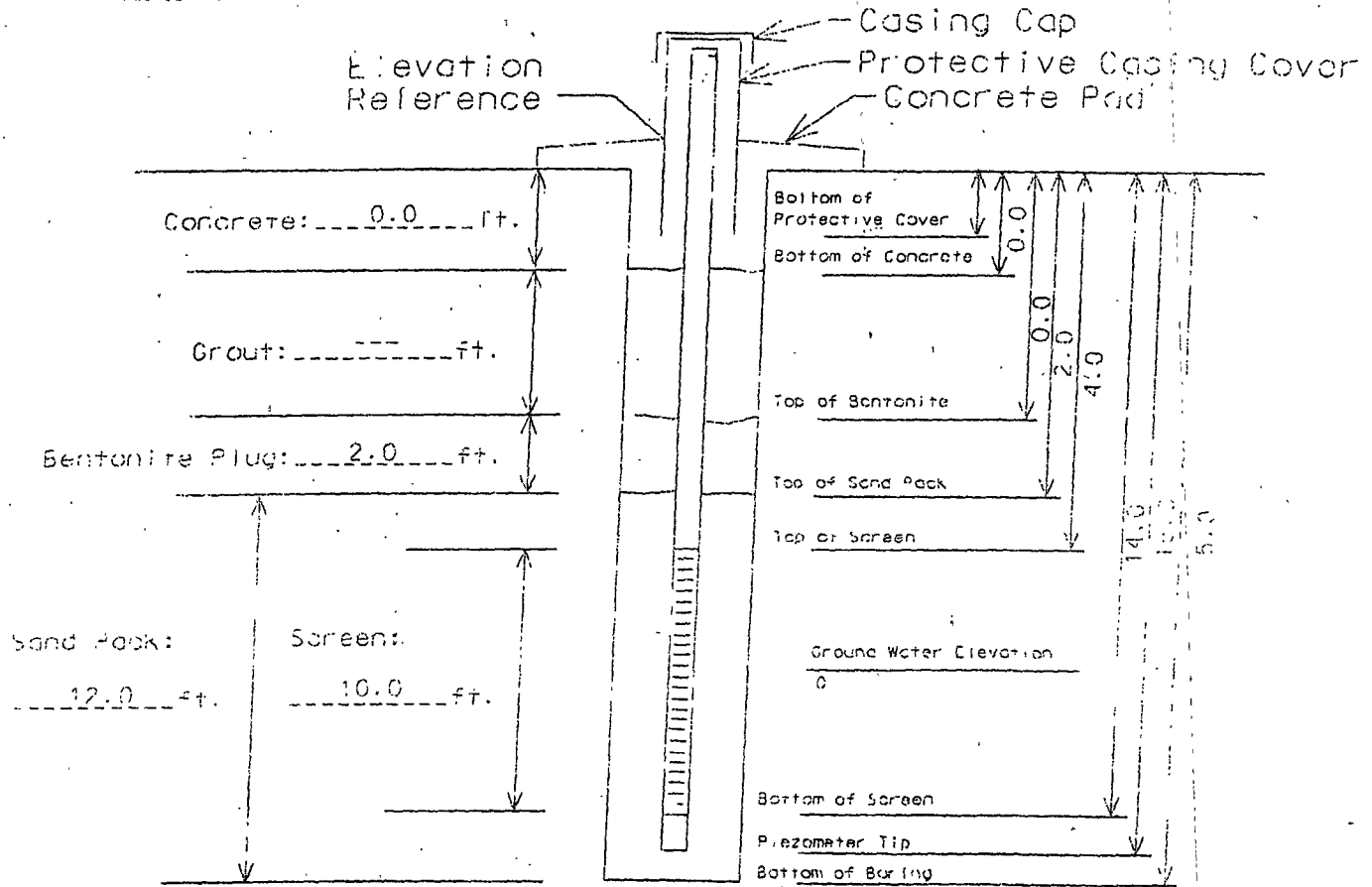
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505-523-7674

Installation Diagram

Monitoring Well No. MW-19



Boring Diameter: 12⁵/₈"

Sand Type: 8-12 Silica

Ballards, type/size: Steel, 3"

Bentonite: 3/8" Chips

Screen Type/Size: 4" PVC Sch. 40, 0.020" Slotted

Other Material: None

Riser Type/Size: 4" PVC Sch. 40

Other: None

Locking Expandable Casing Plug? YES

Site Northings: 0 111 15

Other: N/A

Bottom Cap Used? Yes

Site Eastings: 16 11 14

Client Refining Co.

Project Name: Bloomfield Wells

Elevation: Not Surveyed

File #: 03-122
Site: Bloomfield
Giant Refining
Elevation: Not Surveyed
Date: 10/28/2004

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**MALCOLM
PIRNIE****GIANT**
INDUSTRIES, INC.**Boring Log and Construction for Dewatering Well DW-1**

(Page 1 of 1)

Giant Refining Company
Bloomfield Refinery
Well Installation
Bloomfield, New Mexico

Project No. 5127-003

Start Date : Aug. 16, 2005
Finish Date : Aug. 16, 2005
Location : Bloomfield Refinery
Logged By : Brian Sperrazza
Drilling Subcontractor : EnvirotechDrill Rig : Hollow Stem Auger
Driller, Helpers : Kelly, Kimo
Sampling Method : Split-Spoon
Northing : NA
Easting : NA

Depth in Feet	USCS	Graphic	Lithologic Description of Soil	Size Distribution of Soils			Blows per 6"	Recovery (in.)	Well Name: DW-1 Borehole Diameter: 12 inch
				% Gravel	% Sand	% Fines			
0			NOTE: Lithologic Description from Boring #2.						6" Water Tight Well Cap ~2-ft stickup
1									Clean Backfill
2			Poorly Graded Sandy SILT, brown, fine sand, non-plastic fines, trace of fine gravel, moist/damp.	T	30	70	1	12	Bentonite
3	ML								6" PVC Casing Sch. 40
4									
5									Approx. Depth to Water 4.4 ft bgs
6			Black staining starts.						Top of Screen 5 ft bgs
7			Poorly Graded SILTY SAND, gray/black, fine sand, non-plastic fines, trace of fine gravel.	T	70	30	3 1 1	12	
8	SM								Filter Pack 8-12 Silica Sand
9									
10									
11									
12			Clayey SILT, gray, low plasticity fines, fine to coarse sand, fine gravel.	S	20	75	1	9	6" PVC Screen 0.04-slot
13	ML								
14									Bottom of Screen 14 ft bgs

**MALCOLM
PIRNIE****GIANT**
INDUSTRIES, INC.**Boring Log and Construction for Dewatering Well DW-2**

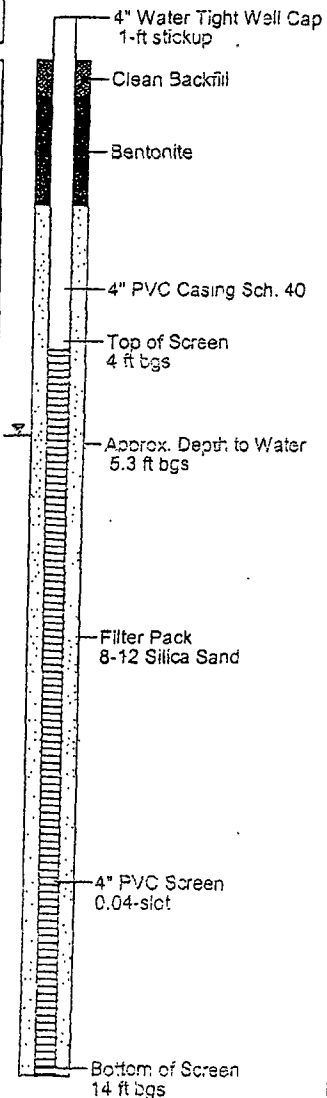
(Page 1 of 1)

Giant Refining Company
Bloomfield Refinery
Well Installation
Bloomfield, New Mexico

Project No. 5127-003

Start Date : Aug. 18, 2005
Finish Date : Aug. 18, 2005
Location : Bloomfield Refinery
Logged By : Brian Sperrazza
Drilling Subcontractor : EnvirotechDrill Rig : Hollow Stem Auger
Driller, Helpers : Kelly, Kimo
Sampling Method : Split-Spoon
Northing : NA
Easting : NA

Depth in Feet	USCS	Graphic	Lithologic Description of Soil	Size Distribution of Soils			Blows per 6"	Recovery (in.)
				% Gravel	% Sand	% Fines		
0								
1								
2	ML		SILT, brown, non-plastic fines, fine sand, fine gravel. Clay 2" thick.	5	35	60	1	10
3							2	
4							2	
5	SM		Poorly Graded SILTY SAND, black, med. sand, non-plastic fines. Clay 3" thick.	5	70	25	1	12
6							2	
7							5	
8	SP-SM		POORLY GRADED SAND WITH SILT, coarse sand, fine gravel, non-plastic fines.	10	75	15		
9								
10								
11	SW		WELL GRADED Gravelly SAND, black, fine to med. gravel, fine to coarse sand, non-plastic fines.	25	70	5	10	24
12							17	
13							23	
14								
15								
16								

Well Name: DW-2
Borehole Diameter: 12 inch



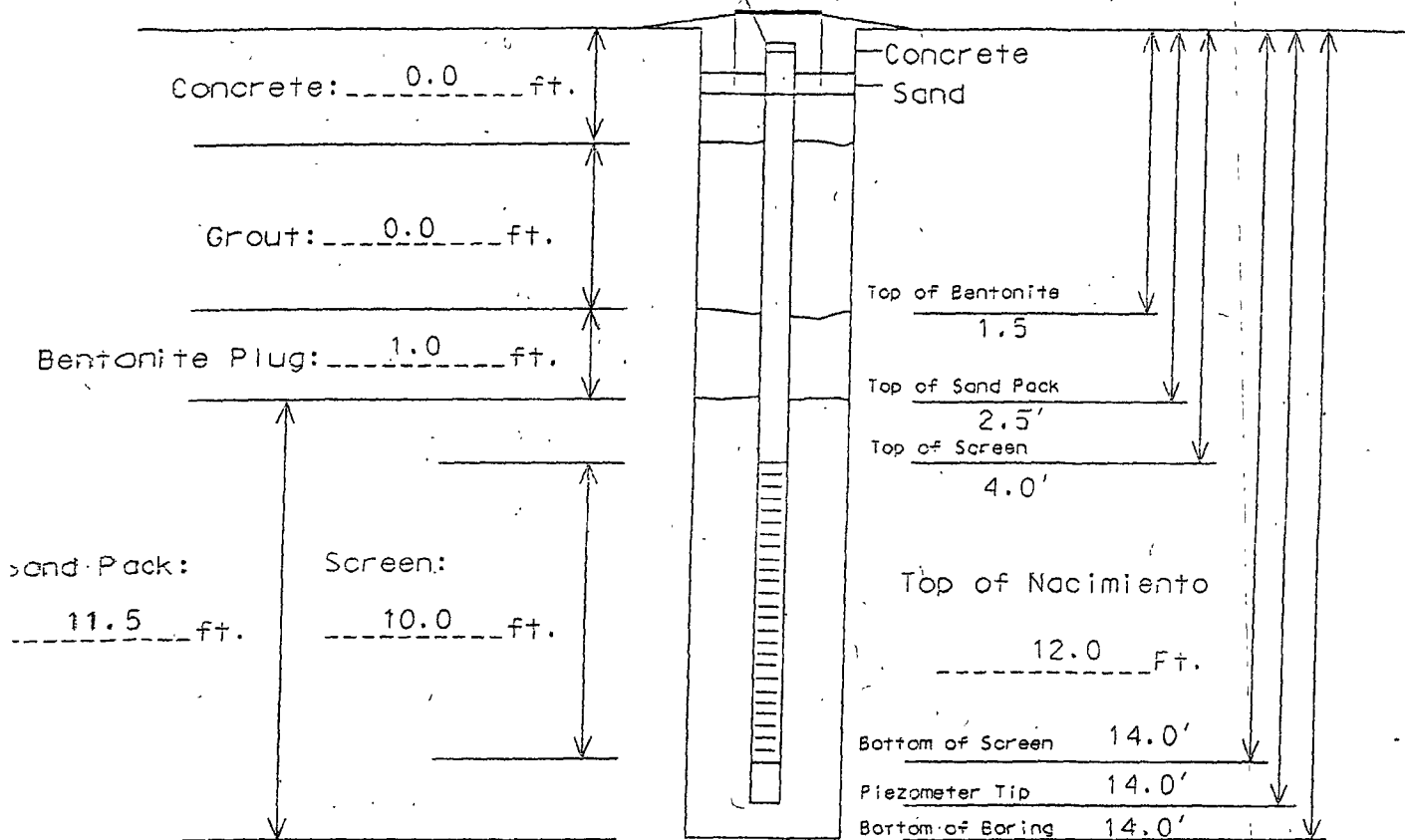
505523-7674

Installation Diagram

Monitoring Well No. CW 0+60

Elevation
Reference

Steel Vault - Flush Mount



Boring Diameter: 13"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other:

Project #: 05-038

Project Name: Bloomfield Refinery

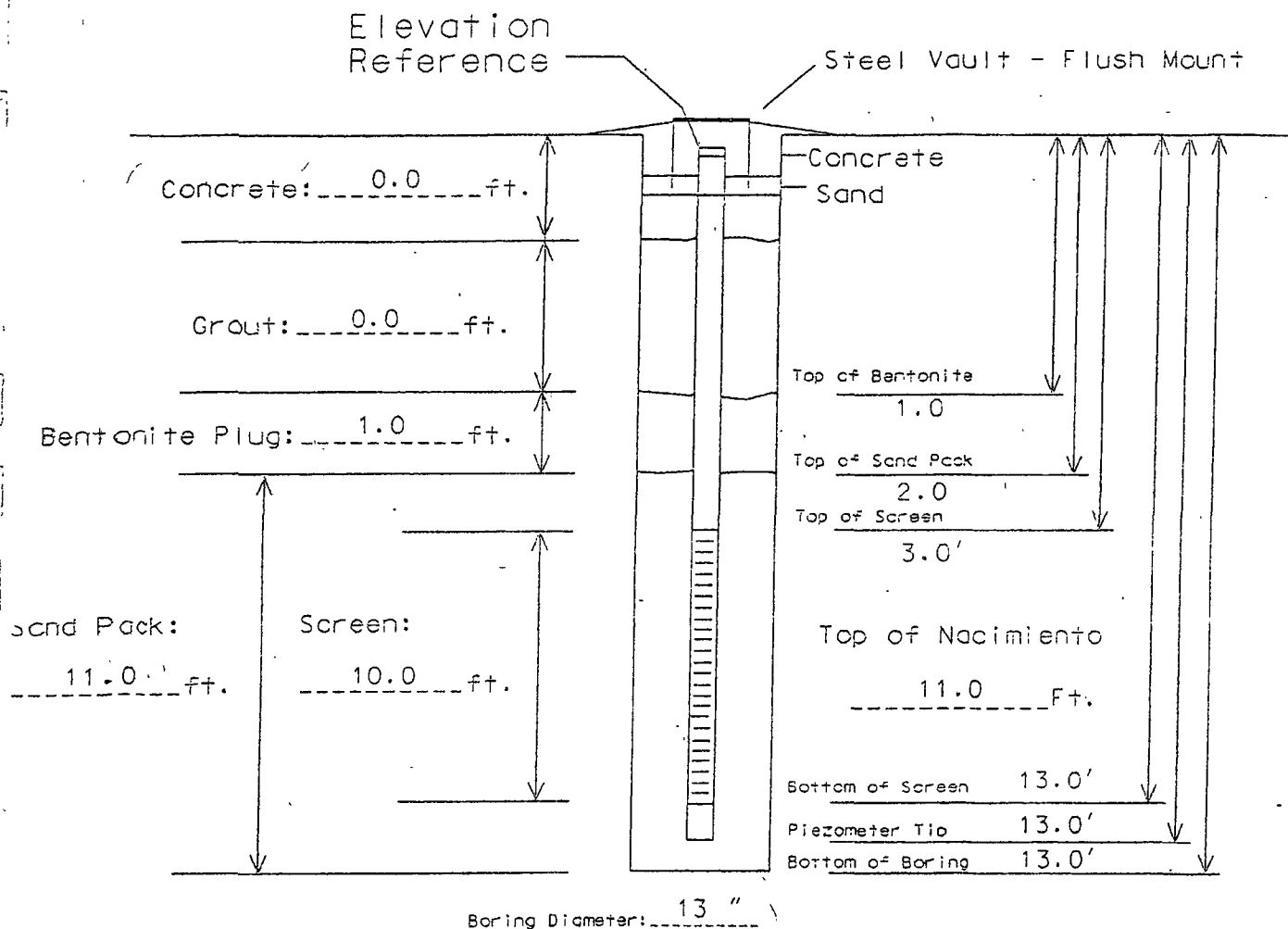
Elevation: TBS



505-523-7674

Installation Diagram

Monitoring Well No. CW 1+50



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

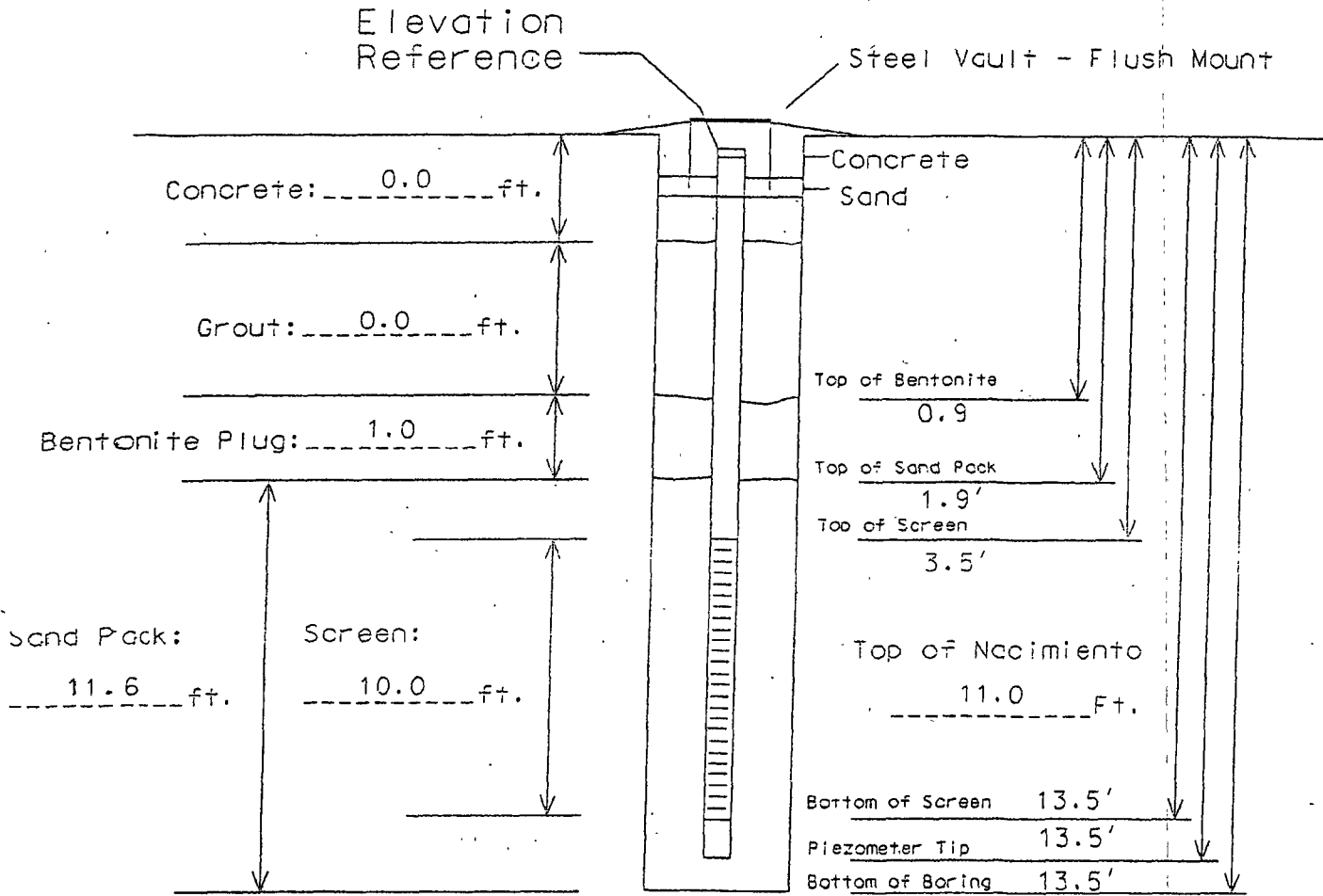
Project Name: Bloomfield Refinery

Elevation: TBS



505523-7674

Installation Diagram

Monitoring Well No. CW 3+85

Boring Diameter: 13 "

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Other: _____

Bottom Cap Used? Yes

Site Easting: TBS

Project #: 05-038

Project Name: Bloomfield Refinery

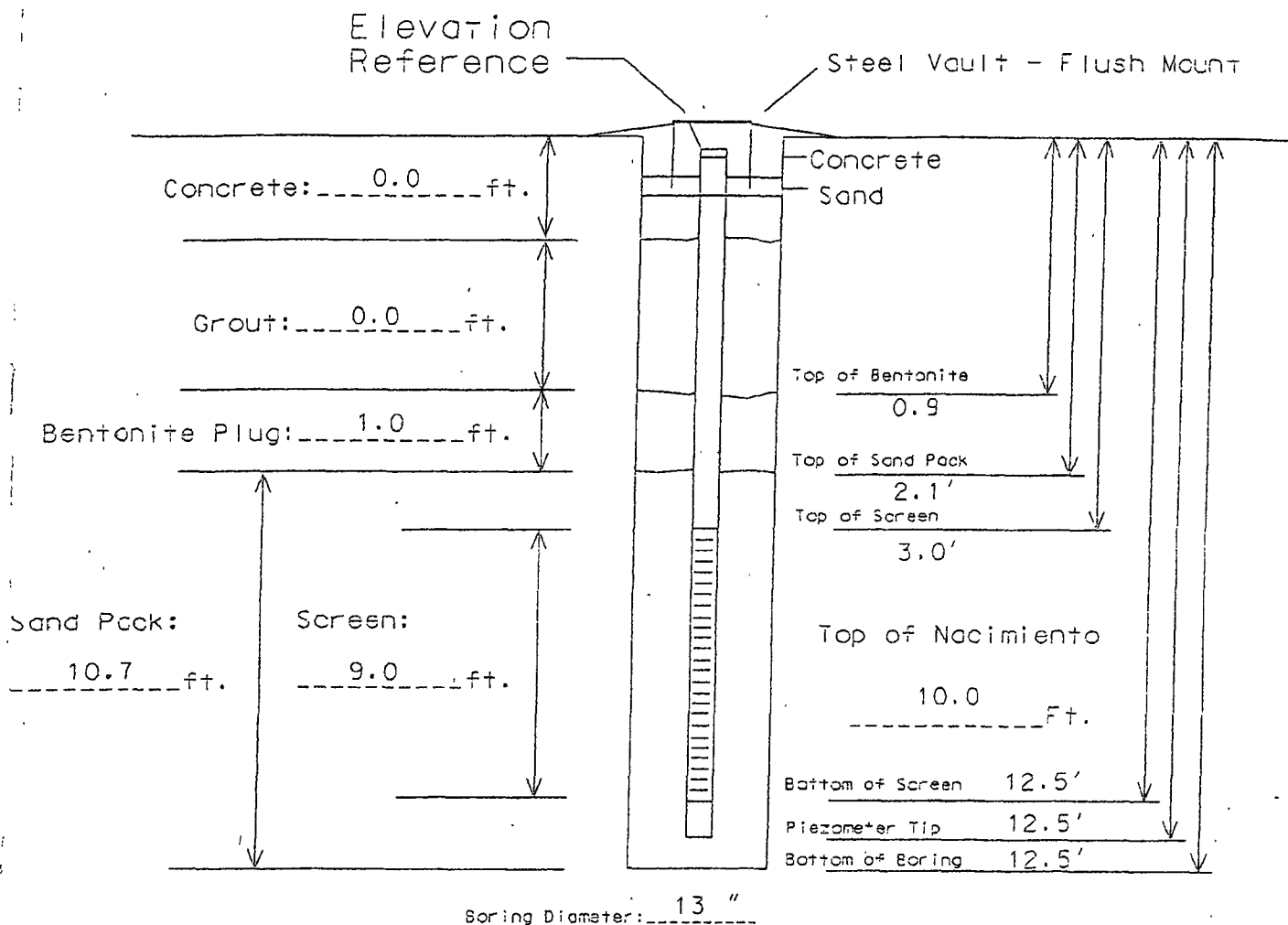
Elevation: TBS



545-523-7674

Installation Diagram

Monitoring Well No. CW 5+50



Sand Type: 10-20 Silica

Ballards, Type/Size: NA

Bentonite: 3/8" chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

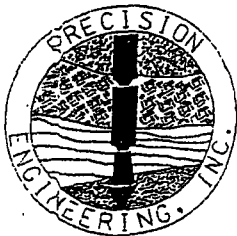
Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

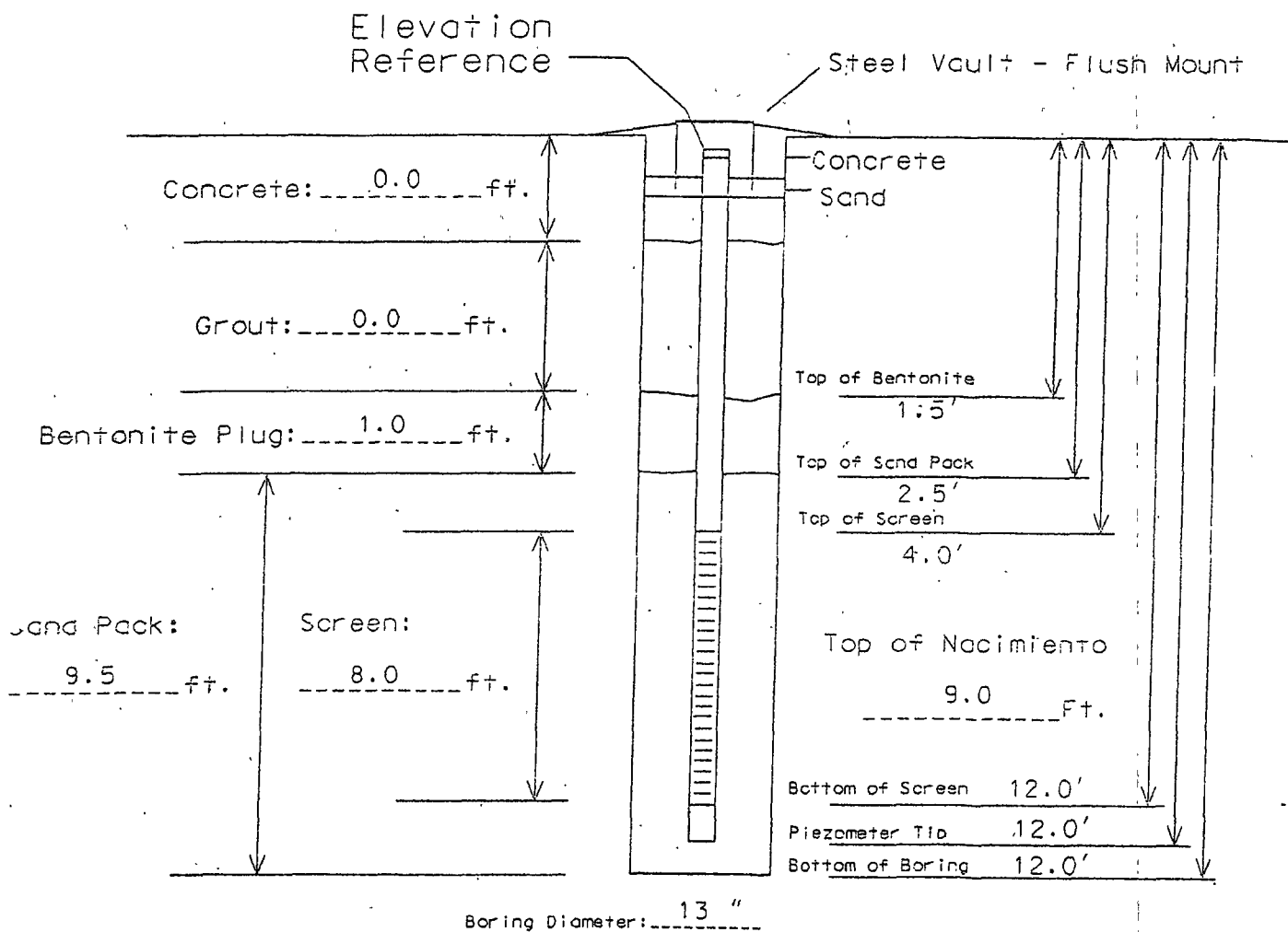
Elevation: TBS



EOS-523-7674

Installation Diagram

Monitoring Well No. CW 6+70



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Other:

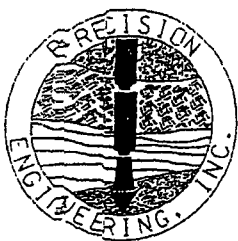
Bottom Cap Used? Yes

Site Easting: TBS

Project #: 05-038

Project Name: Bloomfield Refinery

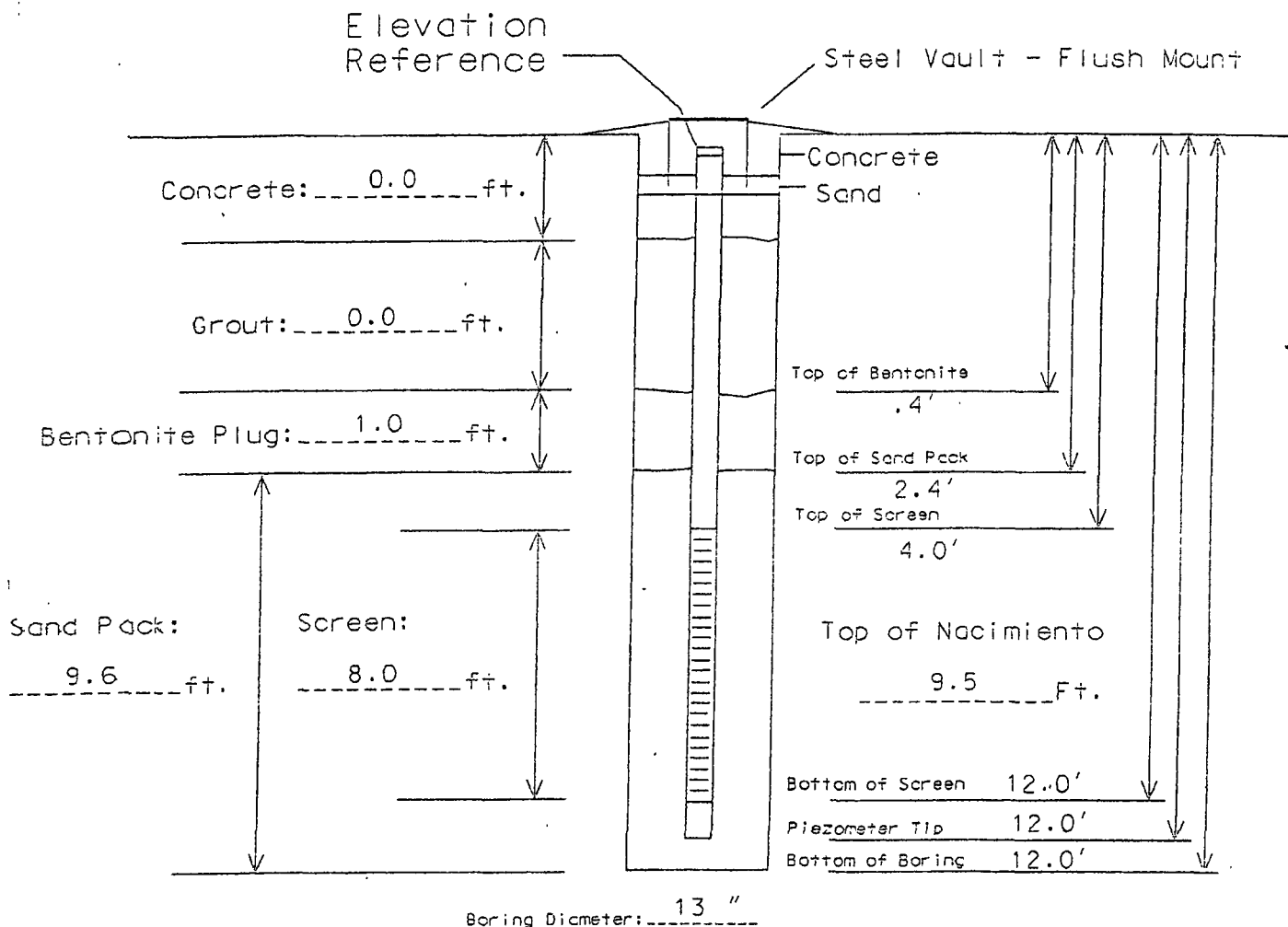
Elevation: TBS



505-23-7674

Installation Diagram

Monitoring Well No. CW 8+10



Sand Type: 10-20 Silica

Bollards. Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Scr. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Scr. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

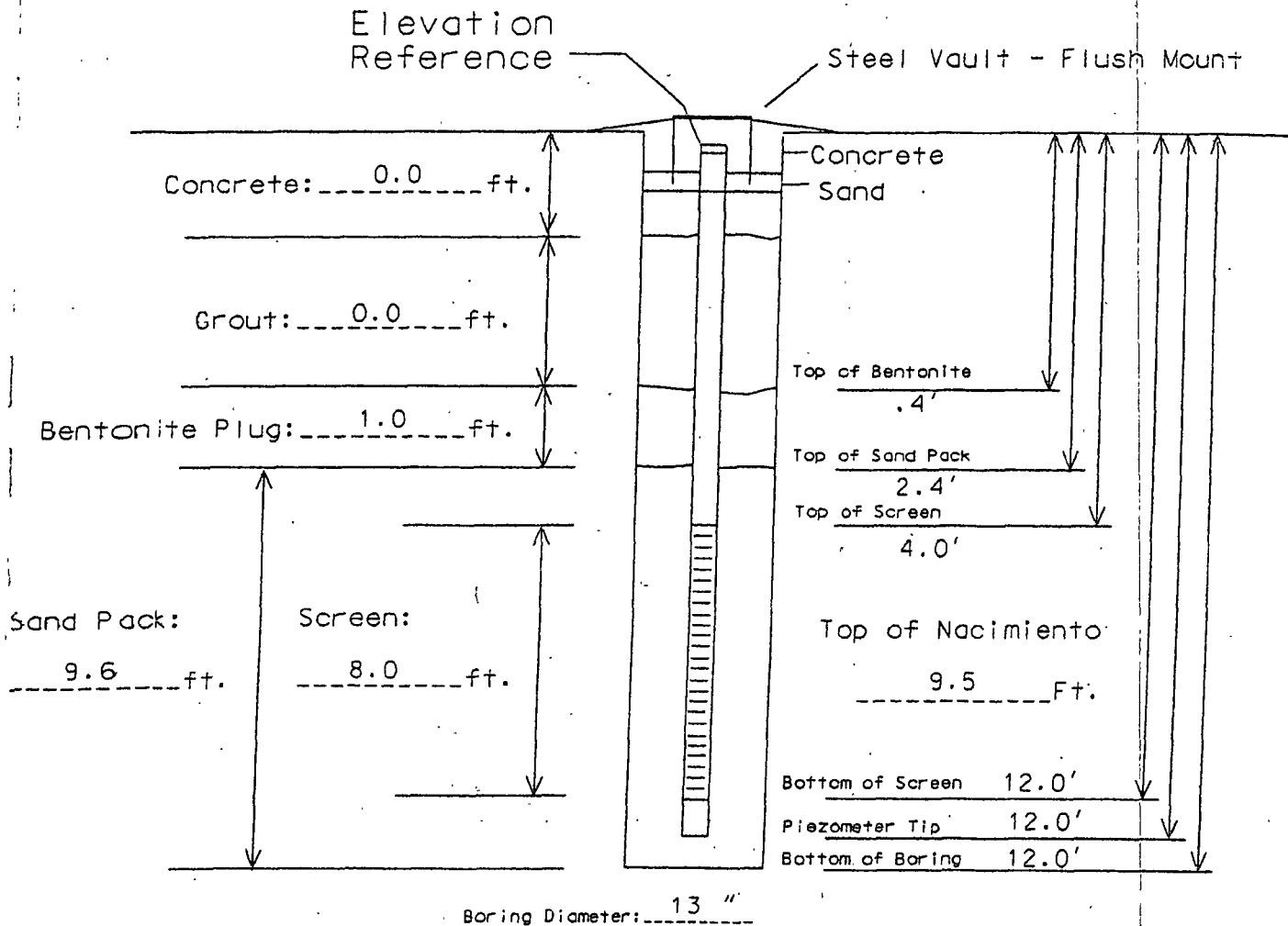
Elevation: TBS



505-23-7674

Installation Diagram

Monitoring Well No. CW 8+10



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

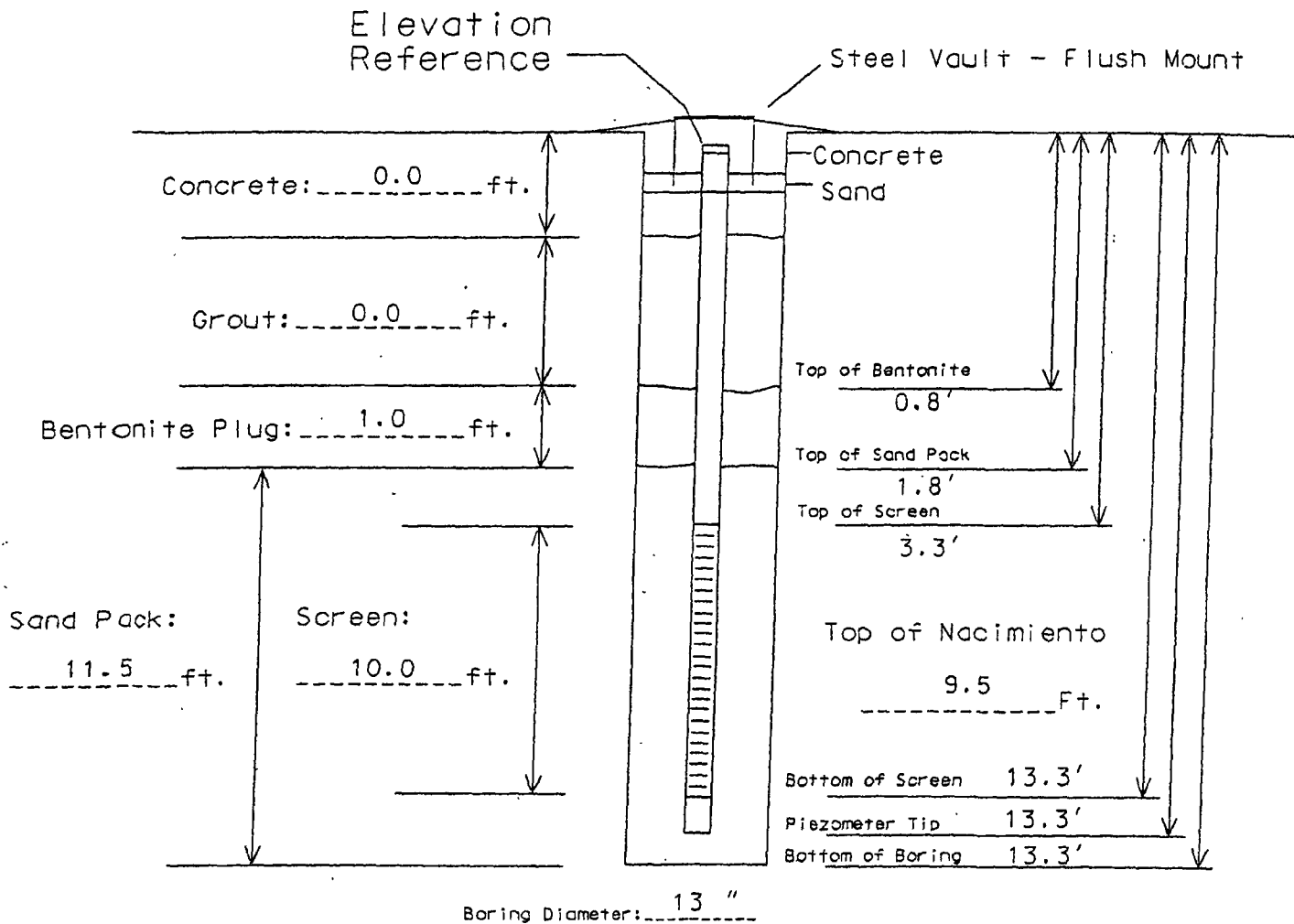
Elevation: TBS



505-523-7674

Installation Diagram

Monitoring Well No. CW 8+45



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

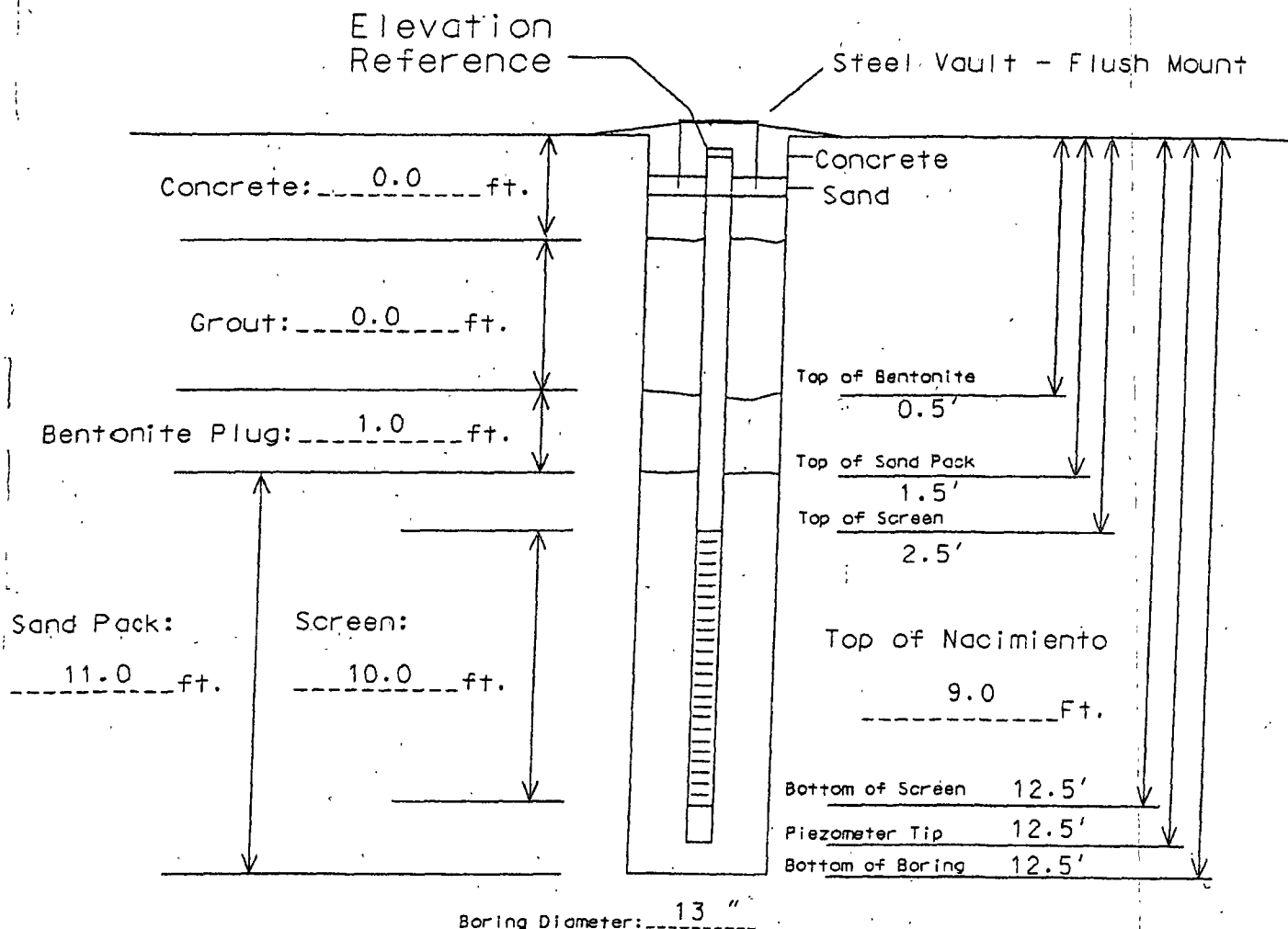
Elevation: TBS



505523-7674

Installation Diagram

Monitoring Well No. CW 11+15.



Sand Type: 10-20 Silica

Ballards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Other: _____

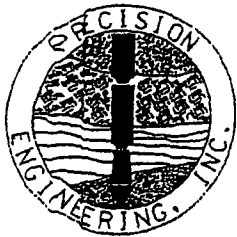
Bottom Cap Used? Yes

Site Easting: TBS

Project #: 05-038

Project Name: Bloomfield Refinery

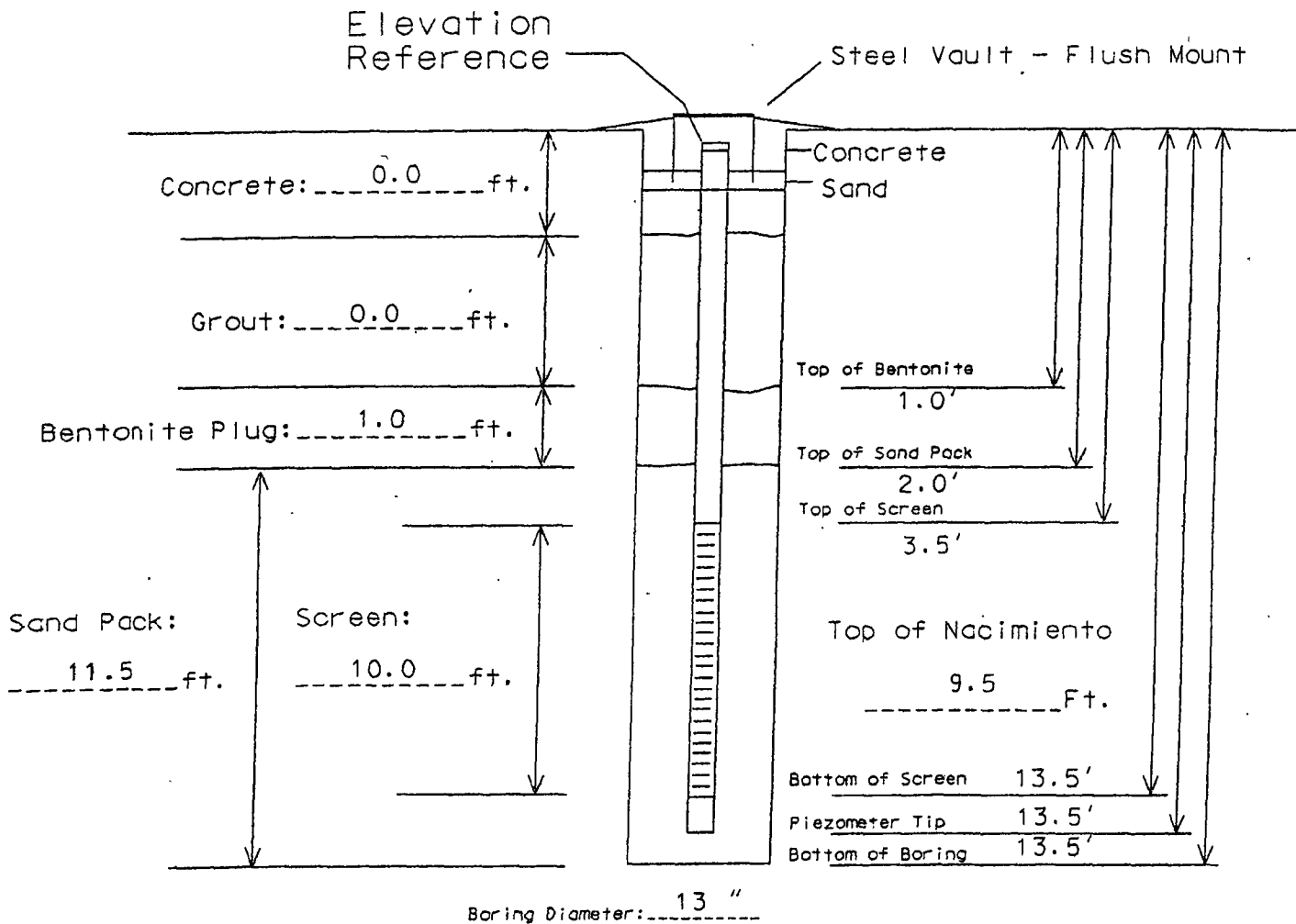
Elevation: TBS



501-523-7674

Installation Diagram

Monitoring Well No. CW 14+10



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

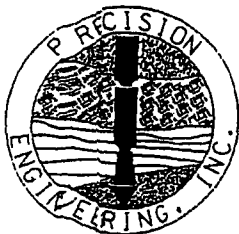
Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

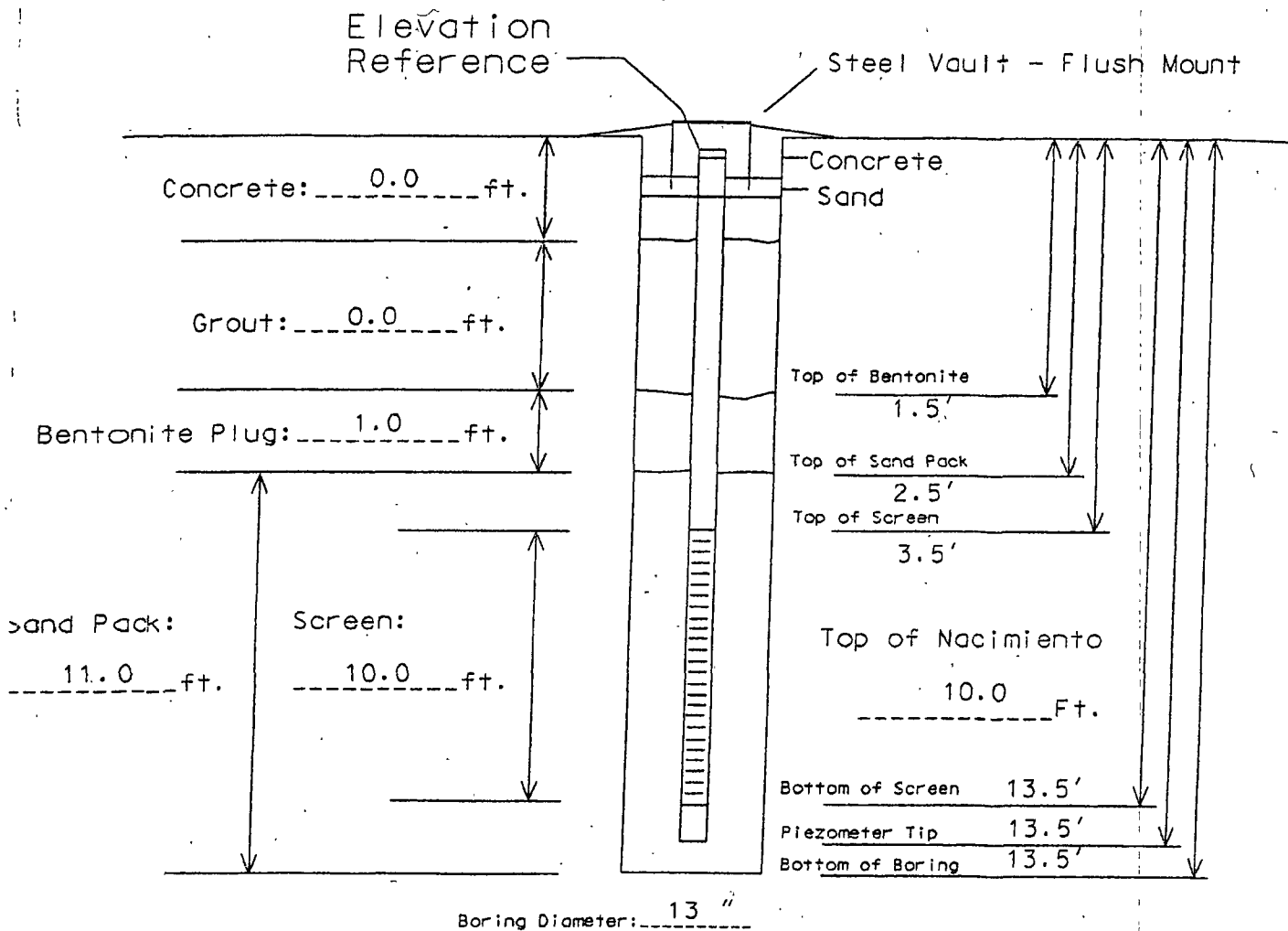
Elevation: TBS



5 05-523-7674

Installation Diagram

Monitoring Well No. CW 16+60



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

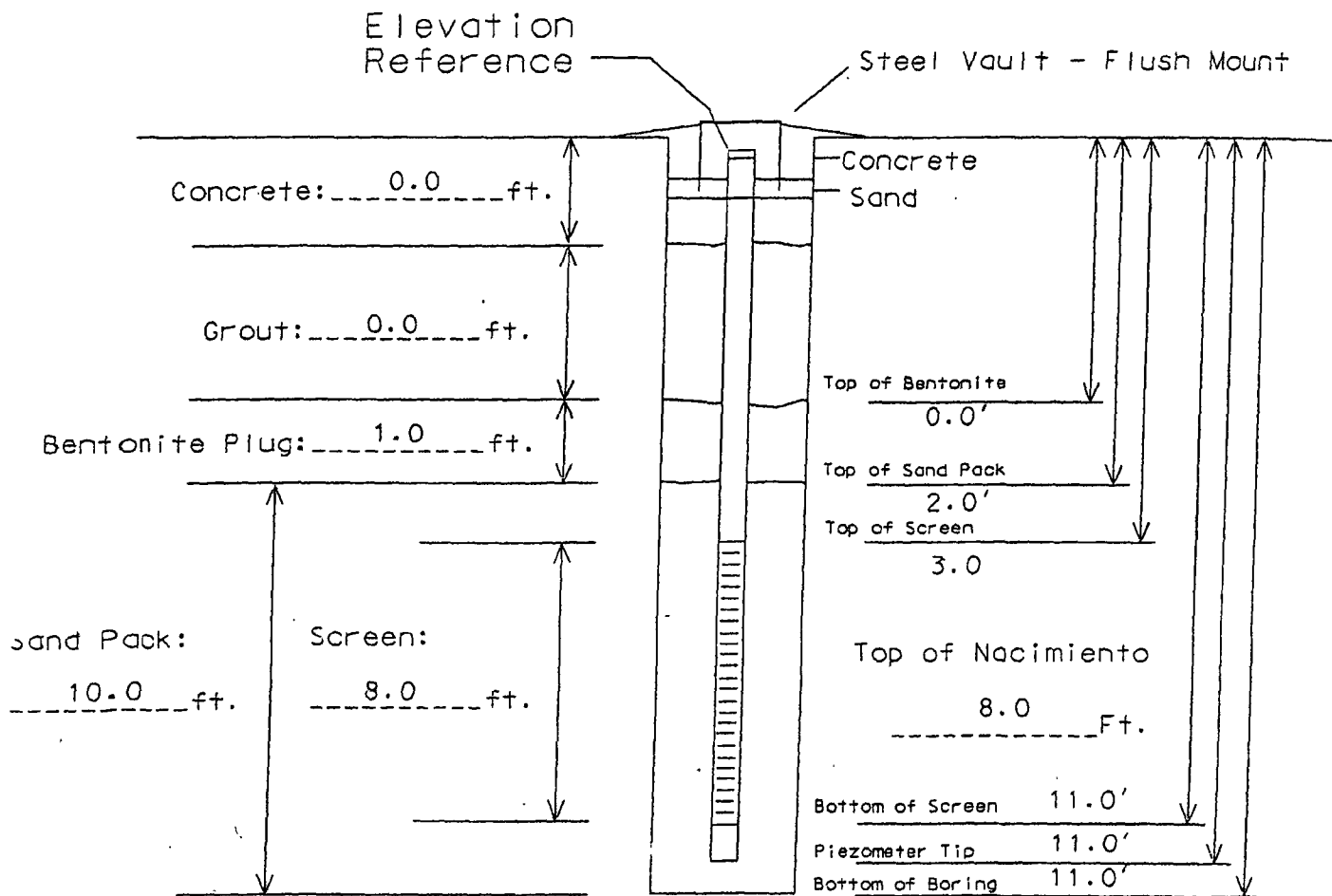
Elevation: TBS



505-523-7674

Installation Diagram

Monitoring Well No. CW 19+50



Boring Diameter: 13"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

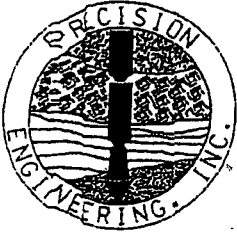
Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

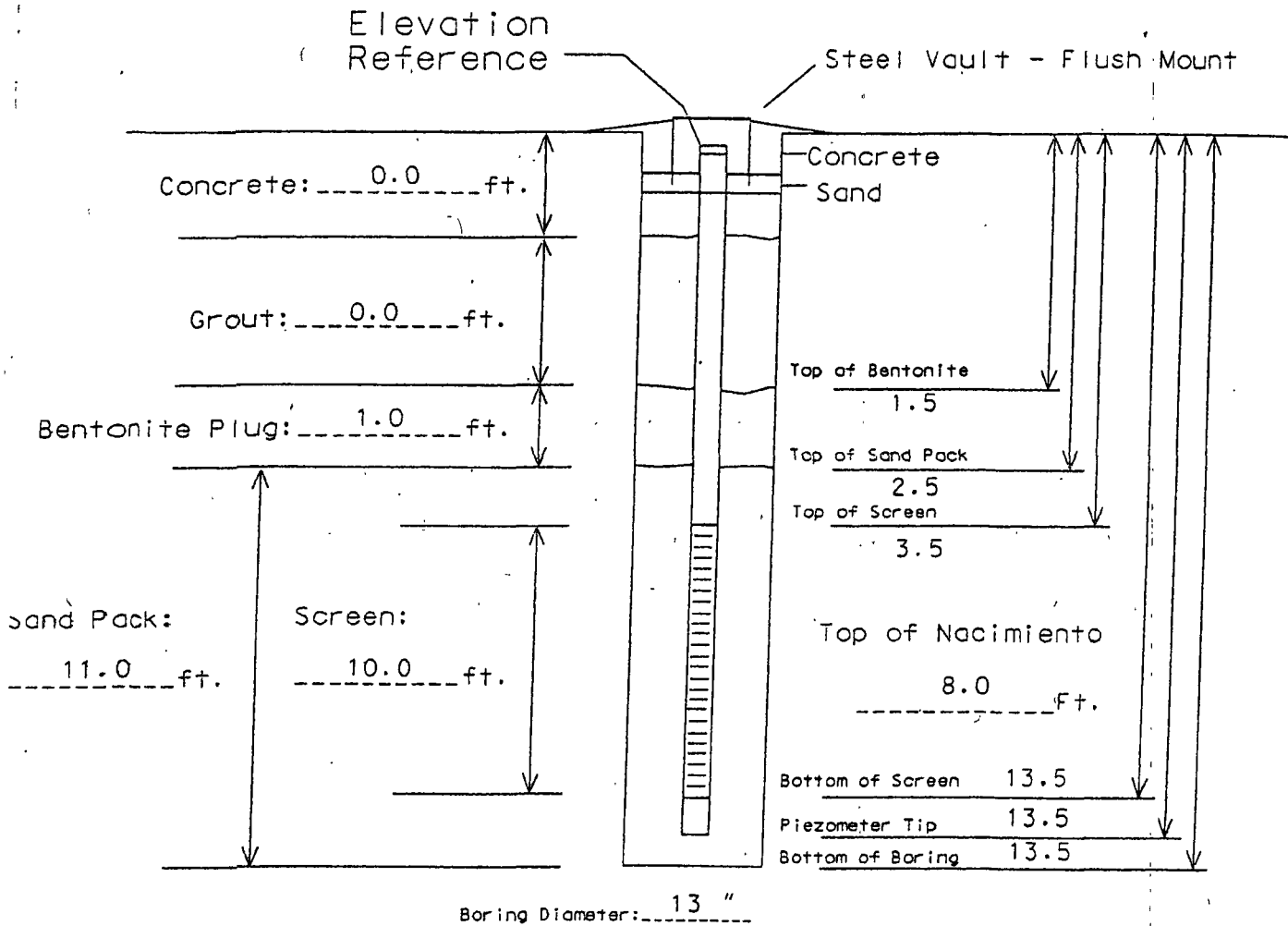
Elevation: TBS



505-523-7674

Installation Diagram

Monitoring Well No. CW 22+00



Sand Type: 10-20 Silica

Bollards. Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

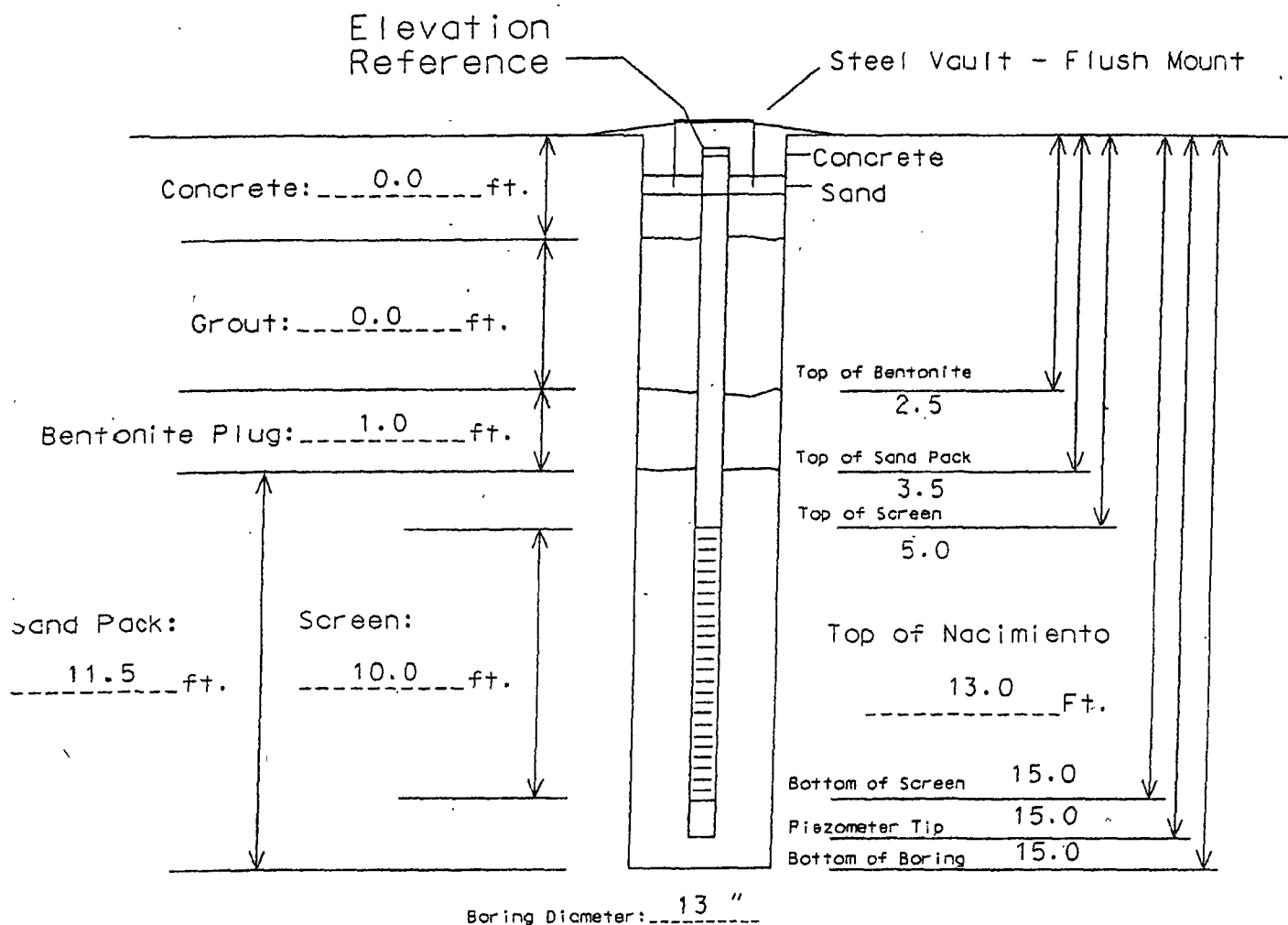
Elevation: TBS



505523-7674

Installation Diagram

Monitoring Well No. CW 23+10



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

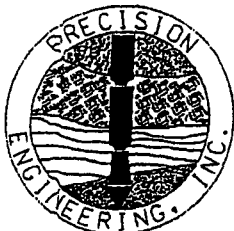
Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

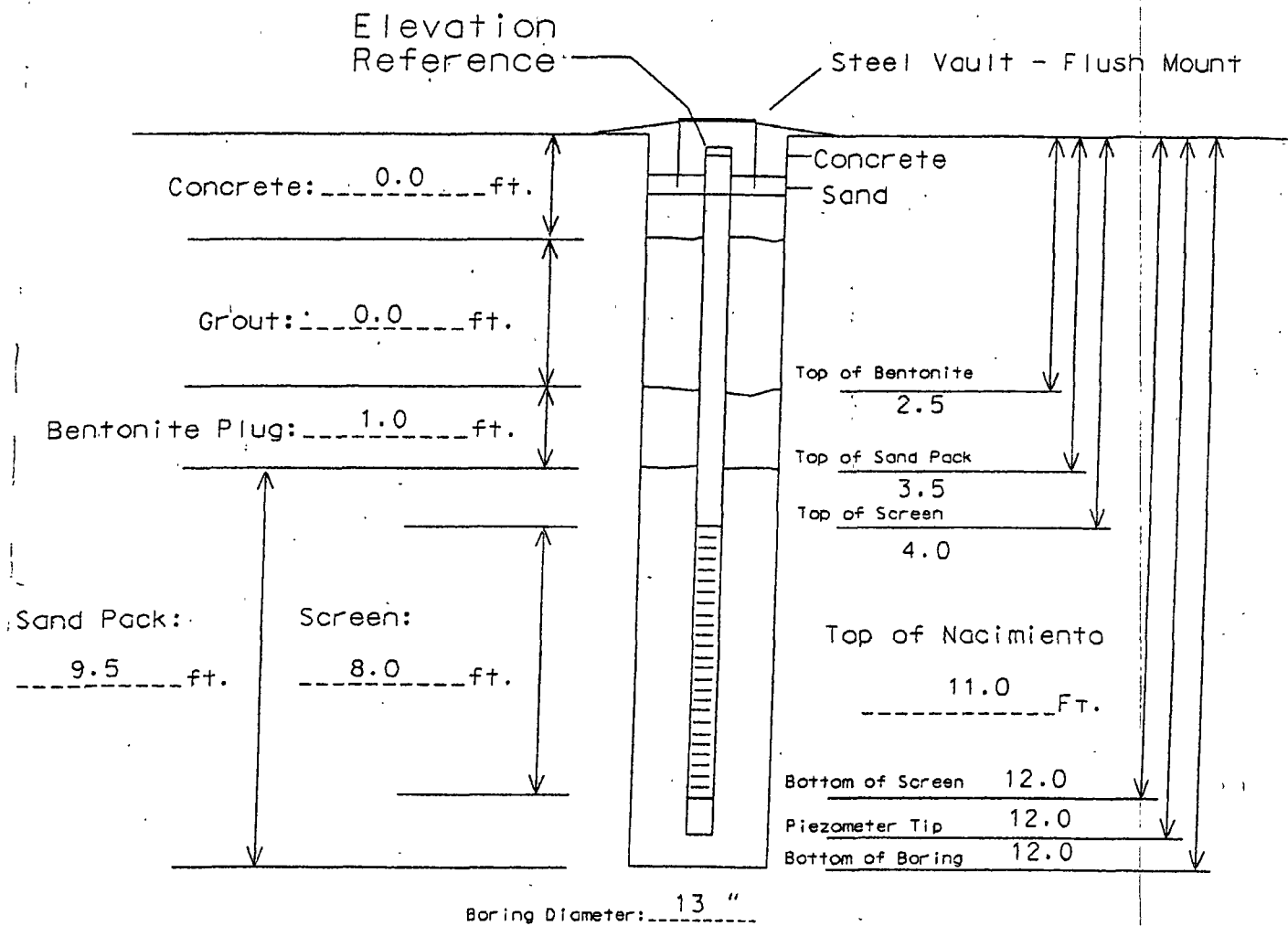
Elevation: TBS



505-523-7674

Installation Diagram

Monitoring Well No. CW 23+90



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

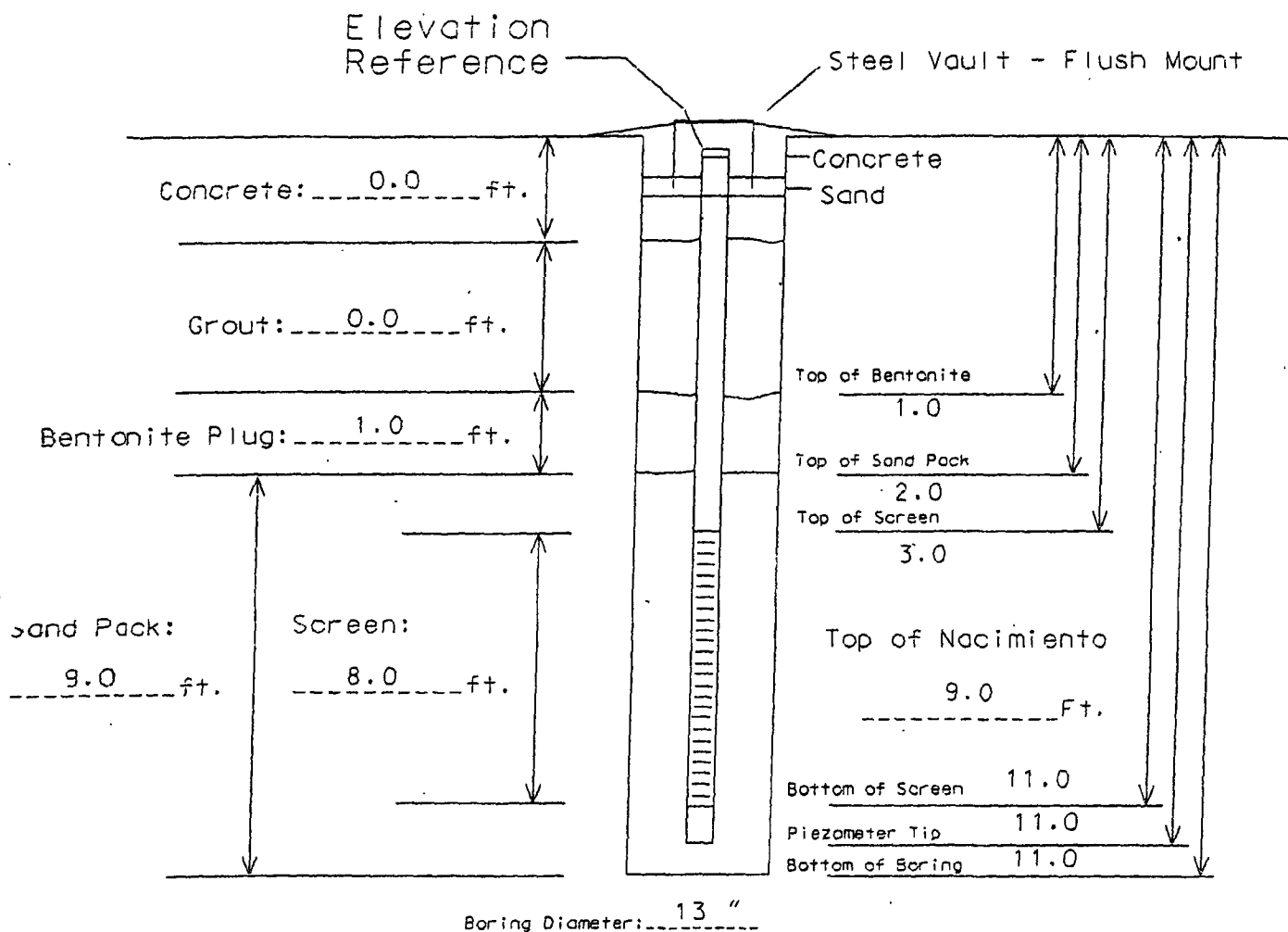
Elevation: TBS



EE-523-7674

Installation Diagram

Monitoring Well No. CW 25+95



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 6" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 6" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other:

Project #: 05-038

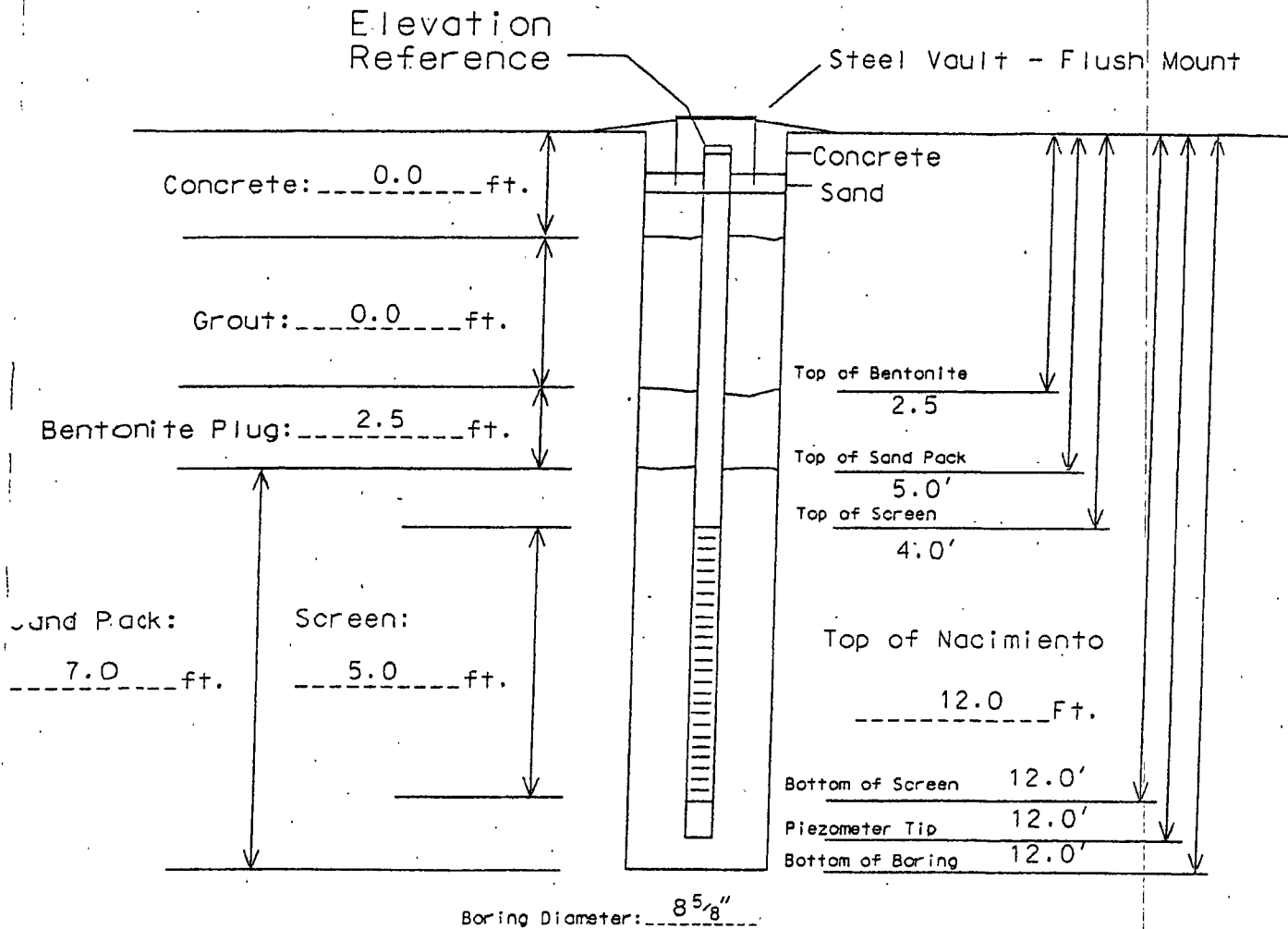
Project Name: Bloomfield Refinery

Elevation: TBS



505523-7674

Installation Diagram

Monitoring Well No. OW 0+60

Sand Type: 10-20 Silica

Bentonite: 3/8" Chips

Cement/Grout: NA

Water: Potable

Other: _____

Project #: 05-038

Bollards, Type/Size: NA

Screen Type/Size: 2" PVC Sch. 40, 0.40" Slotted

Riser Type/Size: 2" PVC Sch. 40

Locking Expandable Casing Plug? Yes

Bottom Cap Used? Yes

Project Name: Bloomfield Refinery

Site Northing: TBS

Site Easting: TBS

Elevation: TBS

File #: 05-038
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/20/2005

Log of Test Borings

[illegible]

LOGGED BY: KMM

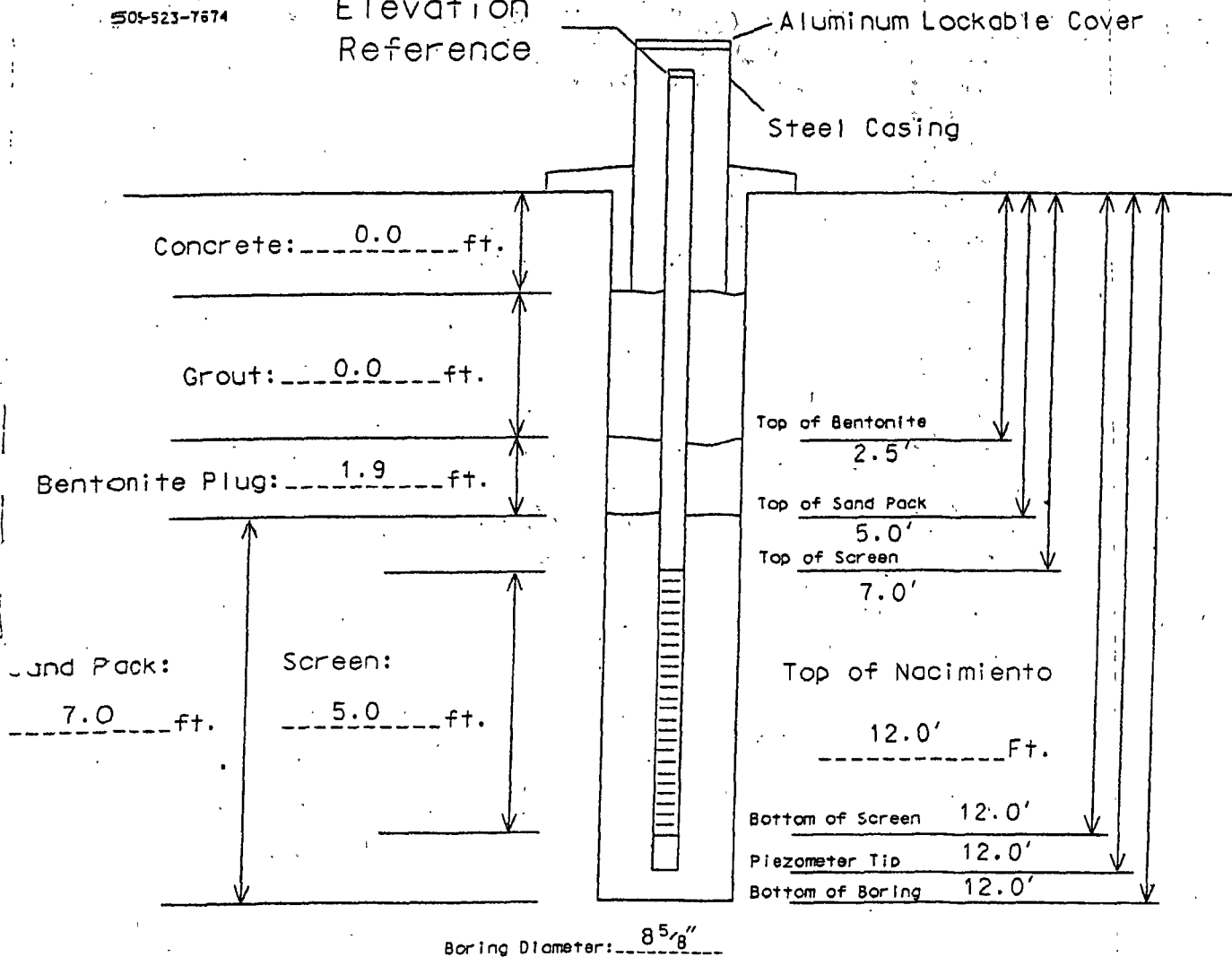


505-523-7674

Installation Diagram

Monitoring Well No. OW 1+50

Elevation
Reference



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Sloomfield Refinery

Elevation: TBS

Sheet: 2 OF 15
Bore Point: See Plan
Water Elevation:
Boring No.: OW 1+50

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

File #: 05-038
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/20/2005

Log of Test Borings

[illegible]

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER

LOGGED BY: WHK

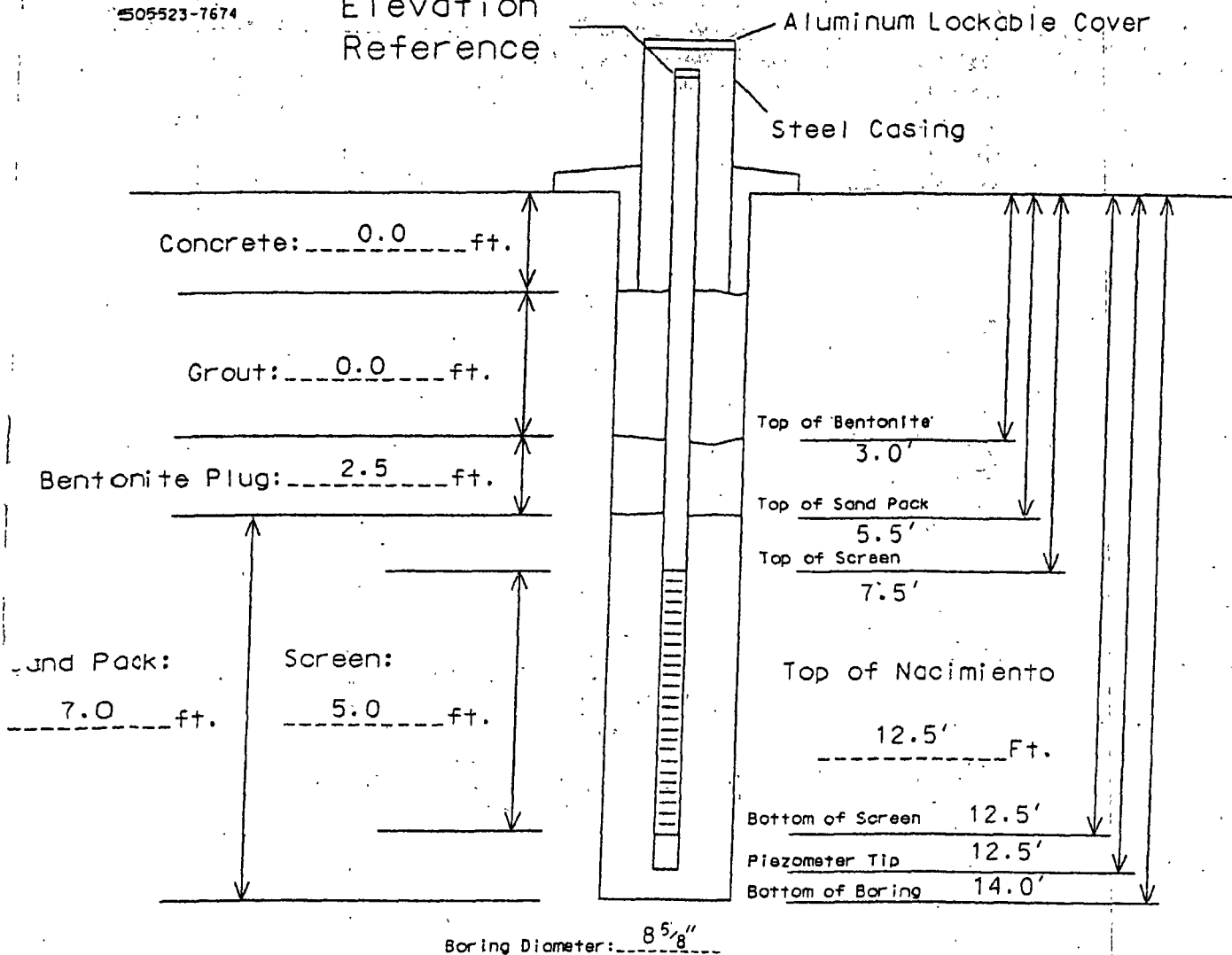


505523-7674

Installation Diagram

Monitoring Well No. OW 3+85

Elevation
Reference



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: C5-038

Project Name: Bloomfield Refinery

Elevation: TBS

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/20/2005

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS.
	0.0-10.5		OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo <u>2.5</u> OoO*Oo OoO*Oo OoO*Oo OoO*Oo <u>5.0</u> OoO*Oo OoO*Oo OoO*Oo OoO*Oo <u>7.5</u> OoO*Oo OoO*Oo OoO*Oo OoO*Oo <u>10.0</u> OoO*Oo		<u>Gravel</u> , cobbles, to boulder size, brown to grey rock, slightly sandy, very dense				
	10.5				Water Level 10.7'				
			***** *****		<u>Sand</u> , medium, silty, grey/black, water bearing dense, moist, moderately dense				
	12.5		***** ===== ===== =====		<u>Nacimiento Formation</u> Sandstone, degraded, weathered, fissile, very, dense, yellow-brown to light brown, damp				
	14.0		=====						
				<u>15.0</u>	TD				
				<u>20.0</u>	Set 2" Well @ 12.5' 5' of Screen, 7' of Riser Top of Sand 7.0' Top of Bentonite 5.5'				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER
LOGGED BY: WHK

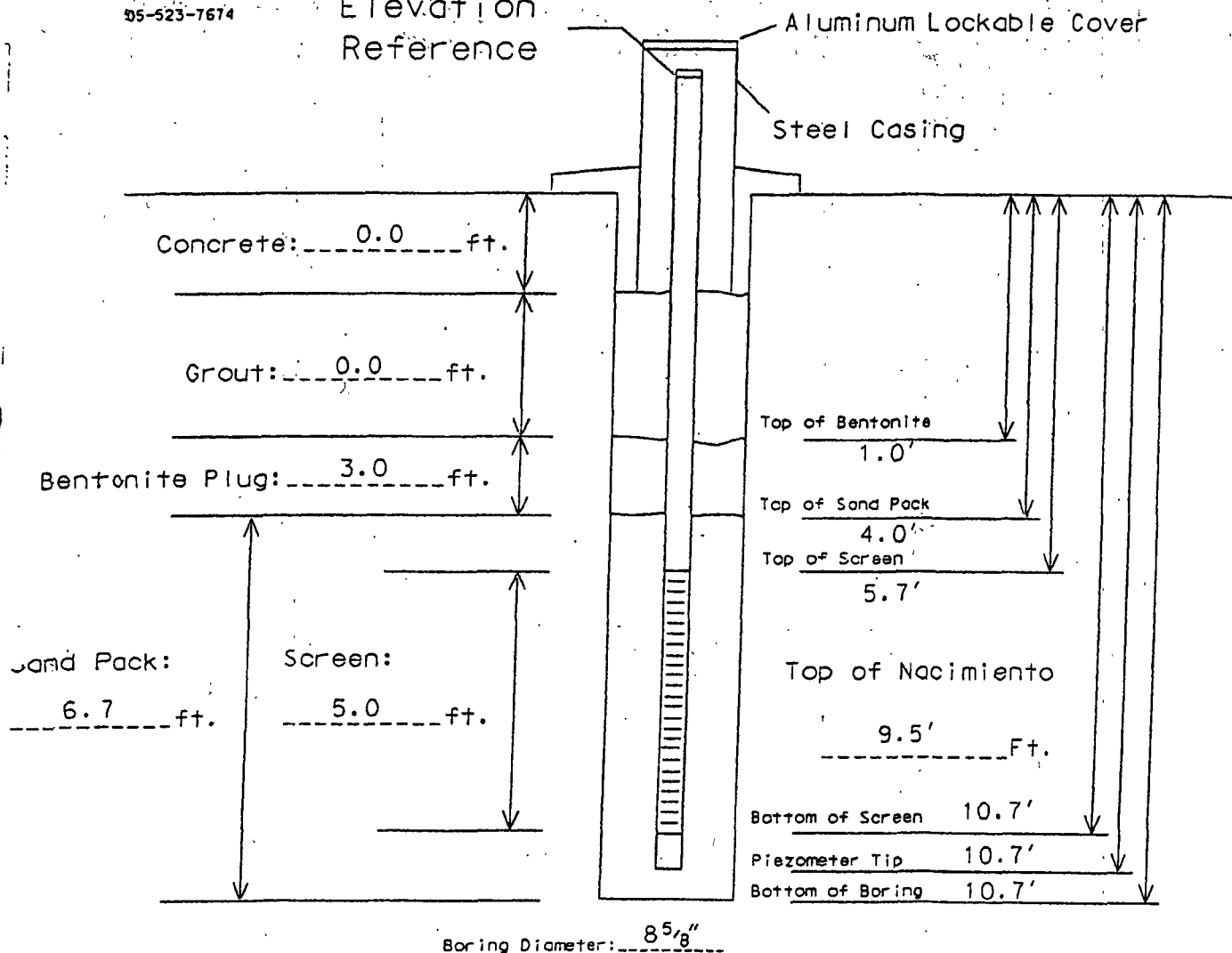
SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER

LOGGED BY: WHK



95-523-7674

Installation Diagram

Monitoring Well No. OW 5+50Elevation
ReferenceSand Type: 10-20 SilicaBollards, Type/Size: NABentonite: 3/8" ChipsScreen Type/Size: 2" PVC Sch. 40, 0.010" SlottedCement/Grout: NARiser Type/Size: 2" PVC Sch. 40Water: PotableLocking Expandable Casing Plug? YesSite Northing: TBSBottom Cap Used? YesSite Easting: TBS

Other: _____

Project #: 05-038Project Name: Bloomfield RefineryElevation: TBS

Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 5/1/2005

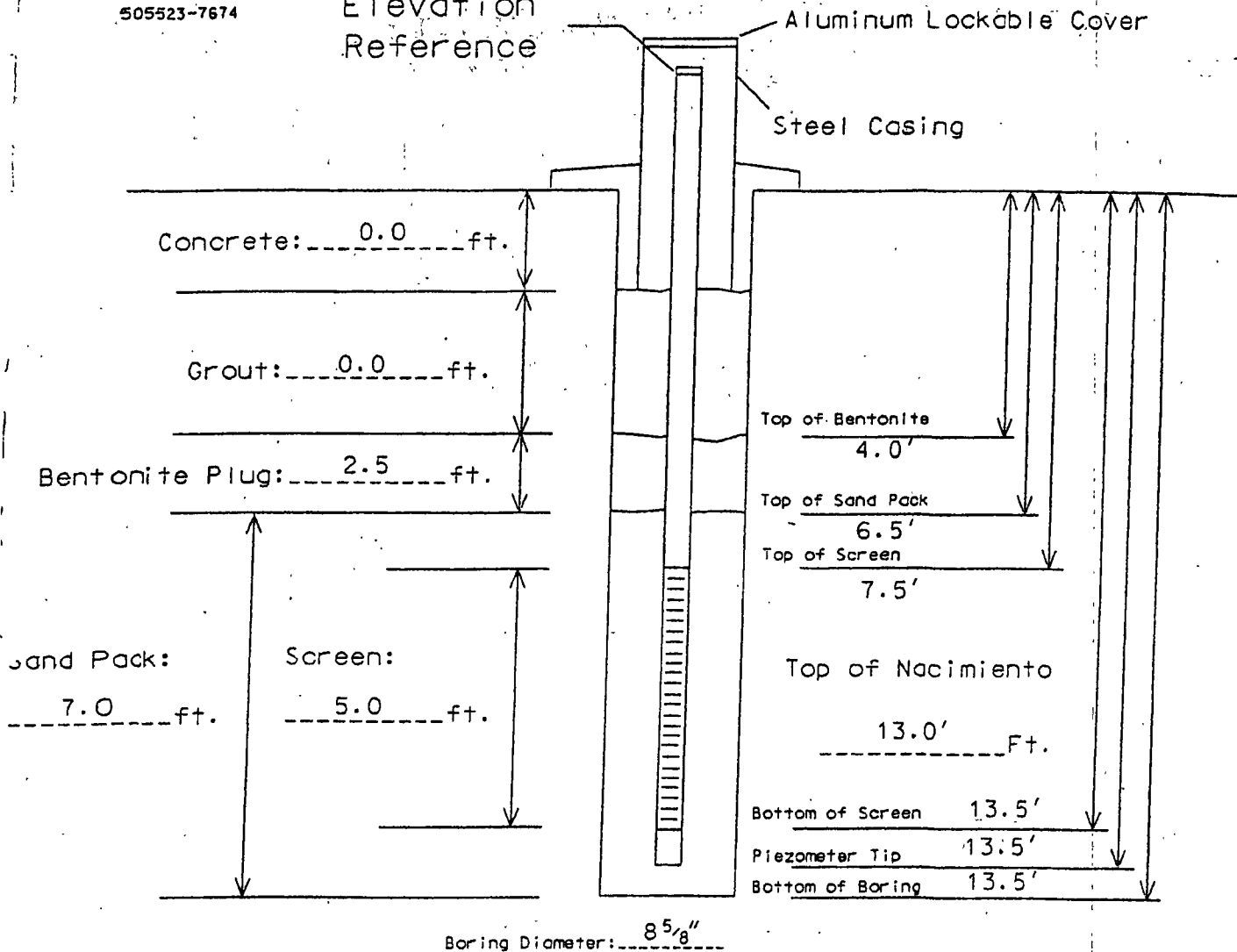


505523-7674

Installation Diagram

Monitoring Well No. OW 6+70

Elevation
Reference



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other:

Project #: 25-038

Project Name: Bloomfield Refinery

Elevation: TBS

Sheet: 5 OF 15
 Bore Point: See Plan
 Water Elevation: Not Encountered
 Boring No.: OW6+70

Precision Engineering, Inc.
 P.O. Box 422
 Las Cruces, NM 88004
 505-523-7674

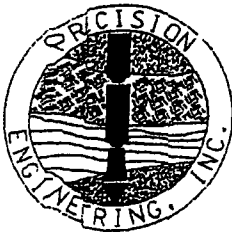
File #: 03-030
 Site: Bloomfield
 Giant Refining
 Elevation: EXISTING
 Date: 4/6/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS.
	0.0-5.5		***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_***	2.5 5.0	Sand, Very Fine to Fine, Silty, Brown, Moist, Gravel, Cobbles				
	5.5-13.0		*0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0* *0*-*0*	7.5 10.0	Sand, Fine, Silty, Light Brown, Damp, Some Small Gravel, (Cobbles @ 12.0')				
	13.0'		===== ===== ===== =====	15.0	Nacimient Formation				
	15.0			20.0	TD 1.5' of Bentonite (Bottom of Hole) Set 2" Well @ 13.5' 5' of Screen 12.5' of Riser Top of Sand 6.5' Top of Bentonite 4.0'				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER

LOGGED BY: KMM

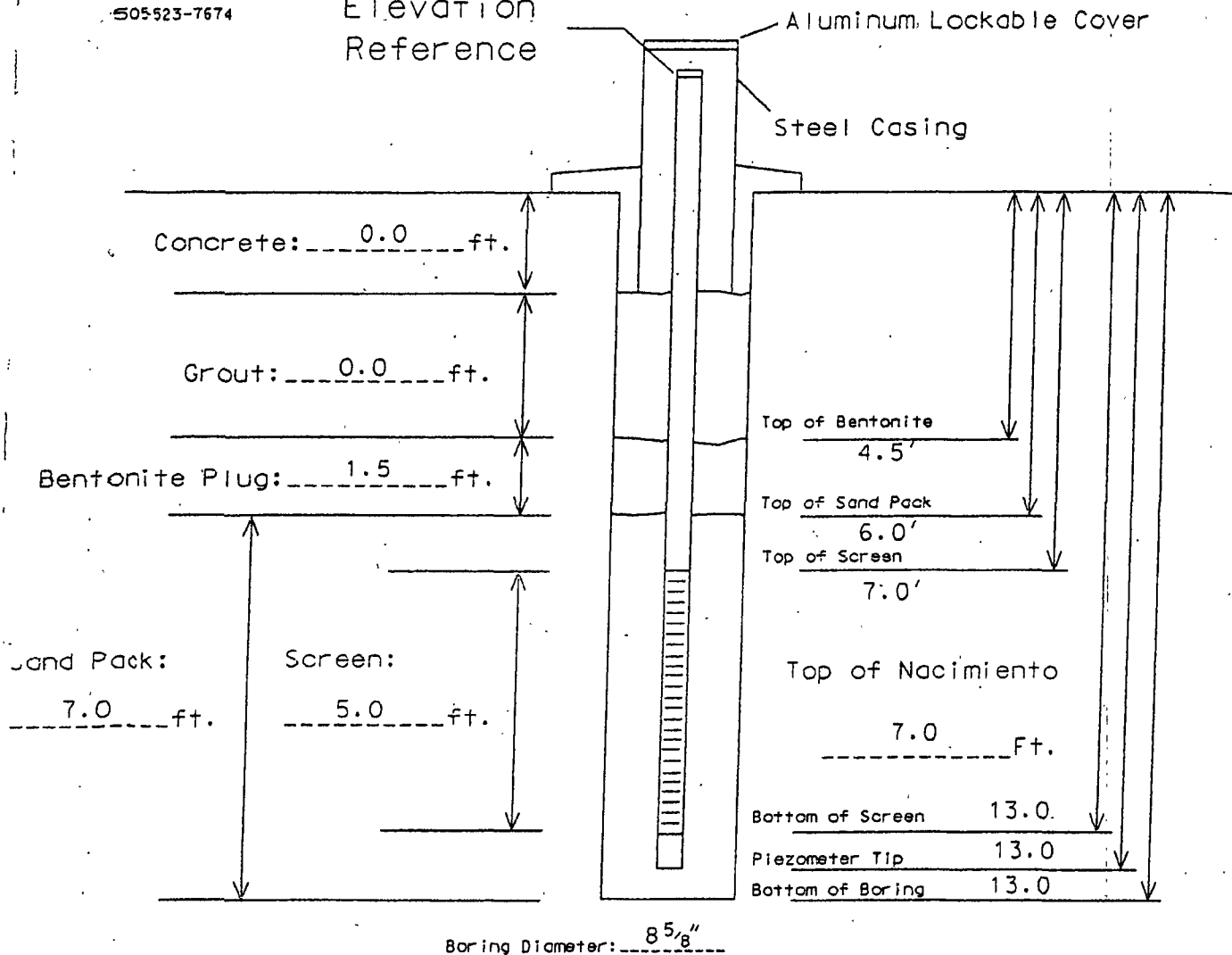


505523-7674

Installation Diagram

Monitoring Well No. OW 8+10

Elevation
Reference



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Boillards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Boomfield Refinery

Elevation: TBS

File #: 00-030
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/6/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS.
	0.0-7.0		***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_*** ***_***	<u>2.5</u> <u>5.0</u>	Sand, Fine to Coarse, Slightly Silty, Brown, Damp, Gravel, Cobbles				
	7.0-13.0		= =	<u>7.5</u> <u>10.0</u>	Nacimiento, Sand, Fine, Green/Brown, Damp Hydrocarbon Odor				
	13.0'			<u>15.0</u> <u>20.0</u>	TD Set 2" Well @ 13.0' 5' of Screen 11.0' of Riser Top of Sand 6.0' Top of Bentonite 4.5'				

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER
LOGGED BY: KMM

LOGGED BY: KMM

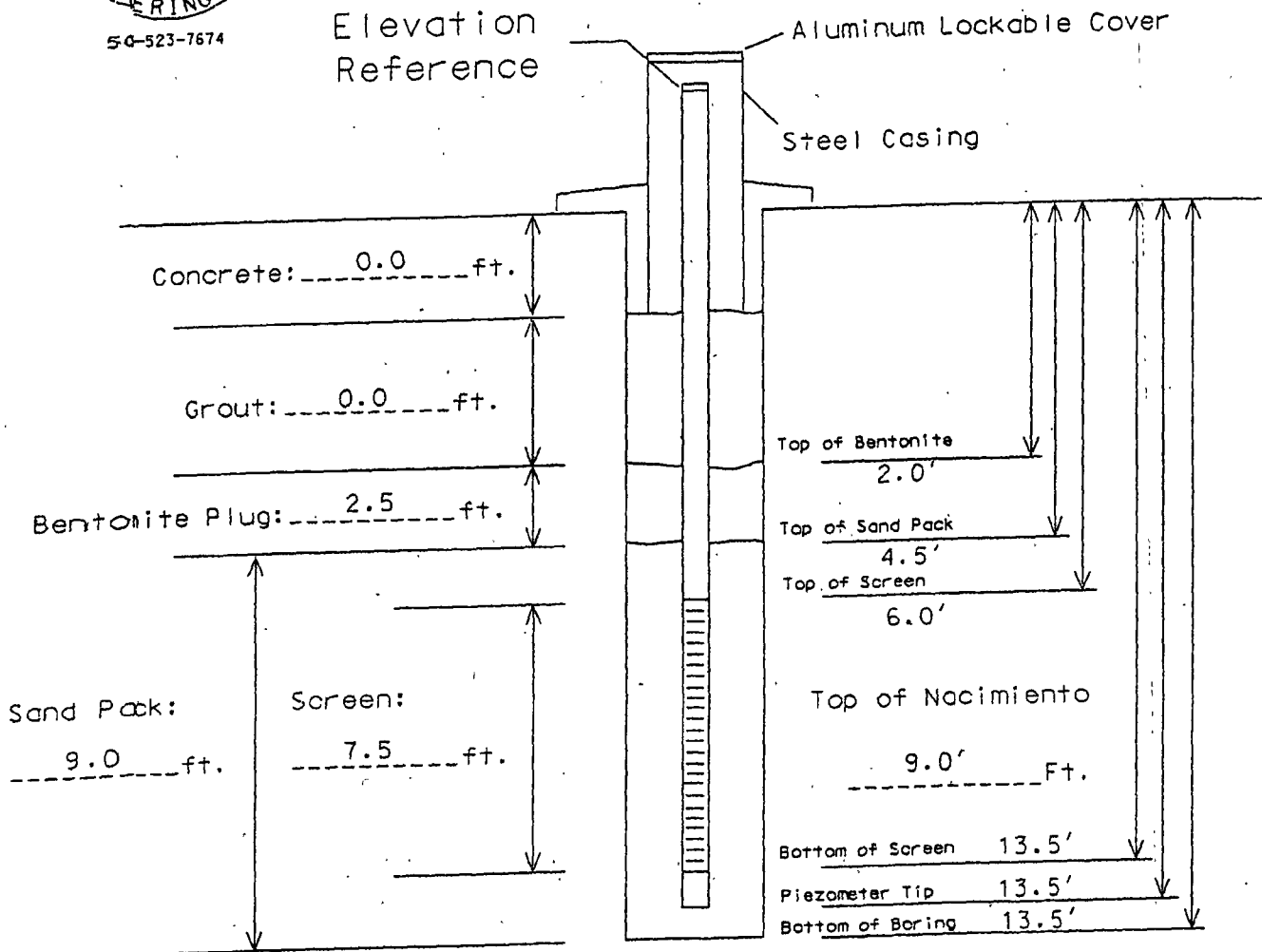
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50-523-7674

Installation Diagram

Monitoring Well No. OW 11+15



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

Elevation: TBS

File #: 00-000
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/7/2005

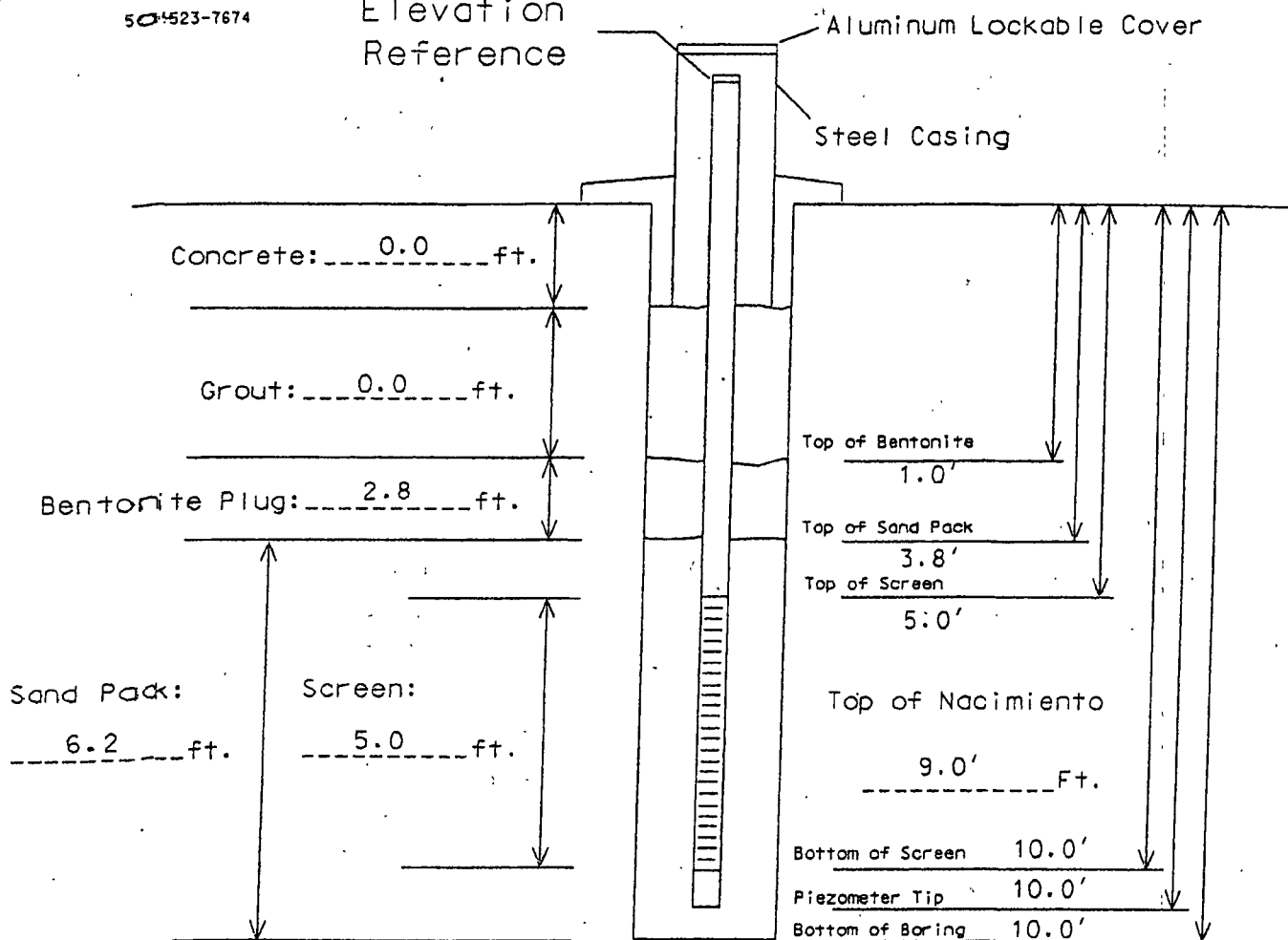


504523-7674

Installation Diagram

Monitoring Well No. DW 14+10

Elevation
Reference



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Other: _____

Bottom Cap Used? Yes

Site Easting: TBS

Project #: 05-038

Project Name: Bloomfield Refinery

Elevation: TBS

Sheet: 8 OF 15
Bore Point: See Plan
Water Elevation:
Boring No.: OW 14+10

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

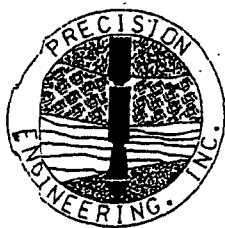
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 5/6/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS	%M	LL	PI	CLASS.
					(MOISTURE, CONDITION, COLOR, ETC.)				
	0.0-8.5		OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo OoO*Oo	2.5 					

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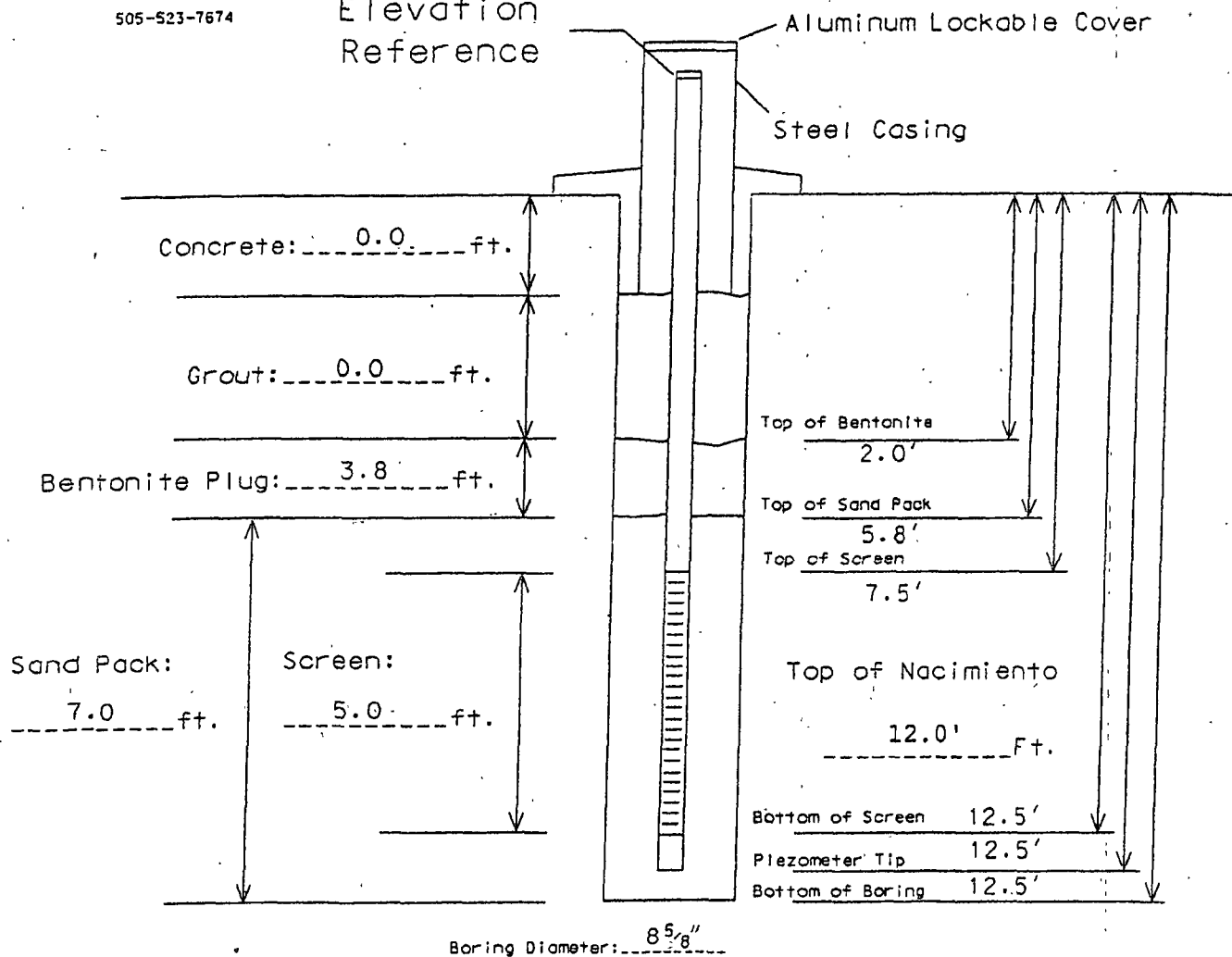


505-523-7674

Installation Diagram

Monitoring Well No. OW 16+60

Elevation
Reference



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

Elevation: TBS

Sheet: 9 OF 15
 Bore Point: See Plan
 Water Elevation: 9.5'
 Boring No.: OW16+60

Precision Engineering, Inc.
 P.O. Box 422
 Las Cruces, NM 88004
 505-523-7674

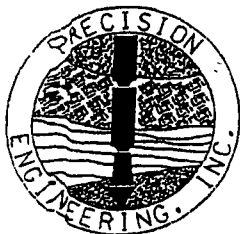
Site: Bloomfield
 Giant Refining
 Elevation: EXISTING
 Date: 4/7/2005

Log of Test Borings

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, ETC.)	%M	LL	PI	CLASS.
	0.0-5.0		***//*** ***//*** ***//*** ***//*** ***//*** ***//*** ***//*** ***//*** ***//*** ***//***	2.5 5.0	Sand, Very Fine to Fine, Clayey, Brown, Moist, Gravel, Cobbles				
	5.0-10.0		***** ***** ***** ***** ***** ***** ***** ***** ***** *****	7.5 10.0	Sand, Fine to Coarse, Black, Moist, Gravel, Some Cobbles, Hydrocarbon Odor @ 5.0'				
	9.5 10.0-12.0		***** ***** ***** *****	10.0	Water Level 9.5' Same as Above, No Gravel or Cobbles, Black Strong Hydrocarbon Odor				
	12.0		=====		Nacimiento				
	12.5				TD				
				15.0	Set 2" Well @ 12.5' 5' of Screen, 10' of Riser Top of Sand 5.8' Top of Bentonite 3.5'				
				20.0					

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER

LOGGED BY: KMM

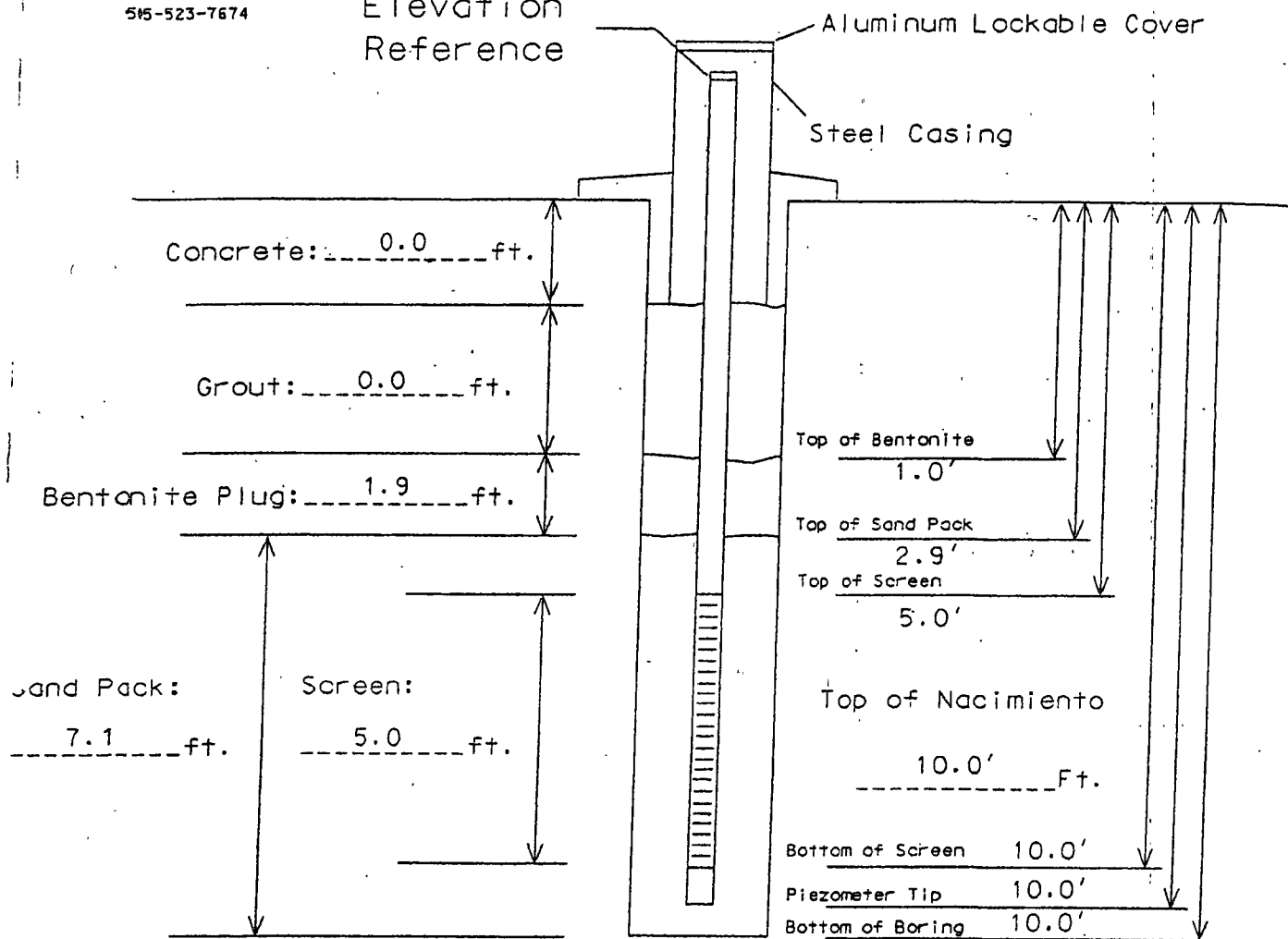


515-523-7674

Installation Diagram

Monitoring Well No. OW 19+50

Elevation
Reference



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other:

Project #: 05-038

Project Name: Sloomfield Refinery

Elevation: TBS

Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 5/7/2005

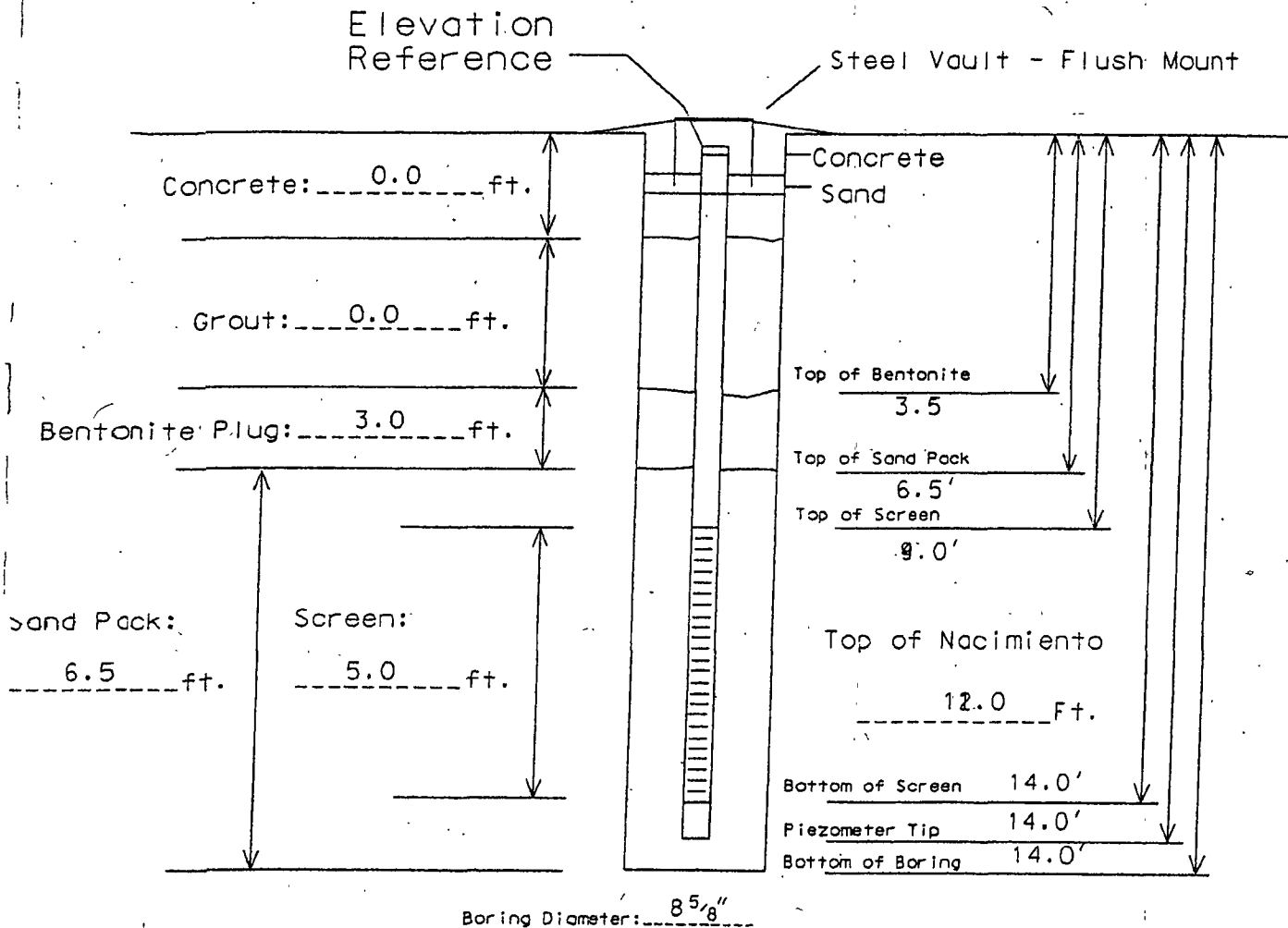
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505-523-7674

Installation Diagram

Monitoring Well No. OW 22+00



Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.40" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

Elevation: TBS

File #: 05-038
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 5/6/2005

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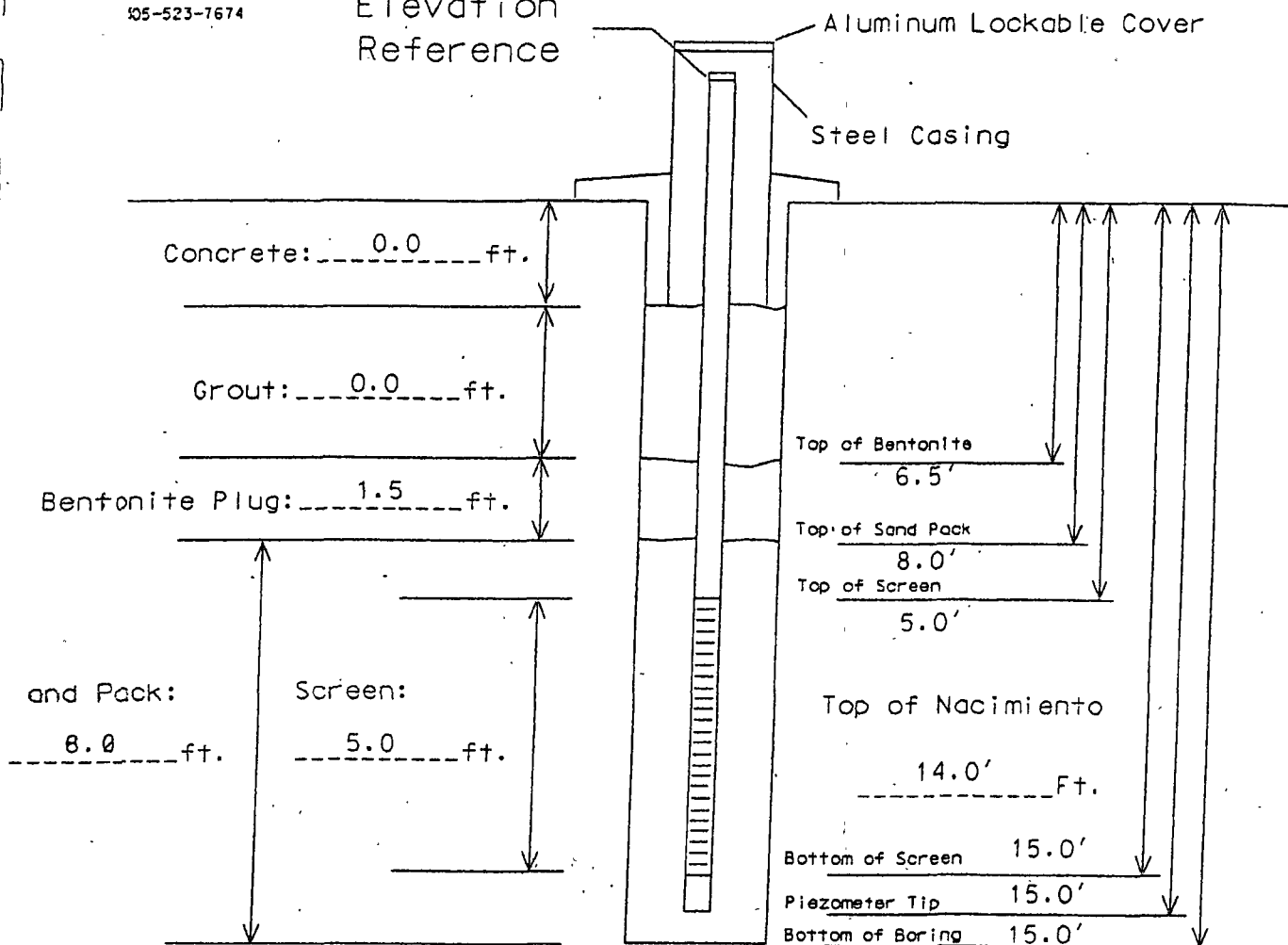


505-523-7674

Installation Diagram

Monitoring Well No. DW 23+10

Elevation
Reference



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards: Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Other: _____

Bottom Cap Used? Yes

Site Easting: TBS

Project #: 05-038

Project Name: Bloomfield Refinery

Elevation: TBS

File #: 00-000
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 5/6/2005

SIZE & TYPE OF BORING: 4 1/4" ID HOLLOW STEMMED AUGER

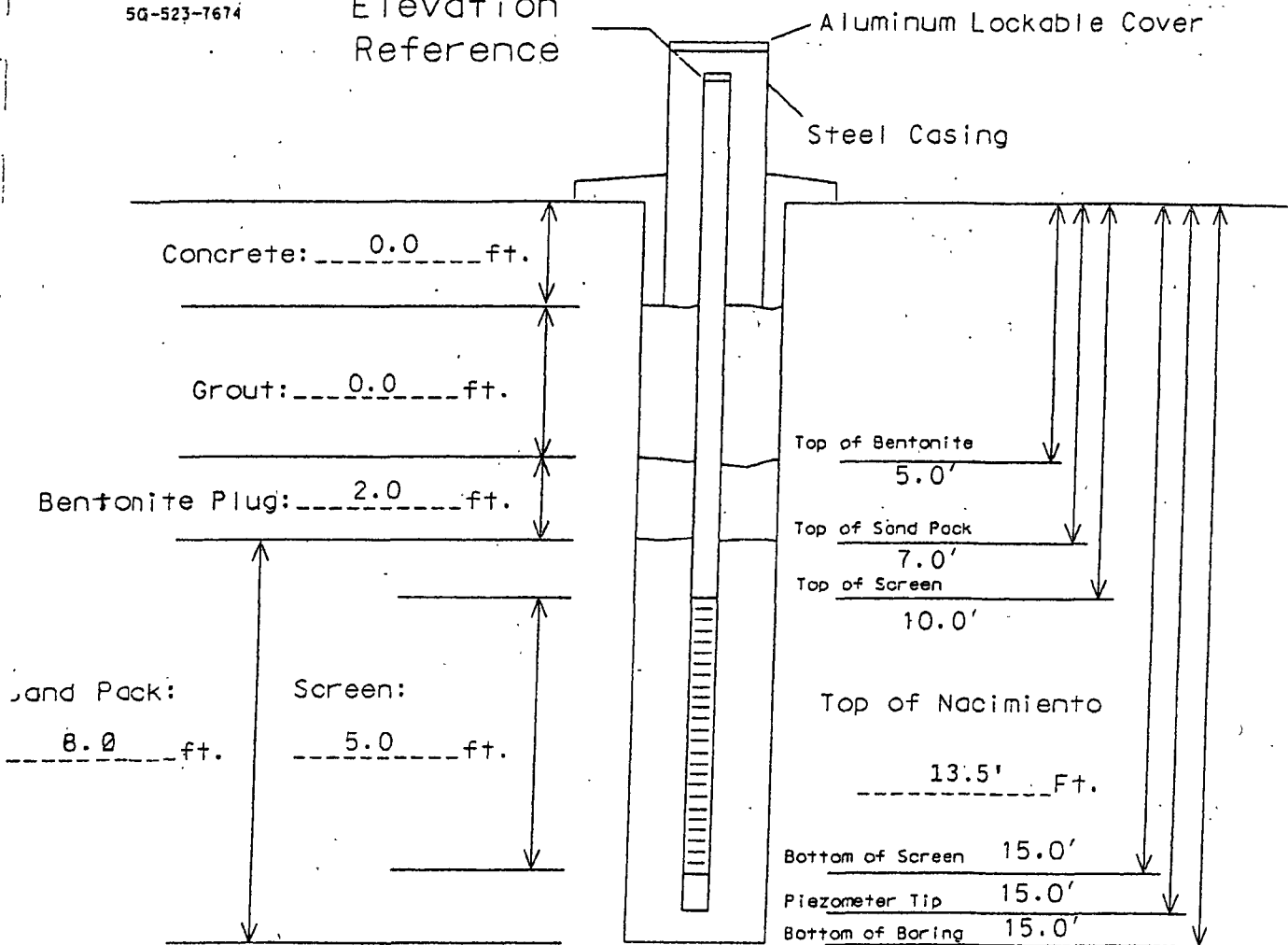


5G-523-7674

Installation Diagram

Monitoring Well No. OW 23+90

Elevation
Reference



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Bollards, Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40, 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

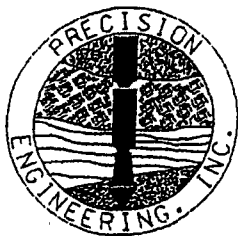
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Project Name: Bloomfield Refinery

Elevation: TBS

Log of Test Borings

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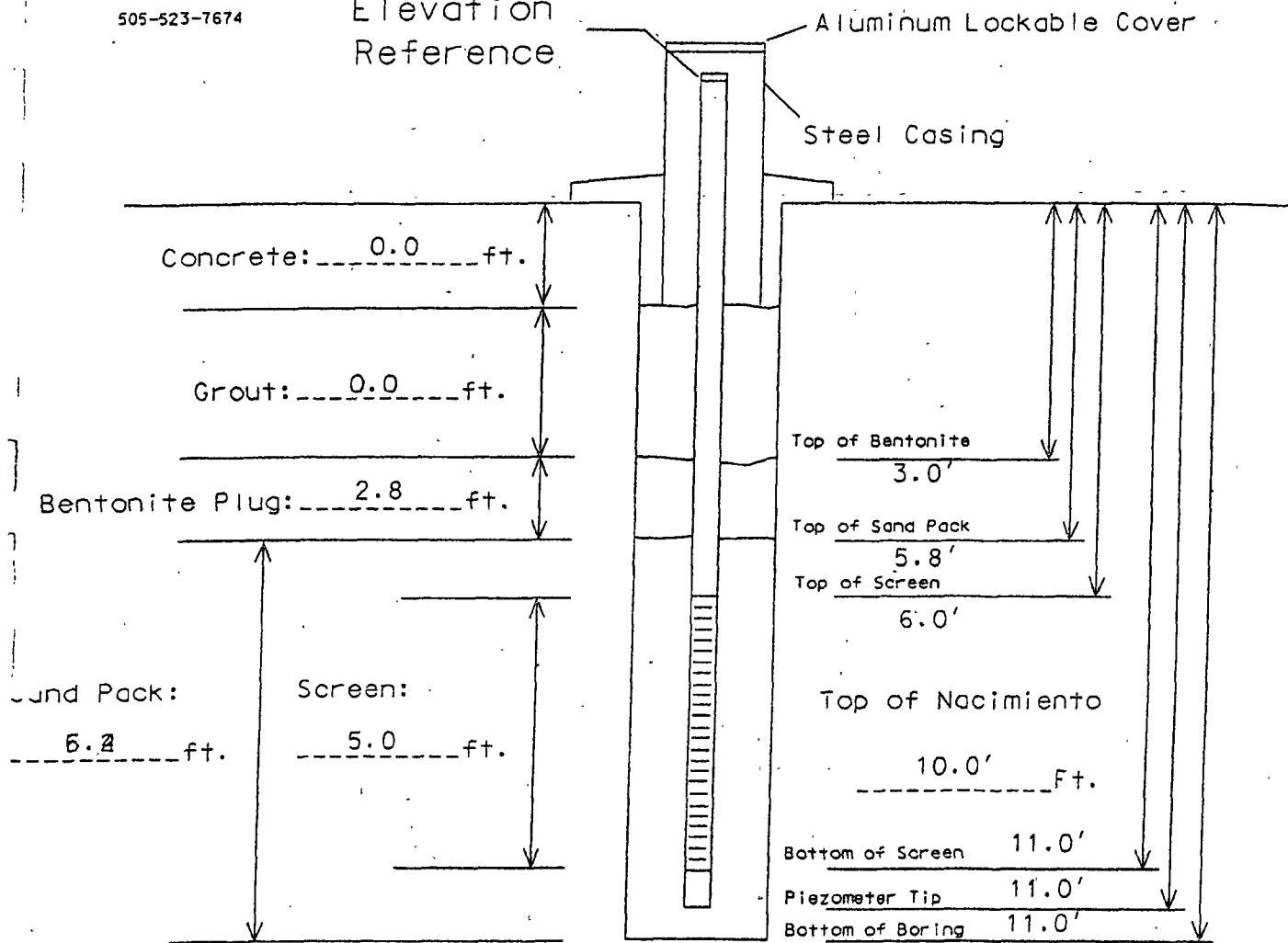


505-523-7674

Installation Diagram

Monitoring Well No. OW 25+70

Elevation
Reference



Boring Diameter: 8 5/8"

Sand Type: 10-20 Silica

Ballards. Type/Size: NA

Bentonite: 3/8" Chips

Screen Type/Size: 2" PVC Sch. 40. 0.010" Slotted

Cement/Grout: NA

Riser Type/Size: 2" PVC Sch. 40

Water: Potable

Locking Expandable Casing Plug? Yes

Site Northing: TBS

Bottom Cap Used? Yes

Site Easting: TBS

Other: _____

Project #: 05-038

Project Name: Bloomfield Refinery

Elevation: TBS

File #: 00-030
Site: Bloomfield
Giant Refining
Elevation: EXISTING
Date: 4/6/2005

RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #2, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: 0-10 Interval (9/25/08, 81°F (0-6), 82°F (6-10)); 10-20 Interval (10/15/08 44°F).

Total Depth: 20 bgl

Ground Water: 16.65' BTOC 10/28/08

Elev., TOC (ft. msl): 5518.794

Elev., PAD (ft. msl): 5516.157

Elev., GL (ft. msl): 5515.872

Site Coordinates:

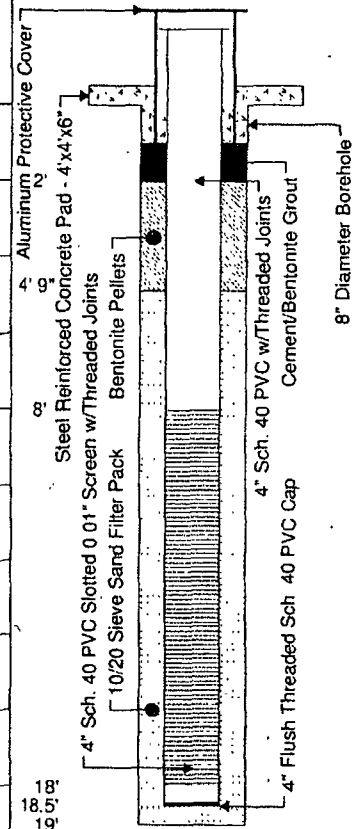
N 50484.517 E 52377.344

Well No.: MW-50 (SWMU2-5)

Start Date: 9/25 & 10/15/2008

Finish Date: 9/25 & 10/15/2008

Depth (ft.)	Sampling					Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)			
0							Ground Surface	
0.5	1030	G/2V/2E/2J			0.4	90	Silty Clay/Clayey Silt (CL/ML) Low plasticity, firm, damp, brown	
1.5	1045	G/2V/2E/2J			0.3	20	Clayey Silt (ML) Similar to above	
5					0.4	60	Gravelly Sand (SW) Fine to medium grain, loose, dry, brownish gray, gravel present throughout	
7					0.3	80	Gravelly Sand (SW) Similar to above	
9					0.5	80	Gravelly Sand (SW) Similar to above	
11					0.8	60	Gravelly Sand (SW) Fine to medium grain, loose, dry, brownish gray, gravel present throughout	
13					0.8	80	Gravelly Sand (SW) Similar to above, damp to moist	
15						50	Gravelly Sand (SW) Similar to above, saturated, trace clay, medium to coarse grain sand	
17						90	Gravelly Sand (SW) Similar to above, saturated, dark brown	
19	FB101508 EB101508	1115 1130	G/2V/2E/3J	14'		60	Sand/Sandstone (SP/SS) Fine grain, compact, damp, light brown to tan Nacimiento Formation	
Total Depth = 20' BGL								



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 3833 S. Staples, Suite N-229
 Corpus Christi, Texas 78411

Sheet. 1 of 1

361/855-7335
 361/855-7410 fax

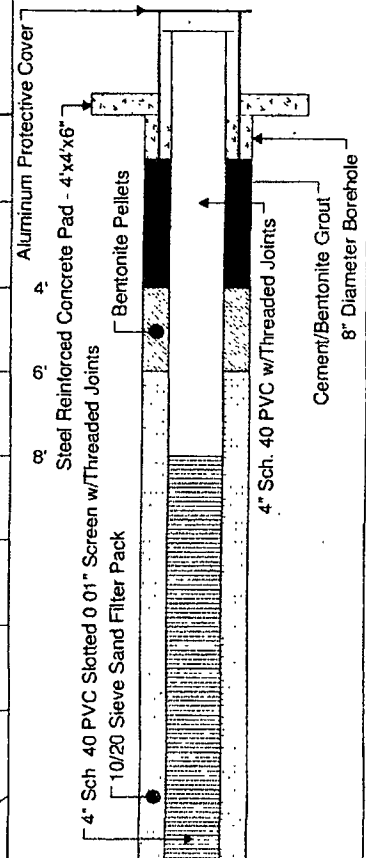
RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #2, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: 0-10 Interval (9/25/08, 85°F); 10-20 Interval (10/1/08 80°F).

Total Depth: 20 bgl
Ground Water: 14.58' BTOC 10/28/08
Elev., TOC (ft. msl): 5515.583
Elev., PAD (ft. msl): 5513.098
Elev., GL (ft. msl): 5512.877
Site Coordinates:
N 50401.208 **E** 52102.539

Well No.: MW-51 (SWMU2-9)
Start Date: 9/25 & 10/1/2008
Finish Date: 9/25 & 10/1/2008

Depth (ft.)	Sampling					Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)			
-4								
-2								
0	0-0.5'	1530	G/2V/ 2E/2J		0.1	60	Ground Surface Clayey Silt (ML) Very fine grain, compact, dry, brown	
2	1.5-2'	1545	G/2V/ 2E/2J		0.2		No Recovery	
4					0.2	60	Gravelly Sand (SW) Very fine to medium grain, loose, dry, brown, gravel present	
6					0.3	60	Gravelly Sand (SW) Similar to above	
8					0.3	80	Gravelly Sand (SW) Similar to above, damp to moist at base	
10					0.3	30	Gravelly Sand (SW) Medium grained, loose, dry to damp, brown, gravel throughout	
12					0.3	30	Gravelly Sand (SW) Similar to above, saturated at 14' bgl	
14	13.5-14'	1115	G/2V/ 2E/3J	14'		80	Sand (SP) Medium to coarse grain, loose, grayish brown, saturated, trace gravel and trace clay nodules, clayey sand at base	
16						20		



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 3833 S. Staples, Suite N-229
 Corpus Christi, Texas 78411

Sheet: 1 of 2

361/855-7335
 361/855-7410 fax



WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.

Site: SWMU Group #2, Bloomfield Refinery

Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: 0-10 Interval (9/25/08, 85°F); 10-20 Interval (10/1/08 80°F).

Total Depth: 20 bgl

Ground Water: 14.58' BTOC 10/28/08

Elev., TOC (ft. msl): 5515.583

Elev., PAD (ft. msl): 5513.098

Elev., GL (ft. msl): 5512.877

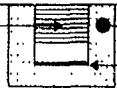
Site Coordinates:

N 50401.208 **E** 52102.539

Well No.: MW-51 (SWMU2-9)

Start Date: 9/25 & 10/1/2008

Finish Date: 9/25 & 10/1/2008

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
19							90	Gravelly Sand (SW) Medium to coarse grain, compact, brownish gray, saturated, clayey from 16-16.5' bgl	 18' 18.5' 19' 4" Sch. 40 PVC Slotted 0.01" Screen w/Threaded Joints 4" Flush Threaded Sch. 40 PVC Cap 10/20 Sieve Sand Filter Pack
21								Sand/Weathered Sandstone (SP/SS) Fine grained, compact to dense, damp, greenish gray to light brown Nacimiento Formation	
23								Total Depth = 20' BGL	
25									
27									
29									
31									
33									
35									
37									

RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #2, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: 0-10 Interval (10/13/08, 40°F); 10-41 Interval (10/14/08, 40°F-42°F). SWMU8-6A is 42°W 10°S of SWMU8-6.

Total Depth: 41' bgl

Ground Water: 36.03' BTOC 10/28/08

Elev., TOC (ft. msl): 5538.626

Elev., PAD (ft. msl): 5536.148

Elev., GL (ft. msl): 5535.908

Site Coordinates:

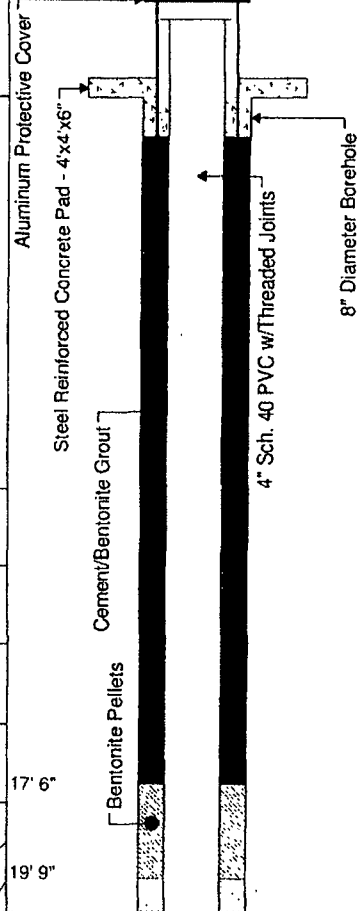
N 49828.227 **E** 52839.886

Well No.: MW-52 (SWMU8-6A)

Start Date: 10/13/2008

Finish Date: 10/14/2008

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2									
0								Ground Surface	
2								Silt (ML) Fine grain, loose, dry, brown	
4									
6									
8									
10									
12					0.3		80	Silt (ML) Fine grain, loose, dry to damp, brown	
14					0.4		100	Silt (ML) Similar to above	
16					0.5		100	Silt (ML) Similar to above	
18					0.4		100	Silt (ML) Similar to above	17' 6"
20					0.5		100	Silt (ML) Similar to above	
								Clayey Silt/Silty Clay (ML/CL) Low plasticity, soft, damp, brown	19' 9"



RPS
 3833 S. Staples, Suite N-229
 Corpus Christi, Texas 78411

Sheet: 1 of 2

361/855-7335
 361/855-7410 fax

RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #2, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: 0-10 Interval (10/13/08, 40°F); 10-41 Interval (10/14/08, 40°F-42°F). SWMU8-6A is 42°W 10°S of SWMU8-6.

Total Depth: 41' bgl
Ground Water: 36.03' BTOC 10/28/08
Elev., TOC (ft. msl): 5538.626
Elev., PAD (ft. msl): 5536.148
Elev., GL (ft. msl): 5535.908
Site Coordinates:
N 49828.227 **E** 52839.886

Well No.: MW-52 (SWMU8-6A)
Start Date: 10/13/2008
Finish Date: 10/14/2008

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
22					0.4		100	Clayey Silt/Silty Clay (ML) Similar to above	
24					0.5		100	Clayey Silt/Silt (ML) Similar to above, except decrease in clay content	
26					0.4		60	Clayey Silt/Silt (ML) Similar to above	
28					0.5		70	Gravelly Sand (SW) Fine grain, loose, damp, brown, gravel throughout	
30					0.4		70	Gravelly Sand (SW) Similar to above	
32					0.5		70	Gravelly Sand (SW) Similar to above	
34	33'-34'	0915	G/2V/ 2E/3J	34'	0.5		60	Gravelly Sand (SW) Similar to above, moist to saturated at base	
36							60	Gravelly Sand (SW) Fine to medium grain, loose to compact, saturated, brown	
38							60	Gravelly Sand (SW) Similar to above, trace sandstone at base, very light reddish brown to tan	
40								Sand/Sandstone (SP/SS) Fine grain, compact, moist to saturated at base, yellowish brown Naciminto Formation	
42								Sand/Sandstone (SP/SS) Similar to above	
Total Depth = 41' BGL									38' 38.5' 39'

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 3833 S. Staples, Suite N-229
 Corpus Christi, Texas 78411

Sheet: 2 of 2

361/855-7335
 361/855-7410 fax



WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #2, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: 0-10 Interval (9/23/08, 80°F); 10-41.5 Interval (9/24/08, (10-28) 60°F, (28-30) 66°F, (30-39) 70°F).

Total Depth: 41.5' bgl
Ground Water: 38.67' BTOC 10/28/08
Elev., TOC (ft. msl): 5541.322
Elev., PAD (ft. msl): 5538.7
Elev., GL (ft. msl): 5538.46
Site Coordinates:
N 49628.129 **E** 52879.301

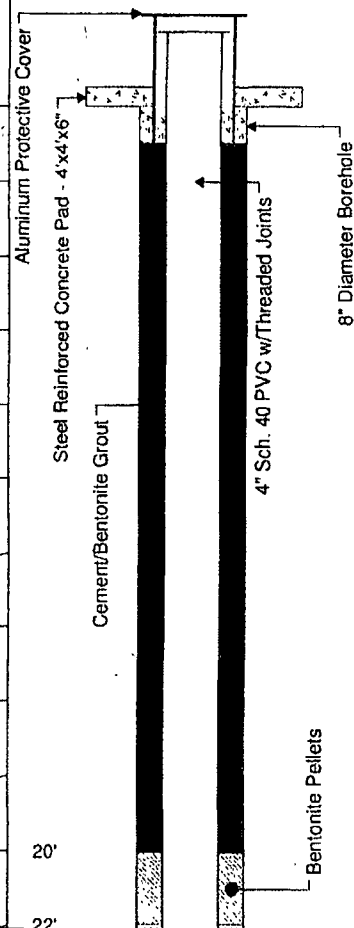
Well No.: MW-53 (SWMU8-12)
Start Date: 9/23/2008
Finish Date: 9/24/2008

Depth (ft.)	Sampling					Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)			
-2							Ground Surface	
0	1-0- 1-0.5'	1630	G/2V/ 2E/2J		0.5	70	Silt (ML) Very fine grain, compact, dry, brown	
2	1-1.5- 2-2'	1645	G/2V/ 2E/2J		0.5	70	Silt (ML) Similar to above	
4					0.5	70	Silt (ML) Similar to above	
6					0.4	90	Silt (ML) Similar to above, damp, trace quartz sand	
8					0.5	90	Silt (ML) Similar to above	
10					0.1	90	Sandy Silt (ML) Very fine grain, compact, dry, brown, with fine grain sand	
12					0.0	90	Sandy Silt (ML) Similar to above	
14					0.0	90	Sandy Silt (ML) Similar to above	
16					0.1	90	Clayey Silt (ML) Very fine grain, compact, dry, brown, calcareous	
18					0.0	90	Clayey Silt (ML) Similar to above	
20					0.1	100	Sandy Silt (ML) Very fine grain, compact to loose, dry, brown, with fine grain sand	
22								

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Corpus Christi, Texas 78411

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361/855-7410 fax



RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #2, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: 0-10 Interval (9/23/08, 80°F); 10-41.5 Interval (9/24/08, (10-28) 60°F, (28-30) 66°F, (30-39) 70°F).

Total Depth: 41.5' bgl
Ground Water: 38 67' BTOC 10/28/08
Elev., TOC (ft. msl): 5541.322
Elev., PAD (ft. msl): 5538.7
Elev., GL (ft. msl): 5538.46
Site Coordinates:
N 49628.129 **E** 52879.301

Well No.: MW-53 (SWMU8-12)
Start Date: 9/23/2008
Finish Date: 9/24/2008

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
23					0.1		100	Sandy Silt (ML) Similar to above	
25					0.1		100	Sandy Silt (ML) Similar to above, damp, calcareous	
27					0.1		70	Silty Sand/Gravelly Sand (SM/SW) Fine grain, loose, dry, light brown to brown, gravelly at base	
29					0.1		60	Gravelly Sand (SW) Similar to above	
31					0.1		50	Gravelly Sand/Sandy Gravel (SW) Similar to above, cobble size	
33					0.1		60	Gravelly Sand/Sandy Gravel (SW) Similar to above	
35					0.1		10	Gravelly Sand/Sandy Gravel (SW) Similar to above	
37	37-38.5	1430	G/2V/ 2E/2J		0.1		20	Gravelly Sand (SW) Similar to above	
39					0.1		90	Clayey Sand (SC) Fine to medium grain, compact, moist to very moist, yellowish brown	
41							90	Sand/Sandstone (SP/SS) Fine grain, very dense, dry, light brown to reddish brown Nacimiento Formation	40' 40.5' 41'
43								Clayey Sand (SC) Fine grained, very dense, damp, greenish gray	
45								Total Depth = 41.5' BGL	

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361/855-7335
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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #2, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: 0-10 Interval (9/26/08, 62°F), 10-38 Interval (10/15/08, (10-22) 65°F, (22-38) 62°F).

Total Depth: 38' bgl

Ground Water: 32.49' BTOC 10/28/08

Elev., TOC (ft. msl): 5530.077

Elev., PAD (ft. msl): 5527.564

Elev., GL (ft. msl): 5527.346

Site Coordinates:

N 49528.406 **E** 50218.954

Well No.: MW-54 (SWMU18-2)

Start Date: 9/26 & 10/15/2008

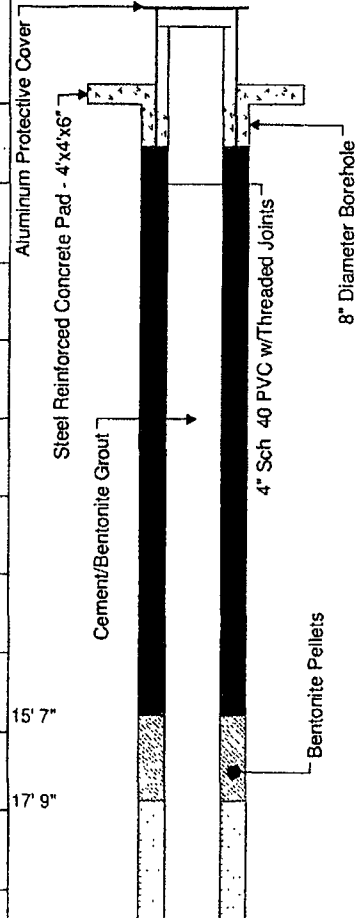
Finish Date: 9/26 & 10/17/2008

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
-2								
0	0-0.5'	0830	G/2V/2E/2J				Ground Surface	
2	1.5-2'	0845	G/2V/2E/2J				Clayey Silt/Gravel (ML) Very fine grain, compact, dry, brown, slight black staining at 0-0.5' bgl, faint odor	
					0.4	60	Silt (ML) Very fine grain, compact, damp, brown	
					0.4	60	Silt (ML) Similar to above	
					0.3	70	Silt (ML) Similar to above, except trace of very fine grain sand	
					0.4	80	Sandy Silt (ML) Very fine grain, compact, damp, brown	
					0.5	80	Sandy Silt/Silty Sand (ML/SM) Similar to above, damp	
					0.3	90	Silty Sand (SM) Very fine grain, loose, damp, brown	
					0.3	90	Silty Sand (SM) Similar to above	
					0.3	90	Silty Sand (SM) Similar to above	
					0.3	80	Silty Sand (SM) Similar to above, damp, black discoloration, odor	
18-20'		1630	G/2V/2E/3J		15.5	80		

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
 Site: SWMU Group #2, Bloomfield Refinery
 Job No.: 354 - Bloomfield, NM
 Geologist: Tracy Payne
 Driller: Enviro-Drill, Inc.
 Drilling Rig: CME 75
 Drilling Method: Hollow-Stem Auger/ODEX

Total Depth: 38' bgl
 Ground Water: 32 49' BTOC 10/28/08
 Elev., TOC (ft. msl): 5530.077
 Elev., PAD (ft. msl): 5527.564
 Elev., GL (ft. msl): 5527.346
 Site Coordinates:
 N 49528.406 E 50218.954

Well No.: MW-54 (SWMU18-2)
 Start Date: 9/26 & 10/15/2008
 Finish Date: 9/26 & 10/17/2008

Sampling Method: Split Spoon

Comments: 0-10 Interval (9/26/08, 62°F); 10-38 Interval (10/15/08, (10-22) 65°F, (22-38) 62°F).

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
22					8.5		60	Gravelly Sand (SW) Fine to medium grain, loose, damp, gray, faint odor, gravel present throughout	
24					12.9		20	Gravelly Sand (SW) Similar to above	
26					16.1		40	Gravelly Sand (SW) Similar to above	
28					58.5		40	Gravelly Sand (SW) Similar to above	
29	28-29'	1645	G/2V/ 2E/3J	30'	400		50	Gravelly Sand (SW) Similar to above, moist to very moist at 29' bgl, hydrocarbon odor	
30							40	Gravelly Sand (SW) Medium to coarse grain, loose, saturated, hydrocarbon odor, black	
32							50	Gravelly Sand (SW) Similar to above, saturated, black, hydrocarbon odor	
34							60	Sand/Sandstone (SP/SS) Fine grain, compact, dense, moist to saturated, hydrocarbon odor, dark gray to black Nacimiento Formation	
36							40	Sand/Sandstone (SP/SS) Similar to above, becomes very dense, damp	
38								Total Depth = 38' BGL	

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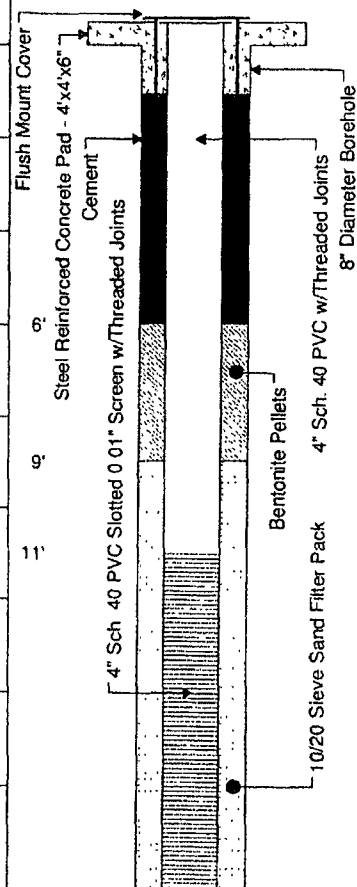
RPS**WELL CONSTRUCTION****Client:** Western Refining Southwest, Inc.**Site:** SWMU Group #1, Bloomfield Refinery**Job No.:** 354 - Bloomfield, NM**Geologist:** Tracy Payne**Driller:** Enviro-Drill, Inc.**Drilling Rig:** CME 75**Drilling Method:** Hollow-Stem Auger/ODEX**Sampling Method:** Split Spoon**Comments:** N36°41.964 W107°58.552**Total Depth:** 27.25' bgl**Ground Water:** Saturated @ 22' bgl**Elev., TOC (ft. msl):** --**Elev., PAD (ft. msl):** --**Elev., GL (ft. msl):** --**Site Coordinates:****N****E****Well No.:** MW-55 (IM1-1)**Start Date:** 4/2/2009**Finish Date:** 4/2/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-1								Ground Surface	
1					0.0 49°F		70	Fill/Clay (CL) Low plasticity, soft, damp, brown	
3					0.2 49°F		50	Fill/Clay (CL) Similar to above	
5					434 49°F		70	Fill/Clay (CL) Low plasticity, soft, damp, brown and gray, hydrocarbon odor	
7					623 49°F		70	Fill/Clay (CL) Similar to above, grayish brown, hydrocarbon odor	
9	8-10'	1045	G/2V/ 2E/3J		891 49°F		60	Fill/Sand (SP) Fine grain, loose, damp, brown to dark brown, hydrocarbon odor	
11					630 48°F		90	Fill/Sand (SP) Similar to above, hydrocarbon odor	
13					518 48°F		90	Gravelly Sand (SW) Fine to coarse grain, loose, damp, dark gray, hydrocarbon odor	
15					806 48°F		50	Gravelly Sand (SW) Similar to above, hydrocarbon odor, black discoloration, not oily	
17					432 48°F		50	Gravelly Sand (SW) Similar to above, damp, odor, black discoloration, not oily	

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RPS**WELL CONSTRUCTION****Client:** Western Refining Southwest, Inc.**Site:** SWMU Group #1, Bloomfield Refinery**Job No.:** 354 - Bloomfield, NM**Geologist:** Tracy Payne**Driller:** Enviro-Drill, Inc.**Drilling Rig:** CME 75**Drilling Method:** Hollow-Stem Auger/ODEX**Sampling Method:** Split Spoon**Comments:** N36°41.964 W107°58.552**Total Depth:** 27.25' bgl**Ground Water:** Saturated @ 22' bgl**Elev., TOC (ft. msl):** --**Elev., PAD (ft. msl):** --**Elev., GL (ft. msl):** --**Site Coordinates:****N****E****Well No.:** MW-55 (IM1-1)**Start Date:** 4/2/2009**Finish Date:** 4/2/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
19-20'	18-20'	1100	G/2V/ 2E/3J		1085 48°F		50	Gravelly Sand (SW) Similar to above, damp, black discoloration, odor, not oily	4" Sch. 40 PVC Slotted 0.01" Screen w/Threaded Joints 10/20 Sieve Sand Filter Pack 4" Flush Threaded Sch. 40 PVC Cap 6" Sand Bed Saturated @ 22' bgl
21-22'	20-22'	1115	G/2V/ 2E/3J	22'	1047 48°F		50	Gravelly Sand (SW) Fine to coarse grain, loose, damp, gray, black discoloration, hydrocarbon odor	
23'							50	Gravelly Sand (SW) Similar to above, oily, saturated	
25'							90	Gravelly Sand (SW) Similar to above, saturated, black, hydrocarbon odor	
27'								Weathered Sandstone/Sand (SS) Fine to medium grain, soft, damp, greenish gray, faint odor	
Total Depth = 27.25' BGL									27.25'

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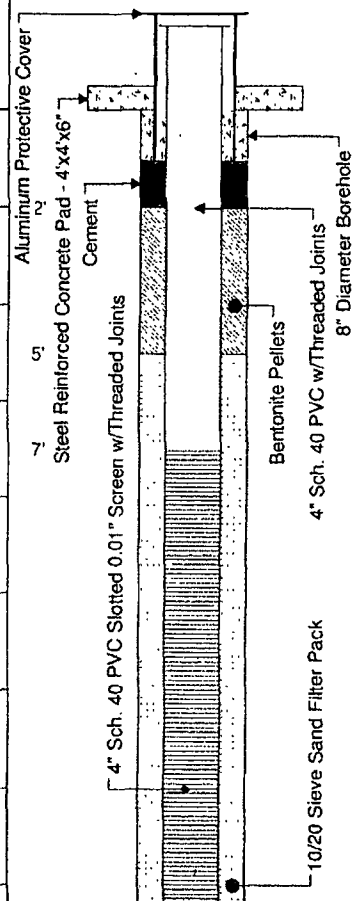
RPS**WELL CONSTRUCTION****Client:** Western Refining Southwest, Inc.**Site:** SWMU Group #1, Bloomfield Refinery**Job No.:** 354 - Bloomfield, NM**Geologist:** Tracy Payne**Driller:** Enviro-Drill, Inc.**Drilling Rig:** CME 75**Drilling Method:** Hollow-Stem Auger/ODEX**Sampling Method:** Split Spoon**Comments:** N36°41.935 W107°58.507, Hydroexcavated to 8'**Total Depth:** 23.75' bgl**Ground Water:** Saturated @ 19' bgl**Elev., TOC (ft. msl):** --**Elev., PAD (ft. msl):** --**Elev., GL (ft. msl):** --**Site Coordinates:****N E****Well No.:** MW-56 (IM1-2)**Start Date:** 4/1/2009 13:40**Finish Date:** 4/1/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2								Ground Surface	
0					1.1		60	Fill/Clay (CL) Low plasticity, soft, damp, brown	
2					51°F				
					1.8		80	Fill/Clay (CL) Similar to above	
					51°F				
4					116		70	Fill/Clay (CL) Similar to above, brown to dark gray, hydrocarbon odor, sand/gravel at base	
					51°F				
6					40		60	Gravelly Sand (SW) Fine to coarse, loose, damp, light gray, no odor	
					51°F				
8					0.4		60	Gravelly Sand (SW) Fine to coarse, loose, damp, light gray, no odor	
					53°F				
10					1.3		80	Gravelly Sand (SW) Similar to above	
					53°F				
12					10.8		80	Gravelly Sand (SW) Similar to above	
					53°F				
14					13.2		80	Gravelly Sand (SW) Similar to above	
					53°F				
16									

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RPS**WELL CONSTRUCTION****Client:** Western Refining Southwest, Inc.**Site:** SWMU Group #1, Bloomfield Refinery**Job No.:** 354 - Bloomfield, NM**Geologist:** Tracy Payne**Driller:** Enviro-Drill, Inc.**Drilling Rig:** CME 75**Drilling Method:** Hollow-Stem Auger/ODEX**Sampling Method:** Split Spoon**Comments:** N36°41.935 W107°58.507; Hydroexcavated to 8'**Total Depth:** 23.75' bgl**Ground Water:** Saturated @ 19' bgl**Elev., TOC (ft. msl):** --**Elev., PAD (ft. msl):** --**Elev., GL (ft. msl):** --**Site Coordinates:****N E****Well No.:** MW-56 (IM1-2)**Start Date:** 4/1/2009 13:40**Finish Date:** 4/1/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
16-18'	16-18'	1630	G/2V/ 2E/3J	19'	50 53°F		80	Gravelly Sand (SW) Similar to above, fine to coarse, loose, moist at base, light gray, hydrocarbon odor	4" Sch. 40 PVC Slotted 0.01" Screen w/Threaded Joints 10/20 Sieve Sand Filter Pack 6" Sand Bed 4" Flush Threaded Sch. 40 PVC Cap 23.75' Saturated @ 19' bgl
18-20'							30	Gravelly Sand (SW) Medium to coarse, loose, saturated, black, hydrocarbon odor, coarse gravel	
20-22'							70	Weathered Sandstone/Sand (SS) Loose, damp to moist, faint odor, gray to brown, trace gray clay	
22-24'								Total Depth = 23.75' BGL	

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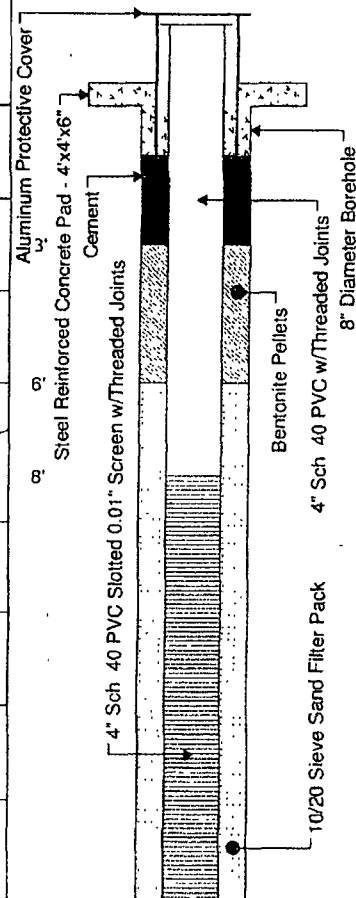
RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #1, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.925 W107°58.516; Hydroexcavated to 7'

Total Depth: 24.25' bgl
Ground Water: Saturated @ 19' bgl
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): --
Site Coordinates:
N **E**

Well No.: MW-57 (IM1-3)
Start Date: 3/31/2009
Finish Date: 3/31/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2								Ground Surface	
0					1.1		40	Fill/Clay (CL) Damp, brown	
2					237		60	Fill/Clay (CL) Damp, brown to dark gray, hydrocarbon odor	
4	4-6'	1645	G/2V/ 2E/3J		567		80	Fill/Clay (CL) Dark gray	
6					57°F		0	Fill/Clay (CL) Similar to above, no recovery	
8					415		20	Gravelly Sand (SW) Fine to coarse grain, loose, damp, gray, fine to coarse gravel, odor	
10					35.9		70	Gravelly Sand (SW) Similar to above, odor	
12					107		70	Gravelly Sand (SW) Similar to above, odor	
14					14.7		10	Gravelly Sand (SW) Similar to above, odor	
16	15-17'	1615	G/2V/ 2E/3J		10.8		70	Gravelly Sand (SW) Similar to above, moist to very moist	
17					48°F				



RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #1, Bloomfield Refinery

Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: N36°41.925 W107°58.516; Hydroexcavated to 7'

Total Depth: 24.25' bgl

Ground Water: Saturated @ 19' bgl

Elev., TOC (ft. msl): --

Elev., PAD (ft. msl): --

Elev., GL (ft. msl): --

Site Coordinates:

N

E

Well No.: MW-57 (IM1-3)

Start Date: 3/31/2009

Finish Date: 3/31/2009

Depth (ft.)	Sampling					Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)			
18				19'			Gravelly Sand (SW) Fine to coarse grain, loose, moist to saturated, dark gray, strong hydrocarbon odor	4" Sch. 40 PVC Slotted 0.01" Screen w/Threaded Joints 10/20 Sieve Sand Filter Pack 6" Sand Bed 4" Flush Threaded Sch. 40 PVC Cap Saturated @ 19' bgl
20						90	Gravelly Sand (SW) Similar to above, saturated, strong hydrocarbon odor	
22						100	Gravelly Sand (SW) Similar to above	
24						100	Clay (CH) High plasticity, very stiff, damp, gray and light yellowish orange	
26							Total Depth = 24.25' BGL	
28								
30								
32								
34								
36								

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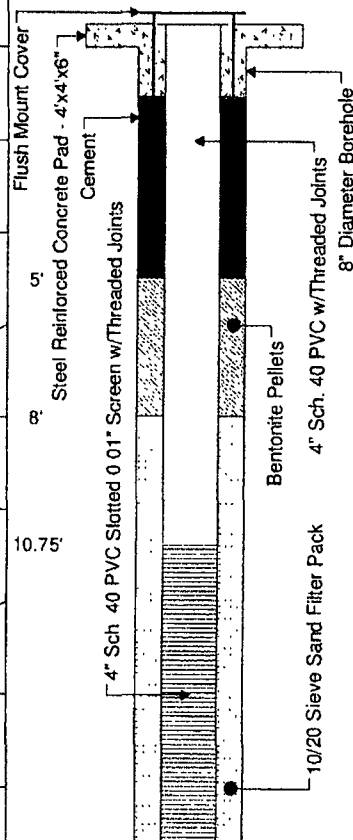
RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
 Site: SWMU Group #1, Bloomfield Refinery
 Job No.: 354 - Bloomfield, NM
 Geologist: Tracy Payne
 Driller: Enviro-Drill, Inc.
 Drilling Rig: CME 75
 Drilling Method: Hollow-Stem Auger/ODEX
 Sampling Method: Split Spoon
 Comments: N36°41.930 W107°58.548

Total Depth: 27' bgl
 Ground Water: Saturated @ 19.5' bgl
 Elev., TOC (ft. msl): --
 Elev., PAD (ft. msl): --
 Elev., GL (ft. msl): --
 Site Coordinates:
 N E

Well No.: MW-58 (IM1-4)
 Start Date: 4/3/2009
 Finish Date: 4/3/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2								Ground Surface	
0					1.1		80	Fill/Clay (CL) Low plasticity, soft, damp, brown	
2					57°F				
2-4'	1215		G/2V/ 2E/3J		395		80	Fill/Clay (CL) Similar to above, hydrocarbon odor, gray discoloration	
4					57°F				
6					380		80	Fill/Clay (CH) High plasticity, firm, damp, gray and brown, hydrocarbon odor, black discoloration	
8					57°F		80	Fill/Clay (CH) Similar to above, hydrocarbon odor, black discoloration	
10					58		80	Fill/Clay (CH) Similar to above	
12					80		80	Gravelly Sand (SW) Medium to coarse grain, compact, damp, dark gray, faint hydrocarbon odor, trace clay, coarse gravel	
14					43		60	Gravelly Sand (SW) Similar to above, hydrocarbon odor, damp to slightly moist, dark gray	
16					29		80	Gravelly Sand (SW) Similar to above, damp, to slightly moist	
					70°F		80	Gravelly Sand (SW) Similar to above	
					17				
					70°F				



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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #1, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.930 W107°58.548

Total Depth: 27' bgl
Ground Water: Saturated @ 19.5' bgl
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): --
Site Coordinates:
 N E

Well No.: MW-58 (IM1-4)
Start Date: 4/3/2009
Finish Date: 4/3/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
18	18-19.5	1230	G/2V/ 2E/3J	19.5	312 70°F		90	Gravelly Sand (SW) Medium to coarse grain, compact, damp to moist, gray, hydrocarbon odor	4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints 10/20 Sieve Sand Filter Pack 6" Sand Bed 4" Flush Threaded Sch. 40 PVC Cap Saturated @ 19.5' bgl
20							90	Sand (SP) Medium grain, compact, moist to very moist, black, strong hydrocarbon odor	
22							90	Sand (SP) Similar to above, saturated, strong hydrocarbon odor	
24								Sand/Clay (SP/CH) No recovery	
26							90	Clay (CH) High plasticity, firm, damp, moist in sand seams, olive brown, odor	
28								Total Depth = 27' BGL	25.75' 27'
30									
32									
34									
36									

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RPS

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery

Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: N36°41.767' W107°58.370'

Total Depth: 44.25' bgl

Ground Water: Saturated @ 40' bgl

Elev., TOC (ft. msl): 5545.196

Elev., PAD (ft. msl): 5542.365

Elev., GL (ft. msl): 5542.373

Site Coordinates:

N 36°41'45.92938"

W 107°58'22.20599"

Well No.: MW-59 (SWMU 4-1)

Start Date: 4/6/2009

Finish Date: 4/6/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
0	0-0.5'	0845	G/2V/ 2E/3J		0.2		100	Clayey Silt (ML) Low plasticity, firm, damp, brown	
1.5	1.5-2'	0930	G/2V/ 2E/3J		2.9		80	Clayey Silt (ML) Similar to above	
2					50.8		80	Clayey Silt (ML) Similar to above, mixed with soft black sticky sludge, odor	
6	6-8'	1130	G/2V/ 2E/3J		214		80	Clayey Silt/Sludge (ML) Gray silt mixed with sludge	
8					9.7		90	Clayey Silt (ML) Low plasticity, soft, damp, brown to light gray, 8 5-9' faint odor	
10					41		80	Clayey Silt (ML) Similar to above, light gray/brown	
12					9.5		60	Silty Sand (SM) Very fine grain, compact, damp, brown	
14								Silty Sand (SM) Similar to above	

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WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.767' W107°58.370'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 40' bgl
Elev., TOC (ft. msl): 5545.196
Elev., PAD (ft. msl): 5542.365
Elev., GL (ft. msl): 5542.373
Site Coordinates:
 N 36°41'45.92938" W 107°58'22.20599"

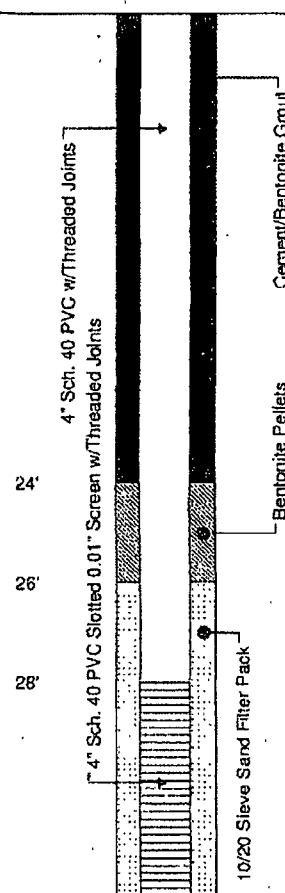
Well No.: MW-59 (SWMU 4-1)
Start Date: 4/6/2009
Finish Date: 4/6/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
16					8.0 50°F		50	
18					8.1 50°F		60	
20					7.3 50°F		80	
22					6.4 50°F		80	
24					6.6 50°F		80	
26					5.5 50°F		80	
28					6.3 50°F		90	
30					4.2 50°F		90	
32					3.9 50°F		80	

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512/347-7588
 512/347-8243 fax





WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.767' W107°58.370'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 40' bgl
Elev., TOC (ft. msl): 5545.196
Elev., PAD (ft. msl): 5542.365
Elev., GL (ft. msl): 5542.373
Site Coordinates:
N 36°41'45.92938" W 107°58'22.20599"

Well No.: MW-59 (SWMU 4-1)
Start Date: 4/6/2009
Finish Date: 4/6/2009

Depth (ft.)	Sampling					Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)			
33					2.8	30	Gravelly Sand (SW) Fine to coarse grain, compact, damp, brown, medium to coarse gravel	15' of 4" Sch. 40 PVC Slotted 0.01" Screen w/Threaded Joints 4" Flush Threaded Sch. 40 PVC Cap 6" Sand Bed 8" Well Sump 10/20 Sieve Sand Filter Pack Saturated @ 40' bgl
35					3.1	60	Sand (SP) Fine grain, loose, damp, brown	
					50°F		Sand (SP) Similar to above	
37	36-38	1700	G/2V/ 2E/3J		3.8	60	Gravelly Sand (SW) Fine to coarse grain, compact, damp, brown, medium to coarse gravel	
					70°F		Sand (SP) Fine grain, loose, damp, brown	
39						60	Gravelly Sand (SW) Fine to coarse grain, compact, damp, brown, medium to coarse gravel	
							Gravelly Sand (SW) Similar to above, moist	
41						60	Sand (SP) Fine grain, loose, damp to moist, brown	
							Gravelly Sand (SW) Fine to coarse grain, compact, saturated, brown, medium to coarse gravel	
43						60	Gravelly Sand (SW) Similar to above	
45							Nacimlento Formation Sandstone (SS) Dense, damp, yellowish brown	44.25' Total Depth = 44.25' BGL
47								
48								

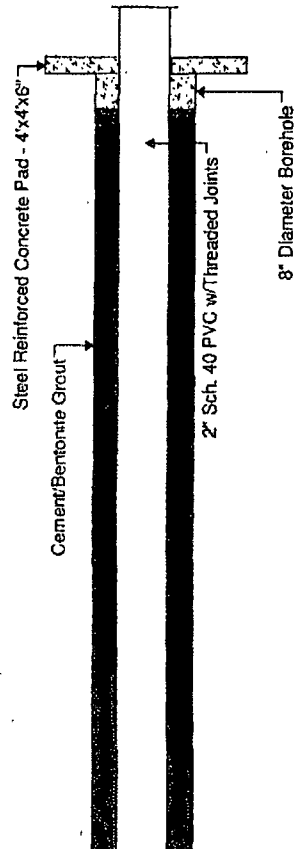
RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.816' W107°58.256'

Total Depth: 42' bgl
Ground Water: Saturated @ 37.75' bgl
Elev., TOC (ft. msl): 5543.607
Elev., PAD (ft. msl): 5540.336
Elev., GL (ft. msl): 5540.449
Site Coordinates:
 N 36°41'48.82442" W 107°58'16.02512"

Well No.: AOC 22-12 / TW-01**Start Date:** 4/13/2009**Finish Date:** 4/13/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
0	0.5'	0915	G/4V/4E/6J		0.9		Ground Surface	
1	1.5'	0930	G/2V/2E/3J		53°F	100	Silt (ML) Very fine grain, compact, damp, brown	
2					3.4			
					53°F	80	Clayey Silt (ML) Similar to above	
					4.9			
					60°F	80	Clayey Silt (ML) Similar to above	
					5.6			
					60°F	90	Clayey Silt (ML) Similar to above	
					5.2			
					60°F	100	Clayey Silt (ML) Similar to above, trace fine grain sand	
					4.9			
					60°F	100	Sandy Silt (ML) Very fine grain, loose to compact, damp, light brown	
					4.2			
					60°F	90	Sandy Silt (ML) Similar to above	
					6.3			
					60°F	60	Clayey Silt (ML) Low plasticity, soft, very fine grain, compact, damp, brown	
					6.0			
					60°F	100	Clayey Silt (ML) Similar to above	
					5.2			
					60°F	100	Sandy Silt (ML) Very fine grain, loose to compact, damp, light brown	
					5.1			
					60°F	90	Silty Sand (SM) Very fine to fine grain, loose, damp, light brown	
					4.4			
					60°F			



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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.816' W107°58.256'

Total Depth: 42' bgl
Ground Water: Saturated @ 37.75' bgl
Elev., TOC (ft. msl): 5543.607
Elev., PAD (ft. msl): 5540.336
Elev., GL (ft. msl): 5540.449
Site Coordinates:
 N 36°41'48.82442" W 107°58'16.02512"

Well No.: AOC 22-12 / TW-01**Start Date:** 4/13/2009**Finish Date:** 4/13/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
24					4.3 60°F		Silty Sand (SM) Very fine to fine grain, loose, damp, light brown	
26					5.7 60°F		Silty Sand (SM) Similar to above, faint odor	
28					5.2 60°F		Silty Sand (SM) Similar to above, clayey sand at base, dark brown, odor	
30					22.7 60°F		Sandy Clay (CL) Low plasticity, soft, damp, dark brown, odor	
32					35 60°F		Silty Sand (SM/SP) Fine grain, loose, damp to very damp, dark gray, odor	
34	32-35'	1150	G/2V/ 2E/3J		25 60°F		Gravelly Sand (SW) Fine to medium grain, loose, damp, gray, coarse gravel, odor	
36	36-37.75'	1210	G/2V/ 2E/3J	37.75'	68 60°F		Gravelly Sand (SW) Similar to above	
38							No Recovery - similar to above	
40							Gravelly Sand (SW) Similar to above, saturated at 37.37' bgl	
42							Sand (SW) Fine to coarse grain, loose, saturated, gray, odor	
44							Sand (SW) Similar to above, saturated, gray, odor	
46							Nacimiento Formation Clayey Sand/Weathered Sandstone (SC/SS) Dense, damp, yellowish brown	

Total Depth = 42' BGL

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery

Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: Hydroexcavated to 8' bgl. N36°41.754' W107°58.434'

Total Depth: 45.5' bgl

Ground Water: Not Encountered

Elev., TOC (ft. msl): 5543.711

Elev., PAD (ft. msl): 5544.003

Elev., GL (ft. msl): 5544.007

Site Coordinates:

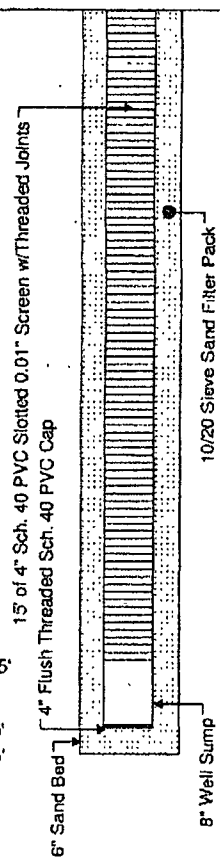
N 36°41'45.37028"

W 107°58'25.98617"

Well No.: MW-60 (AOC 25 -2)

Start Date: 4/5/2009

Finish Date: 4/5/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
33					3.6		100	Silty Sand (SM) Very fine grain, loose to compact, damp, brown	
35					2.5		100	Sand (SP) Fine to medium grain, loose, damp, brown	
								Gravelly Sand (SW) Medium to coarse grain, compact, damp, brown, coarse to fine gravel	
37	36-38'	1715G/2V/2E/3J			4.2		80	Gravelly Sand (SW) Similar to above	
39							10	Gravelly Sand (SW) Similar to above	
							0	Gravelly Sand (SW) Similar to above, no recovery	
41							50	Gravelly Sand (SW) Similar to above	
							0	Gravelly Sand (SW) Similar to above, no recovery	
43									
45							100	Nacimiento Formation Weathered Sandstone/Sandstone (SS) Fine grain, dense, damp, light yellowish brown	
47								Total Depth = 45.5' BGL	

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WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.813' W107°58.287'

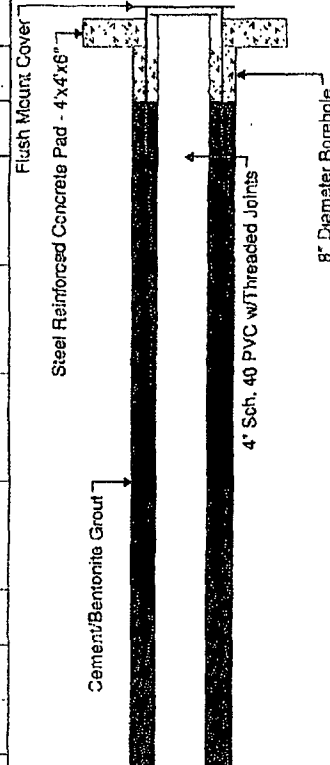
Total Depth: 40.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.411
Elev., PAD (ft. msl): 5539.613
Elev., GL (ft. msl): 5539.588
Site Coordinates:
N 36°41'48.82131" W 107°58'17.15514"

Well No.: MW-61 (AOC 22-15)

Start Date: 4/15/2009

Finish Date: 4/15/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
2									
0								Ground Surface	
1								Asphalt/Base	
1.5	1-1.5'	1135	G/2V/ 2E/3J		2.8 63°F		100	Clayey Silt (ML) Low plasticity, stiff, damp, brown	
2	1.5-2'	1155	G/2V/ 2E/3J		29.5 63°F		60	Clayey Silt (ML) Similar to above, soft	
4					23.4 86°F		50	Clayey Silt (ML) Similar to above	
6					5.5 68°F		0	Clayey Silt (ML) Similar to above - no recovery	
8							10	Clayey Silt (ML) Similar to above	
10					13.1 68°F		80	Clayey Silt (ML) Similar to above, trace very fine grain sand	
12					18.1 68°F		70	Silty Sand (SM) Very fine grain, loose, damp, brown	
								Silty Sand (SM) Similar to above	



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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
 Site: SWMU Group #3, Bloomfield Refinery
 Job No.: 354 - Bloomfield, NM
 Geologist: Tracy Payne
 Driller: Enviro-Drill, Inc.
 Drilling Rig: CME 75
 Drilling Method: Hollow-Stem Auger
 Sampling Method: Split Spoon
 Comments: N36°41.813' W107°58.287'

Total Depth: 40.25' bgl
 Ground Water: Saturated @ 36' bgl
 Elev., TOC (ft. msl): 5539.411
 Elev., PAD (ft. msl): 5539.613
 Elev., GL (ft. msl): 5539.588
 Site Coordinates:
 N 36°41'48.82131" W 107°58'17.15514"

Well No.: MW-61 (AOC 22 -15)

Start Date: 4/15/2009

Finish Date: 4/15/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
15					16.6 68°F			Clayey Silt (ML) Low plasticity, very fine grain, compact, damp, brown	4" Sch. 40 PVC w/Threaded Joints 4" Sch. 40 PVC Slotted 0.01" Screen w/Threaded Joints 10/20 Sieve Sand Filter Pack Bentonite Pellets Cement/Bentonite Grout
					11.2 68°F		70	Clayey Silt (ML) Similar to above	
17					6.5 68°F		80	Clayey/Silty Sand (SC/SM) Very fine grain, compact, damp, brown	
19					13.2 68°F		90	Silty Sand (SM) Similar to above, less clay	
21					13.2 68°F		80	Silty Sand (SM) Similar to above	
23					21.5 67°F		60	Silty Sand (SM) Very fine grain, loose to compact, damp, brown to light brown	
25					12.9 67°F		60	Clayey Silty Sand (SC/SM) Similar to above, increase in clay content	
27					16.0 67°F		90	Clayey Silty Sand (SC/SM) Similar to above	

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WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.813' W107°58.287'

Total Depth: 40.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.411
Elev., PAD (ft. msl): 5539.613
Elev., GL (ft. msl): 5539.588
Site Coordinates:
 N 36°41'48.82131" W 107°58'17.15514"

Well No.: MW-61 (AOC 22 -15)
Start Date: 4/15/2009
Finish Date: 4/15/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
30					17.1 67°F		90	Clayey Silty Sand (SC/SM) Similar to above, trace tan sand seams present	15' of 4" Sch. 40 PVC Slotted 0.01" Screen w/ Threaded Joints 4" Flush Threaded Sch. 40 PVC Cap 6" Sand Bed 8" Well Sump 10/20 Sieve Sand Filter Pack Saturated @ 36' bgl
32					22 67°F		80	Silty Sand (SM) Very fine grain sand, compact, brown to gray, moist, odor Gravelly Sand (SW) Very fine to medium grain, compact to loose, brown to gray, odor, coarse gravel	
34					165 67°F		60	Gravelly Sand (SW) Similar to above, fine to coarse sand, odor, stained	
36	34-36'	1340	G/2V/ 2E/3J	36'	510 67°F		70	Gravelly Sand (SW) Similar to above, odor	
38							10	Gravelly Sand (SW) Similar to above	
40							10	Nacimiento Formation Silty Sandy Clay (CL) Low plasticity, firm, dry to damp, yellow brown to greenish gray, no odor	
42								Total Depth = 40.25' BGL	

RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.717' W107°58.123'

Total Depth: 58.25' bgl
Ground Water: Saturated @ 55' bgl.
Elev., TOC (ft. msl): 5561.322
Elev., PAD (ft. msl): 5558.703
Elev., GL (ft. msl): 5558.555
Site Coordinates:
N 36°41'43.02125" W 107°58'07.46590"

Well No.: MW-62 (AOC 23 -1)**Start Date:** 4/21/2009**Finish Date:** 4/21/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
0	0-0.5' & Dup	1115	G/2V/ 2E/3J		3.1	71°F	100	Ground Surface Silt (ML) Very fine grain, loose, dry, brown	
1.5	1.5-2'	1130	G/2V/ 2E/3J		3.3	71°F	40	Silt (ML) Similar to above, damp	
14.5					14.5	74°F	90	Silt (ML) Similar to above	
14.4					14.4	74°F	100	Sand (SP) Fine grain, loose, damp, dark brown	
14.8					14.8	74°F	60	Sand (SP) Similar to above, brown to light brown	
12.3					12.3	74°F	0	Gravelly Sand (SW) Fine to coarse grain, loose, dry, brown, coarse gravel	
7.1					7.1	77°F	100	Gravelly Sand (SW) Similar to above, no recovery	
17.6					17.6	77°F	90	Silty Sand (SM) Fine grain, loose to compact, damp, light grayish tan	
7.1					7.1	77°F	90	Silty Sand (SM) Similar to above, compact	
7.1					7.1	77°F	90	Silty Sand (SM) Similar to above, compact	

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RPS**WELL CONSTRUCTION****Client:** Western Refining Southwest, Inc.**Site:** SWMU Group #3, Bloomfield Refinery.**Job No.:** 354 - Bloomfield, NM**Geologist:** Tracy Payne**Driller:** Enviro-Drill, Inc.**Drilling Rig:** CME 75**Drilling Method:** Hollow-Stem Auger/ODEX**Sampling Method:** Split Spoon**Comments:** N36°41.717' W107°58.123'**Total Depth:** 58.25' bgl**Ground Water:** Saturated @ 55' bgl**Elev., TOC (ft. msl):** 5561.322**Elev., PAD (ft. msl):** 5558.703**Elev., GL (ft. msl):** 5558.555**Site Coordinates:****N 36°41'43.02125"****W 107°58'07.46590"****Well No.:** MW-62 (AOC 23 -1)**Start Date:** 4/21/2009**Finish Date:** 4/21/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
16					8.7		0	Silty Sand (SM) Similar to above, sandstone present, yellowish brown	
					78°F		60	Silty Sand (SM) Similar to above, no recovery	
18							0	Clayey Silty Sand (SC/SM) Fine grain, very dense, damp, tan	
					2.2		100	Clayey Silty Sand (SC/SM) Similar to above, no recovery	
20					78°F			Clayey Silty Sand (SC/SM) Similar to above, grayish tan, organics at 18.5' bgl, pinkish tan 18.25 to 18.75' bgl	
					3.9		100	Clayey Silty Sand (SC/SM) Fine grain, very dense, damp, grayish tan	
22					78°F			Clayey Silty Sand (SC/SM) Similar to above, compact	
					2.4		100		
24					78°F			Clayey Silty Sand (SC/SM) Similar to above	
					1.6		90	Clayey Silty Sand (SC/SM) Similar to above, no recovery	
26					78°F		0	Clayey Silty Sand (SC/SM) Similar to above, no recovery	
					4.0		90	Silty Sand (SM) Fine grain, compact, damp, light brown	
28					77°F		0	Silty Sand (SM) Similar to above, no recovery	
					3.6		90	Silty Sand (SM) Similar to above, clay/silt lenses present	
30					77°F			Silty Sand (SM) Similar to above, no recovery	
					5.4		90	Silty Sand (SM) Similar to above, increase in silt content	
32					77°F				

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery

Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: N36°41.717' W107°58.123'

Total Depth: 58.25' bgl

Ground Water: Saturated @ 55' bgl

Elev., TOC (ft. msl): 5561.322

Elev., PAD (ft. msl): 5558.703

Elev., GL (ft. msl): 5558.555

Site Coordinates:

N 36°41'43.02125"

W 107°58'07.46590"

Well No.: MW-62 (AOC 23 -1)

Start Date: 4/21/2009

Finish Date: 4/21/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
33					3.2 58°F		50	Sandy Silt (ML) Very fine grain, compact, dry, greenish gray, no plasticity	
35					3.3 58°F		50	Sandy Silt (ML) Similar to above, dense, fine grain sand lenses present, rusty brown and tan	
37					4.4 62°F		50	Silty Sand (SM) Fine grain, compact, damp, light greenish gray	
39					5.3 63°F		90	Silty Sand (SM) Similar to above, slightly cemented, black organics present, gray sand	
41					3.3 71°F		90	Silty Sand (SM) Similar to above, trace clay	
43							0	Silty Sand (SM) Similar to above	
45					3.3 73°F		20	Silty Sand (SM) Similar to above	
47							0	Silty Sand (SM) Similar to above	
49					2.3 84°F		50	Silty Sand (SM) Fine grain, poorly cemented, damp, light greenish gray	

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WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.717' W107°58.123'

Total Depth: 58.25' bgl
Ground Water: Saturated @ 55' bgl
Elev., TOC (ft. msl): 5561.322
Elev., PAD (ft. msl): 5558.703
Elev., GL (ft. msl): 5558.555
Site Coordinates:
N 36°41'43.02125" W 107°58'07.46590"

Well No.: MW-62 (AOC 23 -1)

Start Date: 4/21/2009

Finish Date: 4/21/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
51					3.8		Silty Sand (SM) Similar to above, trace clay, poorly cemented, sandstone present	
52					82°F			
53					4.4		Silty Sand (SM) Similar to above	
53					83°F		Silty Sand (SM) Similar to above	
55							Silty Sand/Sand (SM/SW) Medium to coarse grain, loose, moist to saturated at 55' bgl	
57							Silty Sand (SM) Similar to above, saturated, brown to yellowish brown	
57							Nacimiento Formation Silt/Shale (ML) Very dense, dry, black, no odor	
57.75							Total Depth = 58.25' BGL	
58.25								
59								
61								
63								
65								

RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.771' W107°58.305'

Total Depth: 46' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): 5547.255
Elev., PAD (ft. msl): 5544.482
Elev., GL (ft. msl): 5544.488
Site Coordinates:
N 36°41'46.17547" W 107°58'18.22906"

Well No.: MW-63 (AOC 22 -16)**Start Date:** 4/13/2009**Finish Date:** 4/14/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
-2								
0	0-0.5'	1325	G/2V/ 2E/3J		1.6		Ground Surface	
2	1.5-2'	1335	G/2V/ 2E/3J		0.9		Silt (ML) Very fine grain, compact, damp, brown	
4					4.5 68°F		Clayey Silt (ML) Similar to above	
6					5.8 68°F		Clayey Silt (ML) Similar to above	
8					5.8 68°F		Clayey Silt (ML) Similar to above	
10					7.3 68°F		Clayey Silt (ML) Similar to above	
12					3.2 68°F		Clayey Silt (ML) Similar to above	
14					3.8 68°F		Clayey Silt (ML) Similar to above, trace sand	
							Clayey Silt (ML) Similar to above	

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.771' W107°58.305'

Total Depth: 46' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): 5547.255
Elev., PAD (ft. msl): 5544.482
Elev., GL (ft. msl): 5544.488
Site Coordinates:
 N 36°41'46.17547" W 107°58'18.22906"

Well No.: MW-63 (AOC 22 -16)**Start Date:** 4/13/2009**Finish Date:** 4/14/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
16					6.2 68°F		90		
18					5.8 68°F		80	Clayey Silt (ML) Similar to above	
20					5.7 68°F		90	Clayey Silt/Silt (ML) Similar to above, trace light brown to tan sand in partings	
22					5.8 68°F		90	Silty Sand (SM) Very fine grain, loose, damp, light brown to tan	
24					6.8 68°F		90	Silty Sand (SM) Similar to above, tan	
26					4.9 68°F		90	Silty Sand (SM) Very fine grain, loose, damp, tan	
28					7.5 68°F		90	Silty Sand (SM) Similar to above	
30					7.9 68°F		90	Silty Sand (SM) Similar to above	
32					6.0 68°F		90	Silty Sand (SM) Similar to above	

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.771' W107°58.305'

Total Depth: 46' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): 5547.255
Elev., PAD (ft. msl): 5544.482
Elev., GL (ft. msl): 5544.488
Site Coordinates:
 N 36°41'46.17547" W 107°58'18.22906"

Well No.: MW-63 (AOC 22 -16)**Start Date:** 4/13/2009**Finish Date:** 4/14/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
33					8.5		Gravelly Sand (SW) Medium to coarse grain, loose, damp, brown, coarse gravel	
35					10.9		Gravelly Sand (SW) Similar to above	
37	36-38'	1230	G/2V/ 2E/3J		12.2		Gravelly Sand (SW) Similar to above	
39							No recovery - similar to above	
41							Sand (SW) Medium to coarse grain, loose, saturated, brown, trace gravel	
43							Sand (SW) Similar to above	
45							Sand (SW) Similar to above	
47							No recovery - similar to above	
49							Nacimiento Formation Weathered Sandstone/Sandstone (SS) Dense to fine grain, dry, greenish gray	
							Total Depth = 46' BGL	

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41' 736' W107°58.304'

Total Depth: 50.25' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5552.285
Elev., PAD (ft. msl): 5549.043
Elev., GL (ft. msl): 5549.111
Site Coordinates:
 N 36°41'44.02863" W 107°58'18.35629"

Well No.: MW-64 (AOC 24 -7)**Start Date:** 4/7/2009**Finish Date:** 4/7/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
-2								
0	0-0.5'	1130	G/2V/ 2E/3J				Ground Surface	
1.5	1.5-2'	1145	G/2V/ 2E/3J		0.4 57°F	100	Clayey Silt (ML) Low plasticity, stiff, damp, brown	
2					0.4 57°F	60	Clayey Silt (ML) Similar to above	
4					0.2 57°F	90	Sandy Silt (ML) Low plasticity, fine grain sand, compact, damp, brown	
6					0.3 57°F	60	Sandy Silt (ML) Similar to above	
8					0.4 57°F	70	Sandy Silt (ML) Similar to above	
10					0.3 57°F	90	Clayey Silt (ML) Low plasticity, firm, damp, brown	
12								

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RPS**WELL CONSTRUCTION**

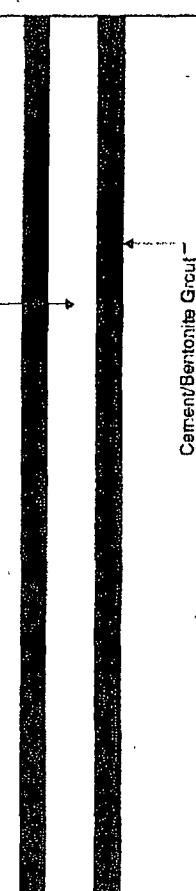
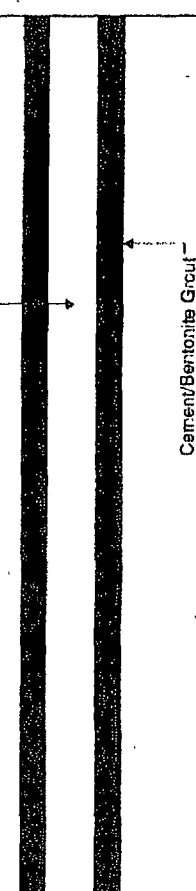
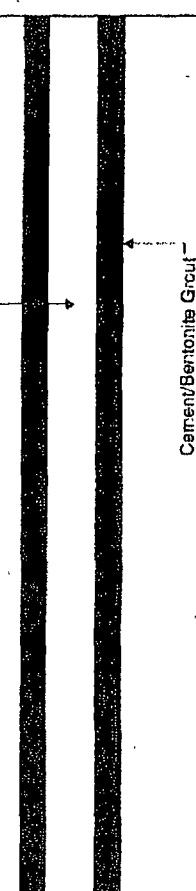
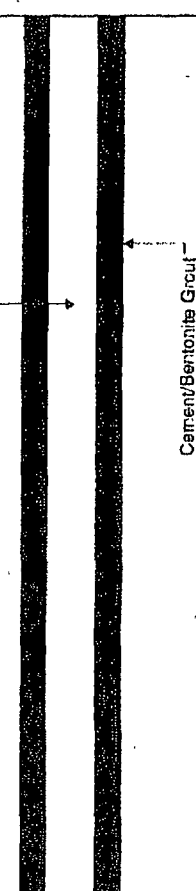
Client: Western Refining Southwest, Inc.
 Site: SWMU Group #3, Bloomfield Refinery
 Job No.: 354 - Bloomfield, NM
 Geologist: Tracy Payne
 Driller: Enviro-Drill, Inc.
 Drilling Rig: CME 75
 Drilling Method: Hollow-Stem Auger
 Sampling Method: Split Spoon
 Comments: N36°41.736' W107°58.304'

Total Depth: 50.25' bgl
 Ground Water: Not Encountered
 Elev., TOC (ft. msl): 5552.285
 Elev., PAD (ft. msl): 5549.043
 Elev., GL (ft. msl): 5549.111
 Site Coordinates:
 N 36°41'44.02863" W 107°58'18.35629"

Well No.: MW-64 (AOC 24 -7)

Start Date: 4/7/2009

Finish Date: 4/7/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
14					0.4		80	Sandy Silt (ML) Low plasticity, fine grain sand, compact, damp, brown, trace gravel	
					57°F				
16					0.4		20	Sandy Silt (ML) Similar to above	
					57°F				
18					0.1		100	Sandy Silt (ML) Similar to above	
					57°F				
20					0.5		100	Sandy Silt (ML) Similar to above, loose, more sand	
					57°F				
22					0.3		100	Silty Sand (SM) Very fine grain, loose, damp, brown	
					57°F				
24					0.1		100	Silty Sand (SM) Similar to above, light brown/tan	
					57°F				
26					0.1		100	Silty Sand (SM) Similar to above	
					57°F				
								Silty Sand (SM) Similar to above	

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RPS

WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.736' W107°58.304'

Total Depth: 50.25' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5552.285
Elev., PAD (ft. msl): 5549.043
Elev., GL (ft. msl): 5549.111
Site Coordinates:
 N 36°41'44.02863" W 107°58'18.35629"

Well No.: MW-84 (AOC 24 -7)
Start Date: 4/7/2009
Finish Date: 4/7/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
28					0.1	57°F	100		
								Silty Sand (SM) Very fine grain, loose, damp, tan	28.5'
					0.3	57°F	100		
30								Silty Sand (SM) Similar to above, decrease in silt	
					0.2	57°F	100		
32								Silty Sand (SM) Similar to above	31.75'
					0.4	57°F	100		
34								Silty Sand (SM) Similar to above	34'
					0.9	57°F	100		
36								Silty Sand (SM) Fine grain, compact, damp, brown, trace gravelly sand at base	
					3.4	57°F	100		
38							0	Gravelly Sand (SW)	
					4.4	68°F	50	Gravelly Sand (SW) Medium to coarse grain, loose, damp, brown, coarse gravel	
40								Gravelly Sand (SW) Similar to above	
					1.2	68°F	50		

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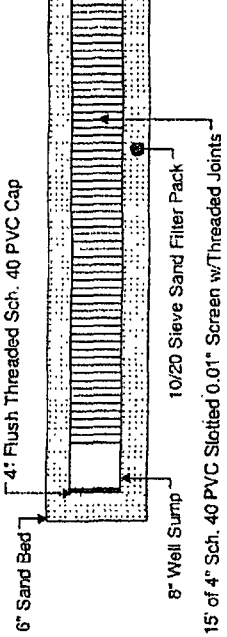
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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36°41.736' W107°58.304'

Total Depth: 50.25' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5552.285
Elev., PAD (ft. msl): 5549.043
Elev., GL (ft. msl): 5549.111
Site Coordinates:
 N 36°41'44.02863" W 107°58'18.35629"

Well No.: MW-64 (AOC 24 -7)**Start Date:** 4/7/2009**Finish Date:** 4/7/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
43					3.1 68°F		80	Gravelly Sand (SW) Similar to above, sand lenses present	
45					3.1 68°F		20	Gravelly Sand (SW) Medium to coarse grain, loose, damp, brown, coarse gravel	
47					3.6 68°F		50	Gravelly Sand (SW) Similar to above	
49							90	Nacimiento Formation Sandy Clay (CH) Dense, very stiff, dry to damp, yellowish brown	
51								Total Depth = 50.25' BGL	
53									
55									

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.826' W107°58.244'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.517
Elev., PAD (ft. msl): 5539.941
Elev., GL (ft. msl): 5539.902
Site Coordinates:
 N 36°41'49.18120" W 107°58'15.39107"

Well No.: MW-65 (AOC 28-8)**Start Date:** 4/16/2009**Finish Date:** 4/16/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
2								
0	0-1' & Dup	0900	G/2V/2E/4J		1.8		Silt/Gravel Six inches of asphalt	
1.5-2'		0920	G/2V/2F/4J		50°F	100	Clayey Silt (ML) Low plasticity, soft, damp, brown	
2					1.0		Clayey Silt (ML) Similar to above	
4					2.3	100	Clayey Silt (ML) Similar to above	
6					50°F		Clayey Silt (ML) Similar to above	
8					2.0	100	Clayey Silt (ML) Similar to above	
10					50°F		Clayey Silt (ML) Similar to above	
12					1.2	100	Clayey Silt (ML) Similar to above	
14					1.0	100	Clayey Silt (ML) Similar to above	
					1.9	80	Sandy Silt (ML) Very fine grain, compact to loose, damp, brown, trace clay	
					46°F		Sandy Silt (ML) Similar to above	
					2.5	70	Sandy Silt (ML) Similar to above	
					46°F			

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RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.826' W107°58.244'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.517
Elev., PAD (ft. msl): 5539.941
Elev., GL (ft. msl): 5539.902
Site Coordinates:
 N 36°41'49.18120" W 107°58'15.39107"

Well No.: MW-65 (AOC 26-8)**Start Date:** 4/16/2009**Finish Date:** 4/16/2009

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
15					2.1 46°F		Sandy Silt (ML) Very fine grain, compact to loose, damp, brown, trace clay	4" Sch. 40 PVC w/ Threaded Joints 4" Sch. 40 PVC Slotted 0.01" Screen w/ Threaded Joints Cement/Bentonite Grout Bentonite Pellets Seve Sand Filter Pack
17					2.1 46°F		Sandy Silt (ML) Similar to above	
19					1.8 45°F		Silty Sand (SM) Very fine grain, loose, damp, light brown	
21					1.2 44°F		Silty Sand (SM) Similar to above, tan sand in seams, calcareous	
23					1.1 44°F		Silty Sand (SM) Similar to above	
25					1.3 44°F		Silty Sand (SM) Similar to above	
27					2.4 45°F		Clayey Silty Sand (SC/SM) Very fine grain, compact, damp, brown, calcareous	
29					11 46°F		Clayey Silty Sand (SC/SM) Similar to above, faint odor	
							Sand (SW) Fine to medium grain, loose, damp, brown, faint odor	

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WELL CONSTRUCTION

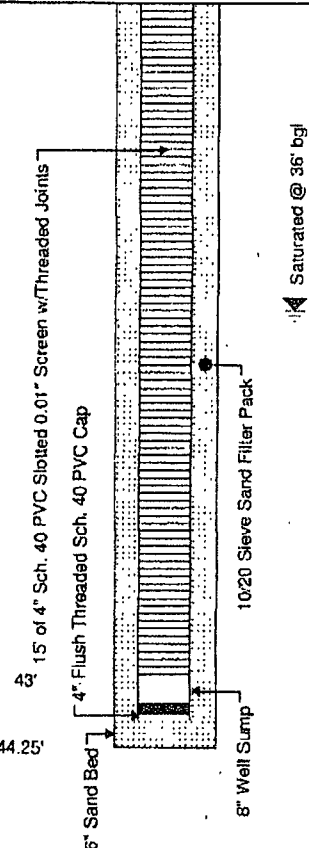
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.826' W107°58.244'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.517
Elev., PAD (ft. msl): 5539.941
Elev., GL (ft. msl): 5539.902
Site Coordinates:
N 36°41'49.18120" W 107°58'15.39107"

Well No.: MW-65 (AOC 26-8)

Start Date: 4/16/2009

Finish Date: 4/16/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
32					20.8 44°F		80	Gravelly Sand (SW) Fine to coarse grain, gravelly at base, damp to moist, odor, gray	
34	32-36'	1430	G/2V/ 2E/4J		58.7 48°F		60	Gravelly Sand (SW) Fine to coarse grain, damp, gravelly, gray, strong odor, trace dark to black clay	
36					145 47°F		80	Gravelly Sand (SW) Similar to above, odor	
38							10	Gravelly Sand (SW) Similar to above, moist to saturated, strong hydrocarbon odor	
40							10	Gravelly Sand (SW) Similar to above, saturated, black	
42							70	Sand (SW) Fine to coarse grain, compact, saturated, dark gray, odor	
44								Sandy Clay/Clayey Sand (CL/SC) Fine grain, very stiff, damp, yellowish brown	
46								Nacimiento Formation Sandy Clay/Clayey Sand (CL/SC) Similar to above, becomes very dense, greenish gray	
Total Depth = 44.25' BGL									



WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.

Site: SWMU Group #3, Bloomfield Refinery

Job No.: 354 - Bloomfield, NM

Geologist: Tracy Payne

Driller: Enviro-Drill, Inc.

Drilling Rig: CME 75

Drilling Method: Hollow-Stem Auger/ODEX

Sampling Method: Split Spoon

Comments: N36°41.818' W107°58.234'

Total Depth: 43.25' bgl

Ground Water: Saturated @ 38' bgl

Elev., TOC (ft. msl): 5544.625

Elev., PAD (ft. msl): 5542.030

Elev., GL (ft. msl): 5541.979

Site Coordinates:

N 36°41'48.97462" W 107°58'14.05858"

Well No.: MW-66 (AOC 26-9)

Start Date: 4/16/2009**Finish Date:** 4/20/2009

Depth (ft.)	Sampling					Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)			
2								Ground Surface Aluminum Protective Cover Steel Reinforced Concrete Pad - 4'x4'x6" 4" Sch. 40 PVC w/Threaded Joints 9" Diameter Borehole Cement/Bentonite Grout
0	0 0.5'	0955	G/2V/ 2E/4J		8.6 66°F	100	Clayey Silt (ML) Low plasticity, firm, damp, brown	
2	1.5 2'	1000	G/2V/ 2E/4J		10.5 66°F	100	Clayey Silt (ML) Similar to above	
4					10.5 66°F	80	Clayey Silt (ML) Similar to above	
6					9.0 66°F	70	Clayey Silt (ML) Similar to above	
8					10.0 66°F	90	Sandy Silt (ML) Very fine grain, compact to loose, damp, brown	
10					8.3 66°F	10	Sandy Silt (ML) Similar to above	
12					8.2 66°F	70	Sandy Silt (ML) Similar to above	

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RPS**WELL CONSTRUCTION****Client:** Western Refining Southwest, Inc.**Site:** SWMU Group #3, Bloomfield Refinery**Job No.:** 354 - Bloomfield, NM**Geologist:** Tracy Payne**Driller:** Enviro-Drill, Inc.**Drilling Rig:** CME 75**Drilling Method:** Hollow Stem Auger/ODEX**Sampling Method:** Split Spoon**Comments:** N36°41.818' W107°58.234'**Total Depth:** 43.25' bgl**Ground Water:** Saturated @ 38' bgl**Elev., TOC (ft. msl):** 5544.625**Elev., PAD (ft. msl):** 5542.030**Elev., GL (ft. msl):** 5541.979**Site Coordinates:****N 36°41'48.97462"****W 107°58'14.05858"****Well No.:** MW-66 (AOC 26-9)**Start Date:** 4/16/2009**Finish Date:** 4/20/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
15					9.6 66°F		80	Sandy Silt (ML) Very fine grain, compact to loose, damp, brown	
17					9.5 66°F		90	Sandy Silt (ML) Similar to above	
19					8.8 66°F		90	Sandy Silt (ML) Similar to above, tan and brown	
21					10.9 66°F		80	Sandy Silt (ML) Similar to above, increase in sand	
								Silty Sand (SM) Very fine grain, compact to loose, damp, light brown	
23					10.4 68°F		90	Silty Sand (SM) Similar to above	
25					10.0 68°F		100	Silty Sand (SM) Similar to above	
27					9.5 68°F		80	Silty Sand (SM) Similar to above	
29					7.9 68°F		70	Silty Sand (SM) Fine to medium grained, compact, damp, brown, trace gravel, clayey	

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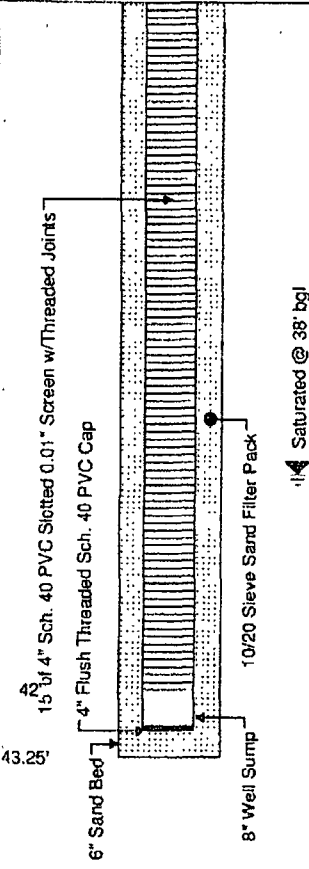


WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36°41.818' W107°58.234'

Total Depth: 43.25' bgl
Ground Water: Saturated @ 38' bgl
Elev., TOC (ft. msl): 5544.625
Elev., PAD (ft. msl): 5542.030
Elev., GL (ft. msl): 5541.979
Site Coordinates:
N 36°41'48.97462" W 107°58'14.05858"

Well No.: MW-66 (AOC 26-9)
Start Date: 4/16/2009
Finish Date: 4/20/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
31					5.6		90	Silty Clayey Sand (SM/SC) Fine to medium grain, compact, damp, brown, trace gravel, clayey	
33					6.3		100	Gravelly Sand (SW) Fine to medium grain, loose, damp, brown, coarse gravel	
35					25.3		30	Gravelly Sand (SW) Similar to above	
37	36-38'	1520	G/2V/ 2E/4J	38'	3939		70	Gravelly Sand (SW) Medium to coarse grain, loose, damp to moist, brown and gray, coarse gravel, odor	
39					75°F		50	Gravelly Sand (SW) Similar to above, saturated, odor	
41							100	Sand (SP) Medium grain, loose, saturated, gray, odor	
43								Nacimiento Formation Sandy Silty Clay (CL) Low to moderate plasticity, stiff to very stiff, dry, grayish green	
45								Total Depth = 43.25' BGL	

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Austin, Texas 78746

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RPS

Client: Western Refining Southwest, Inc.
 Site: SWMU Group #4. Bloomfield Refinery
 Job No.: 354 - Bloomfield, NM
 Geologist: Tracy Payne
 Driller: Enviro-Drill, Inc.
 Drilling Rig: CME 75
 Drilling Method: Hollow-Stem Auger
 Sampling Method: Split Spoon
 Comments: N 36°42.029' W 107°58.194'

WELL CONSTRUCTION

Well No.: MW-67 (SWMU10-9)
 Start Date: 8/26/2010 1230
 Finish Date: 8/26/2010 1630

Total Depth: 23' bgl
 Ground Water: Saturated @ 18' bgl
 Elev., TOC (ft. msl): 5523.312
 Elev., PAD (ft. msl): 5520.676
 Elev., GL (ft. msl): 5520.542
 Site Coordinates:
 N 36°42'01.73369"
 W 107°58'11.54409"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No.	Saturation	Organic Vapor (ppm)	USCS Class			
15					0.5		60	Gravelly Sand (SW) Fine to medium grain, loose, damp, gray, no odor	4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints 10/20 Sieve Sand Filter Pack 4" Flush Threaded Sch. 40 PVC Cap 7" Sand Bed Saturated @ 18' bgl
17	16-18'	1410	G/2V/ 2E/3J	18'	1.0		10	Gravelly Sand (SW) Similar to above, no odor	
19							20	Gravelly Sand (SW) Similar to above, clayey, saturated, no odor	
21							20	Gravelly Sand (SW) Similar to above, saturated, no odor	
23							20	Clay (CH) High plasticity, very stiff, damp to dry, yellowish brown, no odor	
25								Total Depth = 23' BGL	
27									
29									

RPS**WELL CONSTRUCTION**

Client: Western Refining Southwest, Inc.
Site: SWMU Group #5, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N 36°41.957' W107°58.374'

Total Depth: 18' bgl
Ground Water: Saturated @ 14' bgl
Elev., TOC (ft. msl): 5517.372
Elev., PAD (ft. msl): 5514.291
Elev., GL (ft. msl): 5514.304
Site Coordinates:
N 36°41'57.46756"
W 107°58'22.47236"

Well No.: MW-68 (SWMU 15-18)**Start Date:** 8/27/2010 0845**Finish Date:** 8/27/2010 1100

Depth (ft.)	Sampling						Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
3								
1								
1.5-2'		1030	G/2V/ 2E/3J		0.1 72°F		90 Silty Sand (SM) Fine grain, loose, damp, brown, no odor	
0.2					72°F		80 Silty Sand (SM) Similar to above, no odor	
0.5					72°F			
0.1					72°F		10 Gravelly Sand (SW) Fine grain, loose, gray, damp, no odor	
0.1					72°F		10 Gravelly Sand (SW) Similar to above, no odor	
							Gravelly Sand (SW) No recovery, similar to above	
							Gravelly Sand (SW) Similar to above, no odor	
2.0					75°F		60 Gravelly Sand (SW) Similar to above, no odor	
1.5					75°F		50 Gravelly Sand (SW) Similar to above, no odor	
1.3					79°F		80 Gravelly Sand (SW) Similar to above, no odor, very moist to saturated at 14' bgl	

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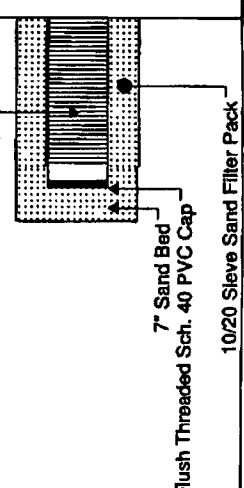
RPS

WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #5, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N 36°41.957' W107°58.374'

Total Depth: 18' bgl
Ground Water: Saturated @ 14' bgl
Elev., TOC (ft. msl): 5517.372
Elev., PAD (ft. msl): 5514.291
Elev., GL (ft. msl): 5514.304
Site Coordinates:
 N 36°41'57.46756"
 W 107°58'22.47236"

Well No.: MW-68 (SWMU 15-18)
Start Date: 8/27/2010 0845
Finish Date: 8/27/2010 1100

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
16							30	Gravelly Sand (SW) Similar to above, saturated, no odor	 4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints 7" Sand Bed 4" Flush Threaded Sch. 40 PVC Cap 10/20 Sieve Sand Filter Pack
17							80	Gravelly Sand (SW) Similar to above, saturated, no odor	
18.25'							100	Weathered Sandstone (SS) Fine to medium grain, dense, friable, damp, light brown to tan Total Depth = 18' BGL	
18									
20									
22									
24									
26									
28									
30									



WELL CONSTRUCTION

Client: Western Refining Southwest, Inc.
Site: SWMU Group #5, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N 36°41.987' W107°58.372'

Total Depth: 12' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5508.513
Elev., PAD (ft. msl): 5505.487
Elev., GL (ft. msl): 5505.201
Site Coordinates:
N 36°41'59.30045"
W 107°58'22.33410"

Well No.: MW-69 (SWMU15-22)
Start Date: 8/31/2010 0830
Finish Date: 8/31/2010 1130

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
0								Ground Surface	
1	0.5'-2'	1005	G/2V/ 2E/3J		1.3 70°F		90	Gravelly Sand (SW) Fine grain, loose, damp, gray, no odor	
3	2'-4'	1015	G/2V/ 2E/3J		1.7 71°F		60	Gravelly Sand (SW) Similar to above, no odor, gravel 1/4-inch to 1-inch	
5					2.2 73°F		50	Gravelly Sand (SW) Similar to above, no odor	
7					2.2 74°F		10	Gravelly Sand (SW) Similar to above, no odor	
9					2.8 74°F		100	Weathered Sandstone (SS) Fine grain, compact/dense, damp, light tan, no odor	
11					2.9 79°F		100	Weathered Sandstone (SS) Similar to above	
13					2.7 79°F			Total Depth = 12' BGL	

Aluminum Protective Cover - 4"x4"x8"

Steel Reinforced Concrete Pad - 4"x4"x8"

1.5'

3.5'

8.5'

9.75'

4" Sch. 40 PVC w/ Threaded Joints

Bentonite Pellets

10" Diameter Borehole

10/20 Sieve Sand Filter Pack

Push Threaded Sch. 40 PVC Cap

7" Sand Bed

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Appendix A

North Boundary Barrier Wall

Appendix B

Chemical Analytical Program

Chemical Analytical Reports

EXECUTIVE SUMMARY

Western Refining Southwest, Inc. - Bloomfield Refinery
50 Road 4990
Bloomfield, NM 87413

US EPA ID: NMD089416416

This report provides a summary of site-wide groundwater monitoring activities conducted at the Bloomfield Refinery in 2010. Monitoring activities conducted during the first half of 2010 followed the guidelines from the *Facility-Wide Groundwater Monitoring Plan December 2007(Revised May 2008)*. Monitoring activities conducted during the latter half of 2010 followed the approved *Facility-Wide Groundwater Monitoring Plan* dated June 2010.

Groundwater Measurements

All facility monitoring wells, recovery wells, observation and collection wells were measured for groundwater elevation in March, April, and August. In March and April, depth-to-fluid measurements were collected in all wells while the recovery wells were in operation and again after the pumps were removed and water levels had stabilized. In August, depth-to-fluid measurements were collected during stabilized groundwater conditions.

Groundwater Monitoring

Semi-annual (April) and annual (August) groundwater sampling activities were performed to monitor potential impacts to groundwater quality associated with historic refinery operations. The semi-annual sampling event followed guidelines from the *Facility-wide Groundwater Monitoring Plan December 2007(Revised 2008)*. The annual sampling event followed guidelines from the *Facility-Wide Groundwater Monitoring Plan* dated June 2010. Future sampling events will continue to follow the most updated Plan.

San Juan River

The San Juan River was sampled on a bi-annual basis in 2010. Analytical results indicate that impacted groundwater from the refinery has not impacted the river.

Tank #33 Effluent

Prior to January 2010, Tank 33 effluent samples were collected on a monthly basis and analyzed for BTEX and MTBE by EPA Method 8260B. In January 2010, analytical results from Tank 33 indicated elevated benzene concentrations. Upon receipt of these results, discharge from Tank 38 to Tank 33 ceased. The discharge piping from Tank 38 was re-routed to discharge directly to the Refinery Wastewater Treatment System. Tank 33 is not longer in-service at this time.

North Boundary Barrier Wall

Groundwater elevation maps indicate that the North Boundary Barrier Wall is performing as intended by capturing the water along the south side of the wall. Inspections of the draws north of the barrier wall indicate where seepage of fuel hydrocarbon impacted water was present has been eliminated.

Visual inspection of Seeps 1-9 has shown groundwater discharge from the seeps along the river bluff has decreased significantly since installation of the slurry wall. Bi-weekly inspections continue to confirm that the vast majority of the fluids in the outfalls are from precipitation events.

Newly Surfaced Groundwater

Newly surfaced groundwater was discovered on Wednesday, May 19, 2010 during a bi-monthly visual inspection of the bluff north of the Refinery. Results of a sample collected in May 2010 indicated elevated concentrations of benzene. Western developed catchments in the area that allowed the surfaced water to be captured. The captured water was pumped to the Refinery for treatment. NMED and OCD were contacted regarding this development. A summary of activities performed and data collected in 2010 regarding this location was provided in a letter report that was submitted to NMED and OCD on February 11, 2011.

Recommendations

Western Refining indefinitely suspended refining operations at the Bloomfield Refinery on November 23, 2009. The crude unloading and product loading racks, storage tanks and other supporting equipment remain in operation. Future monitoring and remedial action will follow the *Facility-Wide Groundwater Monitoring Plan* dated June 2010 or the most updated plan.

Section 1.0 Introduction

SECTION 1.0 INTRODUCTION

1.1 Site Location and Description

Owner: San Juan Refining Company, a NM Corporation
1250 Washington Street
Tempe, AZ 85281

Operator: Western Refining Southwest, Inc.
(Formerly known as Giant Industries Arizona, Inc.), an AZ Corp
1250 Washington Street
Tempe, AZ 85281

Facility Name: Bloomfield Refinery (physical address)
#50 Rd 4990
Bloomfield, New Mexico 87413

Western Refining Southwest, Inc. (postal address)
P.O. Box 159
Bloomfield, New Mexico 87413

Facility Status: Corrective Action/Compliance

US EPA ID: NMD089416416

SIC Code: 2911

Purpose of Monitoring: To Evaluate Present Contamination

Type of Monitoring: Semi-Annual, Annual, and Investigative

The Bloomfield Refinery is a crude oil refining facility with a crude capacity of 18,000 barrels per day. It is located approximately 1 mile south of Bloomfield, New Mexico, in San Juan County, latitude N36 41' 87", longitude W107 58' 70". It is further located approximately ½ mile east of State Route 550 on County Road 4990 (a.k.a. Sullivan Road).

The refinery is located on a bluff 120 feet above the south side of the San Juan River. The top of the bluff is relatively flat and is at an elevation of 5,540 feet above mean sea level (msl). The geological units that comprise the site include, in order of increasing depth, San Juan River Alluvium, Quaternary apron deposits, Aeolian sand and silt, Jackson Lake Terrace, and the Tertiary Nacimiento Formation. An unnamed arroyo flows toward the San Juan River on the southern and western edges of the site. East of the site, a well-defined arroyo cuts a small canyon from the bluff to the San Juan River. Hammond Ditch lies on the bluff between the limit of the Jackson Lake Terrace and the refinery.

Refinery offices are located on the western end of the facility, along with warehouse space, maintenance areas, and a storage yard containing used material (e.g., pipes, valves). Petroleum processing units, located in the northwest portion of the refinery, include the crude unit, fluidized cracking unit, catalytic polymerization unit, and hydrodesulfurization unit. The API Separator and the aeration lagoons are located in the north central section of the refinery.

In the central portion of the site, aboveground storage tanks (AST's) occupy a large percentage of the refinery property. Located on the south side of Sullivan Road are the terminal facilities used for loading product and off-loading crude, as well as gas storage and hazardous waste storage.

On November 23, 2009, Western Refining indefinitely suspended refining operations at the Bloomfield Refinery. The crude unloading and product loading racks, storage tanks and other supporting equipment remain in operation.

1.2 History of Facility Modifications and Improvements

1.2.1 Previous Owner's Activities

Local entrepreneur, Kimball Campbell, constructed the crude topping unit that eventually became the Bloomfield Refinery facility in the late 1950s. O.L. Garretson bought the facility in the early 1960s, renamed it Plateau, Inc. and sold it in 1964 to Suburban Propane of New Jersey.

Operationally, the facility has steadily evolved through a series of improvements, modifications and expansions. Suburban upgraded the facility in 1966, increasing the Crude Unit throughput to 4,100 bpcd and adding 1,850 bpcd Reformer and Naphtha Hydrotreater. In 1975, the Crude Unit was expanded to 8,400 bpcd.

In 1979, the Crude Unit was expanded again to 16,800 bpcd (later demonstrated to have a hydraulic capacity in excess of 18,000 bpcd). A Fluidized Catalytic Cracker (FCC) with a nominal capacity of 6,000 bpcd, an Unsaturated Gas Plant and a Treater Unit were also added at that time. The capacity of the Reformer / Hydrotreater was increased to 2,250 bpcd. The FCC was upgraded in 1982 to conform to State and Federal air quality standards.

1.2.2 Bloomfield Refining Activities

Bloomfield Refining Company (BRC) acquired the facility from Suburban Propane (Plateau) on October 31, 1984. BRC made many improvements to facility operations and equipment. These improvements are summarized below.

1986

- Relocated the spent caustic tank onto a concrete pad with retaining walls.

1987

- Upgraded the Reformer and increased its capacity to 3,600 barrels per day (bpd). Modified the Laboratory and Treater Unit and increased tank storage capacity.
- Cleaned up the North and South bone yards.
- Decommissioned and dismantled old Tanks 6 and 7.
- Relocated the API recovered oil Tank 8 and Tank 9 to concrete pads with concrete retaining walls.
- Established a systematic inspection, maintenance, and repair program for tanks.

1988

- Added a 2,000 bpd Catalytic Polymerization Unit. Removed the facility's two underground storage tanks and replaced them with aboveground storage tanks.
- Completed installation of a Cathodic Protection System for the Tank Farm and underground piping.
- Rebuilt the process area sewer system and added curbed, concrete paving to the unpaved process areas.

1989

- Increased Reformer throughput to 4,000 bpd.
- Activated the groundwater hydrocarbon recovery system.
- Constructed the first double-lined Evaporation Pond as part of Refinery's Discharge Plan improvements.

1990

- Constructed the second double-lined Evaporation Pond as part of the Refinery's Discharge Plan improvements.
- Constructed a drum storage shed and converted to bulk chemical usage, where possible, in order to minimize the use of drummed chemicals.

1991

- Revamped the burner fuel sales rack with concrete paving and curbing.
- Submitted the permit application for a Class 1 Disposal Well.
- Upgraded the groundwater hydrocarbon recovery system.

1992

- Submitted an air quality permit application. The application included a proposal to install a Diesel Hydrosulfurization (HDS) Unit and a Sulfur

Recovery Unit (SRU) in order to comply with new EPA low-sulfur diesel regulations and decrease air emissions.

1993

- Began a program under a Consent Agreement with the United States Environment Protection Agency (USEPA) to conduct Interim Measures (IM), a RCRA Facility Investigation (RFI) and a Corrective Measures Study (CMS) addressing groundwater contamination.
- Replaced portions of the underground cooling water piping.
- Added concrete paving around the API Separator.
- Installed the HDS Unit and SRU.

1994

- Completed installation of the Class 1 Injection Well.
- Retrofitted the Aeration Lagoons with two additional liners.
- Installed a floating cover for the API Separator.
- Closed the clay-lined evaporation ponds and spray evaporation area.

1995

- Improved the diking south of the Refinery to further reduce storm water runoff.
- Began implementation of additional corrective measures for groundwater cleanup as determined from the CMS.

1998

- Converted the former evaporation ponds on the east side of the Refinery to raw water storage ponds.

1999

- Installed sheet pilings and a bentonite slurry wall adjacent to the San Juan River, North of the process units, in order to intercept a small hydrocarbon seep that had been detected in the area.

2001

- Initiated a program to inoculate the Aeration Lagoons with sludge-consuming micro-organisms.

2002

- A concrete liner was installed on the Hammond Ditch. At that time, Giant constructed the Hammond Ditch French Drain Recovery System to address contamination under the ditch.

2003

- Several monitoring wells were converted into recovery wells to further enhance the continuing ground water remediation efforts. MW #45, #46 & #47 were installed to facilitate sample collection. East Outfall #1 Recovery System was set up to return impacted water back to the refinery.

2004

- Monitoring well MW-48, MW-49 and eight temporary piezometers were installed as part of Voluntary River Terrace Investigation activities.
- Several temporary piezometers were drilled on the north side of Hammond Ditch to chart the surface elevation of the Nacimiento Formation. Design of a slurry wall to be constructed on the north side of Hammond Ditch was completed.
- Lined containments were constructed in the draws north of Hammond Ditch in order to collect potentially contaminated groundwater which discharged to the land surface.
- Sewer lines were replaced in the Treater and FCC.

2005

- The North Boundary Barrier Wall installation was completed March 2005. Fourteen observation wells were installed on the north side of the slurry wall and fifteen collection wells were installed on the south side of the slurry wall in April 2005.
- As a matter of preventive maintenance, the lined containments in the draws north of the slurry wall were upgraded periodically.
- In April, five more temporary piezometers were installed at the River Terrace. In August, Dewatering Wells #1 and #2 and thirteen bioventing wells were drilled and construction of the River Terrace Bioventing Project was initiated.

2006

- The River Terrace Bioventing System was put on-line in January 2006. Monitoring data from that project is submitted in a separate report to the regulatory agencies.
- During the week of February 13, 2006 seven sump wells were installed along the bluff north of the barrier wall. These wells were drilled in accordance with the North Barrier Wall Work Plan which was submitted to OCD February 7, 2006.
- Fluids extraction from the observation and collection wells, the north draws, and the sump wells continued throughout 2006.
- As a matter of preventive maintenance, the lined containments in the draws north of the slurry wall were upgraded periodically.

2007

- On May 31, 2007, Giant Industries, Inc. became a wholly-owned subsidiary of Western Refining, Inc. of El Paso, Texas.
- Construction of the Ammonia Refrigeration Unit (ARU) was completed and the system put on line by March 2007. This unit is used to recover propane from hydrogen streams.
- Construction of the Benzene Stripper was completed and the system put in service by October 2007. This unit is used to strip benzene from process waste water.
- Discharge piping was installed at RW #1 to increase the recovery capacity of the well.
- As a matter of preventive maintenance, the lined containments in the draws north of the slurry wall (seeps 1-9) were upgraded periodically.

2008

- The *Facility-Wide Groundwater Monitoring Plan (Revised May 2008)* was approved and implemented in the latter half of 2008.
- In September, Group No. 2 RCRA Site Investigation Activities commenced. Areas included in Group No. 2 are SWMU #2, SWMU #8, SWMU #9, SWMU #11, and SWMU #18.
- As part of the *Closure Plan North and South Aeration Lagoons* the ponds were drained, cleaned out, inspected, repaired, and put back in service. This process started in October 2008 and was completed in February 2009.

2009

- In March, monitoring wells were installed around the Aeration Lagoons to satisfy Group #1 RCRA site investigation requirements. Group #3 site investigation activities began in April. This group includes SWMU #4, SWMU #5, AOC #22, AOC #23, AOC #24, AOC #25, and AOC #26.
- On November 23, 2009, Western Refining indefinitely suspended refining operations at the Bloomfield Refinery. The crude unloading and product loading racks, storage tanks and other supporting equipment remain in operation. Guidelines from the *Facility-Wide Groundwater Monitoring Plan December 2007 (Revised May 2008)* will continue to be followed.

2010

- In January 2010, due to analytical results indicating high benzene levels, piping was installed to permanently route discharge water from Tank 33 to the API Separator.

- Guidelines from the *Facility-Wide Groundwater Monitoring Plan December 2007(Revised May 2008)* were followed through the first six months of 2010.
- In August Group #4 and Group #5 investigation field activities were conducted which included the installation of three monitoring wells.
- After receipt of the New Mexico Environmental Department (NMED) letter *Approval with Direction Facility-Wide Groundwater Monitoring* dated July 26, 2010, Western personnel followed guidelines from the *Facility-Wide Groundwater Monitoring Plan (FWGMP)* dated June 2010.

Section 2.0 Scope of Activities

SECTION 2.0

SCOPE OF ACTIVITIES

Western Refining indefinitely suspended refining operations at the Bloomfield Refinery on November 23, 2009. The crude unloading and product loading racks, storage tanks and other supporting equipment remain in operation. Guidelines from the Facility-Wide Groundwater Monitoring Plan December 2007(Revised May 2008) were followed through the first six months of 2010. After receipt of the New Mexico Environmental Department (NMED) letter Approval With Direction Facility-Wide Groundwater Monitoring dated July 26, 2010, Western personnel followed guidelines from the Facility-Wide Groundwater Monitoring Plan dated June 2010.

The following is a summary of the activities conducted in 2010.

2.1 Below-grade Testing

Throughout 2010, pursuant to conditions of approval stated in Discharge Permit GW-001 (regulated by the Oil Conservation Division), Bloomfield Refinery personnel conducted annual below-grade sump testing and underground process/wastewater line testing.

In July 2010, all water-draw sumps located in the Tank Farm were cleaned out with a vacuum truck, visually inspected, and hydrostatically tested to insure integrity. All sumps passed the hydrostatic test. Double-walled steel (DW Steel) sumps were also inspected through the leak detection port. No evidence of moisture was observed.

Beginning the week of July 12, 2010, all sewer boxes within the facility were cleaned out with a vacuum truck and inspected. No issues were observed during inspection of the sewer boxes.

From June 2010 to October 2010, 5,997 feet of underground piping was hydrostatically tested at Bloomfield Refinery. The piping was located in the Crude Unit, effluent transfer from Tank 37 to the API Separator, effluent transfer from Tank 38 to the API Separator, and effluent transfer from the Aeration Lagoons to the effluent transfer booster pump (P-671) to the Injection Well. No issues were identified during underground piping testing.

Below-grade testing spreadsheets are located in Section 13.0

2.2 Field Data Collection

All facility monitoring wells, recovery wells, observation and collection wells were measured for groundwater elevation in March and April following the guidelines from the *Facility-Wide Groundwater Monitoring Plan December 2007(Revised May 2008)*. Depth-to-groundwater measurements were collected in all wells while the recovery wells were in operation and again after the pumps were removed and water levels had stabilized.

After receipt of the New Mexico Environmental Department (NMED) letter *Approval With Direction Facility-Wide Groundwater Monitoring* dated July 26, 2010, Western personnel followed guidelines from the *Facility-Wide Groundwater Monitoring Plan* dated June 2010. In August, prior to groundwater sampling activities, groundwater levels and SPH thickness measurements were collected at all wells after the pumps had been removed and groundwater levels had stabilized.

All water/product levels were measured to an accuracy of 0.01 foot using a Geotech Interface Probe. After determining water levels, initial well volumes are calculated. Total purge volume is determined by monitoring electrical conductance (E.C.), pH, temperature, oxidation reduction potential (ORP), and total dissolved solids (TDS). After every two gallons or each well volume, whichever is less, has been purged from the well. The wells were considered satisfactorily purged after purging three well volumes or when the field parameter values did not vary by more than 10 percent for at least three measurements. Field parameters are measured using an Ultrameter 6P.

All purged water was collected in a 55-gallon drum and disposed of through the refinery wastewater system.

Field data and well elevations can be found in Section 8.0, Tabs 1.0 – 3.0 and in Appendix A – Tabs 1.0 -15.0.

2.3 North Boundary Barrier Wall Monitoring

Installation of the North Boundary Barrier Wall and Collection System was completed by late April 2005. A biweekly fluid measurement plan was established in August 2005 and continued throughout 2009. This plan requires monitoring of all observation and collection wells as well as MW-11, MW-12, MW-20, MW-21, MW-39, MW-45, MW-46, and MW-47.

From April 2005 thru March 31, 2008, a vacuum truck was used to remove total fluids from the collection and observation wells three times per week. Since April 2008, total fluids removal from the observation and collection wells along Hammond Ditch was conducted using a hand bailer to periodically pull separate phase hydrocarbon from OW 0 +60, OW 1+50, OW 3+85, OW 11+15, MW-45, and MW-47. All purged water was collected in a 55-gallon drum and disposed of through the refinery wastewater system.

A bi-weekly fluid measurement program was utilized throughout 2010 to monitor the sump wells. Measured depth to groundwater tables can be found in Section 8.0 - Tab 2.0.

2.3.1 Semi-Annual Monitoring

Semi-annual sample collection began during the week of April 5, 2010. Samples were collected from each observation well and two collection wells (CW 0+60 and CW 25+95), with the exception of wells that contained separate-phase hydrocarbon (SPH), wells that were dry, or wells that did not contain enough

water to collect a sample. The samples collected were submitted to HALL Environmental Laboratories (HALL) and analyzed for the following:

- Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), and methyl tert-butyl ether (MTBE) by EPA Method 8260B;
- Total Petroleum Hydrocarbons - Diesel Range Organics (TPH-DRO) by EPA Method 8015B;
- Total Petroleum Hydrocarbons - Gasoline Range Organics (TPH-GRO) by EPA Method 8015B (no including at the collection wells).

Prior to sample collection, field measurements were collected which included pH, temperature, dissolved oxygen (DO), oxidation reduction potential (ORP), electrical conductivity (E.C.) and total dissolved solids (TDS).

Semi-annual sampling results indicated high benzene levels in CW 25+95 (22 ppm) therefore the well was placed in recovery well service in May 2010.

Measured depth-to-groundwater tables, analytical results, and field measurements are summarized in Appendix A – Tabs 1-16.

2.3.2 Annual Monitoring

Annual sampling occurred the week of August 16, 2010. Samples were collected from each observation well and two collection wells (CW 0+60 and CW 25+95), with the exception of wells that contained separate-phase hydrocarbon (SPH), wells that were dry, or wells that did not contain enough water to collect a sample. The samples collected were submitted to HALL and analyzed for the following:

- BTEX and MTBE by EPA Method 8260B
- TPH-DRO by EPA Method 8015B
- TPH-GRO by EPA Method 8015B (for observation wells only)

Prior to sample collection, field measurements were collected which included pH, temperature, DO, ORP, electrical conductivity, and TDS.

Measured depth-to-groundwater tables, analytical results, and field measurements are summarized in Appendix A – Tabs 1-16.

2.4 Seeps Monitoring

A bi-weekly visual inspection of the Seeps (Seeps 1 thru Seep 9) and the San Juan River Bluff occurred in 2010.

2.4.1 Semi-Annual Monitoring

During the week of April 12, 2010 semi-annual samples were collected from Seeps 1, 2, 3, 6, and 9. The samples collected were submitted to HALL and analyzed for the following:

- BTEX by EPA Method 8260B
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Alkalinity and Carbon Dioxide by SM2320B
- General Chemistry by EPA Method 300.0

Prior to sample collection, field measurements were collected which included pH, temperature, DO, ORP, electrical conductivity, and TDS. Seeps 4, 5, 7, and 8 were dry when semi-annual monitoring was conducted; therefore analytical samples were not collected in April 2010 at these locations.

Analytical results can be found in Section 8.0 - Tab 9.0. Field measurements can be found in Section 8.0 – Tab 3.0.

2.4.2 Annual Monitoring

During the week of August 9, 1009, samples were collected from Seep 1, 3, and 6. The samples collected were submitted to HALL and analyzed for the following:

- BTEX and MTBE by EPA Method 8260B
- SVOCs by EPA Method 8270
- Alkalinity and Carbon Dioxide by SM2320B
- General Chemistry by EPA Method 300.0

Prior to sample collection, field measurements were collected which included pH, temperature, DO, ORP, electrical conductivity, and TDS.

Seeps 2, 4, 5, 7, and 8 were dry when annual monitoring activities were conducted; therefore analytical samples were not collected in August 2010 at these locations.

Analytical results can be found in Section 8.0 - Tab 9.0. Field measurements can be found in Section 8.0 – Tab 3.0.

2.4.3 Surfaced Groundwater

Newly surfaced groundwater was discovered on Wednesday, May 19, 2010 during the bi-monthly visual inspections of the bluff north of the refinery. This new area is located north of the raw water ponds. A sample was collected on that day and analyzed for BTEX and MTBE by EPA Method 8260B. Results were received on May 26, 2010 that indicated a detected benzene concentration of 110 micrograms per liter (ug/l).

NMED and OCD were contacted following confirmation of the benzene detected concentration. A summary of the activities performed and data collected throughout 2010 at this area was provided in the letter report submitted to NMED and OCD from Western on February 11, 2011. Western personnel will follow the guidelines stated in NMED's response letter Response to Newly Surfaced Groundwater Data Summary dated March 2, 2011.

2.5 Outfall Monitoring

In January 2010, an effluent sample was collected from Tank 33 and analyzed for the following constituents:

- BTEX and MTBE by EPA Method 8260B

Analytical results indicated a detected benzene concentration of 54 milligrams per liter (mg/L). Based on these results, discharge from Tank 33 was discontinued. Vacuum trucks were used to transfer effluent water from Tank 38 to the API Separator while piping was installed to permanently route water to the API Separator. Currently Tank 33 is bypassed and no analysis is occurring.

2.5.1 Semi-Annual Monitoring

The facility-wide semi-annual monitoring event began during the week of April 5, 2010. Guidelines from the *Facility-Wide Groundwater Monitoring Plan (revised 2008)* were followed. Samples were collected from East Outfall #2 and East Outfall #3 and analyzed for the following constituents:

- BTEX and MTBE by EPA Method 8262B
- Dissolved Metals by EPA Method 6010B
- Total Metals by EPA 6010B & 7470
- Anions by EPA Method 300.0
- Alkalinity and Carbon Dioxide by Standard Method SM 2320B

Prior to sample collection, field measurements were collected which included pH, temperature, ORP, electrical conductivity, and TDS.

Analytical results are in Section 8.0 - Tab 9.0 and field measurements are located in Section 8.0 – Tab 3.0.

2.5.2 Annual Monitoring

On August 8, 2010, samples were collected at East Outfall #2 and East Outfall #3. The samples were submitted to HALL and analyzed for the following constituents:

- BTEX and MTBE by EPA Method 8262B
- Dissolved Metals by EPA Method 6010B
- Total Metals by EPA 6010B & 7470
- Anions by EPA Method 300.0
- Alkalinity and Carbon Dioxide by Standard Method SM 2320B

Prior to sample collection, field measurements were collected which included pH, temperature, ORP, electrical conductivity, and TDS.

2.6 Refinery Complex Monitoring

2.6.1 Semi-Annual Monitoring

The Facility-Wide Semi-Annual Monitoring Event began during the week of April 5, 2010. Guidelines from the *Facility-Wide Groundwater Monitoring Plan (revised 2008)* were followed. Groundwater samples were collected from MW-1, MW-8, MW-12, MW-13, MW-30, MW-33, MW-35, MW-37, and MW-38. Samples collected were submitted to HALL and analyzed for the following constituents:

- BTEX and MTBE by EPA Method 8260B
- TPH-GRO by EPA Method 8015B
- TPH-DRO by EPA Method 8015B

Prior to sample collection, field measurements were collected which included pH, temperature, DO, ORP, electrical conductivity, and TDS.

MW-6 was dry and therefore not sampled. MW-20 contained separate phase hydrocarbon and was not sampled.

Analytical results are summarized in Section 8.0 Tabs 4.0 – 7.0. Field measurements are located in Section 8.0 – Tab 3.0.

2.6.2 Annual Monitoring

The Facility-Wide Annual Monitoring Event began during the week of August 16, 2010. Guidelines from the *Facility-Wide Groundwater Monitoring Plan* dated June 2010 were followed. Groundwater samples were collected from MW-1, MW-4, MW-8, MW-11, MW-12, MW-13, MW-26, MW-27, MW-29, MW-30, MW-31, MW-32, MW-33, MW-34, MW-35, MW-37, MW-38, MW-40, MW-44, RW-9, RW-15, RW-18, RW-23, and RW-43. The samples collected were submitted to HALL and analyzed for the following constituents:

- Volatile Organic Compounds (VOCs) by EPA Method 8260B
- TPH-GRO and TPH-DRO by EPA Method 8015B
- Total RCRA 8 Metals by EPA Method 6010B/7470
- Dissolved Metals by EPA Method 6010B
- Anions by EPA Method 300.0
- Alkalinity and Carbon Dioxide by Standard Method SM2320B

Prior to sample collection, field measurements were collected which included pH, temperature, DO, ORP, electrical conductivity, and TDS.

MW-3, MW-5, and MW-6 were dry and no samples were collected. MW-20, MW-21, RW-28, and RW-42 contained separate phase hydrocarbon and were not sampled.

With implementation of the *Facility-Wide Groundwater Monitoring Plan* dated June 2010, RCRA Investigation wells were also included in the annual sampling

event. Samples were collected from MW-50, MW-51, MW-52, MW-53, MW-55, MW-58, MW-59, MW-60, MW-62, MW-63, MW-64, and MW-65. The samples were analyzed for the following constituents:

- VOCs by EPA Method 8260B
- SVOCs by EPA Method 8270
- TPH-GRO and TPH-DERO by EPA Method 8015B
- Total RCRA 8 Metals by EPA Method 6010B/7470
- Dissolved Metals by EPA Method 6010B
- Anions by EPA Method 300.0
- Alkalinity/Carbon Dioxide by Standard Method SM2320B

Prior to sample collection, field measurements were collected which included pH, temperature, DO, ORP, electrical conductivity, and TDS.

MW-54, MW-56, MW-57, MW-61, and MW-66 contained separate phase hydrocarbon and therefore were not sampled.

The analytical laboratory analyzed for combined Nitrate (as N) + Nitrite (as N) to meet hold time for MW-40, MW-55, MW-58, MW-59, MW-64, and MW-65. Due to matrix interferences, the total selenium reporting level on MW-59 is above the regulatory level of 0.05 mg/L. This was due to required dilution during sample analysis.

Analytical results are summarized in Section 8.0 -Tabs 4.0 -8.0. Field measurements are located in Section 8.0 – Tab 3.0.

2.7 San Juan River Monitoring

The San Juan River was sampled on a semi-annual basis in 2010. Samples were collected in April and August and analyzed for the following constituents:

- BTEX and MTBE by EPA Method 8260B
- TPH-GRO and TPH-DRO by EPA Method 8015B
- Total RCRA 8 Metals by EPA Method 6010B/7470
- Dissolved Metals by EPA Method 6010B
- Cations and Anions by EPA Method 300.0
- Alkalinity and Carbon Dioxide by Standard Method SM 2320B

Analysis is summarized in Section 8.0 - Tab 10.0.

Section 3.0 Regulatory Criteria / Groundwater Cleanup Standards

Table of New Mexico and USEPA Groundwater Standards

Metals	(mg/l)
Antimony	0.006 ²
Arsenic	0.01 ²
Barium	1.0
Beryllium	0.004 ²
Cadmium	0.005 ²
Chromium	0.05
Cobalt	0.05
Copper	1.0
Cyanide	0.2
Lead	0.015 ²
Mercury	0.002
Nickel	0.200
Selenium	0.05
Silver	0.05
Uranium	0.03
Vanadium	0.26 ³
Zinc	10.0

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

Table of New Mexico and USEPA Groundwater Standards

Semivolatiles	(ug/l)
1,2,4-Trichlorobenzene	70 ²
1,2-Dichlorobenzene	600 ²
1,3-Dichlorobenzene	Ne
1,4-Dichlorobenzene	75 ²
2,4,5-Trichlorophenol	3,700 ³
2,4,6-Trichlorophenol	6.1 ³
2,4-Dichlorophenol	110 ³
2,4-Dimethylphenol	730 ³
2,4-Dinitrophenol	73 ³
2,4-Dinitrotoluene	0.22 ³
2,6-Dinitrotoluene	37 ³
2-Chloronaphthalene	2900 ³
2-Chlorophenol	180 ³
2-Methylnaphthalene	150 ³
2-Methylphenol	1,800 ³
2-Nitroaniline	110 ³
2-Nitrophenol	Ne
3,3'-Dichlorobenzidine	0.15 ³
3+4-Methylphenol	180 ³
3-Nitroaniline	Ne
4,6-Dinitro-2-methylphenol	Ne
4-Bromophenyl phenyl ether	Ne
4-Chloro-3-methylphenol	Ne
4-Chloroaniline	0.34 ³
4-Chlorophenyl phenyl ether	Ne
4-Nitroaniline	3.4 ³
4-Nitrophenol	Ne
Acenaphthene	2200 ³
Acenaphthylene	Ne

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

Table of New Mexico and USEPA Groundwater Standards

Semivolatiles	(ug/l)
Aniline	12 ³
Anthracene	1100 ³
Azobenzene	0.12 ³
Benz(a)anthracene	0.029 ³
Benzo(a)pyrene	0.2 ²
Benzo(b)fluoranthene	0.029 ³
Benzo(g,h,i)perylene	Ne
Benzo(k)fluoranthene	0.29 ³
Benzoic acid	150,000 ³
Benzyl alcohol	1800 ³
Bis(2-chloroethoxy)methane	110 ³
Bis(2-chloroethyl)ether	0.012 ³
Bis(2-chloroisopropyl)ether	Ne
Bis(2-ethylhexyl)phthalate	6 ²
Butyl benzyl phthalate	35 ³
Carbazole	Ne
Chrysene	2.9 ³
Dibenz(a,h)anthracene	0.0029 ³
Dibenzofuran	Ne
Diethyl phthalate	29,000 ³
Dimethyl phthalate	Ne
Di-n-butyl phthalate	Ne
Di-n-octyl phthalate	Ne
Fluoranthene	1,500 ³
Fluorene	1500 ³
Hexachlorobenzene	1.0 ²
Hexachlorobutadiene	0.86 ³
Hexachlorocyclopentadiene	50 ²
Hexachloroethane	4.8 ³

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

Table of New Mexico and USEPA Groundwater Standards

Semivolatiles	(ug/l)
Indeno(1,2,3-cd)pyrene	0.029 ³
Isophorone	71 ³
Naphthalene	0.14 ³
Nitrobenzene	0.12 ³
N-Nitrosodimethylamine	0.00042 ³
N-Nitrosodi-n-propylamine	0.0096 ³
N-Nitrosodiphenylamine	14 ³
Pentachlorophenol	1 ²
Phenanthrene	Ne
Phenol	5 ³
Pyrene	1100 ³
Pyridine	37 ³

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

Table of New Mexico and USEPA Groundwater Standards

Volatiles	(ug/l)
1,1,1,2-Tetrachloroethane	0.52 ³
1,1,1-Trichloroethane	60
1,1,2,2-Tetrachloroethane	10
1,1,2-Trichloroethane	5 ²
1,1-Dichloroethane	25
1,1-Dichloroethene	5
1,1-Dichloropropene	Ne
1,2,3-Trichlorobenzene	Ne
1,2,3-Trichloropropane	0.0096 ³
1,2,4-Trichlorobenzene	70.0 ²
1,2,4-Trimethylbenzene	15.0 ³
1,2-Dibromo-3-chloropropane	0.2 ²
1,2-Dibromoethane (EDB)	0.05 ²
1,2-Dichlorobenzene	600.0 ²
1,2-Dichloroethane (EDC)	5 ²
1,2-Dichloropropane	5.0 ²
1,3,5-Trimethylbenzene	12 ³
1,3-Dichlorobenzene	Ne
1,3-Dichloropropane	730 ³
1,4-Dichlorobenzene	75.0 ²
1-Methylnaphthalene	2.3 ³
2,2-Dichloropropane	Ne
2-Butanone	710.0 ³
2-Chlorotoluene	730.0 ³
2-Hexanone	Ne
2-Methylnaphthalene	150 ³
4-Chlorotoluene	2600 ³
4-Isopropyltoluene	Ne
4-Methyl-2-pentanone	Ne

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

Table of New Mexico and USEPA Groundwater Standards

Volatiles	(ug/l)
Acetone	22000 ³
Benzene	5 ²
Bromobenzene	20 ³
Bromodichloromethane	0.12 ³
Bromoform	8.5 ³
Bromomethane	8.7 ³
Carbon disulfide	1,000 ³
Carbon Tetrachloride	5 ²
Chlorobenzene	100.0 ²
Chloroethane	Ne
Chloroform	100
Chloromethane	190 ³
cis-1,2-DCE	70 ²
cis-1,3-Dichloropropene	0.4 ³
Dibromochloromethane	0.15 ³
Dibromomethane	370 ³
Dichlorodifluoromethane	390 ³
Ethylbenzene	700 ²
Hexachlorobutadiene	0.86 ³
Isopropylbenzene	680 ³
Methyl tert-butyl ether (MTBE)	12 ³
Methylene Chloride	5 ²
Naphthalene	0.14 ³
n-Butylbenzene	Ne
n-Propylbenzene	Ne
sec-Butylbenzene	Ne
Styrene	100 ²
tert-Butylbenzene	Ne
Tetrachloroethene (PCE)	5 ²

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

Table of New Mexico and USEPA Groundwater Standards

Volatiles	(ug/l)
Toluene	750
trans-1,2-DCE	100 ²
trans-1,3-Dichloropropene	0.4 ³
Trichloroethene (TCE)	5 ²
Trichlorofluoromethane	1,300 ³
Vinyl chloride	1
Xylenes, Total	620

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

Table of New Mexico and USEPA Groundwater Standards

General Chemistry	(mg/l)
Alkalinity, Total (As CaCO ₃)	Ne
Bicarbonate	Ne
Calcium	Ne
Carbonate	Ne
Chloride	250
Fluoride	1.6
Iron	1
Magnesium	Ne
Manganese	0.2
Nitrogen, Nitrate (As N)	10
Nitrogen, Nitrite (As N)	1 ²
Nitrate (As N)+Nitrite (As N)	10
Potassium	Ne
Sodium	Ne
Sulfate	600

Groundwater Standards are WQCC 20NMAC 6.2.3103 unless otherwise indicated

2 - Federal Maximum Contaminant Level

3 - USEPA Regional Screening Levels (April 2009)

Ne - not established

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 D 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 unfiltered concentrations of the contaminants.

A. Human Health Standards-Ground water shall meet the standards of Subsection A and B of this section unless otherwise provided. If more than one water contaminant affecting human health is present, the toxic pollutant criteria as set forth in the definition of toxic pollutant in Section 20.6.2.1101 NMAC for the combination of contaminants, or the Human Health Standard of Subsection A of Section 20.6.2.3103 NMAC for each contaminant shall apply, whichever is more stringent. Non-aqueous phase liquid shall not be present floating atop of or immersed within ground water, as can be reasonably measured.

(1)	Arsenic (As).....	0.1 mg/l
(2)	Barium (Ba).....	1.0 mg/l
(3)	Cadmium (Cd).....	0.01 mg/l
(4)	Chromium (Cr).....	0.05 mg/l
(5)	Cyanide (CN).....	0.2 mg/l
(6)	Fluoride (F).....	1.6 mg/l
(7)	Lead (Pb).....	0.05 mg/l
(8)	Total Mercury (Hg).....	0.002 mg/l
(9)	Nitrate (NO ₃ as N).....	10.0 mg/l
(10)	Selenium (Se).....	0.05 mg/l
(11)	Silver (Ag).....	0.05 mg/l
(12)	Uranium (U).....	0.03 mg/l
(13)	Radioactivity: Combined Radium-226 & Radium-228.....	30 pCi/l
(14)	Benzene.....	0.01 mg/l
(15)	Polychlorinated biphenyls (PCB's).....	0.001 mg/l
(16)	Toluene.....	0.75 mg/l
(17)	Carbon Tetrachloride.....	0.01 mg/l
(18)	1,2-dichloroethane (EDC).....	0.01 mg/l
(19)	1,1-dichloroethylene (1,1-DCE).....	0.005 mg/l
(20)	1,1,2,2-tetrachloroethylene (PCE).....	0.02 mg/l
(21)	1,1,2-trichloroethylene (TCE).....	0.1 mg/l
(22)	ethylbenzene.....	0.75 mg/l
(23)	total xylenes.....	0.62 mg/l
(24)	methylene chloride.....	0.1 mg/l
(25)	chloroform.....	0.1 mg/l
(26)	1,1-dichloroethane.....	0.025 mg/l
(27)	ethylene dibromide (EDB).....	0.0001 mg/l
(28)	1,1,1-trichloroethane.....	0.06 mg/l
(29)	1,1,2-trichloroethane.....	0.01 mg/l
(30)	1,1,2,2-tetrachloroethane.....	0.01 mg/l
(31)	vinyl chloride.....	0.001 mg/l
(32)	PAHs: total naphthalene plus monomethylnaphthalenes.....	0.03 mg/l
(33)	benzo-a-pyrene.....	0.0007 mg/l

B. Other Standards for Domestic Water Supply

(1)	Chloride (Cl).....	250.0 mg/l
(2)	Copper (Cu).....	1.0 mg/l
(3)	Iron (Fe).....	1.0 mg/l
(4)	Manganese (Mn).....	0.2 mg/l
(6)	Phenols.....	0.005 mg/l
(7)	Sulfate (SO ₄).....	600.0 mg/l
(8)	Total Dissolved Solids (TDS).....	1000.0 mg/l
(9)	Zinc (Zn).....	10.0 mg/l
(10)	pH.....	between 6 and 9

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)	5.0 mg/l
(2)	Boron (B)	0.75 mg/l
(3)	Cobalt (Co)	0.05 mg/l
(4)	Molybdenum (Mo)	1.0 mg/l
(5)	Nickel (Ni)	0.2 mg/l

[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]

[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. For any new water discharges, the uranium standard is effective 9-26-04]

NEW MEXICO ENVIRONMENT DEPARTMENT TPH SCREENING GUIDELINES
October 2006

In some instances, it may be practical to assess areas of soil contamination that are the result of releases of petroleum products such as jet fuel and diesel, using total petroleum hydrocarbon (TPH) analyses. TPH results may be used to delineate the extent of petroleum-related contamination at these sites and ascertain if the residual level of petroleum products in soil represents an unacceptable risk to future users of the site. Petroleum hydrocarbons represent complex mixtures of compounds, some of which are regulated constituents and some compounds that are not regulated. In addition, the amount and types of the constituent compounds in a petroleum hydrocarbon release differ widely depending on what type of product was spilled and how the spill has weathered. This variability makes it difficult to determine the toxicity of weathered petroleum products in soil solely from TPH results; however, these results can be used to approximate risk in some cases, depending upon the nature of the petroleum product, the release scenario, how well the site has been characterized, and anticipated potential future land uses. In some cases, site clean up cannot be based solely on results of TPH sampling. The New Mexico Environment Department (NMED) will make these determinations on a case by case basis. If NMED determines that additional data are necessary, these TPH guidelines must be used in conjunction with the screening guidelines for individual petroleum-related contaminants in Table 3 and other contaminants, as applicable.

The screening levels for each petroleum carbon range from the Massachusetts Department of Environmental Protection (MADEP) Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons (VPH/EPH) approach and the percent composition table below were used to generate screening levels corresponding to total TPH. Except for waste oil, the information in the compositional assumptions table was obtained from the Massachusetts Department of Environmental Protection guidance document *Implementation of the MADEP VPH/EPH Approach* (October 31, 2002). TPH toxicity was based only on the weighted sum of the toxicity of the hydrocarbon fractions listed in Table 1.

Table 1. TPH Compositional Assumptions in Soil

Petroleum Product	C11-C22 Aromatics	C9-C18 Aliphatics	C19-C36 Aliphatics
Diesel #2/ new crankcase oil	60%	40%	0%
#3 and #6 Fuel Oil	70%	30%	0%
Kerosene and jet fuel	30%	70%	0%
Mineral oil dielectric fluid	20%	40%	40%
Unknown oil ^a	100%	0%	0%
Waste Oil ^b	0%	0%	100%

^a Sites with oil from unknown sources must be tested for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

^b Compositional assumption for waste oil developed by NMED is based on review of chromatographs of several types of waste oil. Sites with waste oil must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.

A TPH screening guideline was calculated for each of the types of petroleum product based on the assumed composition from Table 1 for petroleum products and the direct soil standards incorporating ceiling concentrations given in the MADEP VPH/EPH Excel spreadsheet for each of the carbon fractions. Groundwater concentrations are based on the weighted sum of the noncarcinogenic toxicity of the petroleum fractions.

Method 1 from the MADEP VPH/EPH document was applied, which represents generic cleanup standards for soil and groundwater. Method 1 applies if contamination exists in only soil and groundwater. The MADEP VPH/EPH further divides groundwater into standards. Standard GW-1 applies when groundwater may be used for drinking water purposes. GW-1 standards are based upon ingestion and use of groundwater as a potable water supply. The TPH screening guidelines for sites with potable groundwater are presented in Table 2a.

Table 2a. TPH Screening Guidelines for Potable Groundwater (GW-1)

TPH			Concentration in Groundwater (mg/L)
Petroleum Product	Residential Direct Exposure (mg/kg)	Industrial Direct Exposure (mg/kg)	
Diesel #2/crankcase oil	520	1120	1.72
#3 and #6 Fuel Oil	440	890	1.34
Kerosene and jet fuel	760	1810	2.86
Mineral oil dielectric fluid	1440	3040	3.64
Unknown oil ^a	200	200	0.2
Waste Oil ^b	2500	5000	Petroleum-Related Contaminants
Gasoline	Not applicable	Not applicable	Petroleum-Related Contaminants
^a Sites with oil from unknown sources must be tested for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.			
^b Compositional assumption for waste oil developed by NMED is based on review of chromatographs of several types of waste oil. Sites with waste oil must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.			

The second standard is GW-2, which is applicable for sites where the depth to groundwater is less than 15 feet from the ground surface and within 30 feet of an occupied structure. The structure may be either residential or industrial. GW-2 standards are based upon "inhalation exposures that could occur to occupants of the building impacted by volatile compounds, which partition from the groundwater" (MADEP 2001). The GW-2 screening guidelines ONLY apply for the evaluation of inhalation exposures. If potential ingestion or contact with contaminated soil and/or

groundwater could occur, then the screening guidelines provided in Table 2.a should be applied. Table 2.b lists the TPH screening guidelines for the inhalation scenario.

Table 2b. TPH Screening Guidelines – Vapor Migration and Inhalation of Groundwater (GW-2)

TPH			Concentration in Groundwater (mg/L)
Petroleum Product	Residential Direct Exposure (mg/kg)	Industrial Direct Exposure (mg/kg)	
Diesel #2/crankcase oil	880	2200	30.4
#3 and #6 Fuel Oil	860	2150	35.3
Kerosene and jet fuel	940	2350	15.7
Mineral oil dielectric fluid	1560	3400	10.4
Unknown oil ^a	800	2000	50.0
Waste Oil ^b	2500	5000	Petroleum-Related Contaminants
Gasoline	Not applicable	Not applicable	Petroleum-Related Contaminants
^a Sites with oil from unknown sources must be tested for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines. ^b Compositional assumption for waste oil developed by NMED is based on review of chromatographs of several types of waste oil. Sites with waste oil must be tested for VOCs, SVOCs, metals, and PCBs to determine if other potentially toxic constituents are present. The TPH guidelines in Table 2 are not designed to be protective of exposure to these constituents therefore they must be tested for, and compared to, their individual NMED soil screening guidelines.			

Mineral oil based hydraulic fluids can be evaluated for petroleum fraction toxicity using the screening guidelines from Tables 2a and 2b specified for waste oil, because this type of hydraulic fluid is composed of approximately the same range of carbon fractions as waste oil. However, these hydraulic fluids often contain proprietary additives that may be significantly more toxic than the oil itself; these additives must be considered on a site- and product-specific basis (see ATSDR hydraulic fluids profile reference). **Use of alternate screening guideline values requires prior written approval from the New Mexico Environment Department.** TPH screening guidelines in Tables 2a and 2b must be used in conjunction with the screening levels for petroleum-related contaminants given in Table 3 because the TPH screening levels are NOT designed to be protective of exposure to these individual petroleum-related contaminants. Table 3 petroleum-related contaminants screening levels are based on the *NMED Technical Background Document for Development of Soil Screening Levels, Rev 4.0 (June 2006)*.

The list of petroleum-related contaminants does not include polyaromatic hydrocarbons (PAHs) with individual screening levels that would exceed the total TPH screening levels (acenaphthene, anthracene, flouranthene, flourene, and pyrene). In addition, these TPH screening guidelines are based solely on human health, not ecological risk considerations, protection of surface water, or

potential indoor air impacts from soil vapors. Potential soil vapor impacts to structures or utilities are not addressed by these guidelines. Site-specific investigations for potential soil vapor impacts to structures or utilities must be done to assure that screenings are consistently protective of human health, welfare or use of the property. NMED believes that use of these screening guidelines will allow more efficient screenings of petroleum release sites at sites while protecting human health and the environment. Copies of the references cited below are available on the MADEP website at http://www.state.ma.us/dep/bwsc/vph_eph.htm and the NMED website at <http://www.nmenv.state.nm.us/HWB/guidance.html>.

Revised Table 3. Petroleum-Related Contaminants Screening Guidelines

Petroleum-Related Contaminants	Values for Direct Exposure to Soil		NMED DAF ^a 20 GW Protection (mg/kg in soil)	NMED DAF ^b 1 GW Protection (mg/kg in soil)
	NMED Residential SSL (mg/kg)	NMED Industrial SSL (mg/kg)		
Benzene	1.03E+01	2.58E+01	2.01E-02	1.00E-03
Toluene	2.52E+02	2.52E+02	2.17E+01	1.08E+00
Ethylbenzene	1.28E+02	1.28E+02	2.02E+01	1.01E+00
Xylenes ^c	8.20E+01	8.20E+01	2.06E+00	1.03E-01
Naphthalene	7.95E+01	3.00E+02	3.94E-01	1.97E-02
2-Methyl naphthalene ^d	5.00E+02	1.00E+03	— ^e	— ^e
Benzo(a)anthracene	6.21E+00	2.34E+01	1.09E+01	5.43E-01
Benzo(b)fluoranthene	6.21E+00	2.34E+01	3.35E+01	1.68E+00
Benzo(k)fluoranthene	6.21E+01	2.34E+02	3.35E+02	1.68E+01
Benzo(a)pyrene	6.21E-01	2.34E+00	2.78E+00	1.39E-01
Chrysene	6.15E+02	2.31E+03	3.48E+02	1.74E+01
Dibenz(a,h)anthracene	6.21E-01	2.34E+00	1.04E+01	5.18E-01
Indeno(1,2,3-c,d)pyrene	6.21E+00	2.34E+01	9.46E+01	4.73E+00
^a DAF - Dilution Attenuation Factor ^b For contaminated soil in contact with groundwater. ^c Based upon total xylenes ^d No NMED value available, value taken from Massachusetts Contingency Plan, 310 CMR 40.0985, 4/3/06. ^e No NMED value available and leachability-based value for DAF =1 or 20 not established in the Massachusetts Contingency Plan, 310 CMR 40.0985, 4/3/06.				

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Section 4.0 Groundwater Monitoring Results

Title	Tab/Figure	Section
Measured Depth to Groundwater.....	Tab 1& 2.....	8.0
Groundwater Elevation and Flow Direction	Figures 4 – 8.....	9.0
Product Thickness Map.....	Figures 9 – 11.....	9.0
BTEX & MTBE Concentration Map.....	Tabs 11-14.....	10.0
Field Water Quality Measurements.....	Tab 3	8.0
Comparison to Previous Monitoring.....	Tabs 3, 4, 5, 6, 7, 8, 10.....	8.0
Measured Depth to Groundwater North Barrier Wall.....	Tabs 1 – 12.....	Appendix A
North Barrier Wall Analytical Data... ..	Tabs 13, 14, 15.....	Appendix A
North Barrier Wall BTEX & MTBE Concentration Map... ..	Tab 16.....	Appendix A

Section 5.0 Chemical Analytical Data

<u>Title</u>	<u>Tab</u>	<u>Section</u>
Background Wells.....	Tab 4.....	8.0
Refinery Wells.....	Tab 5.....	8.0
Cross-gradient Wells.....	Tab 6.....	8.0
Downgradient Wells.....	Tab 7.....	8.0
San Juan River Bluff	Tab 8.....	8.0
Tank #33.....	Tab 9.....	8.0
San Juan River.....	Tab 10.....	8.0
North Barrier Wall.....	Tabs 13, 14, 15.....	Appendix A

Section 6.0 Remediation System Monitoring

SECTION 6.0

REMEDIATION SYSTEM MONITORING

6.1 Total Fluids Pumping

The total fluids pumping system is used to bring SPH and hydrocarbon impacted groundwater to the surface for treatment or disposal. This is accomplished by pumping wells within the SPH plume and adjacent areas. The recovery wells pump SPH and hydrocarbon impacted groundwater to the refinery API separator for product recovery, and then through the refinery process wastewater treatment system. Pumping is most effective in saturated zones with high hydraulic conductivities such as those measured at the refinery. In 2010 total fluids pumping was accomplished through the use of fourteen recovery wells: RW-1, RW-2, RW-9, RW-14, RW-15, RW-16, RW-17, RW-18, RW-19, RW-22, RW-23, RW-28, RW-42 and RW-43.

In 2010 the estimated total gallons pumped (SPH and water) from the recovery wells was 1,232,649 gallons.

6.2 North Boundary Barrier Wall

Installation of the North Boundary Barrier Wall and Collection System were completed in April 2005. The North Boundary Barrier Wall consists of a 2,700 foot long bentonite slurry wall that extends 2 to 5 feet into the Nacimiento Formation. The primary purpose of the wall is to prevent the migration of hydrocarbon-impacted groundwater towards the San Juan River. The collection system consists of 15 collection wells positioned along the refinery-side of the barrier wall. For every collection wells there was installed an observation well along the river-side of the barrier wall.

Groundwater that reaches the Barrier Wall is consequently backed up into the French drain located underneath the Hammond Ditch. Fluids in the French drain discharge into Tank 37 via gravity. The fluids from Tank 37 are then pumped to the API Separator.

From April 2005 to March 31, 2008, a vacuum truck was used to remove fluids from the collection and observation wells at a frequency of 3 times per week. Since April 2008, fluid removal from the observation and collection wells along Hammond Ditch has consisted of using a hand bailer to periodically pull separate phase hydrocarbon from OW 0 +60, OW 1+50, OW 3+85, OW 11+15, MW -45, and MW -47. All purged water was collected in a 55-gallon drum and disposed of through the refinery wastewater system.

Bloomfield Refinery personnel continued to monitor fluid levels on both sides of the barrier wall by collecting depth-to-water and depth-to-product measurements every other week throughout 2010. Depth-to-groundwater measurement data from January 2010 through December 2010 is located in Appendix A, Tabs 1 -12.

6.3 Hammond Ditch Recovery System

The Hammond Ditch Recovery System consists of recovery Tank 37, which collects groundwater from two 8-inch influent lines connected to the perforated sub-drain (the French Drain) beneath the Hammond Irrigation Canal. The Tank 37 liquid level has a float control system and automatically pumps through a flow meter to the API Separator. The total volume pumped through the flow meter in 2010 was 2,397,103 gallons.

6.4 North Outfalls/Draws

A bi-weekly visual inspection of Seeps 1-9 and the San Juan River Bluff occurred throughout 2010.

The vast majority of the fluids in the outfalls are from precipitation events. Water recovery at the seeps is dependant on whether the analytical results exceed any regulatory standards. If exceeded, that water will be pumped for recovery.

Inspections of the draws north of the barrier wall and analysis of samples of water collected in the seeps indicate that the barrier wall is preventing migration of contaminated groundwater toward the San Juan River. Since installation of the barrier wall, all previous areas where seepage of fuel hydrocarbon impacted water was present have been eliminated.

6.5 River Terrace

The River Terrace Bioventing Project was placed on-line in January 2006. Monitoring and remedial actions are following the Voluntary Measures Bioventing Monitoring Plan that has been approved by NMED and are submitted in a separate report to the agencies.

6.6 East Outfall

The east outfall is collected into a pipe, which flows to Tank 38 and then is pumped to the API. The total gallons pumped in 2010 were 10,563,144 gallons.

6.7 Overall System Capabilities

Recovery volumes have remained consistent over the last few years. The remediation system has continued to be effective after the shut down of Bloomfield Refinery.

Section 7.0 Summary – Conclusions and Recommendations

SECTION 7.0 SUMMARY

7.1 Compliance Monitoring

Measured depth-to-groundwater tables and analytical summaries are located in Section 8.0 of this report.

7.2 Refinery Complex

7.2.1 Groundwater Measurements

Depth-to-groundwater measurements were collected at all refinery monitoring wells, recovery wells, observation and collection wells in March and April 2010 following the guidelines from the *Facility-Wide Groundwater Monitoring Plan December 2007(Revised 2008)*. Water elevation measurements were collected in all wells while the recovery wells were in operation and again after the pumps were removed and water levels had stabilized.

After receipt of the New Mexico Environmental Department (NMED) letter *Approval with Direction Facility-Wide Groundwater Monitoring* dated July 26, 2010, Western personnel followed guidelines from the *Facility-Wide Groundwater Monitoring Plan* dated June 2010. In August, prior to groundwater sampling activities, groundwater levels and SPH thickness measurements were collected at all wells after the pumps had been removed and water levels had stabilized.

As outlined in the Facility-Wide Groundwater Monitoring Plan, wells at the Bloomfield Refinery have been segregated into five separate groups within the Refinery Complex.

- **Background Wells:** This group includes MW-3, MW-5, and MW-6.
- **Cross-gradient Wells:** This group includes MW-1, MW-13, MW-26, MW-27, MW-32, and MW-33.
- **Refinery Area Wells:** This group includes RW-1, MW-4, MW-8, RW-9, RW-15, RW-18, MW-20, MW-21, RW-23, RW-28, MW-29, MW-30, MW-31, MW-40, RW-42, RW-43, and MW-44.
- **Down-gradient Wells:** This group includes MW-11, MW-12, MW-34, MW-35, MW-37, and MW-38.
- **RCRA Investigation Wells:** This group includes MW-50, MW-51, MW-52, MW-53, MW-54, MW-55, MW-56, MW-57, MW-58, MW-59, MW-60, MW-61, MW-62, MW-63, MW-64, MW-65, and MW-66.

The RCRA Investigation wells were added to the Facility-Wide Groundwater Monitoring Plan dated June 2010, and therefore were not included in the semi-annual sampling event that was conducted in April 2010.

Figures 4 - 8 in Section 9.0 present groundwater elevation and contour maps that were developed using the data gathered in the groundwater measurement

program. Depth-to-groundwater summary tables used to determine Figures 4 – 11 can be found in Section 8.0, Tab 1.0. The following is a brief summary of the total fluid measurements collected in 2010.

Background Wells

Monitoring wells MW-5 and MW-6 were dry in March, April, and August of 2010. MW-3 had very little groundwater detected throughout 2010 with fluid thickness levels ranging between 0.40 feet and 0.42 feet.

Refinery Wells

Monitoring well MW-4, MW-8, MW-29, MW-30, MW-31, MW-44, and recover well RW-15 did not contain separate phase hydrocarbon (SPH) during any of the three measuring events.

Due to heavy mud conditions, Western personnel could not locate MW-40 in the field; therefore depth-to-fluid measurements were not collected at MW-40 during the 1st and 2nd quarters of 2010. The well was located using a metal detector and marked for future reference. MW-40 did not contain SPH in August 2010.

SPH was detected at RW-9 (0.01 ft) in March 2010. SPH was not detected at RW-9 during the subsequent measurement events.

RW-23 contained SPH in April 2010. SPH was not detected in March and August 2010.

RW-18 and RW-43 contained SPH in March and April 2010. SPH was not detected in both wells during the August event.

SPH was not detected at RW-42 in March 2010; however SPH was detected in April (0.1 ft) and August (0.58 ft) of 2010.

RW-28 contained SPH in March and August of 2010. Fluid measurement were not collected at RW-28 in April 2010 because the recovery pump was stuck in the well.

MW-20, MW-21, and RW-1 contained SPH in all three measuring events with quantities varying from a low of 0.02 feet (RW-1 – August) to a high of 0.65 feet (MW-20 – August).

Cross-Gradient Wells

SPH was not detected at monitoring wells MW-1, MW-13, MW-26, MW-27, MW-32, and MW-33 during all three measuring events (March, April, and August).

Down-Gradient Wells

SPH was not detected at monitoring wells MW-11, MW-12, MW-34, MW-35, MW-37, and MW-38 during all three measuring event (March, April, and August).

RCRA Investigation Wells

SPH was detected in monitoring wells MW-54, MW-56, MW-57, MW-61, and MW-66 during the August measuring event.

7.2.2 Groundwater Monitoring Results

Facility-wide semi-annual monitoring activities were performed during the week of April 5, 2010. Guidelines from the *Facility-Wide Groundwater Monitoring Plan (revised 2008)* were followed. Annual monitoring activities commenced the week of August 16, 2010. Activities conducted during annual sampling followed the guidelines as stated in the *Facility-Wide Groundwater Monitoring Plan* dated June 2010.

No groundwater samples were collected at MW-5 and MW-6 in 2010 due to insufficient available groundwater.

BTEX - TPH

Refinery Wells

Detected concentrations of BTEX at monitoring well MW-29 and MW-44 did not exceed their respective regulatory screening levels in 2010. The detected concentrations of TPH-DRO at MW-44 exceeded the regulatory screening level of 0.2 mg/L; however TPH-DRO concentrations at MW -29 were below the respective screening level. Benzene and TPH-DRO concentrations at MW-40 and MW-4 were over the respective screening levels in August 2010. Also in August, detected concentrations of benzene, ethylbenzene, xylene, and TPH-DRO at MW-31 and RW-15 were above respective regulatory limits. RW-23 and RW-43 surpassed limits on benzene, ethylbenzene, xylene, methyl tert-butyl ether (MTBE), and TPH-DRO and RW-9 and RW-18 surpassed the benzene, MTBE, and TPH-DRO standards in August. MW-30 exceeded BTEX and TPH-DRO regulatory standards in April and August. MW-8 was over the TPH-DRO standard in August and April.

Monitoring wells MW-20 and MW-21 and recovery wells RW-1, RW-28, and RW-42 were not sampled since the wells contained separate phase hydrocarbon during their respective sampling events.

Cross-Gradient Wells

Analytical results from MW-1 and MW-26 exceeded the benzene regulatory standards in August. MW-13, MW-26 and MW-27 surpassed the TPH-DRO screening guidelines. The analytical results from MW-32 and MW-33 were non-detect for the regulatory limits for BTEX and TPH-DRO.

Down-Gradient Wells

Analytical results from all six wells (MW-11, MW-12, MW-34, MW-35, MW-37, and MW-38) in the down-gradient list were either non-detect or did not surpass regulatory limits for BTEX in 2010. April and August analytical results for MW-35, MW-37, and MW-38 exceeded the TPH-DRO regulatory limit. MW-11 and MW-34 surpassed TPH-DRO standards in August. MW-12 topped TPH-DRO limits in April 2010.

RCRA Investigation Wells

MW-52, MW-53, MW-60, MW-62, MW-63, and MW-64 analytical results did not exceed regulatory standards for BTEX, MTBE, or TPH-DRO in August 2010. MW-50, MW-51, MW-55, MW-58, MW-59, and MW-65 surpassed benzene standards with results ranging from a low of 0.042 mg/L at MW-59 to a high of 11.0 mg/L at MW-55. MTBE and TPH-DRO regulatory limits were exceeded in MW-55, MW-58, MW-59, and MW-65. In addition, ethylbenzene and xylene standards were topped in MW-55 and MW-65.

San Juan River Bluff – Bluff Seeps

Outfall #2 and Outfall #3 analytical results did not exceed regulatory standards for BTEX or MTBE. Samples collected from Seep 1, Seep 2, Seep 3, Seep 6, Seep 8 and Seep 9 in either April or August (dependent upon fluids present) did not exceed BTEX regulatory standards. The MTBE standard of 0.012mg/L was exceeded in the April sampling event at Seep 1(0.073 mg/L) and Seep 9 (0.027 mg/L).

General Chemistry

General chemistry parameters were analyzed during the annual sampling event in August and not in April 2010.

Refinery Wells

WQCC TDS standard (1000 mg/L) was exceeded by MW-4, MW-8, MW-30, MW-31, MW-40, MW-44, RW-9, RW-15, RW-18, RW-23 and RW-43. The results ranged from a low of 1401 mg/L in RW-23 to a high of 4451 mg/L in RW-18. The sulfate standard (600 mg/L) was surpassed by MW-8 (1300 mg/L), MW-18 (1700 mg/L), and MW-44 (3200 mg/L). The chloride standard (250 mg/L) was met or exceeded by MW-30, MW-31, MW-40, RW-15, RW-18, and RW-43 with a low of 280 mg/L in RW-43 to a high of 660 mg/L in MW-31.

Cross-Gradient Wells

MW-13, MW-26, MW-27, MW-32, and MW-33 exceeded the TDS standard with results that ranged from a low of 2046 mg/L at MW-13 to a high of 4148 mg/L at MW-32. The sulfate regulatory limit was surpassed by MW-13, MW-27, MW-32, and MW-33. Chloride standard was topped by results from MW-26, MW-32, and MW-33. The nitrogen standard (10 mg/L) was exceeded by MW-32 (34 mg/L) and MW-33 (28 mg/L).

Down-Gradient Wells

The TDS standard was exceeded by MW-11, MW-34, MW-35, and MW-37 with a range of 1268 mg/L (MW-35) to 1929 mg/L (MW-11). MW-11 (300 mg/L) and MW-37 (320 mg/L) topped the chloride standard.

RCRA Investigation Wells

MW-52, MW-53, MW-55, MW-58, MW-59, MW-60, MW-62, MW-63, MW-64, and MW-65 exceeded the TDS standard with results that ranged from a low of 1523 mg/L at MW-59 to a high of 5330 mg/L at MW-62. The sulfate regulatory limit was surpassed by MW-52 (1700 mg/L), MW-53 (990 mg/L), MW-60 (730 mg/L), MW-62 (5100 mg/L), MW-63 (2200 mg/L), MW-64 (1600 mg/L), and MW-65 (620 mg/L). Chloride standard (250 mg/L) was topped by results from MW-52, MW-53, MW-55, MW-58, MW-63, and MW-64.

San Juan River Bluff – Bluff Seeps

Outfalls 2 and Outfall 3 analytical results did not exceed regulatory limits for general chemistry standards. Seep 1, Seep 2, Seep 3, Seep 6, and Seep 9 exceeded TDS, sulfate, and chloride regulatory limits during their respective sampling events.

Total Metals (RCRA 8)

Total Metals (RCRA 8) were analyzed only during the annual sampling event in August 2010 but not required during the April 2010 sampling event.

Refinery Wells

The barium standard of 1.0 mg/L was exceeded by MW-4 (2.7 mg/L), MW-40 (2.3 mg/L), RW-9 (3.3 mg/L), RW-15 (1.6 mg/L), RW-18 (1.3 mg/L), RW-23 (2.5 mg/L), and RW-43 (7.5 mg/L). MW-4 (0.016 mg/L), RW-23 (0.067 mg/L), and RW-43 (0.03 mg/L) surpassed the lead standard of 0.015 mg/L. The chromium regulatory limit (0.05 mg/L) was topped by MW-8 (3.7 mg/L), RW-18 (0.075 mg/L), and RW-43 (0.03 mg/L). MW-4 surpassed the arsenic standard of 0.01 mg/L with a result of 0.046 mg/L.

Cross-Gradient Wells

MW-26 surpassed the barium standard with a result of 2.3 mg/L. Total metals results from all other Cross-Gradient wells were either non-detect or below regulatory levels.

Down-Gradient Wells

MW-11 surpassed the barium standard (1.0 mg/L) with a result of 1.1 mg/L. MW-12 exceeded the total chromium standard (0.05 mg/L) with a result of 2.1 mg/L and the total lead standard (0.015 mg/L) with a result of 0.044 mg/L. MW-12 (0.021 mg/L) and MW-35 (0.075 mg/L) topped the total arsenic limit of 0.01 mg/L.

RCRA Investigation Wells

MW-55 exceeded the total arsenic, total barium, total chromium, and total lead standards with results of 0.06 mg/L, 5.9 mg/L, 0.054 mg/L, and 0.3 mg/L respectively. MW-58 surpassed barium regulatory levels with a result of 1.6 mg/L.

and lead levels with a result of 0.034 mg/L. MW-62 topped arsenic standards at 0.024 mg/L.

San Juan River Bluff – Bluff Seeps

Outfalls 2 and Outfall 3 analytical results did not exceed regulatory standards for total metals. Total metals analysis was not required for any Seeps.

Dissolved Metals

Samples collected in August 2010 were analyzed for WQCC dissolved metals. Dissolved metals analysis was not required for the April 2010 sampling event.

Refinery Wells

MW-4, MW-40, RW-9, RW-15, and RW-23 exceeded barium (1.0 mg/L), iron (1.0 mg/L), and manganese (0.2 mg/L) regulatory limits. Barium exceedances ranged from a low of 1.5 mg/L (RW-15) to a high of 3.2 mg/L (RW-9). Iron varied from a low of 1.5 mg/L (RW-9) to a high of 14.0 mg/L (RW-15). Manganese results ranged from 2.1 mg/L (RW-9) to 3.3 mg/L (MW-4). MW-29 (1.6 mg/L), MW-30 (1.4 mg/L), MW-31 (0.47 mg/L), RW-18 (0.56 mg/L), and RW-43 (2.8 mg/L) also surpassed manganese standards. In addition, RW-18 topped iron standards with a result of 3.0 mg/L and RW-43 exceeded barium regulatory levels at 2.6 mg/L.

Cross-Gradient Wells

MW-13 topped manganese standards (0.2 mg/L) with a result of 1.4 mg/L. MW-26 exceeded barium, iron, and manganese regulatory levels with results of 2.1 mg/L, 6.0 mg/L, and 2.8 mg/L respectively. MW-27 surpassed manganese standards with results of 2.6 mg/L.

Down-Gradient Wells

MW-11, MW-34, MW-35, MW-37, and MW-38 exceeded iron and manganese standards. Iron exceedances ranged from a low of 1.9 mg/L at MW-37 to a high of 14.0 mg/L at MW-11. Manganese varied from a low of 1.3 mg/L at MW-37 to a high of 3.2 at MW-34. MW-11 surpassed barium with a result of 1.1 mg/L.

RCRA Investigation Wells

With the exception of MW-64 (0.013 mg/L), every well that was sampled in this group exceeded the manganese regulatory limit of 0.2 mg/L. The manganese results ranged from a high of 6.8 mg/L at MW-55 to a low of 0.33 mg/L at MW-60. Iron standards were surpassed in MW-55, MW-58, MW-59, and MW-65. MW-55 and MW-58 also topped the barium limit. In addition, MW-63 exceeded the uranium standard of 0.03 mg/L with a result of 0.056 mg/L.

San Juan River Bluff – Bluff Seeps

Outfall 2 and Outfall 3 analytical results did not exceed regulatory standards for total metals. Dissolved metals analysis was not required for any Seeps.

Semi-Volatile Organic Compounds

Due to the approved *Facility-Wide Groundwater Monitoring Plan* dated June 2010, RCRA Investigation Wells were the only wells analyzed for SVOCs in 2010.

RCRA Investigation Wells

Of the 70 analytes determined in Method 8270, only four were detected in the twelve RCRA Investigation Wells that were sampled. MW-50, MW-51, MW-52, MW-53, MW-60, MW-62, MW-63, and MW-64 were non-detect for any analyte in Method 8270. MW-55, MW-58, MW-59, and MW-65 exceeded the naphthalene standard of 0.0014 mg/L with range of 0.012 mg/L at MW-59 to a high of 0.29 mg/L at MW-55. The phenol standard of 0.005 mg/L was surpassed at MW-55 (0.016 mg/L) and MW-58 (0.011 mg/L). In addition, MW-55 equaled the 2-Methylnaphthalene standard of 0.15 mg/L with a result of 0.15 mg/L.

7.3 North Boundary Barrier Wall and Seeps

7.3.1 Visual Inspections

A bi-weekly visual inspection of Seep 1 thru Seep 9 and of the San Juan River Bluff occurred throughout 2010. Visual inspection continues to confirm that the vast majority of the fluids in the outfalls are from precipitation events.

During the week of April 12, 2010, semi-annual samples were collected from Seep 1, Seep 2, Seep 3, Seep 6, and Seep 9. Guidelines from the *Facility-Wide Groundwater Monitoring Plan December 2007(Revised 2008)* were followed. During the week of August 10, 2010, samples were collected from Seep 1, Seep 3, and Seep 6 following the guidelines from the approved *Facility-Wide Groundwater Monitoring Plan* dated June 2010. Analyses of these water samples indicate that BTEX volatile organic constituents are non-detect.

Analytical results can be found in Section 8.0, Tab 9.0.

7.3.2 Newly Surfaced Groundwater

Newly surfaced groundwater was discovered on Wednesday, May 19, 2010 during the bi-monthly visual inspections of the bluff north of the refinery. This new area is located north of the raw water ponds. A sample was collected on that day and analyzed for BTEX and MTBE using method 8260. Results were received on May 26, 2010 that indicated a benzene concentration of 110 ug/l. A summary of the activities performed and data collected throughout 2010 is provided in the letter *Western Refining Southwest, Inc. – Bloomfield Refinery - Newly Surfaced Groundwater Data Summary* sent to NMED and OCD on February 11, 2011.

Western personnel will follow the guidelines stated in NMED's response letter *Response to Newly Surfaced Groundwater Data Summary* dated March 2, 2011.

7.3.3 Groundwater Measurements

In August 2005 Bloomfield Refinery personnel established a bi-weekly fluid measurement scheme requiring monitoring of all observation and collection wells along Hammond Ditch as well as MW-11, MW-12, MW-20, MW-21, MW-39, MW-45, MW-46, and MW-47. This measurement program continued throughout 2010.

In conjunction with the biweekly measurement program, all facility monitoring wells, recovery wells, observation and collection wells were measured for groundwater elevation during the first and second quarter following guidelines from the *Facility-Wide Groundwater Monitoring Plan December 2007 (Revised May 2008)*. In August 2010, prior to groundwater sampling activities, Western personnel followed guidelines from the *Facility-Wide Groundwater Monitoring Plan* dated June 2010. Groundwater elevation maps were developed using the data gathered in the groundwater measurement program.

Separate phase hydrocarbon (SPH) was detected in OW 1+50 in March (0.15 feet), April (0.01 feet), August (0.53 feet). OW 11+15 had SPH present in April (0.04 feet) and August (0.01 feet). OW +10 was dry in August. OW 6+70 and OW 14+10 were dry in all three events.

Quarterly measured depth to groundwater tables can be found in Section 8.0, Tab 1.0. Biweekly measurement tables are located in Appendix A – Tabs 1.0 - 12.0.

7.3.4 Groundwater Monitoring Results

Semi-Annual sample collection began during the week of April 5, 2010. Annual sampling occurred the week of August 16, 2010. During both sampling events, groundwater samples were collected from all observation wells and two collection wells (CW-0+60 and CW25+95) with the exception of wells that contain separate phase hydrocarbon or wells that were dry or did not contain enough water to collect a sample.

April and August analytical data for CW 0+60 exceeded the benzene regulatory standard of 0.005 mg/L with results of 0.036 mg/L (April) and 0.250 mg/L (August). CW 0+60 also surpassed the TPH-DRO regulatory limit of 0.20 mg/L in April and August with a result of 2.8 mg/L and 1.5 mg/L respectively. CW 25+95 sampling data exceeded BTEX and TPH-DRO regulatory standards in April and August.

Every observation well that was sampled exceeded the TDS standard of 1000 mg/L except for OW 23+10 in August (982 mg/L), OW 23+90 in April (845 mg/L) and August (822 mg/L), and OW 25+70 in April (773 mg/L) and August (850 mg/L). Results ranged from a low of 1056 mg/L at OW 0+60 (August) to a high of 3568 mg/L at OW 19+50 (August). OW 1+50, OW 3+85, OW 11+15, OW 16+60, OW 23+10, OW 23+90, and OW 25+70 exceeded regulatory limits of benzene (0.005 mg/L). Results ranged from a low of 0.007 mg/L at OW 3+85 (August) to a

high of 15.0 mg/L at OW 25+70 (April). The TPH-DRO regulatory standard of 0.2 mg/L was exceeded by OW 0+60, OW 1+50, OW 3+85, OW 11+15, OW 16+60, OW 22+00, OW 23+10, OW 23+90, and OW 25+70. Results ranged from a low of 0.25mg/L at OW 22+00 (April) to a high of 1500 mg/L at OW 11+15 (April). OW 11+15, OW 16+60, OW 19+50, and OW 22+00 surpassed the MTBE regulatory limit of 0.012 mg/L with results ranging from a low of 0.055 mg/L at OW 19+50 (August) and a high of 1.7 mg/L at OW 11+15. The xylene standard of 0.62 mg/L was topped in April at OW 1+50 (5.7 mg/L) and OW 25+70 (1.4 mg/L).

7.4 Remedial Action and Conclusions

7.4.1 North Boundary Barrier Wall

Visual inspection of Seeps 1-9 has shown ground water discharge from the seeps along the river bluff has decreased significantly since installation of the slurry wall. Bi-weekly inspections continue to confirm that the vast majority of the fluids in the outfalls are from precipitation events.

With semi-annual sampling results indicating elevated benzene levels in the eastern edge of Observation and Collection Wells, CW 25+95 was put into recovery well service in May 2010.

Groundwater elevation maps indicate that the wall is performing as intended by capturing the water along the south side of the wall. Inspections of the draws north of the barrier wall and analysis of fluids collected at the seeps indicate that seepage of fuel hydrocarbon impacted water has been eliminated.

7.4.2 Facility-Wide Monitoring and Remedial Actions

Western Refining indefinitely suspended refining operations at the Bloomfield Refinery on November 23, 2009. The crude unloading and product loading racks, storage tanks and other supporting equipment remain in operation. Guidelines from the *Facility-Wide Groundwater Monitoring Plan* dated June 2010 will continue to be followed.

Section 8.0 Tables

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-01	4th Quarter	NA	5519.21	21.56	NA	NA	NA	NA
		NA	5519.21	21.56	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5519.21	21.56	NPP	17.05	5502.16	NPP
		NA	5519.21	21.56	NPP	NA	NA	NPP
	2nd Quarter	4/6/2010	5519.21	21.56	NPP	17.26	5501.95	NPP
		4/12/2010	5519.21	21.56	NPP	17.20	5502.01	NPP
	1st Quarter	3/10/2010	5519.21	21.56	NPP	17.31	5501.90	NPP
		3/16/2010	5519.21	21.56	NPP	17.34	5501.87	NPP
MW-03	4th Quarter	NA	5539.27	36.75	NA	NA	NA	NA
		NA	5539.27	36.75	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5539.27	36.75	NPP	36.33	5502.94	NPP
		NA	5539.27	36.75	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5539.27	36.75	NPP	36.35	5502.92	NPP
		4/12/2010	5539.27	36.75	NPP	36.33	5502.94	NPP
	1st Quarter	3/10/2010	5539.27	36.75	NPP	36.33	5502.94	NPP
		3/16/2010	5539.27	36.75	NPP	36.42	5502.85	NPP
MW-04	4th Quarter	NA	5527.78	30.48	NA	NA	NA	NA
		NA	5527.78	30.48	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5527.78	30.48	NPP	27.21	5500.57	NPP
		NA	5527.78	30.48	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5527.78	30.48	NPP	26.63	5501.15	NPP
		4/12/2010	5527.78	30.48	NPP	26.52	5501.26	NPP
	1st Quarter	3/10/2010	5527.78	30.48	NPP	26.7	5501.08	NPP
		3/16/2010	5527.78	30.48	NPP	26.6	5501.18	NPP
MW-05	4th Quarter	NA	5548.56	37.20	NA	NA	NA	NA
		NA	5548.56	37.20	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5548.56	37.20	NPP	NWP		NPP
		NA	5548.56	37.20	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5548.56	37.20	NPP	NWP		NPP
		4/12/2010	5548.56	37.20	NPP	NWP		NPP
	1st Quarter	3/10/2010	5548.56	37.20	NPP	NWP		NPP
		3/16/2010	5548.56	37.20	NPP	NWP		NPP

NPP = No Product Present

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NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-06	4th Quarter	NA	5554.61	48.00	NA	NA	NA	NA
		NA	5554.61	48.00	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5554.61	48.00	NPP	NWP		NPP
		NA	5554.61	48.00	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5554.61	48.00	NPP	NWP		NPP
		4/12/2010	5554.61	48.00	NPP	NWP		NPP
	1st Quarter	3/10/2010	5554.61	48.00	NPP	NWP		NPP
		3/16/2010	5554.61	48.00	NA	NA	NA	NA
MW-07	4th Quarter	NA	5527.66	62.61	NA	NA	NA	NA
		NA	5527.66	62.61	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5527.66	62.61	NPP	27.50	5500.16	NPP
		NA	5527.66	62.61	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5527.66	62.61	NPP	27.03	5500.63	NPP
		4/12/2010	5527.66	62.61	NPP	27.07	5500.59	NPP
	1st Quarter	3/10/2010	5527.66	62.61	NPP	27.03	5500.63	NPP
		3/16/2010	5527.66	62.61	NPP	27.17	5500.49	NPP
MW-08	4th Quarter	NA	5534.58	35.93	NA	NA	NA	NA
		NA	5534.58	35.93	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5534.58	35.93	NPP	31.65	5502.93	NPP
		NA	5534.58	35.93	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5534.58	35.93	NPP	31.63	5502.95	NPP
		4/12/2010	5534.58	35.93	NPP	31.56	5503.02	NPP
	1st Quarter	3/10/2010	5534.58	35.93	NPP	31.56	5503.02	NPP
		3/16/2010	5534.58	35.93	NPP	31.73	5502.85	NPP
MW-11	4th Quarter	NA	5510.31	22.94	NA	NA	NA	NA
		NA	5510.31	22.94	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5510.31	22.94	NPP	11.38	5498.93	NPP
		NA	5510.31	22.94	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5510.31	22.94	NPP	11.10	5499.21	NPP
		4/12/2010	5510.31	22.94	NPP	11.17	5499.14	NPP
	1st Quarter	3/10/2010	5510.31	22.94	NPP	11.06	5499.25	NPP
		3/16/2010	5510.31	22.94	NPP	11.00	5499.31	NPP

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-12	4th Quarter	NA	5501.61	14.98	NA	NA	NA	NA
		NA	5501.61	14.98	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5501.61	14.98	NPP	10.73	5490.88	NPP
		NA	5501.61	14.98	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5501.61	14.98	NPP	9.72	5491.89	NPP
		4/12/2010	5501.61	14.98	NPP	10.88	5490.73	NPP
	1st Quarter	3/10/2010	5501.61	14.98	NPP	9.83	5491.78	NPP
		3/16/2010	5501.61	14.98	NPP	9.77	5491.84	NPP
MW-13	4th Quarter	NA	5542.04	52.89	NA	NA	NA	NA
		NA	5542.04	52.89	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5542.04	52.89	NPP	40.45	5501.59	NPP
		NA	5542.04	52.89	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5542.04	52.89	NPP	40.37	5501.67	NPP
		4/12/2010	5542.04	52.89	NPP	40.35	5501.69	NPP
	1st Quarter	3/10/2010	5542.04	52.89	NPP	40.40	5501.64	NPP
		3/16/2010	5542.04	52.89	NPP	40.41	5501.63	NPP
MW-20	4th Quarter	NA	5519.9	27.13	NA	NA	NA	NA
		NA	5519.9	27.13	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5519.90	27.13	20.60	21.25	5499.17	0.65
		NA	5519.90	27.13	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5519.9	27.13	20.58	21.20	5499.20	0.62
		4/12/2010	5519.9	27.13	20.57	21.14	5499.22	0.57
	1st Quarter	3/10/2010	5519.9	27.13	20.57	21.10	5499.22	0.53
		3/16/2010	5519.9	27.13	20.60	21.20	5499.18	0.60
MW-21	4th Quarter	NA	5521.99	30.38	NA	NA	NA	NA
		NA	5521.99	30.38	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5521.99	30.38	21.65	21.72	5500.33	0.07
		NA	5521.99	30.38	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5521.99	30.38	21.52	21.62	5500.45	0.10
		4/12/2010	5521.99	30.38	21.52	21.59	5500.46	0.07
	1st Quarter	3/10/2010	5521.99	30.38	21.42	21.52	5500.55	0.10
		3/16/2010	5521.99	30.38	21.46	21.56	5500.51	0.10

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Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-25	4th Quarter	NA	5533.99	41.20	NA	NA	NA	NA
		NA	5533.99	41.20	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5533.99	41.20	32.79	32.94	5501.17	0.15
		NA	5533.99	41.20	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5533.99	41.20	32.56	32.72	5501.40	0.16
		4/12/2010	5533.99	41.20	32.55	32.75	5501.40	0.20
	1st Quarter	3/10/2010	5533.99	41.20	32.61	32.87	5501.33	0.26
		3/16/2010	5533.99	41.20	32.62	32.85	5501.32	0.23
MW-26	4th Quarter	NA	5517.88	25.11	NA	NA	NA	NA
		NA	5517.88	25.11	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5517.88	25.11	NPP	17.38	5500.50	NPP
		NA	5517.88	25.11	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5517.88	25.11	NPP	17.11	5500.77	NPP
		4/12/2010	5517.88	25.11	NPP	17.07	5500.81	NPP
	1st Quarter	3/10/2010	5517.88	25.11	NPP	17.13	5500.75	NPP
		3/16/2010	5517.88	25.11	NPP	17.13	5500.75	NPP
MW-27	4th Quarter	NA	5518.67	24.42	NA	NA	NA	NA
		NA	5518.67	24.42	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5518.67	24.42	NPP	18.74	5499.93	NPP
		NA	5518.67	24.42	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5518.67	24.42	NPP	18.51	5500.16	NPP
		4/12/2010	5518.67	24.42	NPP	18.48	5500.19	NPP
	1st Quarter	3/10/2010	5518.67	24.42	NPP	18.54	5500.13	NPP
		3/16/2010	5518.67	24.42	NPP	18.55	5500.12	NPP
MW-29	4th Quarter	NA	5524.97	28.62	NA	NA	NA	NA
		NA	5524.97	28.62	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5524.97	28.62	NPP	22.96	5502.01	NPP
		NA	5524.97	28.62	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5524.97	28.62	NPP	22.98	5501.99	NPP
		4/12/2010	5524.97	28.62	NPP	22.92	5502.05	NPP
	1st Quarter	3/10/2010	5524.97	28.62	NPP	22.99	5501.98	NPP
		3/16/2010	5524.97	28.62	NPP	23.03	5501.94	NPP

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-30	4th Quarter	NA	5536.83	40.13	NA	NA	NA	NA
		NA	5536.83	40.13	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5536.83	40.13	NPP	33.83	5503.00	NPP
		NA	5536.83	40.13	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5536.83	40.13	NPP	33.98	5502.85	NPP
		4/12/2010	5536.83	40.13	NPP	33.9	5502.93	NPP
	1st Quarter	3/10/2010	5536.83	40.13	NPP	33.92	5502.91	NPP
		3/16/2010	5536.83	40.13	NPP	34.03	5502.80	NPP
MW-31	4th Quarter	NA	5536.24	39.16	NA	NA	NA	NA
		NA	5536.24	39.16	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5536.24	39.16	NPP	34.11	5502.13	NPP
		NA	5536.24	39.16	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5536.24	39.16	NPP	34.13	5502.11	NPP
		4/12/2010	5536.24	39.16	NPP	34.07	5502.17	NPP
	1st Quarter	3/10/2010	5536.24	39.16	NPP	34.08	5502.16	NPP
		3/16/2010	5536.24	39.16	NPP	34.14	5502.10	NPP
MW-32	4th Quarter	NA	5525.64	27.51	NA	NA	NA	NA
		NA	5525.64	27.51	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5525.64	27.51	NPP	25.08	5500.56	NPP
		NA	5525.64	27.51	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5525.64	27.51	NPP	24.83	5500.81	NPP
		4/12/2010	5525.64	27.51	NPP	24.83	5500.81	NPP
	1st Quarter	3/10/2010	5525.64	27.51	NPP	24.86	5500.78	NPP
		3/16/2010	5525.64	27.51	NPP	24.85	5500.79	NPP
MW-33	4th Quarter	NA	5521.79	25.51	NA	NA	NA	NA
		NA	5521.79	25.51	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5521.79	25.51	NPP	22.32	5499.47	NPP
		NA	5521.79	25.51	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5521.79	25.51	NPP	22.17	5499.62	NPP
		4/12/2010	5521.79	25.51	NPP	22.94	5498.85	NPP
	1st Quarter	3/10/2010	5521.79	25.51	NPP	22.19	5499.60	NPP
		3/16/2010	5521.79	25.51	NPP	22.18	5499.61	NPP

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Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-34	4th Quarter	NA	5511.63	20.96	NA	NA	NA	NA
		NA	5511.63	20.96	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5511.63	20.96	NPP	14.06	5497.57	NPP
		NA	5511.63	20.96	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5511.63	20.96	NPP	13.96	5497.67	NPP
		4/12/2010	5511.63	20.96	NPP	13.97	5497.66	NPP
	1st Quarter	3/10/2010	5511.63	20.96	NPP	13.94	5497.69	NPP
		3/16/2010	5511.63	20.96	NPP	13.95	5497.68	NPP
MW-35	4th Quarter	NA	5518.95	26.45	NA	NA	NA	NA
		NA	5518.95	26.45	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5518.95	26.45	NPP	22.13	5496.82	NPP
		NA	5518.95	26.45	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5518.95	26.45	NPP	22.01	5496.94	NPP
		4/12/2010	5518.95	26.45	NPP	22.05	5496.90	NPP
	1st Quarter	3/10/2010	5518.95	26.45	NPP	21.98	5496.97	NPP
		3/16/2010	5518.95	26.45	NPP	21.98	5496.97	NPP
MW-36	4th Quarter	NA	5516.95	23.26	NA	NA	NA	NA
		NA	5516.95	23.26	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5516.95	23.26	NPP	20.81	5496.14	NPP
		NA	5516.95	23.26	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5516.95	23.26	NPP	20.54	5496.41	NPP
		4/12/2010	5516.95	23.26	NPP	20.65	5496.30	NPP
	1st Quarter	3/10/2010	5516.95	23.26	NPP	20.58	5496.37	NPP
		3/16/2010	5516.95	23.26	NPP	20.6	5496.35	NPP
MW-37	4th Quarter	NA	5519.62	27.58	NA	NA	NA	NA
		NA	5519.62	27.58	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5519.62	27.58	NPP	23.48	5496.14	NPP
		NA	5519.62	27.58	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5519.62	27.58	NPP	23.26	5496.36	NPP
		4/12/2010	5519.62	27.58	NPP	23.32	5496.30	NPP
	1st Quarter	3/10/2010	5519.62	27.58	NPP	23.26	5496.36	NPP
		3/16/2010	5519.62	27.58	NPP	23.27	5496.35	NPP

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-38	4th Quarter	NA	5519.19	26.82	NA	NA	NA	NA
		NA	5519.19	26.82	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5519.19	26.82	NPP	23.81	5495.38	NPP
		NA	5519.19	26.82	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5519.19	26.82	NPP	23.48	5495.71	NPP
		4/12/2010	5519.19	26.82	NPP	23.53	5495.66	NPP
	1st Quarter	3/10/2010	5519.19	26.82	NPP	23.41	5495.78	NPP
		3/16/2010	5519.19	26.82	NPP	23.4	5495.79	NPP
MW-39	4th Quarter	NA	5520.83	38.34	NA	NA	NA	NA
		NA	5520.83	38.34	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5520.83	38.34	NPP	25.90	5494.93	NPP
		NA	5520.83	38.34	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5520.83	38.34	NPP	25.56	5495.27	NPP
		4/12/2010	5520.83	38.34	NPP	25.57	5495.26	NPP
	1st Quarter	3/10/2010	5520.83	38.34	NPP	25.44	5495.39	NPP
		3/16/2010	5520.83	38.34	NPP	25.70	5495.13	NPP
MW-40	4th Quarter	NA	5527.31	30.07	NA	NA	NA	NA
		NA	5527.31	30.07	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5527.31	30.07	NPP	28.15	5499.16	NPP
		NA	5527.31	30.07	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5527.31	30.07	NPP	Couldn't find the well - too much mud over it		NPP
		4/12/2010	5527.31	30.07	NPP			NPP
	1st Quarter	3/10/2010	5527.31	30.07	NPP	Couldn't find the well - too much mud over it		NPP
		3/16/2010	5527.31	30.07	NPP			NPP
MW-41	4th Quarter	NA	5526.41	31.62	NA	NA	NA	NA
		NA	5526.41	31.62	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5526.41	31.62	26.61	26.75	5499.77	0.14
		NA	5526.41	31.62	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5526.41	31.62	26.53	26.58	5499.87	0.05
		4/12/2010	5526.41	31.62	26.45	26.53	5499.94	0.08
	1st Quarter	3/10/2010	5526.41	31.62	26.50	26.84	5499.84	0.34
		3/16/2010	5526.41	31.62	26.55	26.57	5499.86	0.02

NPP = No Product Present

NWP = No Water Present

NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-44	4th Quarter	NA	5535.44	50.91	NA	NA	NA	NA
		NA	5535.44	50.91	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5535.44	50.91	NPP	34.18	5501.26	NPP
		NA	5535.44	50.91	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5535.44	50.91	NPP	33.76	5501.68	NPP
		4/12/2010	5535.44	50.91	NPP	33.85	5501.59	NPP
	1st Quarter	3/10/2010	5535.44	50.91	NPP	33.67	5501.77	NPP
		3/16/2010	5535.44	50.91	NPP	34.04	5501.40	NPP
MW-45	4th Quarter	NA	5506.36	16.92	NA	NA	NA	NA
		NA	5506.36	16.92	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5506.36	16.92	NPP	11.73	5494.63	NPP
		NA	5506.36	16.92	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5506.36	16.92	NPP	11.64	5494.72	NPP
		4/12/2010	5506.36	16.92	NPP	11.67	5494.69	NPP
	1st Quarter	3/10/2010	5506.36	16.92	NPP	11.65	5494.71	NPP
		3/16/2010	5506.36	16.92	NPP	11.82	5494.54	NPP
MW-46	4th Quarter	NA	5504.65	10.39	NA	NA	NA	NA
		NA	5504.65	10.39	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5504.65	10.39	NPP	NWP		NPP
		NA	5504.65	10.39	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5504.65	10.39	NPP	9.86	5494.79	NPP
		4/12/2010	5504.65	10.39	NPP	9.85	5494.80	NPP
	1st Quarter	3/10/2010	5504.65	10.39	NPP	9.84	5494.81	NPP
		3/16/2010	5504.65	10.39	NPP	9.84	5494.81	NPP
MW-47	4th Quarter	NA	5506.77	14.28	NA	NA	NA	NA
		NA	5506.77	14.28	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5506.77	14.28	NPP	12.69	5494.08	NPP
		NA	5506.77	14.28	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5506.77	14.28	NPP	12.24	5494.53	NPP
		4/12/2010	5506.77	14.28	NPP	12.26	5494.51	NPP
	1st Quarter	3/10/2010	5506.77	14.28	NPP	12.31	5494.46	NPP
		3/16/2010	5506.77	14.28	NPP	12.33	5494.44	NPP

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NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-50	4th Quarter	NA	5518.79	22.14	NA	NA	NA	NA
		NA	5518.79	22.14	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5518.79	22.14	NPP	16.77	5502.02	NPP
		NA	5518.79	22.14	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5518.79	22.14	NPP	16.91	5501.88	NPP
		4/12/2010	5518.79	22.14	NPP	16.86	5501.93	NPP
	1st Quarter	3/10/2010	5518.79	22.14	NPP	17.03	5501.76	NPP
		3/16/2010	5518.79	22.14	NPP	17.03	5501.76	NPP
MW-51	4th Quarter	NA	5515.58	22.18	NA	NA	NA	NA
		NA	5515.58	22.18	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5515.58	22.18	NPP	14.56	5501.02	NPP
		NA	5515.58	22.18	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5515.58	22.18	NPP	14.73	5500.85	NPP
		4/12/2010	5515.58	22.18	NPP	14.73	5500.85	NPP
	1st Quarter	3/10/2010	5515.58	22.18	NPP	14.83	5500.75	NPP
		3/16/2010	5515.58	22.18	NPP	14.82	5500.76	NPP
MW-52	4th Quarter	NA	5538.63	41.73	NA	NA	NA	NA
		NA	5538.63	41.73	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5538.63	41.73	NPP	36.22	5502.41	NPP
		NA	5538.63	41.73	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5538.63	41.73	NPP	36.52	5502.11	NPP
		4/12/2010	5538.63	41.73	NPP	36.22	5502.41	NPP
	1st Quarter	3/10/2010	5538.63	41.73	NPP	36.27	5502.36	NPP
		3/16/2010	5538.63	41.73	NPP	36.35	5502.28	NPP
MW-53	4th Quarter	NA	5541.32	43.58	NA	NA	NA	NA
		NA	5541.32	43.58	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5541.32	43.58	NPP	38.86	5502.46	NPP
		NA	5541.32	43.58	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5541.32	43.58	NPP	38.86	5502.46	NPP
		4/12/2010	5541.32	43.58	NPP	38.83	5502.49	NPP
	1st Quarter	3/10/2010	5541.32	43.58	NPP	38.88	5502.44	NPP
		3/16/2010	5541.32	43.58	NPP	38.92	5502.40	NPP

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NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-54	4th Quarter	NA	5530.08	41.34	NA	NA	NA	NA
		NA	5530.08	41.34	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5530.08	41.34	32.32	32.68	5497.69	0.36
		NA	5530.08	41.34	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5530.08	41.34	32.43	32.78	5497.58	0.35
		4/12/2010	5530.08	41.34	30.91	31.11	5499.13	0.20
	1st Quarter	3/10/2010	5530.08	41.34	32.45	32.77	5497.56	0.32
		3/16/2010	5530.08	41.34	32.02	32.18	5498.03	0.16
MW-55	4th Quarter	NA	5519.84	26.29	NA	NA	NA	NA
		NA	5519.84	26.29	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5519.84	26.29	NPP	21.61	5498.23	NPP
		NA	5519.84	26.29	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5519.84	26.29	NPP	22.04	5497.80	NPP
		4/12/2010	5519.84	26.29	NPP	21.88	5497.96	NPP
	1st Quarter	3/10/2010	5519.84	26.29	NPP	22.05	5497.79	NPP
		3/16/2010	5519.84	26.29	NPP	21.98	5497.86	NPP
MW-56	4th Quarter	NA	5519.31	25.36	NA	NA	NA	NA
		NA	5519.31	25.36	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5519.31	25.36	19.80	20.12	5499.44	0.32
		NA	5519.31	25.36	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5519.31	25.36	19.75	19.94	5499.52	0.19
		4/12/2010	5519.31	25.36	19.74	19.89	5499.54	0.15
	1st Quarter	3/10/2010	5519.31	25.36	19.72	19.88	5499.56	0.16
		3/16/2010	5519.31	25.36	19.75	19.94	5499.52	0.19
MW-57	4th Quarter	NA	5521.17	26.00	NA	NA	NA	NA
		NA	5521.17	26.00	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5521.17	26.00	21.45	21.65	5499.68	0.20
		NA	5521.17	26.00	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5521.17	26.00	21.34	21.52	5499.80	0.18
		4/12/2010	5521.17	26.00	21.35	21.52	5499.79	0.17
	1st Quarter	3/10/2010	5521.17	26.00	21.31	21.50	5499.83	0.19
		3/16/2010	5521.17	26.00	21.35	21.53	5499.79	0.18

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NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-58	4th Quarter	NA	5520.29	27.42	NA	NA	NA	NA
		NA	5520.29	27.42	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5520.29	27.42	NPP	20.93	5499.36	NPP
		NA	5520.29	27.42	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5520.29	27.42	NPP	20.88	5499.41	NPP
		4/12/2010	5520.29	27.42	NPP	20.84	5499.45	NPP
	1st Quarter	3/10/2010	5520.29	27.42	NPP	20.90	5499.39	NPP
		3/16/2010	5520.29	27.42	NPP	20.95	5499.34	NPP
MW-59	4th Quarter	NA	5545.20	46.95	NA	NA	NA	NA
		NA	5545.20	46.95	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5545.20	46.95	NPP	43.37	5501.83	NPP
		NA	5545.20	46.95	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5545.20	46.95	NPP	43.35	5501.85	NPP
		4/12/2010	5545.20	46.95	NPP	43.33	5501.87	NPP
	1st Quarter	3/10/2010	5545.20	46.95	NPP	43.40	5501.80	NPP
		3/16/2010	5545.20	46.95	NPP	43.39	5501.81	NPP
MW-60	4th Quarter	NA	5543.71	43.40	NA	NA	NA	NA
		NA	5543.71	43.40	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5543.71	43.40	NPP	42.56	5501.15	NPP
		NA	5543.71	43.40	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5543.71	43.40	NPP	42.43	5501.28	NPP
		4/12/2010	5543.71	43.40	NPP	42.42	5501.29	NPP
	1st Quarter	3/10/2010	5543.71	43.40	NPP	42.48	5501.23	NPP
		3/16/2010	5543.71	43.40	NPP	42.47	5501.24	NPP
MW-61	4th Quarter	NA	5539.41	40.86	NA	NA	NA	NA
		NA	5539.41	40.86	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5539.41	40.86	36.58	37.04	5502.74	0.46
		NA	5539.41	40.86	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5539.41	40.86	36.59	37.05	5502.73	0.46
		4/12/2010	5539.41	40.86	36.57	37.05	5502.75	0.48
	1st Quarter	3/10/2010	5539.41	40.86	36.60	37.08	5502.72	0.48
		3/16/2010	5539.41	40.86	36.61	37.11	5502.70	0.50

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NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-62	4th Quarter	NA	5561.32	61.28	NA	NA	NA	NA
		NA	5561.32	61.28	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5561.32	61.28	NPP	56.25	5505.07	NPP
		NA	5561.32	61.28	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5561.32	61.28	NPP	56.04	5505.28	NPP
		4/12/2010	5561.32	61.28	NPP	55.93	5505.39	NPP
	1st Quarter	3/10/2010	5561.32	61.28	NPP	55.94	5505.38	NPP
		3/16/2010	5561.32	61.28	NPP	56.50	5504.82	NPP
MW-63	4th Quarter	NA	5547.26	47.84	NA	NA	NA	NA
		NA	5547.26	47.84	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5547.26	47.84	NPP	44.86	5502.40	NPP
		NA	5547.26	47.84	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5547.26	47.84	NPP	44.66	5502.60	NPP
		4/12/2010	5547.26	47.84	NPP	44.85	5502.41	NPP
	1st Quarter	3/10/2010	5547.26	47.84	NPP	44.88	5502.38	NPP
		3/16/2010	5547.26	47.84	NPP	44.89	5502.37	NPP
MW-64	4th Quarter	NA	5552.29	52.40	NA	NA	NA	NA
		NA	5552.29	52.40	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5552.29	52.40	NPP	50.20	5502.09	NPP
		NA	5552.29	52.40	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5552.29	52.40	NPP	50.16	5502.13	NPP
		4/12/2010	5552.29	52.40	NPP	50.15	5502.14	NPP
	1st Quarter	3/10/2010	5552.29	52.40	NPP	50.18	5502.11	NPP
		3/16/2010	5552.29	52.40	NPP	50.17	5502.12	NPP
MW-64	4th Quarter	NA	5552.29	52.40	NA	NA	NA	NA
		NA	5552.29	52.40	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5552.29	52.40	NPP	50.20	5502.09	NPP
		NA	5552.29	52.40	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5552.29	52.40	NPP	50.16	5502.13	NPP
		4/12/2010	5552.29	52.40	NPP	50.15	5502.14	NPP
	1st Quarter	3/10/2010	5552.29	52.40	NPP	50.18	5502.11	NPP
		3/16/2010	5552.29	52.40	NPP	50.17	5502.12	NPP

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NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW-65	4th Quarter	NA	5539.52	44.25	NA	NA	NA	NA
		NA	5539.52	44.25	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5539.52	44.25	NPP	36.95	5502.57	NPP
		NA	5539.52	44.25	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5539.52	44.25	NA	NA	NA	NA
		4/12/2010	5539.52	44.25	NA	NA	NA	NA
	1st Quarter	3/10/2010	5539.52	44.25	NA	NA	NA	NA
		3/16/2010	5539.52	44.25	NA	NA	NA	NA
MW-66	4th Quarter	NA	5544.62	43.25	NA	NA	NA	NA
		NA	5544.62	43.25	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5544.62	43.25	41.78	41.92	5502.81	0.14
		NA	5544.62	43.25	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5544.62	43.25	NA	NA	NA	NA
		4/12/2010	5544.62	43.25	NA	NA	NA	NA
	1st Quarter	3/10/2010	5544.62	43.25	NA	NA	NA	NA
		3/16/2010	5544.62	43.25	NA	NA	NA	NA
P-03	4th Quarter	NA	5510.77	22.73	NA	NA	NA	NA
		NA	5510.77	22.73	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5510.77	22.73	NPP	11.02	5499.75	NPP
		NA	5510.77	22.73	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5510.77	22.73	NPP	10.41	5500.36	NPP
		4/12/2010	5510.77	22.73	NPP	10.51	5500.26	NPP
	1st Quarter	3/10/2010	5510.77	22.73	NPP	9.25	5501.52	NPP
		3/16/2010	5510.77	22.73	NPP	9.67	5501.10	NPP
RW-01	4th Quarter	NA	5529.34	40.80	NA	NA	NA	NA
		NA	5529.34	40.80	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5529.34	40.80	31.00	31.02	5498.34	0.02
		NA	5529.34	40.80	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5529.34	40.80	32.40	32.55	5496.91	0.15
		4/12/2010	5529.34	40.80	30.64	30.66	5498.70	0.02
	1st Quarter	3/10/2010	5529.34	40.80	32.20	32.45	5497.09	0.25
		3/16/2010	5529.34	40.80	30.75	31.04	5498.53	0.29

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
RW-02	4th Quarter	NA	5526.94	35.86	NA	NA	NA	NA
		NA	5526.94	35.86	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5526.94	35.86	26.35	26.85	5500.49	0.50
		NA	5526.94	35.86	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5526.94	35.86	27.50	27.75	5499.39	0.25
		4/12/2010	5526.94	35.86	26.85	27.05	5500.05	0.20
	1st Quarter	3/10/2010	5526.94	35.86	27.37	30.08	5499.03	2.71
		3/16/2010	5526.94	35.86	25.72	26.02	5501.16	0.30
RW-03	4th Quarter	NA	5520.35	34.57	NA	NA	NA	NA
		NA	5520.35	34.57	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5520.35	34.57	NPP	21.76	5498.59	NPP
		NA	5520.35	34.57	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5520.35	34.57	NPP	21.65	5498.70	NPP
		4/12/2010	5520.35	34.57	NPP	21.45	5498.90	NPP
	1st Quarter	3/10/2010	5520.35	34.57	21.60	21.63	5498.74	0.03
		3/16/2010	5520.35	34.57	NPP	21.3	5499.05	NPP
RW-09	4th Quarter	NA	5523.21	34.04	NA	NA	NA	NA
		NA	5523.21	34.04	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5523.21	34.04	NPP	24.70	5498.51	NPP
		NA	5523.21	34.04	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5523.21	34.04	NPP	28.18	5495.03	NPP
		4/12/2010	5523.21	34.04	NPP	25.51	5497.70	NPP
	1st Quarter	3/10/2010	5523.21	34.04	NPP	27.91	5495.30	NPP
		3/16/2010	5523.21	34.04	25.05	25.06	5498.16	0.01
RW-14	4th Quarter	NA	5537.5	41.94	NA	NA	NA	NA
		NA	5537.5	41.94	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5537.50	41.94	NPP	34.96	5502.54	NPP
		NA	5537.50	41.94	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5537.5	41.94	NPP	35.60	5501.90	NPP
		4/12/2010	5537.5	41.94	35.13	35.20	5502.36	0.07
	1st Quarter	3/10/2010	5537.5	41.94	35.25	35.45	5502.21	0.20
		3/16/2010	5537.5	41.94	34.99	35.50	5502.41	0.51

NPP = No Product Present

NWP = No Water Present

NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
RW-15	4th Quarter	NA	5536.83	43.43	NA	NA	NA	NA
		NA	5536.83	43.43	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5536.83	43.43	NPP	34.67	5502.16	NPP
		NA	5536.83	43.43	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5536.83	43.43	NPP	36.09	5500.74	NPP
		4/12/2010	5536.83	43.43	NPP	35.78	5501.05	NPP
	1st Quarter	3/10/2010	5536.83	43.43	NPP	35.90	5500.93	NPP
		3/16/2010	5536.83	43.43	NPP	34.70	5502.13	NPP
RW-16	4th Quarter	NA	5535.45	41.48	NA	NA	NA	NA
		NA	5535.45	41.48	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5535.45	41.48	32.75	32.76	5502.70	0.01
		NA	5535.45	41.48	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5535.45	41.48	NPP	37.41	5498.04	NPP
		4/12/2010	5535.45	41.48	NPP	34.94	5500.51	NPP
	1st Quarter	3/10/2010	5535.45	41.48	NPP	34.82	5500.63	NPP
		3/16/2010	5535.45	41.48	NPP	33.70	5501.75	NPP
RW-17	4th Quarter	NA	5533.84	41.89	NA	NA	NA	NA
		NA	5533.84	41.89	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5533.84	41.89	NPP	32.84	5501.00	NPP
		NA	5533.84	41.89	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5533.84	41.89	NPP	34.65	5499.19	NPP
		4/12/2010	5533.84	41.89	NPP	33.63	5500.21	NPP
	1st Quarter	3/10/2010	5533.84	41.89	NPP	35.23	5498.61	NPP
		3/16/2010	5533.84	41.89	NPP	32.74	5501.10	NPP
RW-18	4th Quarter	NA	5529.38	37.58	NA	NA	NA	NA
		NA	5529.38	37.58	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5529.38	37.58	NPP	35.33	5494.05	NPP
		NA	5529.38	37.58	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5529.38	37.58	NPP	35.17	5494.21	NPP
		4/12/2010	5529.38	37.58	32.42	32.65	5496.91	0.23
	1st Quarter	3/10/2010	5529.38	37.58	NPP	35.07	5494.31	NPP
		3/16/2010	5529.38	37.58	34.47	34.49	5494.91	0.02

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NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
RW-19	4th Quarter	NA	5530.51	36.64	NA	NA	NA	NA
		NA	5530.51	36.64	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5530.51	36.64	NPP	30.00	5500.51	NPP
		NA	5530.51	36.64	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5530.51	36.64	32.52	32.55	5497.98	0.03
		4/12/2010	5530.51	36.64	NPP	30.50	5500.01	NPP
	1st Quarter	3/10/2010	5530.51	36.64	32.73	32.80	5497.77	0.07
		3/16/2010	5530.51	36.64	29.85	29.92	5500.65	0.07
RW-22	4th Quarter	NA	5524.44	35.60	NA	NA	NA	NA
		NA	5524.44	35.60	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5524.44	35.60	NPP	25.63	5498.81	NPP
		NA	5524.44	35.60	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5524.44	35.60	27.51	30.35	5496.36	2.84
		4/12/2010	5524.44	35.60	NPP	25.93	5498.51	NPP
	1st Quarter	3/10/2010	5524.44	35.60	27.75	29.65	5496.31	1.90
		3/16/2010	5524.44	35.60	NPP	25.85	5498.59	NPP
RW-23	4th Quarter	NA	5521.38	35.53	NA	NA	NA	NA
		NA	5521.38	35.53	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5521.38	35.53	NPP	23.41	5497.97	NPP
		NA	5521.38	35.53	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5521.38	35.53	30.81	30.88	5490.56	0.07
		4/12/2010	5521.38	35.53	26.66	26.73	5494.71	0.07
	1st Quarter	3/10/2010	5521.38	35.53	NPP	30.80	5490.58	NPP
		3/16/2010	5521.38	35.53	NPP	23.75	5497.63	NPP
RW-28	4th Quarter	NA	5527.93	36.99	NA	NA	NA	NA
		NA	5527.93	36.99	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5527.93	36.99	29.17	29.19	5498.76	0.02
		NA	5527.93	36.99	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5527.93	36.99	Unable to measure - pump was stuck in the well- Repaired 4-20-2010			
		4/12/2010	5527.93	36.99				
	1st Quarter	3/10/2010	5527.93	36.99	29.49	29.5	5498.44	0.01
		3/16/2010	5527.93	36.99	28.92	29.05	5498.98	0.13

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Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
RW-42	4th Quarter	NA	5527.48	32.02	NA	NA	NA	NA
		NA	5527.48	32.02	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5527.48	32.02	26.92	27.50	5500.44	0.58
		NA	5527.48	32.02	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5527.48	32.02	26.85	26.95	5500.61	0.10
		4/12/2010	5527.48	32.02	26.70	26.80	5500.76	0.10
	1st Quarter	3/10/2010	5527.48	32.02	NPP	26.96	5500.52	NPP
		3/16/2010	5527.48	32.02	NPP	26.85	5500.63	NPP
RW-43	4th Quarter	NA	5520.02	24.03	NA	NA	NA	NA
		NA	5520.02	24.03	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5520.02	24.03	NPP	20.65	5499.37	NPP
		NA	5520.02	24.03	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5520.02	24.03	20.45	20.47	5499.57	0.02
		4/12/2010	5520.02	24.03	20.45	20.46	5499.57	0.01
	1st Quarter	3/10/2010	5520.02	24.03	20.43	20.50	5499.58	0.07
		3/16/2010	5520.02	24.03	20.48	20.52	5499.53	0.04

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Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	4th Quarter	NA	5506.62	12.26	NA	NA	NA	NA
		NA	5506.62	12.26	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5506.62	12.26	NPP	11.74	5494.88	NPP
		NA	5506.62	12.26	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5506.62	12.26	NPP	11.47	5495.15	NPP
		4/12/2010	5506.62	12.26	NPP	11.5	5495.12	NPP
	1st Quarter	3/10/2010	5506.62	12.26	NPP	11.57	5495.05	NPP
		3/16/2010	5506.62	12.26	NPP	11.57	5495.05	NPP
OW 1+50	4th Quarter	NA	5508.03	14.36	NA	NA	NA	NA
		NA	5508.03	14.36	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5508.03	14.36	13.67	14.2	5494.25	0.53
		NA	5508.03	14.36	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5508.03	14.36	NPP	13.34	5494.69	NPP
		4/12/2010	5508.03	14.36	13.31	13.32	5494.72	0.01
	1st Quarter	3/10/2010	5508.03	14.36	13.32	13.47	5494.68	0.15
		3/16/2010	5508.03	14.36	13.35	13.37	5494.68	0.02
OW 3+85	4th Quarter	NA	5507.31	15.06	NA	NA	NA	NA
		NA	5507.31	15.06	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5507.31	15.06	NPP	13.3	5494.01	NPP
		NA	5507.31	15.06	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5507.31	15.06	NPP	12.8	5494.51	NPP
		4/12/2010	5507.31	15.06	NPP	12.81	5494.50	NPP
	1st Quarter	3/10/2010	5507.31	15.06	NPP	12.87	5494.44	NPP
		3/16/2010	5507.31	15.06	NPP	12.83	5494.48	NPP
OW 5+50	4th Quarter	NA	5507.59	13.67	NA	NA	NA	NA
		NA	5507.59	13.67	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5507.59	13.67	NPP	13.21	5494.38	NPP
		NA	5507.59	13.67	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5507.59	13.67	NPP	13.33	5494.26	NPP
		4/12/2010	5507.59	13.67	NPP	13.24	5494.35	NPP
	1st Quarter	3/10/2010	5507.59	13.67	NPP	13.43	5494.16	NPP
		3/16/2010	5507.59	13.67	NPP	13.56	5494.03	NPP

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 6+70	4th Quarter	NA	5504.78	14.67	NA	NA	NA	NA
		NA	5504.78	14.67	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5504.78	14.67	NPP	NWP		NPP
		NA	5504.78	14.67	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5504.78	14.67	NPP	NWP		NPP
		4/12/2010	5504.78	14.67	NPP	NWP		NPP
	1st Quarter	3/10/2010	5504.78	14.67	NPP	NWP		NPP
		3/16/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	4th Quarter	NA	5506.53	15.99	NA	NA	NA	NA
		NA	5506.53	15.99	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5506.53	15.99	NPP	NWP		NPP
		NA	5506.53	15.99	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5506.53	15.99	NPP	15.75	5490.78	NPP
		4/12/2010	5506.53	15.99	NPP	15.90	5490.63	NPP
	1st Quarter	3/10/2010	5506.53	15.99	NPP	15.90	5490.63	NPP
		3/16/2010	5506.53	15.99	NPP	15.55	5490.98	NPP
OW 11+15	4th Quarter	NA	5506.7	16.59	NA	NA	NA	NA
		NA	5506.7	16.59	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5506.70	16.59	12.43	12.44	5494.27	0.01
		NA	5506.70	16.59	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5506.7	16.59	NPP	12.38	5494.32	NPP
		4/12/2010	5506.7	16.59	12.39	12.43	5494.30	0.04
	1st Quarter	3/10/2010	5506.7	16.59	NPP	12.39	5494.31	NPP
		3/16/2010	5506.7	16.59	NPP	12.54	5494.16	NPP
OW 14+10	4th Quarter	NA	5508.14	12.96	NA	NA	NA	NA
		NA	5508.14	12.96	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5508.14	12.96	NPP	NWP		NPP
		NA	5508.14	12.96	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5508.14	12.96	NPP	NWP		NPP
		4/12/2010	5508.14	12.96	NPP	NWP		NPP
	1st Quarter	3/10/2010	5508.14	12.96	NPP	NWP		NPP
		3/16/2010	5508.14	12.96	NPP	NWP		NPP

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 16+60	4th Quarter	NA	5508.43	15.21	NA	NA	NA	NA
		NA	5508.43	15.21	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5508.43	15.21	NPP	12.69	5495.74	NPP
		NA	5508.43	15.21	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5508.43	15.21	NPP	12.27	5496.16	NPP
		4/12/2010	5508.43	15.21	NPP	12.28	5496.15	NPP
	1st Quarter	3/10/2010	5508.43	15.21	NPP	12.33	5496.10	NPP
		3/16/2010	5508.43	15.21	NPP	12.38	5496.05	NPP
OW 19+50	4th Quarter	NA	5508.03	13.00	NA	NA	NA	NA
		NA	5508.03	13.00	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5508.03	13.00	NPP	12.42	5495.61	NPP
		NA	5508.03	13.00	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5508.03	13.00	NPP	11.43	5496.60	NPP
		4/12/2010	5508.03	13.00	NPP	11.41	5496.62	NPP
	1st Quarter	3/10/2010	5508.03	13.00	NPP	11.78	5496.25	NPP
		3/16/2010	5508.03	13.00	NPP	11.72	5496.31	NPP
OW 22+00	4th Quarter	NA	5506.91	14.16	NA	NA	NA	NA
		NA	5506.91	14.16	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5506.91	14.16	NPP	12.72	5494.19	NPP
		NA	5506.91	14.16	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5506.91	14.16	NPP	10.92	5495.99	NPP
		4/12/2010	5506.91	14.16	NPP	11.18	5495.73	NPP
	1st Quarter	3/10/2010	5506.91	14.16	NPP	10.74	5496.17	NPP
		3/16/2010	5506.91	14.16	NPP	10.36	5496.55	NPP
OW 23+10	4th Quarter	NA	5514.12	18.34	NA	NA	NA	NA
		NA	5514.12	18.34	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5514.12	18.34	NPP	16.28	5497.84	NPP
		NA	5514.12	18.34	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5514.12	18.34	NPP	16.22	5497.90	NPP
		4/12/2010	5514.12	18.34	NPP	16.23	5497.89	NPP
	1st Quarter	3/10/2010	5514.12	18.34	NPP	16.18	5497.94	NPP
		3/16/2010	5514.12	18.34	NPP	16.2	5497.92	NPP

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 23+90	4th Quarter	NA	5515.18	18.01	NA	NA	NA	NA
		NA	5515.18	18.01	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5515.18	18.01	NPP	17.11	5498.07	NPP
		NA	5515.18	18.01	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5515.18	18.01	NPP	16.99	5498.19	NPP
		4/12/2010	5515.18	18.01	NPP	17.12	5498.06	NPP
	1st Quarter	3/10/2010	5515.18	18.01	NPP	17.09	5498.09	NPP
		3/16/2010	5515.18	18.01	NPP	17.05	5498.13	NPP
OW 25+70	4th Quarter	NA	5509.00	13.98	NA	NA	NA	NA
		NA	5509.00	13.98	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5509.00	13.98	NPP	10.72	5498.28	NPP
		NA	5509.00	13.98	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5509.00	13.98	NPP	10.64	5498.36	NPP
		4/12/2010	5509.00	13.98	NPP	10.72	5498.28	NPP
	1st Quarter	3/10/2010	5509.00	13.98	NPP	10.71	5498.29	NPP
		3/16/2010	5509.00	13.98	NPP	10.7	5498.30	NPP

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Groundwater Elevation Measurements - 2010
(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 0+60	4th Quarter	NA	5506.68	14.09	NA	NA	NA	NA
		NA	5506.68	14.09	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5506.68	14.09	NPP	8.35	5498.33	NPP
		NA	5506.68	14.09	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5506.68	14.09	NPP	8.29	5498.39	NPP
		4/12/2010	5506.68	14.09	NPP	8.24	5498.44	NPP
	1st Quarter	3/10/2010	5506.68	14.09	NPP	8.33	5498.35	NPP
		3/16/2010	5506.68	14.09	NPP	8.09	5498.59	NPP
CW 1+50	4th Quarter	NA	5505.13	13.74	NA	NA	NA	NA
		NA	5505.13	13.74	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5505.13	13.74	NPP	6.95	5498.18	NPP
		NA	5505.13	13.74	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5505.13	13.74	NPP	6.84	5498.29	NPP
		4/12/2010	5505.13	13.74	NPP	6.71	5498.42	NPP
	1st Quarter	3/10/2010	5505.13	13.74	NPP	6.89	5498.24	NPP
		3/16/2010	5505.13	13.74	NPP	6.73	5498.40	NPP
CW 3+85	4th Quarter	NA	5503.87	13.11	NA	NA	NA	NA
		NA	5503.87	13.11	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5503.87	13.11	NPP	5.72	5498.15	NPP
		NA	5503.87	13.11	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5503.87	13.11	NPP	6.59	5497.28	NPP
		4/12/2010	5503.87	13.11	NPP	6.56	5497.31	NPP
	1st Quarter	3/10/2010	5503.87	13.11	NPP	5.67	5498.20	NPP
		3/16/2010	5503.87	13.11	NPP	5.62	5498.25	NPP
CW 5+50	4th Quarter	NA	5503.76	12.27	NA	NA	NA	NA
		NA	5503.76	12.27	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5503.76	12.27	NPP	6.36	5497.40	NPP
		NA	5503.76	12.27	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5503.76	12.27	NPP	6.34	5497.42	NPP
		4/12/2010	5503.76	12.27	NPP	6.33	5497.43	NPP
	1st Quarter	3/10/2010	5503.76	12.27	NPP	6.31	5497.45	NPP
		3/16/2010	5503.76	12.27	NPP	6.29	5497.47	NPP

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Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 6+70	4th Quarter	NA	5503.84	11.45	NA	NA	NA	NA
		NA	5503.84	11.45	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5503.84	11.45	NPP	6.71	5497.13	NPP
		NA	5503.84	11.45	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5503.84	11.45	NPP	6.61	5497.23	NPP
		4/12/2010	5503.84	11.45	NPP	6.62	5497.22	NPP
	1st Quarter	3/10/2010	5503.84	11.45	NPP	6.59	5497.25	NPP
		3/16/2010	5503.84	11.45	NPP	6.59	5497.25	NPP
CW 8+10	4th Quarter	NA	5504.02	11.63	NA	NA	NA	NA
		NA	5504.02	11.63	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5504.02	11.63	NPP	7.51	5496.51	NPP
		NA	5504.02	11.63	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5504.02	11.63	NPP	7.42	5496.60	NPP
		4/12/2010	5504.02	11.63	NPP	7.44	5496.58	NPP
	1st Quarter	3/10/2010	5504.02	11.63	NPP	7.49	5496.53	NPP
		3/16/2010	5504.02	11.63	NPP	7.56	5496.46	NPP
CW 8+45	4th Quarter	NA	5503.8	12.6	NA	NA	NA	NA
		NA	5503.8	12.6	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5503.80	12.6	NPP	7.65	5496.15	NPP
		NA	5503.80	12.6	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5503.8	12.60	NPP	7.53	5496.27	NPP
		4/12/2010	5503.8	12.60	NPP	7.55	5496.25	NPP
	1st Quarter	3/10/2010	5503.8	12.60	NPP	7.57	5496.23	NPP
		3/16/2010	5503.8	12.60	NPP	7.71	5496.09	NPP
CW 11+15	4th Quarter	NA	5503.95	12.27	NA	NA	NA	NA
		NA	5503.95	12.27	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5503.95	12.27	NPP	6.02	5497.93	NPP
		NA	5503.95	12.27	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5503.95	12.27	NPP	5.91	5498.04	NPP
		4/12/2010	5503.95	12.27	NPP	5.89	5498.06	NPP
	1st Quarter	3/10/2010	5503.95	12.27	NPP	6.13	5497.82	NPP
		3/16/2010	5503.95	12.27	NPP	6.05	5497.90	NPP

NPP = No Product Present

NWP = No Water Present

NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 14+10	4th Quarter	NA	5504.39	13.05	NA	NA	NA	NA
		NA	5504.39	13.05	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5504.39	13.05	NPP	6.42	5497.97	NPP
		NA	5504.39	13.05	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5504.39	13.05	NPP	6.36	5498.03	NPP
		4/12/2010	5504.39	13.05	NPP	6.39	5498.00	NPP
	1st Quarter	3/10/2010	5504.39	13.05	NPP	6.35	5498.04	NPP
		3/16/2010	5504.39	13.05	NPP	6.49	5497.90	NPP
CW 16+60	4th Quarter	NA	5504.32	12.86	NA	NA	NA	NA
		NA	5504.32	12.86	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5504.32	12.86	NPP	6.22	5498.10	NPP
		NA	5504.32	12.86	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5504.32	12.86	NPP	6.18	5498.14	NPP
		4/12/2010	5504.32	12.86	NPP	6.22	5498.10	NPP
	1st Quarter	3/10/2010	5504.32	12.86	NPP	6.12	5498.20	NPP
		3/16/2010	5504.32	12.86	NPP	6.13	5498.19	NPP
CW 19+50	4th Quarter	NA	5504.52	9.99	NA	NA	NA	NA
		NA	5504.52	9.99	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5504.52	9.99	NPP	5.42	5499.10	NPP
		NA	5504.52	9.99	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5504.52	9.99	NPP	6.48	5498.04	NPP
		4/12/2010	5504.52	9.99	NPP	6.41	5498.11	NPP
	1st Quarter	3/10/2010	5504.52	9.99	NPP	6.48	5498.04	NPP
		3/16/2010	5504.52	9.99	NPP	6.51	5498.01	NPP
CW 22+00	4th Quarter	NA	5508.04	12.34	NA	NA	NA	NA
		NA	5508.04	12.34	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5508.04	12.34	NPP	8.81	5499.23	NPP
		NA	5508.04	12.34	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5508.04	12.34	NPP	8.82	5499.22	NPP
		4/12/2010	5508.04	12.34	NPP	8.83	5499.21	NPP
	1st Quarter	3/10/2010	5508.04	12.34	NPP	8.79	5499.25	NPP
		3/16/2010	5508.04	12.34	NPP	8.82	5499.22	NPP

NPP = No Product Present

NWP = No Water Present

NA - Not Applicable due to approved FWGMP June 2010

Groundwater Elevation Measurements - 2010

(Pre and Post Recovery Well Operation 1st and 2nd QTR)

Section 8.0 - Tab 1.0

Well ID	Monitoring Event	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 23+10	4th Quarter	NA	5510.04	14.65	NA	NA	NA	NA
		NA	5510.04	14.65	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5510.04	14.65	NPP	10.47	5499.57	NPP
		NA	5510.04	14.65	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5510.04	14.65	NPP	10.44	5499.60	NPP
		4/12/2010	5510.04	14.65	NPP	10.46	5499.58	NPP
	1st Quarter	3/10/2010	5510.04	14.65	NPP	10.42	5499.62	NPP
		3/16/2010	5510.04	14.65	NPP	10.45	5499.59	NPP
CW 23+90	4th Quarter	NA	5507.32	11.72	NA	NA	NA	NA
		NA	5507.32	11.72	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5507.32	11.72	NPP	7.9	5499.42	NPP
		NA	5507.32	11.72	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5507.32	11.72	NPP	7.97	5499.35	NPP
		4/12/2010	5507.32	11.72	NPP	7.98	5499.34	NPP
	1st Quarter	3/10/2010	5507.32	11.72	NPP	7.94	5499.38	NPP
		3/16/2010	5507.32	11.72	NPP	7.96	5499.36	NPP
CW 25+95	4th Quarter	NA	5505.9	12.25	NA	NA	NA	NA
		NA	5505.9	12.25	NA	NA	NA	NA
	3rd Quarter	8/16/2010	5505.90	12.25	Well is in recovery service - no measurement			
		NA	5505.90	12.25	NA	NA	NA	NA
	2nd Quarter	4/6/2010	5505.9	12.25	NPP	7.15	5498.75	NPP
		4/12/2010	5505.9	12.25	NPP	7.14	5498.76	NPP
	1st Quarter	3/10/2010	5505.9	12.25	NPP	7.15	5498.75	NPP
		3/16/2010	5505.9	12.25	NPP	7.16	5498.74	NPP

NPP = No Product Present

NWP = No Water Present

NA - Not Applicable due to approved FWGMP June 2010

Sump Well Fluids Monitoring Jan. 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	1/11/2010	5508.27	53.08	NPP	52.78	5455.49	NPP
	1/25/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
SW2-0206	1/11/2010	5507.75	27.69	NPP	26.68	5481.07	NPP
	1/25/2010	5507.75	27.69	NPP	26.65	5481.10	NPP
SW3-0206	1/11/2010	5505.29	52.56	NPP	26.64	5478.65	NPP
	1/25/2010	5505.29	52.56	NPP	26.09	5479.20	NPP
SW4-0206	1/11/2010	5504.45	42.34	NPP	32.56	5471.89	NPP
	1/25/2010	5504.45	42.34	NPP	32.50	5471.95	NPP
SW5-0206	1/11/2010	5514.34	52.24	NPP	34.45	5479.89	NPP
	1/25/2010	5514.34	52.24	NPP	34.40	5479.94	NPP
SW6-0206	1/11/2010	5519.72	47.41	NPP	41.33	5478.39	NPP
	1/25/2010	5519.72	47.41	NPP	41.13	5478.59	NPP
SW7-0206	1/11/2010	5517.63	32.95	NPP	17.33	5500.30	NPP
	1/25/2010	5517.63	32.95	NPP	17.44	5500.19	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring Feb. 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	2/9/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
	2/23/2010	5508.27	53.08	NPP	52.76	5455.51	NPP
SW2-0206	2/9/2010	5507.75	27.69	NPP	26.65	5481.10	NPP
	2/23/2010	5507.75	27.69	NPP	26.67	5481.08	NPP
SW3-0206	2/9/2010	5505.29	52.56	NPP	26.03	5479.26	NPP
	2/23/2010	5505.29	52.56	NPP	26.15	5479.14	NPP
SW4-0206	2/9/2010	5504.45	42.34	NPP	32.46	5471.99	NPP
	2/23/2010	5504.45	42.34	NPP	32.44	5472.01	NPP
SW5-0206	2/9/2010	5514.34	52.24	NPP	34.01	5480.33	NPP
	2/23/2010	5514.34	52.24	NPP	34.04	5480.30	NPP
SW6-0206	2/9/2010	5519.72	47.41	NPP	41.06	5478.66	NPP
	2/23/2010	5519.72	47.41	NPP	41.07	5478.65	NPP
SW7-0206	2/9/2010	5517.63	32.95	NPP	17.6	5500.03	NPP
	2/23/2010	5517.63	32.95	NPP	17.83	5499.80	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring March 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	3/10/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
	3/26/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
SW2-0206	3/10/2010	5507.75	27.69	NPP	26.70	5481.05	NPP
	3/26/2010	5507.75	27.69	NPP	26.74	5481.01	NPP
SW3-0206	3/10/2010	5505.29	52.56	NPP	26.17	5479.12	NPP
	3/26/2010	5505.29	52.56	NPP	26.25	5479.04	NPP
SW4-0206	3/10/2010	5504.45	42.34	NPP	32.40	5472.05	NPP
	3/26/2010	5504.45	42.34	NPP	32.45	5472.00	NPP
SW5-0206	3/10/2010	5514.34	52.24	NPP	33.93	5480.41	NPP
	3/26/2010	5514.34	52.24	NPP	33.87	5480.47	NPP
SW6-0206	3/10/2010	5519.72	47.41	NPP	41.15	5478.57	NPP
	3/26/2010	5519.72	47.41	NPP	41.35	5478.37	NPP
SW7-0206	3/10/2010	5517.63	32.95	NPP	17.57	5500.06	NPP
	3/26/2010	5517.63	32.95	NPP	17.98	5499.65	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring April 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	4/12/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
	4/26/2010	5508.27	53.08	NPP	52.78	5455.49	NPP
SW2-0206	4/12/2010	5507.75	27.69	NPP	26.79	5480.96	NPP
	4/26/2010	5507.75	27.69	NPP	27.25	5480.50	NPP
SW3-0206	4/12/2010	5505.29	52.56	NPP	26.31	5478.98	NPP
	4/26/2010	5505.29	52.56	NPP	26.37	5478.92	NPP
SW4-0206	4/12/2010	5504.45	42.34	NPP	32.48	5471.97	NPP
	4/26/2010	5504.45	42.34	NPP	32.73	5471.72	NPP
SW5-0206	4/12/2010	5514.34	52.24	NPP	33.95	5480.39	NPP
	4/26/2010	5514.35	52.24	NPP	35.67	5478.68	NPP
SW6-0206	4/12/2010	5519.72	47.41	NPP	41.47	5478.25	NPP
	4/26/2010	5519.72	47.41	NPP	41.53	5478.19	NPP
SW7-0206	4/12/2010	5517.63	32.95	NPP	18.38	5499.25	NPP
	4/26/2010	5517.63	32.95	NPP	18.20	5499.43	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring May 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	5/10/2010	5508.27	53.08	NPP	52.78	5455.49	NPP
	5/24/2010	5508.27	53.08	NPP	52.78	5455.49	NPP
SW2-0206	5/10/2010	5507.75	27.69	NPP	26.88	5480.87	NPP
	5/24/2010	5507.75	27.69	NPP	26.93	5480.82	NPP
SW3-0206	5/10/2010	5505.29	52.56	NPP	26.32	5478.97	NPP
	5/24/2010	5505.29	52.56	NPP	26.37	5478.92	NPP
SW4-0206	5/10/2010	5504.45	42.34	NPP	32.50	5471.95	NPP
	5/24/2010	5504.45	42.34	NPP	32.53	5471.92	NPP
SW5-0206	5/10/2010	5514.34	52.24	33.85	33.86	5480.49	0.01
	5/24/2010	5514.34	52.24	NPP	33.93	5480.41	NPP
SW6-0206	5/10/2010	5519.72	47.41	41.76	41.77	5477.96	0.01
	5/24/2010	5519.72	47.41	NPP	41.97	41.98	NPP
SW7-0206	5/10/2010	5517.63	32.95	NPP	18.72	5498.91	NPP
	5/24/2010	5517.63	32.95	NPP	18.82	5498.81	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring June 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Section 8.0 - Tab 2.0	Separate Phase Hydrocarbon Thickness
SW1-0206	6/7/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
	6/22/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
SW2-0206	6/7/2010	5507.75	27.69	NPP	27.15	5480.60	NPP
	6/22/2010	5507.75	27.69	NPP	27.00	5480.75	NPP
SW3-0206	6/7/2010	5505.29	52.56	NPP	26.30	5478.99	NPP
	6/22/2010	5505.29	52.56	NPP	26.45	5478.84	NPP
SW4-0206	6/7/2010	5504.45	42.34	NPP	32.81	5471.64	NPP
	6/22/2010	5504.45	42.34	NPP	32.68	5471.77	NPP
SW5-0206	6/7/2010	5514.34	52.24	34.14	34.16	5480.20	0.02
	6/22/2010	5514.34	52.24	42.45	42.46	5471.89	0.01
SW6-0206	6/7/2010	5519.72	47.41	42.78	42.79	5476.94	0.01
	6/22/2010	5519.72	47.41	42.45	42.46	5477.27	0.01
SW7-0206	6/7/2010	5517.63	32.95	NPP	18.87	5498.76	NPP
	6/22/2010	5517.63	32.95	NPP	19.07	5498.56	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring July 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	7/9/2010	5508.27	53.08	NPP	52.77	5455.50	NPP
	7/21/2010	5508.27	53.08	NPP	52.76	5455.51	NPP
SW2-0206	7/9/2010	5507.75	27.69	NPP	27.04	5480.71	NPP
	7/21/2010	5507.75	27.69	NPP	27.05	5480.70	NPP
SW3-0206	7/9/2010	5505.29	52.56	NPP	26.41	5478.88	NPP
	7/21/2010	5505.29	52.56	NPP	26.37	5478.92	NPP
SW4-0206	7/9/2010	5504.45	42.34	NPP	32.77	5471.68	NPP
	7/21/2010	5504.45	42.34	NPP	32.82	5471.63	NPP
SW5-0206	7/9/2010	5514.34	52.24	34.30	34.31	5480.04	0.01
	7/21/2010	5514.34	52.24	NPP	34.36	5479.98	NPP
SW6-0206	7/9/2010	5519.72	47.41	42.67	42.68	5477.05	0.01
	7/21/2010	5519.72	47.41	42.84	42.85	5476.88	0.01
SW7-0206	7/9/2010	5517.63	32.95	NPP	19.15	5498.48	NPP
	7/21/2010	5517.63	32.95	NPP	18.98	5498.65	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring Aug. 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Section 8.0 - Tab 2.0	Separate Phase Hydrocarbon Thickness
SW1-0206	8/5/2010	5508.27	53.08	NPP	52.78	5455.49	NPP
	8/31/2010	5508.27	53.08	NPP	52.76	5455.51	NPP
SW2-0206	8/5/2010	5507.75	27.69	NPP	27.03	5480.72	NPP
	8/31/2010	5507.75	27.69	NPP	26.92	5480.83	NPP
SW3-0206	8/5/2010	5505.29	52.56	NPP	26.23	5479.06	NPP
	8/31/2010	5505.29	52.56	NPP	26.05	5479.24	NPP
SW4-0206	8/5/2010	5504.45	42.34	NPP	32.88	5471.57	NPP
	8/31/2010	5504.45	42.34	NPP	32.92	5471.53	NPP
SW5-0206	8/5/2010	5514.34	52.24	34.00	34.01	5480.34	0.01
	8/31/2010	5514.34	52.24	34.42	34.43	5479.92	0.01
SW6-0206	8/5/2010	5519.72	47.41	43.00	43.02	5476.72	0.02
	8/31/2010	5519.72	47.41	43.11	43.12	5476.61	0.01
SW7-0206	8/5/2010	5517.63	32.95	NPP	18.9	5498.73	NPP
	8/31/2010	5517.63	32.95	NPP	18.51	5499.12	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring Sept. 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	9/16/2010	5508.27	53.08	NPP	52.75	5455.52	NPP
	9/29/2010	5508.27	53.08	NPP	52.75	5455.52	NPP
SW2-0206	9/16/2010	5507.75	27.69	NPP	26.88	5480.87	NPP
	9/29/2010	5507.75	27.69	NPP	26.72	5481.03	NPP
SW3-0206	9/16/2010	5505.29	52.56	NPP	25.98	5479.31	NPP
	9/29/2010	5505.29	52.56	NPP	25.90	5479.39	NPP
SW4-0206	9/16/2010	5504.45	42.34	NPP	32.93	5471.52	NPP
	9/29/2010	5504.45	42.34	NPP	32.91	5471.54	NPP
SW5-0206	9/16/2010	5514.34	52.24	34.36	34.38	5479.98	0.02
	9/29/2010	5514.34	52.24	34.32	34.34	5480.02	0.02
SW6-0206	9/16/2010	5519.72	47.41	43.08	43.09	5476.64	0.01
	9/29/2010	5519.72	47.41	43.01	43.03	5476.71	0.02
SW7-0206	9/16/2010	5517.63	32.95	NPP	18.41	5499.22	NPP
	9/29/2010	5517.63	32.95	NPP	18.29	5499.34	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring Oct. 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	10/14/2010	5508.27	53.08	NPP	52.57	5455.70	NPP
	10/26/2010	5508.27	53.08	NPP	52.57	5455.70	NPP
SW2-0206	10/14/2010	5507.75	27.69	NPP	26.62	5481.13	NPP
	10/26/2010	5507.75	27.69	NPP	26.51	5481.24	NPP
SW3-0206	10/14/2010	5505.29	52.56	NPP	25.90	5479.39	NPP
	10/26/2010	5505.29	52.56	NPP	25.71	5479.58	NPP
SW4-0206	10/14/2010	5504.45	42.34	NPP	32.96	5471.49	NPP
	10/26/2010	5504.45	42.34	NPP	32.85	5471.60	NPP
SW5-0206	10/14/2010	5514.34	52.24	34.48	34.50	5479.86	0.02
	10/26/2010	5514.34	52.24	34.29	34.30	5480.05	0.01
SW6-0206	10/14/2010	5519.72	47.41	42.92	42.95	5476.79	0.03
	10/26/2010	5519.72	47.41	42.74	42.75	5476.98	0.01
SW7-0206	10/14/2010	5517.63	32.95	NPP	18.43	5499.20	NPP
	10/26/2010	5517.63	32.95	NPP	17.9	5499.73	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring Nov. 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	11/10/2010	5508.27	53.08	NPP	52.57	5455.70	NPP
	11/23/2010	5508.27	53.08	NPP	52.58	5455.69	NPP
SW2-0206	11/10/2010	5507.75	27.69	NPP	26.39	5481.36	NPP
	11/23/2010	5507.75	27.69	NPP	26.35	5481.40	NPP
SW3-0206	11/10/2010	5505.29	52.56	NPP	25.67	5479.62	NPP
	11/23/2010	5505.29	52.56	NPP	25.78	5479.51	NPP
SW4-0206	11/10/2010	5504.45	42.34	NPP	32.83	5471.62	NPP
	11/23/2010	5504.45	42.34	NPP	32.79	5471.66	NPP
SW5-0206	11/10/2010	5514.34	52.24	34.21	34.22	5480.13	0.01
	11/23/2010	5514.34	52.24	34.25	34.26	5480.09	0.01
SW6-0206	11/10/2010	5519.72	47.41	42.52	42.53	5477.20	0.01
	11/23/2010	5519.72	47.41	42.59	42.60	5477.13	0.01
SW7-0206	11/10/2010	5517.63	32.95	NPP	17.85	5499.78	NPP
	11/23/2010	5517.63	32.95	NPP	17.83	5499.80	NPP

NPP = No Product Present NWP = No Water Present

Sump Well Fluids Monitoring Dec. 2010

Section 8.0 - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
SW1-0206	12/6/2010	5508.27	53.08	NPP	52.58	5455.69	NPP
	12/20/2010	5508.27	53.08	NPP	52.56	5455.71	NPP
SW2-0206	12/6/2010	5507.75	27.69	NPP	26.30	5481.45	NPP
	12/20/2010	5507.75	27.69	NPP	26.21	5481.54	NPP
SW3-0206	12/6/2010	5505.29	52.56	NPP	25.79	5479.50	NPP
	12/20/2010	5505.29	52.56	NPP	25.81	5479.48	NPP
SW4-0206	12/6/2010	5504.45	42.34	NPP	32.70	5471.75	NPP
	12/20/2010	5504.45	42.34	NPP	32.66	5471.79	NPP
SW5-0206	12/6/2010	5514.34	52.24	34.27	34.28	5480.07	0.01
	12/20/2010	5514.34	52.24	NPP	34.29	5480.05	NPP
SW6-0206	12/6/2010	5519.72	47.41	42.56	42.57	5477.16	0.01
	12/20/2010	5519.72	47.41	NPP	42.41	5477.31	NPP
SW7-0206	12/6/2010	5517.63	32.95	NPP	17.85	5499.78	NPP
	12/20/2010	5517.63	32.95	NPP	17.89	5499.74	NPP

NPP = No Product Present NWP = No Water Present

Water Quality Field Measurements

Section 8.0 - Tab 3.0

RW/MW	Date	Depth to H2O (ft)	Depth to Product (ft)	Well Depth (ft)	TDS (mg/L)	E.C. (umhos/cm)	pH	TEMP. (Fahrenheit)	D.O. (mg/L)	ORP (mV)
MW #1	Aug-10	17.05	NPP	21.56	588	841	7.04	63.6	1.8	282
	Apr-10	17.26	NPP	21.56	570	821	7.02	52.3	2.5	301
	Aug-09	16.72	NPP	21.56	529	771	6.93	61.2	2.5	225
MW #3	Aug-10	36.33	NPP	36.75	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	36.35	NPP	36.75	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Aug-09	36.18	NPP	36.75	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
MW #4	Aug-10	27.21	NPP	30.48	1725	2323	6.94	64.7	1.5	266
	Apr-10	26.52	NPP	30.48	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	27.19	NPP	30.48	1871	2545	6.94	64.0	2.3	258
MW #5	Aug-10	NWP	NPP	37.2	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	NWP	NPP	37.2	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Aug-09	NWP	NPP	37.2	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
MW #6	Aug-10	NWP	NPP	47.92	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	NWP	NPP	47.92	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Aug-09	NWP	NPP	47.92	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
MW #7	Aug-10	27.50	NPP	62.61	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	27.07	NPP	62.61	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	27.4	NPP	62.61	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #8	Aug-10	31.65	NPP	35.93	1712	2258	6.60	58.9	2.1	276
	Apr-10	31.63	NPP	35.93	1878	2550	6.81	58.6	1.1	351
	Aug-09	31.35	NPP	35.93	693	1004	6.98	65.9	0.9	240
MW #11	Aug-10	11.38	NPP	22.94	1906	2545	7.03	66.4	2.0	254
	Apr-10	11.10	NPP	22.94	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	11.49	NPP	22.94	1929	2619	6.96	64.4	1.3	268
MW #12	Aug-10	10.73	NPP	14.98	390	563	7.03	64.3	0.6	286
	Apr-10	9.72	NPP	14.98	370	540	7.04	50.5	5.4	278
	Aug-09	11.20	NPP	14.98	1256	1763	6.93	62.5	0.9	212
MW #13	Aug-10	40.45	NPP	52.89	2977	3816	6.97	62.9	1.1	255
	Apr-10	40.37	NPP	52.89	2465	3262	6.91	60.1	1.4	324
	Aug-09	40.42	NPP	52.89	2684	3474	6.91	60.3	1.4	256
MW #20	Aug-10	21.25	20.6	27.13	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	21.20	20.58	27.13	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	21.23	20.62	27.13	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹

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NWP = No Water Present

NPP = No Product Present

Water Quality Field Measurements

Section 8.0 - Tab 3.0

RW/MW	Date	Depth to H2O (ft)	Depth to Product (ft)	Well Depth (ft)	TDS (mg/L)	E.C. (umhos/cm)	pH	TEMP. (Fahrenheit)	D.O. (mg/L)	ORP (mV)
MW #21	Aug-10	21.72	21.65	30.38	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	21.62	21.52	30.38	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	21.80	21.7	30.38	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #25	Aug-10	32.94	32.79	41.2	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	32.72	32.56	41.2	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	32.95	32.7	41.2	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #26	Aug-10	17.38	NPP	25.11	2046	2698	6.83	64.4	1.3	300
	Apr-10	17.11	NPP	25.11	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	17.39	NPP	25.11	2149	2877	6.88	62.8	1.1	222
MW #27	Aug-10	18.74	NPP	24.42	2211	2890	6.95	61.7	1.4	262
	Apr-10	18.57	NPP	24.42	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	18.75	NPP	24.42	1975	2665	6.94	61.6	0.9	225
MW #29	Aug-10	22.96	NPP	28.62	772	1083	6.8	60.7	2.0	289
	Apr-10	22.92	NPP	28.62	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	22.74	NPP	28.62	636	919	7.0	60.6	1.1	222
MW #30	Aug-10	33.83	NPP	40.13	2309	3014	6.82	62.5	1.2	206
	Apr-10	33.98	NPP	40.13	2254	3009	6.89	61.9	0.5	315
	Aug-09	33.75	NPP	40.13	2300	3062	6.96	62.1	2.3	270
MW #31	Aug-10	34.11	NPP	39.16	2857	3681	7.0	63.8	0.4	211
	Apr-10	34.07	NPP	39.16	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	34.10	NPP	39.16	2300	4073	6.9	62.1	5.6	237
MW #32	Aug-10	25.08	NPP	27.51	4148	51	6.99	61.3	6.4	274
	Apr-10	24.83	NPP	27.51	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	25.03	NPP	27.51	4218	5318	6.99	60.1	7.8	224
MW #33	Aug-10	22.32	NPP	25.51	2973	3794	7.01	60.9	4.4	292
	Apr-10	22.17	NPP	25.51	2804	3648	6.91	58.4	7.1	328
	Aug-09	22.36	NPP	25.51	2962	3863	6.97	61.8	2.6	218
MW #34	Aug-10	14.06	NPP	20.96	1286	1772	7.12	63.6	2.9	233
	Apr-10	13.96	NPP	20.96	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	14.18	NPP	20.96	1495	2061	6.92	61.8	0.9	239
MW #35	Aug-10	22.13	NPP	26.45	1268	1742	7.05	62.3	1.4	246
	Apr-10	22.01	NPP	26.45	1469	2032	6.98	57.7	1.3	295
	Aug-09	22.09	NPP	26.45	1079	1611	6.94	61.5	0.8	231

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Water Quality Field Measurements

Section 8.0 - Tab 3.0

RW/MW	Date	Depth to H2O (ft)	Depth to Product (ft)	Well Depth (ft)	TDS (mg/L)	E.C. (umhos/cm)	pH	TEMP. (Fahrenheit)	D.O. (mg/L)	ORP (mV)
MW #36	Aug-10	20.81	NPP	23.26	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	20.65	NPP	23.26	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	20.87	NPP	23.26	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #37	Aug-10	23.48	NPP	27.58	1686	2276	6.97	63.3	0.9	275
	Apr-10	23	NPP	27.58	1650	2265	6.96	58.7	1.2	316
	Aug-09	23.22	NPP	27.58	1588	2180	6.95	60.6	0.9	223
MW #38	Aug-10	23.81	NPP	26.82	939	1317	6.99	64.7	0.6	276
	Apr-10	23.48	NPP	26.82	994	1416	6.97	58.3	1.7	309
	Aug-09	23.86	NPP	26.82	925	1319	6.99	61.9	0.9	193
MW #39	Aug-10	25.9	NPP	38.34	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	25.57	NPP	38.34	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	25.92	NPP	38.34	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #40	Aug-10	28.15	NPP	30.07	2106	2790	7.0	68.8	1.0	281
	Apr-10	Unable to find MW due to heavy mud conditions		30.07	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	28.17	NPP	30.07	2080	2809	7.0	68.4	2.1	246
MW #41	Aug-10	26.75	26.61	31.62	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	26.53	26.45	31.62	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	27.10	26.55	31.62	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #44	Aug-10	34.18	NPP	50.91	4306	5296	6.78	60.6	2.6	320
	Apr-10	33.85	NPP	50.91	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	34.04	NPP	50.91	3807	4663	6.98	61.4	1.2	261
MW #45	Aug-10	11.73	NPP	16.92	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	11.67	NPP	16.92	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	11.68	NPP	16.92	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #46	Aug-10	NS	NPP	10.39	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	NS	NPP	10.39	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Aug-09	NS	NPP	10.39	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
MW#47	Aug-10	12.80	NPP	14.28	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	12.50	NPP	14.28	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	13.30	12.68	14.28	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #50	Aug-10	16.77	NPP	20	425	612	7.12	61.4	0.7	248
MW #51	Aug-10	14.56	NPP	20	459	664	7.12	63.1	0.5	273
MW #52	Aug-10	36.22	NPP	41	2801	3602	7.07	62.2	0.6	291

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Water Quality Field Measurements

Section 8.0 - Tab 3.0

RW/MW	Date	Depth to H2O (ft)	Depth to Product (ft)	Well Depth (ft)	TDS (mg/L)	E.C. (umhos/cm)	pH	TEMP. (Fahrenheit)	D.O. (mg/L)	ORP (mV)
MW #53	Aug-10	38.86	NPP	41.5	3394	4288	7.14	61.6	0.59	242
MW #54	Aug-10	32.68	32.32	38	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #55	Aug-10	21.61	NPP	27.25	2440	3160	6.85	61.1	1.28	277
MW #56	Aug-10	20.12	19.8	23.75	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #57	Aug-10	21.65	21.45	24.25	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #58	Aug-10	20.93	NPP	27	1928	2562	6.95	65.3	1.68	279
MW #59	Aug-10	43.37	NPP	44.25	1523	2067	6.9	62.4	0.61	287
MW #60	Aug-10	42.56	NPP	45.5	1939	2567	6.88	61.5	0.68	284
MW #61	Aug-10	37.04	36.58	40.86	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #62	Aug-10	56.25	NPP	58.25	5330	6458	6.93	62.4	50' cord - didn't reach	297
MW #63	Aug-10	44.86	NPP	46	3809	4764	7.06	68.3	0.44	222
MW #64	Aug-10	50.2	NPP	50.25	4279	5302	7.06	65.5	4.59	251
MW #65	Aug-10	36.95	NPP	44.25	2103	2787	7.05	65.8	0.41	245
MW #66	Aug-10	41.92	41.78	43.25	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
O/F #2	Aug-10	Not a Well	Not a Well	Not a Well	271	388	6.95	65.8	NS ³	271
	Apr-10	Not a Well	Not a Well	Not a Well	523	757	7.00	50.2	NS ³	246
	Aug-09	Not a Well	Not a Well	Not a Well	281	441	6.95	63.7	NS ³	NS ³
O/F #3	Aug-10	Not a Well	Not a Well	Not a Well	219	317	6.94	64.9	NS ³	274
	Apr-10	Not a Well	Not a Well	Not a Well	352	512	7.01	50.4	NS ³	295
	Aug-09	Not a Well	Not a Well	Not a Well	238	355	6.94	57.9	NS ³	NS ³
RW #1	Aug-10	31.02	31.00	40.8	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	30.66	30.64	40.8	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	30.90	NPP	40.8	2291	3057	6.97	63.0	NS ³	253
RW #2	Aug-10	26.85	26.35	35.86	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	27.05	26.85	35.86	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	26.80	26.30	35.86	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #3	Aug-10	21.76	NPP	34.57	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	21.45	NPP	34.57	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	21.79	NPP	34.57	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #9	Aug-10	24.7	NPP	34.04	2234	2925	6.9	62.0	1.4	241
	Apr-10	25.51	NPP	34.04	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	24.8	NPP	34.04	1988	2681	7.0	60.9	2.4	271
RW #14	Aug-10	34.96	NPP	41.94	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	35.2	35.13	41.94	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	35.45	34.71	41.94	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²

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Water Quality Field Measurements

Section 8.0 - Tab 3.0

RW/MW	Date	Depth to H2O (ft)	Depth to Product (ft)	Well Depth (ft)	TDS (mg/L)	E.C. (umhos/cm)	pH	TEMP. (Fahrenheit)	D.O. (mg/L)	ORP (mV)
RW #15	Aug-10	34.67	NPP	43.43	2540	3295	7.05	61.9	0.6	278
	Apr-10	35.78	NPP	43.43	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	34.61	NPP	43.43	2613	3435	6.92	60.0	2.8	265
RW #16	Aug-10	32.8	32.75	41.48	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	34.94	NPP	41.48	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	33.8	NPP	41.48	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #17	Aug-10	32.84	NPP	41.89	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	33.6	NPP	41.89	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	32.93	NPP	41.89	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #18	Aug-10	35.83	NPP	37.58	4451	5434	6.9	65.8	2.3	132
	Apr-10	32.65	32.42	37.58	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	34.13	33.9	37.58	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #19	Aug-10	30	NPP	36.64	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	30.5	NPP	36.64	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	30.13	30.08	36.64	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #22	Aug-10	25.63	NPP	35.61	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Apr-10	25.93	NPP	35.61	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	25.95	25.32	35.61	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #23	Aug-10	23.41	NPP	35.53	1401	1911	7.00	64.2	2.2	241
	Apr-10	26.73	26.66	35.53	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	23.58	NPP	35.53	1239	1857	6.98	64.8	2.4	222
RW #28	Aug-10	29.19	29.17	36.99	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	pump stuck in casing - unable to measure		36.99	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	29.02	28.83	36.99	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #42	Aug-10	27.5	26.92	32.02	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	26.8	26.7	32.02	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	27.01	26.95	32.02	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #43	Aug-10	20.65	NPP	24.03	1993	2647	6.8	70.0	130	124
	Apr-10	20.46	NPP	24.03	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	21.83	21.64	24.03	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹

NS¹= Well is Dry or Not Enough Water to Sample- No Sample

NS² = Not Sampled due to approved Facility-Wide Monitoring Plan - June 2010

NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NWP = No Water Present

NPP = No Product Present

Water Quality Field Measurements

Section 8.0 - Tab 3.0

Seep #	Date	TDS (mg/L)	E.C. (umhos/cm)	pH	TEMP. (Fahrenheit)	D.O. (mg/L)	ORP (mV)
Seep 1	Aug-10	3423	4283	6.90	76.3	NS ²	243
	Apr-10	2785	3654	7.08	57.3	6.8	235
	Aug-09	3086	4061	7.08	76.8	NS ³	230
Seep 2	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	3791	4763	7.02	53.4	14.3	263
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
Seep 3	Aug-10	15000	16000	6.80	74.8	NS ²	253
	Apr-10	3391	4371	7.04	56.7	7.3	267.0
	Aug-09	1271	1438	7.19	73.4	NS ³	283
Seep 6	Aug-10	14400	15610	6.94	73.4	NS ²	270
	Apr-10	2992	3889	6.94	50.0	11.1	308.0
	Aug-09	8862	10.4	6.98	66.6	NS ³	283
Seep 7	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
Seep 8	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
Seep 9	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹
	Apr-10	3615	4699	7.06	55.8	9.0	277
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹

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NS² = Not Sampled due to approved Facility-Wide Monitoring Plan - June 2010

NS³ = Analyte Inadvertently not Monitored this Sampling Event

NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon

NWP = No Water Present

NPP = No Product Present

Background Wells

Groundwater Analysis - Organics

Section 8.0 - Tab 4.0

Sample Location	Date	EPA Method 8260B					EPA Method 8015B		1-W06020 NMAG 6.2.3103 2 - MCL 3 - 40CFR141.61 4-TPH Screening Guidelines Table 2a (DRO) 5-USEPA Regional Screening Levels (April 2009) - MTBE
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	DRO (mg/L)	GRO (mg/L)	
		0.005 ²	0.75 ¹	0.70 ²	0.62 ¹	0.012 ⁵	0.2 ⁴		
MW #3	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
MW #5	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
MW #6	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	

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NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Background Wells

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 4.0

Sample Location	Date	EPA 300.0						SM 2320B		
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)
		1.6	250			10		600		
MW #3	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
MW #5	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
MW #6	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹

WQCC 20 NMAC 6.2.3103

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NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

* - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

Background Wells

Groundwater Analysis - Total Metals

Section 8.0 - Tab 4.0

Sample Location	Date	EPA Method 6010B, EPA Method 7470: Mercury							
		Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)	Mercury (mg/L)
MW #3		0.01	1	0.005	0.05	0.015	0.05	0.05	0.002
	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
MW #5	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
MW #6	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
40 CFR 141.62 MCL									

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NS³ = Sample Inadvertently not Collected this Sampling Event

NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

* - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

Background Wells

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 4.0

		EPA Method 6020A for Uranium - EPA Method 6010B for All Other Metals														WQCC 20 NMAG 6.2.3103	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
		0.1	1	0.01		0.05	1	1	0.05		0.2		0.05	0.05		0.03	10
MW #3	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-06	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
MW #5	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-06	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
MW #6	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-08	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-07	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-06	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹

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 NS² = Not Sampled due to approved Facility-Wide Monitoring Plan
 NS³ = Sample Inadvertently not Collected this Sampling Event
 NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon
 NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Sample Location	Date	EPA Method 8260B					EPA Method 8015B	
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	DRO (mg/L)	GRO (mg/L)
		0.005 ²	0.75 ¹	0.70 ³	0.62 ¹	0.012 ⁵	0.2 ⁴	
RW #1	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	0.14	<0.005	<0.005	0.014	0.036	65	3.9
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #4	Aug-10	0.57	<0.01	0.045	0.14	<0.003	1.1	8.6
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	0.22	<0.02	0.056	0.65	<0.02	9	6.4
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #8	Aug-10	<0.001	<0.001	0.015	0.037	<0.001	0.34	0.34
	Apr-10	<0.001	<0.001	0.0077	0.024	<0.001	0.55	0.14
	Aug-09	0.024	0.21	0.047	0.48	<0.001	<1.0	3.3
	Apr-09	<0.001	<0.001	<0.001	<0.002	<0.001	<1.0	<0.05
RW #9	Aug-10	3.9	<0.05	0.37	0.55	2.3	8.8	21
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	9.5	<0.02	0.89	2.2	3.4	14	47
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #15	Aug-10	4.3	<0.10	3.6	16.0	<0.10	5.7	69
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	3.0	2.0	2.5	11.0	<0.05	9.4	90
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #18	Aug-10	0.23	<0.02	0.048	0.093	1.6	910	11
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #20	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹

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NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

1 - WQCC 20 NMAC 6.2.3103
2 - MCL
3 - 40CFR141.61
4 - TPH Screening Guidelines Table 2a (DRO)
5 - USEPA Regional Screening Levels (April 2009) - MTBE

Refinery Wells

Groundwater Analysis - Organics

Section 8.0 - Tab 5.0

Sample Location	Date	EPA Method 8260B					EPA Method 8015B		4 - TPH Screening Guidelines Table 2a (DRO) 5 - USEPA Regional Screening Levels (April 2009) - MTBE
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	DRO (mg/L)	GRO (mg/L)	
		0.005 ²	0.75 ¹	0.70 ³	0.62 ¹	0.012 ⁵	0.2		
MW #21	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	1 - WQCC 20 NMAC 6.2.3103 2 - MCL 3 - 40CFR141.61
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
RW #23	Aug-10	4.5	<0.05	1.1	2.7	1.3	240	25	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	6.2	<0.05	1.5	2.2	1.2	36	36	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
RW #28	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #29	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	<1.0	<0.05	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #30	Aug-10	5.8	3.6	4.1	14.0	<0.032	7	63	
	Apr-10	5.7	4.8	3.7	14.0	<0.10	6.2	65	
	Aug-09	9.5	8.0	6.3	24.0	<0.10	24	84	
	Apr-09	5.1	2.7	3.9	14.0	<0.10	23	76	
MW #31	Aug-10	3.8	<0.10	1.6	3.8	<0.10	1.8	30	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	3.3	0.024	0.83	1.6	<0.02	5.1	19	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #40	Aug-10	0.04	<0.005	<0.005	<0.0075	0.011	26	5.8	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	0.019	<0.005	<0.005	<0.0075	0.013	17	5.4	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	

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Refinery Wells

Groundwater Analysis - Organics

Section 8.0 - Tab 5.0

Sample Location	Date	EPA Method 8260B					EPA Method 8015B	
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	DRO (mg/L)	GRO (mg/L)
		0.005 ²	0.75 ¹	0.70 ³	0.62 ¹	0.012 ³	0.2 ⁴	
RW #42	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
RW #43	Aug-10	8.9	0.62	0.81	5.1	3.6	89	48
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
MW #44	Aug-10	<0.001	<0.001	<0.001	<0.0015	0.0011	0.22	<0.05
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.0015	<1.0	<0.05
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²

1-WQCC 20 NMAG 6.2.3103 2-MCL 3-40CFR141.61
4-TPH Screening Guidelines Table 2a (DRO)
6-USEPA Regional Screening Levels (April 2009) - MTBE

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NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Refinery Wells

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 5.0

Sample Location	Date	EPA 300.0							SM 2320B		
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)	
RW #1	Aug-10	1.6	250			10		600			
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	<2.0	330	<2.0	3.5	<2.0	<10.0	<10.0	1100	1100	1100
	Aug-08	0.31	250	<0.50	2.3	<0.10	<0.50	<0.50	1100	1100	1100
MW #4	Aug-07	<0.50	220	<0.50	2.2	<0.50	<2.5	110	1400	1300	1300
	Aug-10	0.25	180	<0.50	2.6	<0.50	<2.5	3.2	1000	1000	1000
	Aug-09	0.29	180	<2.0	2.7	<0.10	<0.05	6.5	1100	1100	1100
	Aug-08	0.23	190	<0.10	3.5	<0.10	<0.50	4.4	1000	1000	1000
MW #8	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-10	1.4	96	<2.0	0.64	0.21	<0.50	1300	<5.0	<5.0	<5.0
	Aug-09	0.33	20	<0.10	0.23	0.5	<0.50	410	100	110	110
	Aug-08	0.69	180	0.12	1.6	24	<0.50	790	220	230	230
RW #9	Aug-07	0.74	410	<0.10	1.6	20	<0.50	1300	200	190	190
	Aug-10	<1.0	230	<1.0	4.9	<1.0	<5.0	6.3	1300	1300	1300
	Aug-09	<1.0	160	<1.0	4.5	<1.0	<5.0	280	920	1000	1000
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #15	Aug-07	<2.0	420	<2.0	3.9	<2.0	<10	41	1200	1000	1000
	Aug-10	0.25	470	<2.0	7.8	0.33	<0.50	<0.50	1200	1200	1200
	Aug-09	<0.10	460	<0.10	1.6	<0.10	<0.50	1.3	980	1100	1100
	Aug-08	0.29	420	<2.0	7.8	<0.10	<0.50	0.76	1200	1200	1200
RW #18	Aug-07	0.32	400	<2.0	8.4	<0.10	<0.50	<0.50	1300	1300	1300
	Aug-10	<2.0	380	<2.0	4.3	<2.0	<10	1700	950	950	950
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #18	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹

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WQCC 20 NMAG 6.2.3103

Refinery Wells

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 5.0

Sample Location	Date	EPA 300.0						SM 2320B		
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)
MW #20	Aug-10	1.6	250			10		600		
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #21	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #23	Aug-10	<1.0	87	<1.0	1.1	<1.0	<5.0	<5.0	900	900
	Aug-09	<1.0	100	<1.0	5.1	<1.0	<5.0	11	860	890
	Aug-08	0.4	76	<0.10	<1.0	<0.10	<0.50	3.2	850	780
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #28	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #29	Aug-10	0.33	69	<0.10	0.43	1.9	<0.50	210	240	240
	Aug-09	0.4	52	<0.10	0.45	0.93	<0.50	160	190	210
	Aug-08	0.36	57	<0.10	0.4	0.99	<0.50	160	200	210
	Aug-07	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³
MW #30	Aug-10	0.12	290	<2.0	4.9	<0.10	<0.50	47	1300	1300
	Aug-09	<1.0	230	<2.0	4.6	<2.0	<5.0	24	1100	1200
	Aug-08	0.15	210	*<0.10	5.6	*<0.10	<0.50	12	1500	1400
	Aug-07	0.17	240	<0.10	4.7	<0.10	<0.50	76	1500	1400

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Refinery Wells

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 5.0

Sample Location	Date	EPA 300.0							SM 2320B	
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)
MW #31	Aug-10	1.6	250			10		600		
	Aug-10	0.16	660	<2.0	12	0.95	<0.50	4.8	1100	1100
	Aug-09	0.21	720	<2.0	15	0.14	<0.50	22	1000	1100
	Aug-08	0.15	740	<1.0	17	<0.10	<0.50	6.4	1100	1100
MW #40	Aug-07	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-10	0.24	320	*15	4.1	*15	<0.0025	<0.50	1100	1100
	Aug-09	0.28	310	<2.0	4.0	<0.10	<0.50	<0.50	1100	1100
	Aug-08	0.33	310	<2.0	4.4	<2.0	<0.50	<0.50	1200	1200
RW #42	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
RW #43	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-10	<1.0	280	<1.0	3.7	<1.0	6	15	1000	1000
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #44	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-10	0.13	65	<0.10	0.23	0.19	<10	3200	340	340
	Aug-09	0.19	69	*1.0	0.27	*1.0	<0.50	2900	330	350
	Aug-08	0.62	72	<0.10	0.28	<0.10	<0.50	3000	360	350
	Aug-07	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³

WQCC 20 NMAG 6.2.3103

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Refinery Wells

Groundwater Analysis - Total Metals

Section 8.0 - Tab 5.0

EPA Method 6010B, EPA Method 7470: Mercury										40 CFR 141.61 MCL
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)	Mercury (mg/L)	
RW #1		0.01	1	0.005	0.05	0.015	0.05	0.05	0.0002	
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-09	<0.02	2.1	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002	
	Aug-08	<0.02	1.7	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002	
	Aug-07	<0.02	0.61	<0.002	<0.006	0.019	<0.05	<0.005	<0.0002	
MW #4	Aug-10	0.046	2.7	<0.002	0.14	0.016	<0.05	<0.005	<0.0008	
	Aug-09	<0.02	2.0	<0.002	0.0084	0.0081	<0.05	<0.005	<0.002	
	Aug-08	<0.02	1.3	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-10	<0.02	0.1	<0.002	3.7	<0.005	<0.05	<0.005	0.0003	
MW #8	Aug-09	<0.02	0.034	<0.002	0.021	<0.005	<0.05	<0.005	<0.0002	
	Aug-08	<0.02	<0.020	<0.002	0.0071	<0.005	<0.05	<0.005	<0.0002	
	Aug-07	<0.02	0.027	<0.002	0.56	<0.005	<0.05	0.069	<0.0002	
	Aug-10	<0.02	3.3	<0.002	0.007	0.012	<0.05	<0.005	<0.0008	
	Aug-09	<0.02	0.23	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002	
RW #9	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-07	<0.020	1.7	<0.002	<0.006	0.052	<0.05	<0.005	<0.0002	
	Aug-10	<0.02	1.6	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002	
	Aug-09	<0.02	1.7	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002	
	Aug-08	<0.02	1.2	<0.002	<0.006	<0.005	<0.05	<0.005	<0.001	
RW #15	Aug-07	<0.02	1.8	<0.002	<0.006	<0.005	<0.05	<0.005	<0.001	
	Aug-10	<0.02	1.3	0.0025	0.075	<0.025	<0.25	<0.005	0.0025	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	

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Refinery Wells

Groundwater Analysis - Total Metals

Section 8.0 - Tab 5.0

Sample Location	Date	EPA Method 6010B, EPA Method 7470: Mercury							40 CFR 141.61 MCL		
		Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)	Mercury (mg/L)		
MW #20	Aug-10	0.01	1	0.005	0.05	0.015	0.05	0.05	0.002		
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
MW #21	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
RW #23	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-10	<0.02	2.5	<0.002	<0.006	0.067	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	1.7	<0.002	<0.006	0.0096	<0.25	<0.005	<0.0002		
	Aug-08	<0.02	1.4	<0.002	<0.006	0.013	<0.25	<0.005	<0.0002		
RW #28	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
MW #29	Aug-10	<0.02	0.054	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	0.028	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-08	<0.02	0.072	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002		
	Aug-07	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³		
	Aug-10	<0.02	0.77	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #30	Aug-09	<0.02	0.91	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-08	<0.02	0.72	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002		
	Aug-07	<0.020	0.89	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		

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Refinery Wells

Groundwater Analysis - Total Metals

Section 8.0 - Tab 5.0

		EPA Method 6010B, EPA Method 7470: Mercury									
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)	Mercury (mg/L)	40 CFR 141.61 MCL	
MW #31	Aug-10	0.01	1	0.005	0.05	0.015	0.05	0.05	0.0002		
	Aug-09	<0.02	0.79	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-08	<0.02	0.81	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-07	<0.02	1.1	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #40	Aug-07	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²		
	Aug-10	<0.02	2.3	<0.002	0.012	0.006	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	2.8	<0.002	<0.006	0.0075	<0.25	<0.005	<0.0002		
	Aug-08	<0.02	1.8	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002		
RW #42	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
RW #43	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-10	<0.02	7.5	<0.002	0.14	0.03	<0.05	<0.005	0.0009		
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
MW #44	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
	Aug-10	<0.02	<0.02	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	<0.02	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-08	<0.02	<0.02	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002		
MW #44	Aug-07	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³		

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Refinery Wells

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 5.0

EPA Method 6020A for Uranium - EPA Method 6010B for All Other Metals																	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
RW #1	Aug-10	0.1	1	0.01	NR ¹	NR ¹	NR ¹	NR ¹	0.05	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	<0.02	1.9	<0.002	110	<0.006	<0.006	3.9	<0.005	40	2.5	4.1	<0.05	<0.005	570	<0.001	<0.05
	Aug-08	<0.02	1.7	<0.002	NS ³	<0.006	<0.006	3.7	<0.005	NS ³	2.5	NS ³	<0.25	<0.005	NS ³	<0.001	0.052
	Aug-07	<0.02	68	<0.002	140	<0.006	<0.006	8.0	0.007	37	4.2	3.1	<0.25	<0.005	530	<0.10	<0.05
	Aug-10	<0.02	1.9	<0.002	150	<0.006	<0.006	12	<0.005	57	3.3	3.6	<0.05	<0.005	310	<0.001	<0.05
MW #4	Aug-09	<0.02	1.7	<0.002	130	<0.006	0.017	12	<0.005	52	3.2	5.3	<0.05	<0.005	380	<0.001	<0.05
	Aug-08	<0.02	1.3	<0.002	NS ³	<0.006	<0.006	9.6	<0.005	NS ³	3.1	NS ³	<0.25	<0.005	NS ³	<0.001	<0.05
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-10	<0.02	0.025	<0.002	200	3.2	<0.006	34.0	<0.005	30	9.9	3.1	<0.05	<0.005	260	0.005	0.17
MW #8	Aug-09	<0.02	0.025	<0.002	150	<0.006	<0.006	0.042	<0.005	12	0.61	1.9	<0.05	<0.005	50	0.001	<0.05
	Aug-08	<0.02	<0.02	<0.002	NS ³	0.007	<0.006	0.1	<0.005	NS ³	0.027	NS ³	<0.25	<0.005	NS ³	0.01	0.096
	Aug-07	<0.02	<0.02	<0.002	250	<0.006	<0.006	0.2	<0.005	35	0.24	3.1	0.1	<0.005	420	<0.10	<0.05
	Aug-10	<0.02	3.2	<0.002	160	<0.006	<0.006	1.5	<0.005	54	2.1	4.6	<0.05	<0.005	520	<0.001	<0.05
RW #9	Aug-09	<0.02	0.25	<0.002	140	<0.006	<0.006	2.3	0.007	39	2.2	2.9	<0.05	<0.005	450	<0.001	<0.05
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-07	<0.020	2.5	<0.002	180	<0.006	<0.006	16.0	0.026	52	4.4	3.0	<0.25	<0.005	400	<0.10	0.084
	Aug-10	<0.02	1.5	<0.002	160	<0.006	<0.006	14.0	<0.005	54	2.3	4.6	<0.05	<0.005	590	<0.001	<0.05
RW #15	Aug-09	<0.02	1.5	<0.002	150	<0.006	<0.006	7.2	<0.005	51	4	3.6	<0.05	<0.005	580	<0.001	<0.05
	Aug-08	<0.02	1.2	<0.002	130	<0.006	<0.006	5.3	<0.005	44	2.8	3.7	<0.25	<0.005	550	<0.001	0.054
	Aug-07	<0.020	1.6	<0.002	140	<0.006	<0.006	16.0	<0.005	42	3.2	3.3	<0.25	<0.005	550	<0.10	0.057
	Aug-10	<0.02	0.048	<0.002	110	<0.006	<0.006	3.0	<0.005	98	0.56	7	<0.05	<0.005	1000	<0.001	<0.05
RW #18	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹

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NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon
 NR² = No Sample Required per OCD and NMED pre-2007 Conditions
 * - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

Refinery Wells

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 5.0

EPA Method 6020A for Uranium - EPA Method 6010B for All Other Metals																		WQCG 20NMAC6.2.3.103
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)	
MW #20	Aug-10	0.1	1	0.01		0.05	1	1	0.05		0.2		0.05	0.05	0.03	10		
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #21	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
RW #23	Aug-10	<0.02	2.4	<0.002	140	<0.006	<0.006	11	0.006	58	6.1	8.2	<0.05	<0.005	220	<0.001	<0.05	
	Aug-09	<0.02	1.3	<0.002	120	<0.006	<0.006	1.1	0.0086	52	4.6	6.8	<0.05	<0.005	200	<0.001	0.058	
	Aug-08	<0.02	1.4	<0.002	110	<0.006	<0.006	2.9	0.013	47	4.6	6.3	<0.25	<0.005	170	<0.001	<0.05	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
RW #28	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #29	Aug-10	<0.02	0.027	<0.002	90	<0.006	<0.006	<0.02	<0.005	23	1.6	2.5	<0.05	<0.005	120	0.002	<0.05	
	Aug-09	<0.02	<0.02	<0.002	53	<0.006	<0.006	<0.02	<0.005	14	0.87	2.2	<0.05	<0.005	110	0.0017	<0.05	
	Aug-08	<0.02	<0.02	<0.002	NS ³	<0.006	<0.006	<0.02	<0.005	NS ³	0.97	NS ³	<0.25	<0.005	NS ³	0.002	0.059	
	Aug-07	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	
MW #30	Aug-10	<0.02	0.74	<0.002	150	<0.006	<0.006	0.1	<0.005	35	1.4	3.3	<0.05	<0.005	570	<0.001	<0.05	
	Aug-09	<0.02	0.70	<0.002	190	<0.006	<0.006	0.4	<0.005	42	1.7	4	<0.05	<0.005	600	<0.001	<0.05	
	Aug-08	<0.02	0.72	<0.002	NS ³	<0.006	<0.006	0.37	<0.005	NS ³	1.7	NS ³	<0.25	<0.005	NS ³	<0.001	<0.05	
	Aug-07	<0.02	0.59	<0.002	190	<0.006	<0.006	0.31	<0.005	39	1.8	2.9	<0.25	<0.005	560	<0.10	<0.05	

NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

* - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

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Refinery Wells

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 5.0

EPA Method 6020A for Uranium - EPA Method 6010B for All Other Metals																	WQCC 20N/AC6.2-3103	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)	
MW #31	Aug-10	0.1	1	0.01	140	<0.006	<0.006	1	0.05	67	0.47	4.4	<0.05	0.05	630	<0.001	<0.05	
	Aug-09	<0.02	0.81	<0.002	150	<0.006	<0.006	0.12	<0.005	63	0.51	4.7	<0.05	<0.005	690	<0.001	<0.05	
	Aug-08	<0.02	1.1	<0.002	NS ³	<0.006	<0.006	0.21	<0.005	NS ³	0.71	NS ³	<0.05	<0.005	NS ³	<0.001	<0.05	
	Aug-07	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #40	Aug-10	<0.02	1.7	<0.002	100	<0.006	<0.006	4.6	<0.005	47	2.2	3.8	<0.05	<0.005	500	<0.001	<0.05	
	Aug-09	<0.02	1.7	<0.002	86	<0.006	<0.006	6.2	<0.005	41	2.3	3.8	<0.05	<0.005	540	<0.001	0.057	
	Aug-08	<0.02	1.8	<0.002	91	<0.006	<0.006	5.5	<0.005	42	2.5	3.5	<0.25	<0.005	520	<0.001	0.063	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
RW #42	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
RW #43	Aug-10	<0.02	2.6	<0.002	120	<0.006	<0.006	0.85	<0.005	61	2.8	40	<0.05	<0.005	410	<0.001	<0.05	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-08	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-07	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #44	Aug-10	<0.02	<0.02	<0.002	470	<0.006	<0.006	<0.02	<0.005	68	0.025	8.1	<0.05	<0.005	940	<0.001	<0.05	
	Aug-09	<0.02	0.7	<0.002	190	<0.006	<0.006	0.40	<0.005	42	1.7	4.0	<0.05	<0.005	600	<0.001	<0.05	
	Aug-08	<0.02	<0.02	<0.002	470	<0.006	<0.006	0.083	<0.005	64	1.7	8.0	<0.25	<0.005	900	0.001	<0.05	
	Aug-07	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	NS ³	

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Cross - Gradient Wells

Groundwater Analysis - Organics

Section 8.0 - Tab 6.0

Sample Location	Date	EPA Method 8260B					EPA Method 8015B		4 - ITPH Screening Guidelines Table 2a (DRO) - MTBE
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	DRO (mg/L)	GRO (mg/L)	
		0.005 ²	0.75 ¹	0.70 ³	0.62 ¹	0.012 ³	0.2 ³		
MW #1	Aug-10	0.018	<0.001	<0.001	<0.0015	<0.001	<0.20	0.067	1 - MQCC 20 NMAC 6.2.3103 2 - MCL 3 - 40CFR141.61 5 - USEPA Regional Screening Levels (April 2009) - MTBE
	Apr-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	<1.0	<0.05	
	Apr-09	<0.001	<0.001	<0.001	<0.002	<0.001	<1.0	<0.05	
MW #13	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	0.34	<0.05	
	Apr-10	<0.001	<0.001	<0.001	<0.0015	<0.001	0.31	<0.05	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	0.0017	<1.0	<0.05	
	Apr-09	<0.001	<0.001	<0.001	<0.002	0.0018	<1.0	<0.05	
MW #26	Aug-10	0.1	<0.01	0.086	<0.015	0.93	2.4	4.3	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	0.11	<0.005	0.12	<0.0075	0.0095	7.8	5	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #27	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	0.47	<0.05	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	1.3	<0.05	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #32	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	<1.0	<0.05	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #33	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
	Apr-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	<1.0	<0.05	
	Apr-09	<0.001	<0.001	<0.001	<0.002	<0.001	<1.0	<0.05	

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Cross - Gradient Wells

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 6.0

Sample Location	Date	EPA 300.0							SM 2320B		
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)	
MW #1	Aug-10	1.6	250			10		600			
	Aug-10	0.56	15	<0.10	0.12	1.4	<0.50	150	280	280	
	Aug-09	0.53	16	<0.10	0.3	0.69	<0.50	70	250	270	
	Aug-08	0.67	19	<0.10	0.14	1.2	<0.50	130	250	280	
	Aug-07	0.74	16	<0.10	<0.50	1.9	<0.50	160	270	290	
MW #13	Aug-10	0.11	230	<2.0	2.8	5.4	<0.50	1100	900	900	
	Aug-09	0.16	200	<2.0	2.6	5.8	<0.50	1000	840	890	
	Aug-08	0.16	240	0.58	3.6	6.0	<0.50	1100	1000	970	
	Aug-07	0.2	310	<0.10	4.0	7.8	<0.50	1100	1000	960	
	Aug-10	0.34	320	<2.0	4.4	1.9	<0.50	0.99	1100	1100	
MW #26	Aug-09	0.32	400	<2.0	5.2	<0.10	<0.50	<0.50	1100	1100	
	Aug-08	0.34	390	<1.0	5.5	<0.10	<0.50	<0.50	1100	1000	
	Aug-07	0.38	330	<0.10	5.4	<0.10	<0.50	0.52	1200	1000	
	Aug-10	0.39	240	<2.0	1.8	<0.1	<0.50	1000	290	290	
	Aug-09	0.38	180	<2.0	1.3	<0.10	<0.5	960	280	290	
MW #27	Aug-08	0.47	170	<1.0	1.2	<0.10	<0.50	990	330	320	
	Aug-07	0.76	110	<1.0	0.83	<0.10	<0.5	1300	350	290	
	Aug-10	0.2	900	<2.0	4.8	34	<0.50	1700	160	160	
	Aug-09	0.21	840	<2.0	7.9	37	<0.50	1500	150	170	
	Aug-08	0.21	1000	<1.0	4.7	26	<0.50	1400	160	180	
MW #32	Aug-07	0.36	1100	<1.0	4.7	15	<0.50	1300	180	190	
	Aug-10	0.36	400	<2.0	1.9	28	<0.50	1300	130	130	
	Aug-09	0.32	600	<2.0	5.4	23	<0.50	1000	120	130	
	Aug-08	0.35	540	<1.0	2.7	19	<0.50	1100	130	140	
	Aug-07	0.31	560	<1.0	3.0	26	<0.50	1300	150	160	

WQGC-20 NMAC 6.2.3103

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Cross - Gradient Wells

Groundwater Analysis - Total Metals

Section 8.0 - Tab 6.0

		EPA Method 6010B, EPA Method 7470; Mercury									
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)	Mercury (mg/L)	40 CFR 141.61 MCL	
MW #1	Aug-10	0.01	1	0.005	0.05	0.015	0.05	0.05	0.0002		
	Aug-09	<0.02	0.099	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-08	<0.02	0.18	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-07	<0.020	<0.020	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	0.086	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
MW #13	Aug-10	<0.02	0.027	<0.002	<0.006	<0.005	<0.05	<0.005	0.0002		
	Aug-09	<0.02	0.023	<0.002	<0.006	0.005	<0.25	<0.005	<0.0002		
	Aug-08	<0.020	0.026	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-07	<0.020	0.026	<0.002	0.006	0.006	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	2.3	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #26	Aug-09	<0.02	2.4	<0.002	<0.006	0.008	<0.05	<0.005	<0.0002		
	Aug-08	<0.020	2.3	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-07	<0.020	2.3	<0.002	<0.006	0.009	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	0.084	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	0.03	<0.002	<0.006	0.007	<0.05	<0.005	<0.0002		
MW #27	Aug-08	<0.020	0.028	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-07	<0.020	0.09	<0.002	<0.006	0.011	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	0.06	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	0.033	<0.002	<0.006	0.0074	<0.05	<0.005	<0.0002		
	Aug-08	<0.020	0.026	<0.002	<0.006	<0.006	<0.050	<0.005	<0.0002		
MW #32	Aug-07	<0.020	0.037	<0.002	<0.006	<0.006	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	<0.02	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	<0.02	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-08	<0.020	<0.02	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-07	<0.020	<0.02	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
MW #33	Aug-10	<0.02	<0.02	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	<0.02	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-08	<0.020	<0.02	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-07	<0.020	0.26	<0.002	<0.006	0.007	<0.050	<0.005	<0.0002		
	Aug-10	<0.020	0.26	<0.002	<0.006	0.007	<0.050	<0.005	<0.0002		

NS¹ = Well is Dry or Not Enough Water to Sample- No Sample

NS² = Not Sampled due to approved Facility-Wide Monitoring Plan

NS³ = Sample Inadvertently not Collected this Sampling Event

* - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Cross - Gradient Wells

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 6.0

EPA Method 6020A for Uranium - EPA Method 6010B for All Other Metals																	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
MW #1	Aug-10	0.1	1	0.01		0.05	1	1	0.05		0.2		0.05	0.05		0.03	10
	Aug-10	<0.02	0.025	<0.002	77	<0.006	<0.006	0.039	<0.005	20	0.027	2.3	<0.05	<0.005	77	0.0022	<0.05
	Aug-09	<0.02	<0.02	<0.002	63	<0.006	<0.006	0.041	<0.005	16	0.031	2.6	<0.05	<0.005	85	0.002	<0.05
	Aug-08	<0.02	<0.02	<0.002	NS ³	<0.006	<0.006	<0.02	<0.005	NS ³	0.022	NS ³	<0.05	<0.005	NS ³	0.002	<0.05
	Aug-07	<0.02	0.023	<0.002	63	<0.006	<0.006	<0.02	<0.005	16	0.027	2.0	<0.05	<0.005	78	<0.1	<0.05
MW #13	Aug-10	<0.02	0.024	<0.002	270	<0.006	<0.006	<0.02	<0.005	94	1.4	4.3	<0.05	<0.005	600	0.0078	<0.05
	Aug-09	<0.02	0.022	<0.002	240	<0.006	<0.006	<0.02	<0.005	76	1.3	4.0	<0.05	<0.005	540	0.008	<0.05
	Aug-08	<0.02	0.026	<0.002	NS ³	<0.006	<0.006	<0.02	<0.005	NS ³	1.4	NS ³	<0.025	<0.005	NS ³	0.009	<0.05
	Aug-07	<0.02	0.027	<0.002	270	<0.006	<0.006	0.047	<0.005	81	1.4	3.6	<0.05	<0.005	640	<0.1	<0.05
	Aug-10	<0.02	2.1	<0.002	120	<0.006	<0.006	6.0	<0.005	41	2.8	3.7	<0.05	<0.005	470	<0.001	<0.05
MW #26	Aug-09	<0.02	2.2	<0.002	120	<0.006	<0.006	7.2	<0.005	41	2.9	3.7	<0.05	<0.005	460	<0.001	<0.05
	Aug-08	<0.02	2.3	<0.002	NS ³	<0.006	<0.006	6.9	<0.005	NS ³	3	NS ³	<0.025	<0.005	NS ³	<0.001	<0.05
	Aug-07	<0.2	2.3	<0.002	110	<0.006	<0.006	6.3	<0.005	38	3.2	3	<0.05	<0.005	450	<0.1	<0.05
	Aug-10	<0.02	0.03	<0.002	260	<0.006	<0.006	0.2	<0.005	39	2.6	2.7	<0.05	<0.005	390	0.0021	<0.05
	Aug-09	<0.02	0.03	<0.002	230	<0.006	<0.006	0.4	<0.005	33	2.1	2.7	<0.05	<0.005	350	0.0014	<0.05
MW #27	Aug-08	<0.02	0.028	<0.002	NS ³	<0.006	<0.006	1.5	<0.005	NS ³	4.6	NS ³	<0.025	<0.005	NS ³	0.002	0.058
	Aug-07	<0.02	0.021	<0.002	330	<0.006	<0.006	10	<0.005	41	9.6	2.6	<0.05	<0.005	350	<0.1	<0.05
	Aug-10	<0.02	0.022	<0.002	360	<0.006	<0.006	<0.02	<0.005	57	<0.002	4.4	<0.05	<0.005	910	0.0083	
	Aug-09	<0.02	0.022	<0.002	330	<0.006	<0.006	<0.02	<0.005	52	<0.002	4.8	<0.05	<0.005	780	0.01	<0.05
	Aug-08	<0.02	0.026	<0.002	NS ³	<0.006	<0.006	<0.02	<0.005	NS ³	<0.002	NS ³	<0.25	<0.005	NS ³	0.01	<0.05
MW #32	Aug-07	<0.02	0.028	<0.002	350	<0.006	<0.006	<0.02	<0.005	51	0.002	3.5	<0.05	<0.005	820	<0.1	<0.05
	Aug-10	<0.02	<0.02	<0.002	260	<0.006	<0.006	<0.02	<0.005	39	<0.002	4.5	<0.05	<0.005	600	0.0064	<0.05
	Aug-09	<0.02	<0.02	<0.002	230	<0.006	<0.006	<0.02	<0.005	33	<0.002	5.5	<0.05	<0.005	550	0.006	<0.05
	Aug-08	<0.02	<0.02	<0.002	NS ³	<0.006	<0.006	<0.02	<0.005	NS ³	<0.002	NS ³	<0.025	<0.005	NS ³	0.007	<0.05
	Aug-07	<0.02	<0.02	<0.002	270	<0.006	<0.006	<0.02	<0.005	37	0.009	4.1	<0.05	<0.005	620	<0.1	<0.05

NS¹ = Well is Dry or Not Enough Water to Sample - No Sample

NS² = Not Sampled due to approved Facility-Wide Monitoring Plan

NS³ = Sample Inadvertently not Analyzed this Sampling Event

NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

* - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

Downgradient Wells

Groundwater Analysis - Organics

Section 8.0 - Tab 7.0

Sample Location	Date	EPA Method 8260B					EPA Method 8015B		1 - WQCC 20 NMAC 6.2.3.103 2 - MCL 3 - 40CFR141.61 4 - TPH Screening Guidelines Table 2a (DRO) 5 - USEPA Regional Screening Levels (April 2009) - MTBE
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	DRO (mg/L)	GRO (mg/L)	
		0.005 ²	0.75 ³	0.70 ³	0.62 ¹	0.012 ⁵	0.2 ⁴		
MW #11	Aug-10	0.0014	<0.001	0.0038	<0.0015	0.011	2.0	2.2	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	0.099	<0.001	0.004	<0.0015	0.014	12.0	1.9	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #12	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
	Apr-10	<0.001	<0.001	<0.001	<0.0015	<0.001	0.3	<0.05	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	<1.0	<0.05	
	Apr-09	<0.001	<0.001	<0.001	<0.002	<0.001	<1.0	<0.05	
MW #34	Aug-10	<0.001	<0.001	<0.001	<0.0015	0.0021	1.0	0.70	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	0.032	<0.001	<0.001	<0.0015	0.0041	9.5	0.74	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #35	Aug-10	<0.001	<0.001	<0.001	<0.0015	0.0016	0.52	0.58	
	Apr-10	<0.001	<0.001	<0.001	<0.0015	0.0012	0.74	0.53	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	0.0025	2.9	0.84	
	Apr-09	<0.001	<0.001	<0.001	<0.002	0.0024	2.3	0.33	
MW #37	Aug-10	<0.005	<0.01	<0.01	<0.015	<0.01	0.33	0.79	
	Apr-10	<0.001	<0.001	<0.001	<0.0015	<0.001	0.47	0.075	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	2.1	<0.05	
	Apr-09	<0.001	<0.001	<0.001	<0.002	<0.001	2.4	0.053	
MW #38	Aug-10	<0.005	<0.005	<0.005	<0.0075	<0.005	0.33	0.075	
	Apr-10	<0.001	<0.001	<0.001	<0.0015	<0.001	0.42	<0.05	
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	<1.0	<0.05	
	Apr-09	<0.001	<0.001	<0.001	<0.002	0.002	1.6	<0.05	

NS¹ = Well is Dry or Not Enough Water to Sample- No Sample

NS² = Not Sampled due to approved Facility-Wide Monitoring Plan

NS³ = Sample Inadvertently not Collected this Sampling Event

NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Downgradient Wells

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 7.0

Sample Location	Date	EPA 300.0							SM 2320B	
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)
MW #11	Aug-10	1.6	250			10		600		
	Aug-10	<0.50	300	<0.50	3.90	<0.5	<2.5	5.3	970	970
	Aug-09	0.38	330	<0.20	4.00	<0.10	<0.50	4.0	1100	980
	Aug-08	0.57	110	<1.0	1.40	<0.10	<0.50	1.1	1100	1100
	Aug-07	0.57	96	<1.0	1.03	<0.10	<0.50	10	1300	1000
MW #12	Aug-10	0.55	5.9	<0.10	<0.10	0.22	<0.50	69	210	210
	Aug-09	0.44	15	<0.10	0.25	<0.10	<0.50	600	300	320
	Aug-08	0.50	8.3	<0.10	<0.10	<0.10	<0.50	130	270	280
	Aug-07	0.39	19	<0.10	<0.50	<0.10	<0.50	830	250	260
	Aug-10	0.65	200	<2.0	2.10	1.20	<0.50	320	760	760
MW #34	Aug-09	0.61	180	<2.0	2.20	<0.10	<0.50	18	850	880
	Aug-08	0.83	110	<0.10	1.30	<0.10	<0.50	9.9	740	750
	Aug-07	0.83	100	<1.0	1.30	<0.10	<0.50	68	880	840
	Aug-10	0.54	170	0.50	1.90	<0.50	<2.5	3.1	760	760
	Aug-09	0.64	98	<1.0*	1.10	<1.0*	<0.50	10	670	710
MW #35	Aug-08	0.76	110	<0.1	1.30	<0.10	<0.50	3.6	830	870
	Aug-07	0.71	100	<1.0	1.00	<0.10	<0.50	4.3	820	820
	Aug-10	0.73	320	<2.0	3.40	0.40	<0.50	16	800	800
	Aug-09	0.77	280	<1.0*	2.50	<1.0*	<0.50	37	740	810
	Aug-08	0.79	230	<0.10	2.90	<0.10	<0.50	34	760	820
MW #37	Aug-07	0.75	320	3.70	<1.0	<0.10	<0.50	37	870	890
	Aug-10	0.77	79	<0.10	0.91	0.12	<0.50	33	590	590
	Aug-09	0.84	64	<1.0*	0.70	<1.0*	<0.50	68	530	580
	Aug-08	0.78	60	<0.10	0.67	<0.10	<0.50	150	570	600
	Aug-07	1.00	43	<0.10	0.50	<0.10	<0.50	89	610	630

WQCC 20 NMAC 6.2.3103

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 NS³ = Sample Inadvertently not Collected this Sampling Event
 * - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime
 NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon
 NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Downgradient Wells

Groundwater Analysis - Total Metals

Section 8.0 - Tab 7.0

Sample Location	Date	EPA Method 6010B, EPA Method 7470: Mercury									
		Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)	Mercury (mg/L)	40 CFR 141.62 MCL	
MW #11	Aug-10	0.033	1.1	0.005	0.05	0.015	0.05	0.05	0.002		
	Aug-09	<0.02	0.92	<0.002	0.009	0.011	<0.050	<0.005	<0.0002		
	Aug-08	<0.02	0.7	<0.002	0.009	0.0074	<0.25	<0.005	<0.0002		
	Aug-07	<0.02	0.75	<0.002	<0.006	0.019	<0.050	<0.005	<0.0002		
	Aug-10	0.021	0.21	<0.002	2.1	0.044	<0.05	<0.005	0.0002		
MW #12	Aug-09	<0.02	0.17	<0.002	0.69	0.081	<0.050	<0.005	<0.0002		
	Aug-08	<0.02	0.06	<0.002	0.011	<0.005	<0.050	<0.005	<0.0002		
	Aug-07	<0.02	0.19	<0.002	0.93	0.03	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	0.38	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	0.71	<0.002	<0.006	0.0073	<0.050	<0.005	<0.0002		
MW #34	Aug-08	<0.02	0.57	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002		
	Aug-07	<0.02	0.55	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-10	0.075	0.99	<0.002	<0.006	0.0062	<0.05	<0.005	<0.0002		
	Aug-09	<0.02	0.54	<0.002	<0.006	0.011	<0.05	<0.005	<0.0002		
	Aug-08	<0.02	0.65	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002		
MW #35	Aug-07	0.022	0.86	<0.002	<0.006	0.008	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	0.9	<0.002	<0.006	<0.005	<0.05	<0.005	0.00056		
	Aug-09	<0.02	0.7	<0.002	<0.006	0.0065	<0.25	<0.005	<0.0002		
	Aug-08	<0.02	0.43	<0.002	<0.006	<0.005	<0.25	<0.005	<0.0002		
	Aug-07	<0.02	0.65	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
MW #37	Aug-10	<0.02	0.42	<0.002	<0.006	<0.005	<0.05	<0.005	0.0004		
	Aug-09	<0.02	0.18	<0.002	<0.006	0.009	<0.25	<0.005	<0.0002		
	Aug-08	<0.02	0.17	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-07	<0.02	0.14	<0.002	<0.006	0.020	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	0.14	<0.002	<0.006	0.020	<0.050	<0.005	<0.0002		
MW #38	Aug-09	<0.02	0.18	<0.002	<0.006	0.009	<0.25	<0.005	<0.0002		
	Aug-08	<0.02	0.17	<0.002	<0.006	<0.005	<0.050	<0.005	<0.0002		
	Aug-07	<0.02	0.14	<0.002	<0.006	0.020	<0.050	<0.005	<0.0002		
	Aug-10	<0.02	0.14	<0.002	<0.006	0.020	<0.050	<0.005	<0.0002		
	Aug-09	<0.02	0.14	<0.002	<0.006	0.020	<0.050	<0.005	<0.0002		

NS¹= Well is Dry or Not Enough Water to Sample- No Sample

NS² = Not Sampled due to approved Facility-Wide Monitoring Plan

NS³ = Sample Inadvertently not Collected this Sampling Event

* - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Downgradient Wells

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 7.0

		EPA Method 6020A for Uranium - EPA Method 6010B for All Other Metals														WQCG 20NMAC66.2.3103	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
MW #11	Aug-10	<0.02	1.1	<0.002	130	<0.006	<0.006	14	0.0054	28	2.1	1.9	<0.05	<0.005	450	<0.001	<0.05
	Aug-09	<0.02	0.87	<0.002	120	<0.006	<0.006	12	0.007	27	2.3	1.6	<0.05	<0.005	420	<0.001	<0.05
	Aug-08	<0.02	0.7	<0.002	NS*	0.009	<0.006	12	0.007	NS*	1.9	NS*	<0.25	<0.005	NS*	<0.001	<0.05
	Aug-07	<0.02	0.6	<0.002	98	<0.006	0.008	9.5	0.011	22	1.9	1.5	<0.05	<0.005	400	<0.1	<0.05
	Aug-10	<0.02	0.043	<0.002	50	<0.006	<0.006	0.061	<0.005	8.9	0.15	<1.0	<0.05	<0.005	66	0.0012	<0.05
MW #12	Aug-09	<0.02	0.066	<0.002	100	0.013	<0.006	0.26	<0.005	21	0.34	<1.0	<0.05	<0.005	260	0.008	<0.05
	Aug-08	<0.02	0.06	<0.002	NS*	0.011	<0.006	0.021	<0.005	NS*	0.065	NS*	<0.25	<0.005	NS*	0.003	0.095
	Aug-07	<0.02	0.05	<0.002	120	0.008	<0.006	0.042	<0.005	25	0.46	1.1	<0.05	<0.005	220	<0.1	<0.05
	Aug-10	<0.02	0.52	<0.002	78	<0.006	<0.006	3.1	<0.005	15	3.2	1.2	<0.05	<0.005	320	<0.001	<0.05
	Aug-09	<0.02	0.65	<0.002	99	<0.006	<0.006	3.6	<0.005	19	3.6	1.3	<0.05	<0.005	350	<0.001	<0.05
MW #34	Aug-08	<0.02	0.57	<0.002	NS*	<0.006	<0.006	4.1	<0.005	NS*	3.1	NS*	<0.25	<0.005	NS*	<0.001	<0.05
	Aug-07	<0.02	0.25	<0.002	130	<0.006	<0.006	1.4	0.005	30	2.0	2.9	<0.05	<0.005	520	<0.1	<0.05
	Aug-10	<0.10	0.75	<0.002	95	<0.006	<0.006	3.9	<0.005	17	2.7	2.6	<0.05	<0.005	330	<0.001	<0.05
	Aug-09	<0.2	0.39	<0.002	73	<0.006	<0.006	3.1	<0.005	13	1.6	2.3	<0.05	<0.005	270	<0.001	<0.05
	Aug-08	<0.02	0.65	<0.002	NS*	<0.006	<0.006	2.6	<0.005	NS*	1.4	NS*	<0.25	<0.005	NS*	<0.001	<0.05
MW #35	Aug-07	<0.02	0.71	<0.002	79	<0.006	0.006	3.5	<0.005	16	1.7	1.9	<0.05	<0.005	340	<0.1	<0.05
	Aug-10	<0.02	0.45	<0.002	99	<0.006	<0.006	1.9	<0.005	20	1.3	3.3	<0.05	<0.005	410	<0.001	<0.05
	Aug-09	<0.02	0.43	<0.002	82	<0.006	<0.006	1.1	<0.005	18	1.4	2.9	<0.05	<0.005	370	<0.001	<0.05
	Aug-08	<0.02	0.43	<0.002	NS*	<0.006	<0.006	0.95	<0.005	NS*	1.2	NS*	<0.25	<0.005	NS*	<0.001	0.15
	Aug-07	<0.02	0.47	<0.002	110	<0.006	<0.006	1.5	0.005	23	1.7	2.9	<0.05	<0.005	460	<0.1	<0.05
MW #37	Aug-10	<0.02	0.25	<0.002	88	<0.006	<0.006	2.1	<0.005	14	2.3	2.4	<0.05	<0.005	210	0.0015	<0.05
	Aug-09	<0.10	0.11	<0.002	91	<0.006	<0.006	2.5	<0.005	16	1.6	3.3	<0.05	<0.005	210	0.003	<0.05
	Aug-08	<0.02	0.17	<0.002	NS*	<0.006	<0.006	2.2	<0.005	NS*	2.6	NS*	<0.25	<0.005	NS*	0.002	<0.05
	Aug-07	<0.02	0.11	<0.002	95	<0.006	<0.006	1.2	<0.005	16	2	2.5	<0.05	<0.005	230	<0.1	<0.05
	Aug-10	<0.02	0.11	<0.002	95	<0.006	<0.006	1.2	<0.005	16	2	2.5	<0.05	<0.005	230	<0.1	<0.05

NS* = Well is Dry or Not Enough Water to Sample- No Sample

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NS* = Sample Inadvertently not Analyzed this Sampling Event

NR* = No Sample Required - Well Contains Separate Phase Hydrocarbon

NR* = No Sample Required per OGD and NMED pre-2007 Conditions

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RCRA Investigation Wells

Groundwater Analysis - Organics

Section 8.0 - Tab 8.0

Sample Location	Date	EPA Method 8260B					EPA Method 8015B		
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	DRO (mg/L)	GRO (mg/L)	
		0.005 ¹	0.75 ¹	0.70 ²	0.62 ¹	0.012 ³	0.2 ³		
MW #50	Aug-10	0.09	0.0024	0.0041	0.0017	<0.001	<0.20	0.48	1 - WEGG-20-NMAC: 6.2, 3103 2 - MCL 3 - 40CFR141.61 4 - TPH Screening Guidelines Table 2a (DRO) 5 - USEPA Regional Screening Levels (April 2009) - MTBE
MW #51	Aug-10	0.39	0.0089	0.002	0.034	<0.001	<0.2	1.8	
MW #52	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
MW #53	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
MW #54	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #55	Aug-10	11.0	0.029	2.6	1.7	7.0	13.0	59.0	
MW #56	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #57	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #58	Aug-10	4.5	<0.02	0.14	<0.03	15	6.6	29	
MW #59	Aug-10	0.042	<0.005	0.1	<0.0075	0.14	0.61	1.3	
MW #60	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
MW #61	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #62	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
MW #63	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	0.13	
MW #64	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	<0.05	
MW #65	Aug-10	3.6	<0.05	2.1	9.9	0.096	9.8	40	
MW #66	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	

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NR² = No Sample Required per OCD and NMED pre-2007 Conditions

RCRA Investigation Wells

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 8.0

Sample Location	Date	EPA 300.0							SM 2320B		
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)	
		1.6	250			10		600			
MW #50	Aug-10	0.4	12	0.1	<0.10	0.14	<0.50	66	210	210	
MW #51	Aug-10	0.52	14	<0.10	<0.10	0.14	<0.50	61	250	250	
MW #52	Aug-10	0.76	600	<2.0	1.7	3	<0.50	1700	190	190	
MW #53	Aug-10	0.29	840	<2.0	1.8	8.1	<0.50	990	350	350	
MW #54	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #55	Aug-10	0.35	470	*6.1	4.4	*6.1	<0.50	1.3	1000	1000	
MW #56	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #57	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #58	Aug-10	0.31	270	*5.5	5	*5.5	<0.50	1.8	1100	1100	
MW #59	Aug-10	0.34	120	*1.3	1.4	*1.3	<0.50	210	860	860	
MW #60	Aug-10	<0.10	110	<2.0	2.3	31	<0.50	730	590	590	
MW #61	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
MW #62	Aug-10	<0.10	16	<0.10	<0.10	0.29	<0.50	5100	550	550	
MW #63	Aug-10	0.16	290	<2.0	4.6	110	<0.50	2200	580	580	
MW #64	Aug-10	0.18	840	*52	2.9	*52	<0.50	1600	340	340	
MW #65	Aug-10	<0.50	220	*<1.0	3.7	*<1.0	<2.5	620	1100	1100	
MW #66	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	

WQCC 20 NMAC 6.2.3103

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RCRA Investigation Wells

Groundwater Analysis - Total Metals

Section 8.0 - Tab 8.0

		EPA Method 6010B, EPA Method 7470: Mercury								40 CFR 141.61 MCL	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)	Mercury (mg/L)		
MW #50	Aug-10	0.01	1	0.005	0.05	0.015	0.05	0.05	0.002		
MW #51	Aug-10	<0.02	0.13	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #52	Aug-10	<0.02	0.12	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #53	Aug-10	<0.02	0.11	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #54	Aug-10	<0.02	0.078	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #55	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
MW #56	Aug-10	0.06	5.9	<0.002	0.054	0.3	<0.05	<0.005	<0.001		
MW #57	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
MW #58	Aug-10	<0.02	1.6	<0.002	<0.006	0.034	<0.05	<0.005	<0.001		
MW #59	Aug-10	<0.02	0.095	<0.002	<0.006	<0.005	<0.05	<0.005	<0.001		
MW #60	Aug-10	<0.02	0.089	<0.002	0.0063	0.0051	<0.05	<0.005	<0.0002		
MW #61	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		
MW #62	Aug-10	0.024	0.032	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #63	Aug-10	<0.02	0.029	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #64	Aug-10	<0.02	0.60	<0.002	0.029	0.005	<0.05	<0.005	<0.0002		
MW #65	Aug-10	0.03	0.076	<0.002	<0.006	<0.005	<0.05	<0.005	<0.0002		
MW #66	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹		

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RCRA Wells

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 8.0

EPA Method 6020A for Uranium - EPA Method 6010B for All Other Metals																	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
		0.1	1	0.01		0.05	1	1	0.05		0.2		0.05	0.05		0.03	10
MW #50	Aug-10	<0.02	0.059	<0.002	61	<0.006	<0.006	0.035	<0.005	16	3.7	1.9	<0.05	<0.005	42	<0.001	<0.05
MW #51	Aug-10	<0.02	0.076	<0.002	71	<0.006	<0.006	0.20	<0.005	15.0	2.0	2.0	<0.05	<0.005	48	0.0018	<0.05
MW #52	Aug-10	<0.02	0.038	<0.002	250	<0.006	<0.006	0.70	<0.005	70	3.6	4.4	<0.05	<0.005	560	0.0072	<0.05
MW #53	Aug-10	<0.02	0.025	<0.002	290	<0.006	<0.006	0.13	<0.005	48	1.0	5.3	<0.05	<0.005	700	0.0108	<0.05
MW #54	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #55	Aug-10	<0.02	2.5	<0.002	180	<0.006	<0.006	12	<0.005	54	5.8	11.0	<0.05	0.005	400	<0.001	<0.05
MW #56	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #57	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #58	Aug-10	<0.02	1.6	<0.002	150	<0.006	<0.006	8.9	0.0085	49	4.3	4.9	<0.05	<0.005	390	<0.001	<0.05
MW #59	Aug-10	<0.02	0.073	<0.002	150	<0.006	<0.006	2.7	<0.005	32	2.9	3.2	<0.25	<0.005	340	0.0023	<0.05
MW #60	Aug-10	<0.02	0.038	<0.002	220	<0.006	<0.006	<0.02	<0.005	69	0.33	2.9	<0.05	<0.005	320	0.0086	<0.05
MW #61	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW #62	Aug-10	<0.02	<0.02	<0.002	430	<0.006	<0.006	0.87	<0.005	37	1.6	10	<0.05	<0.005	1400	0.0066	<0.05
MW #63	Aug-10	<0.02	<0.02	<0.002	430	<0.006	<0.006	<0.02	<0.005	150	3.7	5	<0.05	<0.005	660	0.056	<0.05
MW #64	Aug-10	<0.02	<0.02	<0.002	430	<0.006	<0.006	0.03	<0.005	67	0.013	4.9	<0.05	<0.005	780	0.0143	<0.05
MW #65	Aug-10	<0.02	0.069	<0.002	180	<0.006	<0.006	6.2	<0.005	56	3.5	3.8	<0.05	<0.005	490	0.0067	<0.05
MW #66	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹

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RCRA Investigation Wells

Groundwater Analysis - Semi-Volatile Organic Compounds

Section 8.0 - Tab 8.0

Sample Location	Date	EPA Method 8270B			
		2,4 Dimethylphenol (mg/L)	2-Methylnaphthalene (mg/L)	Naphthalene (mg/L)	Phenol (mg/L)
			0.15 ²	0.0014 ²	0.005 ²
MW #50	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #51	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #52	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #53	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #54	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹
MW #55	Aug-10	<0.01	0.15	0.29	0.016
MW #56	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹
MW #57	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹
MW #58	Aug-10	<0.01	0.090	0.076	0.011
MW #59	Aug-10	<0.01	<0.01	0.012	<0.01
MW #60	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #61	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹
MW #62	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #63	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #64	Aug-10	<0.01	<0.01	<0.0022	<0.0026
MW #65	Aug-10	0.054	0.097	0.26	<0.0026
MW #66	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹

1 WQCC 20 NMAC 6.2.3103
USEPA Regional Screening Levels (April 2009)

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San Juan River Bluff

Groundwater Analysis - Organics

Section 8.0 - Tab 9.0

		EPA Method 8260B					1- WQCG 20 NMAC 6.2.3103 2- MCL 4- TTPH Screening Guidelines Table 2a (DRO) 5- USEPA Regional Screening Levels (April 2009) - MTBE
Sample Location	Date	Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	
		0.005 ²	0.75 ¹	0.70 ³	0.62 ¹	0.012 ⁵	
Outfall #2	Aug-10	<0.001	<0.001	<0.001	<0.003	<0.0015	
	Apr-10	<0.001	<0.001	<0.001	<0.003	<0.0015	
	Aug-09	<0.001	<0.001	<0.001	<0.003	<0.0015	
	Apr-09	<0.001	<0.001	<0.001	<0.003	<0.0015	
Outfall #3	Aug-10	<0.001	<0.001	<0.001	<0.003	<0.0015	
	Apr-10	<0.001	<0.001	<0.001	<0.003	<0.0015	
	Aug-09	<0.001	<0.001	<0.001	<0.003	<0.0015	
	Apr-09	<0.001	<0.001	<0.001	<0.003	<0.0015	

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San Juan River Bluff

Groundwater Analysis - General Chemistry

Section 8.0 - Tab 9.0

Sample Location	Date	EPA 300.0							SM 2320B		
		Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Bromide (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)	
Outfall #2	Aug-10	1.6	250			10		600			
		0.46	8.3	<0.10	<0.10	2.6	<0.50	81	120	120	
	Apr-10	0.56	11	<0.10	<0.10	1.4	<0.50	110	270	270	
	Aug-09	0.43	5.3	<0.10	0.18	<0.10	<0.50	73	120	130	
Outfall #3	Apr-09	0.65	11	*<0.10	0.11	*<0.10	<0.50	84	320	360	
	Aug-10	0.25	3.6	<0.10	<0.10	0.17	<0.50	62	90	90	
	Apr-10	0.26	7.7	<0.10	<0.10	0.57	<0.50	110	120	120	
	Aug-09	0.27	4.5	<0.10	0.16	0.25	<0.50	50	92	100	
	Apr-09	0.47	22	*<0.10	0.16	*<0.10	<0.50	150	280	300	

WQCC 20 NMAC 6.2.3.103

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San Juan River Bluff

Groundwater Analysis - Total Metals

Section 8.0 - Tab 9.0

Sample Location	Date	EPA Method 6010B, EPA Method 7470: Mercury						
		Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Cr (mg/L)	Lead (mg/L)	Se (mg/L)	Silver (mg/L)
Outfall #2	Aug-10	0.01	1	0.005	0.05	0.015	0.05	0.005
	Aug-10	<0.02	0.049	<0.002	<0.006	<0.005	<0.05	<0.0002
	Apr-10	<0.02	0.058	<0.002	<0.006	<0.005	<0.05	<0.0002
	Aug-09	<0.02	0.029	<0.002	<0.006	<0.005	<0.05	<0.0002
	Apr-09	<0.02	0.048	<0.002	<0.006	<0.005	<0.05	<0.0002
Outfall #3	Aug-10	<0.02	0.065	<0.002	<0.006	<0.005	<0.05	<0.0002
	Apr-10	<0.02	0.064	<0.002	<0.006	<0.005	<0.05	<0.0002
	Aug-09	<0.02	0.056	>0.002	<0.006	0.006	<0.05	<0.0002
	Apr-09	<0.02	0.04	>0.002	<0.006	<0.005	<0.05	<0.0002

40 CFR 141.62 MCL

NS¹= Well is Dry or Not Enough Water to Sample- No Sample
 NS² = Not Sampled due to approved Facility-Wide Monitoring Plan
 NS³ = Sample Inadvertently not Collected this Sampling Event
 NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon
 NR² = No Sample Required per OCD and NMED pre-2007 Conditions

San Juan River Bluff

Groundwater Analysis - Dissolved Metals

Section 8.0 - Tab 9.0

EPA Method 6010B																	
Sample Location	Date	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Cr (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Mg (mg/L)	Mn (mg/L)	K (mg/L)	Se (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
Outfall #2	Aug-10	<0.02	0.046	<0.002	52	<0.006	<0.006	0.17	<0.005	9.7	0.2	1.4	<0.05	<0.005	26	0.001	<0.05
	Apr-10	<0.02	0.056	<0.002	86	<0.006	<0.006	<0.02	<0.005	18	<0.002	1.7	<0.05	<0.005	55	0.0032	<0.05
	Aug-09	<0.02	0.028	<0.002	48	<0.006	<0.006	<0.02	<0.005	9.5	0.0028	1.9	<0.05	<0.005	27	0.0018	<0.05
	Apr-09	<0.02	0.047	<0.002	98	<0.006	<0.006	<0.02	<0.005	21	<0.002	2	<0.05	<0.005	64	0.005	<0.05
	Aug-10	<0.02	0.061	<0.002	39	<0.006	<0.006	<0.02	<0.005	6.8	<0.002	1.7	<0.05	<0.005	17	<0.001	<0.05
Outfall #3	Apr-10	<0.02	0.063	<0.002	59	<0.006	<0.006	<0.02	<0.005	11	<0.002	1.8	<0.05	<0.005	30	0.0023	<0.05
	Aug-09	<0.02	0.053	<0.002	39	<0.006	<0.006	<0.02	<0.005	7.5	<0.002	1.5	<0.05	<0.005	20	0.0013	<0.05
	Apr-09	<0.02	0.044	<0.002	99	<0.006	<0.006	<0.02	<0.005	20	<0.002	1.7	<0.05	<0.005	76	0.005	<0.05

WQCG 20NMAG 6.2.3103

NS¹= Well is Dry or Not Enough Water to Sample- No Sample
 NS²= Not Sampled due to approved Facility-Wide Monitoring Plan
 NS³= Sample Inadvertently not Collected this Sampling Event
 NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon
 NR²= No Sample Required per OCD and NMED pre-2007 Conditions

Bluff Seeps

Groundwater Analysis

Section 8.0 - Tab 9.0

WQCC 20 NMAC 6.2.3103														
Sample Location	Date	EPA 8260B					EPA 300.0					SM 2320B		
		Benzene (mg/L)	Toluene (mg/L)	EthylBen (mg/L)	Xylene (mg/L)	MTBE (mg/L)	Fluoride (mg/L)	Chloride (mg/L)	Nitrite (mg/L)	Nitrogen (mg/L)	P (mg/L)	Sulfate (mg/L)	CO2 (mg/L)	ALK (mg/L)
Seep 1	Aug-10	0.005	0.75	0.70	0.62	0.012	1.6	250		10		600		
	Aug-10	<0.001	<0.001	<0.001	<0.002	<0.001	0.32	380	<0.10	<2.0	<0.50	1800	260	260
	Apr-10	<0.001	<0.001	<0.001	<0.003	0.073	0.19	220	<0.10	<2.0	<0.50	1600	360	360
	Aug-09	<0.001	<0.001	<0.001	<0.003	0.0034	0.29	390	<2.0	<0.10	<0.50	1500	200	220
Seep 2	Apr-09	<0.001	<0.001	<0.001	<0.002	0.072	0.28	310	<1.0	<0.10	<0.50	1400	340	380
	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Apr-10	<0.001	<0.001	<0.001	<0.003	0.008	0.83	640	0.69	<2.0	<10.0	5000	110	120
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
Seep 3	Apr-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-10	<0.001	<0.001	<0.001	<0.002	<0.001	0.7	6000	<0.50	<2.0	<0.50	1800	240	240
	Apr-10	<0.001	<0.001	<0.001	<0.003	0.011	0.21	370	<0.10	<2.0	<0.50	2500	330	330
	Aug-09	<0.001	<0.001	<0.001	<0.003	<0.0015	0.22	1400	<2.0	<2.0	<10.0	6800	120	130
Seep 6	Apr-09	<0.001	<0.001	<0.001	<0.002	0.006	0.32	340	<1.0	<0.10	<0.50	2200	290	320
	Aug-10	<0.001	<0.001	<0.001	<0.002	<0.001	<0.50	5800	<20*	no analysis*	<2.5	2000	140	140
	Apr-10	<0.001	<0.001	<0.001	<0.003	0.006	0.17	3100	<1.0*	no analysis*	<0.50	1300	350	350
	Aug-09	<0.001	<0.001	<0.001	<0.003	<0.0015	0.58	4800	<2.0	<2.0	<10.0	1500	150	160
Seep 8	Apr-09	<0.001	<0.001	<0.001	<0.002	0.014	<0.50	2900	<2.0*	<2.0*	<0.50	1000	420	440
	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Apr-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
Seep 9	Apr-09	<0.001	<0.001	<0.001	<0.002	<0.001	0.27	650	<2.0*	<2.0*	<0.50	2200	190	200
	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
	Apr-10	<0.001	<0.001	<0.001	<0.003	0.027	0.37	710	<0.10	<2.0	<0.50	2000	350	350
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹
Seep 9	Apr-09	<0.001	<0.001	<0.001	<0.002	0.048	0.35	620	<2.0*	<2.0*	<0.50	1500	420	460

NS¹= Well is Dry or Not Enough Water to Sample- No Sample

NS² = Not Sampled - Sample was taken before implementation of Facility-Wide Monitoring Plan

* - Laboratory analyzed for combined Nitrate (As N) + Nitrite (As N) to meet holdtime

San Juan River Analysis - 2010

Organics

Section 8.0 - Tab 10.0

EPA Method - 8260							
	Sampling Event	Date Sampled	North of MW #46	North of MW #45	Upstream of Refinery	Downstream of Refinery	
Benzene (mg/L)	Semi-Annual	08/11/10	<0.001	<0.001	<0.001	<0.001	0.005 (mg/L) 40CFR141.61
	Semi-Annual	04/13/10	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/20/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	04/13/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/05/08	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	03/12/08	<0.001	<0.001	<0.001	<0.001	
Toluene (mg/L)	Semi-Annual	08/11/10	<0.001	<0.001	<0.001	<0.001	0.75 (mg/L) WQCC 20 NMAC 6.2.3103
	Semi-Annual	04/13/10	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/20/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	04/13/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/05/08	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	03/12/08	<0.001	<0.001	<0.001	<0.001	
EthylBen (mg/L)	Semi-Annual	08/11/10	<0.001	<0.001	<0.001	<0.001	0.7 (mg/L) 40CFR141.61
	Semi-Annual	04/13/10	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/20/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	04/13/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/05/08	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	03/12/08	<0.001	<0.001	<0.001	<0.001	
Xylene (mg/L)	Semi-Annual	08/11/10	<0.003	<0.003	<0.003	<0.003	0.62 (mg/L) WQCC 20 NMAC 6.2.3103
	Semi-Annual	04/13/10	<0.003	<0.003	<0.003	<0.003	
	Semi-Annual	08/20/09	<0.003	<0.003	<0.003	<0.003	
	Semi-Annual	04/13/09	<0.003	<0.003	<0.003	<0.003	
	Semi-Annual	08/05/08	<0.003	<0.003	<0.003	<0.003	
	Semi-Annual	03/12/08	<0.002	<0.002	<0.002	<0.002	
MTBE (mg/L)	Semi-Annual	08/11/10	<0.0015	<0.0015	<0.0015	<0.0015	0.012 (mg/L) USEPA Regional Screening Levels (April 2009)
	Semi-Annual	04/13/10	<0.0015	<0.0015	<0.0015	<0.0015	
	Semi-Annual	08/20/09	<0.0015	<0.0015	<0.0015	<0.0015	
	Semi-Annual	04/13/09	<0.0015	<0.0015	<0.0015	<0.0015	
	Semi-Annual	08/05/08	<0.0015	<0.0015	<0.0015	<0.0015	
	Semi-Annual	03/12/08	<0.0025	<0.0025	<0.0025	<0.0025	

San Juan River Analysis - 2010

Organics

Section 8.0 - Tab 10.0

		Sampling Event	Date Sampled	North of MW #46	North of MW #45	Upstream of Refinery	Downstream of Refinery	
EPA Method 8015B	DRO (mg/L)	Semi-Annual	08/11/10	<0.2	<0.2	<0.2	<0.2	0.20 (mg/L) TPH Screening Guidelines Table 2a
		Semi-Annual	04/13/10	<0.2	<0.2	<0.2	<0.2	
		Semi-Annual	08/20/09	<1.0	<1.0	<1.0	<1.0	
		Semi-Annual	04/13/09	<1.0	<1.0	<1.0	<1.0	
		Semi-Annual	08/05/08	<1.0	<1.0	<1.0	<1.0	
		Semi-Annual	03/12/08	<1.0	<1.0	<1.0	<1.0	
	MRO (mg/L)	Semi-Annual	08/11/10	<2.5	<2.5	<2.5	<2.5	
		Semi-Annual	04/13/10	<2.5	<2.5	<2.5	<2.5	
		Semi-Annual	08/20/09	<5.0	<5.0	<5.0	<5.0	
		Semi-Annual	04/13/09	<5.0	<5.0	<5.0	<5.0	
		Semi-Annual	08/05/08	<5.0	<5.0	<5.0	<5.0	
		Semi-Annual	03/12/08	<5.0	<5.0	<5.0	<5.0	
	GRO (mg/L)	Semi-Annual	08/11/10	<0.050	<0.050	<0.050	<0.050	
		Semi-Annual	04/13/10	<0.050	<0.050	<0.050	<0.050	
		Semi-Annual	08/20/09	<0.050	<0.050	<0.050	<0.050	
		Semi-Annual	04/13/09	<0.050	<0.050	<0.050	<0.050	
		Semi-Annual	08/05/08	<0.050	<0.050	<0.050	<0.050	
		Semi-Annual	03/12/08	<0.050	<0.050	<0.050	<0.050	

San Juan River Analysis - 2010

General Chemistry

Section 8.0 - Tab 10.0

	mg/L	Sampling Event	Date Sampled	North of MW #46	North of MW #45	Upstream of Refinery	Downstream of Refinery	WQCC
								20 NMAC 6.2.3103
EPA Method 300.0	Fluoride	Semi-Annual	08/11/10	0.16	0.17	0.18	0.16	1.60
		Semi-Annual	04/13/10	0.14	0.16	0.15	0.16	
		Semi-Annual	08/20/09	0.22	0.10	0.23	0.22	
		Semi-Annual	04/13/09	0.15	0.14	0.15	0.18	
		Semi-Annual	08/05/08	0.20	0.20	0.24	0.19	
		Semi-Annual	03/12/08	0.19	0.20	0.20	0.21	
	Chloride	Semi-Annual	08/11/10	3.1	3.0	3.2	3.1	250
		Semi-Annual	04/13/10	3.7	3.6	3.6	3.8	
		Semi-Annual	08/20/09	3.2	3.1	3.5	2.8	
		Semi-Annual	04/13/09	3.1	3.1	3.3	3.1	
		Semi-Annual	08/05/08	3.0	2.9	5.5	3.1	
		Semi-Annual	03/12/08	2.7	2.7	2.8	2.8	
	Nitrite	Semi-Annual	08/11/10	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	04/13/10	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	08/20/09	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	04/13/09	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	08/05/08	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	03/12/08	<0.10	<0.10	<0.10	<0.10	
	Bromide	Semi-Annual	08/11/10	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	04/13/10	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	08/20/09	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	04/13/09	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	08/05/08	<0.10	<0.10	<0.10	<0.10	
		Semi-Annual	03/12/08	<0.10	<0.10	<0.10	<0.10	
	Phosphorous	Semi-Annual	08/11/10	<0.50	<0.50	<0.50	<0.50	
		Semi-Annual	04/13/10	<0.50	<0.50	<0.50	<0.50	
		Semi-Annual	08/20/09	<0.50	<0.50	<0.50	<0.50	
		Semi-Annual	04/13/09	<0.50	<0.50	<0.50	<0.50	
		Semi-Annual	08/05/08	<0.50	<0.50	<0.50	<0.50	
		Semi-Annual	03/12/08	<0.50	<0.50	<0.50	<0.50	
	Sulfate	Semi-Annual	08/11/10	61	60	60	65	600
		Semi-Annual	04/13/10	72	72	74	77	
		Semi-Annual	08/20/09	49	50	62	44	
		Semi-Annual	04/13/09	72	72	73	75	
		Semi-Annual	08/05/08	60	59	130	62	
		Semi-Annual	03/12/08	52	53	53	59	

San Juan River Analysis - 2010

General Chemistry

Section 8.0 - Tab 10.0

	mg/L	Sampling Event	Date Sampled	North of MW #46	North of MW #45	Upstream of Refinery	Downstream of Refinery	WQCC 20 NMAC 6.2.3103
EPA 160.1	TDS	Semi-Annual	03/11/10	204	211	203	206	1000
		Semi-Annual	04/13/10	221	220	220	231	
		Semi-Annual	03/20/09	180	193	184	196	
		Semi-Annual	04/13/09	250	240	250	280	
		Semi-Annual	03/05/08	190	200	360	200	
		Semi-Annual	03/12/08	240	260	480	260	
EPA 310.1	CO3	Semi-Annual	03/11/10	86	84	85	86	
		Semi-Annual	04/13/10	84	84	84	87	
		Semi-Annual	03/20/09	82	83	83	280	
		Semi-Annual	04/13/09	78	78	76	78	
		Semi-Annual	03/05/08	85	84	85	80	
		Semi-Annual	03/12/08	85	84	84	84	
	ALK	Semi-Annual	03/11/10	86	84	85	86	
		Semi-Annual	04/13/10	84	84	84	87	
		Semi-Annual	03/20/09	82	83	83	84	
		Semi-Annual	04/13/09	87	87	85	87	
		Semi-Annual	03/05/08	89	91	95	90	
		Semi-Annual	03/12/08	85	84	84	86	
EPA 120.1	E.C. (umhos/cm)	Semi-Annual	03/11/10	320	320	310	320	
		Semi-Annual	04/13/10	340	340	340	350	
		Semi-Annual	03/20/09	310	280	270	280	
		Semi-Annual	04/13/09	330	340	340	350	
		Semi-Annual	03/05/08	300	290	450	300	
		Semi-Annual	03/12/08	280	280	280	300	

San Juan River Analysis- 2010

Dissolved Metals

Section 8.0 - Tab 10.0

EPA Method 6010B							WQCC
mg/L	Sampling Event	Date Sampled	North of MW #46	North of MW #45	Upstream of Refinery	Downstream of Refinery	20 NMAC 6.2.3103
Arsenic	Semi-Annual	08/11/10	<0.020	<0.020	<0.020	<0.020	0.10
	Semi-Annual	04/13/10	<0.020	<0.020	<0.020	<0.020	
	Semi-Annual	08/20/09	<0.020	<0.020	<0.020	<0.020	
	Semi-Annual	04/13/09	<0.020	<0.020	<0.020	<0.020	
	Semi-Annual	08/05/08	<0.020	<0.020	<0.020	<0.020	
	Semi-Annual	03/12/08	<0.020	<0.020	<0.020	<0.020	
Barium	Semi-Annual	08/11/10	0.068	0.069	0.068	0.067	1.00
	Semi-Annual	04/13/10	0.065	0.065	0.065	0.650	
	Semi-Annual	08/20/09	0.060	0.041	0.060	0.063	
	Semi-Annual	04/13/09	0.064	0.068	0.065	0.064	
	Semi-Annual	08/05/08	0.077	0.081	0.130	0.080	
	Semi-Annual	03/12/08	0.086	0.080	0.085	0.081	
Cadmium	Semi-Annual	08/11/10	<0.002	<0.002	<0.002	<0.002	0.01
	Semi-Annual	04/13/10	<0.002	<0.002	<0.002	<0.002	
	Semi-Annual	08/20/09	<0.002	<0.002	<0.002	<0.002	
	Semi-Annual	04/13/09	<0.002	<0.002	<0.002	<0.002	
	Semi-Annual	08/05/08	<0.002	<0.002	<0.002	<0.002	
	Semi-Annual	03/12/08	<0.002	<0.002	<0.002	<0.002	
Calcium	Semi-Annual	08/11/10	36	35	34	36	
	Semi-Annual	04/13/10	35	35	34	36	
	Semi-Annual	08/20/09	30	22	28	31	
	Semi-Annual	04/13/09	36	35	35	38	
	Semi-Annual	08/05/08	33	34	39	34	
	Semi-Annual	03/12/08	28	28	29	28	
Chromium	Semi-Annual	08/11/10	<0.006	<0.006	<0.006	<0.006	0.05
	Semi-Annual	04/13/10	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	08/20/09	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	04/13/09	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	08/05/08	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	03/12/08	0.007	<0.006	0.007	<0.006	
Copper	Semi-Annual	08/11/10	<0.006	<0.006	<0.006	<0.006	1.00
	Semi-Annual	04/13/10	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	08/20/09	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	04/13/09	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	08/05/08	<0.006	<0.006	<0.006	<0.006	
	Semi-Annual	03/12/08	<0.006	<0.006	<0.006	<0.006	
Iron	Semi-Annual	08/11/10	0.036	0.036	<0.02	Jan-00	1.00
	Semi-Annual	04/13/10	0.027	0.026	0.022	<0.02	
	Semi-Annual	08/20/09	<0.02	<0.02	<0.02	<0.02	
	Semi-Annual	04/13/09	0.030	0.032	0.021	0.04	
	Semi-Annual	08/05/08	0.059	0.068	0.074	0.09	
	Semi-Annual	03/12/08	0.360	3.800	0.490	0.33	

San Juan River Analysis- 2010

Dissolved Metals

Section 8.0 - Tab 10.0

EPA Method 6010B							WQCC 20 NMIC 6.2.3103
mg/L	Sampling Event	Date Sampled	North of MW #46	North of MW #45	Upstream of Refinery	Downstream of Refinery	
Lead	Semi-Annual	08/11/10	<0.005	<0.005	<0.005	<0.005	0.05
	Semi-Annual	04/13/10	<0.005	<0.005	<0.005	<0.005	
	Semi-Annual	08/20/09	<0.005	<0.005	<0.005	<0.005	
	Semi-Annual	04/13/09	<0.005	<0.005	<0.005	<0.005	
	Semi-Annual	08/05/08	<0.005	<0.005	<0.005	<0.005	
	Semi-Annual	03/12/08	<0.005	<0.005	<0.005	<0.005	
Magnesium	Semi-Annual	08/11/10	6.0	6.0	6.0	6.1	
	Semi-Annual	04/13/10	6.5	6.5	6.7	6.6	
	Semi-Annual	08/20/09	5.6	4.1	5.4	5.7	
	Semi-Annual	04/13/09	6.1	6.1	6.2	6.4	
	Semi-Annual	08/05/08	5.5	5.7	7.0	5.5	
	Semi-Annual	03/12/08	4.5	4.9	4.7	4.5	
Manganese	Semi-Annual	08/11/10	0.011	0.010	0.007	0.016	0.20
	Semi-Annual	04/13/10	0.025	0.025	0.033	0.054	
	Semi-Annual	08/20/09	0.004	0.004	0.003	0.006	
	Semi-Annual	04/13/09	0.017	0.180	0.023	0.046	
	Semi-Annual	08/05/08	0.008	0.012	0.073	0.012	
	Semi-Annual	03/12/08	0.040	0.037	0.038	0.035	
Potassium	Semi-Annual	08/11/10	1.8	1.8	1.8	1.8	
	Semi-Annual	04/13/10	1.8	1.8	1.8	1.8	
	Semi-Annual	08/20/09	1.7	1.1	1.6	1.6	
	Semi-Annual	04/13/09	1.7	1.6	1.7	1.8	
	Semi-Annual	08/05/08	1.8	1.8	2.0	1.9	
	Semi-Annual	03/12/08	1.7	2.3	1.8	1.7	
Selenium	Semi-Annual	08/11/10	<0.050	<0.050	<0.050	<0.050	0.05
	Semi-Annual	04/13/10	<0.050	<0.050	<0.050	<0.050	
	Semi-Annual	08/20/09	<0.050	<0.050	<0.050	<0.050	
	Semi-Annual	04/13/09	<0.050	<0.050	<0.050	<0.050	
	Semi-Annual	08/05/08	<0.050	<0.050	<0.050	<0.050	
	Semi-Annual	03/12/08	<0.050	<0.050	<0.050	<0.050	
Silver	Semi-Annual	08/11/10	<0.0050	<0.0050	<0.0050	<0.0050	0.05
	Semi-Annual	04/13/10	<0.0050	<0.0050	<0.0050	<0.0050	
	Semi-Annual	08/20/09	<0.0050	<0.0050	<0.0050	<0.0050	
	Semi-Annual	04/13/09	<0.0050	<0.0050	<0.0050	<0.0050	
	Semi-Annual	08/05/08	<0.0050	<0.0050	<0.0050	<0.0050	
	Semi-Annual	03/12/08	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	Semi-Annual	08/11/10	19	19	19	20	
	Semi-Annual	04/13/10	25	25	29	26	
	Semi-Annual	08/20/09	16	11	14	16	
	Semi-Annual	04/13/09	23	22	25	24	
	Semi-Annual	08/05/08	19	19	49	20	
	Semi-Annual	03/12/08	19	21	20	21	

San Juan River Analysis- 2010

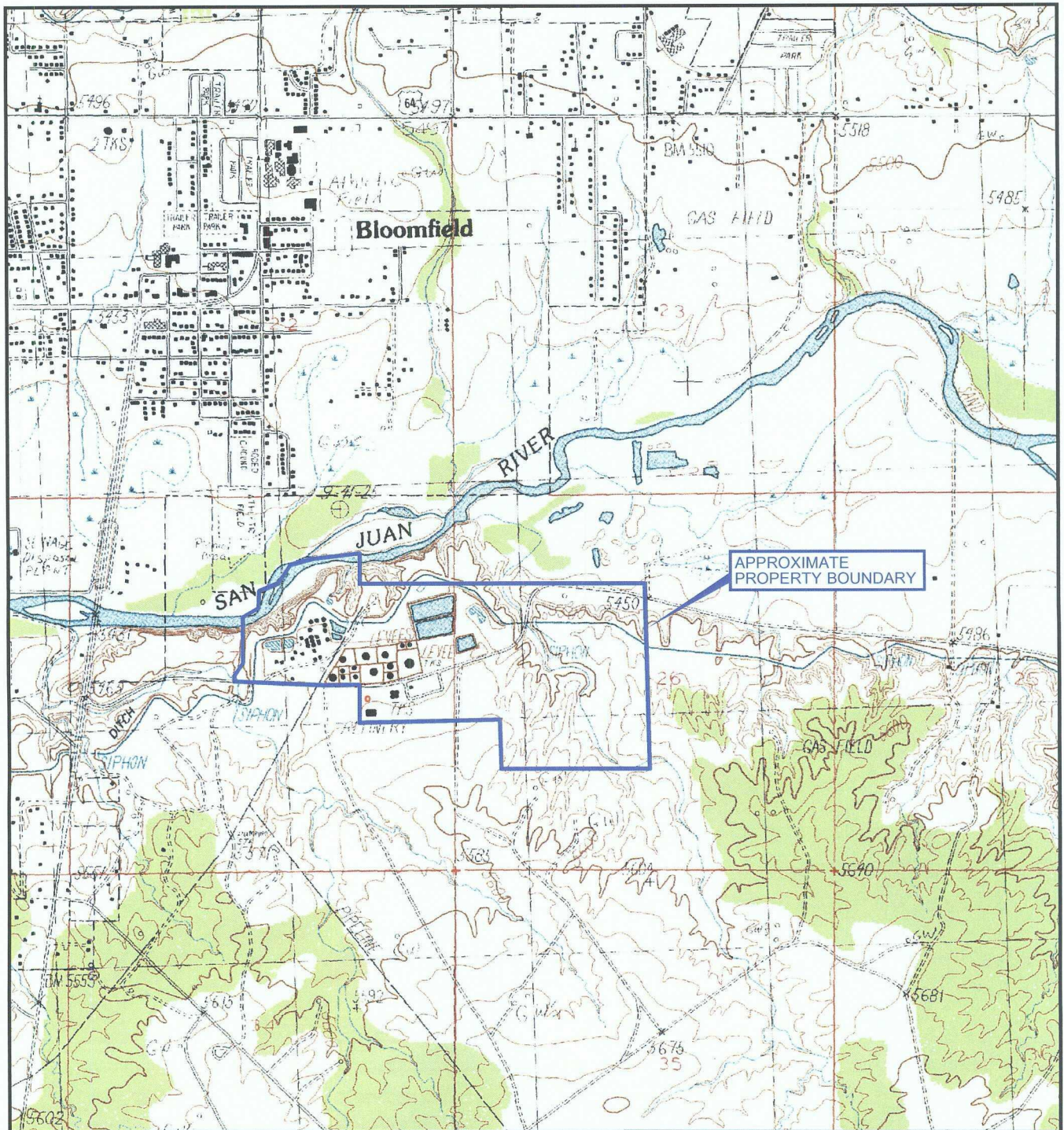
Dissolved Metals

Section 8.0 - Tab 10.0

EPA Method 6010B							WQCC
mg/L	Sampling Event	Date Sampled	North of MW #46	North of MW #45	Upstream of Refinery	Downstream of Refinery	20 NMAC 6.2.3103
Uranium	Semi-Annual	08/11/10	<0.001	<0.001	<0.001	<0.001	0.03
	Semi-Annual	04/13/10	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/20/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	04/13/09	<0.001	<0.001	<0.001	<0.001	
	Semi-Annual	08/05/08	<0.001	<0.00	0.0013	<0.00	
	Semi-Annual	03/12/08	<0.10	<0.10	<0.10	<0.10	
Zinc	Semi-Annual	08/11/10	<0.05	<0.05	<0.05	<0.05	10
	Semi-Annual	04/13/10	<0.05	<0.05	<0.05	<0.05	
	Semi-Annual	08/20/09	<0.05	<0.05	<0.05	<0.05	
	Semi-Annual	04/13/09	0.066	0.052	0.12	0.082	
	Semi-Annual	08/05/08	<0.05	<0.05	<0.05	<0.05	
	Semi-Annual	03/12/08	<0.05	<0.05	<0.05	<0.05	

Section 9.0 Figures

<u>Title</u>	<u>Figure</u>
Vicinity Map.....	Figure 1
Facility Site Plan (11X17).....	Figure 2
Facility Site Plan.....	Figure 3
Groundwater Elevation and Flow Direction – March 10th – 1 st QTR.....	Figure 4
Groundwater Elevation and Flow Direction – March 16th – 1 st QTR.....	Figure 5
Groundwater Elevation and Flow Direction – April 6th – 2 nd QTR.....	Figure 6
Groundwater Elevation and Flow Direction – April 10th – 2 nd QTR.....	Figure 7
Groundwater Elevation and Flow Direction – August 16th – 3 rd QTR.....	Figure 8
Product Thickness Map – March 10th – 1 st QTR.....	Figure 9
Product Thickness Map – April 6th– 2 nd QTR	Figure 10
Product Thickness Map – August 16th – 3 rd QTR.....	Figure 11
BTEX & MTBE Concentration Map – April.....	Figure 12
BTEX & MTBE Concentration Map – August.....	Figure 13
San Juan River Bluff – Seep Identification.....	Figure 14



Map Source: USGS 7.5 Min. Quad Sheet BLOOMFIELD, NM., 1985.



Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 01/06/10 | FILE: WestRef-A25

FIGURE 1
SITE LOCATION MAP
BLOOMFIELD REFINERY



0 2000
SCALE IN FEET



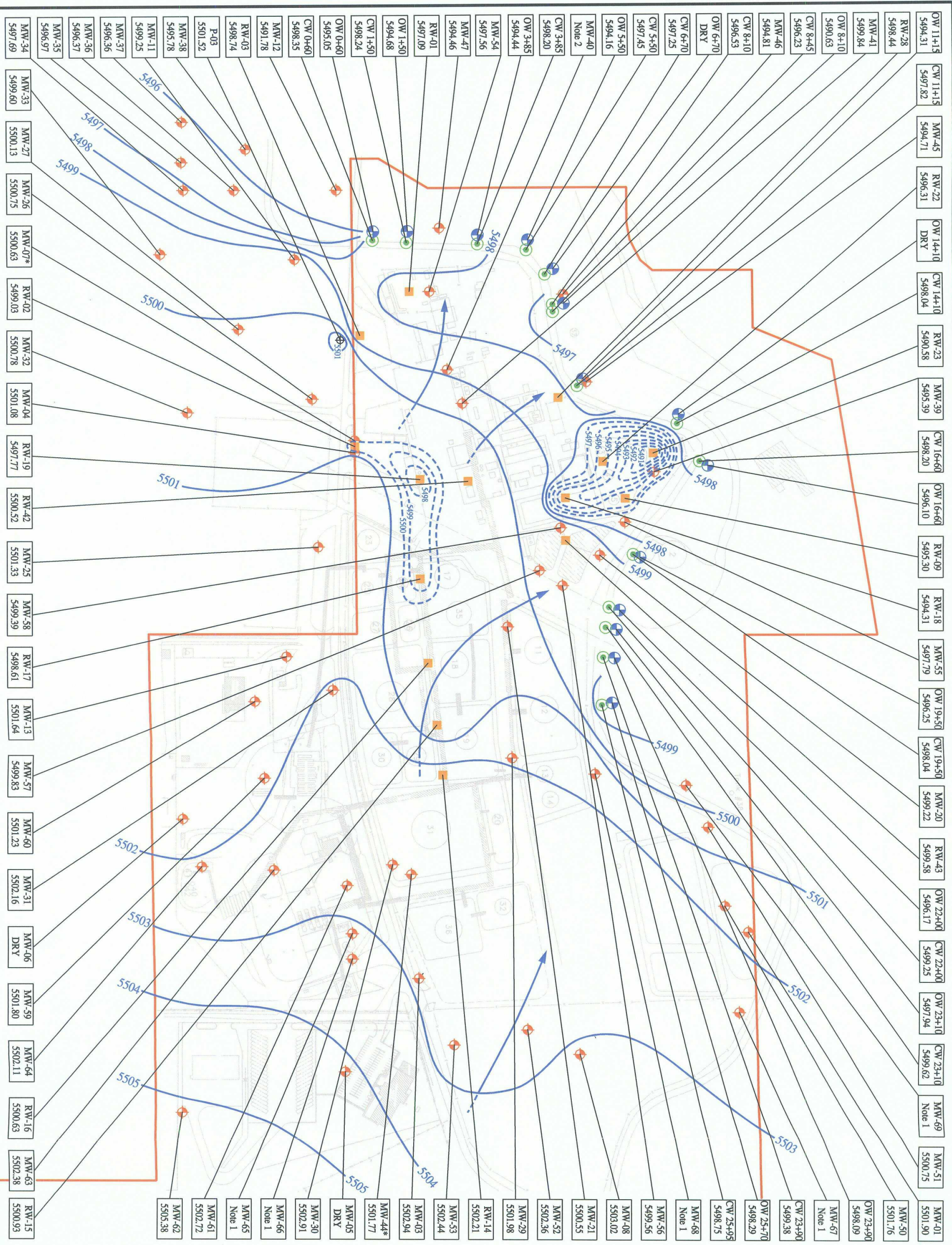
QUADRANGLE LOCATION

WELL LOCATION MAP
JANUARY 2011
BLOOMFIELD REFINERY

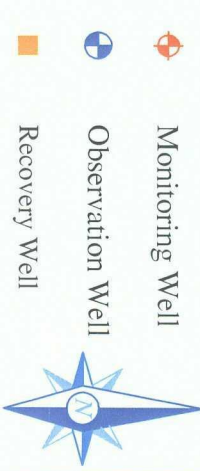


LEGEND

- MW-1 • MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
 - RW-1 • RECOVERY WELL LOCATION AND IDENTIFICATION NUMBER
 - OW • OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
 - CW • COLLECTION WELL LOCATION AND IDENTIFICATION NUMBER
 - SM-1 • SUMP WELL LOCATION AND IDENTIFICATION NUMBER
 - P-2 • PIEZOMETER IDENTIFICATION
- UNDER GROUND PIPE-WAY
 - ABOVE GROUND PIPE-WAY
 - SLURRY BARRIER WALL
 - FORMER TANK LOCATION



Legend



- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- Piezometer
- Seep
- Site
- Approximate Property Line
- Groundwater Elevation Contours
- Inferred Groundwater Elevation
- Groundwater Flow Direction - Dashed where inferred

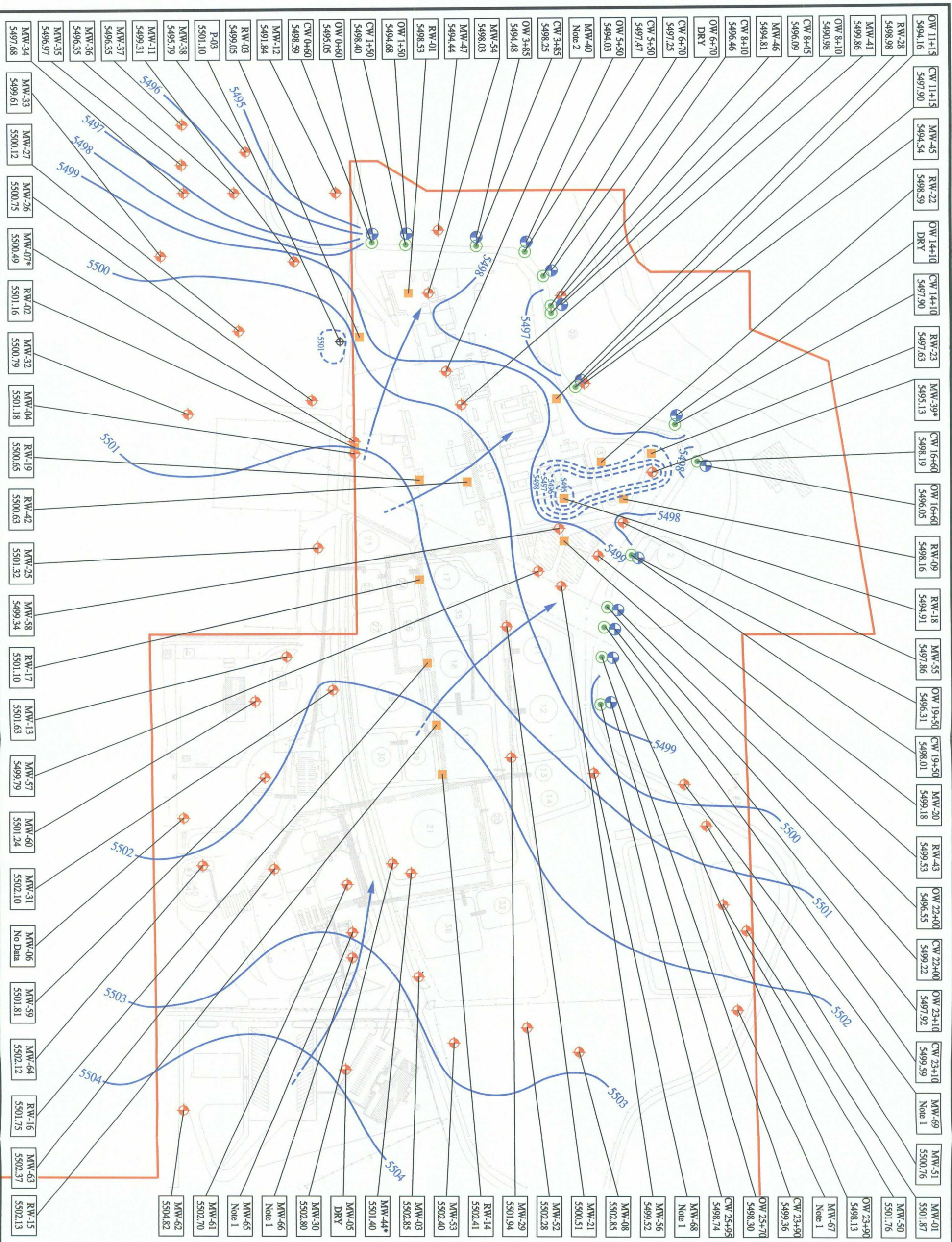
MW-47
5494.46
-Well ID
-Groundwater Elevation (ft amsl)

Notes:
* Deeper Well; data not used to contour.
1. MW-65 thru MW-69 are not part of facility wide monitoring plan.
2. MW-40 could not be located in field.

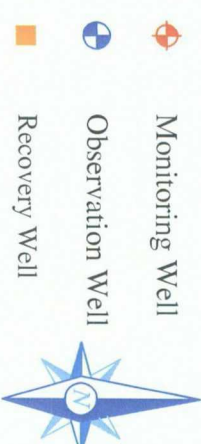
1st Quarter
March 10th
0 125 250 375 500
Feet



Groundwater Elevation and
Flow Direction - March 10th
1st Quarter 2010
Bloomfield Refinery



Legend



- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- Piezometer
- Seep
- Site
- Approximate Property Line
- Groundwater Elevation Contours
- Inferred Groundwater Elevation
- Groundwater Flow Direction - Dashed where inferred
- Well ID
- Groundwater Elevation (ft amsl)

Notes:

- * Deeper Well; data not used to contour.
- 1. MW-65 thru MW-69 are not part of facility wide monitoring plan.
- 2. MW-40 could not be located in field.

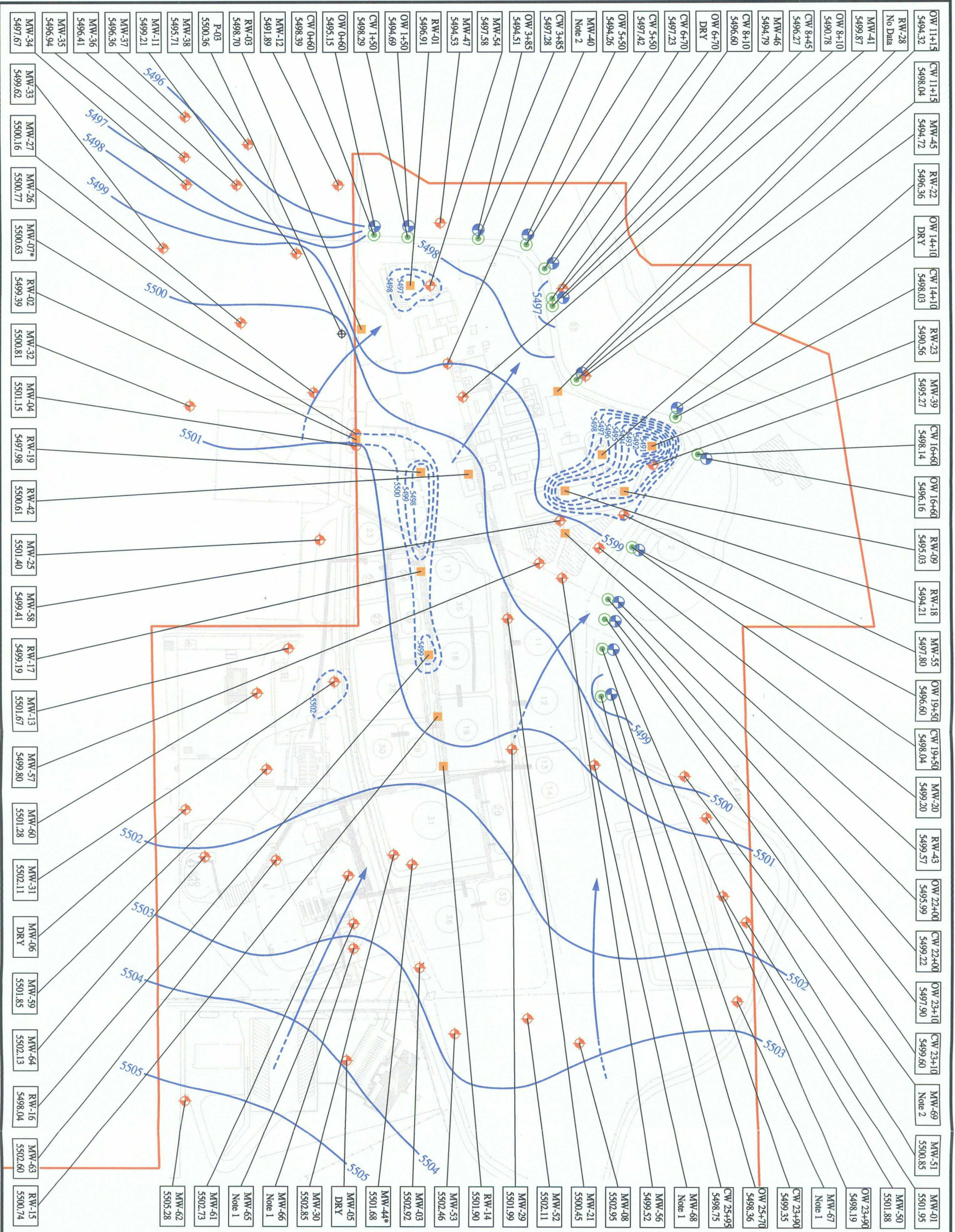
1st Quarter
March 16th



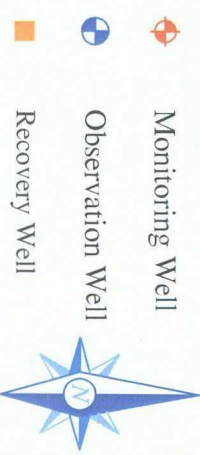
Groundwater Elevation and
Flow Direction - March 16th
1st Quarter 2010
Bloomfield Refinery

March 2011

Figure 5



Legend



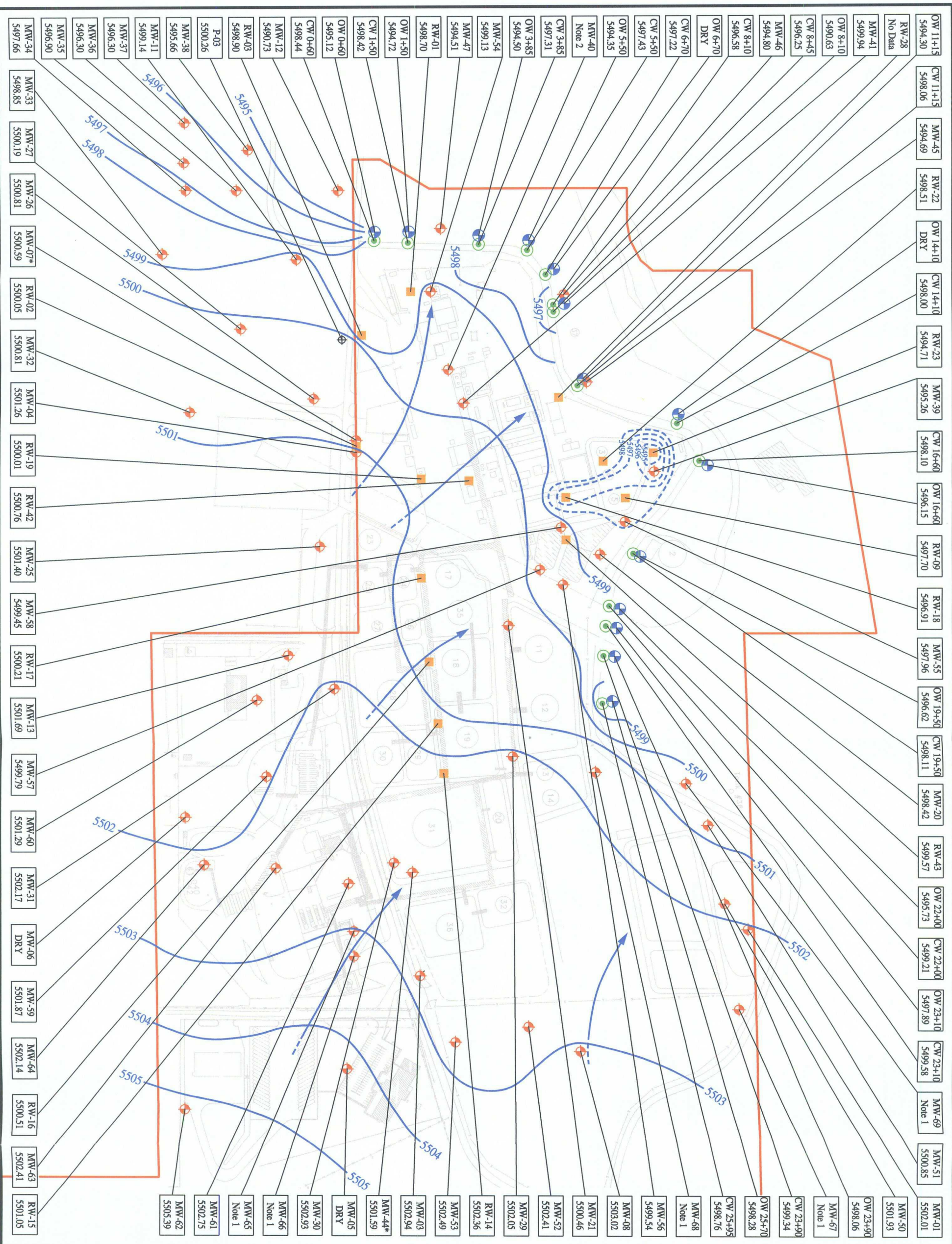
- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- Piezometer
- Seep
- Site
- Approximate Property Line
- Groundwater Elevation Contours
- Inferred Groundwater Elevation
- Groundwater Flow Direction - Dashed where inferred
- Well ID
- Groundwater Elevation (ft amsl)

Notes:
* Deeper Well; data not used to contour.
1. MW-65 thru MW-69 are not part of facility wide monitoring plan.
2. MW-40 could not be located in field.

2nd Quarter
April 6th



Groundwater Elevation and
Flow Direction - April 6th
2nd Quarter 2010
Bloomfield Refinery



Legend

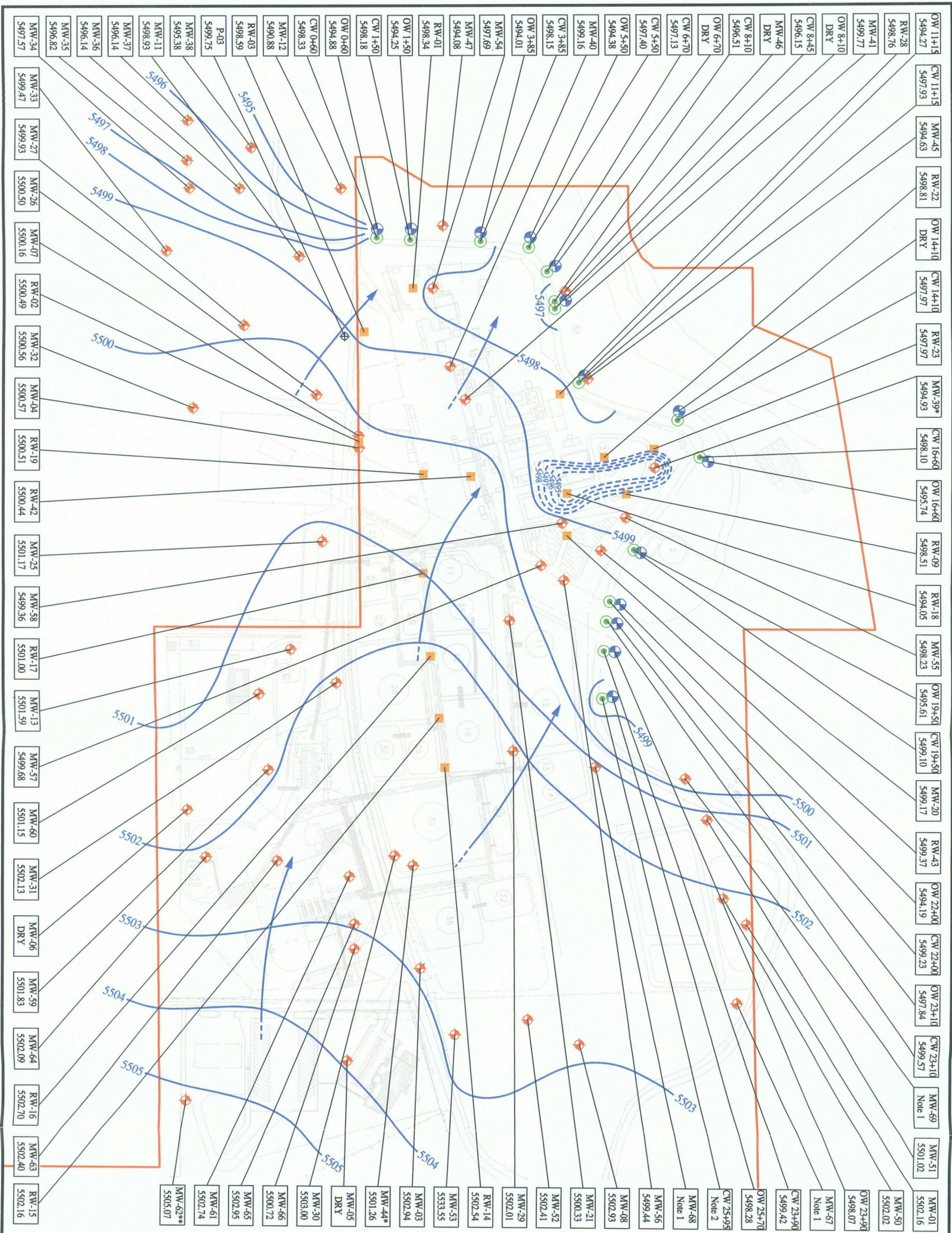
- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- Piezometer
- Seep
- Site
- Approximate Property Line
- Groundwater Elevation Contours
- Inferred Groundwater Elevation
- Groundwater Flow Direction - Dashed where inferred
- Well ID
- Groundwater Elevation (ft amsl)

Notes:
* Deeper Well; data not used to contour.
1. MW-65 thru MW-69 are not part of facility wide monitoring plan.
2. MW-40 could not be located in field.

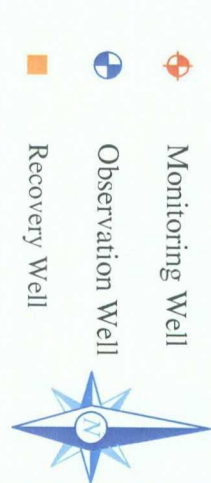
2nd Quarter
April 12th



Groundwater Elevation and
Flow Direction - April 12th
2nd Quarter 2010
Bloomfield Refinery



Legend



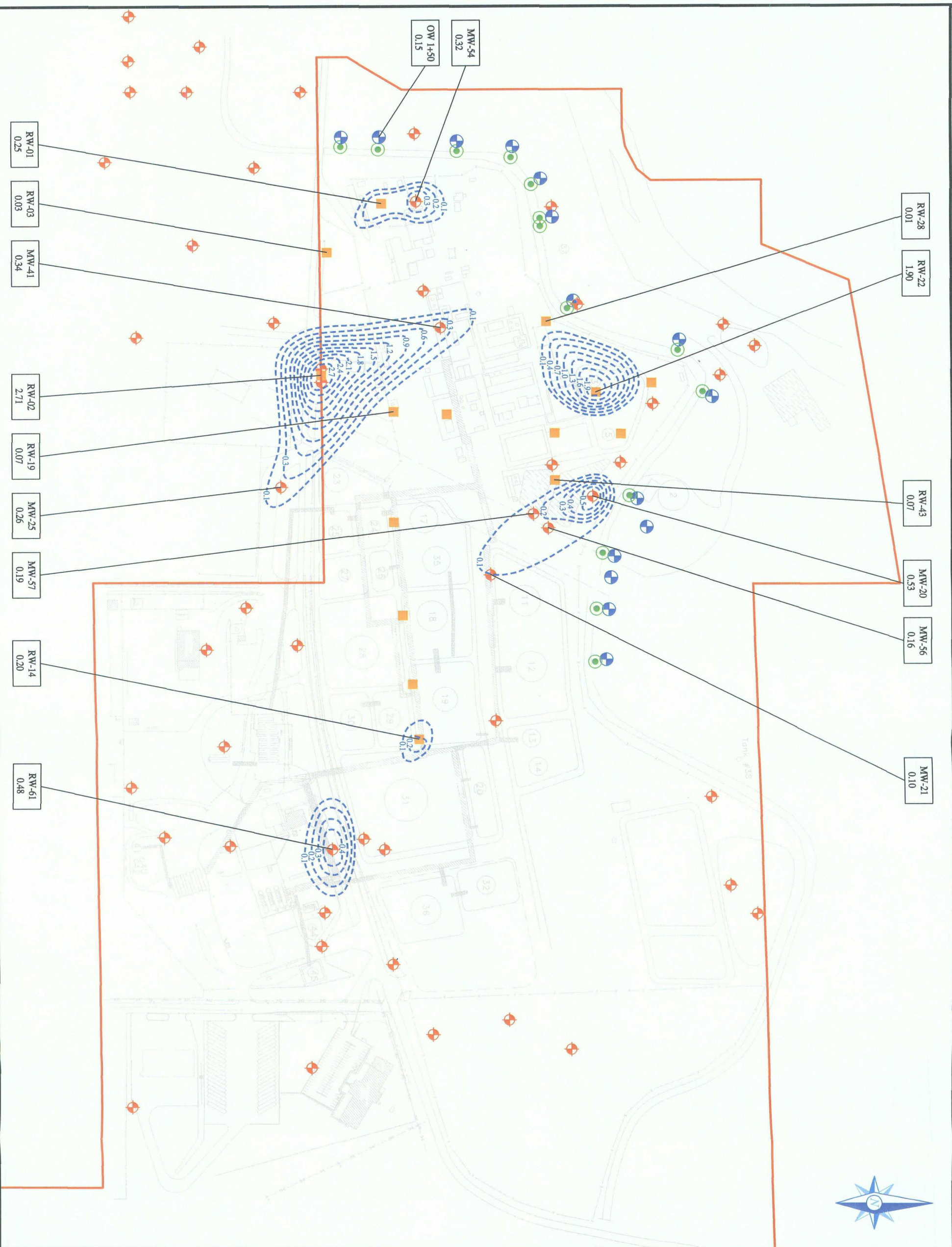
Notes:
* Deeper Well; data not used to contour.
** Well data questionable, will re-survey.
1. MW-67 thru MW-69 are not part of facility wide monitoring plan.
2. CW-25+95 is being used for recovery service, no measurements taken.

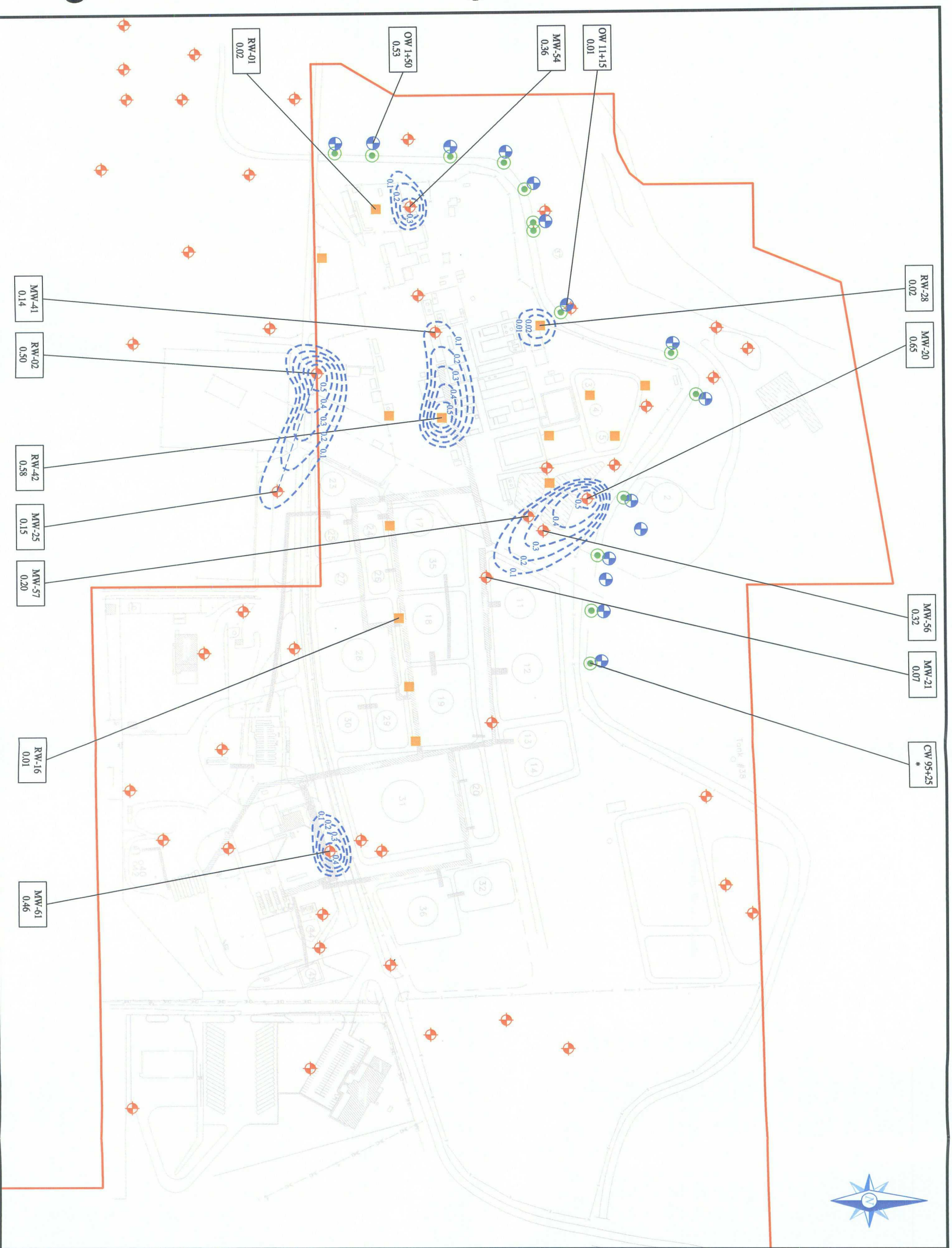
3rd Quarter

August 16th



Groundwater Elevation and
Flow Direction - August 16th
3rd Quarter 2010
Bloomfield Refinery





Legend

- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- August 2009 Product Thickness
- Site
- Approximate Property Line

MW-21
0.14
-Well ID
-Product Thickness (feet)

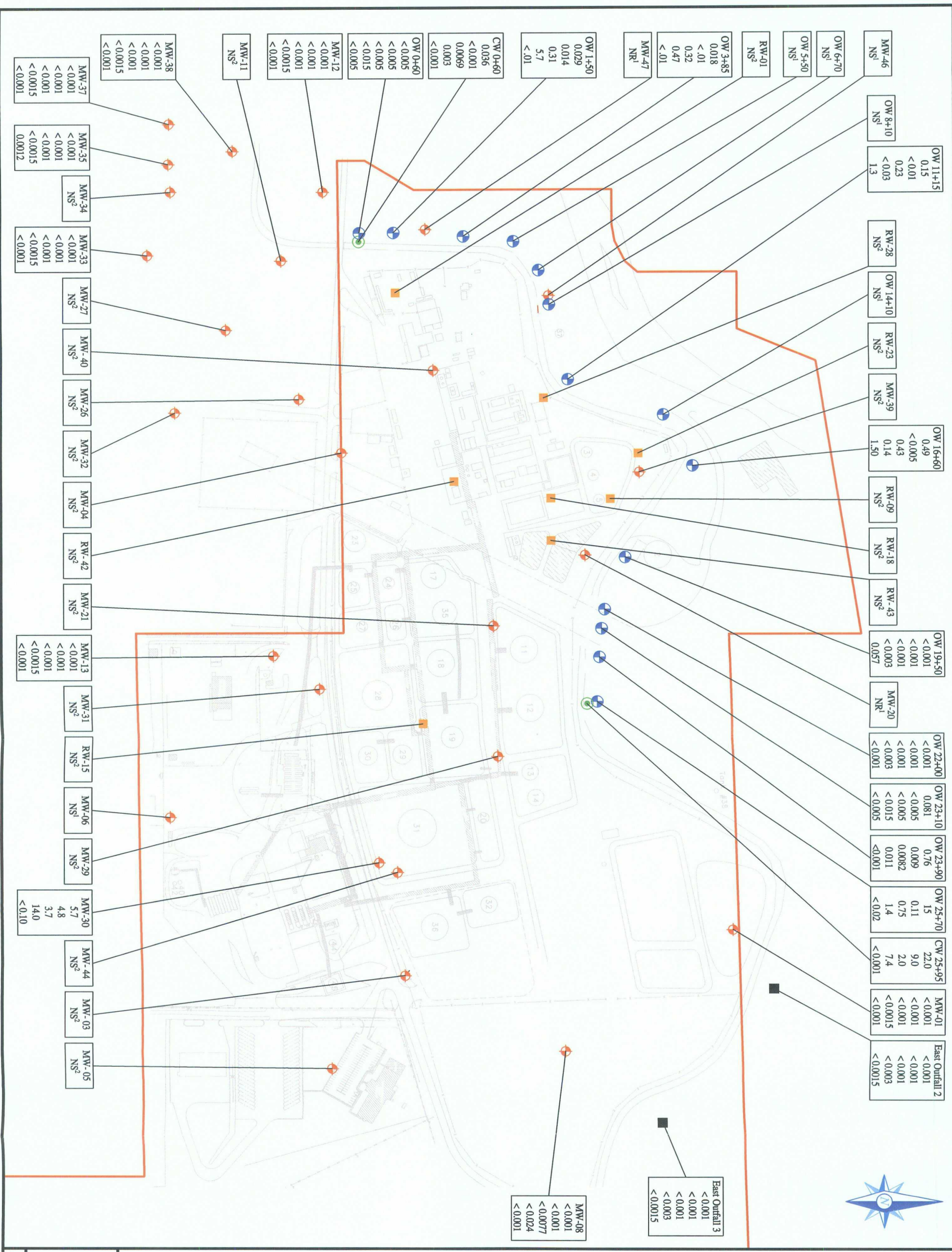
Note:
Free product measured in observation wells located outside the barrier wall were not contoured.

* Well is in Recovery Service
No Measurement

3rd Qtr
2010



Product Thickness Map
August 16th - 3rd Quarter
Bloomfield Refinery



Legend

- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- Outfall
- Site
- Approximate Property Line

MW-38	-Well ID
<0.001	-Benzene
<0.001	-Toluene
<0.001	-Ethylbenzene
<0.0015	-Xylenes, Total
0.002	-MTBE

Notes:

All concentrations in milligrams per liter (mg/L)

NS¹ = Well is Dry or Not Enough Water to Sample- No sample

NS² = Not sampled due to approved Facility-wide Monitoring Plan.

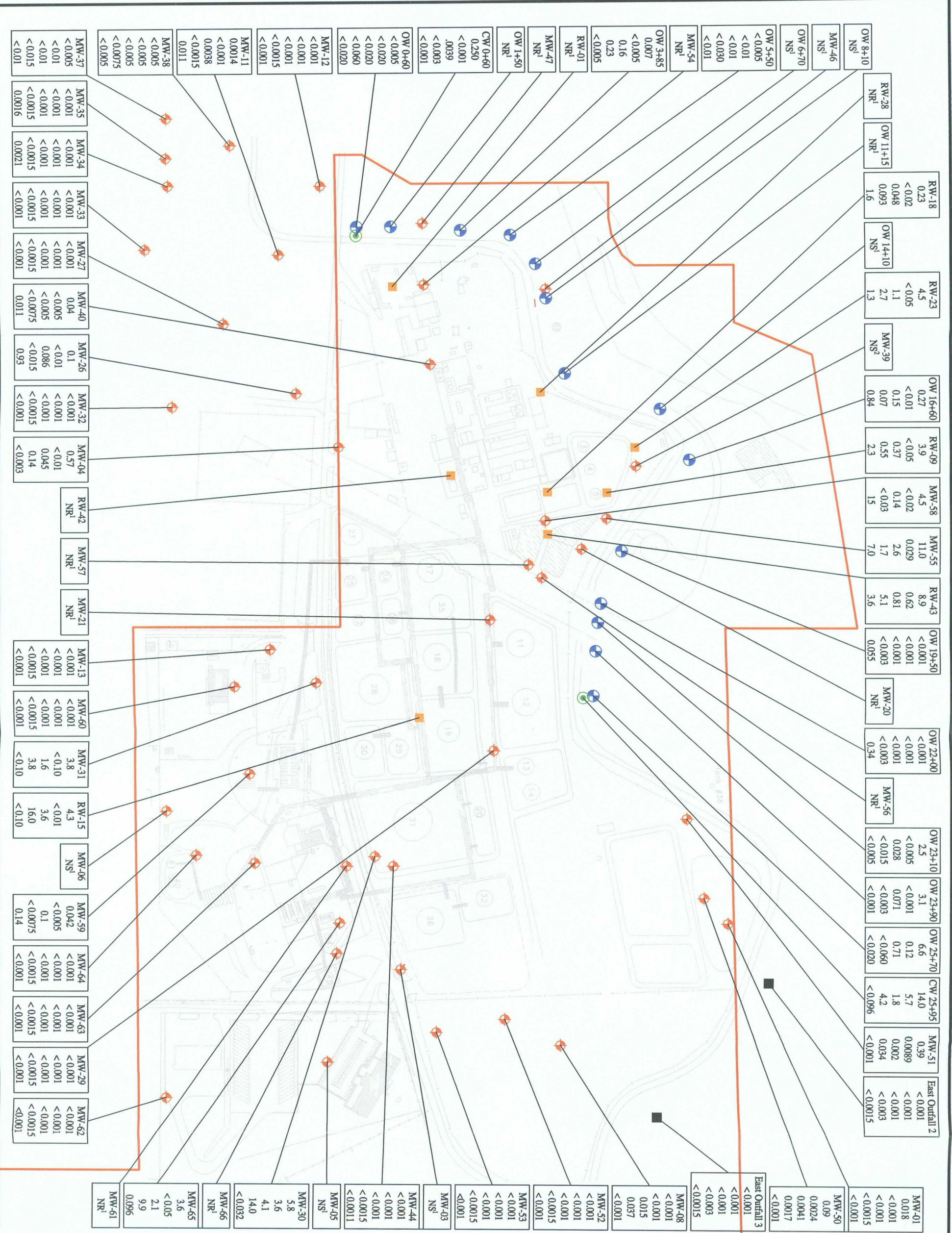
NS³ = Sample Inadvertently not Collected this Sampling Event.

NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED Conditions



BTEX and MTBE
Concentration Map - April 2010
Bloomfield Refinery



Legend

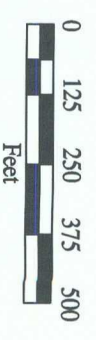
- Monitoring Well
- Observation Well
- Recovery Well
- Collection Well
- Outfall
- Site
- Approximate Property Line

MW-38
-Well ID
<0.005
-Benzene
<0.005
-Toluene
<0.005
-Ethylbenzene
<0.0075
-Xylenes, Total
0.005
-MTBE

Notes:

All concentrations in
milligrams per liter (mg/L)

- NS¹ = Well is Dry or Not Enough
Water to Sample- No sample
Collected this Sampling Event.
- NS² = Sample Inadvertently not
Collected this Sampling Event.
- NR¹ = No Sample Required - Well
Contains Separate Phase
Hydrocarbon
- NR² = No Sample Required per OCD
and NMED Conditions



BTEX and MTBE
Concentration Map - August 2010
Bloomfield Refinery

San Juan River Bluff – Seep Identification

Seeps are Designated by Numbers 1- 9

Figure 14



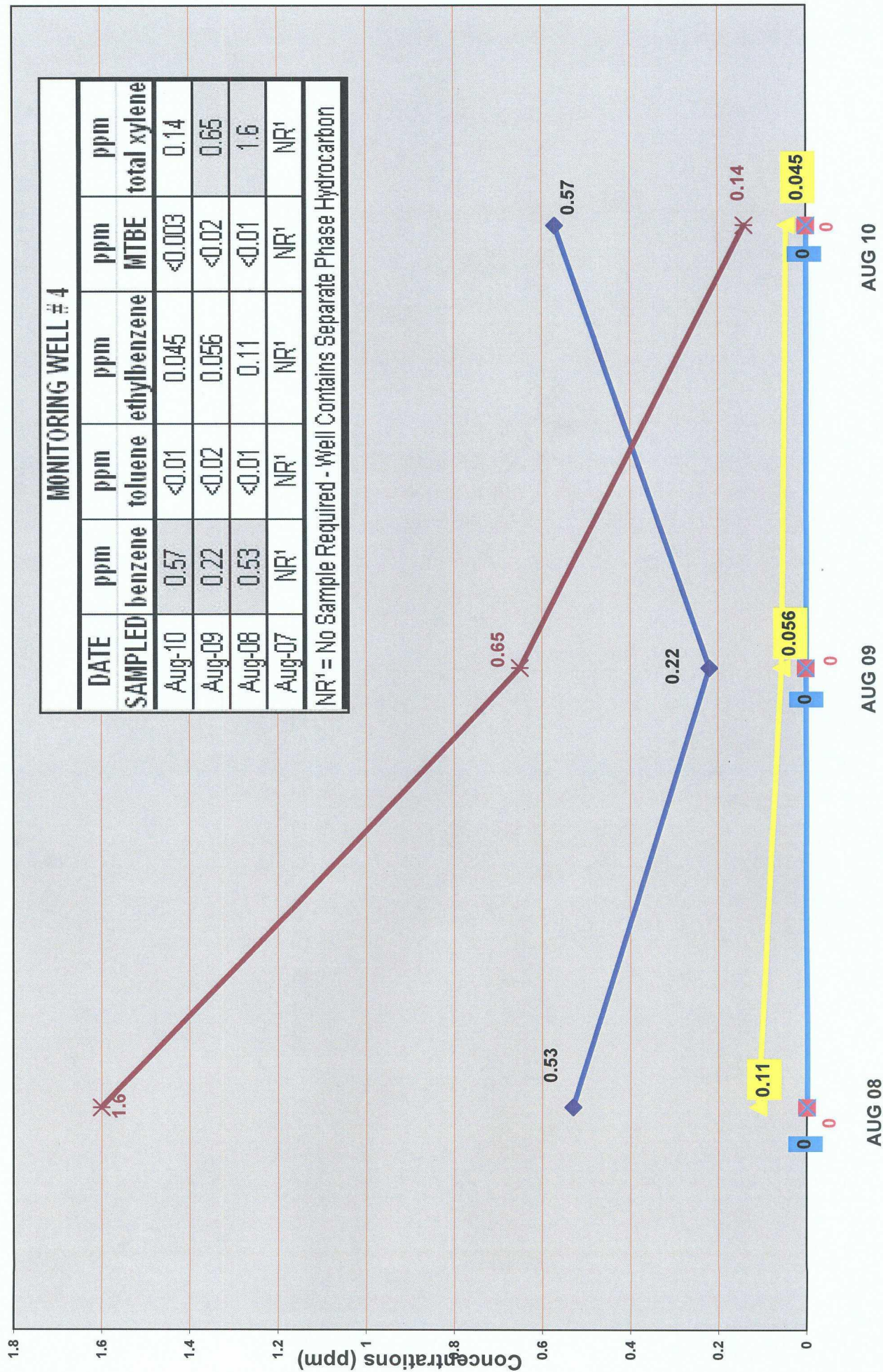
Section 10.0 BTEX & MTBE Concentration vs Time

<u>Title</u>	<u>Tab</u>
Refinery Wells.....	11
Cross-gradient Wells.....	12
Downgradient Wells.....	13
San Juan River Bluff.....	14

Monitoring Well #4

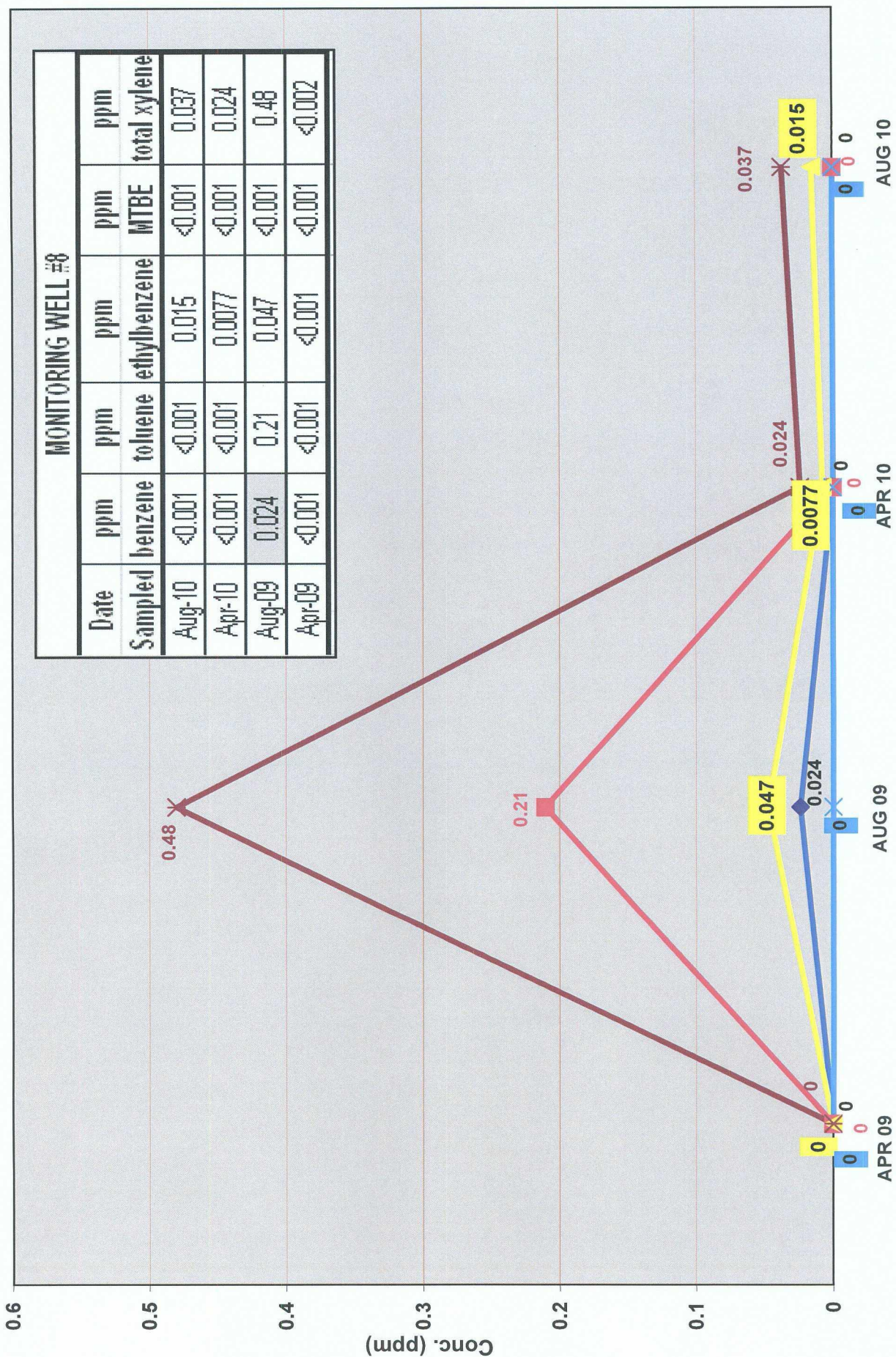
Section 10.0 - Tab 11.0

◆ Benzene
 ■ Toluene
 ▲ Ethylbenzene
 ✱ MTBE
 ✱ Total Xylene



Monitoring Well #8

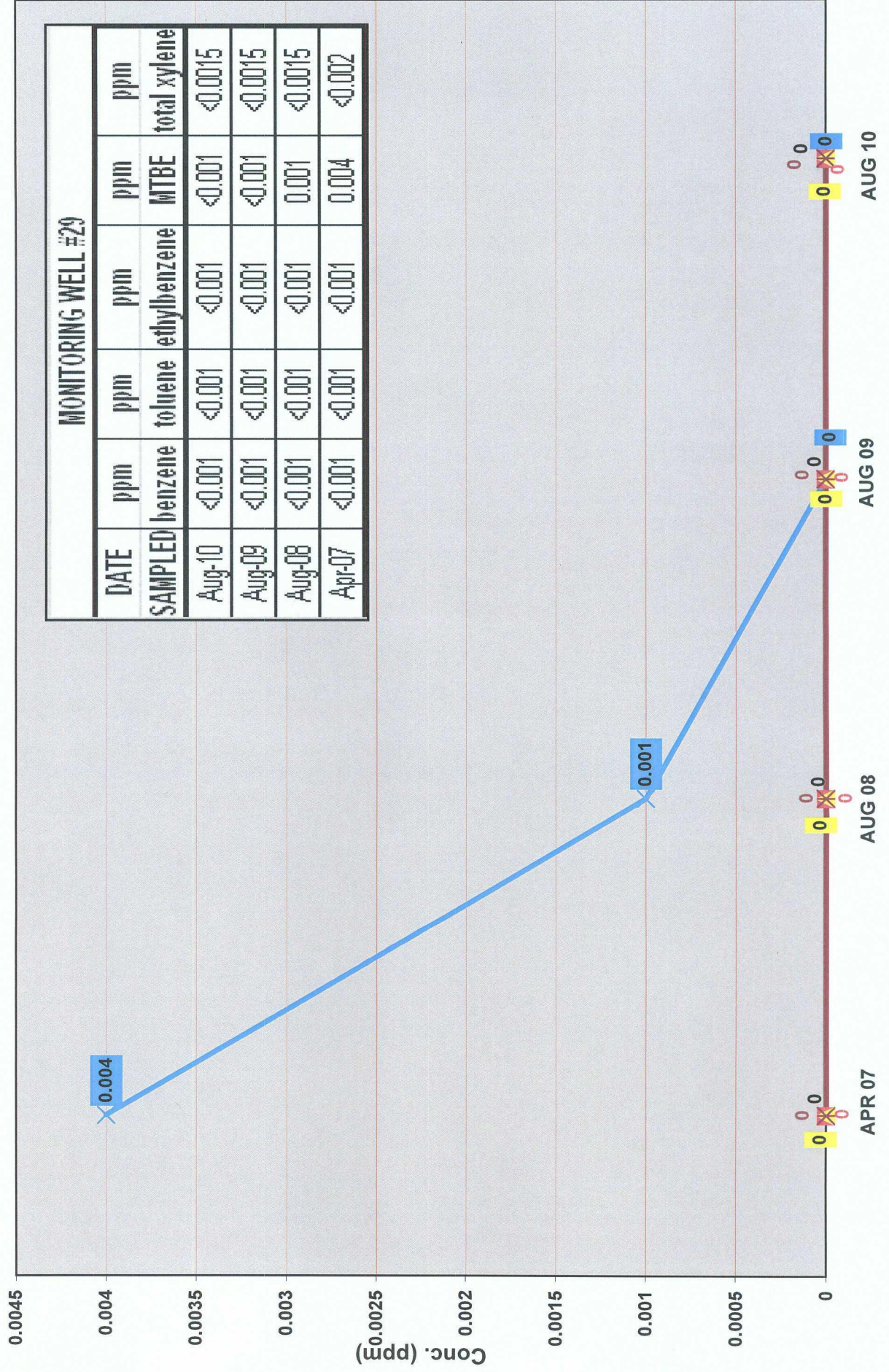
Section 10.0 - Tab 11.0



MONITORING WELL #8						
Date	ppm	benzene	toluene	ethylbenzene	ppm	ppm
Sampled						total xylene
Aug-10	<0.001	<0.001	<0.001	0.015	<0.001	0.037
Apr-10	<0.001	<0.001	<0.001	0.0077	<0.001	0.024
Aug-09	0.024	0.024	0.21	0.047	<0.001	0.48
Apr-09	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002

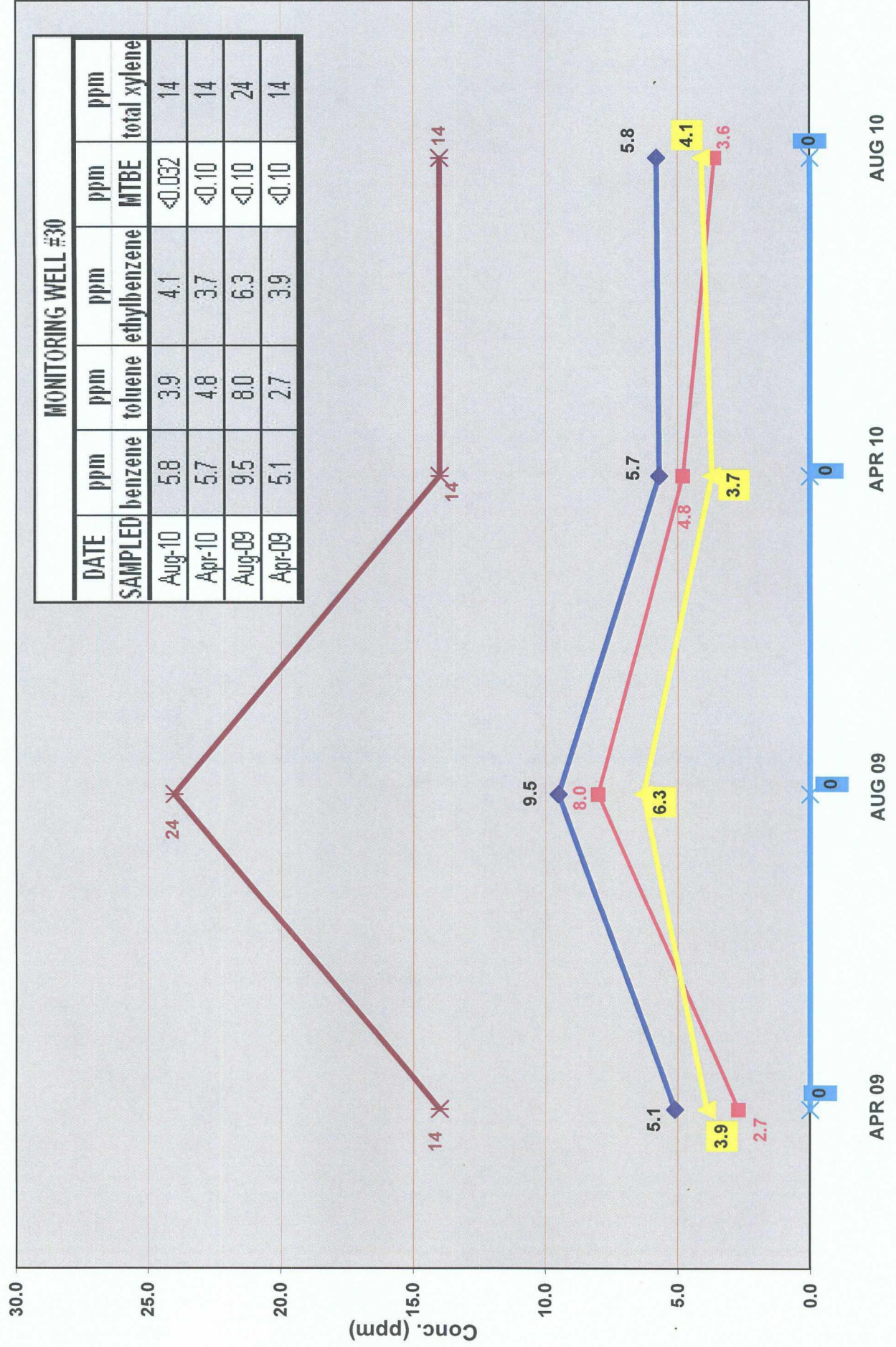
Monitoring Well #29

Section 10.0 - Tab 11.0

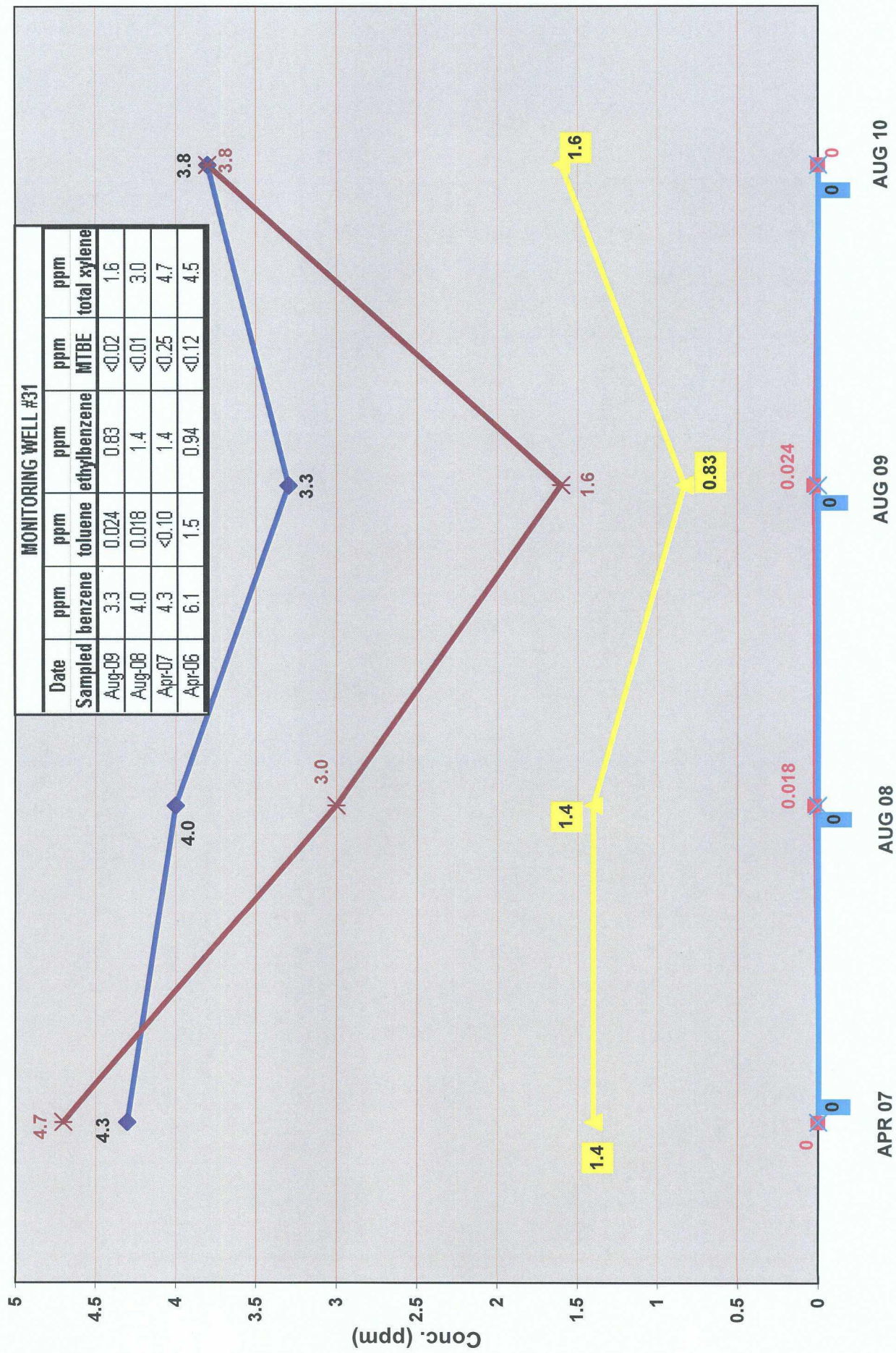


Monitoring Well #30

Section 10.0 - Tab 11.0

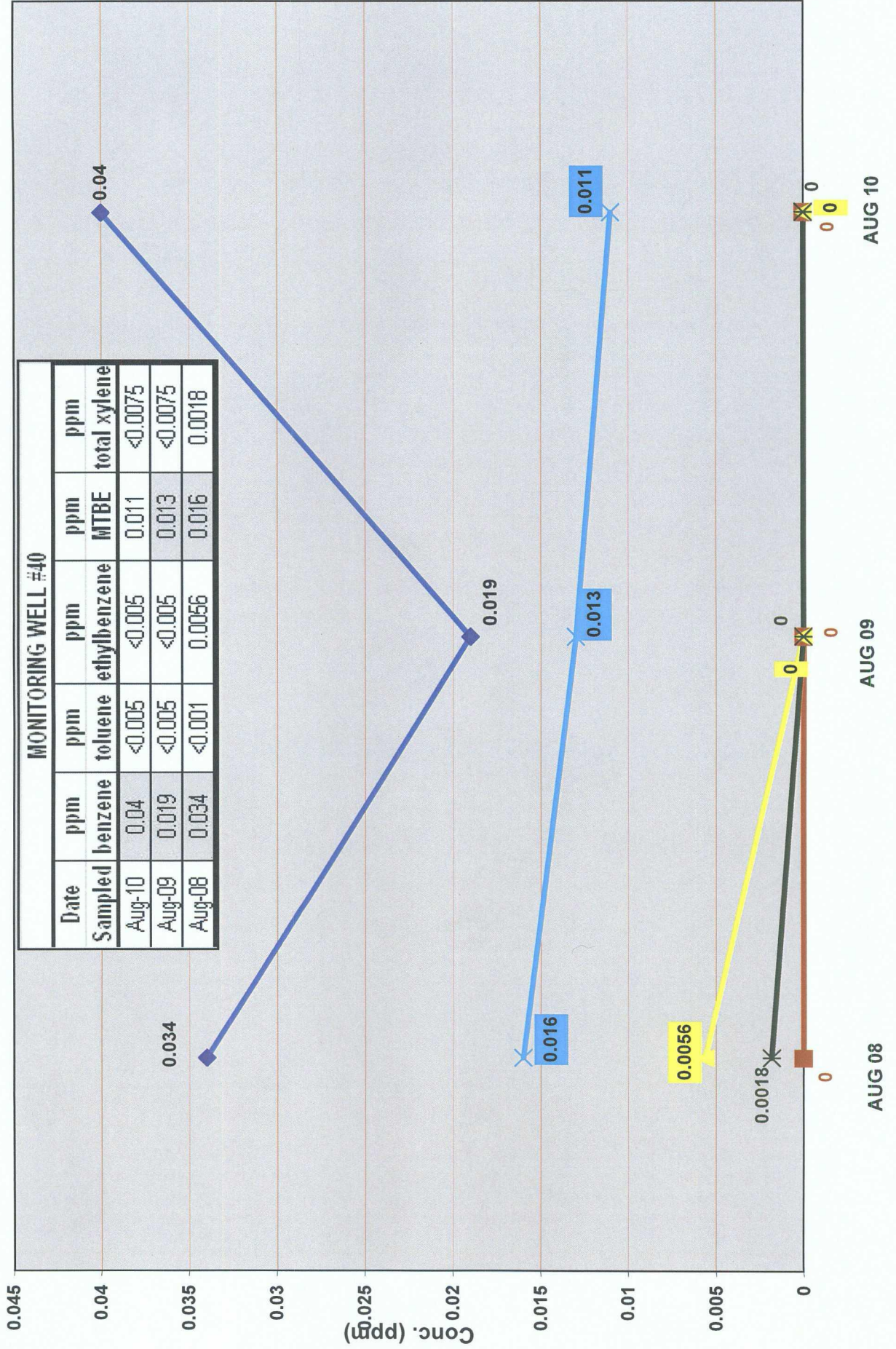


Monitoring Well #31



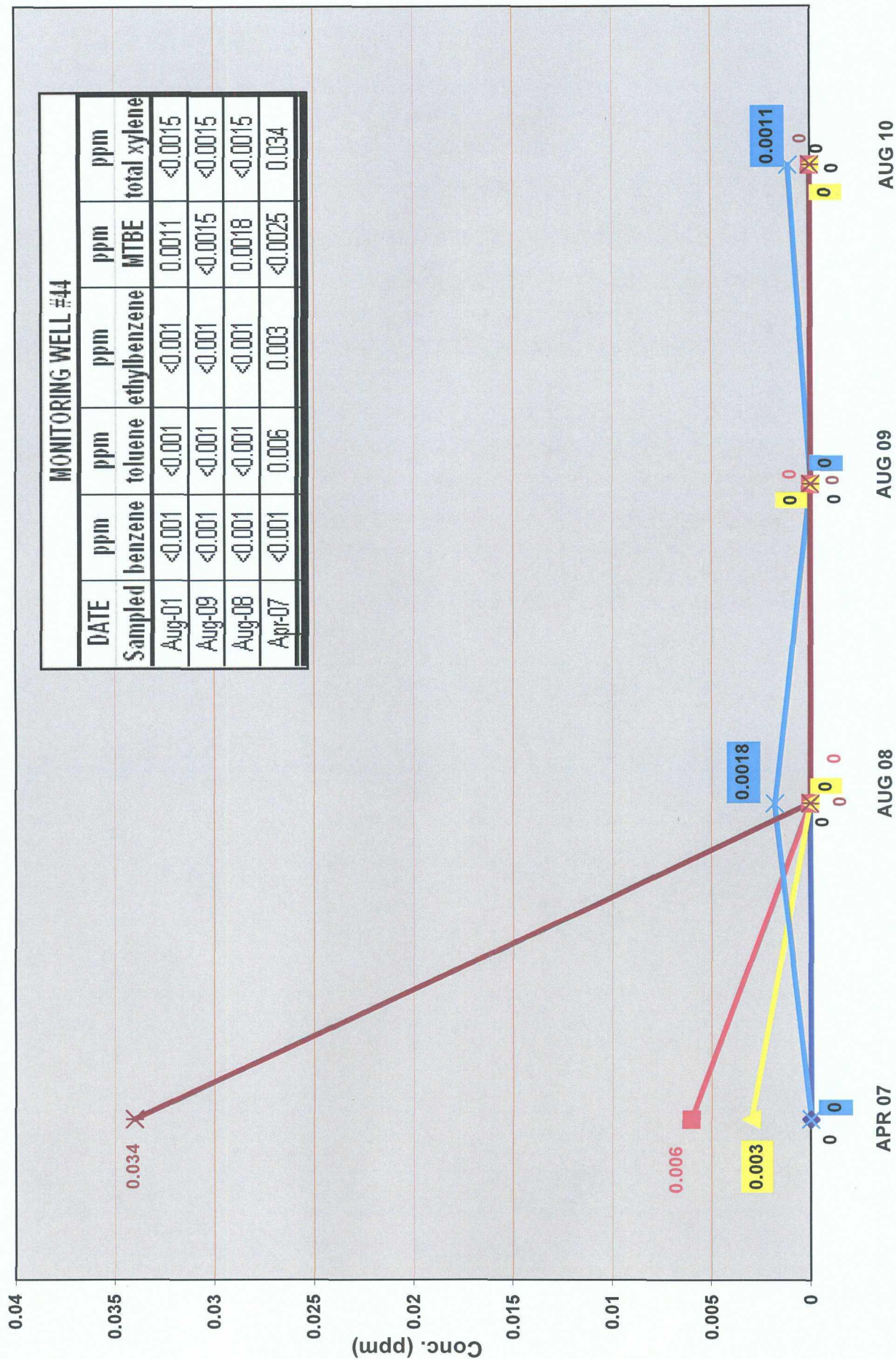
MONITORING WELL #31						
Date	benzene	toluene	ethylbenzene	ppm	ppm	ppm
Aug-09	3.3	0.024	0.83	<0.02	1.6	1.6
Aug-08	4.0	0.018	1.4	<0.01	3.0	3.0
Apr-07	4.3	<0.10	1.4	<0.25	4.7	4.7
Apr-06	6.1	1.5	0.94	<0.12	4.5	4.5

Monitoring Well #40



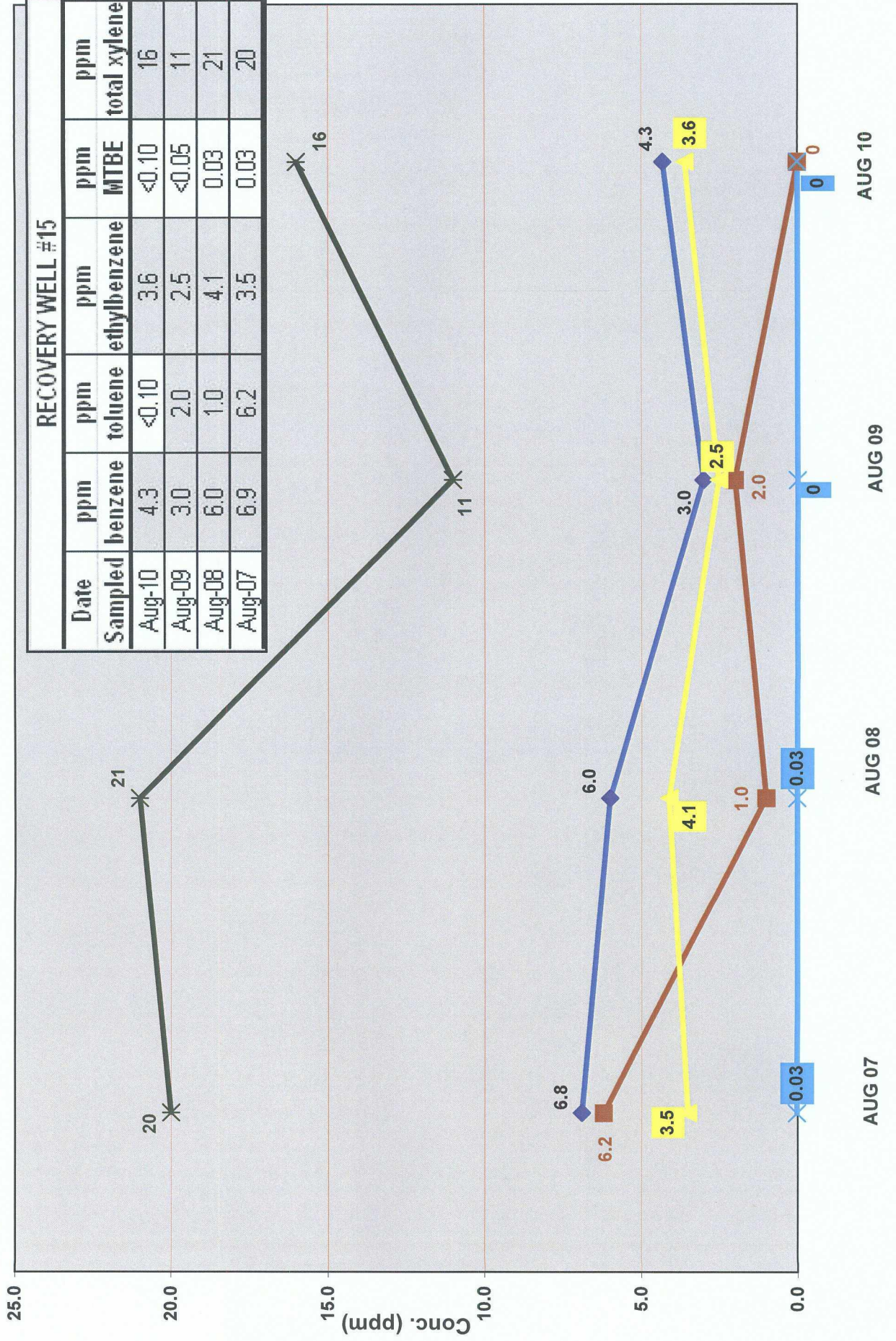
Monitoring Well #44

Section 10.0 - Tab 11.0



Recovery Well #15

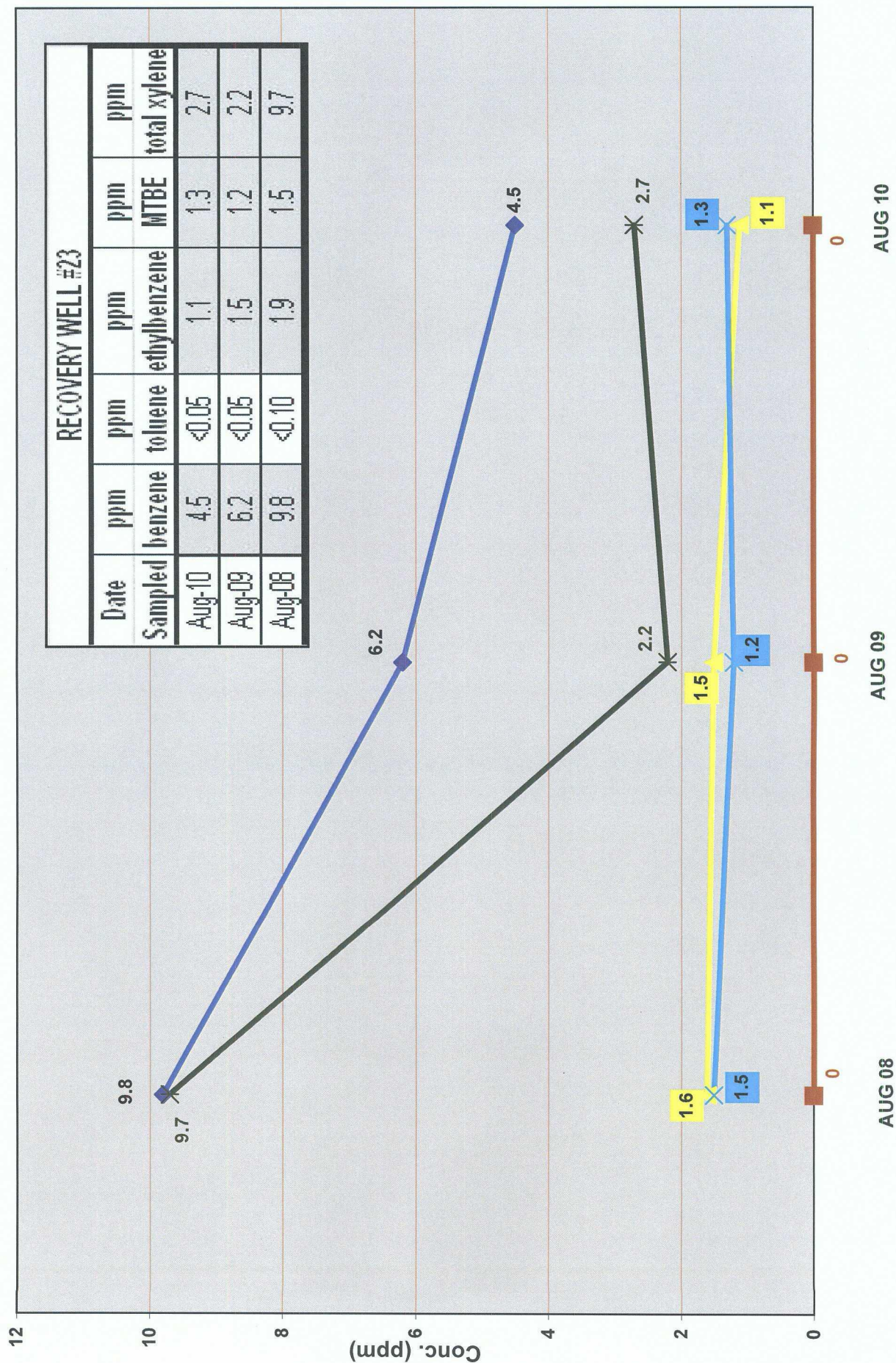
Section 10.0 - Tab 11.0



RECOVERY WELL #15						
Date	benzene	toluene	ethylbenzene	MTBE	total xylene	ppm
Aug-10	4.3	<0.10	3.6	<0.10	16	ppm
Aug-09	3.0	2.0	2.5	<0.05	11	ppm
Aug-08	6.0	1.0	4.1	0.03	21	ppm
Aug-07	6.9	6.2	3.5	0.03	20	ppm

Recovery Well #23

Section 10.0 - Tab 11.0



RECOVERY WELL #23						
Date	ppm	ppm	ppm	ppm	ppm	ppm
Sampled	benzene	toluene	ethylbenzene	MTBE	total xylene	
Aug-10	4.5	<0.05	1.1	1.3	2.7	
Aug-09	6.2	<0.05	1.5	1.2	2.2	
Aug-08	9.8	<0.10	1.9	1.5	9.7	

Monitoring Well #1

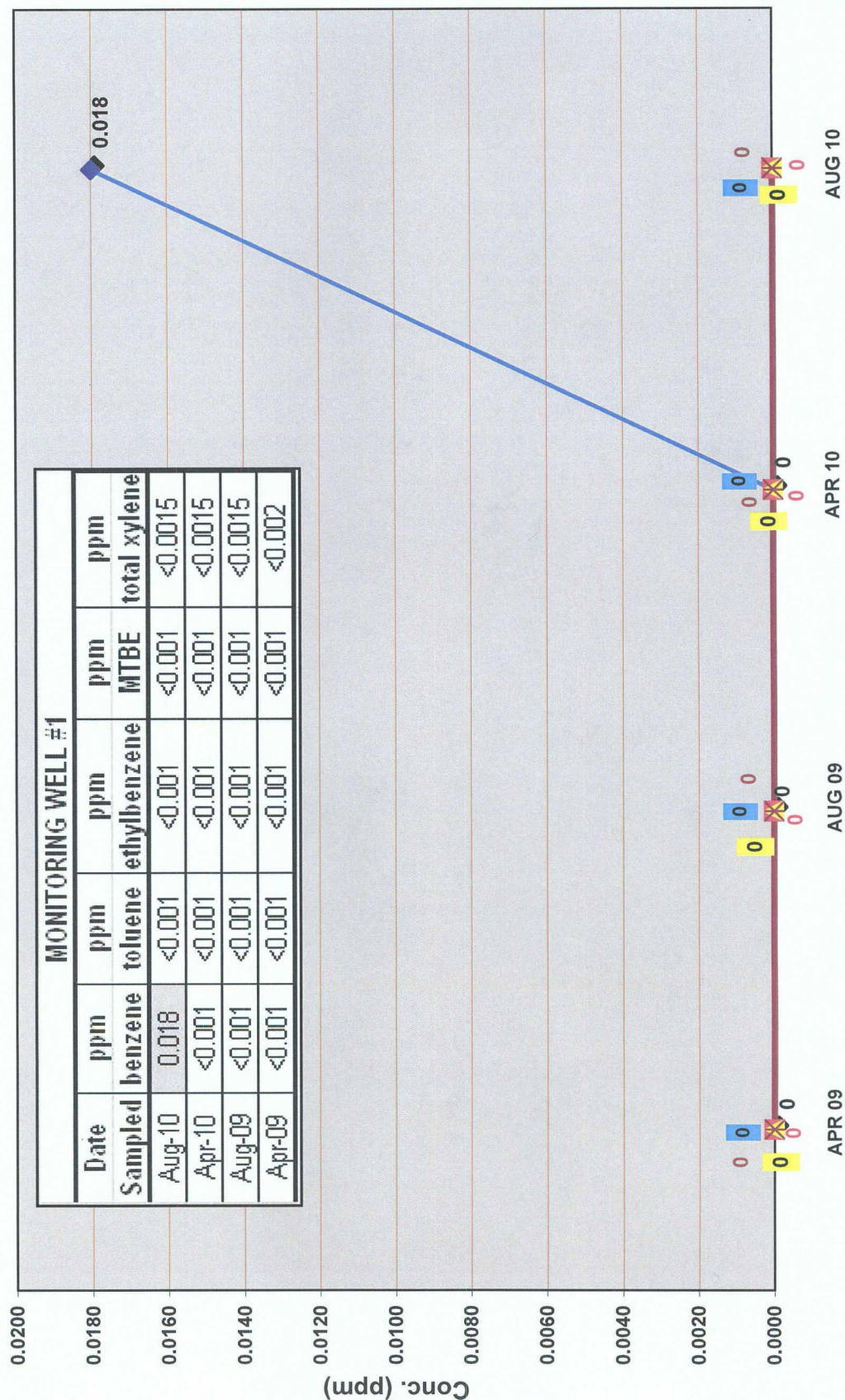
◆ Benzene

✱ Toluene

✱ Ethylbenzene

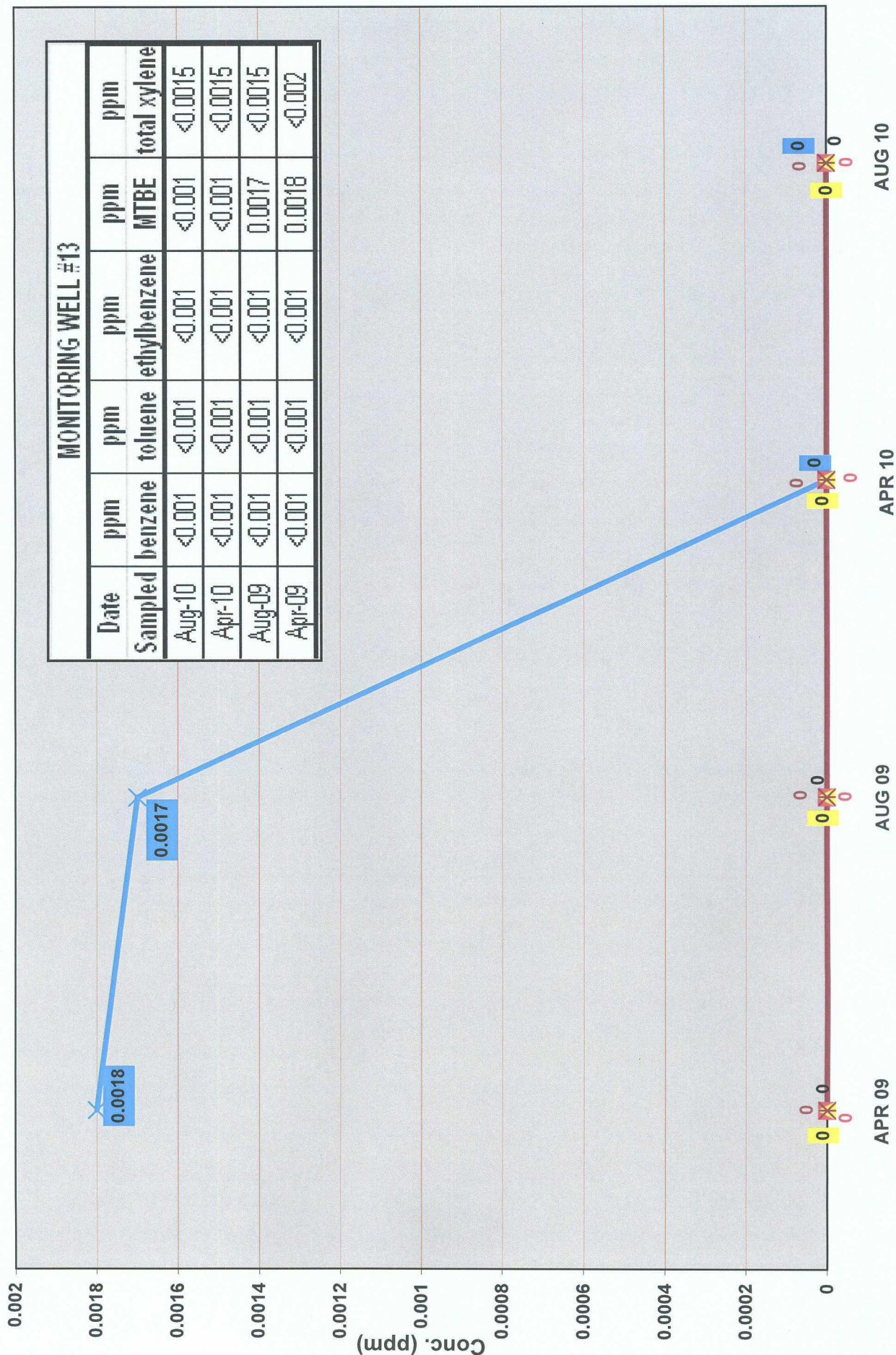
✱ MTBE

✱ Total Xylene



Monitoring Well #13

Section 10.0 - Tab 12.0

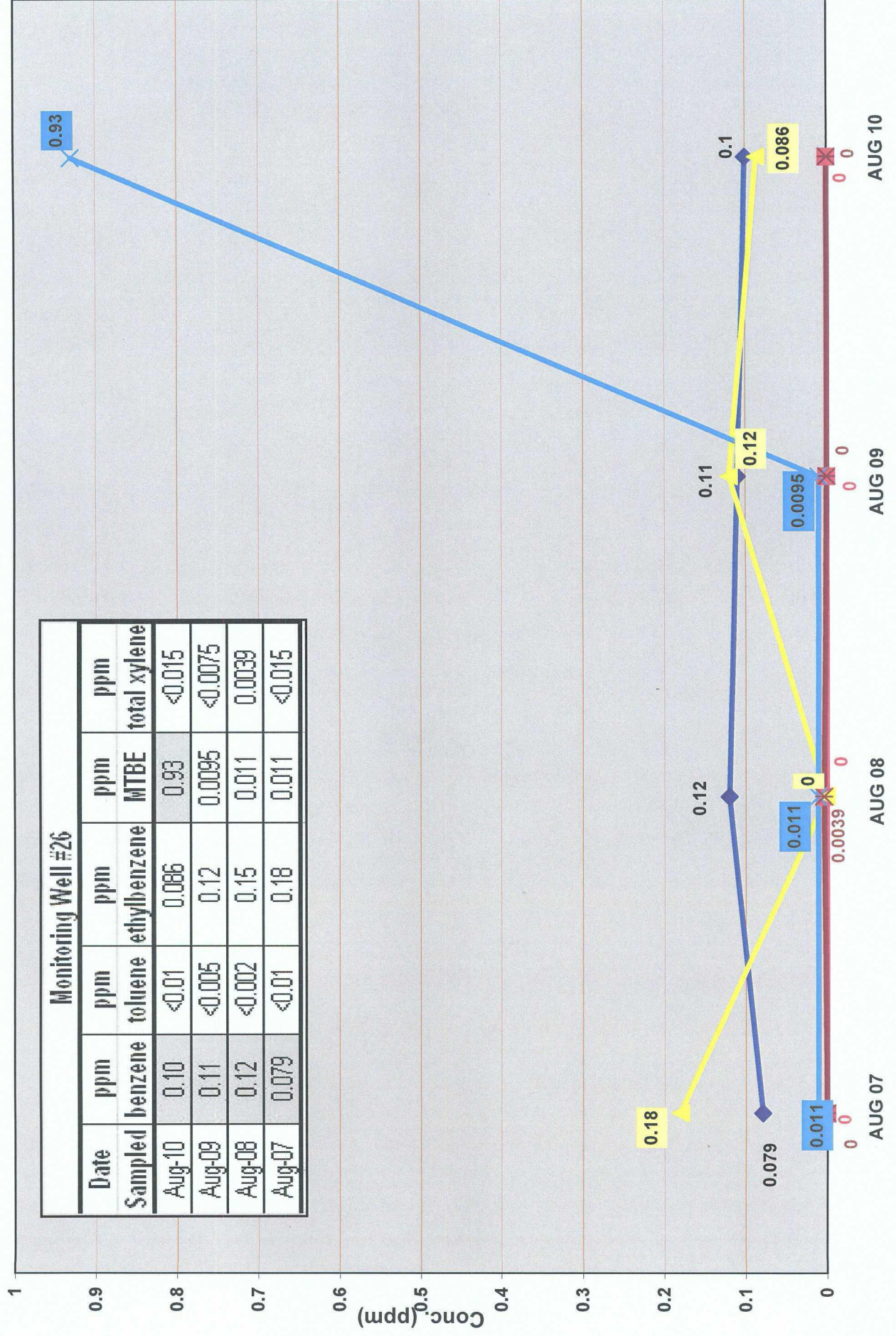


Monitoring Well #26

Section 10.0 - Tab 12.0



Monitoring Well #26					
Date	ppm	ppm	ppm	ppm	ppm
Sampled	benzene	toluene	ethylbenzene	MTBE	total xylene
Aug-10	0.10	<0.01	0.086	0.93	<0.015
Aug-09	0.11	<0.005	0.12	0.0095	<0.0075
Aug-08	0.12	<0.002	0.15	0.011	0.0039
Aug-07	0.079	<0.01	0.18	0.011	<0.015

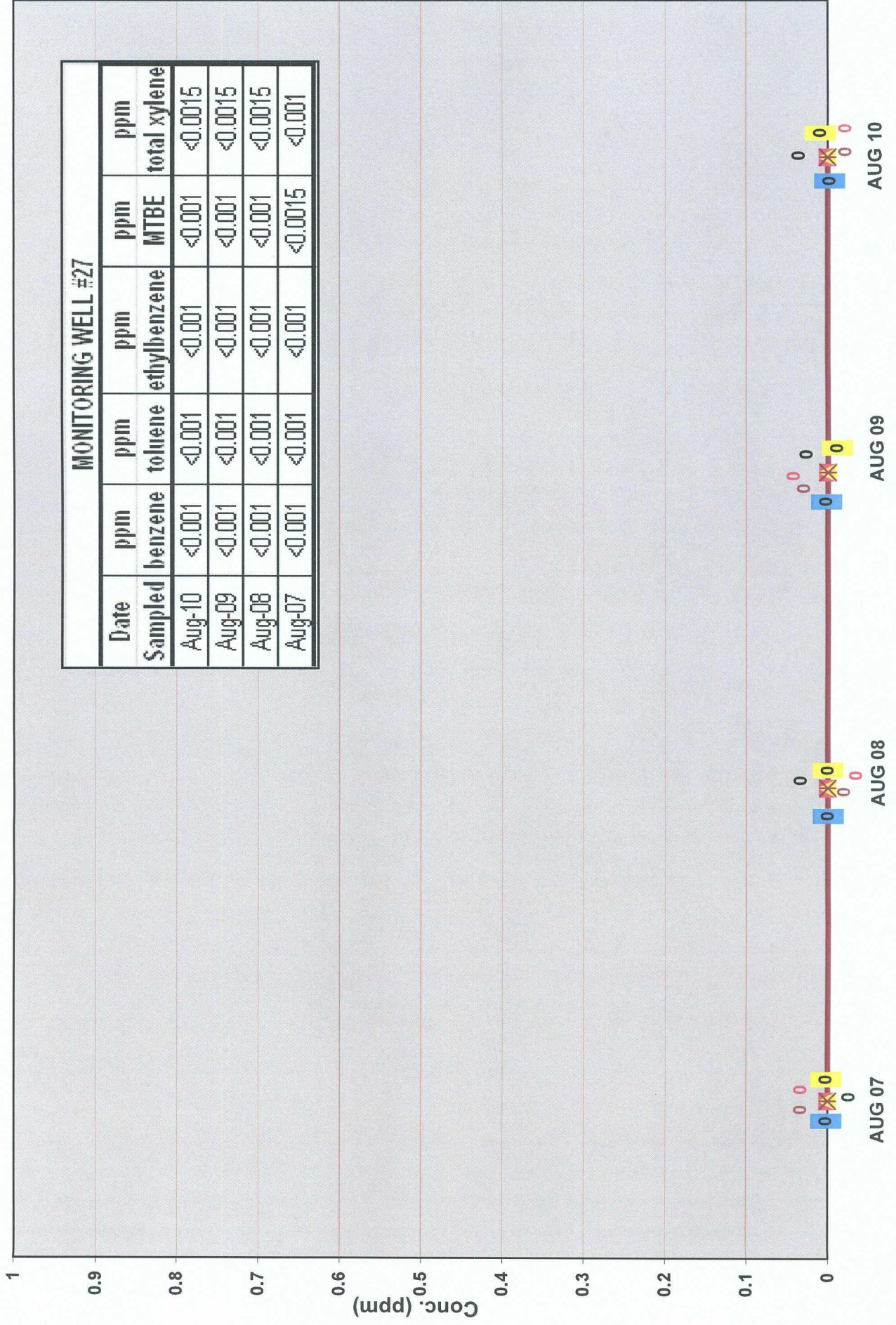


Monitoring Well #27

Section 10.0 - Tab 12.0

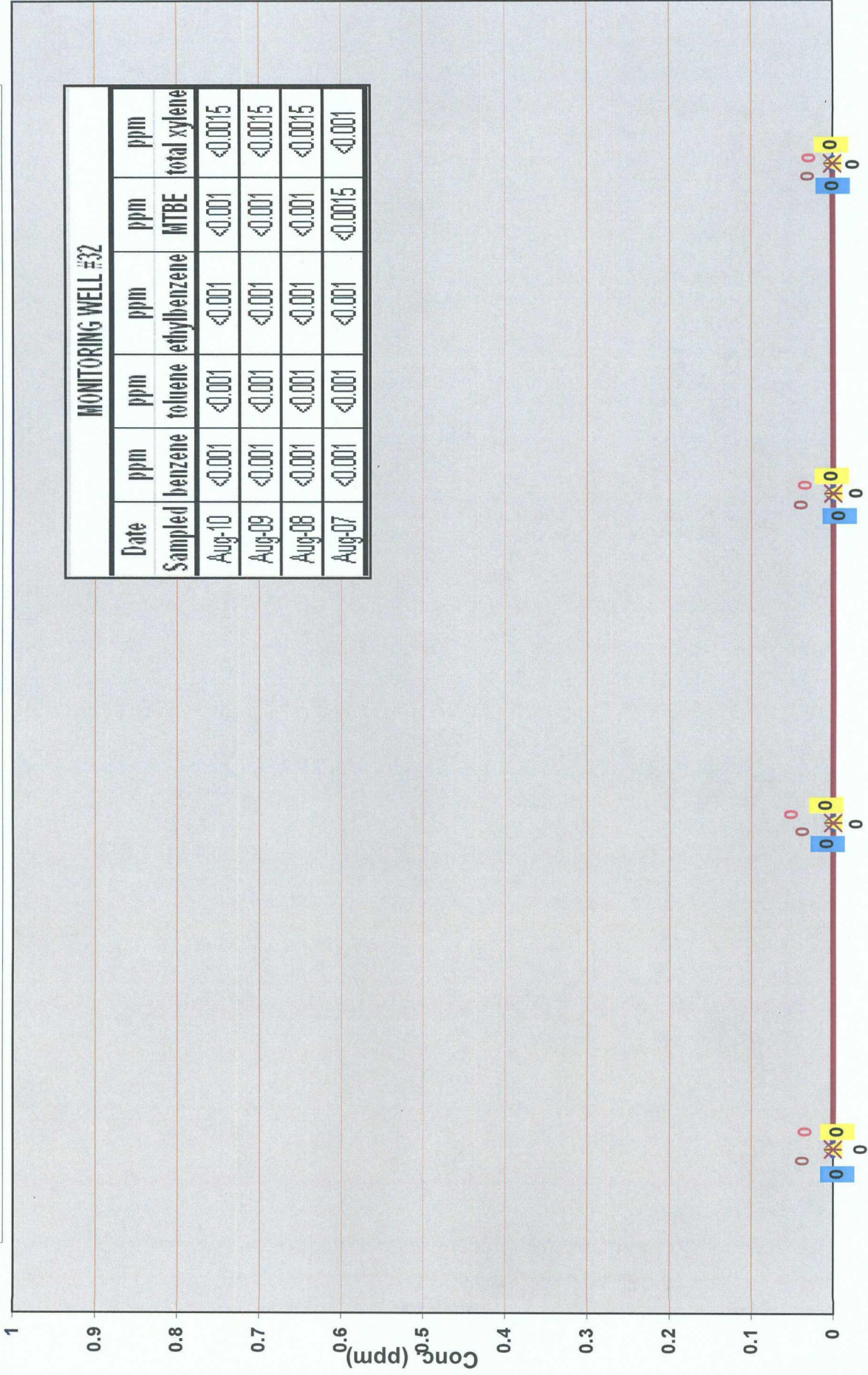


MONITORING WELL #27						
Date	ppm	ppm	ppm	ppm	ppm	ppm
Sampled	benzene	toluene	ethylbenzene	MTBE	total xylene	
Aug-10	<0.001	<0.001	<0.001	<0.001	<0.0015	
Aug-09	<0.001	<0.001	<0.001	<0.001	<0.0015	
Aug-08	<0.001	<0.001	<0.001	<0.001	<0.0015	
Aug-07	<0.001	<0.001	<0.001	<0.0015	<0.001	



Monitoring Well #32

Section 10.0 - Tab 12.0

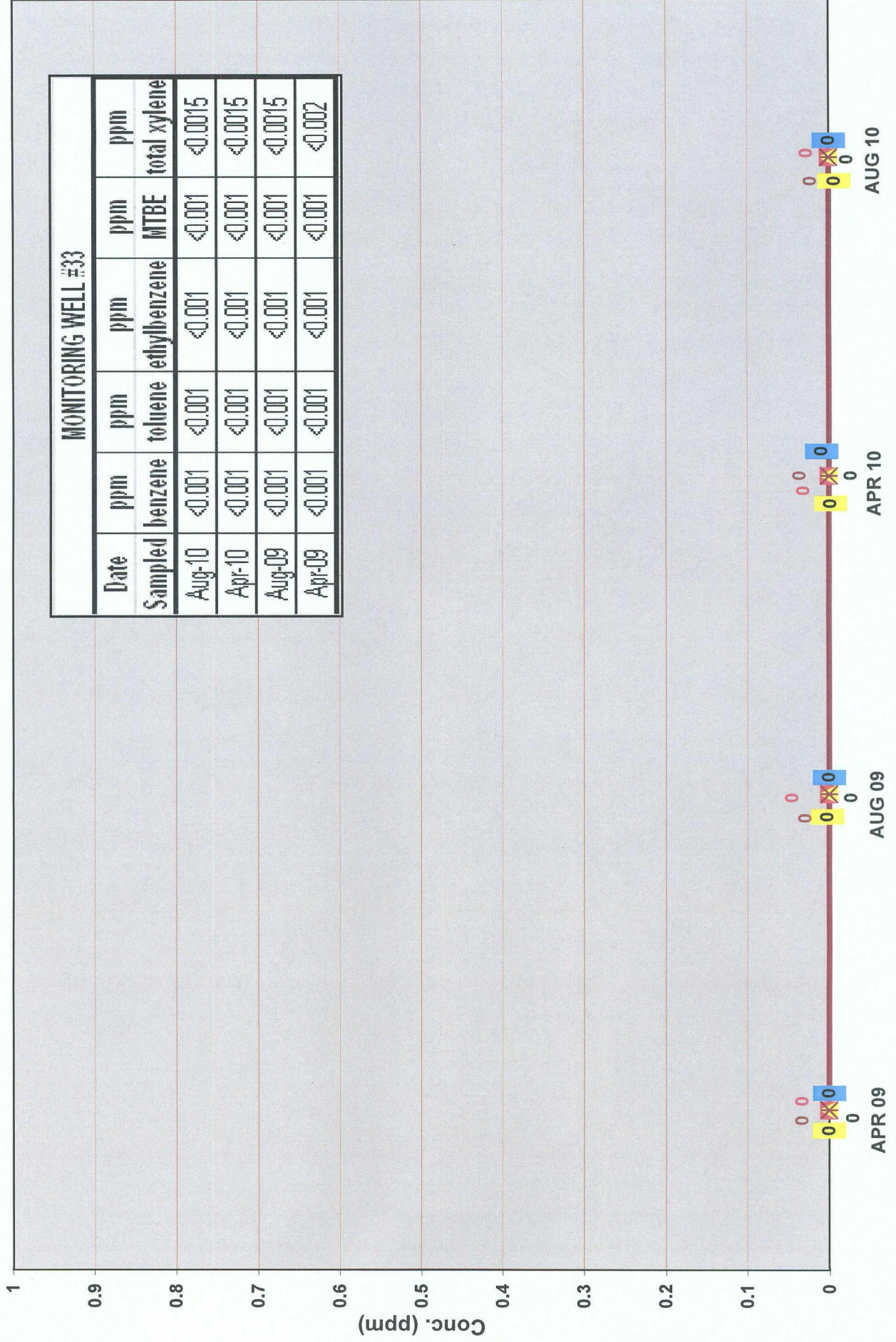


MONITORING WELL #32						
Date	ppm	benzene	toluene	ethylbenzene	MTBE	ppm
Aug-10	<0.001	<0.001	<0.001	<0.001	<0.001	total xylene
Aug-09	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0015
Aug-08	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0015
Aug-07	<0.001	<0.001	<0.001	<0.001	<0.0015	<0.001

AUG 07 AUG 08 AUG 09 AUG 10

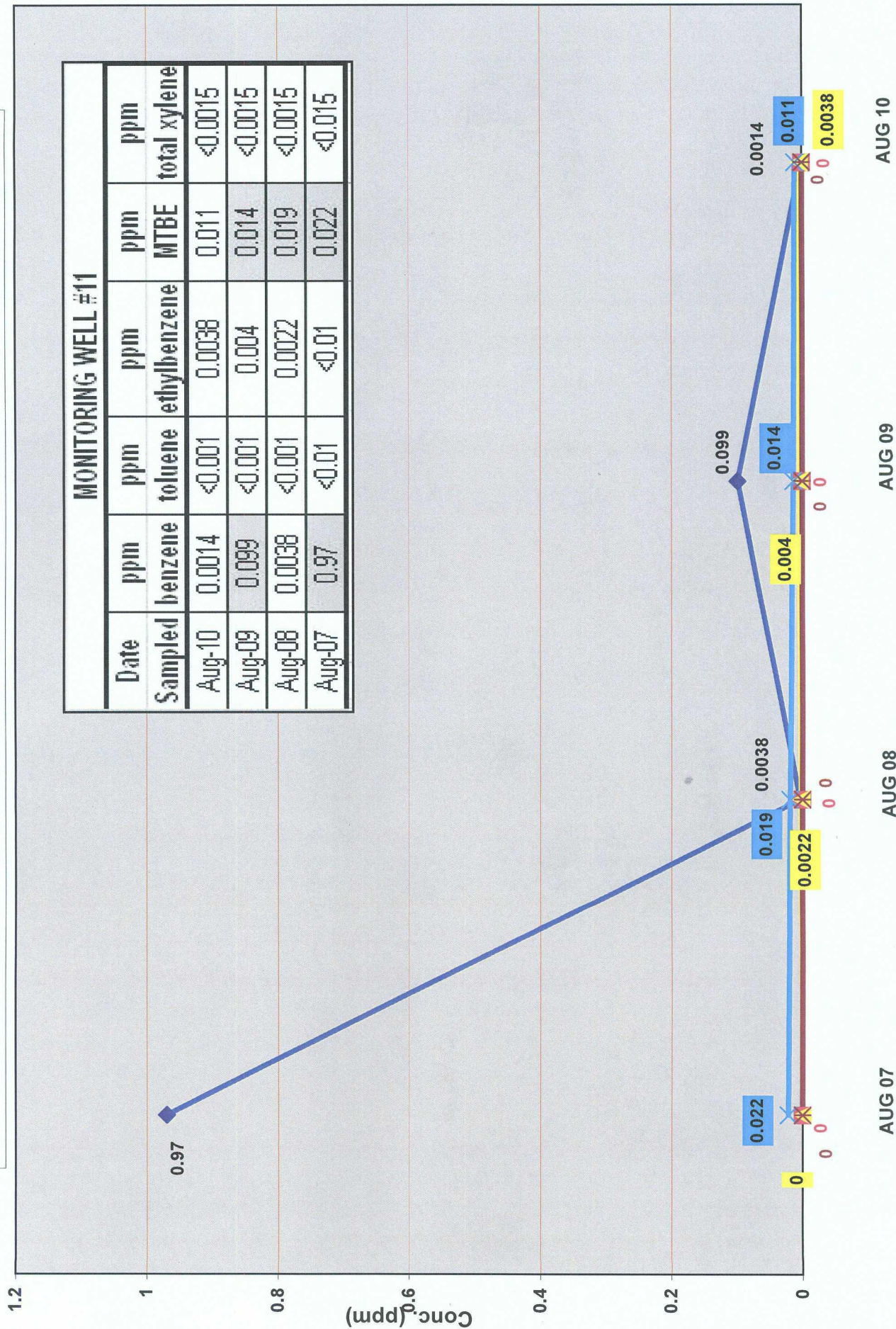
Monitoring Well #33

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Monitoring Well #11

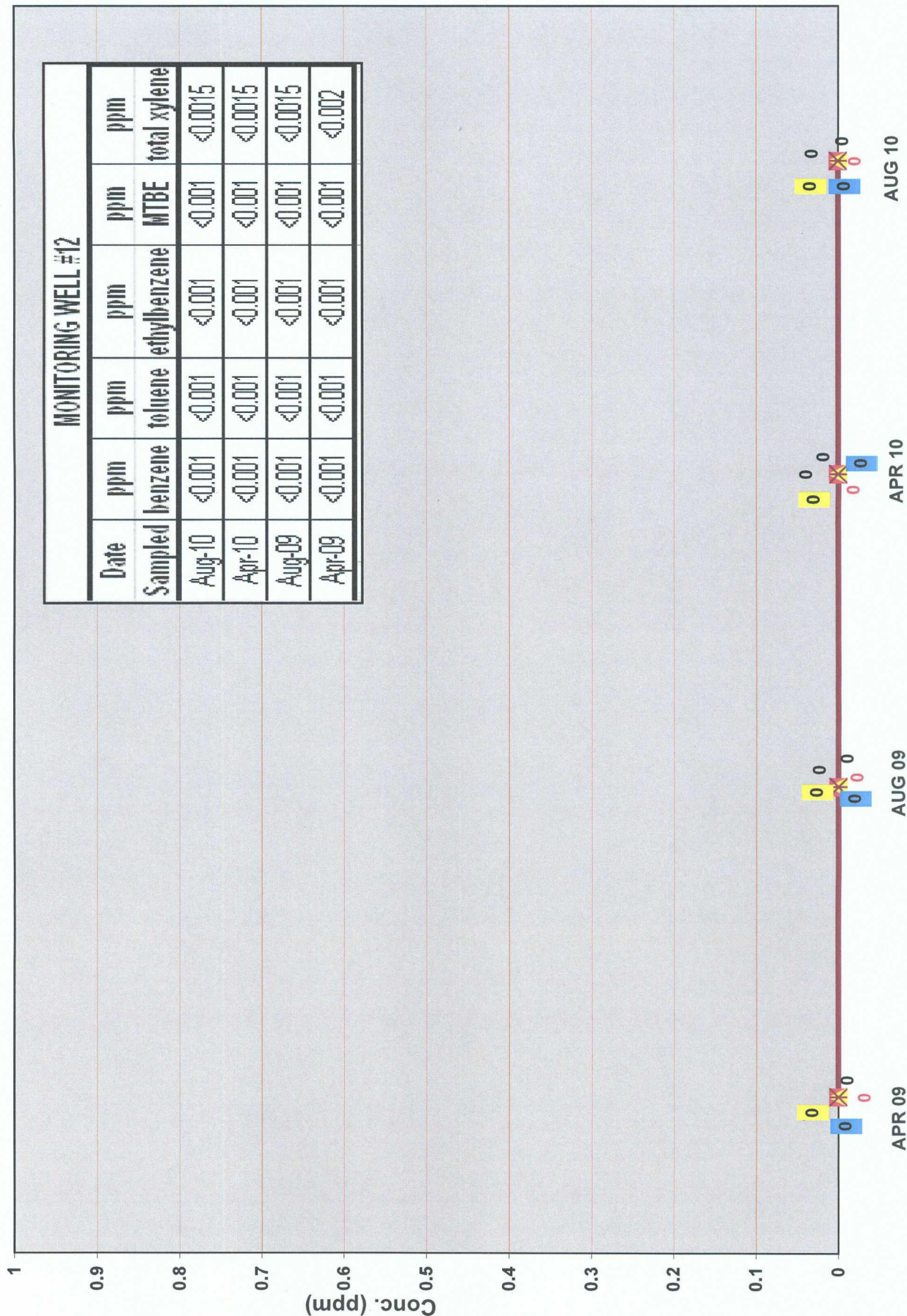
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MONITORING WELL #11					
Date	benzene	toluene	ethylbenzene	MTBE	total xylene
Aug-10	0.0014	<0.001	0.0038	0.011	<0.0015
Aug-09	0.099	<0.001	0.004	0.014	<0.0015
Aug-08	0.0038	<0.001	0.0022	0.019	<0.0015
Aug-07	0.97	<0.01	<0.01	0.022	<0.015

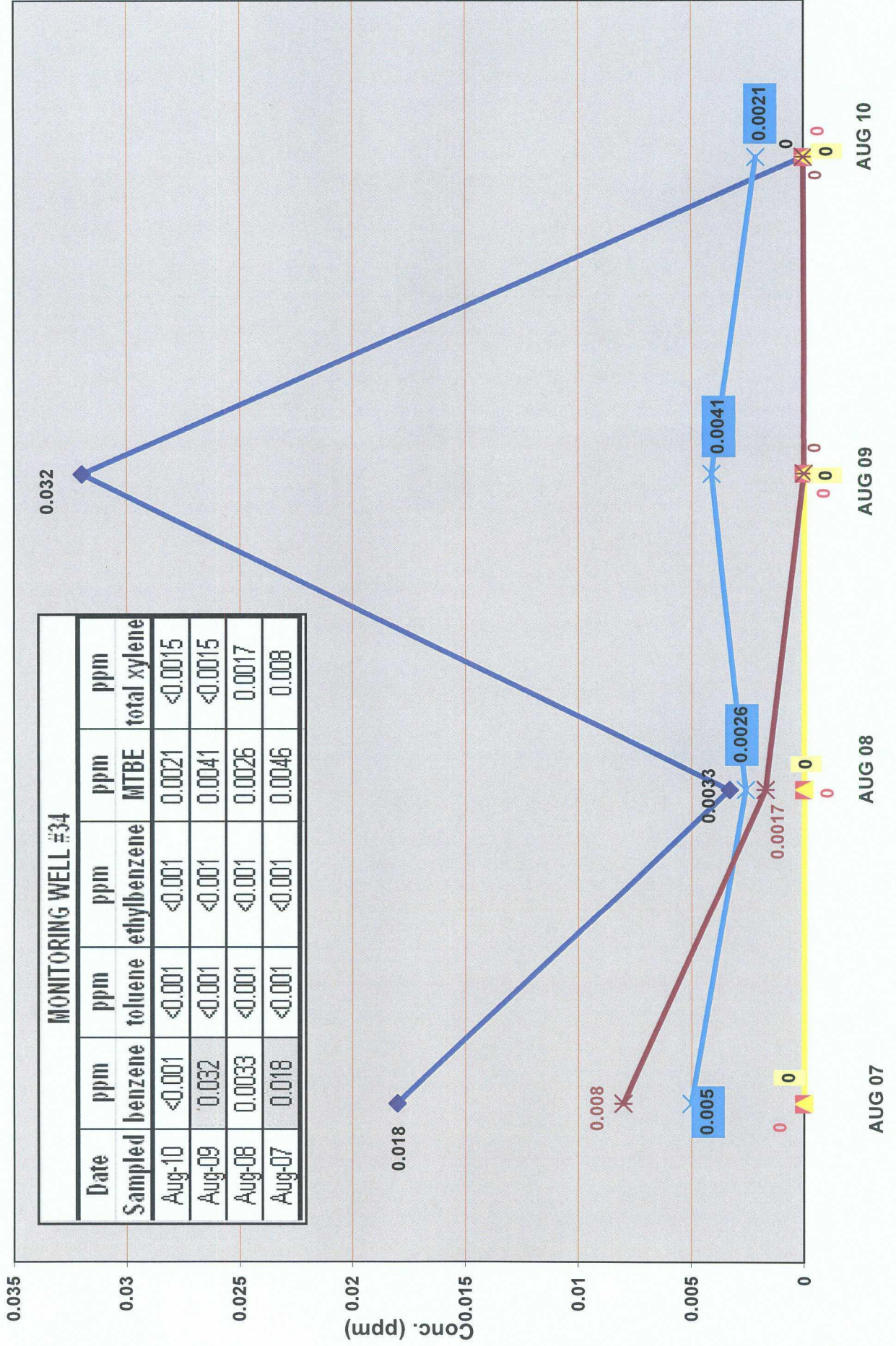
Monitoring Well #12

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MONITORING WELL #12						
Date	ppm	benzene	toluene	ethylbenzene	ppm	ppm
Sampled						
Aug-10	<0.001	<0.001	<0.001	<0.001	MTBE	total xylene
Apr-10	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0015
Aug-09	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0015
Apr-09	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002

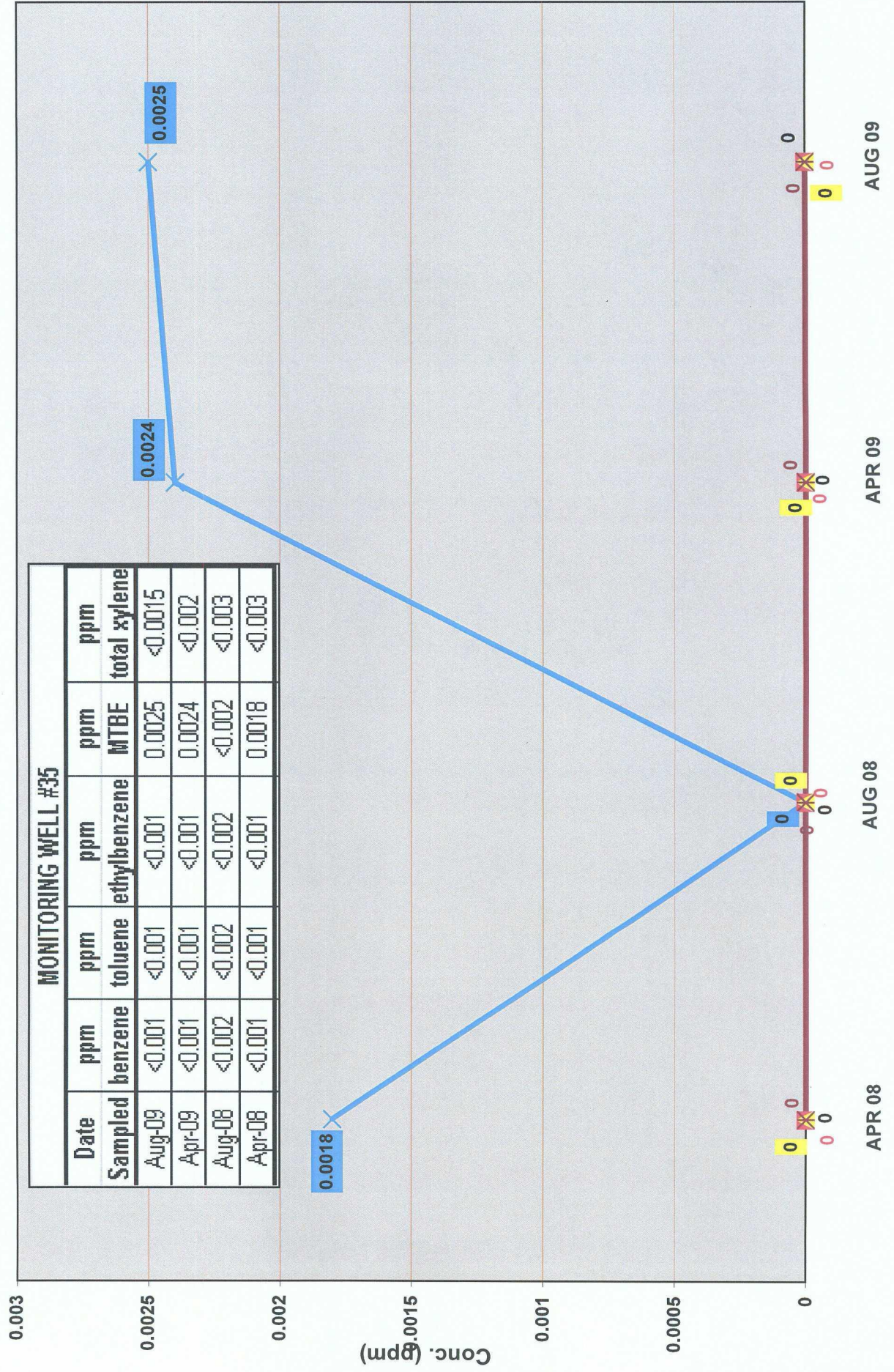
Monitoring Well #34



Monitoring Well #35

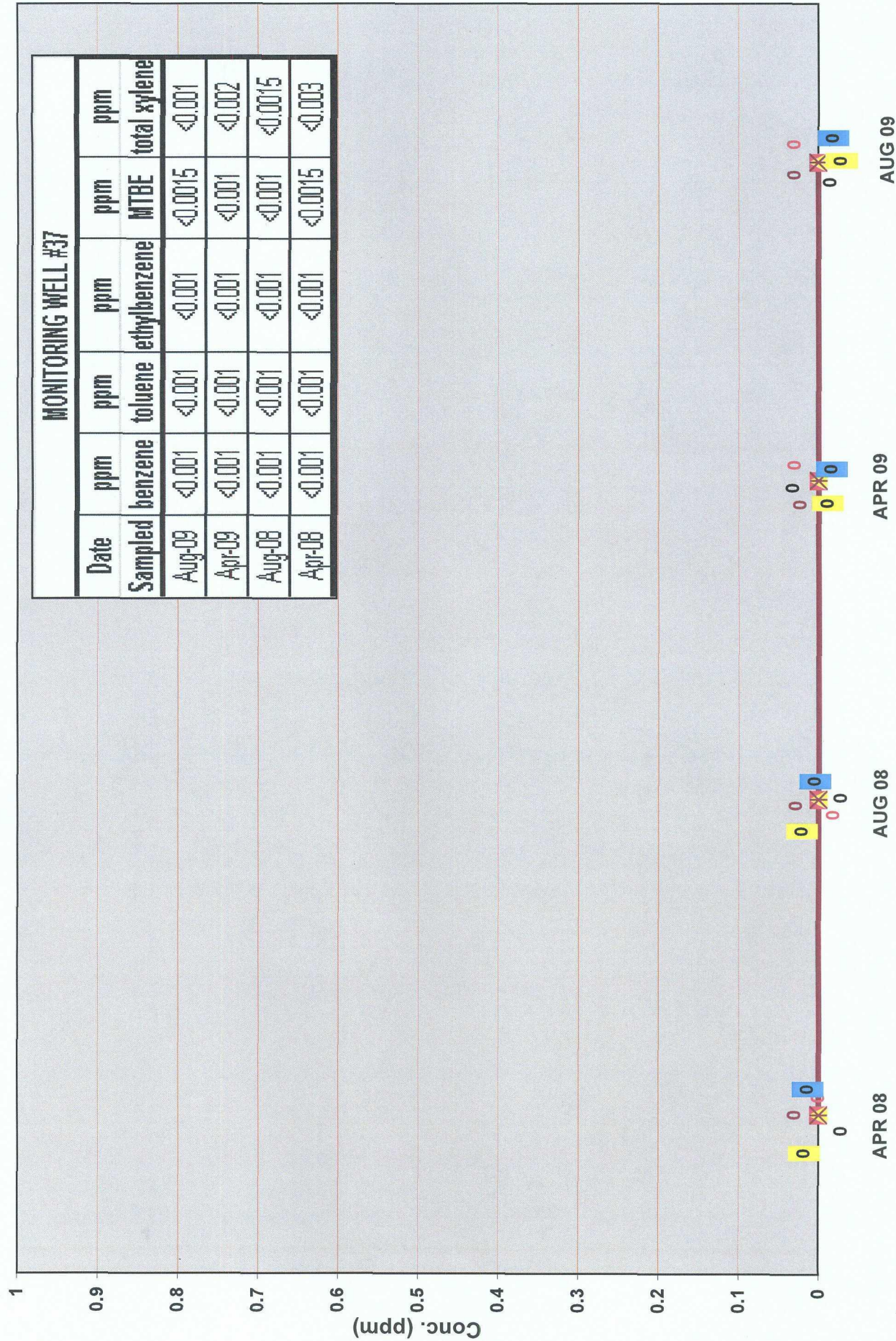


MONITORING WELL #35									
Date	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Sampled	benzene	toluene	ethylbenzene	total xylene	benzene	toluene	ethylbenzene	total xylene	total xylene
Aug-09	<0.001	<0.001	<0.001	<0.0015	0.0025	0.0025	0.0024	0.0024	0.0025
Apr-09	<0.001	<0.001	<0.001	<0.002	0.0024	0.0024	0.0022	0.0022	0.0024
Aug-08	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.0018	<0.0018	<0.003
Apr-08	<0.001	<0.001	<0.001	<0.003	0.0018	0.0018	0.0018	0.0018	0.0018



Monitoring Well #37

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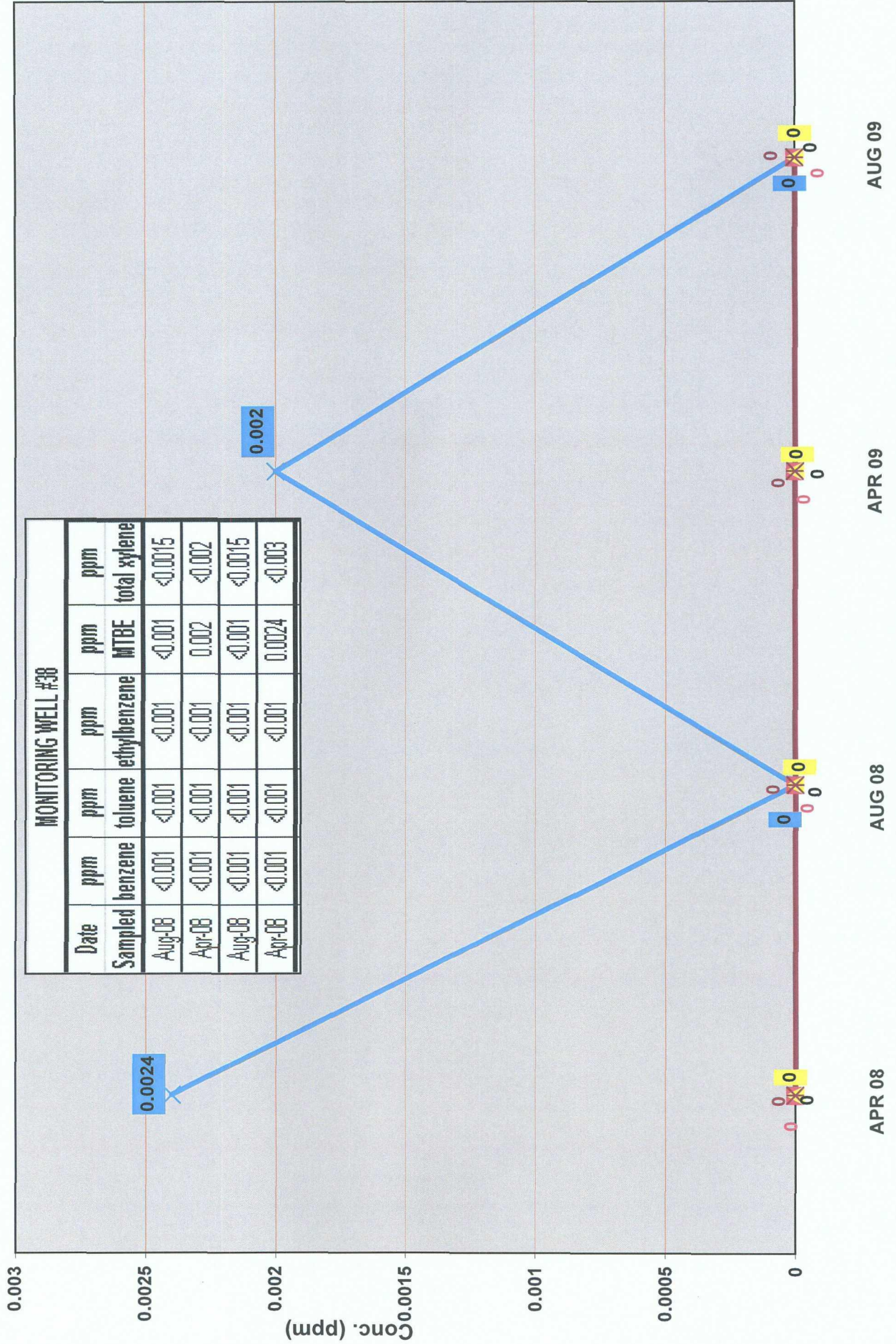


MONITORING WELL #37						
Date	ppm	ppm	ppm	ppm	ppm	ppm
Sampled	benzene	toluene	ethylbenzene	MTBE	total xylene	
Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	
Apr-09	<0.001	<0.001	<0.001	<0.001	<0.002	
Aug-08	<0.001	<0.001	<0.001	<0.001	<0.0015	
Apr-08	<0.001	<0.001	<0.001	<0.0015	<0.003	

Monitoring Well #38



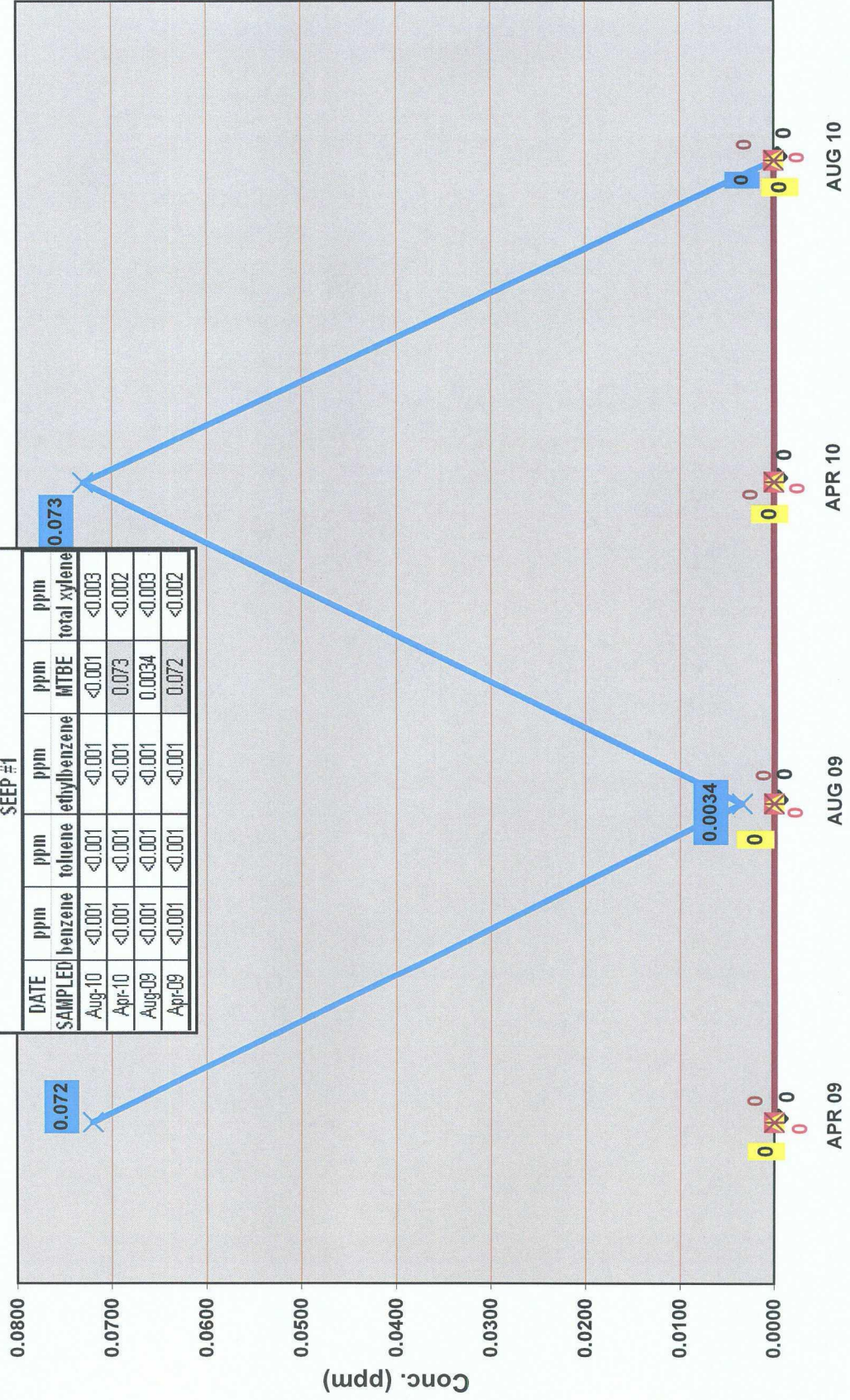
MONITORING WELL #38					
Date	ppm	ppm	ppm	ppm	ppm
Sampled	benzene	toluene	ethylbenzene	MTBE	total xylene
Aug-08	<0.001	<0.001	<0.001	<0.001	<0.0015
Apr-08	<0.001	<0.001	<0.001	0.002	<0.002
Aug-08	<0.001	<0.001	<0.001	<0.001	<0.0015
Apr-08	<0.001	<0.001	<0.001	0.0024	<0.003



Seep #1



SEEP #1					
DATE	ppm	ppm	ppm	ppm	ppm
SAMPLED benzene	toluene	ethylbenzene	MTBE	total xylene	
Aug-10	<0.001	<0.001	<0.001	<0.003	
Apr-10	<0.001	<0.001	0.073	<0.002	
Aug-09	<0.001	<0.001	0.0034	<0.003	
Apr-09	<0.001	<0.001	0.072	<0.002	



Seep #3

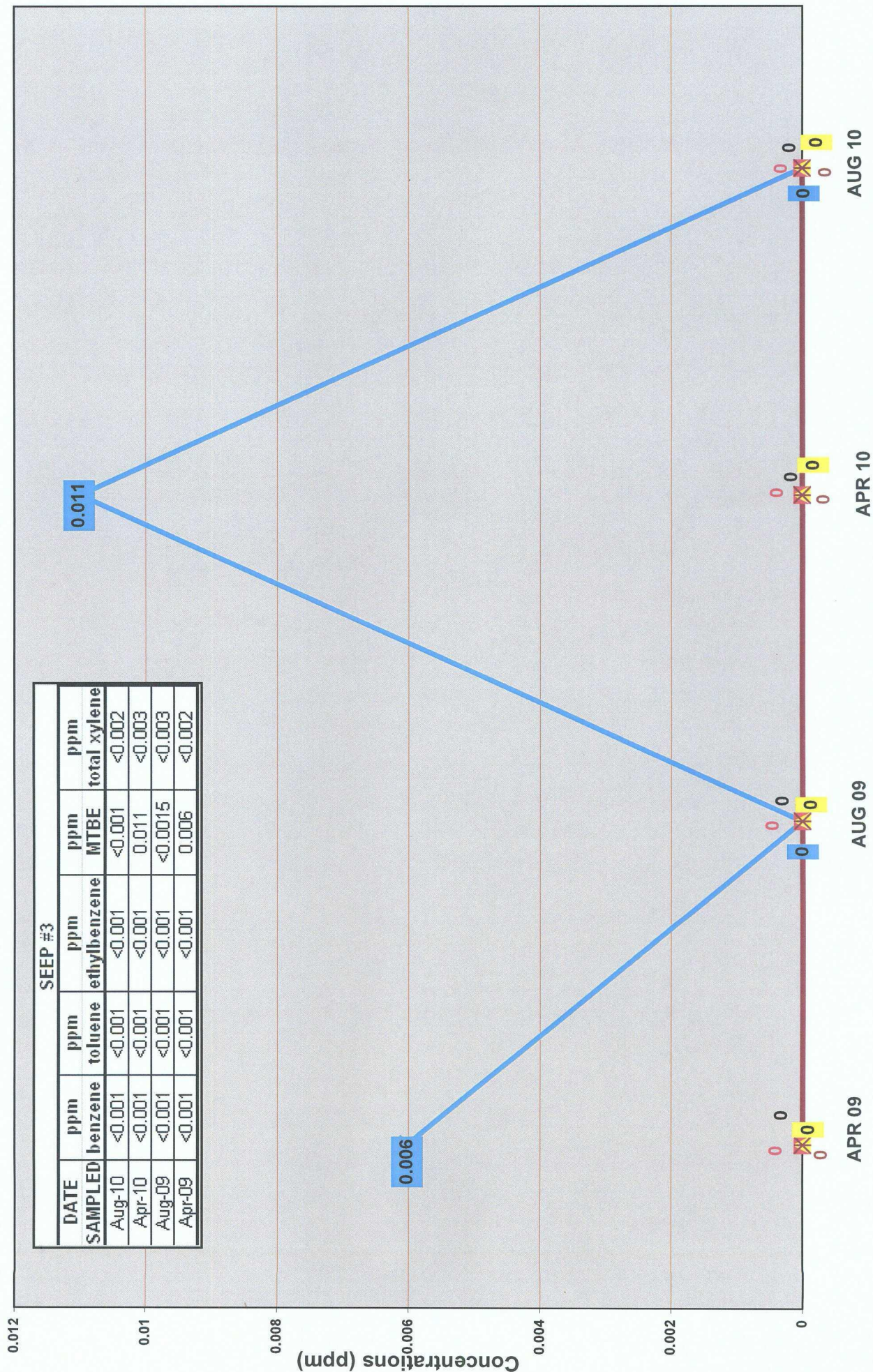
— Total Xylene

— MTBE

— Ethylbenzene

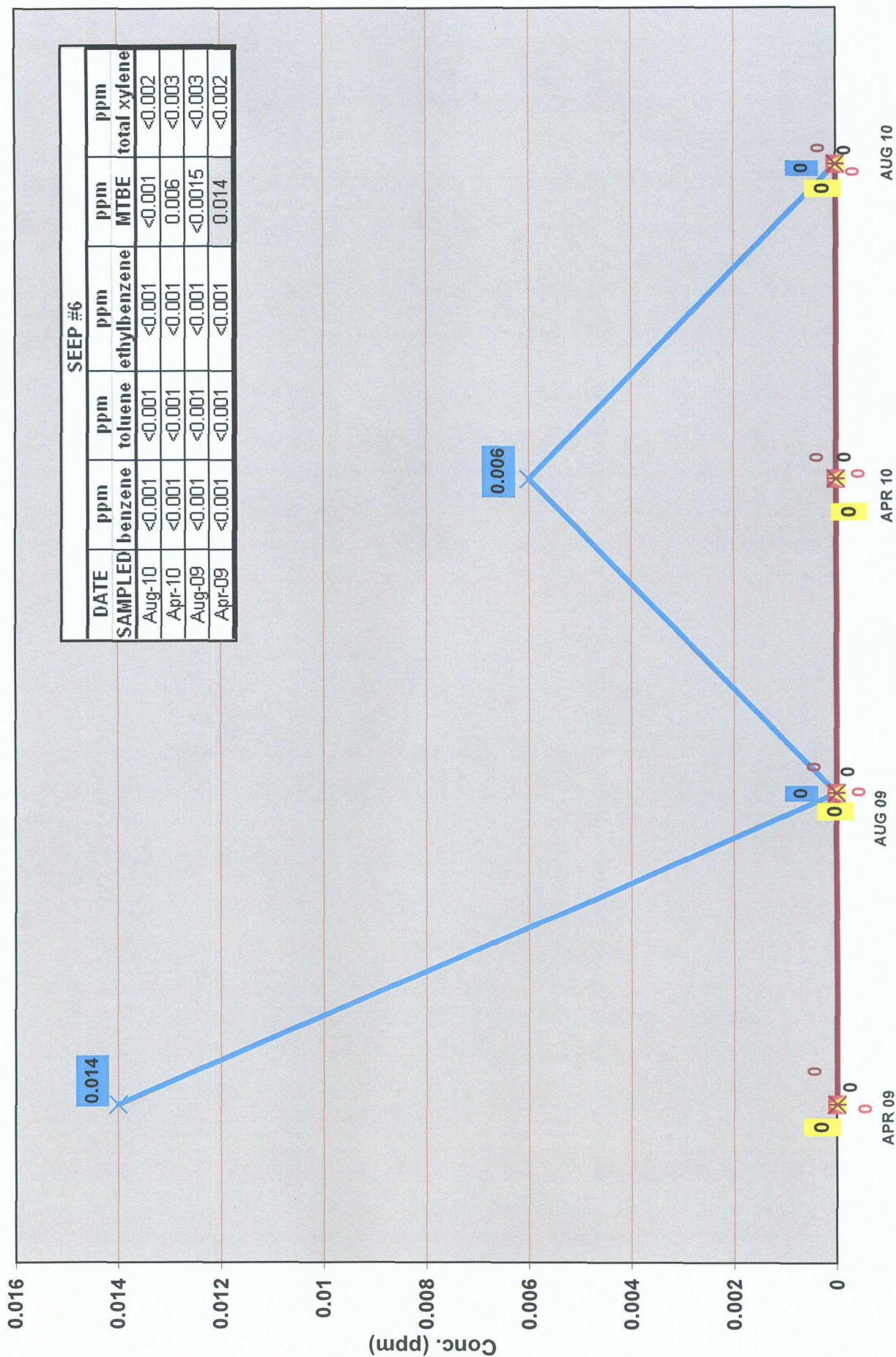
— Toluene

— Benzene



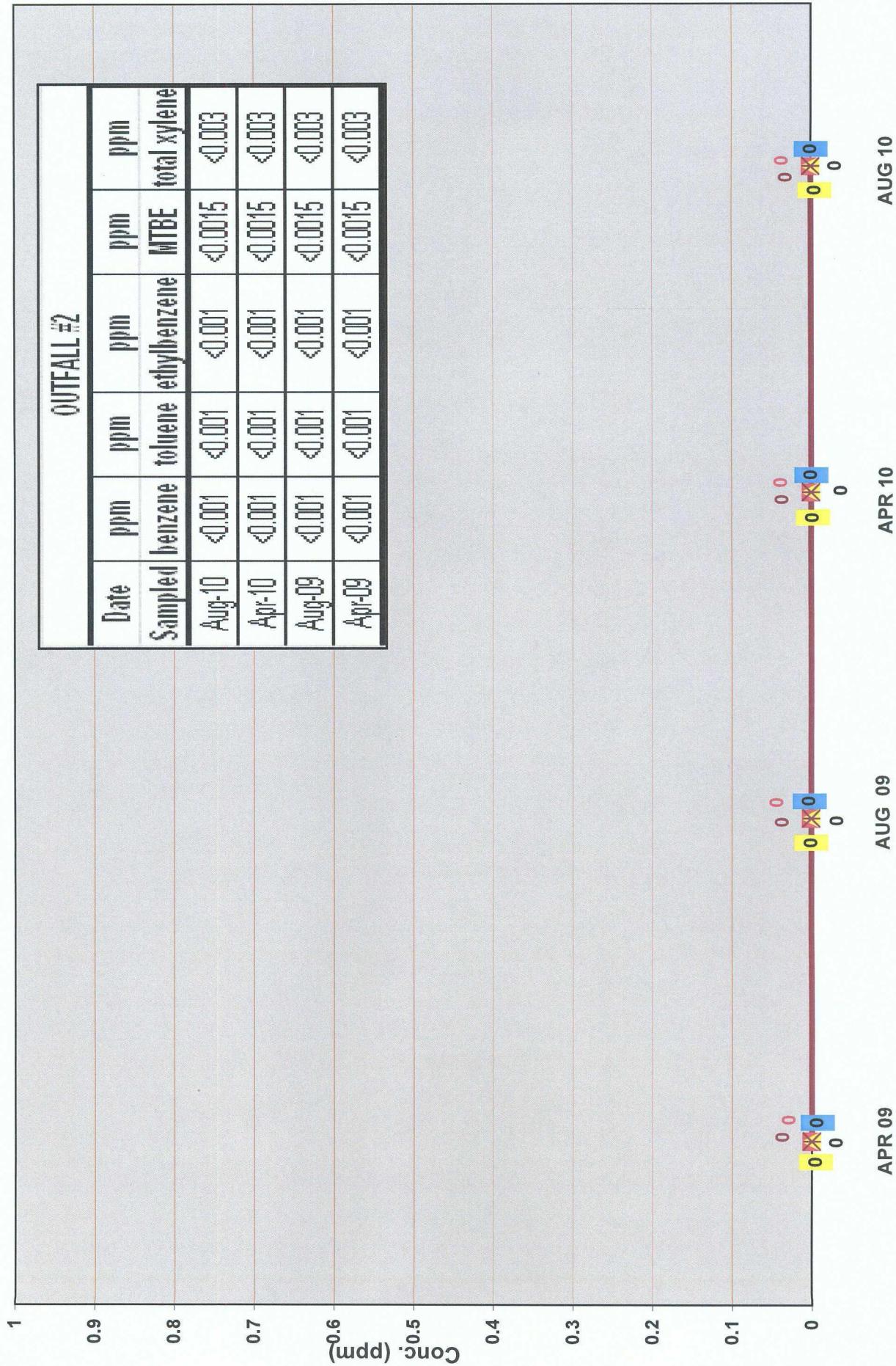
Seep #6

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OUTFALL #2

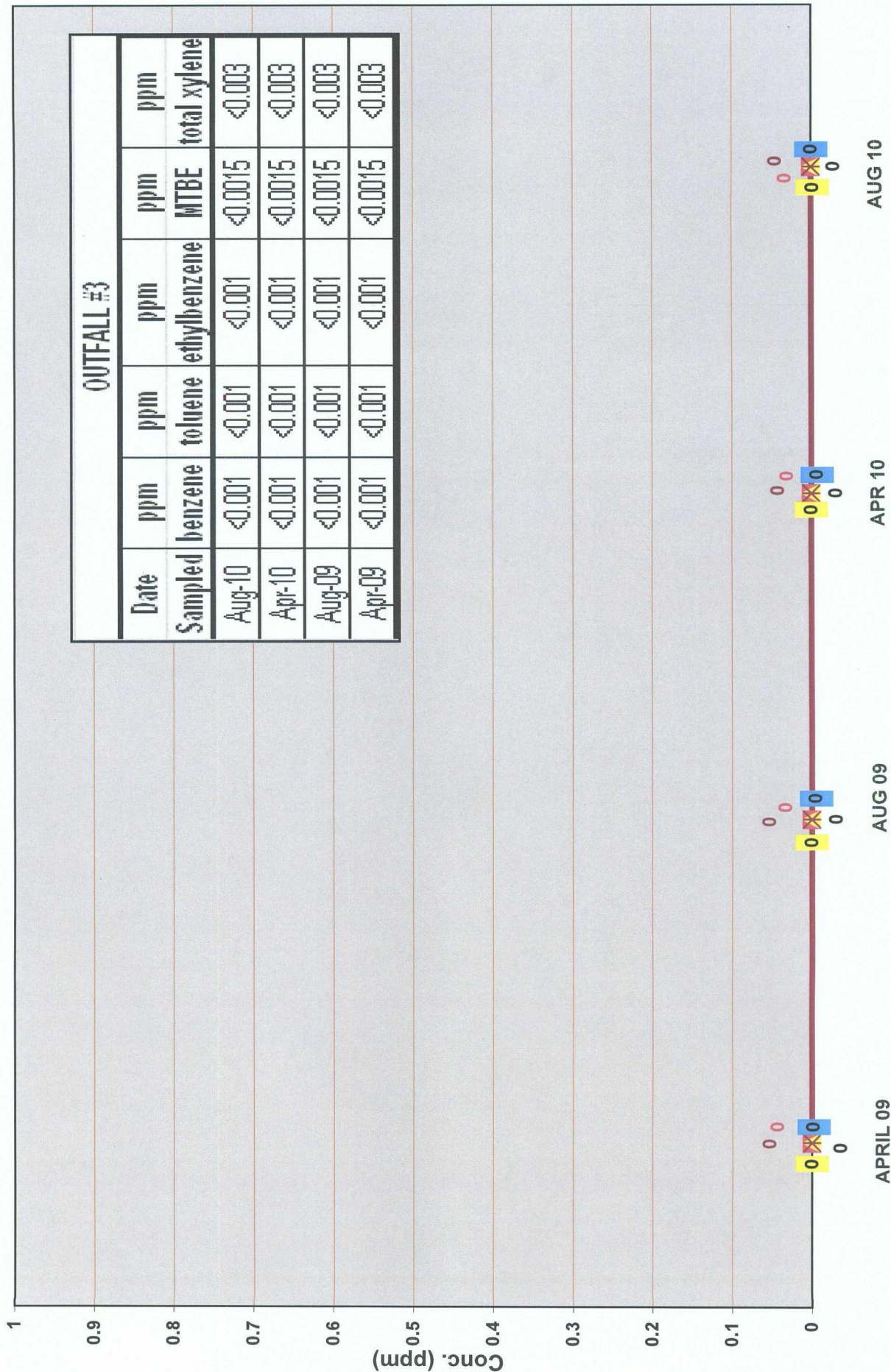
Section 10.0 - Tab 14.0



OUTFALL #3

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Legend: Benzene (blue diamond), Toluene (red square), Ethylbenzene (yellow triangle), MTBE (blue cross), Total Xylene (red asterisk)



Section 11.0 Field Methods

11.0

Field Methods

Groundwater Elevation

All facility monitoring wells, recovery wells, observation and collection wells were measured for groundwater elevation in March, April, and August. Refinery personnel followed the guidelines of the *Facility-Wide Groundwater Monitoring Plan December 2007 (Revised May 2008)* to collect groundwater levels and SPH thickness measurements in March and April. Water elevation measurements were collected in all wells while the recovery wells were in operation and again after the pumps were removed and water levels had stabilized (5 or more days later). After receipt of the New Mexico Environmental Department (NMED) letter *Approval With Direction Facility-Wide Groundwater Monitoring* dated July 26, 2010, Western personnel followed guidelines from the *Facility-Wide Groundwater Monitoring Plan (FWGMP)* dated June 2010. In August, prior to groundwater sampling activities, groundwater levels and SPH thickness measurements were collected at all wells after the pumps had been removed and water levels had stabilized.

All water/product levels are determined to an accuracy of 0.01 foot using a Geotech Interface Meter. The technician records separate phase hydrocarbon, depth to water, and total well depth using this probe.

Water Quality/Groundwater Sampling

Prior to purging, a YSI 550A Dissolved Oxygen Probe is used to determine dissolved oxygen (DO) levels. Water quality parameters are measured using an Ultrameter 6P by the Myron L Company. Electrical conductance, oxidation-reduction potential (ORP), Total Dissolved Solids (TDS), pH, and temperature are monitored during purging.

Well Purging Technique

After determining water levels and measuring DO, initial well volumes are calculated. Total purge volume is determined by monitoring electrical conductance, pH, temperature, ORP, and TDS after every two gallons or each well volume, whichever is less, has been purged from the well. The wells were considered satisfactorily purged when the field parameter values did not vary by more than 10 percent for at least three measurements.

Well volumes are determined using the following equation:

Well Depth – Casing Height – Depth to Liquid X Conversion Factor X Three.

The conversion factor is determined by the diameter of the well casing.

<u>Casing</u>	<u>Conversion Factor</u>
6"	1.50 gal/ft
5"	1.02 gal/ft
4"	0.74 gal/ft
3"	0.367 gal/ft
2"	0.163 gal/ft

Typically disposable bailers are used for purging and sampling. Each bailer holds one liter of liquid. Three well volumes can be calculated by counting the number of times a well is bailed. On occasion, the submersible pump is used for purging wells that have a large volume of water. All purged water is poured/pumped into a 55-gallon drum designated for sampling events.

Well Sampling and Sample Handling Procedure

Equipment and supplies needed for collecting representative groundwater samples include:

- Interface Meter
- YSI 550A Dissolved Oxygen Probe
- Ultrameter 6P
- Distilled Water
- Disposable Latex Gloves
- Disposable Bailers
- Submersible pump and Generator (if needed)
- String/Twine
- Cooler with Ice
- Bottle kits with Preservatives (provided by the contract laboratory)
- Disposable 0.45 micron Field Filters and Syringes
- Glass Jar (usually 4 oz.)
- Sharpie Permanent Marker
- Field Paperwork/Logsheet
- Two 5-gallon buckets
- Trash container (plastic garbage bag)
- Ziploc Bags
- Paper towels

After sufficient purging, samples are collected with the bailer and poured into the appropriate sample containers. Two people are usually utilized for sampling. Sampling takes place over a bucket to insure that spills are contained

For dissolved metals, sample water is poured into a jar and then extracted with a syringe. The syringe is then used to push water through a field filter into the proper sample bottle to collect the dissolved metals sample. Volatile organic analysis samples are collected as to allow no head space in the container.

Samples are labeled immediately with location, date, time, analysis, preservative, and sampler. Then they are put in a Ziploc bag and placed in a cooler holding sufficient ice to keep them cool. The field log sheet is reviewed to verify all entries.

Purge and Decontamination Water Disposal

The Ultrameter 6P, YSI 550A Dissolved Oxygen Probe, and the interface probe are rinsed with distilled water after every well. The rinse procedure takes place over a bucket to insure that spills are contained. All rinse and purge water is contained and then disposed of through the refinery wastewater system.

The submersible pump is decontaminated by placing it in a 55-gallon barrel filled with plant water and some Alconox. The pump is activated and will pump down the barrel twice. External areas are washed down and rinsed, also. All wash and rinse water is on containment and runs to the refinery wastewater system. Any glassware used is taken to the refinery laboratory and washed with Alconox and water and rinsed with reverse osmosis water. Laboratory wastewater runs through the refinery system.

Instrument Calibration

Calibration of the YSI 550A Dissolved Oxygen Instrument occurs at the beginning of each day of sampling. The probe is powered on and allowed to stabilize, which usually takes 15 minutes. Enter the calibration menu. The LCD will prompt you to enter the local altitude in hundreds of feet. When the proper altitude appears on the LCD, press the **ENTER** key.

The LCD will then prompt you to enter the salinity of the water you are about to analyze. After entering the correct salinity, the instrument will return to normal operation.

The Ultrameter 6P instrument calibration occurs at the beginning of each day of sampling. For Conductivity and TDS calibration, the cell is rinsed three times with a 3000 umhos/cm NaCl Standard. The cell cup is refilled with the standard. Either the **COND** or the **TDS** button is pressed and then the **CAL** button is pushed. Press the up or down arrow until the display agrees with the standard. The **CAL** button is pressed to accept the value.

The Ultrameter 6P has an electronic ORP calibration which is automatically calibrated with the 7 pH. The pH sensor well is rinsed three times with 7.0 buffer solution and then refilled again with that buffer. The **pH** button is pressed then the **CAL** button. The up or down arrow is adjusted until the display agrees with the buffer value. The **CAL** button is pushed to accept that value. Repeat the calibration steps using an acid buffer solution and then again with a base buffer solution.

Remediation System Measurement

Recovery well flows are measured using a 1000 ml graduated cylinder. The sample port on the discharge line of the pump is opened and effluent flows into the graduated cylinder. During a pump cycle, a measurement is taken over time and then calculated to a gallon per day rate.

Recovery rates at Tk #37 (Hammond Ditch French Drain) and Tk #38 (#1 East Outfall) are determined through flow meters installed in those systems. Refinery personnel record the rates periodically.

Section 12.0 Waste Disposition

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
7/28/2010	LCCRD	003449193 FLE	UN2733, Waste Amines, Flammable, Corrosive (Monoethanolamine, Triethylamine) D-001, D-002	1	DM	15 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCCRD	003449193 FLE	Un 1992, Waste Flammable Liquids, Toxic (Isopropanol, Methyl Ethyl Ketone) D-001, U-159, U161, U-296	1	DF	105 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCCRD	003449193 FLE	UN 1325, Waste Flammable Solids, Organic, (Hexamethylenetetramene, Sulfur) D-001	1	DF	20 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCCRO	003449193 FLE	UN 3087, Waste Oxidizing Solid, Toxic (Potassium Chlorate, Sodium Dichromate) D-001, D-007	1	DF	10 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCHG4	003449193 FLE	UN-2024, Waste Mercury Compounds, Liquid, (Mercuric Iodide, Mercuric Thiocyanate) D-009	1	DF	4 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Metals Recovery	Yes
7/28/2010	LCCRC	003449193 FLE	UN 3287, Waste Toxic Liquid, Inorganic, (Cadmium Chloride, Lead Acetate) D-004, D-006, D-008, D011	1	DF	70 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCCRC	003449193 FLE	UN 2811, Toxic Solids, Organic, (Chloroacetic Acid, Tetramethylammonium chloride))	1	DF	5 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCCRA	003449193 FLE	UN 3264, Waste Corrosive Liquid, Acidic, (Hydrochloric Acid, Sulfuric Acid) D-002	1	DF	45 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCCRA	003449193 FLE	UN 2031, Waste Nitric Acid D-001, D-002	1	DF	10 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes

BA = Burlap, cloth, paper, or plastic bags

CF = Fiber or plastic boxes, cartons, cases

CM = Metal boxes, cartons, cases (including roll-offs)

CW = Wooden boxes, cartons, cases

CY = Cylinders

DF = Fiberboard or plastic drums, barrels, kegs

DM = Metal drums, barrels, kegs

DT = Dump truck

DW = Wooden drums, barrels, kegs

HG = Hopper or gondola cars

TC = Tanker cars

TP = Portable tanks

TT = Cargo tanks (tank trucks)

Waste 2010

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
7/28/2010	LCCRB	003449193 FLE	UN 3267, Waste Corrosive Liquid, Basic (Ammonium Hydroxide, Sodium Hydroxide) D-002	1	DF	10 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Incineration	Yes
7/28/2010	LCHG1	003449193 FLE	UN 2809, Waste Mercury D-009	2	DM	900 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Metals Recovery	Yes
7/28/2010	LCCRN	003449193 FLE	Non DOT Regulated, (Silica, Starch)	1	210 P	37,820 P	Clean Harbors Arizona, LLC 1340 West Lincoln Street Phoenix, Arizona 85007	Energy Recovery	Yes
7/28/2010	CH447202	003449194 FLE	UN 1993, Waste Flammable Liquid (Isopropyl Alcohol, Naphthalene) (Unichem 7055) D-001	1	DM	400 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447222	003449194 FLE	UN 1992, Waste Flammable Liquid (Xylene, Ethylbenzene) (Unichem 7219) D-001	1	DM	90 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447188	003449194 FLE	Waste Flammable Liquid, (Kerosene, O-Xylene) (Innospec 425) D-001	1	DM	60 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447150	003449194 FLE	UN 1993, Waste Flammable Liquid, (Isopropanol) (Dow CA-2003) D-001	4	DM	1,600 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447041	003449194 FLE	UN 1897, Waste Tetrachloroethylene, (Perchloroethylene) D-039, U210	2	DM	200 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447192	003449194 FLE	UN2735, Waste Amines, Liquid, Corrosive (N-Di-Sec-Butyl-Phenylene Diamine) Octel 22) D-002	1	DM	60 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes

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 CY = Cylinders
 DF = Fiberboard or plastic drums, barrels, kegs
 DM = Metal drums, barrels, kegs
 DT = Dump truck
 DW = Wooden drums, barrels, kegs
 HG = Hopper or gondola cars
 TC = Tanker cars
 TP = Portable tanks
 TT = Cargo tanks (tank trucks)

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
7/28/2010	CH247415	003449194 FLE	NA3077, Hazardous Waste, Solid (Main Column Bottoms Sludge) D-006, D-009, K-170	1	DM	590 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447153	003449194 FLE	NA1993, Combustible Liquid, (Kerosene, Naphthalene) (Unichem 7534)	2	DM	695 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447045	003449194 FLE	Non DOT Regulated Material, Ethoxylated Nonylphenol (Nalsperse 7308)	1	DM	260 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447048	003449194 FLE	Non DoOT Regulated Material, Alkylene Oxide Polyglycol (Dow CA-2102)	1	DM	400 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	CH447038	003449194 FLE	Non DOT Regulated Material (Antimony Pentoxide Solution) (Passivation Plus)	1	DM	80 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
7/28/2010	LCCRI	003449195 FLE	UN 1560, Waste Arsenic Trichloride (DOT SP-9168) D-003, D-004	1	CF	2 P	Clean Harbors Aragonite LLC 11600 North Aptus Rd Grantsville, Utah 84029	Incineration	Yes
7/28/2010	LRCTS	003449195 FLE	UN 1687, Waste Sodium Azide	1	DF	1 P	Clean Harbors Aragonite LLC 11600 North Aptus Rd Grantsville, Utah 84029	Incineration	Yes
7/28/2010	CH315430	003458081 FLE	NA 3082, Hazardous Waste Liquid Vacuum Truck Sludge (F037)	2	DM	900 P	Clean Harbors Deer Park, LLC 2027 Battleground RD Deer Park, TX 77536	Incineration	Yes

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CY = Cylinders

DF = Fiberboard or plastic drums, barrels, kegs

DM = Metal drums, barrels, kegs

DT = Dump truck

DW = Wooden drums, barrels, kegs

HG = Hopper or gondola cars

TC = Tanker cars

TP = Portable tanks

TT = Cargo tanks (tank trucks)

Waste 2010

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		*Quantity	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
9/20/2010	100079	007305602 JJK	UN 3190, Self-Heating Solid, Inorganic (Unifiner Spent Catalyst) K-171	3	CM	11,380 P	DuraTherm, Inc 2700 Avenue S San Leon, Texas 77539	Thermal Desposition (H039)	Yes
9/20/2010	100080	007305602 JJK	UN 2881, Metal Catalyst, Dry (Sulfur Guard Spent Catalyst) K-171	1	CM	3,900 P	DuraTherm, Inc 2700 Avenue S San Leon, Texas 77539	Thermal Desposition (H039)	Yes
9/20/2010	100080	007305602 JJK	UN 2881, Metal Catalyst, Dry (Sulfur Guard Spent Catalyst) K-171	6	DM	2,380 P	DuraTherm, Inc 2700 Avenue S San Leon, Texas 77539	Thermal Desposition (H039)	Yes
9/20/2010	100078	007305602 JJK	UN 3190, Self-Heating Solid, Inorganic (DHT - K757- Spent Catalyst)	2	CM	7,600 P	DuraTherm, Inc 2700 Avenue S San Leon, Texas 77539	Thermal Desposition (H039)	Yes
9/20/2010	100078	007305598 JJK	UN 3190, Self-Heating Solid, Inorganic (DHT - K757- Spent Catalyst)	8	CM	23,360 P	DuraTherm, Inc 2700 Avenue S San Leon, Texas 77539	Thermal Desposition (H039)	Yes
* The quantity listed is the actual weight that was dumped from the flow bin. The weight on the manifest includes the bin weight also - Duratherm subtracts the bin weight and lists the actual weight of the waste.									
12/21/2010	CH247415	003897920 FLE	NA3077, Hazardous Waste, Solid (Main Column Bottoms Sludge) D-006, D-009, K-170	2	DM	1,014 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
12/21/2010	CH364761	003897920 FLE	NA 3077, Hazardous Waste Solid (Benzene Stripper Sludge) F-038	3	DM	1,521 P	Clean Harbors El Dorado LLC 309 American Circle El Dorado, Arkansas 71730	Incineration	Yes
12/21/2010	CH315430	0038979191 FLE	NA 3082, Hazardous Waste Liquid Vacuum Truck Sludge (F037)	4	DM	2,028 P	Clean Harbors Deer Park, LLC 2027 Independence Parkway South La Porte, TX 77571	Incineration	Yes

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CF = Fiber or plastic boxes, cartons, cases
CY = metal boxes, cartons, cases (including off-
offs)
CW = Wooden boxes, cartons, cases
CY = Cylinders

DF = Fiberboard or plastic drums, barrels, kegs
DM = Metal drums, barrels, kegs
DT = Dump truck
DW = Wooden drums, barrels, kegs
HG = Hopper or gondola cars

TC = Tanker cars
TP = Portable tanks
TT = Cargo tanks (tank trucks)

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity *	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
2/1/2010	090067768-01	002459359FLE	API Sludge (Hazardous Waste Solid) K-051, D-018	1	CM	26,280 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/1/2010	090067768-01	002459360FLE	API Sludge (Hazardous Waste Solid) K-051, D-018	1	CM	30,920 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/1/2010	090067768-01	002459380FLE	API Sludge (Hazardous Waste Solid) K-051, D-018	1	CM	22,300 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/5/2010	090067768-01	002459403FLE	API Sludge (Hazardous Waste Solid) K-051, D-018	1	CM	23,660 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/5/2010	090067768-01	002459402FLE	API Sludge (Hazardous Waste Solid) K-051, D-018	1	CM	28,660 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/5/2010	090067768-01	002459384FLE	API Sludge (Hazardous Waste Solid) K-051, D-018	1	CM	28,880 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/5/2010	090067768-01	002459385FLE	API Sludge (Hazardous Waste Solid) K-051, D-018	1	CM	26,300 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes

* The quantity listed is the actual weight that was dumped from the roll-off bin. The weight on the manifest includes the bin weight also - Robston subtracts the bin weight and lists the actual weight of the waste.

BA = Burlap, cloth, paper, or plastic bags
CF = Fiber or plastic boxes, cartons, cases
CM = Metal boxes, cartons, cases (including roll-offs)

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CY = Cylinders

DF = Fiberboard or plastic drums, barrels, kegs
DM = Metal drums, barrels, kegs
DT = Dump truck

DW = Wooden drums, barrels, kegs
HG = Hopper or gondola cars

TC = Tanker cars
TP = Portable tanks
TT = Cargo tanks (tank trucks)

Tank Clean Out - 2010

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity *	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
2/1/2010	090067769-00	002459358FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	22,840 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/1/2010	090067769-00	002459368FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	27,640 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/3/2010	090067769-00	002459369FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	24,360 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/5/2010	090067769-00	002459370FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	27,960 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/8/2010	090067769-00	002459393FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	26,340 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/8/2010	090067769-00	002459394FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	28,020 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/8/2010	090067769-00	002459395FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	29,120 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/8/2010	090067769-00	002459396FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	20,880 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/8/2010	090067769-00	002459397FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	29,580 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes

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 CY = Cylinders

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Tank Cleanout - 2010

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity *	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
2/10/2010	090067769-00	002459388FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	34,380 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/10/2010	090067769-00	002459389FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	30,080 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/10/2010	090067769-00	002459390FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	27,980 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/10/2010	090067769-00	002459391FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	26,380 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/10/2010	090067769-00	002459392FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	26,600 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/12/2010	090067769-00	002459371FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	27,020 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/12/2010	090067769-00	002459372FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	27,000 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/12/2010	090067769-00	002459373FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	31,140 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/12/2010	090067769-00	002459374FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	26,700 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes

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Tank Clean Out - 2010

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity *	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
2/12/2010	090067769-00	002459375FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	29,500 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/15/2010	090067769-00	002459430FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	37,400 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/15/2010	090067769-00	002459376FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	27,980 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/15/2010	090067769-00	002459432FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	27,460 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/15/2010	090067769-00	002459440FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	30,020 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/18/2010	090067769-00	002459433FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	30,360 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/18/2010	090067769-00	002459434FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	29,160 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/18/2010	090067769-00	002459436FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	31,240 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/19/2010	090067769-00	002459435FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	28,060	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes

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Tank Cleanout - 2010

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity *	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
2/19/2010	090067769-00	002459437FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	28,900 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/22/2010	090067769-00	002459438FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	33,060 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
2/22/2010	090067769-00	002459439FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	34,120 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
3/2/2010	090067769-00	002459444FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	32,060 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
3/3/2010	090067769-00	002459445FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	32,000 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
3/5/2010	090067769-00	002459446FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	30840	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
3/5/2010	090067769-00	002459483FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	33,220 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
3/5/2010	090067769-00	002459484FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	26,560 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes
3/9/2010	090067769-00	002459485FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	6,400 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes

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Tank Clean Out - 2010

Section 12.0

Pick-up Date	Profile #	Manifest #	Description	Containers		Quantity *	Destination	Treatment	Cert. of Disposal/ Consumption
				No.	Type				
3/11/2010	090067769-00	002459447FLE	Tank Bottoms (Tk #43, Tk #17, Tk #27 CleanOut) K-169	1	CM	21,200 P	US Ecology Texas 3.5 South Petronilla Road Robston, Texas 78380	Energy Recovery	Yes

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TC = Tanker cars
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Section 13.0 Below Grade Testing

Line Number	Description (Service)	Line Size	Line Length	Starting Location	End Location	Drawing Reference	Construction Material	Inspection Scheduled	Inspection Date	Inspection Results Pass/Fail	Test/ Inspection Method	Repairs/Maint Needed	Repairs-Maint Completion date
1	Effluent Wtr. Transfer Line	6	3250 L/F	Effluent Pond Outlet Pump P-616	Effluent Transfer P-671	D-500-800-031	PVC	2012	Jul-10	Pass	Hydrostatic	None	N/A
2	Effluent Wtr. Trans. Pump	6	908 L/F	North Evaporation Pond Outlet	Effluent Transfer Pump P-671	D-500-800-031	PVC	2012					
3	Effluent Wtr. Pump Disch.	6	2,797 L/F	Effluent Transfer P-671	Injection Well Building	D-500-800-031	PVC	2012	Oct-09	Pass	Hydrostatic	None	N/A
4	Injection Well Recir. Line	6	910 L/F	Injection Well Building	North Evaporation Pond	D-500-800-031	PVC	2012					
5	River Terrace Transfer Line	2	911 L/F	River Terrace Processing Skid	River Pump Building Water Basin	D-500-800-043	PVC	2012					
6	Crude Transfer Line	12	912 L/F	Pipe Rack East Of LPG Sigs Tks.	Pipe Rack Southwest of Tk. # 31	N/A	Carbon steel	2008	May-08	Pass	Praxair	None	N/A
7	Steam Header at Terminals	6	913 L/F	Pipe Rack Southwest of Tk. # 31	Pipe Rack East Of LPG Sigs. Tks.	N/A	Carbon steel	2011					
8	Condensate Return Header	4	914 L/F	Pipe Rack East Of LPG Sigs Tks.	Pipe Rack Southwest of Tk. # 31	N/A	Carbon steel	2011					
9	C-4 To Blend	4	218 L/F	Pipe Rack East Of LPG Bullets	Pipe Rack Southwest of Tk. # 31	N/A	Carbon steel	*Temporarily Out of Service					
10	ULSD Sales Line	12	916 L/F	Pipe Rack Southwest of Tk. # 31	Filter Pad Area North Of Loading Pad	N/A	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
11	Unleaded Gasoline Sales	12	917 L/F	Pipe Rack Southwest of Tk. # 31	Filter Pad Area North Of Loading Pad	N/A	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
12	Naphtha Sales from Tk #35	12	980 L/F	Pipe Rack Southwest of Tk. # 31	Filter Pad Area North Of Loading Pad	N/A	Carbon steel	out of service					
13	Lite Straight Run Product	4	218 L/F	Pipe Rack Southwest of Tk. # 31	Rack Area North Of B-23	N/A	Carbon steel	2011					
14	Poly Material To Storage	3	275 L/F	Pipe Rack Southwest of Tk. # 31	Area Northeast of B-21	N/A	Carbon steel	*Temporarily Out of Service					
15	Poly Unit Feed Line	3	275 L/F	Area Northeast of B-21	Pipe Rack Southwest of Tk. # 31	N/A	Carbon steel	*Temporarily Out of Service					
16	LPG Rerun Line	2	275 L/F	Area Northeast of B-21	Pipe Rack Southwest of Tk. # 31	N/A	Carbon steel	*Temporarily Out of Service					
17	Saturate To Storage	2	275 L/F	Pipe Rack Southwest of Tk. # 31	Area Northeast of B-21	N/A	Carbon steel	*Temporarily Out of Service					
18	C-4 To Storage	2	275 L/F	Pipe Rack Southwest of Tk. # 31	Area Northeast of B-21	N/A	Carbon steel	*Temporarily Out of Service					
19	C-3 To Storage	2	275 L/F	Pipe Rack Southwest of Tk. # 31	Area Northeast of B-21	N/A	Carbon steel	*Temporarily Out of Service					
20	JP-8 Sales Line	8	388 L/F	Pipe Rack Southwest of Tk. # 31	Out Of Service	N/A	Carbon steel	out of service					
21	Off Road Diesel Sales From Tk.18	6	389 L/F	Pipe Rack Southwest of Tk. # 31	Filter Pad Area North Of Loading Pad	N/A	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
22	Slop Line To Tk. # 22	4	390 L/F	Area Northeast of B-21	Out of Service	N/A	Carbon steel	out of service					
23	Isomerate/Naphtha Line	6	699 L/F	Low Rack West Of Tk.# 25	Area West of B-12	D-000-900-023	Carbon steel	2008	May-08	Pass	Praxair	None	N/A
24	Sub Grade Gasoline (Tk #32)	8	392 L/F	Pipe Rack West Of Tk.# 36	Filter Pad Area North Of Loading Pad	N/A	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
25	Premium Sales from Tks # 3 & 4	6	393 L/F	Pipe Rack West Of Tk.# 36	Filter Pad Area North Of Loading Pad	N/A	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
26	Naphtha to VRU	4	313 L/F	Crude Line East of B-21	Manifold @ VRU Unit	NewTech 595-M-601	Carbon steel	2008	May-08	Pass	Praxair	None	N/A
27	Naphtha Feed To VRU Unit	4	223 L/F	Transfer Pump @ Tk. # 44	Manifold @ VRU Unit	NewTech 595-M-601	Carbon steel	2008	May-08	Pass	Praxair	None	N/A
28	Naphtha Fill/Rerun To Tk. #44	4	223 L/F	Manifold @ VRU Unit	Naphtha Fill Line To Tk. # 44	NewTech 595-M-601	Carbon steel	2008	May-08	Pass	Praxair	None	N/A
29	Off-Road Diesel To Bays #1 & 2	8	397 L/F	From F-706 Filter Piping	To Meter Spools @ Bays # 1&2	D-700-500-118	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
30	(Old Kerosene) To Bay # 3	6	398 L/F	From F-706 Filter Piping	To Meter Spools @ Bays # 3	D-700-500-118	Carbon steel	2011					

*All lines that are temporarily out of service due to suspension of refining operations were steamed out and are hydrocarbon free

13.0 BLOOMFIELD REFINERY

UNDERGROUND PROCESS AND WASTEWATER LINES - Inspection & Repair Schedule

Line Number	Description (Service)	Line Size	Line Length	Starting Location	End Location	Drawing Reference	Construction Material	Inspection Scheduled	Inspection Date	Inspection Results Pass/Fail	Test/ Inspection Method	Repairs/ Maint Needed	Repairs-Maint Completion date
31	Premium Sales Line	10	399 L/F	From F-705 Filter Piping	To Meter Spools @ Bays # 1, 2 & 3	D-700-500-118	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
32	Unleaded Gasoline Sales Line	10	400 L/F	From F-704 Filter Piping	To Meter Spools @ Bays # 1, 2 & 3	D-700-500-118	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
33	ULSD To Bay # 4	8	401 L/F	From F-703 Filter Piping	To Meter Spool @ Bay # 4	D-700-500-123	Carbon steel	2007	Nov-07	Pass	Praxair	None	N/A
34	Ethanol Pump Suction Line	8	330 L/F	From Tk. # 45 Outlet Nozzle	To P-707 & P-707A Pump Suction	D-700-500-140	Carbon steel	2012					
35	Ethanol Unloading Line	4	330 L/F	From P-706 Pump Discharge	To Tk. # 45 Inlet Nozzle	D-700-500-140	Carbon steel	2012					
36	Naphtha Unloading Line	6	420 L/F	Suction Manifold @ P-607A	Unloading line @ Tk. #18 and 19	B-600-500-296	Carbon steel	2007	Sep-07	Pass		None	N/A
37	Naphtha Rundown To Tk. # 35	3	99	Line From North Pipe Rack Area	To Tk. # 35 Fill Nozzle	B-600-500-232	Carbon steel						*Temporarily Out of Service
38	Naphtha Feed Line to Unit	4	99	From P-607A Pump Discharge	To North Pipe Rack Feed To Units	B-600-500-236	Carbon steel						*Temporarily Out of Service
39	Cooling Water Supply Line	12	165 L/F	From # 1 Cooling Tower Pumps	To Rack Area @ Reformer Unit	D-500-500-011	Carbon steel						*Temporarily Out of Service
40	Cooling Water Return Line	12	165 L/F	From Rack Area @ Reformer	To #1 Cooling Tower Water Inlet	D-500-500-011	Carbon steel						*Temporarily Out of Service
41	Cooling Water Supply Line	20	145 L/F	From # 2 Cooling Tower Pumps	To S. End of FCC Unit @ Twr. 207 Area	D-201-500-123	Carbon steel						*Temporarily Out of Service
42	Cooling Water Return Line	20	145 L/F	From South End of FCC Unit	To # 2 Cooling Tower Water Inlet	D-201-500-123	Carbon steel						*Temporarily Out of Service
43	Sewer Transfer Line	10	54 L/F	From Main Sewer Box # 12	To Main Sewer Box # 11	D-500-500-402	Carbon steel	2012					
44	Sewer Transfer Line	10	46 L/F	From Main Sewer Box # 11	To Observation Access Can	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
45	Sewer Transfer Line	12	33 L/F	From Observation Access Can	To Observation Access Can	D-500-500-402	Carbon steel	2012					
46	Sewer Transfer Line	12	73 L/F	From Observation Access Can	To Main Sewer Box # 5	D-500-500-402	Carbon steel	2012					
47	Sewer Transfer Line	14	69 L/F	From Main Sewer Box # 5	To Observation Access Can (Desalter)	D-500-500-402	Carbon steel	2012					
48	Sewer Transfer Line	14	86 L/F	From Observation Access Can	To Main Sewer Box # 3	D-500-500-402	Carbon steel	2012					
49	Sewer Transfer Line	12	62 L/F	From Main Sewer Box # 9	To Main Sewer Box # 8	D-500-500-402	Carbon steel	2012					
50	Sewer Transfer Line	12	66 L/F	From Main Sewer Box # 8	To Main Sewer Box # 7	D-500-500-402	Carbon steel	2012					
51	Sewer Transfer Line	14	86 L/F	From Main Sewer Box # 7	To Main Sewer Box # 3	D-500-500-402	Carbon steel	2012					
52	Sewer Transfer Line	14	145 L/F	From Main Sewer Box # 3	To Observation Access Can (Precipitator)	D-500-500-402	Carbon steel	2012					
53	Sewer Transfer Line	14	100 L/F	From Observation Access Can	To Main Sewer Box # 1	D-500-500-402	Carbon steel	2012					
54	Sewer Transfer Line	12/10	TBD	From Main Sewer Box # 1	To Inlet @ API Separator	D-500-500-106	Carbon steel	2012					
55	Sewer Collection Manifold	8>4	56 L/F	Area East Side of # 4 Boiler	To North Side of Sewer Box # 12	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
56	Sewer Collection Manifold	10>4	164 L/F	Area @ & Around Crude Twr.	To North Side Of Sewer Box # 11	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
57	Sewer Collection Manifold	8>4	100 L/F	Area @ & Around E-106A & B	To Northwest Of Sewer Box # 10	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
58	Sewer Collection Manifold	6	10 L/F	Area @ V-101A Desalter	To East Side Of Sewer Box # 10	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
59	Sewer Collection Manifold	10>4	TBD	Area Thru Reformer Pump Row	To Observation Access Can	D-500-500-098	Carbon steel	2012					

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BLOOMFIELD REFINERY



UNDERGROUND PROCESS AND WASTEWATER LINES - Inspection & Repair Schedule



Line Number	Description (Service)	Line Size	Line Length	Starting Location	End Location	Drawing Reference	Construction Material	Inspection Scheduled	Inspection Date	Inspection Results Pass/Fail	Test/ Inspection Method	Repairs/ Maint Needed	Repairs-Maint Completion date
59	Sewer Collection Manifold	10>4	TBD	Area Thru Reformer Pump Row	To Observation Access Can	D-500-500-098	Carbon steel	2012					
60	Sewer Collection Manifold	10>4	TBD	Area Along East Side of Reformer	To Observation Access Can	D-500-500-098	Carbon steel	2012					
61	Sewer Collection Manifold	8>4	60 L/F	Area @ & Around V101 Desalter	To Observation Access Can (Desalter)	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
62	Sewer Collection Manifold	8>4	140 L/F	Area @ & Around T-101 Tower	To West Side Of Sewer Box # 9	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
63	Sewer Collection Manifold	8>4	104 L/F	Area @ & Around P101 Charge P.	To North Side Of Sewer Box # 9	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
64	Sewer Collection Manifold	8>4	88 L/F	Area @ & Around T-103 Tower	To Northwest Side Of Sewer Box # 8	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
65	Sewer Collection Manifold	8>4	92 L/F	Area @ & Around Heavy Oil Exch.	To North Side Of Sewer Box # 8	D-500-500-402	Carbon steel	2010	Jul-10	Pass	Hydrostatic	None	N/A
66	Sewer Collection Manifold	8>4	TBD	Area @ & Around Main Air Blower	To Northwest Side Of Sewer Box # 3	D-500-500-134	Carbon steel	2012					
67	Sewer Collection Manifold	6>3	TBD	Area @ Burner Fuel Loading	To Observation Access Can (Precipitator)	D-600-500-127	Carbon steel	2012					
68	Sewer Collection Manifold	4	TBD	Area Drains @ Air Building	To Sewer Transfer Line (Box # 1 to API)	D-500-500-160	Carbon steel	2012					
69	Sewer Collection Manifold	4	86 L/F	P-224 Pump & Cat Surface Drain	To Sewer Transfer Line From FCC Process	D-201-500-001	Carbon steel	2011	Jul-09	Pass	Hydrostatic	None	N/A
70	Sewer Collect./Transfer Line	6	325 L/F	Gas Con Unit Collection M.H.	To FCC Sewer Box Manhole # 13	D-201-500-001	Carbon steel	2011	Jul-09	Pass	Hydrostatic	None	N/A
71	Sewer Transfer Line	10	35 L/F	From FCC Sewer Box M.H. # 13	To FCC Sewer Box # 14 (Roadway)	D-201-500-001	Carbon steel	2011	Jul-09	Pass	Hydrostatic	None	N/A
72	Sewer Transfer Line	10	TBD	From FCC Sewer Box M.H. #14	To 20" Inlet @ API	D-500-500-106	Carbon steel	2011					
73	Sewer Collection Manifold	6/4	335 L/F	Area @ & Around Gas Con. Unit	To Gas Con. Unit Sewer Collection	D-200-200-233	Carbon steel	2011	Jul-09	Pass	Hydrostatic	None	N/A
74	Sewer Transfer Line	10	TBD	From Treater Main Sewer Box # 16	To Sewer Box #15 - S.E. Of C-204	D-500-500-166	Carbon steel	2011					
75	Sewer Transfer Line	10	TBD	Sewer Box #15 - S.E. Of C-204	To 20" Inlet @ API	D-500-500-105	Carbon steel	2011					
76	Sewer Collection Manifold	10>4	410 L/F	Area In & Around Treater Unit	To Treater Sewer Box At South Side Of Unit	D-500-500-122	Carbon steel	2011	Sep-09	Pass	Hydrostatic	None	N/A
77	Sewer Collection Manifold	6>2	550 L/F	Area In & Around Poly Unit	To Inlet Bay @ API	D-500-500-126	Carbon steel	2011	May-09	Pass	Hydrostatic	None	N/A
78	Sewer Transfer Line	10	130 L/F	From Sewer Box # 17 @ DHT Unit	To Sewer Box # 18 @ S.E. Corner of Poly	D-500-500-097	Carbon steel	2011	Jun-09	Pass	Hydrostatic with Replacer with Stainless Steel Flange	None	N/A
79	Sewer Transfer Line	12	TBD	From Sewer Box # 18	To Inlet Manifold @ API Basin Area		Carbon steel	2011					
80	Sewer Collection Manifold	10>4	TBD	Area In & Around DHT/Larox Unit	To Sewer Box # 18 @ S.E. Corner of DHT		Carbon steel	2007	Dec-07	Pass	Hydrotest	None	N/A
81	Crude Transfer Line	12	99 L/F	Pipe Rack East Of LPG Stg Tks.	Pipe Rack South of Crude Unloading Bays #43	D-000-900-023	Carbon steel	2008	May-08	Pass	Praxair	None	N/A
82	Crude Transfer Line	12	194 L/F	Pipe Rack South of Crude Unloading Bays	Berm South of Tank #43	D-000-900-023	Carbon steel	2008	May-08	Pass	Praxair	None	N/A
83	Sewer Transfer Line	4	822 L/F	Discharge at Tk #37	Valve box at corner Northeast of DHT	AMEC 6/7	Carbon Steel/PVC	2010	Jun-10	Pass	Hydrostatic	None	N/A
84	Premium Sales Line from Tk #3 & 4	8	300 L/F	Area West of API Separator	DHT Option City		Carbon Steel	2007	Nov-07	Pass	Praxair	None	N/A
85	Diesel Receipts	6	25 L/F	Roadway SW of Tk #17	Piperack btwn Tk #34 and Tk #25	D-800-600-104	Carbon Steel	2010	Jun-10	Pass	Hydrotest	None	N/A
86	Premium/Unheaded Receipts	6	25 L/F	Roadway SW of Tk #17	Piperack btwn Tk #34 and Tk #25	D-800-600-099	Carbon Steel	2010	Jun-10	Pass	Hydrotest	None	N/A
87	Groundwater Recovery Transfer Line	3	970 L/F	Tk #38	Slop Line NE of Tk #31	D-600-800-121	Carbon Steel	2010	Aug-10	Pass	Hydrotest	None	N/A
88	Injection Well Transfer	4	45 L/F	Injection Well Building	Downhole Injection Well	D-500-800-031	Carbon Steel	2010	Oct-10	Pass	Hydrotest	None	N/A

*All lines that are temporarily out of service due to suspension of refining operations were steamed out and are hydrocarbon free

Total in 2010 - 5997 feet

13.0 BLOOMFIELD REFINERY

TANKS - Inspection & Repair Schedule

(*schedule set according to API 650 & 653)

Tank #	Service	Normal Capacity (bbls)	Last Test/ Inspection	Test/ Inspection Method	Next Test/ Inspection Scheduled	Date OCD-SFO Requirements Satisfied	Test/ Inspection Date	Repairs/Maint Needed	Repairs/Maint Completion Date
2	FILTERED WATER	64,347	2000	Internal	2010	2010	11/13/2010	None	11/13/2010
3	MID-GRADE	9,365	2003	Internal	2013	2013	10/1/2003	Seal Replacement	10/8/2003
4	MID-GRADE	9,365	2003	Internal	2013	2013	9/17/2003	Seal Replacement	9/24/2003
5	WASTE WATER SURGE	9096	2007	Internal	2017	2007	5/28/2008	None	N/A
8	CRUDE SLOP	460	2007	External (Concrete Liner)	2017	2007	6/7/2007	None	N/A
9	CRUDE SLOP	460	2007	External (Concrete Liner)	2017	2007	11/10/07	None	N/A
10	SPENT CAUSTIC - O/S	360	2007	Internal	2017	2007	8/24/2007	Repaired Hatch & Floor	8/22/2007
11	LOW REFORMATE	50,358	2002	Internal	2012	2012	9/11/2002	Seal Replacement	9/18/2002
12	CAT / POLY GAS - O/S	50,358	1999	Internal	2010	2010	5/5/2010	Emptied, Cleaned - Not Inspected	
13	UNLEAD SALES	27,646	2008	Internal	2018	2008	5/15/2010	New Floor Installed	5/15/2011
14	UNLEAD SALES	27,615	2005	Internal	2015	2005	9/21/2005	None	N/A
17	CAT FEED - O/S	38403	2007	Internal	2017	2007	1/15/2010	Emptied, Cleaned - Not Inspected	
18	#1 DIESEL SALES - O/S	50358	1999	Internal	2010	2010	4/23/2010	Emptied, Cleaned - Inspected	
19	#2 DIESEL SALES	34991	2000	Internal	2010	2010	12/01/10	Floor Repair	12/28/2010
20	NAPHTHA	10000	2007	Internal	2017	2007	10/29/07	New Construction	N/A
23	BASE GASOLINE - O/S	38,402	2002	Internal	2012	2012	06/15/10	Emptied, Cleaned - Not Inspected	
24	ULS DIESEL	10107	2006	Internal	2016	2006	03/01/06	New Construction	N/A
25	ULS DIESEL	10107	2006	Internal	2016	2006	02/06/06	New Construction	N/A
26	SWEET NAPHTHA	3,264	2008	Praxair	2018	2008	05/29/08	None	N/A
27	HEAVY BURNER FUEL - O/S	9,854	2006	Internal	2016	2006	08/31/06	Emptied, Cleaned - Not Inspected	
28	CRUDE - O/S	77,854	2009	Internal	2019	2009	11/09/09	Emptied, Cleaned - Not Inspected	
29	#2 DIESEL/FCC SLOP - O/S	16,676	2005	Internal	2015	2005	07/10/10	Emptied, Cleaned - Not Inspected	
30	PREMIUM UNLEAD BLEND	16,676	2004	Internal	2014	2004	05/24/10	None	5/24/2010
31	CRUDE	98,676	2003	Internal	2013	2013	01/09/03	Repair Roof Drain	1/8/2003
32	PREMIUM UNLEAD SALES	17,913	1999	Internal/UTS*	2019	2009	04/01/09	None	N/A
33	RECOVERY WELL WATER	360	2008	Internal	2018	2008	04/09/08	None	N/A
34	INJECTION WELL RESERVOR	360	2002	Internal	2012	2012	11/20/02	Repair Pinhole	1/20/2002
35	REFORMER FEED	43904	2005	Internal	2015	2005	03/18/10	Emptied, Cleaned - Not Inspected	
36	CAT / POLY GAS	43904	2005	Internal	2015	2005	08/24/05	None	N/A
37	FRENCH DRAIN	121	2009	Internal/UTS*	2019	2009	06/11/09	None	N/A
38	EAST OUTFALL	302	2003	Internal	2013	2013	04/09/08	None	N/A
41	CRUDE STORAGE	2798	2008	Praxair	2018	2008	05/29/08	None	N/A
42A	TERMINALS SLOP	400	2007	API 650	2017	2007	06/01/07	New Construction	N/A
42B	TERMINALS SLOP	400	2007	API 650	2017	2007	06/01/07	New Construction	N/A
43	TERMINALS SLOP	560	O/S	O/S	O/S	O/S	O/S	Out of Service	O/S
44	VRU NAPHTHA	1,751	2008	Praxair	2018	2008	05/29/08	None	N/A
45	ETHANOL	4821	2008	Internal	2018	2008	02/20/08	None	N/A

S = Ultrasonic Thickness Survey

O/S = Out of Service

13.0 BLOOMFIELD REFINERY SEWER BOXES - Inspection & Repair Schedule

Sewer Box Number	Location	Type Material	Drawing Reference	Actual Inspection Date	Inspection results Pass/Fail	Repairs/Maint Needed	Repairs/Maint Completion date
1	Northwest of Main Pipe Bridge	Concrete	D-500-500-134	7/14/2010	Pass	None	N/A
2	Southeast of Precipitator	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
3	Southeast of Main Blower	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
4	Southeast of Old Desalter	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
5	Southeast of Control Room	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
6	Southeast of Reformer	Concrete	D-500-500-124	7/15/2010	Pass	None	N/A
7	Southwest of Mainblower	Concrete	D-500-500-124	5/4/2009	Pass	None	N/A
8	South of E-113's	Concrete	D-500-500-124	7/14/2010	Pass	None	N/A
9	South of P-105's	Concrete	D-500-500-124	7/14/2010	Pass	None	N/A
10	West of New Desalter	Concrete	D-500-500-124	7/14/2010	Pass	None	N/A
11	South of T-102	Concrete	D-500-500-124	7/14/2010	Pass	None	N/A
12	South of P-103;s	Concrete	D-500-500-124	7/14/2010	Pass	None	N/A
13	In Roadway South of FCCU	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
14	In Roadway Southwest of C-801's	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
15	In Roadway Southeast of Wet Gas	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
16	South of Treater	Concrete	D-500-500-134	7/14/2010	Pass	None	N/A
17	In Roadway East of DHT	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A
18	In Roadway Southeast of Poly Unit	Concrete	D-500-500-134	7/15/2010	Pass	None	N/A

13.0 BLOOMFIELD REFINERY SUMPS - Inspection & Repair Schedule

Sump Number	Location	Type Material	Drawing Reference	Actual Inspection Date	Inspection results Pass/Fail	Repairs/Maint Needed	Repairs/Maint Completion date
16	Sump @ S.W. Side Of Tk. 3	Concrete	D-000-900-023	7/6/2010	Pass	None	N/A
17	Sump Between Tk. 3 & 4	Concrete	D-000-900-023	7/6/2010	Pass	None	N/A
18	Sump Between Tk. 4 & 5	Concrete	D-000-900-023	7/6/2010	Pass	None	N/A
19	Sump @ N.Side Of Tk. 5	Concrete	D-000-900-023	7/6/2010	Pass	None	N/A
20	Sump Between Tk. 11 & 12	Concrete	D-000-900-023	7/6/2010	Pass	None	N/A
21	Sump Between Tk. 13 & 14	Concrete	D-000-900-023	7/6/2010	Pass	None	N/A
22	Sump @ N. Side Of Tk. 17	Concrete	D-000-900-023	7/7/2010	Pass	None	N/A
23	Sump @ N.E. Side Of Tk. 18	Concrete	D-000-900-023	7/7/2010	Pass	None	N/A
24	Sump @ N.E. Side Of Tk. 19	Concrete	D-000-900-023	7/7/2010	Pass	None	N/A
25	Sump @ S.W. Side Of Tk. 20	DW Steel	D-000-900-023	7/8/2010	Pass	None	N/A
26	Sump @ S. Side Of Tk. 23	Concrete	D-000-900-023	7/14/2010	Pass	None	N/A
27	Sump @ E. Side Of Tk. 24	DW Steel	D-000-900-023	7/14/2010	Pass	None	N/A
28	Sump @ E. Side Of Tk. 25	DW Steel	D-000-900-023	7/14/2010	Pass	None	N/A
29	Sump @ N.W. Side Of Tk. 26	Concrete	D-000-900-023	7/14/2010	Pass	None	N/A
30	Sump @ S.E. Side Of Tk. 27	Concrete	D-000-900-023	7/14/2010	Pass	None	N/A
31	Sump @ West Side Of Tk. 28	Concrete	D-000-900-023	7/13/2010	Pass	None	N/A
32	Sump @ N.E. Side Of Tk. 29	Concrete	D-000-900-023	7/13/2010	Pass	None	N/A
33	Sump @ S.W. Side Of Tk. 30	Concrete	D-000-900-023	7/13/2010	Pass	None	N/A
34	Sump @ N.W. Side Of Tk. 31	Concrete	D-000-900-023	7/8/2010	Pass	None	N/A
35	Sump @ S.E. Side Of Tk. 31	Concrete	D-000-900-023	7/8/2010	Pass	None	N/A
36	Sump @ East Side Of Tk. 32	Concrete	D-000-900-023	7/8/2010	Pass	None	N/A
37	Sump @ N.E. Side Of Tk. 35	DW Steel	D-000-900-023	7/7/2010	Pass	None	N/A
38	Sump @ N.E. Side Of Tk. 36	DW Steel	D-000-900-023	7/8/2010	Pass	None	N/A
39	Sump @ S. Side Of Tk. 18	Concrete	D-000-900-023	7/7/2010	Pass	None	N/A
40	Sump @ S. Side Of Tk. 19	Concrete	D-000-900-023	7/7/2010	Pass	None	N/A
41	Sump @ S. Side Of Flare	Concrete	D-000-900-023	7/6/2010	Pass	None	N/A
42	Sump @ N.W. Of Precipitator	Concrete	D-000-900-023	7/13/2010	Pass	None	N/A

Appendix A North Barrier Wall

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Observation Well Fluids Monitoring Jan. 2010

Appendix A - Tab 1.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	1/11/2010	5506.62	12.26	NPP	12.22	5494.40	NPP
	1/25/2010	5506.62	12.26	NPP	12.23	5494.39	NPP
OW 1+50	1/11/2010	5508.03	14.36	14.07	14.33	5493.91	0.26
	1/25/2010	5508.03	14.36	14.03	14.36	5493.93	0.33
OW 3+85	1/11/2010	5507.31	15.06	13.62	13.84	5493.65	0.22
	1/25/2010	5507.31	15.06	13.60	13.73	5493.68	0.13
OW 5+50	1/11/2010	5507.59	13.67	NPP	13.64	5493.95	NPP
	1/25/2010	5507.59	13.67	NPP	13.64	5493.95	NPP
OW 6+70	1/11/2010	5504.78	14.67	NPP	NWP		NPP
	1/25/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	1/11/2010	5506.53	15.99	NPP	NWP		NPP
	1/25/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	1/11/2010	5506.70	16.59	12.25	12.65	5494.37	0.40
	1/25/2010	5506.70	16.59	12.62	12.63	5494.08	0.01
OW 14+10	1/11/2010	5508.14	12.96	NPP	NWP		NPP
	1/25/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	1/11/2010	5508.43	15.21	NPP	13.13	5495.30	NPP
	1/25/2010	5508.43	15.21	NPP	13.14	5495.29	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring Jan. 2010

Appendix A - Tab 1.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	1/11/2010	5508.03	13.00	NPP	NWP		NPP
	1/25/2010	5508.03	13.00	NPP	NWP		NPP
OW 22+00	1/11/2010	5506.91	14.16	NPP	12.45	5494.46	NPP
	1/25/2010	5506.91	14.16	NPP	10.88	5496.03	NPP
OW 23+10	1/11/2010	5514.12	18.34	NPP	16.28	5497.84	NPP
	1/25/2010	5514.12	18.34	NPP	16.23	5497.89	NPP
OW 23+90	1/11/2010	5515.18	18.01	NPP	17.13	5498.05	NPP
	1/25/2010	5515.18	18.01	NPP	17.08	5498.10	NPP
OW 25+70	1/11/2010	5509.00	13.98	NPP	10.78	5498.22	NPP
	1/25/2010	5509.00	13.98	NPP	10.82	5498.18	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring Jan. 2010

Appendix A - Tab 1.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
0+60 CW	1/11/2010	5506.68	14.09	NPP	8.97	5497.71	NPP
	1/25/2010	5506.68	14.09	NPP	8.53	5498.15	NPP
1+50 CW	1/11/2010	5505.13	13.74	NPP	7.38	5497.75	NPP
	1/25/2010	5505.13	13.74	NPP	7.24	5497.89	NPP
3+85 CW	1/11/2010	5503.87	13.11	NPP	5.98	5497.89	NPP
	1/25/2010	5503.87	13.11	NPP	5.98	5497.89	NPP
5+50 CW	1/11/2010	5503.76	12.27	NPP	6.57	5497.19	NPP
	1/25/2010	5503.76	12.27	NPP	6.42	5497.34	NPP
6+70 CW	1/11/2010	5503.84	11.45	NPP	6.98	5496.86	NPP
	1/25/2010	5503.84	11.45	NPP	6.84	5497.00	NPP
8+10 CW	1/11/2010	5504.02	11.63	NPP	7.92	5496.10	NPP
	1/25/2010	5504.02	11.63	NPP	7.91	5496.11	NPP
8+45 CW	1/11/2010	5503.80	12.6	NPP	8.07	5495.73	NPP
	1/25/2010	5503.80	12.6	NPP	8.03	5495.77	NPP
11+15 CW	1/11/2010	5503.95	12.27	NPP	6.03	5497.92	NPP
	1/25/2010	5503.95	12.27	NPP	6.12	5497.83	NPP
14+10 CW	1/11/2010	5504.39	13.05	NPP	6.52	5497.87	NPP
	1/25/2010	5504.39	13.05	NPP	6.51	5497.88	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring Jan. 2010

Appendix A - Tab 1.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	1/11/2010	5504.32	12.86	NPP	6.23	5498.09	NPP
	1/25/2010	5504.32	12.86	NPP	6.18	5498.14	NPP
CW 19+50	1/11/2010	5504.52	9.99	NPP	6.55	5497.97	NPP
	1/25/2010	5504.52	9.99	NPP	6.56	5497.96	NPP
CW 22+00	1/11/2010	5508.04	12.34	NPP	9.02	5499.02	NPP
	1/25/2010	5508.04	12.34	NPP	8.96	5499.08	NPP
CW 23+10	1/11/2010	5510.04	14.65	NPP	10.62	5499.42	NPP
	1/25/2010	5510.04	14.65	NPP	10.61	5499.43	NPP
CW 23+90	1/11/2010	5507.32	11.72	NPP	8.09	5499.23	NPP
	1/25/2010	5507.32	11.72	NPP	8.07	5499.25	NPP
CW 25+95	1/11/2010	5505.90	12.25	NPP	7.19	5498.71	NPP
	1/25/2010	5505.90	12.25	NPP	7.19	5498.71	NPP

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring Jan. 2010

Appendix A - Tab 1.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	1/11/2010	5510.31	22.94	NPP	11.61	5498.70	NPP
	1/25/2010	5510.31	22.94	NPP	11.21	5499.10	NPP
MW #12	1/11/2010	5501.61	14.98	NPP	10.31	5491.30	NPP
	1/25/2010	5501.61	14.98	NPP	10.23	5491.38	NPP
MW #20	1/11/2010	5519.90	27.13	20.68	21.40	5499.08	0.72
	1/25/2010	5519.90	27.13	20.68	21.42	5499.07	0.74
MW #21	1/11/2010	5521.99	30.38	21.86	21.88	5500.13	0.02
	1/25/2010	5521.99	30.38	21.83	21.91	5500.14	0.08
MW #39	1/11/2010	5520.83	38.34	NPP	26.74	5494.09	NPP
	1/25/2010	5520.83	38.34	NPP	25.65	5495.18	NPP
MW #45	1/11/2010	5506.36	16.92	11.88	11.98	5494.46	0.10
	1/25/2010	5506.36	16.92	12.04	12.08	5494.31	0.04
MW #46	1/11/2010	5504.65	10.39	NPP	NWP		NPP
	1/25/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	1/11/2010	5506.77	14.28	12.81	13.43	5493.84	0.62
	1/25/2010	5506.77	14.28	12.78	13.41	5493.86	0.63

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring Feb. 2010

Appendix A - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	2/9/2010	5506.62	12.26	NPP	11.69	5494.93	NPP
	2/23/2010	5506.62	12.26	NPP	11.57	5495.05	NPP
OW 1+50	2/9/2010	5508.03	14.36	NPP	13.31	5494.72	NPP
	2/23/2010	5508.03	14.36	NPP	13.34	5494.69	NPP
OW 3+85	2/9/2010	5507.31	15.06	NPP	12.92	5494.39	NPP
	2/23/2010	5507.31	15.06	NPP	12.92	5494.39	NPP
OW 5+50	2/9/2010	5507.59	13.67	NPP	13.66	5493.93	NPP
	2/23/2010	5507.59	13.67	NPP	13.58	5494.01	NPP
OW 6+70	2/9/2010	5504.78	14.67	NPP	NWP		NPP
	2/23/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	2/9/2010	5506.53	15.99	NPP	NWP		NPP
	2/23/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	2/9/2010	5506.70	16.59	NPP	12.51	5494.19	NPP
	2/23/2010	5506.70	16.59	NPP	12.49	5494.21	NPP
OW 14+10	2/9/2010	5508.14	12.96	NPP	NWP		NPP
	2/23/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	2/9/2010	5508.43	15.21	NPP	12.63	5495.80	NPP
	2/23/2010	5508.43	15.21	NPP	12.45	5495.98	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring Feb. 2010

Appendix A - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	2/9/2010	5508.03	13.00	NPP	12.94	5495.09	NPP
	2/23/2010	5508.03	13.00	NPP	12.32	5495.71	NPP
OW 22+00	2/9/2010	5506.91	14.16	NPP	10.28	5496.63	NPP
	2/23/2010	5506.91	14.16	NPP	10.58	5496.33	NPP
OW 23+10	2/9/2010	5514.12	18.34	NPP	16.10	5498.02	NPP
	2/23/2010	5514.12	18.34	NPP	16.22	5497.90	NPP
OW 23+90	2/9/2010	5515.18	18.01	NPP	16.98	5498.20	NPP
	2/23/2010	5515.18	18.01	NPP	17.05	5498.13	NPP
OW 25+70	2/9/2010	5509.00	13.98	NPP	10.67	5498.33	NPP
	2/23/2010	5509.00	13.98	NPP	10.71	5498.29	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring Feb. 2010

Appendix A - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
0+60 CW	2/9/2010	5506.68	14.09	NPP	8.08	5498.60	NPP
	2/23/2010	5506.68	14.09	NPP	8.26	5498.42	NPP
1+50 CW	2/9/2010	5505.13	13.74	NPP	6.86	5498.27	NPP
	2/23/2010	5505.13	13.74	NPP	6.93	5498.20	NPP
3+85 CW	2/9/2010	5503.87	13.11	NPP	5.82	5498.05	NPP
	2/23/2010	5503.87	13.11	NPP	5.77	5498.10	NPP
5+50 CW	2/9/2010	5503.76	12.27	NPP	6.34	5497.42	NPP
	2/23/2010	5503.76	12.27	NPP	6.35	5497.41	NPP
6+70 CW	2/9/2010	5503.84	11.45	NPP	6.67	5497.17	NPP
	2/23/2010	5503.84	11.45	NPP	6.64	5497.20	NPP
8+10 CW	2/9/2010	5504.02	11.63	NPP	7.73	5496.29	NPP
	2/23/2010	5504.02	11.63	NPP	7.63	5496.39	NPP
8+45 CW	2/9/2010	5503.80	12.6	NPP	7.83	5495.97	NPP
	2/23/2010	5503.80	12.6	NPP	7.72	5496.08	NPP
11+15 CW	2/9/2010	5503.95	12.27	NPP	6.05	5497.90	NPP
	2/23/2010	5503.95	12.27	NPP	6.11	5497.84	NPP
14+10 CW	2/9/2010	5504.39	13.05	NPP	6.48	5497.91	NPP
	2/23/2010	5504.39	13.05	NPP	6.56	5497.83	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring Feb. 2010

Appendix A - Tab 2.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	2/9/2010	5504.32	12.86	NPP	6.15	5498.17	NPP
	2/23/2010	5504.32	12.86	NPP	6.22	5498.10	NPP
CW 19+50	2/9/2010	5504.52	9.99	NPP	6.54	5497.98	NPP
	2/23/2010	5504.52	9.99	NPP	6.59	5497.93	NPP
CW 22+00	2/9/2010	5508.04	12.34	NPP	8.86	5499.18	NPP
	2/23/2010	5508.04	12.34	NPP	7.82	5500.22	NPP
CW 23+10	2/9/2010	5510.04	14.65	NPP	10.49	5499.55	NPP
	2/23/2010	5510.04	14.65	NPP	10.43	5499.61	NPP
CW 23+90	2/9/2010	5507.32	11.72	NPP	7.98	5499.34	NPP
	2/23/2010	5507.32	11.72	NPP	7.95	5499.37	NPP
CW 25+95	2/9/2010	5505.90	12.25	NPP	7.16	5498.74	NPP
	2/23/2010	5505.90	12.25	NPP	7.16	5498.74	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	2/9/2010	5510.31	22.94	NPP	10.79	5499.52	NPP
	2/23/2010	5510.31	22.94	NPP	11.01	5499.30	NPP
MW #12	2/9/2010	5501.61	14.98	NPP	10.11	5491.50	NPP
	2/23/2010	5501.61	14.98	NPP	9.94	5491.67	NPP
MW #20	2/9/2010	5519.90	27.13	20.66	21.28	5499.12	0.62
	2/23/2010	5519.90	27.13	20.62	21.26	5499.15	0.64
MW #21	2/9/2010	5521.99	30.38	21.59	21.68	5500.38	0.09
	2/23/2010	5521.99	30.38	21.48	21.58	5500.49	0.10
MW #39	2/9/2010	5520.83	38.34	NPP	25.58	5495.25	NPP
	2/23/2010	5520.83	38.34	NPP	25.62	5495.21	NPP
MW #45	2/9/2010	5506.36	16.92	NPP	11.78	5494.58	NPP
	2/23/2010	5506.36	16.92	NPP	11.75	5494.61	NPP
MW #46	2/9/2010	5504.65	10.39	NPP	NWP		NPP
	2/23/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	2/9/2010	5506.77	14.28	NPP	12.31	5494.46	NPP
	2/23/2010	5506.77	14.28	NPP	12.32	5494.45	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	3/10/2010	5506.62	12.26	NPP	11.57	5495.05	NPP
	3/26/2010	5506.62	12.26	NPP	11.50	5495.12	NPP
OW 1+50	3/10/2010	5508.03	14.36	13.32	13.47	5494.68	0.15
	3/26/2010	5508.03	14.36	NPP	13.29	5494.74	NPP
OW 3+85	3/10/2010	5507.31	15.06	NPP	12.87	5494.44	NPP
	3/26/2010	5507.31	15.06	NPP	12.86	5494.45	NPP
OW 5+50	3/10/2010	5507.59	13.67	NPP	13.43	5494.16	NPP
	3/26/2010	5507.59	13.67	NPP	13.42	5494.17	NPP
OW 6+70	3/10/2010	5504.78	14.67	NPP	NWP		NPP
	3/26/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	3/10/2010	5506.53	15.99	NPP	15.90	5490.63	NPP
	3/26/2010	5506.53	15.99	NPP	15.61	5490.92	NPP
OW 11+15	3/10/2010	5506.70	16.59	NPP	12.38	5494.32	NPP
	3/26/2010	5506.70	16.59	NPP	12.37	5494.33	NPP
OW 14+10	3/10/2010	5508.14	12.96	NPP	NWP		NPP
	3/26/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	3/10/2010	5508.43	15.21	NPP	12.33	5496.10	NPP
	3/26/2010	5508.43	15.21	NPP	12.26	5496.17	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	3/10/2010	5508.03	13.00	NPP	11.78	5496.25	NPP
	3/26/2010	5508.03	13.00	NPP	11.42	5496.61	NPP
OW 22+00	3/10/2010	5506.91	14.16	NPP	10.74	5496.17	NPP
	3/26/2010	5506.91	14.16	NPP	10.61	5496.30	NPP
OW 23+10	3/10/2010	5514.12	18.34	NPP	16.18	5497.94	NPP
	3/26/2010	5514.12	18.34	NPP	16.20	5497.92	NPP
OW 23+90	3/10/2010	5515.18	18.01	NPP	17.09	5498.09	NPP
	3/26/2010	5515.18	18.01	NPP	17.05	5498.13	NPP
OW 25+70	3/10/2010	5509.00	13.98	NPP	10.71	5498.29	NPP
	3/26/2010	5509.00	13.98	NPP	10.70	5498.30	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring March 2010

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 0+60	3/10/2010	5506.68	14.09	NPP	8.33	5498.35	NPP
	3/26/2010	5506.68	14.09	NPP	8.18	5498.50	NPP
CW 1+50	3/10/2010	5505.13	13.74	NPP	6.89	5498.24	NPP
	3/26/2010	5505.13	13.74	NPP	6.77	5498.36	NPP
CW 3+85	3/10/2010	5503.87	13.11	NPP	5.67	5498.20	NPP
	3/26/2010	5503.87	13.11	NPP	6.58	5497.29	NPP
CW 5+50	3/10/2010	5503.76	12.27	NPP	6.31	5497.45	NPP
	3/26/2010	5503.76	12.27	NPP	6.31	5497.45	NPP
CW 6+70	3/10/2010	5503.84	11.45	NPP	6.59	5497.25	NPP
	3/26/2010	5503.84	11.45	NPP	6.58	5497.26	NPP
CW 8+10	3/10/2010	5504.02	11.63	NPP	7.49	5496.53	NPP
	3/26/2010	5504.02	11.63	NPP	7.41	5496.61	NPP
CW 8+45	3/10/2010	5503.80	12.6	NPP	7.57	5496.23	NPP
	3/26/2010	5503.80	12.6	NPP	7.52	5496.28	NPP
CW 11+15	3/10/2010	5503.95	12.27	NPP	6.93	5497.02	NPP
	3/26/2010	5503.95	12.27	NPP	5.84	5498.11	NPP
CW 14+10	3/10/2010	5504.39	13.05	NPP	6.35	5498.04	NPP
	3/26/2010	5504.39	13.05	NPP	6.25	5498.14	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	3/10/2010	5504.32	12.86	NPP	6.12	5498.20	NPP
	3/26/2010	5504.32	12.86	NPP	6.08	5498.24	NPP
CW 19+50	3/10/2010	5504.52	9.99	NPP	6.48	5498.04	NPP
	3/26/2010	5504.52	9.99	NPP	6.41	5498.11	NPP
CW 22+00	3/10/2010	5508.04	12.34	NPP	8.79	5499.25	NPP
	3/26/2010	5508.04	12.34	NPP	8.77	5499.27	NPP
CW 23+10	3/10/2010	5510.04	14.65	NPP	10.42	5499.62	NPP
	3/26/2010	5510.04	14.65	NPP	10.40	5499.64	NPP
CW 23+90	3/10/2010	5507.32	11.72	NPP	7.94	5499.38	NPP
	3/26/2010	5507.32	11.72	NPP	7.95	5499.37	NPP
CW 25+95	3/10/2010	5505.90	12.25	NPP	7.15	5498.75	NPP
	3/26/2010	5505.90	12.25	NPP	7.15	5498.75	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	3/10/2010	5510.31	22.94	NPP	11.06	5499.25	NPP
	3/26/2010	5510.31	22.94	NPP	11.03	5499.28	NPP
MW #12	3/10/2010	5501.61	14.98	NPP	9.83	5491.78	NPP
	3/26/2010	5501.61	14.98	NPP	9.75	5491.86	NPP
MW #20	3/10/2010	5519.90	27.13	20.57	21.10	5499.22	0.53
	3/26/2010	5519.90	27.13	20.55	21.07	5499.25	0.52
MW #21	3/10/2010	5521.99	30.38	21.42	21.52	5500.55	0.10
	3/26/2010	5521.99	30.38	21.49	21.59	5500.48	0.10
MW #39	3/10/2010	5520.83	38.34	NPP	25.44	5495.39	NPP
	3/26/2010	5520.83	38.34	NPP	25.49	5495.34	NPP
MW #45	3/10/2010	5506.36	16.92	NPP	11.65	5494.71	NPP
	3/26/2010	5506.36	16.92	NPP	11.61	5494.75	NPP
MW #46	3/10/2010	5504.65	10.39	NPP	9.84	5494.81	NPP
	3/26/2010	5504.65	10.39	NPP	9.84	5494.81	NPP
MW #47	3/10/2010	5506.77	14.28	NPP	12.31	5494.46	NPP
	3/26/2010	5506.77	14.28	NPP	12.25	5494.52	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	4/12/2010	5506.62	12.26	NPP	11.50	5495.12	NPP
	4/26/2010	5506.62	12.26	NPP	11.47	5495.15	NPP
OW 1+50	4/12/2010	5508.03	14.36	13.31	13.32	5494.72	0.01
	4/26/2010	5508.03	14.36	13.34	13.35	5494.69	0.01
OW 3+85	4/12/2010	5507.31	15.06	NPP	12.81	5494.50	NPP
	4/26/2010	5507.31	15.06	NPP	12.84	5494.47	NPP
OW 5+50	4/12/2010	5507.59	13.67	NPP	13.24	5494.35	NPP
	4/26/2010	5507.59	13.67	NPP	13.43	5494.16	NPP
OW 6+70	4/12/2010	5504.78	14.67	NPP	NWP		NPP
	4/26/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	4/12/2010	5506.53	15.99	NPP	15.90	5490.63	NPP
	4/26/2010	5506.53	15.99	NPP	15.96	5490.57	NPP
OW 11+15	4/12/2010	5506.70	16.59	12.39	12.43	5494.30	0.04
	4/26/2010	5506.70	16.59	12.29	12.42	5494.38	0.13
OW 14+10	4/12/2010	5508.14	12.96	NPP	NWP		NPP
	4/26/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	4/12/2010	5508.43	15.21	NPP	12.28	5496.15	NPP
	4/26/2010	5508.43	15.21	NPP	12.30	5496.13	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	4/12/2010	5508.03	13.00	NPP	11.41	5496.62	NPP
	4/26/2010	5508.03	13.00	NPP	11.43	5496.60	NPP
OW 22+00	4/12/2010	5506.91	14.16	NPP	11.18	5495.73	NPP
	4/26/2010	5506.91	14.16	NPP	11.46	5495.45	NPP
OW 23+10	4/12/2010	5514.12	18.34	NPP	16.23	5497.89	NPP
	4/26/2010	5514.12	18.34	NPP	16.23	5497.89	NPP
OW 23+90	4/12/2010	5515.18	18.01	NPP	17.12	5498.06	NPP
	4/26/2010	5515.18	18.01	NPP	17.94	5497.24	NPP
OW 25+70	4/12/2010	5509.00	13.98	NPP	10.72	5498.28	NPP
	4/26/2010	5509.00	13.98	NPP	10.69	5498.31	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 0+60	4/12/2010	5506.68	14.09	NPP	8.24	5498.44	NPP
	4/26/2010	5506.68	14.09	NPP	8.27	5498.41	NPP
CW 1+50	4/12/2010	5505.13	13.74	NPP	6.71	5498.42	NPP
	4/26/2010	5505.13	13.74	NPP	6.90	5498.23	NPP
CW 3+85	4/12/2010	5503.87	13.11	NPP	6.56	5497.31	NPP
	4/26/2010	5503.87	13.11	NPP	6.65	5497.22	NPP
CW 5+50	4/12/2010	5503.76	12.27	NPP	6.33	5497.43	NPP
	4/26/2010	5503.76	12.27	NPP	6.33	5497.43	NPP
CW 6+70	4/12/2010	5503.84	11.45	NPP	6.62	5497.22	NPP
	4/26/2010	5503.84	11.45	NPP	6.59	5497.25	NPP
CW 8+10	4/12/2010	5504.02	11.63	NPP	7.44	5496.58	NPP
	4/26/2010	5504.02	11.63	NPP	7.44	5496.58	NPP
CW 8+45	4/12/2010	5503.80	12.6	7.55	7.7	5496.22	0.15
	4/26/2010	5503.80	12.6	7.58	7.62	5496.21	0.04
CW 11+15	4/12/2010	5503.95	12.27	NPP	5.89	5498.06	NPP
	4/26/2010	5503.95	12.27	NPP	5.59	5498.36	NPP
CW 14+10	4/12/2010	5504.39	13.05	NPP	6.39	5498.00	NPP
	4/26/2010	5504.39	13.05	NPP	6.48	5497.91	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	4/12/2010	5504.32	12.86	NPP	6.22	5498.10	NPP
	4/26/2010	5504.32	12.86	NPP	6.29	5498.03	NPP
CW 19+50	4/12/2010	5504.52	9.99	NPP	6.41	5498.11	NPP
	4/26/2010	5504.52	9.99	NPP	6.25	5498.27	NPP
CW 22+00	4/12/2010	5508.04	12.34	NPP	8.83	5499.21	NPP
	4/26/2010	5508.04	12.34	NPP	8.83	5499.21	NPP
CW 23+10	4/12/2010	5510.04	14.65	NPP	10.46	5499.58	NPP
	4/26/2010	5510.04	14.65	10.45	10.63	5499.55	0.18
CW 23+90	4/12/2010	5507.32	11.72	NPP	7.98	5499.34	NPP
	4/26/2010	5507.32	11.72	NPP	17.10	5490.22	NPP
CW 25+95	4/12/2010	5505.90	12.25	NPP	7.14	5498.76	NPP
	4/26/2010	5505.90	12.25	NPP	7.12	5498.78	NPP

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring April 2010

Appendix A - Tab 4.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	4/12/2010	5510.31	22.94	NPP	11.17	5499.14	NPP
	4/26/2010	5510.31	22.94	NPP	10.91	5499.40	NPP
MW #12	4/12/2010	5501.61	14.98	NPP	10.88	5490.73	NPP
	4/26/2010	5501.61	14.98	NPP	9.62	5491.99	NPP
MW #20	4/12/2010	5519.90	27.13	21.14	21.57	5498.67	0.43
	4/26/2010	5519.90	27.13	20.56	21.12	5499.23	0.56
MW #21	4/12/2010	5521.99	30.38	21.52	21.59	5500.46	0.07
	4/26/2010	5521.99	30.38	21.55	21.64	5500.42	0.09
MW #39	4/12/2010	5520.83	38.34	NPP	25.48	5495.35	NPP
	4/26/2010	5520.83	38.34	NPP	25.50	5495.33	NPP
MW #45	4/12/2010	5506.36	16.92	NPP	11.67	5494.69	NPP
	4/26/2010	5506.36	16.92	NPP	11.68	5494.68	NPP
MW #46	4/12/2010	5504.65	10.39	NPP	9.85	5494.80	NPP
	4/26/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	4/12/2010	5506.77	14.28	NPP	12.26	5494.51	NPP
	4/26/2010	5506.77	14.28	NPP	12.29	5494.48	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring May 2010

Appendix A - Tab 5.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
0+60 OW	5/10/2010	5506.62	12.26	NPP	11.29	5495.33	NPP
	5/24/2010	5506.62	12.26	NPP	11.30	5495.32	NPP
1+50 OW	5/10/2010	5508.03	14.36	NPP	13.31	5494.72	NPP
	5/24/2010	5508.03	14.36	NPP	13.34	5494.69	NPP
3+85 OW	5/10/2010	5507.31	15.06	NPP	12.85	5494.46	NPP
	5/24/2010	5507.31	15.06	NPP	12.95	5494.36	NPP
5+50 OW	5/10/2010	5507.59	13.67	NPP	13.51	5494.08	NPP
	5/24/2010	5507.59	13.67	NPP	13.38	5494.21	NPP
6+70 OW	5/10/2010	5504.78	14.67	NPP	NWP		NPP
	5/24/2010	5504.78	14.67	NPP	NWP		NPP
8+10 OW	5/10/2010	5506.53	15.99	NPP	15.97	5490.56	NPP
	5/24/2010	5506.53	15.99	NPP	NWP		NPP
11+15 OW	5/10/2010	5506.70	16.59	NPP	12.37	5494.33	NPP
	5/24/2010	5506.70	16.59	NPP	12.38	5494.32	NPP
14+10 OW	5/10/2010	5508.14	12.96	NPP	NWP		NPP
	5/24/2010	5508.14	12.96	NPP	NWP		NPP
16+60 OW	5/10/2010	5508.43	15.21	NPP	12.25	5496.18	NPP
	5/24/2010	5508.43	15.21	NPP	12.38	5496.05	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring May 2010

Appendix A - Tab 5.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	5/10/2010	5508.03	13.00	NPP	11.42	5496.61	NPP
	5/24/2010	5508.03	13.00	NPP	11.59	5496.44	NPP
OW 22+00	5/10/2010	5506.91	14.16	NPP	11.68	5495.23	NPP
	5/24/2010	5506.91	14.16	NPP	11.81	5495.10	NPP
OW 23+10	5/10/2010	5514.12	18.34	NPP	16.21	5497.91	NPP
	5/24/2010	5514.12	18.34	NPP	16.28	5497.84	NPP
OW 23+90	5/10/2010	5515.18	18.01	NPP	17.09	5498.09	NPP
	5/24/2010	5515.18	18.01	NPP	17.15	5498.03	NPP
OW 25+70	5/10/2010	5509.00	13.98	NPP	10.67	5498.33	NPP
	5/24/2010	5509.00	13.98	NPP	10.79	5498.21	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring May 2010

Appendix A - Tab 5.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
09+60 CW	5/10/2010	5506.68	14.09	NPP	8.27	5498.41	NPP
	5/24/2010	5506.68	14.09	NPP	8.33	5498.35	NPP
1+50 CW	5/10/2010	5505.13	13.74	NPP	6.92	5498.21	NPP
	5/24/2010	5505.13	13.74	NPP	7.00	5498.13	NPP
3+85 CW	5/10/2010	5503.87	13.11	NPP	6.71	5497.16	NPP
	5/24/2010	5503.87	13.11	NPP	5.79	5498.08	NPP
5+50 CW	5/10/2010	5503.76	12.27	NPP	6.34	5497.42	NPP
	5/24/2010	5503.76	12.27	NPP	6.40	5497.36	NPP
6+70 CW	5/10/2010	5503.84	11.45	NPP	6.61	5497.23	NPP
	5/24/2010	5503.84	11.45	NPP	6.66	5497.18	NPP
8+10 CW	5/10/2010	5504.02	11.63	NPP	7.43	5496.59	NPP
	5/24/2010	5504.02	11.63	NPP	7.45	5496.57	NPP
8+45 CW	5/10/2010	5503.80	12.6	NPP	7.55	5496.25	NPP
	5/24/2010	5503.80	12.6	NPP	7.59	5496.21	NPP
11+15 CW	5/10/2010	5503.95	12.27	NPP	5.98	5497.97	NPP
	5/24/2010	5503.95	12.27	NPP	6.09	5497.86	NPP
14+10 CW	5/10/2010	5504.39	13.05	NPP	6.47	5497.92	NPP
	5/24/2010	5504.39	13.05	NPP	6.55	5497.84	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring May 2010

Appendix A - Tab 5.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	5/10/2010	5504.32	12.86	NPP	6.29	5498.03	NPP
	5/24/2010	5504.32	12.86	NPP	6.35	5497.97	NPP
CW 19+50	5/10/2010	5504.52	9.99	NPP	6.05	5498.47	NPP
	5/24/2010	5504.52	9.99	NPP	6.15	5498.37	NPP
CW 22+00	5/10/2010	5508.04	12.34	NPP	8.81	5499.23	NPP
	5/24/2010	5508.04	12.34	NPP	8.85	5499.19	NPP
CW 23+10	5/10/2010	5510.04	14.65	NPP	10.45	5499.59	NPP
	5/24/2010	5510.04	14.65	NPP	10.49	5499.55	NPP
CW 23+90	5/10/2010	5507.32	11.72	NPP	7.93	5499.39	NPP
	5/24/2010	5507.32	11.72	NPP	7.97	5499.35	NPP
CW 25+95	5/10/2010	5505.90	12.25	NPP	7.10	5498.80	NPP
	5/24/2010	5505.90	12.25	Recovery Pump Service			

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring May 2010

Appendix A - Tab 5.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	5/10/2010	5510.31	22.94	NPP	10.86	5499.45	NPP
	5/24/2010	5510.31	22.94	NPP	10.87	5499.44	NPP
MW #12	5/10/2010	5501.61	14.98	NPP	9.58	5492.03	NPP
	5/24/2010	5501.61	14.98	NPP	9.65	5491.96	NPP
MW #20	5/10/2010	5519.90	27.13	20.59	21.20	5499.19	0.61
	5/24/2010	5519.90	27.13	20.61	21.26	5499.16	0.65
MW #21	5/10/2010	5521.99	30.38	21.58	21.68	5500.39	0.10
	5/24/2010	5521.99	30.38	21.63	21.75	5500.34	0.12
MW #39	5/10/2010	5520.83	38.34	NPP	25.68	5495.15	NPP
	5/24/2010	5520.83	38.34	NPP	25.68	5495.15	NPP
MW #45	5/10/2010	5506.36	16.92	11.38	12.69	5494.72	1.31
	5/24/2010	5506.36	16.92	NPP	11.74	5494.62	NPP
MW #46	5/10/2010	5504.65	10.39	NPP	NWP		NPP
	5/24/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	5/10/2010	5506.77	14.28	NPP	12.29	5494.48	NPP
	5/24/2010	5506.77	14.28	NPP	12.33	5494.44	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring June 2010

Appendix A - Tab 6.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
0+60 OW	6/7/2010	5506.62	12.26	NPP	11.31	5495.31	NPP
	6/22/2010	5506.62	12.26	NPP	11.37	5495.25	NPP
1+50 OW	6/7/2010	5508.03	14.36	13.37	13.38	5494.66	0.01
	6/22/2010	5508.03	14.36	13.43	13.63	5494.56	0.20
3+85 OW	6/7/2010	5507.31	15.06	NPP	12.88	5494.43	NPP
	6/22/2010	5507.31	15.06	NPP	12.99	5494.32	NPP
5+50 OW	6/7/2010	5507.59	13.67	NPP	13.24	5494.35	NPP
	6/22/2010	5507.59	13.67	NPP	13.14	5494.45	NPP
6+70 OW	6/7/2010	5504.78	14.67	NPP	NWP		NPP
	6/22/2010	5504.78	14.67	NPP	NWP		NPP
8+10 OW	6/7/2010	5506.53	15.99	NPP	NWP		NPP
	6/22/2010	5506.53	15.99	NPP	NWP		NPP
11+15 OW	6/7/2010	5506.70	16.59	NPP	12.40	5494.30	NPP
	6/22/2010	5506.70	16.59	NPP	12.47	5494.23	NPP
14+10 OW	6/7/2010	5508.14	12.96	NPP	NWP		NPP
	6/22/2010	5508.14	12.96	NPP	NWP		NPP
16+60 OW	6/7/2010	5508.43	15.21	NPP	12.46	5495.97	NPP
	6/22/2010	5508.43	15.21	NPP	12.54	5495.89	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring June 2010

Appendix A - Tab 6.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	6/7/2010	5508.03	13.00	NPP	11.77	5496.26	NPP
	6/22/2010	5508.03	13.00	NPP	11.86	5496.17	NPP
OW 22+00	6/7/2010	5506.91	14.16	NPP	12.05	5494.86	NPP
	6/22/2010	5506.91	14.16	NPP	12.31	5494.60	NPP
OW 23+10	6/7/2010	5514.12	18.34	NPP	16.37	5497.75	NPP
	6/22/2010	5514.12	18.34	NPP	16.33	5497.79	NPP
OW 23+90	6/7/2010	5515.18	18.01	NPP	17.21	5497.97	NPP
	6/22/2010	5515.18	18.01	NPP	17.16	5498.02	NPP
OW 25+70	6/7/2010	5509.00	13.98	NPP	10.81	5498.19	NPP
	6/22/2010	5509.00	13.98	NPP	10.75	5498.25	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring June 2010

Appendix A - Tab 6.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
09+60 CW	6/7/2010	5506.68	14.09	NPP	8.29	5498.39	NPP
	6/22/200	5506.68	14.09	NPP	8.33	5498.35	NPP
1+50 CW	6/7/2010	5505.13	13.74	NPP	6.93	5498.20	NPP
	6/22/200	5505.13	13.74	NPP	6.90	5498.23	NPP
3+85 CW	6/7/2010	5503.87	13.11	NPP	5.72	5498.15	NPP
	6/22/200	5503.87	13.11	NPP	5.69	5498.18	NPP
5+50 CW	6/7/2010	5503.76	12.27	NPP	6.38	5497.38	NPP
	6/22/200	5503.76	12.27	NPP	6.35	5497.41	NPP
6+70 CW	6/7/2010	5503.84	11.45	NPP	6.68	5497.16	NPP
	6/22/200	5503.84	11.45	NPP	6.69	5497.15	NPP
8+10 CW	6/7/2010	5504.02	11.63	NPP	7.46	5496.56	NPP
	6/22/200	5504.02	11.63	NPP	7.48	5496.54	NPP
8+45 CW	6/7/2010	5503.80	12.6	NPP	7.66	5496.14	NPP
	6/22/200	5503.80	12.6	NPP	7.63	5496.17	NPP
11+15 CW	6/7/2010	5503.95	12.27	NPP	5.96	5497.99	NPP
	6/22/200	5503.95	12.27	NPP	6.02	5497.93	NPP
14+10 CW	6/7/2010	5504.39	13.05	NPP	6.34	5498.05	NPP
	6/22/200	5504.39	13.05	NPP	6.29	5498.10	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring June 2010

Appendix A - Tab 6.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	6/7/2010	5504.32	12.86	NPP	6.29	5498.03	NPP
	6/22/200	5504.32	12.86	NPP	6.25	5498.07	NPP
CW 19+50	6/7/2010	5504.52	9.99	NPP	5.82	5498.70	NPP
	6/22/200	5504.52	9.99	NPP	5.44	5499.08	NPP
CW 22+00	6/7/2010	5508.04	12.34	NPP	8.84	5499.20	NPP
	6/22/200	5508.04	12.34	NPP	8.75	5499.29	NPP
CW 23+10	6/7/2010	5510.04	14.65	NPP	10.48	5499.56	NPP
	6/22/200	5510.04	14.65	NPP	10.46	5499.58	NPP
CW 23+90	6/7/2010	5507.32	11.72	NPP	7.92	5499.40	NPP
	6/22/200	5507.32	11.72	NPP	7.88	5499.44	NPP
CW 25+95	6/7/2010	5505.90	12.25	Recovery Pump Service			
	6/22/200	5505.90	12.25	Recovery Pump Service			

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring June 2010

Appendix A - Tab 6.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	6/7/2010	5510.31	22.94	NPP	10.91	5499.40	NPP
	6/22/200	5510.31	22.94	NPP	11.00	5499.31	NPP
MW #12	6/7/2010	5501.61	14.98	NPP	9.89	5491.72	NPP
	6/22/200	5501.61	14.98	NPP	10.13	5491.48	NPP
MW #20	6/7/2010	5519.90	27.13	20.60	21.27	5499.17	0.67
	6/22/200	5519.90	27.13	20.60	21.27	5499.17	0.67
MW #21	6/7/2010	5521.99	30.38	21.68	21.74	5500.30	0.06
	6/22/200	5521.99	30.38	21.65	21.75	5500.32	0.10
MW #39	6/7/2010	5520.83	38.34	NPP	25.76	5495.07	NPP
	6/22/200	5520.83	38.34	NPP	25.80	5495.03	NPP
MW #45	6/7/2010	5506.36	16.92	NPP	11.72	5494.64	NPP
	6/22/200	5506.36	16.92	NPP	11.74	5494.62	NPP
MW #46	6/7/2010	5504.65	10.39	NPP	NWP		NPP
	6/22/200	5504.65	10.39	NPP	NWP		NPP
MW #47	6/7/2010	5506.77	14.28	NPP	12.37	5494.40	NPP
	6/22/200	5506.77	14.28	NPP	12.42	5494.35	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring July 2010

Appendix A - Tab 7.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	7/9/2010	5506.62	12.26	NPP	11.58	5495.04	NPP
	7/21/2010	5506.62	12.26	NPP	11.65	5494.97	NPP
OW 1+50	7/9/2010	5508.03	14.36	13.45	13.98	5494.47	0.53
	7/21/2010	5508.03	14.36	13.53	14.01	5494.40	0.48
OW 3+85	7/9/2010	5507.31	15.06	NPP	13.05	5494.26	NPP
	7/21/2010	5507.31	15.06	NPP	13.13	5494.18	NPP
OW 5+50	7/9/2010	5507.59	13.67	NPP	13.11	5494.48	NPP
	7/21/2010	5507.59	13.67	NPP	13.15	5494.44	NPP
OW 6+70	7/9/2010	5504.78	14.67	NPP	NWP		NPP
	7/21/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	7/9/2010	5506.53	15.99	NPP	NWP		NPP
	7/21/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	7/9/2010	5506.70	16.59	NPP	12.42	5494.28	NPP
	7/21/2010	5506.70	16.59	12.36	12.40	5494.33	0.04
OW 14+10	7/9/2010	5508.14	12.96	NPP	NWP		NPP
	7/21/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	7/9/2010	5508.43	15.21	NPP	12.57	5495.86	NPP
	7/21/2010	5508.43	15.21	NPP	12.65	5495.78	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring July 2010

Appendix A - Tab 7.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	7/9/2010	5508.03	13.00	NPP	12.04	5495.99	NPP
	7/21/2010	5508.03	13.00	NPP	12.19	5495.84	NPP
OW 22+00	7/9/2010	5506.91	14.16	NPP	12.51	5494.40	NPP
	7/21/2010	5506.91	14.16	NPP	12.69	5494.22	NPP
OW 23+10	7/9/2010	5514.12	18.34	NPP	16.37	5497.75	NPP
	7/21/2010	5514.12	18.34	NPP	16.28	5497.84	NPP
OW 23+90	7/9/2010	5515.18	18.01	NPP	17.15	5498.03	NPP
	7/21/2010	5515.18	18.01	NPP	17.12	5498.06	NPP
OW 25+70	7/9/2010	5509.00	13.98	NPP	10.74	5498.26	NPP
	7/21/2010	5509.00	13.98	NPP	10.75	5498.25	NPP

Collection Well Fluids Monitoring July 2010

Appendix A - Tab 7.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 0+60	7/9/2010	5506.68	14.09	NPP	8.30	5498.38	NPP
	7/21/2010	5506.68	14.09	NPP	8.34	5498.34	NPP
CW 1+50	7/9/2010	5505.13	13.74	NPP	6.86	5498.27	NPP
	7/21/2010	5505.13	13.74	NPP	6.90	5498.23	NPP
CW 3+85	7/9/2010	5503.87	13.11	NPP	5.62	5498.25	NPP
	7/21/2010	5503.87	13.11	NPP	5.68	5498.19	NPP
CW 5+50	7/9/2010	5503.76	12.27	NPP	6.28	5497.48	NPP
	7/21/2010	5503.76	12.27	NPP	6.32	5497.44	NPP
CW 6+70	7/9/2010	5503.84	11.45	NPP	6.63	5497.21	NPP
	7/21/2010	5503.84	11.45	NPP	6.66	5497.18	NPP
CW 8+10	7/9/2010	5504.02	11.63	NPP	7.46	5496.56	NPP
	7/21/2010	5504.02	11.63	NPP	7.45	5496.57	NPP
CW 8+45	7/9/2010	5503.80	12.6	NPP	7.63	5496.17	NPP
	7/21/2010	5503.80	12.6	NPP	7.61	5496.19	NPP
CW 11+15	7/9/2010	5503.95	12.27	NPP	6.06	5497.89	NPP
	7/21/2010	5503.95	12.27	NPP	5.99	5497.96	NPP
CW 14+10	7/9/2010	5504.39	13.05	NPP	6.29	5498.10	NPP
	7/21/2010	5504.39	13.05	NPP	6.27	5498.12	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring July 2010

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	7/9/2010	5504.32	12.86	NPP	6.23	5498.09	NPP
	7/21/2010	5504.32	12.86	NPP	6.21	5498.11	NPP
CW 19+50	7/9/2010	5504.52	9.99	NPP	5.67	5498.85	NPP
	7/21/2010	5504.52	9.99	NPP	5.65	5498.87	NPP
CW 22+00	7/9/2010	5508.04	12.34	NPP	8.72	5499.32	NPP
	7/21/2010	5508.04	12.34	NPP	8.75	5499.29	NPP
CW 23+10	7/9/2010	5510.04	14.65	NPP	10.45	5499.59	NPP
	7/21/2010	5510.04	14.65	NPP	10.43	5499.61	NPP
CW 23 90	7/9/2010	5507.32	11.72	NPP	7.89	5499.43	NPP
	7/21/2010	5507.32	11.72	NPP	7.85	5499.47	NPP
CW 25+95	7/9/2010	5505.90	12.25	Recovery Pump Service		Recovery Pump Service	
	7/21/2010	5505.90	12.25	Recovery Pump Service		Recovery Pump Service	

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring July 2010

Appendix A - Tab 7.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	7/9/2010	5510.31	22.94	NPP	11.12	5499.19	NPP
	7/21/2010	5510.31	22.94	NPP	11.22	5499.09	NPP
MW #12	7/9/2010	5501.61	14.98	NPP	10.42	5491.19	NPP
	7/21/2010	5501.61	14.98	NPP	10.59	5491.02	NPP
MW #20	7/9/2010	5519.90	27.13	20.60	21.26	5499.17	0.66
	7/21/2010	5519.90	27.13	20.58	21.22	5499.19	0.64
MW #21	7/9/2010	5521.99	30.38	21.64	21.71	5500.34	0.07
	7/21/2010	5521.99	30.38	21.62	21.7	5500.35	0.08
MW #39	7/9/2010	5520.83	38.34	NPP	25.86	5494.97	NPP
	7/21/2010	5520.83	38.34	NPP	25.87	5494.96	NPP
MW #45	7/9/2010	5506.36	16.92	NPP	11.76	5494.60	NPP
	7/21/2010	5506.36	16.92	NPP	11.68	5494.68	NPP
MW #46	7/9/2010	5504.65	10.39	NPP	NWP		NPP
	7/21/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	7/9/2010	5506.77	14.28	NPP	12.51	5494.26	NPP
	7/21/2010	5506.77	14.28	NPP	12.58	5494.19	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring August 2010

Appendix A - Tab 8.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	8/5/2010	5506.62	12.26	NPP	11.69	5494.93	NPP
	8/31/2010	5506.62	12.26	NPP	11.81	5494.81	NPP
OW 1+50	8/5/2010	5508.03	14.36	13.65	14.12	5494.29	0.47
	8/31/2010	5508.03	14.36	13.68	14.11	5494.26	0.43
OW 3+85	8/5/2010	5507.31	15.06	NPP	13.23	5494.08	NPP
	8/31/2010	5507.31	15.06	NPP	13.38	5493.93	NPP
OW 5+50	8/5/2010	5507.59	13.67	NPP	13.01	5494.58	NPP
	8/31/2010	5507.59	13.67	NPP	13.43	5494.16	NPP
OW 6+70	8/5/2010	5504.78	14.67	NPP	NWP		NPP
	8/31/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	8/5/2010	5506.53	15.99	NPP	NWP		NPP
	8/31/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	8/5/2010	5506.70	16.59	12.37	12.4	5494.32	0.03
	8/31/2010	5506.70	16.59	12.37	12.38	5494.33	0.01
OW 14+10	8/5/2010	5508.14	12.96	NPP	NWP		NPP
	8/31/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	8/5/2010	5508.43	15.21	NPP	12.72	5495.71	NPP
	8/31/2010	5508.43	15.21	NPP	12.82	5495.61	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring August 2010

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	8/5/2010	5508.03	13.00	NPP	12.34	5495.69	NPP
	8/31/2010	5508.03	13.00	NPP	12.59	5495.44	NPP
OW 22+00	8/5/2010	5506.91	14.16	NPP	12.65	5494.26	NPP
	8/31/2010	5506.91	14.16	NPP	12.64	5494.27	NPP
OW 23+10	8/5/2010	5514.12	18.34	NPP	16.30	5497.82	NPP
	8/31/2010	5514.12	18.34	NPP	16.20	5497.92	NPP
OW 23+90	8/5/2010	5515.18	18.01	NPP	17.13	5498.05	NPP
	8/31/2010	5515.18	18.01	NPP	17.12	5498.06	NPP
OW 25+70	8/5/2010	5509.00	13.98	NPP	10.73	5498.27	NPP
	8/31/2010	5509.00	13.98	NPP	10.71	5498.29	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring August 2010

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 0+60	8/5/2010	5506.68	14.09	NPP	8.29	5498.39	NPP
	8/31/2010	5506.68	14.09	NPP	8.09	5498.59	NPP
CW 1+50	8/5/2010	5505.13	13.74	NPP	6.92	5498.21	NPP
	8/31/2010	5505.13	13.74	NPP	6.73	5498.40	NPP
CW 3+85	8/5/2010	5503.87	13.11	NPP	5.75	5498.12	NPP
	8/31/2010	5503.87	13.11	NPP	5.59	5498.28	NPP
CW 5+50	8/5/2010	5503.76	12.27	NPP	6.38	5497.38	NPP
	8/31/2010	5503.76	12.27	NPP	6.34	5497.42	NPP
CW 6+70	8/5/2010	5503.84	11.45	NPP	6.72	5497.12	NPP
	8/31/2010	5503.84	11.45	NPP	6.68	5497.16	NPP
CW 8+10	8/5/2010	5504.02	11.63	NPP	7.50	5496.52	NPP
	8/31/2010	5504.02	11.63	NPP	7.46	5496.56	NPP
CW 8+45	8/5/2010	5503.80	12.6	NPP	7.65	5496.15	NPP
	8/31/2010	5503.80	12.6	NPP	7.62	5496.18	NPP
CW 11+15	8/5/2010	5503.95	12.27	NPP	6.07	5497.88	NPP
	8/31/2010	5503.95	12.27	NPP	6.03	5497.92	NPP
CW 14+10	8/5/2010	5504.39	13.05	NPP	6.51	5497.88	NPP
	8/31/2010	5504.39	13.05	NPP	6.46	5497.93	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring August 2010

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	8/5/2010	5504.32	12.86	NPP	6.3	5498.02	NPP
	8/31/2010	5504.32	12.86	NPP	6.26	5498.06	NPP
CW 19+50	8/5/2010	5504.52	9.99	NPP	5.95	5498.57	NPP
	8/31/2010	5504.52	9.99	NPP	6.81	5497.71	NPP
CW 22+00	8/5/2010	5508.04	12.34	NPP	8.85	5499.19	NPP
	8/31/2010	5508.04	12.34	NPP	8.86	5499.18	NPP
CW 23+10	8/5/2010	5510.04	14.65	NPP	10.48	5499.56	NPP
	8/31/2010	5510.04	14.65	NPP	10.49	5499.55	NPP
CW 23+90	8/5/2010	5507.32	11.72	NPP	7.90	5499.42	NPP
	8/31/2010	5507.32	11.72	NPP	7.93	5499.39	NPP
CW 25+95	8/5/2010	5505.90	12.25	Recovery Pump Service			
	8/31/2010	5505.90	12.25	Recovery Pump Service			

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	8/13/2009	5510.31	22.94	NPP	11.1	5499.21	NPP
	8/31/2010	5510.31	22.94	NPP	11.05	5499.26	NPP
MW #12	8/13/2009	5501.61	14.98	NPP	10.80	5490.81	NPP
	8/24/2009	5501.61	14.98	NPP	10.77	5490.84	NPP
MW #20	8/13/2009	5519.90	27.13	20.58	21.25	5499.19	0.67
	8/24/2009	5519.90	27.13	20.61	21.25	5499.16	0.64
MW #21	8/13/2009	5521.99	30.38	21.60	21.68	5500.37	0.08
	8/24/2009	5521.99	30.38	21.63	21.7	5500.35	0.07
MW #39	8/13/2009	5520.83	38.34	NPP	25.85	5494.98	NPP
	8/24/2009	5520.83	38.34	NPP	25.88	5494.95	NPP
MW #45	8/13/2009	5506.36	16.92	NPP	11.64	5494.72	NPP
	8/24/2009	5506.36	16.92	NPP	11.74	5494.62	NPP
MW #46	8/13/2009	5504.65	10.39	NPP	9.36	5495.29	NPP
	8/24/2009	5504.65	10.39	NPP	dry		NPP
MW #47	8/13/2009	5506.77	14.28	NPP	11.67	5495.10	NPP
	8/24/2009	5506.77	14.28	NPP	12.77	5494.00	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 09+60	9/16/2010	5506.62	12.26	NPP	11.66	5494.96	NPP
	9/29/2010	5506.62	12.26	NPP	11.73	5494.89	NPP
OW 1+50	9/16/2010	5508.03	14.36	13.66	13.81	5494.34	0.15
	9/29/2010	5508.03	14.36	13.71	14.01	5494.26	0.30
OW 3+85	9/16/2010	5507.31	15.06	NPP	13.37	5493.94	NPP
	9/29/2010	5507.31	15.06	NPP	13.25	5494.06	NPP
OW 5+50	9/16/2010	5507.59	13.67	NPP	13.46	5494.13	NPP
	9/29/2010	5507.59	13.67	NPP	13.44	5494.15	NPP
OW 6+70	9/16/2010	5504.78	14.67	NPP	NWP		NPP
	9/29/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	9/16/2010	5506.53	15.99	NPP	NWP		NPP
	9/29/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	9/16/2010	5506.70	16.59	12.54	12.55	5494.16	0.01
	9/29/2010	5506.70	16.59	12.36	12.40	5494.33	0.04
OW 14+10	9/16/2010	5508.14	12.96	NPP	NWP		NPP
	9/29/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	9/16/2010	5508.43	15.21	NPP	12.72	5495.71	NPP
	9/29/2010	5508.43	15.21	NPP	12.80	5495.63	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	9/16/2010	5508.03	13.00	NPP	12.76	5495.27	NPP
	9/29/2010	5508.03	13.00	NPP	12.75	5495.28	NPP
OW 22+00	9/16/2010	5506.91	14.16	NPP	12.48	5494.43	NPP
	9/29/2010	5506.91	14.16	NPP	12.52	5494.39	NPP
OW 23+10	9/16/2010	5514.12	18.34	NPP	16.22	5497.90	NPP
	9/29/2010	5514.12	18.34	NPP	16.31	5497.81	NPP
OW 23+90	9/16/2010	5515.18	18.01	NPP	17.11	5498.07	NPP
	9/29/2010	5515.18	18.01	NPP	17.16	5498.02	NPP
OW 25+70	9/16/2010	5509.00	13.98	NPP	10.70	5498.30	NPP
	9/29/2010	5509.00	13.98	NPP	10.79	5498.21	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 0+60	9/16/2010	5506.68	14.09	NPP	8.08	5498.60	NPP
	9/29/2010	5506.68	14.09	NPP	8.11	5498.57	NPP
CW 1+50	9/16/2010	5505.13	13.74	NPP	6.72	5498.41	NPP
	9/29/2010	5505.13	13.74	NPP	6.77	5498.36	NPP
CW 3+85	9/16/2010	5503.87	13.11	NPP	6.62	5497.25	NPP
	9/29/2010	5503.87	13.11	NPP	5.65	5498.22	NPP
CW 5+50	9/16/2010	5503.76	12.27	NPP	6.35	5497.41	NPP
	9/29/2010	5503.76	12.27	NPP	6.36	5497.40	NPP
CW 6+70	9/16/2010	5503.84	11.45	NPP	6.70	5497.14	NPP
	9/29/2010	5503.84	11.45	NPP	6.73	5497.11	NPP
CW 8+10	9/16/2010	5504.02	11.63	NPP	7.50	5496.52	NPP
	9/29/2010	5504.02	11.63	NPP	7.49	5496.53	NPP
CW 8+45	9/16/2010	5503.80	12.6	NPP	7.65	5496.15	NPP
	9/29/2010	5503.80	12.6	NPP	7.65	5496.15	NPP
CW 11+15	9/16/2010	5503.95	12.27	NPP	6.01	5497.94	NPP
	9/29/2010	5503.95	12.27	NPP	5.98	5497.97	NPP
CW 14+10	9/16/2010	5504.39	13.05	NPP	6.45	5497.94	NPP
	9/29/2010	5504.39	13.05	NPP	6.42	5497.97	NPP

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	9/16/2010	5504.32	12.86	NPP	6.67	5497.65	NPP
	9/29/2010	5504.32	12.86	NPP	6.25	5498.07	NPP
CW 19+50	9/16/2010	5504.52	9.99	NPP	6.16	5498.36	NPP
	9/29/2010	5504.52	9.99	NPP	5.95	5498.57	NPP
CW 22+00	9/16/2010	5508.04	12.34	NPP	8.88	5499.16	NPP
	9/29/2010	5508.04	12.34	NPP	8.87	5499.17	NPP
CW 23+10	9/16/2010	5510.04	14.65	NPP	10.56	5499.48	NPP
	9/29/2010	5510.04	14.65	NPP	10.52	5499.52	NPP
CW 23+90	9/16/2010	5507.32	11.72	NPP	7.95	5499.37	NPP
	9/29/2010	5507.32	11.72	NPP	7.95	5499.37	NPP
CW 25+95	9/16/2010	5505.90	12.25	Recovery Pump Service			
	9/29/2010	5505.90	12.25	Recovery Pump Service			

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	9/16/2010	5510.31	22.94	NPP	11.1	5499.21	NPP
	9/29/2010	5510.31	22.94	NPP	11.19	5499.12	NPP
MW #12	9/16/2010	5501.61	14.98	NPP	10.80	5490.81	NPP
	9/29/2010	5501.61	14.98	NPP	10.83	5490.78	NPP
MW #20	9/16/2010	5519.90	27.13	20.58	21.25	5499.19	0.67
	9/29/2010	5519.90	27.13	20.60	21.25	5499.17	0.65
MW #21	9/16/2010	5521.99	30.38	21.60	21.68	5500.37	0.08
	9/29/2010	5521.99	30.38	21.63	21.72	5500.34	0.09
MW #39	9/16/2010	5520.83	38.34	NPP	25.90	5494.93	NPP
	9/29/2010	5520.83	38.34	NPP	25.86	5494.97	NPP
MW #45	9/16/2010	5506.36	16.92	NPP	11.73	5494.63	NPP
	9/29/2010	5506.36	16.92	NPP	11.70	5494.66	NPP
MW #46	9/16/2010	5504.65	10.39	NPP	NWP		NPP
	9/29/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	9/16/2010	5506.77	14.28	12.65	12.84	5494.08	0.19
	9/29/2010	5506.77	14.28	12.68	12.72	5494.08	0.04

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	10/14/2010	5506.62	12.26	NPP	11.82	5494.80	NPP
	10/26/2010	5506.62	12.26	NPP	11.85	5494.77	NPP
OW 1+50	10/14/2010	5508.03	14.36	13.76	14.28	5494.17	0.52
	10/26/2010	5508.03	14.36	13.79	14.33	5494.13	0.54
OW 3+85	10/14/2010	5507.31	15.06	13.51	13.53	5493.80	0.02
	10/26/2010	5507.31	15.06	13.34	13.52	5493.93	0.18
OW 5+50	10/14/2010	5507.59	13.67	NPP	13.45	5494.14	NPP
	10/26/2010	5507.59	13.67	NPP	13.43	5494.16	NPP
OW 6+70	10/14/2010	5504.78	14.67	NPP	NWP		NPP
	10/26/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	10/14/2010	5506.53	15.99	NPP	NWP		NPP
	10/26/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	10/14/2010	5506.70	16.59	12.47	12.5	5494.22	0.03
	10/26/2010	5506.70	16.59	12.36	12.38	5494.34	0.02
OW 14+10	10/14/2010	5508.14	12.96	NPP	NWP		NPP
	10/26/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	10/14/2010	5508.14	15.21	NPP	12.71	5495.43	NPP
	10/26/2010	5508.43	15.21	NPP	12.72	5495.71	NPP

NPP = No Product Present NWP = No Water Present

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Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+ 50	10/14/2010	5508.03	13.00	NPP	12.89	5495.14	NPP
	10/26/2010	5508.03	13.00	NPP	12.88	5495.15	NPP
OW 22+ 00	10/14/2010	5506.91	14.16	NPP	12.61	5494.30	NPP
	10/26/2010	5506.91	14.16	NPP	12.36	5494.55	NPP
OW 23+ 10	10/14/2010	5514.12	18.34	NPP	16.34	5497.78	NPP
	10/26/2010	5514.12	18.34	NPP	16.31	5497.81	NPP
OW 23+ 90	10/14/2010	5515.18	18.01	NPP	17.19	5497.99	NPP
	10/26/2010	5515.18	18.01	NPP	17.15	5498.03	NPP
OW 25+ 70	10/14/2010	5509.00	13.98	NPP	10.81	5498.19	NPP
	10/26/2010	5509.00	13.98	NPP	10.78	5498.22	NPP

NPP = No Product Present NWP = No Water Present

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Appendix A - Tab 10.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
0+60 CW	10/14/2010	5506.68	14.09	NPP	8.33	5498.35	NPP
	10/26/2010	5506.68	14.09	NPP	8.22	5498.46	NPP
1+50 CW	10/14/2010	5505.13	13.74	NPP	6.94	5498.19	NPP
	10/26/2010	5505.13	13.74	NPP	6.92	5498.21	NPP
3+85 CW	10/14/2010	5503.87	13.11	NPP	5.75	5498.12	NPP
	10/26/2010	5503.87	13.11	NPP	5.77	5498.10	NPP
5+50 CW	10/14/2010	5503.76	12.27	NPP	6.42	5497.34	NPP
	10/26/2010	5503.76	12.27	NPP	6.43	5497.33	NPP
6+70 CW	10/14/2010	5503.84	11.45	NPP	6.77	5497.07	NPP
	10/26/2010	5503.84	11.45	NPP	6.78	5497.06	NPP
8+10 CW	10/14/2010	5504.02	11.63	NPP	7.59	5496.43	NPP
	10/26/2010	5504.02	11.63	NPP	7.53	5496.49	NPP
8+45 CW	10/14/2010	5503.80	12.6	NPP	7.77	5496.03	NPP
	10/26/2010	5503.80	12.6	NPP	7.7	5496.10	NPP
11+15 CW	10/14/2010	5503.95	12.27	NPP	11.15	5492.80	NPP
	10/26/2010	5503.95	12.27	NPP	6.02	5497.93	NPP
14+10 CW	10/14/2010	5504.39	13.05	NPP	6.52	5497.87	NPP
	10/26/2010	5504.39	13.05	NPP	6.47	5497.92	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring Oct. 2010

Appendix A - Tab 10.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	10/14/2010	5504.32	12.86	NPP	6.29	5498.03	NPP
	10/26/2010	5504.32	12.86	NPP	6.29	5498.03	NPP
CW 19+50	10/14/2010	5504.52	9.99	NPP	5.96	5498.56	NPP
	10/26/2010	5504.52	9.99	NPP	6.35	5498.17	NPP
CW 22+00	10/14/2010	5508.04	12.34	NPP	8.91	5499.13	NPP
	10/26/2010	5508.04	12.34	NPP	8.90	5499.14	NPP
CW 23+10	10/14/2010	5510.04	14.65	NPP	10.56	5499.48	NPP
	10/26/2010	5510.04	14.65	NPP	10.54	5499.50	NPP
CW 23+90	10/14/2010	5507.32	11.72	NPP	7.98	5499.34	NPP
	10/26/2010	5507.32	11.72	NPP	8.02	5499.30	NPP
CW 25+95	10/14/2010	5505.90	12.25	Recovery Pump Service			
	10/26/2010	5505.90	12.25	Recovery Pump Service			

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring Oct. 2010

Appendix A - Tab 10.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	10/14/2010	5510.31	22.94	NPP	11.35	5498.96	NPP
	10/26/2010	5510.31	22.94	NPP	11.1	5499.21	NPP
MW #12	10/14/2010	5501.61	14.98	NPP	10.84	5490.77	NPP
	10/26/2010	5501.61	14.98	NPP	10.70	5490.91	NPP
MW #20	10/14/2010	5519.90	27.13	20.63	21.31	5499.13	0.68
	10/26/2010	5519.90	27.13	20.60	21.25	5499.17	0.65
MW #21	10/14/2010	5521.99	30.38	21.68	21.8	5500.29	0.12
	10/26/2010	5521.99	30.38	21.67	21.78	5500.30	0.11
MW #39	10/14/2010	5520.83	38.34	NPP	25.91	5494.92	NPP
	10/26/2010	5520.83	38.34	NPP	25.77	5495.06	NPP
MW #45	10/14/2010	5506.36	16.92	11.79	11.83	5494.56	0.04
	10/26/2010	5506.36	16.92	NPP	11.70	5494.66	NPP
MW #46	10/14/2010	5504.65	10.39	NPP	NWP		NPP
	10/26/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	10/14/2010	5506.77	14.28	12.71	12.78	5494.05	0.07
	10/26/2010	5506.77	14.28	12.71	12.78	5494.05	0.07

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring November 2010

Appendix A - Tab 11.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	11/10/2010	5506.62	12.26	NPP	11.92	5494.70	NPP
	11/23/2010	5506.62	12.26	NPP	12	5494.62	NPP
OW 1+50	11/10/2010	5508.03	14.36	13.83	14.32	5494.10	0.49
	11/23/2010	5508.03	14.36	13.85	14.31	5494.09	0.46
OW 3+85	11/10/2010	5507.31	15.06	NPP	13.37	13.59	NPP
	11/23/2010	5507.31	15.06	13.43	13.59	5493.85	0.16
OW 5+50	11/10/2010	5507.59	13.67	NPP	13.50	5494.09	NPP
	11/23/2010	5507.59	13.67	NPP	13.50	5494.09	NPP
OW 6+70	11/10/2010	5504.78	14.67	NPP	NWP		NPP
	11/23/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	11/10/2010	5506.53	15.99	NPP	NWP		NPP
	11/23/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	11/10/2010	5506.70	16.59	12.37	12.39	5494.33	0.02
	11/23/2010	5506.70	16.59	NPP	12.54	5494.16	NPP
OW 14+10	11/10/2010	5508.14	12.96	NPP	NWP		NPP
	11/23/2010	5508.14	12.96	NPP	NWP		NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring November 2010

Appendix A - Tab 11.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 16+60	11/10/2010	5508.43	15.21	NPP	12.73	5495.70	NPP
	11/23/2010	5508.43	15.21	NPP	12.82	5495.61	NPP
OW 19+50	11/10/2010	5508.03	13.00	NPP	NWP		NPP
	11/23/2010	5508.03	13.00	NPP	12.90	5495.13	NPP
OW 22+00	11/10/2010	5506.91	14.16	NPP	12.31	5494.60	NPP
	11/23/2010	5506.91	14.16	NPP	11.59	5495.32	NPP
OW 23+10	11/10/2010	5514.12	18.34	NPP	16.30	5497.82	NPP
	11/23/2010	5514.12	18.34	NPP	16.27	5497.85	NPP
OW 23+90	11/10/2010	5515.18	18.01	NPP	17.15	5498.03	NPP
	11/23/2010	5515.18	18.01	NPP	17.12	5498.06	NPP
OW 25+70	11/10/2010	5509.00	13.98	NPP	10.80	5498.20	NPP
	11/23/2010	5509.00	13.98	NPP	10.73	5498.27	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring November 2010

Appendix A - Tab 11.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 0+60	11/10/2010	5506.68	14.09	NPP	8.4	5498.28	NPP
	11/23/2010	5506.68	14.09	NPP	8.65	5498.03	NPP
CW 1+50	11/10/2010	5505.13	13.74	NPP	6.95	5498.18	NPP
	11/23/2010	5505.13	13.74	NPP	7.18	5497.95	NPP
CW 3+85	11/10/2010	5503.87	13.11	NPP	5.76	5498.11	NPP
	11/23/2010	5503.87	13.11	NPP	5.94	5497.93	NPP
CW 5+50	11/10/2010	5503.76	12.27	NPP	6.46	5497.30	NPP
	11/23/2010	5503.76	12.27	NPP	6.54	5497.22	NPP
CW 6+70	11/10/2010	5503.84	11.45	NPP	6.79	5497.05	NPP
	11/23/2010	5503.84	11.45	NPP	6.88	5496.96	NPP
CW 8+10	11/10/2010	5504.02	11.63	NPP	7.57	5496.45	NPP
	11/23/2010	5504.02	11.63	NPP	7.79	5496.23	NPP
CW 8+45	11/10/2010	5503.80	12.6	NPP	7.72	5496.08	NPP
	11/23/2010	5503.80	12.6	NPP	7.96	5495.84	NPP
CW 11+15	11/10/2010	5503.95	12.27	NPP	5.94	5498.01	NPP
	11/23/2010	5503.95	12.27	NPP	6.15	5497.80	NPP
CW 14+10	11/10/2010	5504.39	13.05	NPP	6.42	5497.97	NPP
	11/23/2010	5504.39	13.05	NPP	6.74	5497.65	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring November 2010

Appendix A - Tab 11.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	11/10/2010	5504.32	12.86	NPP	6.3	5498.02	NPP
	11/23/2010	5504.32	12.86	NPP	6.45	5497.87	NPP
CW 19+50	11/10/2010	5504.52	9.99	NPP	6.50	5498.02	NPP
	11/23/2010	5504.52	9.99	NPP	6.70	5497.82	NPP
CW 22+00	11/10/2010	5508.04	12.34	NPP	8.91	5499.13	NPP
	11/23/2010	5508.04	12.34	NPP	8.92	5499.12	NPP
CW 23+10	11/10/2010	5510.04	14.65	NPP	10.54	5499.50	NPP
	11/23/2010	5510.04	14.65	NPP	10.56	5499.48	NPP
CW 23+90	11/10/2010	5507.32	11.72	NPP	8.01	5499.31	NPP
	11/23/2010	5507.32	11.72	NPP	8.02	5499.30	NPP
CW 25+95	11/10/2010	5505.90	12.25	Recovery Pump Service			
	11/23/2010	5505.90	12.25	Recovery Pump Service			

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring November 2010

Appendix A - Tab 11.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	11/10/2010	5510.31	22.94	NPP	11.37	5498.94	NPP
	11/23/2010	5510.31	22.94	NPP	11.55	5498.76	NPP
MW #12	11/10/2010	5501.61	14.98	NPP	10.57	5491.04	NPP
	11/23/2010	5501.61	14.98	NPP	10.55	5491.06	NPP
MW #20	11/10/2010	5519.90	27.13	20.61	21.30	5499.15	0.69
	11/23/2010	5519.90	27.13	20.66	21.37	5499.10	0.71
MW #21	11/10/2010	5521.99	30.38	21.67	21.75	5500.30	0.08
	11/23/2010	5521.99	30.38	21.70	21.8	5500.27	0.10
MW #39	11/10/2010	5520.83	38.34	NPP	25.77	5495.06	NPP
	11/23/2010	5520.83	38.34	NPP	25.87	5494.96	NPP
MW #45	11/10/2010	5506.36	16.92	NPP	11.67	5494.69	NPP
	11/23/2010	5506.36	16.92	11.90	11.95	5494.45	0.05
MW #46	11/10/2010	5504.65	10.39	NPP	NWP		NPP
	11/23/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	11/10/2010	5506.77	14.28	NPP	12.83	5493.94	NPP
	11/23/2010	5506.77	14.28	12.77	12.87	5493.98	0.10

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring Dec. 2010

Appendix A - Tab 12.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 0+60	12/6/2010	5506.62	12.26	NPP	12.04	5494.58	NPP
	12/20/2010	5506.62	12.26	NPP	12.06	5494.56	NPP
OW 1+50	12/6/2010	5508.03	14.36	13.98	14.30	5493.99	0.32
	12/20/2010	5508.03	14.36	13.97	14.32	5493.99	0.35
OW 3+85	12/6/2010	5507.31	15.06	NPP	13.45	5493.86	NPP
	12/20/2010	5507.31	15.06	NPP	13.47	5493.84	NPP
OW 5+50	12/6/2010	5507.59	13.67	NPP	13.57	5494.02	NPP
	12/20/2010	5507.59	13.67	NPP	13.60	5493.99	NPP
OW 6+70	12/6/2010	5504.78	14.67	NPP	NWP		NPP
	12/20/2010	5504.78	14.67	NPP	NWP		NPP
OW 8+10	12/6/2010	5506.53	15.99	NPP	NWP		NPP
	12/20/2010	5506.53	15.99	NPP	NWP		NPP
OW 11+15	12/6/2010	5506.70	16.59	NPP	12.56	5494.14	NPP
	12/20/2010	5506.70	16.59	NPP	12.54	5494.16	NPP
OW 14+10	12/6/2010	5508.14	12.96	NPP	NWP		NPP
	12/20/2010	5508.14	12.96	NPP	NWP		NPP
OW 16+60	12/6/2010	5508.43	15.21	NPP	12.80	5495.63	NPP
	12/20/2010	5508.43	15.21	NPP	12.75	5495.68	NPP

NPP = No Product Present NWP = No Water Present

Observation Well Fluids Monitoring Dec. 2010

Appendix A - Tab 12.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
OW 19+50	12/6/2010	5508.03	13.00	NPP	12.89	5495.14	NPP
	12/20/2010	5508.03	13.00	NPP	12.81	5495.22	NPP
OW 22+00	12/6/2010	5506.91	14.16	NPP	11.40	5495.51	NPP
	12/20/2010	5506.91	14.16	NPP	11.98	5494.93	NPP
OW 23+10	12/6/2010	5514.12	18.34	NPP	16.25	5497.87	NPP
	12/20/2010	5514.12	18.34	NPP	16.29	5497.83	NPP
OW 23+90	12/6/2010	5515.18	18.01	NPP	17.13	5498.05	NPP
	12/20/2010	5515.18	18.01	NPP	17.13	5498.05	NPP
OW 25+70	12/6/2010	5509.00	13.98	NPP	10.74	5498.26	NPP
	12/20/2010	5509.00	13.98	NPP	10.75	5498.25	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring Dec. 2010

Appendix A - Tab 12.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
0+60 CW	12/6/2010	5506.68	14.09	NPP	8.70	5497.98	NPP
	12/20/2010	5506.68	14.09	NPP	8.51	5498.17	NPP
1+50 CW	12/6/2010	5505.13	13.74	NPP	7.25	5497.88	NPP
	12/20/2010	5505.13	13.74	NPP	7.26	5497.87	NPP
3+85 CW	12/6/2010	5503.87	13.11	NPP	5.96	5497.91	NPP
	12/20/2010	5503.87	13.11	NPP	5.97	5497.90	NPP
5+50 CW	12/6/2010	5503.76	12.27	NPP	6.55	5497.21	NPP
	12/20/2010	5503.76	12.27	NPP	6.53	5497.23	NPP
6+70 CW	12/6/2010	5503.84	11.45	NPP	6.86	5496.98	NPP
	12/20/2010	5503.84	11.45	NPP	6.87	5496.97	NPP
8+10 CW	12/6/2010	5504.02	11.63	NPP	7.78	5496.24	NPP
	12/20/2010	5504.02	11.63	NPP	7.79	5496.23	NPP
8+45 CW	12/6/2010	5503.80	12.6	NPP	7.96	5495.84	NPP
	12/20/2010	5503.80	12.6	NPP	7.98	5495.82	NPP
11+15 CW	12/6/2010	5503.95	12.27	NPP	6.12	5497.83	NPP
	12/20/2010	5503.95	12.27	NPP	6.13	5497.82	NPP
14+10 CW	12/6/2010	5504.39	13.05	NPP	6.73	5497.66	NPP
	12/20/2010	5504.39	13.05	NPP	6.71	5497.68	NPP

NPP = No Product Present NWP = No Water Present

Collection Well Fluids Monitoring Dec. 2010

Appendix A - Tab 12.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
CW 16+60	12/6/2010	5504.32	12.86	NPP	6.50	5497.82	NPP
	12/20/2010	5504.32	12.86	NPP	6.47	5497.85	NPP
CW 19+50	12/6/2010	5504.52	9.99	NPP	6.66	5497.86	NPP
	12/20/2010	5504.52	9.99	NPP	6.65	5497.87	NPP
CW 22+00	12/6/2010	5508.04	12.34	NPP	8.87	5499.17	NPP
	12/20/2010	5508.04	12.34	NPP	8.89	5499.15	NPP
CW 23+10	12/6/2010	5510.04	14.65	NPP	10.57	5499.47	NPP
	12/20/2010	5510.04	14.65	NPP	10.58	5499.46	NPP
CW 23+90	12/6/2010	5507.32	11.72	NPP	8.00	5499.32	NPP
	12/20/2010	5507.32	11.72	NPP	8.02	5499.30	NPP
CW 25+95	12/6/2010	5505.90	12.25	Recovery Pump Service		Recovery Pump Service	
	12/20/2010	5505.90	12.25	Recovery Pump Service		Recovery Pump Service	

NPP = No Product Present NWP = No Water Present

Monitoring Well Fluids Monitoring Dec. 2010

Appendix A - Tab 12.0

Well ID	Date	Measuring Point Elevation	Total Well Depth	Depth To Product (DTP)	Depth To Water (DTW)	Corrected Groundwater Elevation	Separate Phase Hydrocarbon Thickness
MW #11	12/6/2010	5510.31	22.94	NPP	11.40	5498.91	NPP
	12/20/2010	5510.31	22.94	NPP	11.37	5498.94	NPP
MW #12	12/6/2010	5501.61	14.98	NPP	10.50	5491.11	NPP
	12/20/2010	5501.61	14.98	NPP	10.47	5491.14	NPP
MW #20	12/6/2010	5519.90	27.13	20.63	21.32	21.34	0.69
	12/20/2010	5519.90	27.13	20.64	21.33	5499.12	0.69
MW #21	12/6/2010	5521.99	30.38	21.68	21.78	5500.29	0.10
	12/20/2010	5521.99	30.38	21.64	21.74	5500.33	0.10
MW #39	12/6/2010	5520.83	38.34	NPP	25.86	5494.97	NPP
	12/20/2010	5520.83	38.34	NPP	25.83	5495.00	NPP
MW #45	12/6/2010	5506.36	16.92	11.91	11.97	5494.44	0.06
	12/20/2010	5506.36	16.92	11.90	11.95	5494.45	0.05
MW #46	12/6/2010	5504.65	10.39	NPP	NWP		NPP
	12/20/2010	5504.65	10.39	NPP	NWP		NPP
MW #47	12/6/2010	5506.77	14.28	NPP	12.91	5493.86	NPP
	12/20/2010	5506.77	14.28	12.95	13.04	5493.80	0.09

NPP = No Product Present NWP = No Water Present

North Barrier Wall

Appendix A - Tab13.0

Collection Wells Groundwater Analysis & Field Data

EPA Method 8260B										Field Data					
EPA Method 8015B										E.C.	pH	Temp	TDS	Dissolved Oxygen	Oxygen Reduction Potential
DRO															
TPH Screening Guidelines Table 2a										mmhos/cm	6.0-9.0	Fahrenheit	1000 (mg/l)	mg/l	mV
Date Sampled															
WQCC 20 NMAC 6.2.3103 40CFR141.61 (Benzene and Ethylbenzene) USEPA Regional Screening Levels (April 2009)-MTBE	Aug-10	0.005 (mg/L)	0.75 (mg/L)	0.70 (mg/L)	0.62 (mg/L)	0.012 (mg/L)	0.20 (mg/L)	1.5	1067	67.2	6.82	67.2	757	2.58	280
	Apr-10	0.036	<0.001	0.0069	0.003	<0.001	2.8	2.8	1197	52.7	6.97	52.7	842	2.25	289
	Aug-09	0.045	<0.001	0.0038	<0.003	<0.001	4.1	4.1	1240	67.5	6.89	67.5	863	NR ²	NR ²
	Apr-09	0.034	<0.001	0.036	<0.003	<0.001	5.6	5.6	1231	53.7	6.93	53.7	867	NR ²	NR ²
	Aug-10	14.0	5.7	1.8	4.2	<0.096*	0.6	0.6	1343	66.5	6.96	66.5	960	1.09	141
CW 25+95	Apr-10	22.0	9.0	2.0	7.4	<0.001	2.5	2.5	965	52.2	6.95	52.2	675	1.32	255
	Aug-09	<0.001	<0.001	<0.001	<0.003	0.0011	<1.0	<1.0	1215	65.7	6.93	65.7	846	NR ²	NR ²
	Apr-09	0.340	<0.001	0.0016	<0.003	0.0036	<1.0	<1.0	1823	57.2	6.84	57.2	1313	NR ²	NR ²

* = High Dilution Factor due to nature of sample and matrix interferences

NS¹= Well is Dry or Not Enough Water to Sample- No Sample

NS² = Not Sampled due to approved Facility-Wide Monitoring Plan

NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Groundwater Analysis & Field Data

EPA Method 8260B										EPA Method 8015B			Field Data				
WQCC 20 NMAC 6.2.3103 40CFR141.61 (Benzene and Ethylbenzene) USEPA Regional Screening Levels (April 2009)- MTBE	Date Sampled	Benzene	Toluene	Ethylben	Xylene	MTBE	DRO		GRO	E.C.	pH	Temp	TDS	Dissolved Oxygen	Oxygen Reduction Potential		
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	TPH Screening Guidelines Table 2a		(mg/L)	mmhos/cm	6.0-9.0	Fahrenheit	1000 (mg/l)	mg/L	m.V.		
OW 8+10	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	0.012	0.20	NS¹	NS²	NS¹	NS¹	NS¹	NS¹	NS¹		
	Apr-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS²	NS¹	NS¹	NS¹	NS¹	NS²		
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS²	NS¹	NS¹	NS¹	NS²	NS²		
	Apr-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS²	NS¹	NS¹	NS¹	NS²	NS²		
OW 11+15	Aug-10	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹	NR¹		
	Apr-10	0.15	<0.01	0.23	<0.03	1.3	1500	2.5	1932	6.94	55.8	1394	NR²	NR²	NR²		
	Aug-09	0.33	<0.01	0.033	<0.03	1.7	60	3.2	1940	6.82	65.1	1393	NR²	NR²	NR²		
	Apr-09	0.23	<0.001	0.034	0.015	1.1	100	2.7	1921	6.82	57.6	1391	NR²	NR²	NR²		
OW 14+10	Aug-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NR²	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹		
	Apr-10	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NR²	NS¹	NS¹	NS¹	NS¹	NR²	NR²		
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NR²	NS¹	NS¹	NS¹	NS¹	NR²	NR²		
	Apr-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NR²	NS¹	NS¹	NS¹	NS¹	NR²	NR²		
OW 16+60	Aug-10	0.27	<0.01	0.15	0.07	0.84	11	5.8	2631	6.79	68.5	1982	2.86	199	199		
	Apr-10	0.49	<0.005	0.43	0.14	1.50	280	12.0	2601	6.9	58.3	1921	NR²	NR²	NR²		
	Aug-09	0.75	<0.01	0.24	0.24	2.00	62	14.0	2653	6.82	69.6	1952	NR²	NR²	NR²		
	Apr-09	0.40	<0.005	0.47	0.17	2.20	36	7.5	2655	6.77	62.2	1972	NR²	NR²	NR²		
OW 19+50	Aug-10	<0.001	<0.001	<0.001	<0.003	0.055	2.2	0.065	4496	6.87	68.9	3568	1.73	292	292		
	Apr-10	<0.001	<0.001	<0.001	<0.003	0.057	1.2	0.076	4005	6.92	54.7	3129	NR²	NR²	NR²		
	Aug-09	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NS¹	NR²	NR²		
	Apr-09	<0.001	<0.001	<0.001	0.0034	0.042	12	0.11	3678	6.77	59.8	2824	NR²	NR²	NR²		

NS¹= Well is Dry or Not Enough Water to Sample- No SampleNS² = Not Sampled due to approved Facility-Wide Monitoring PlanNS³ = Sample Inadvertently not Analyzed this Sampling EventNR¹= No Sample Required - Well Contains Separate Phase HydrocarbonNR² = No Sample Required per OCD and NMED pre-2007 Conditions

North Barrier Wall

Appendix A - Tab14.0

Groundwater Analysis & Field Data

Observation Wells		EPA Method 8260B						EPA Method 8015B		Field Data					
WQCC 20 NMAC 6.2.3103 40CFR141.61 (Benzene and Ethylbenzene) USEPA Regional Screening Levels (April 2009)- MTBE	Date Sampled	Benzene	Toluene	Ethylben	Xylene	MTBE	DRO	GRO	E.C.	pH	Temp	TDS	Dissolved Oxygen	Oxygen Reduction Potential	
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	TPH Screening Guidelines Table 2a	(mg/L)	mmhos/cm	6.0-9.0	Farenheit	1000 (mg/l)	mg/L	m.V.	
OW 22+00	Aug-10	<0.001	<0.001	<0.001	<0.003	0.34	0.41	0.37	3804	6.85	68.6	2953	1.5	286	
	Apr-10	<0.001	<0.001	<0.001	<0.003	<0.001	0.28	<0.05	3075	6.8	52.4	2326	NR ²	NR ²	
	Aug-09	<0.001	<0.001	<0.001	<0.003	0.69	1.5	0.11	3601	6.82	66.2	2742	NR ²	NR ²	
	Apr-09	<0.001	<0.001	<0.001	<0.003	0.034	4.6	0.059	2942	6.8	56.3	2213	NR ²	NR ²	
OW 23+10	Aug-10	2.5	<0.005	0.028	<0.015	<0.005	1.8	5.7	1379	6.9	69.5	982	1.06	272	
	Apr-10	0.081	<0.005	<0.005	<0.015	<0.005	2.5	0.45	1505	6.85	55.7	1070	NR ²	NR ²	
	Aug-09	<0.001	<0.001	<0.001	<0.003	0.0078	2.5	0.28	1756	6.8	66.8	1250	NR ²	NR ²	
	Apr-09	<0.001	<0.001	<0.001	<0.003	0.006	22.0	0.33	1535	6.86	59.4	1115	NR ²	NR ²	
OW 23+90	Aug-10	3.1	<0.001	0.071	<0.003	<0.001	1.0	7.4	1159	6.97	67.8	822	2.05	238	
	Apr-10	0.76	0.009	0.0082	0.011	<0.001	0.31	2.3	1203	6.9	56.1	845	NR ²	NR ²	
	Aug-09	<0.001	<0.001	<0.001	<0.003	0.0013	<1.0	0.26	1659	6.83	64.8	1178	NR ²	NR ²	
	Apr-09	<0.001	<0.001	<0.001	<0.003	<0.001	1.6	0.16	1401	6.8.5	60.1	989	NR ²	NR ²	
OW 25+70	Aug-10	6.6	0.12	0.71	<0.060	<0.020	0.83	20	1199	6.94	70.4	850	0.97	273	
	Apr-10	15	0.11	0.75	1.4	<0.02	1.2	50	1100	6.9	51.8	773	NR ²	NR ²	
	Aug-09	<0.001	<0.001	<0.001	<0.003	<0.001	<1.0	<0.05	1204	6.85	68.1	837	NR ²	NR ²	
	Apr-09	0.31	<0.001	0.009	<0.003	0.0014	<1.0	0.6	1450	6.85	55.8	1025	NR ²	NR ²	

NS¹= Well is Dry or Not Enough Water to Sample- No Sample

NS² = Not Sampled due to approved Facility-Wide Monitoring Plan

NS³ = Sample Inadvertently not Analyzed this Sampling Event

NR¹= No Sample Required - Well Contains Separate Phase Hydrocarbon

NR² = No Sample Required per OCD and NMED pre-2007 Conditions

Monitoring Wells Groundwater Analysis & Field Data

EPA Method 8260B							EPA Method 8015B	Field Data			
WQCC 20 NMAC 6.2.3103 40CFR141.61 (Benzene and Ethylbenzene) USEPA Regional Screening Levels (April 2009)-MTBE	Benzene	Toluene	Ethylben	Xylene	MTBE	DRO	E.C.	pH	Temp	TDS	
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	TPH Screening Guidelines Table 2a (mg/L.)					
MW - #11	Date Sampled	0.005	0.70	0.62	0.012	0.20	minhos/cm	6.0-9.0	Fahrenheit	1000 (mg/l)	
	Aug-10	0.0014	<0.001	0.0038	<0.0015	0.011	2.0	2545	7.03	66.4	1906.0
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-09	0.099	<0.001	0.004	<0.0015	0.014	12	2619	6.96	64.4	1929
MW - #12	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²
	Aug-10	<0.001	<0.001	<0.001	<0.0015	<0.001	<0.20	563	7.03	64.3	390
	Apr-10	<0.001	<0.001	<0.001	<0.0015	<0.001	0.30	540	7.04	50.5	370
	Aug-09	<0.001	<0.001	<0.001	<0.0015	<0.001	<1.0	1763	6.93	62.5	1256
MW - #20	Apr-09	<0.001	<0.001	<0.001	<0.002	<0.001	<1.0	1346	7.06	50.3	946
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
MW - #21	Apr-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Apr-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹

NS¹= Well is Dry or Not Enough Water to Sample- No SampleNR¹= No Sample Required - Well Contains Separate Phase HydrocarbonNS² = Not Sampled due to approved Facility-Wide Monitoring PlanNR² = No Sample Required per OCD and NMED pre-2007 ConditionsNS³ = Sample inadvertently not Analyzed this Sampling Event

North Barrier Wall

Appendix A - Tab15.0

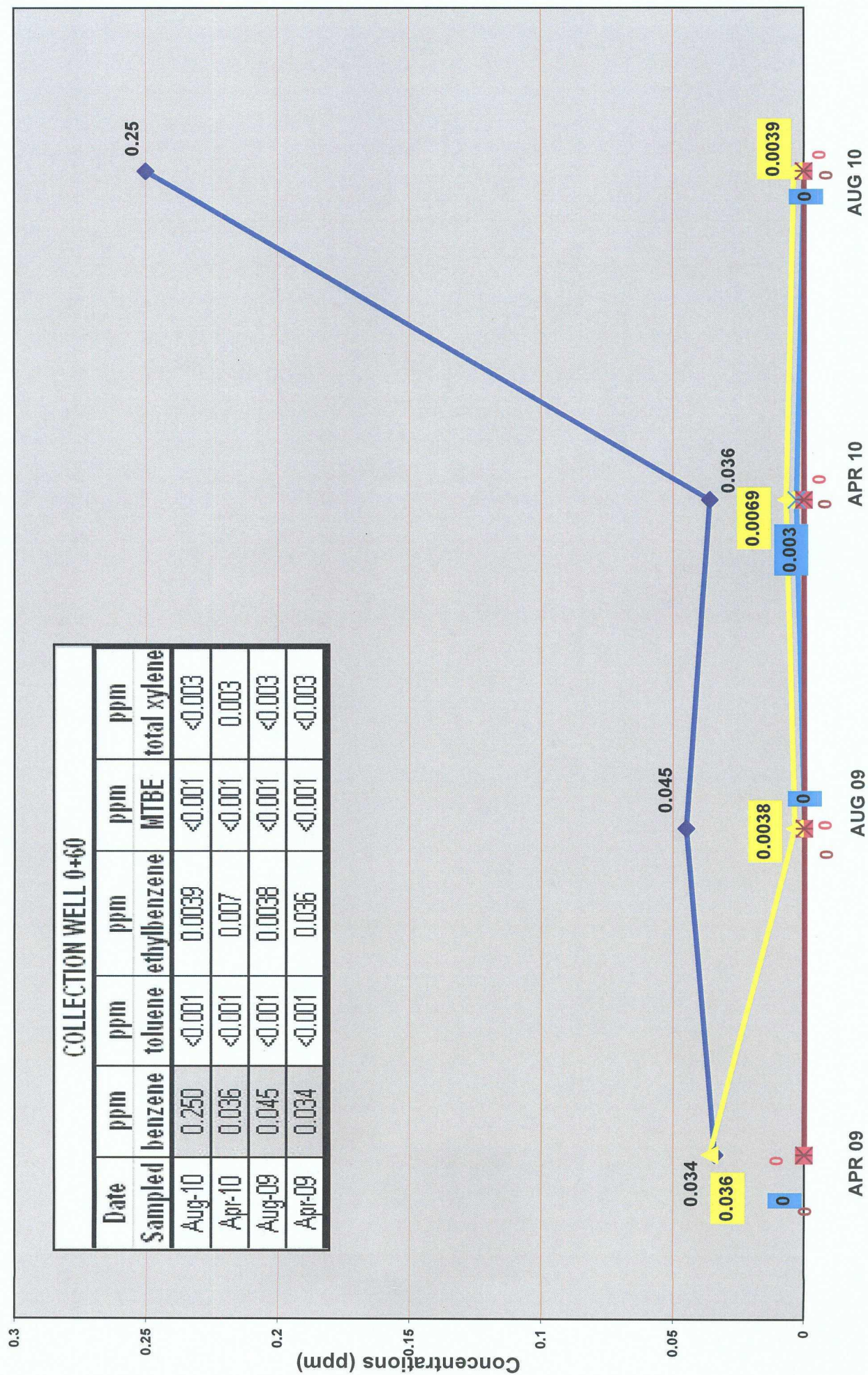
Monitoring Wells Groundwater Analysis & Field Data

EPA Method 8260B										Field Data			
WQCC 20 NMAC 6.2.3103 40CFR141.61 (Benzene and Ethylbenzene) USEPA Regional Screening Levels (April 2009)-MTBE	Benzene	Toluene	Ethylben	Xylene	MTBE	EPA Method 8015B		E.C.	pH	Temp	TDS		
	Date Sampled	0.005 (mg/L)	0.75 (mg/L)	0.70 (mg/L.)	0.62 (mg/L.)	0.012 (mg/L)	DRO TPH Screening Guidelines Table 2a						
MW #39	Aug-10	NS ²	NS ²	NS ²	NS ²	0.62 (mg/L.)	0.012 (mg/L)	0.20 (mg/L.)	mmhos/cm	6.0-9.0	Fahrenheit	4000 (mg/l)	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #45	Aug-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Apr-10	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Aug-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
	Apr-09	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	NS ²	
MW #46	Aug-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-10	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Aug-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
	Apr-09	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	NS ¹	
MW #47	Aug-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Apr-10	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Aug-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	
	Apr-09	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	NR ¹	

NS¹ = Well is Dry or Not Enough Water to Sample - No Sample
 NS² = Not Sampled due to approved Facility-Wide Monitoring Plan
 NS³ = Sample Inadvertently not Analyzed this Sampling Event
 NR¹ = No Sample Required - Well Contains Separate Phase Hydrocarbon
 NR² = No Sample Required per OCD and NMED pre-2007 Conditions

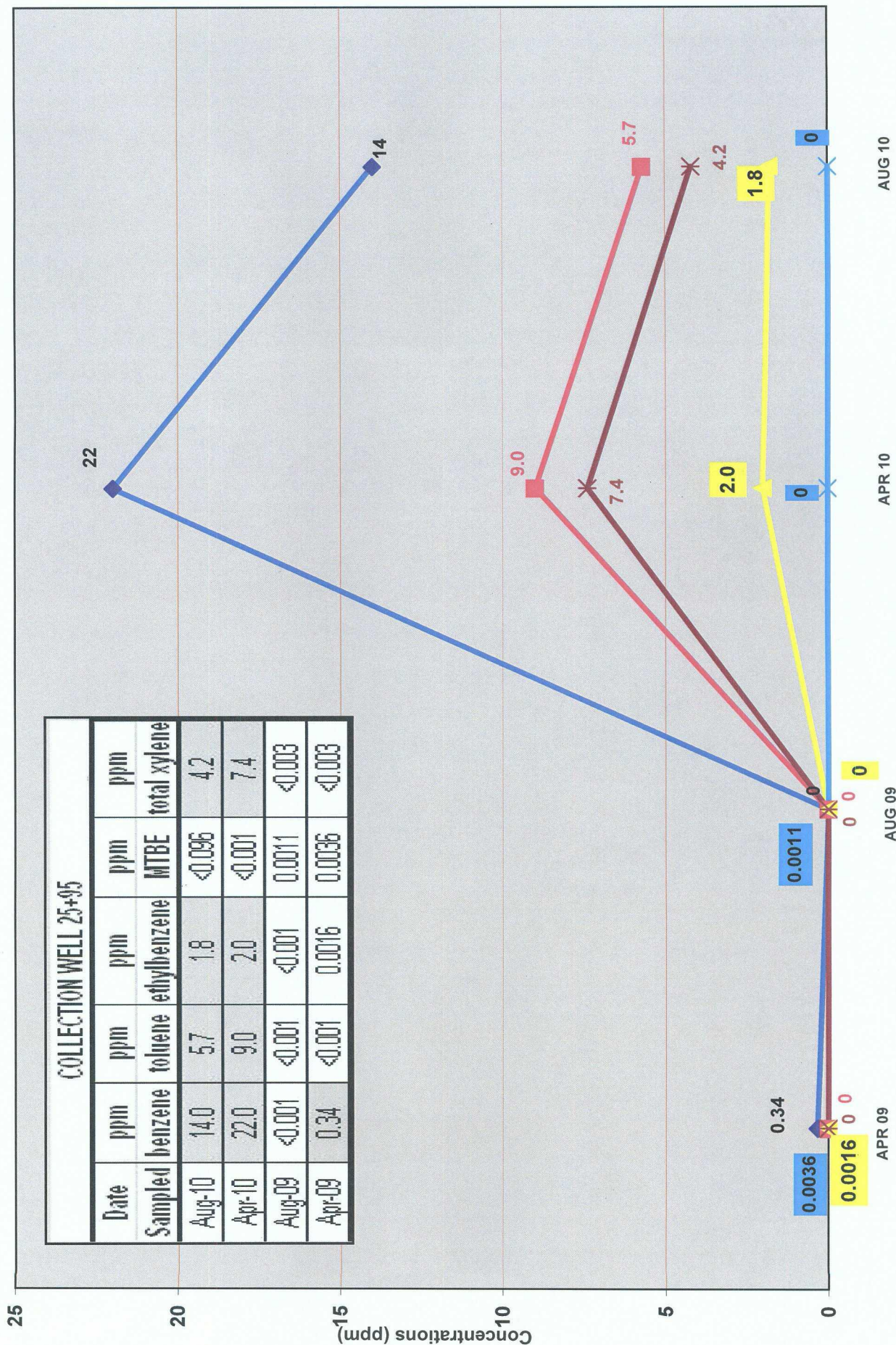


COLLECTION WELL 0+60						
Date	ppm	ppm	ppm	ppm	ppm	ppm
Sampled	benzene	toluene	ethylbenzene	MTBE	total xylene	
Aug-10	0.250	<0.001	0.0039	<0.001	<0.003	
Apr-10	0.036	<0.001	0.007	<0.001	0.003	
Aug-09	0.045	<0.001	0.0038	<0.001	<0.003	
Apr-09	0.034	<0.001	0.036	<0.001	<0.003	



Collection Well 25+95

Appendix A - Tab 16.0

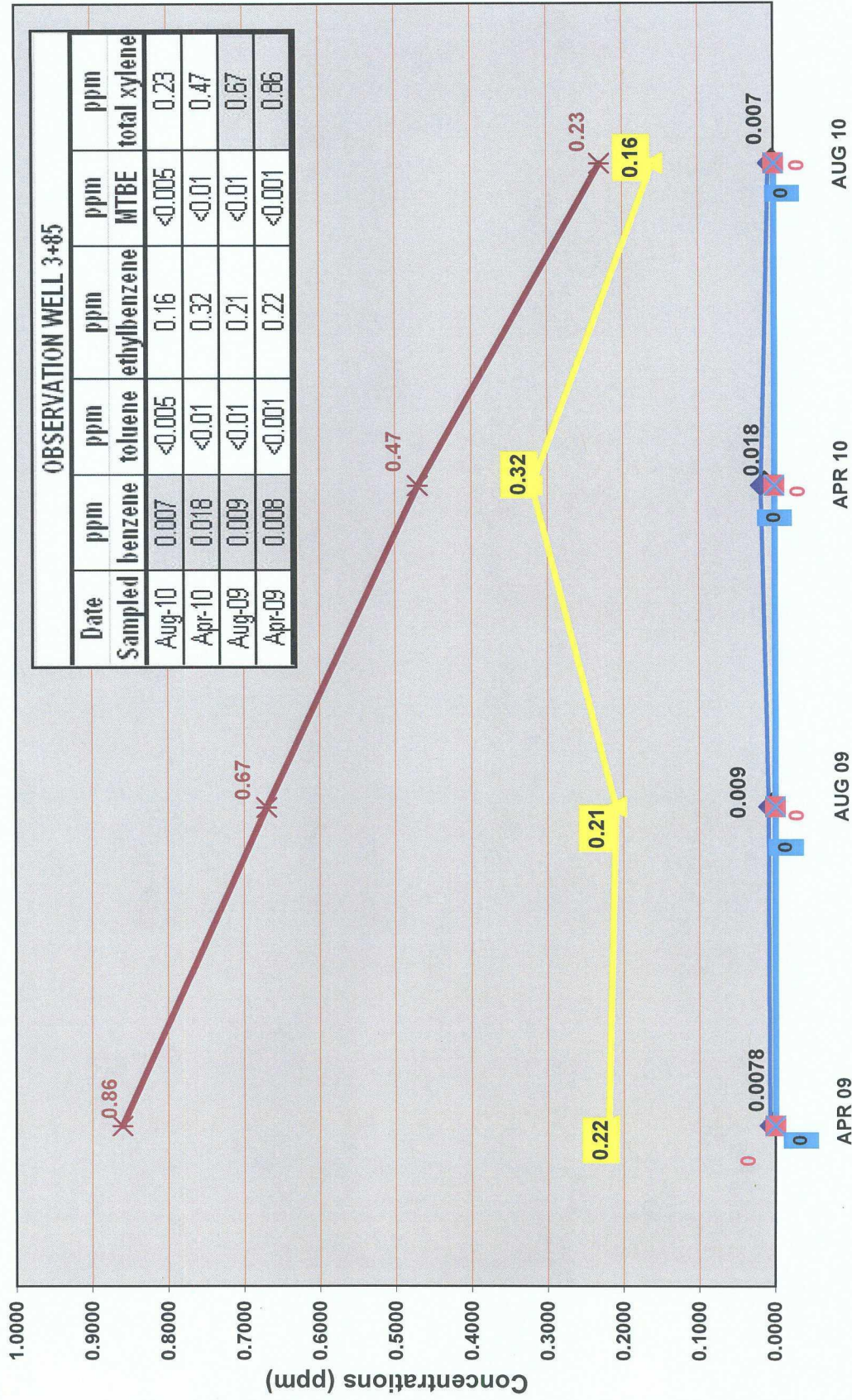


Observation Well 0+60

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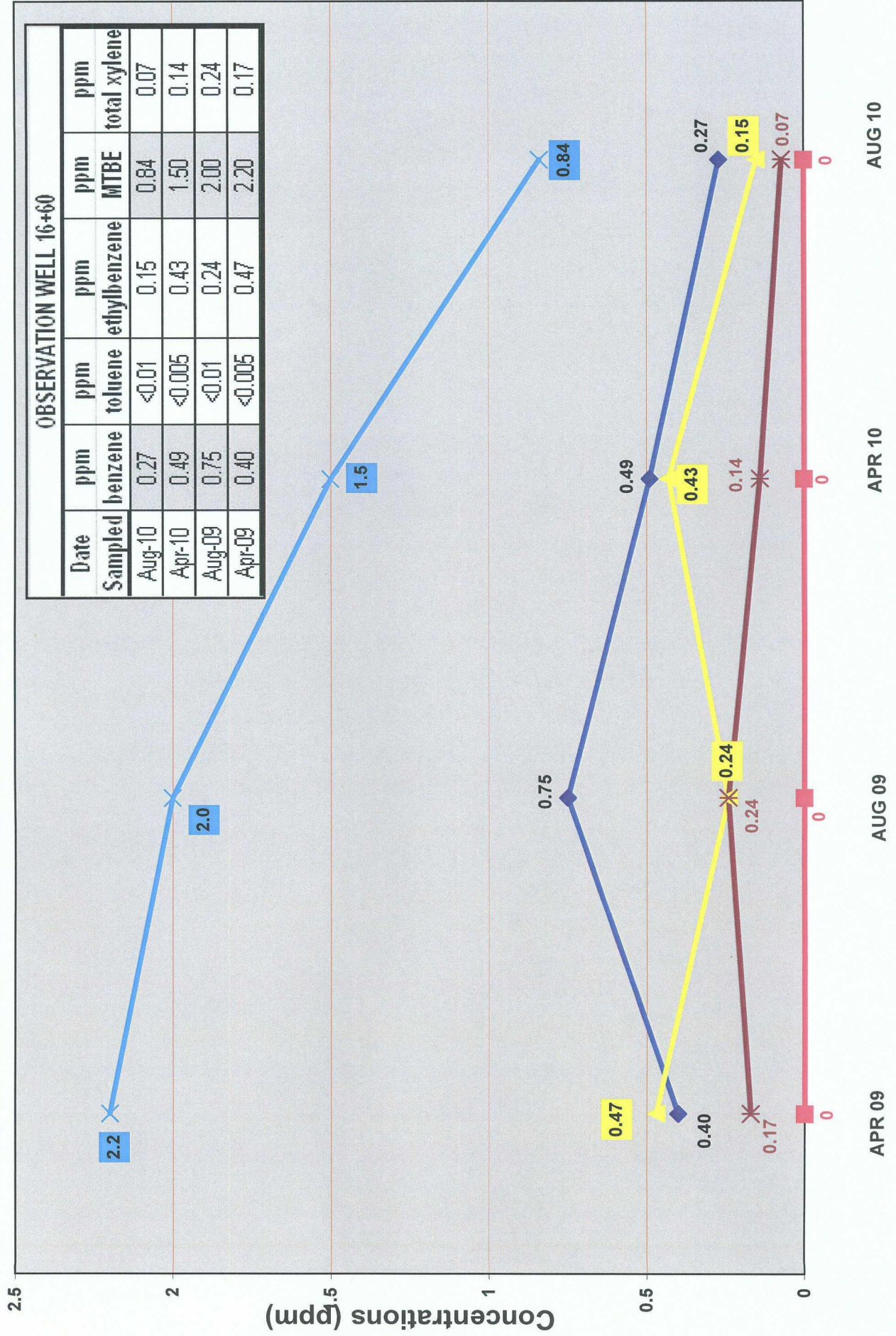


Observation Well 3+85



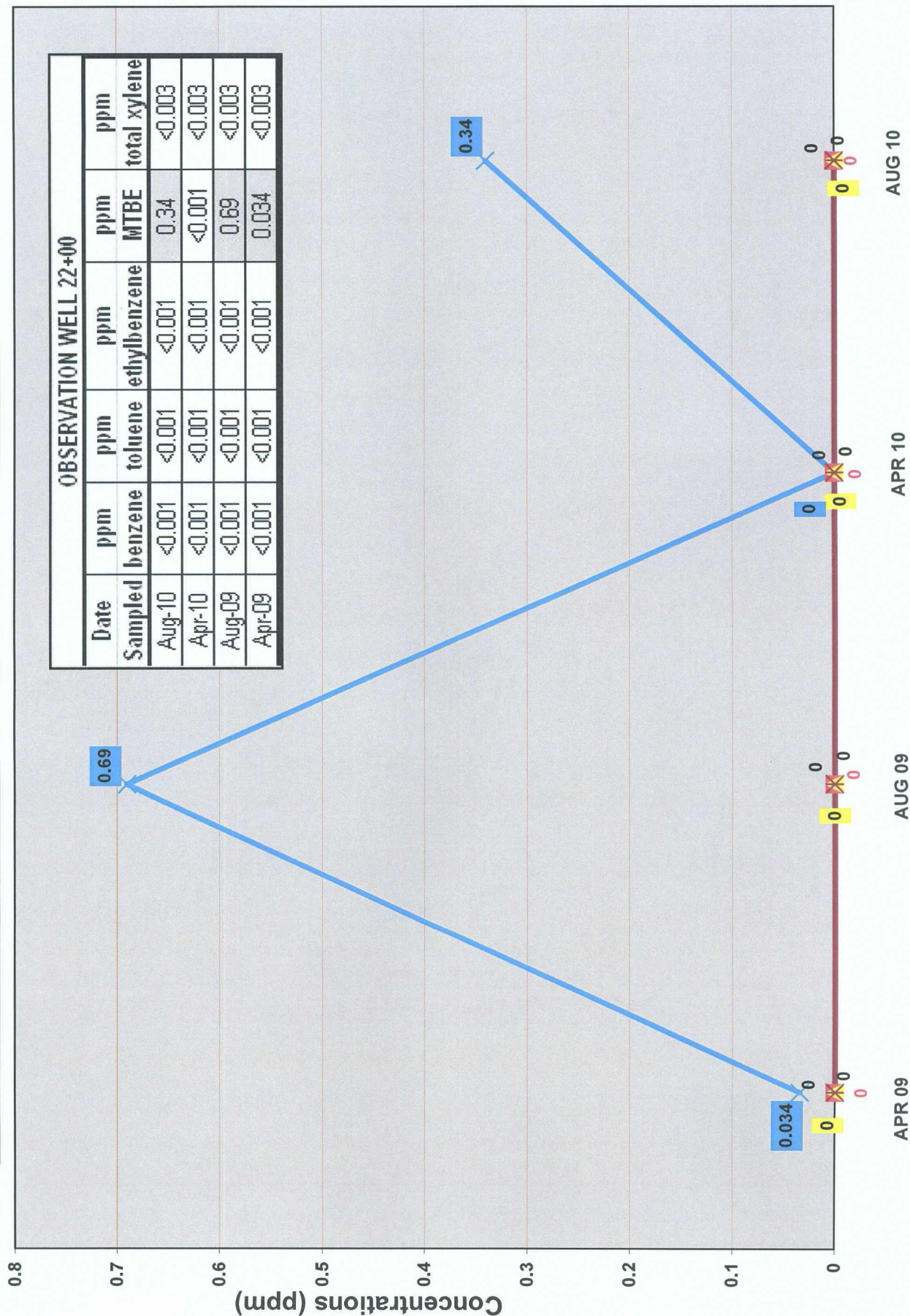
Observation Well 16+60

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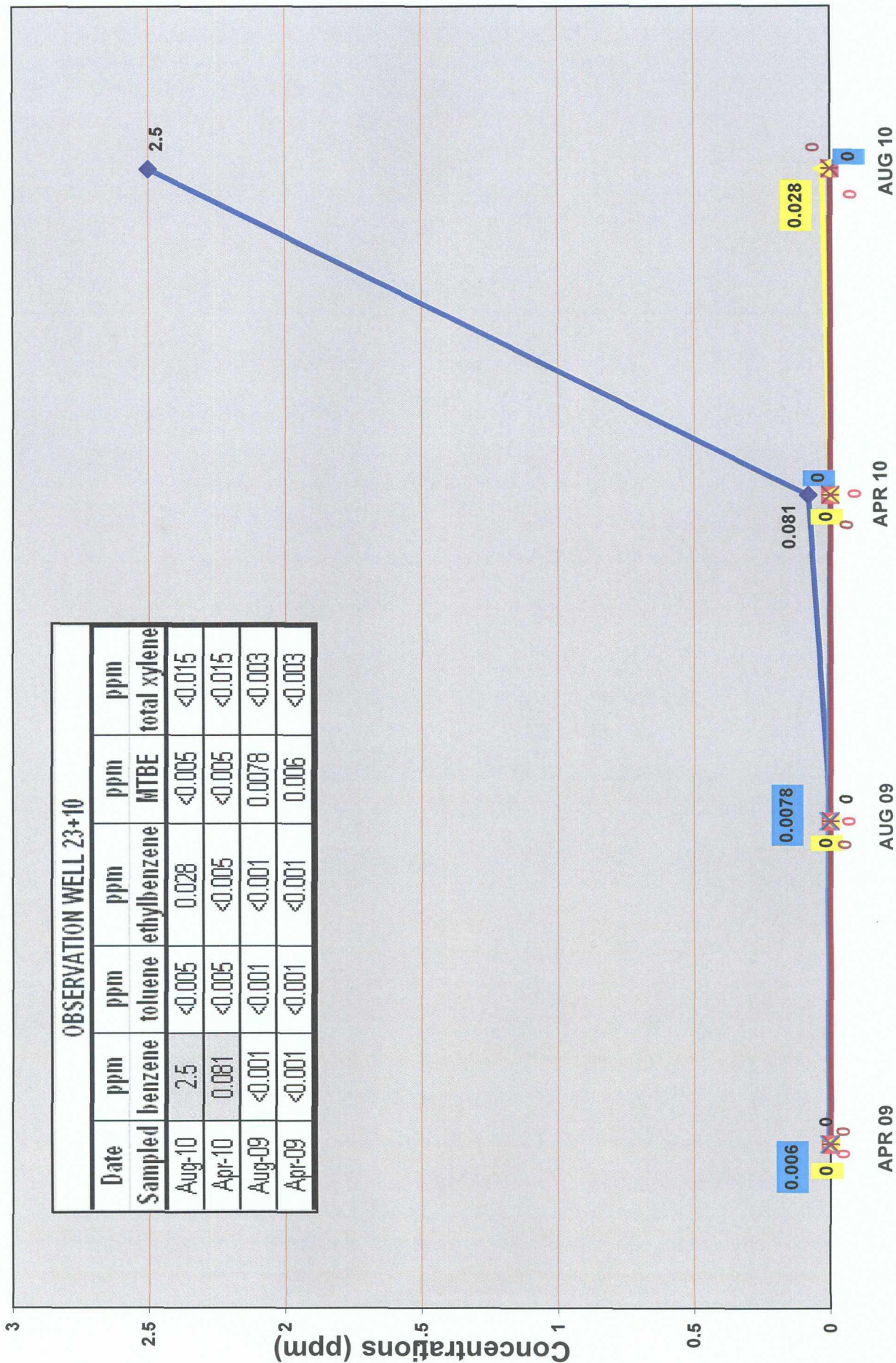
OBSERVATION WELL 16+60									
Date	Sampled	benzene	toluene	ethylbenzene	MTBE	total xylene	ppm	ppm	ppm
Aug-10		0.27	<0.01	0.15	0.84	0.07			
Apr-10		0.49	<0.005	0.43	1.50	0.14			
Aug-09		0.75	<0.01	0.24	2.00	0.24			
Apr-09		0.40	<0.005	0.47	2.20	0.17			

Observation Well 22+00



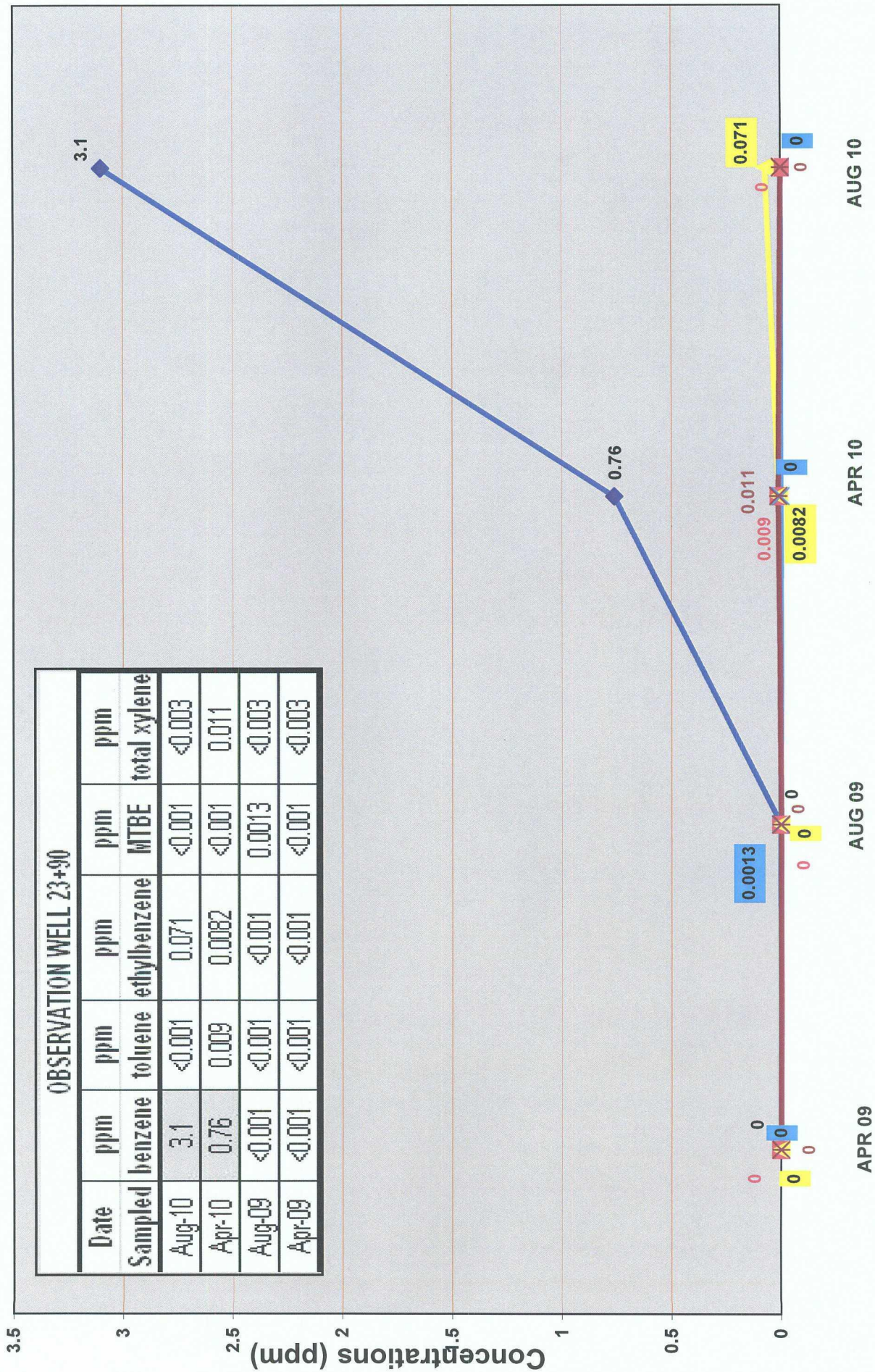
Observation Well 23+10

Appendix A - Tab 16.0



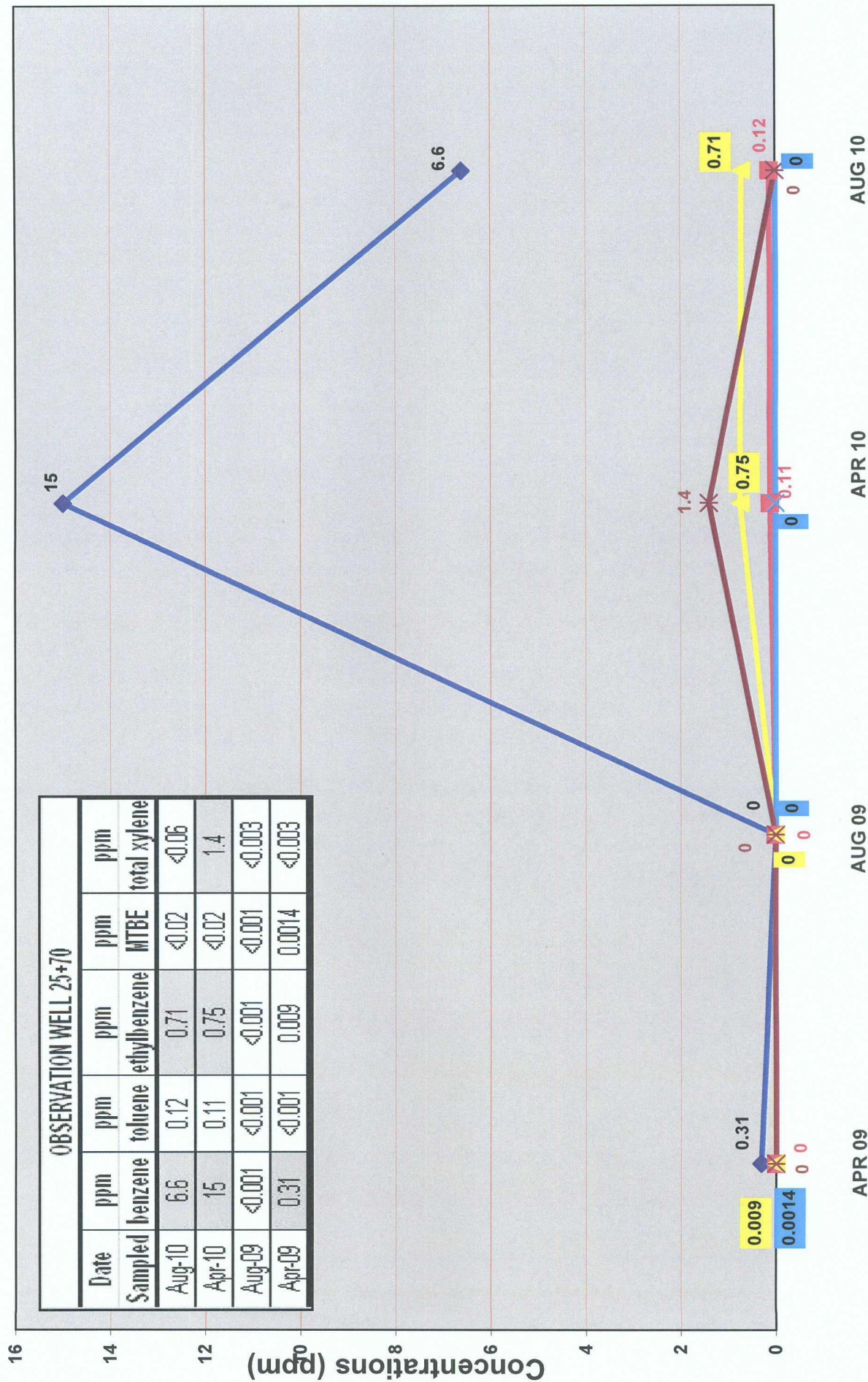
Observation Well 23+90

Appendix A - Tab 16.0



Observation Well 25+70

Appendix A - Tab 16.0



Appendix B Chemical Analytical Program

Hall Environmental Analysis Laboratory

QUALITY ASSURANCE PLAN

Effective Date: February 2nd 2010

Revision 9.2

www.hallenvironmental.com

Control Number: 0000095

Approved By:


Andy Freeman
Laboratory Manager

12/2/10
Date

Approved By:


Carolyn Swanson
Quality Assurance/Quality Control Officer

Date

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Appendix C TCEQ Accreditation

Full list of approved analytes, methods, analytical techniques and fields of testing

Reserved, available upon request

Appendix D Utah ELCP Accreditation

Full list of approved analytes, methods, analytical techniques and fields of testing

Reserved, available upon request

Appendix E ADHS Accreditation

Full list of approved analytes, methods, analytical techniques and fields of testing

Reserved, available upon request

Appendix F NMED-DWB Certification

Reserved, available upon request

Appendix G NM DOH Certification

Reserved, available upon request

Appendix H Terms and Definitions

Reserved, available upon request

Appendix I Chain of Custody Record

Reserved, available upon request

Appendix J HEAL Forms

Analyst Ethics and Data Integrity Agreement

IDOC Certificate

ADOCP Certificate

Training Forms

Corrective Action Report

Reserved, available upon request

3.0 Introduction

Purpose of Document

The purpose of this Quality Assurance Plan is to formally document the quality assurance policies and procedures of Hall Environmental Analysis Laboratory, Inc. (HEAL), for the benefit of its employees, clients, and accrediting organizations. HEAL continually implements all aspects of this plan as an essential and integral part of laboratory operations in order to ensure that high quality data is produced in an efficient and effective manner.

Objectives

The objective of HEAL is to achieve and maintain excellence in environmental testing. This is accomplished by developing, incorporating and documenting the procedures and policies specified by each of our accrediting authorities and outlined in this plan. A laboratory staff that is analytically competent, well qualified, and highly trained carries out these activities. An experienced management team, knowledgeable in their area of expertise, monitors them. Finally, a comprehensive quality assurance program governs laboratory practices and ensures that the analytical results are valid, defensible, reproducible, reconstructable and of the highest quality.

HEAL establishes and thoroughly documents its activities to ensure that all data generated and processed will be scientifically valid and of known and documented quality. Routine laboratory activities are detailed in method specific standard operating procedures (SOP). All data reported meets the applicable requirements for the specific method that is referenced, ORELAP, TCEQ, EPA, client specific requirements and/or State Bureaus. In the event that these requirements are ever in contention with each other, it is HEAL's policy to always follow the most prudent requirement available. For specific method requirements refer to HEAL's Standard Operating Procedures (SOP's), EPA methods, Standard Methods 20th edition, ASTM methods or state specific methods.

HEAL management ensures that this document is correct in terms of required accuracy, data reproducibility, and that the procedures contain proper quality control measures. HEAL management additionally ensures that all equipment is reliable, well maintained and appropriately calibrated. The procedures and practices of the laboratory are geared towards not only strictly following our regulatory requirements but also allowing the flexibility to conform to client specific specifications. Meticulous records are maintained for all samples and their respective analyses so that results are well documented and defensible in a court of law.

The HEAL Quality Assurance/Quality Control Officer (QA/QCO) and upper management are responsible for supervising and administering this quality assurance program, and ensuring each individual is responsible for its proper implementation. All HEAL management remains committed to the encouragement of excellence in analytical testing and will continue to provide the necessary resources and environment conducive to its achievement.

Policies

Understanding that quality cannot be mandated, it is the policy of this laboratory to provide an environment that encourages all staff members to take pride in the quality of their work. In addition to furnishing proper equipment and supplies, HEAL stresses the importance of continued training and professional development. Further, HEAL recognizes the time required for data interpretation. Therefore, no analyst should feel pressure to sacrifice data quality for data quantity. Each staff member must perform with the highest level of integrity and professional competence, always being alert to problems that could compromise the quality of their technical work.

Management and senior personnel supervise analysts closely in all operations. Under no circumstance is the willful act or fraudulent manipulation of analytical data condoned. Such acts must be reported immediately to HEAL management. Reported acts will be assessed on an individual basis and resulting actions could result in dismissal. The laboratory staff is encouraged to speak with lab managers or senior management if they feel that there are any undue commercial, financial, or other pressures, which might adversely affect the quality of their work; or in the event that they suspect that data quality has been compromised in any way. HEAL's Quality Assurance/Quality Control Officer is available if any analyst and/or manager wishes to anonymously report any suspected or known breaches in data integrity.

All proprietary rights and client information at HEAL (including national security concerns) are considered confidential. No information will be given out without the express verbal or written permission of the client. All reports generated will be held in the strictest of confidence.

This is a controlled document. Each copy is assigned a unique tracking number and when released to a client or accrediting agency the QA/QCO keeps the tracking number on file. This document is reviewed on an annual basis to ensure that it is valid and representative of current practices at HEAL.

4.0 Organization and Responsibility

Company

HEAL is accredited in accordance with the 2003 NELAC standard (see NELAC accredited analysis list in the appendix), through ORELAP and TCEQ and by the Arizona Department of Health Services. Additionally, HEAL is qualified as defined under the State of New Mexico Water Quality Control Commission regulations and the New Mexico State Drinking Water Bureau. HEAL is a locally owned small business that was established in 1991. HEAL is a full service environmental analysis laboratory with analytical capabilities that include both organic and inorganic methodologies and has performed analyses of soil, water, air as well as various other matrices for many sites in the region. HEAL's client base includes local, state and federal agencies, private consultants, commercial industries as well as individual homeowners. HEAL has performed as a subcontractor to the state of New Mexico and to the New Mexico Department of Transportation. HEAL has been acclaimed by its customers as producing quality results and as being adaptive to client-specific needs.

The laboratory is divided into an organic section, and an inorganic section. Each section has a designated manager/technical director. The technical directors report directly to the laboratory manager, who oversees all operations.

Certifications

ORELAP – NELAC Oregon Primary accrediting authority.

TCEQ – NELAC Texas Secondary accrediting authority.

The Arizona Department of Health Services

The New Mexico Drinking Water Bureau

The New Mexico Department of Health

See appendix B-E for copies of current licenses and licensed parameters, or refer to our current list of certifications online at www.hallenvironmental.com.

In the event of a certification being revoked or suspended HEAL will notify, in writing, those clients that require the effected certification.

Personnel

HEAL management ensures the competence of all who operate equipment, perform environmental tests, evaluate results, and sign test reports. Personnel performing specific tasks shall be qualified on the basis of appropriate education, training, experience and /or demonstrated skills.

All personnel shall be responsible for complying with HEAL's quality assurance/quality control requirements that pertain to their technical function. Each technical staff member must have a combination of experience and education to adequately demonstrate specific knowledge of their particular function and a general knowledge of laboratory operations, test methods, quality assurance/quality control procedures and records management.

All employees training certificates and diplomas are kept on file with demonstrations of capability for each method they perform. An Organizational Chart can be found in Appendix A.

Laboratory Director

The Laboratory Director is responsible for overall technical direction and business leadership of HEAL. The Laboratory Manager, the Project Manager and Quality Assurance/Quality Control Officer report directly to the Laboratory Director. Someone with a minimum of 7 years of directly related experience and a bachelor's degree in a scientific or engineering discipline should fill this position.

Laboratory Manager/Lead Technical Director

The Laboratory Manager shall exercise day-to-day supervision of laboratory operations for the appropriate fields of accreditation and reporting of results. The Laboratory Manager shall be experienced in the fields of accreditation for which the laboratory is approved or seeking accreditation. The Laboratory Manager shall certify that personnel with appropriate educational and/or technical background perform all tests for which HEAL is accredited. Such certification shall be documented.

The Laboratory Manager shall monitor standards of performance in quality control and quality assurance and monitor the validity of the analyses performed and data generated at HEAL to assure reliable data.

The Laboratory Manager is responsible for the daily operations of the laboratory. The Laboratory Manager is the lead technical director of the laboratory and in conjunction with the section technical directors is responsible for coordinating activities within the laboratory with the overall goal of efficiently producing high quality data within a reasonable time frame.

In events where employee scheduling or current workload is such that new work cannot be incorporated, without missing hold times, the Laboratory Manager has authority to modify employee scheduling, re-schedule projects or, when appropriate, allocate the work to approved subcontracting laboratories.

Additionally, the laboratory manager reviews and approves new analytical procedures and methods, and performs a final review of most analytical results. The Laboratory Manager provides technical support to both customers and HEAL staff.

The Laboratory Manager also observes the performance of supervisors to ensure good laboratory practices and proper techniques are being taught and utilized, assisting in overall quality control implementation, and strategic planning for the future of the company. Other duties include assisting in establishing laboratory policies which lead to the fulfillment of requirements for various certification programs, assuring that all Quality Assurance and Quality Control documents are reviewed and approved, and assisting in conducting Quality Assurance Audits.

The laboratory manager addresses questions or complaints that cannot be answered by the section managers.

The Laboratory Manager shall have a bachelor's degree in a chemical, environmental, biological sciences, physical sciences or engineering field, and at least five years of experience in the environmental analysis of representative inorganic and organic analytes for which the laboratory seeks or maintains accreditation.

Quality Assurance Quality Control Officer

The Quality Assurance/Quality Control Officer (QA/QCO) serves as the focal point for QA/QC and shall be responsible for the oversight and/or review of quality control data. The QA/QCO functions independently from laboratory operations and shall be empowered to halt unsatisfactory work and/or prevent the reporting of results generated from an out-of-control measurement system. The QA/QCO shall objectively evaluate data and perform assessments without any outside/managerial influence. The QA/QCO shall have direct access to the highest level of management at which decisions are made on laboratory policy and/or resources. The QA/QCO shall notify laboratory management of deficiencies in the quality system in periodic, independent reports.

The QA/QCO shall have general knowledge of the analytical test methods, for which data review is performed, have documented training and/or experience in QA/QC procedures and in the laboratory's quality system. The QA/QCO will have a minimum of a BS in a scientific or related field and a minimum of three years of related experience.

The QA/QCO shall schedule and conduct internal audits as per the Internal Audit SOP at least annually, monitor and trend Corrective Action Reports as per the Data Validation SOP, periodically review control charts for out of control conditions and initiate any appropriate corrective actions.

The QA/QCO shall oversee the analysis of proficiency testing in accordance with our standards and monitor any corrective actions issued as a result of this testing.

The QA/QCO reviews all standard operating procedures and statements of work in order to assure their accuracy and compliance to method and regulatory requirements.

The QA/QCO shall be responsible for maintaining and updating this quality manual.

Business/Project Manager

The role of the business/project manager is to act as a liaison between HEAL and our clients. The project manager reviews reports, updates clients on the status of projects in-house, prepares quotations for new work, and is responsible for HEAL's marketing effort.

All new work is assessed by the project manager and reviewed with the other managers so as to not exceed the laboratories capacity. In events where employee scheduling or current workload is such that new work cannot be incorporated without missing hold times, the Project Manager has authority to re-schedule projects.

It is also the duty of the project manager to work with the Laboratory Manager and QA/QCO to insure that before new work is undertaken the resources required and accreditations requested are available to meet the client's specific needs.

Additionally, the Project Manager can initiate the review of the need for new analytical procedures and methods, and performs a final review of some analytical results. The Project Manager provides technical support to customers. Someone with a minimum of 2 years of directly related experience and a bachelor's degree in a scientific or engineering discipline should fill this position.

Section Manager/Technical Directors

The Section Manager/Technical Directors are full-time members of the staff at HEAL who exercise day-to-day supervision of laboratory operations for the appropriate fields of accreditation and reporting of results for their department within HEAL. A Technical Director's duties shall include, but not be limited to, monitoring standards of performance in quality control and quality assurance; monitoring the validity of the analyses performed and the data generated in their sections to ensure reliable data, overseeing training and supervising departmental staff, schedule incoming work for their sections and monitor laboratory personnel to ensure that proper procedures and techniques are being utilized. They supervise and implement new Quality Control procedures as directed by the QA/QCO, update and maintain quality control records including, but not limited to, training forms, IDOCs, ADOCPs, MDLs and evaluate laboratory personnel in their Quality Control activities. In addition technical directors are responsible for upholding the spirit and intent of HEAL's data integrity procedures.

They are the technical director of the associated section and review analytical data to acknowledge that data meets all criteria set forth for good Quality Assurance practices. Someone with a minimum of 2 years of experience in the environmental analysis of

representative analytes for which HEAL seeks or maintains accreditation and a bachelor's degree in a scientific or related discipline should fill this position.

Health and Safety / Chemical Hygiene Officer

Refer to the most recent version of the Health and Safety and Chemical Hygiene Plans for the rolls, responsibilities and basic requirements of the Health and Safety Officer (H&SO) and the Chemical Hygiene Officer (CHO). These jobs can be executed by the same employee.

Chemist I, II and III

Chemists are responsible for the analysis of various sample matrices including, but not limited to, solid, aqueous, and air as well as the generation of high quality data in accordance with the HEAL SOPs and QA/QC guidelines in a reasonable time as prescribed by standard turnaround schedules or as directed by the Section Manager or Laboratory Manager.

Chemists are responsible for making sure all data generated is entered in the database in the correct manner and the raw data is reviewed, signed and delivered to the appropriate peer for review. A Chemist reports daily to the section manager and will inform them as to material needs of the section specifically pertaining to the analyses performed by the chemist. Additional duties may include preparation of samples for analysis, maintenance of lab instruments or equipment, cleaning and providing technical assistance to lower level laboratory staff.

The senior chemist in the section may be asked to perform supervisory duties as related to operational aspects of the section. The chemist may perform all duties of a lab technician.

The position of Chemist is a full or part time hourly position and is divided into three levels, Chemist I, II, and III. All employees hired into a Chemist position at HEAL must begin as a Chemist I and remain there at a minimum of three months regardless of their education and experience. Chemist I must have a minimum of an AA in a related field or equivalent experience (equivalent experience means years of related experience can be substituted for the education requirement). A Chemist I is responsible for analysis, instrument operation and data reduction. Chemist II must have a minimum of an AA in a related field or equivalent experience and must have documented and demonstrated aptitude to perform all functions of a Chemist II. A Chemist II is responsible for the full analysis of their test methods, routine instrument maintenance, purchase of consumables as dictated by their Technical Director, advanced data reduction and basic data review. Chemist II may also assist Chemist III in method development and, as dictated by their Technical Director, may be responsible for the review and/or revision of their method specific SOPs. Chemist III must have Bachelors degree or equivalent experience and must have documented and demonstrated aptitude to perform all functions of a Chemist III. A Chemist III is responsible for all tasks completed by a Chemist I and II as well as advanced

data review, non-routine instrument maintenance, assisting their technical director in basic supervisory duties and method development.

Laboratory Technician

A laboratory technician is responsible for providing support in the form of sample preparation, basic analysis, general laboratory maintenance, glassware washing, chemical inventories and sample kit preparation. This position can be filled by someone without the education and experience necessary to obtain a position as a chemist.

Sample Control Manager

The sample control manager is responsible for receiving samples and reviewing the sample login information after it has been entered into the computer. The sample control manager also checks the samples against the chain-of-custody for any sample and/or labeling discrepancies prior to distribution.

The sample control manager is responsible for sending out samples to the sub-contractors along with the review and shipping of field sampling bottle kits. The sample control manager acts as a liaison between the laboratory and field sampling crew to ensure that the appropriate analytical test is assigned. If a discrepancy is noted the sample control manager or sample custodian will contact the customer to resolve any questions or problems. The sample control manager is an integral part of the customer service team.

This position should be filled by someone with a high school diploma and a minimum of 2 years of related experience and can also be filled by a senior manager.

Sample Custodians

Sample Custodians work directly under the Sample Control Manager. They are responsible for sample intake into the laboratory and into the LIMS. Sample Custodians take orders from our clients and prepare appropriate bottle kits to meet the client's needs. Sample Custodians work directly with the clients in properly labeling and identifying samples as well as properly filling out legal COCs. When necessary, Sample Custodians contact clients to resolve any questions or problems associated with their samples. Sample Custodians are responsible for distributing samples throughout the laboratory and are responsible for notifying analysts of special circumstances such as short holding times or improper sample preservation upon receipt.

Delegations in the Absence of Key Personnel

Planned absences shall be preceded by notification to the Laboratory Manager. The appropriate staff members shall be informed of the absence. In the case of unplanned absences, the organizational superior shall either assume the responsibilities and duties or delegate the responsibilities and duties to another appropriately qualified employee.

In the event that the Laboratory Manager is absent for a period of time exceeding fifteen consecutive calendar days, another full-time staff member meeting the basic qualifications and competent to temporarily perform this function will be designated. If this absence exceeds thirty-five consecutive calendar days, HEAL will notify ORELAP in writing of the absence and the pertinent qualifications of the temporary laboratory manager.

Laboratory Personnel Qualification and Training

All personnel joining HEAL shall undergo orientation and training. During this period the new personnel shall be introduced to the organization and their responsibilities, as well as the policies and procedures of the company. They shall also undergo on the job training and shall work with trained staff. They will be shown required tasks and be observed while performing them.

When utilizing staff undergoing training, appropriate supervision shall be dictated and overseen by the appropriate section technical director. Prior to analyzing client samples, a new employee, or an employee new to a procedure, must meet the following basic requirements. The SOP and Method for the analysis must be read and signed by the employee indicating that they read, understood and intend to comply with the requirements of the documents. The employee must undergo documented training. Training is conducted by a senior analyst familiar with the procedure and overseen by the section Technical Director. This training is documented by any means deemed appropriate by the trainer and section Technical Director, and kept on file in the employees file located in the QA/QCO's office. The employee must perform a successful Initial Demonstration of Proficiency (IDOC). See Appendix H for the training documents and checklists utilized at HEAL to ensure that all of these requirements are met. Once all of the above requirements are met it is incumbent upon the section Technical Director to determine at which point the employee can begin to perform the test unsupervised. A Certification to Complete Work Unsupervised (see Appendix H) is then filled out by the employee and technical director.

All IDOCs shall be documented through the use of the certification form which can be found in Appendix H. IDOCs are performed by analyzing four Laboratory Control Spikes (LCSs). Using the results of the LCSs the mean recovery is calculated in the appropriate reporting units and the standard deviations of the population sample (n-1) (in the same units) as well as the relative percent difference for each parameter of interest. When it is not possible or pertinent to determine mean and standard deviations HEAL assesses performance against established and documented criteria dictated in the method SOP. The mean and standard deviation are compared to the corresponding acceptance criteria for

precision and accuracy in the test method (if applicable) or in laboratory-generated acceptance criteria. In the event that the HEAL SOP or test method fail to establish the pass/fail criteria the default limits of +/- 20% for calculated recovery and <20% relative percent difference based on the standard deviation will be utilized. If all parameters meet the acceptance criteria, the IDOC is successfully completed. If any one of the parameters do not meet the acceptance criteria, the performance is unacceptable for that parameter and the analyst must either locate and correct the source of the problem and repeat the test for all parameters of interest or repeat the test for all parameters that failed to meet criteria. Repeat failure, however, confirms a general problem with the measurement system. If this occurs the source of the problem must be identified and the test repeated for all parameters of interest.

New employees that do not have prior analysis experience will not be allowed to perform analysis until they have demonstrated attention to detail with minimal errors in the assigned tasks. To ensure a sustained level of quality performance among staff members, continuing demonstration of capability shall be performed at least once a year. These are as an Annual Documentation of Continued Proficiency (ADOCP).

At least once per year an ADOCP must be completed by: the acceptable performance of a blind sample (this is typically done using a PT sample but can be a single blind sample to the analyst), by performing another IDOC, or by summarizing the data of four consecutive laboratory control samples with acceptable levels of precision and accuracy (these limits are those currently listed in the LIMS for an LCS using the indicated test method.) ADOCPs are documented using a standard form and are kept on file in each analysts employee folder.

Each new employee shall be provided with data integrity training as a formal part of their new employee orientation. Each new employee will sign an ethics and data integrity agreement to ensure that they understand that data quality is our main objective. Every HEAL employee recognizes that although turn around time is important, quality is put above any pressure to complete the task expediently. Analysts are not compensated for passing QC parameters nor are incentives given for the quantity of work produced. Data Integrity and Ethics training are performed on an annual basis in order to remind all employees of HEAL's policy on data quality. Employees are required to understand that any infractions of the laboratory data integrity procedures will result in a detailed investigation that could lead to very serious consequences including immediate termination, debarment or civil/criminal prosecution.

Training for each member of HEAL's technical staff is further established and maintained through documentation that each employee has read, understood, and is using the latest version of this Quality Assurance Manual. Training courses or workshops on specific equipment, analytical techniques or laboratory procedures are documented through attendance sheets, certificates of attendance, training forms or quizzes. This training documentation is located in either analyst specific employee folders in the QA/QCO Office or in the current years group training folder, also located in the QA/QCO Office. On the front of all methods, SOPs and procedures for HEAL there is a signoff sheet that is signed by all pertinent employees, indicating that they have read, understood and agreed to perform the most recent version of the document.

0 Receipt and Handling of Samples

Sampling

Procedures

HEAL does not provide field sampling for any projects. Sample kits are prepared and provided for clients upon request. The sample kits contain the appropriate sampling containers (with a preservative when necessary), labels, blue ice (The use of "blue ice" by anyone except HEAL personnel is discouraged because it generally does not maintain the appropriate temperature of the sample. If blue ice is used, it should be completely frozen at the time of use, the sample should be chilled before packing, and special notice taken at sample receipt to be certain the required temperature has been maintained.), a cooler, chain-of-custody forms, plastic bags, bubble wrap, and any special sampling instructions. Sample kits are reviewed prior to shipment for accuracy and completeness.

Containers

Containers which are sent out for sampling are purchased by HEAL from a commercial source. Glass containers are certified "EPA Cleaned" QA level 1. Plastic containers are certified clean when required. These containers are received with a Certificate of Analysis verifying that the containers have been cleaned according to the EPA wash procedure. Containers are used once and discarded. If the samples are collected and stored in inappropriate containers the laboratory may not be able to accurately quantify the amount of the desired components. In this case re-sampling may be required.

Preservation

If sampling for an analyte(s) requires preservation, the sample custodians fortify the containers prior to shipment to the field, or provide the preservative for the sampler to add in the field. The required preservative is introduced into the vials in uniform amounts and done so rapidly to minimize the risk of contamination. Vials that contain a preservative are labeled appropriately. If the samples are stored with inappropriate preservatives the laboratory may not be able to accurately quantify the amount of the desired components. In this case re-sampling may be required.

Refer to the current Login SOP and/or the current price book for detailed sample receipt and handling procedures, appropriate preservation and holding time requirements.

Sample Custody

Chain-of-Custody Form

A Chain-of-Custody (COC) form is used to provide a record of sample chronology from the field to receipt at the laboratory. HEAL's COC contains the client's name, address, phone and fax numbers, the project name and number, the project manager's name, and the field sampler's name. It also identifies the date and time of sample collection, sample matrix, field sample ID number, number/volume of sample containers, sample temperature upon receipt, and any sample preservative information.

There is also a space to record the HEAL ID number assigned to samples after they are received. Next to the sample information is a space for the client to indicate the desired analyses to be performed. There is a section for the client to indicate the data package level as well as any accreditation requirements. Finally, there is a section to track the actual custody of the samples. The custody section contains lines for signatures, dates and times when samples are relinquished and received. The COC form also includes a space to record special sample related instructions, sampling anomalies, time constraints, and any sample disposal considerations.

It is paramount that all COCs arrive at HEAL complete and accurate so that the samples can be processed and allocated for testing in a timely and efficient manor. A sample chain-of-custody form can be found in Appendix G or on line at www.hallenvironmental.com.

Receiving Samples

Samples are received by authorized HEAL personnel. Upon arrival, the COC is compared to the respective samples. After the samples and COC have been determined to be complete and accurate, the sampler signs over the COC. The HEAL staff member in turn signs the chain-of-custody, also noting the current date, time and sample temperature. This relinquishes custody of the samples from the sampler and delegates sample custody to HEAL. The third (pink) copy of the COC form is given to the person who has relinquished custody of the samples.

Logging in Samples and Storage

Standard Operating Procedures have been established for the receiving and tracking of all samples (refer to the current HEAL Login SOP). These procedures ensure that samples are received and properly logged into the laboratory, and that all associated documentation, including chain of custody forms, are complete and consistent with the samples received. Each sample set is given a unique HEAL tracking ID number. Individual sample locations within a defined sample set are given a unique sample ID suffix-number. Labels with the HEAL numbers, and tests requested, are generated and

placed on their respective containers. The pH of preserved, non-volatile samples is checked and noted if out of compliance. Due to the nature of the samples, the pHs of volatile samples are checked after analysis. Samples are reviewed prior to being distributed for analysis.

Samples are distributed for analysis based upon the requested tests. In the event that sample volume is limited and different departments at HEAL are required to share the sample, volatile work takes precedence and will always be analyzed first before the sample is sent to any other department for analysis.

Each project (sample set) is entered into the Laboratory Information Management System (LIMS) with a unique ID that will be identified on every container. The ID tag includes the Lab ID, Client ID, date and time of collection, and the analysis/analyses to be performed. The LIMS continually updates throughout the lab. Therefore, at any time, an analyst or manager may inquire about a project and/or samples status. For more information about the login procedures, refer to the Sample Login SOP.

Disposal of Samples

Samples are held at HEAL for a minimum of thirty days and then transferred to the HEAL warehouse for disposal. Analytical results are used to characterize their respective sample contamination level(s) so that the proper disposal can be performed. These wastes will be disposed of according to their hazard as well as their type and level of contamination. Refer to the Hall Environmental Analysis Laboratory Chemical Hygiene Plan and current Sample Disposal SOP for details regarding waste disposal.

Waste drums are provided by an outside agency. These drums are removed by the outside agency and disposed of in a proper manner.

The wastes that are determined to be non-hazardous are disposed of as non-hazardous waste in accordance with the Chemical Hygiene Plan and Sample Disposal SOP.

6.0 Analytical Procedures

All analytical methods used at HEAL incorporate necessary and sufficient Quality Assurance and Quality Control practices. A Standard Operating Procedure (SOP) is used for each method to provide the necessary criteria to yield acceptable results. These procedures are reviewed at least annually and revised as necessary and are attached as a pdf file in the Laboratory Information Management System (LIMS) for easy access by each analyst. The sample is often consumed or altered during the analytical process. Therefore, it is important that each step in the analytical process be correctly followed in order to yield valid data.

When unforeseen problems arise, the analyst, technical director, and, when necessary, laboratory manager meet to discuss the factors involved. The analytical requirements are evaluated and a suitable corrective action or resolution is established. The client is notified in the case narrative with the final report or before, if the validity of their result is in question.

List of Procedures Used

Typically, the procedures used by HEAL are EPA approved methodologies or 20th edition Standard Methods. However, proprietary methods for client specific samples are sometimes used. The following tables list EPA and Standard Methods Method numbers with their corresponding analytes and/or instrument classification.

Methods Utilized at HEAL

Drinking Water (DW) Non-Potable Water (NPW) Solids (S)		
Methodology	Matrix	Title of Method
120.1	DW NPW	"Conductance (Specific Conductance, μ ohms at 25 ° C)"
180.1	DW NPW	"Turbidity (Nephelometric)"
200.2	DW NPW	"Sample Preparation Procedure For Spectrochemical Determination of Total Recoverable Elements"
200.7	DW NPW	"Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry"
200.8	DW NPW	"Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry."
245.1	DW NPW	"Mercury (Manual Cold Vapor Technique)"
300.0	DW NPW S	"Determination of Inorganic Anions by Ion Chromatography"
413.2	NPW S	"Oil and Grease"
418.1	NPW S	"Petroleum Hydrocarbons (Spectrophotometric, Infrared)"
504.1	DW	"EDB, DBCP and 123TCP in Water by Microextraction and Gas Chromatography"

505	DW	"Analysis of Organohalide Pesticides and Commercial Polychlorinated Biphenyl (PCB) Products in Water by Microextraction and Gas Chromatography"
515.1	DW	"Determination of Chlorinated Acids in Water by Gas Chromatography with an Electron Capture Detector"
524.2	DW	"Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry"
531.1	DW	"Measurement of N-Methylcarbamoyloximes and N-Methylcarbamates in Water by Direct Aqueous Injection HPLC with Post Column Derivatization"
547	DW	"Determination of Glyphosate in Drinking Water by Direct-Aqueous Injection HPLC, Post-Column Derivatization, and Fluorescence Detection"
552.1	DW	"Determination of Haloacetic Acids and Dalapon in Drinking Water by Ion-Exchange Liquid-Solid Extraction and Gas Chromatography with an Electron Capture Detector"
1311	S	"Toxicity Characteristic Leaching Procedure"
1311ZHE	S	"Toxicity Characteristic Leaching Procedure"
3005A	NPW	"Acid Digestion of Waters for Total Recoverable or Dissolved Metals for Analysis by FLAA or ICP Spectroscopy"
3010A	S	"Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy"
3050B	S	"Acid Digestion of Sediment, Sludge, and Soils"
3510C	DW NPW	"Separatory Funnel Liquid-Liquid Extraction"
3540	S	"Soxhlet Extraction"
3545	S	"Pressurized Fluid Extraction(PFE)"
3665	NPW S	"Sulfuric Acid/Permanganate Cleanup"
5030B	NPW	"Purge-and-Trap for Aqueous Samples"
5035	S	"Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples"
6010B	NPW S	"Inductively Coupled Plasma-Atomic Emission Spectrometry"
6020	NPW S	"Inductively Coupled Plasma-Mass Spectrometry"
7470A	NPW	"Mercury in Liquid Waste (Manual Cold-Vapor Technique)"
7471A	S	"Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)"
8021B	NPW S	"Aromatic and Halogenated Volatiles By Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors"
815B	NPW S	"Nonhalogenated Volatile Organics by Gas Chromatography" (Gasoline Range and Diesel Range Organics)

8015AZ	S	"C10-C32 Hydrocarbons in Soil-8015AZ"
8081A	NPW S	"Organochlorine Pesticides by Gas Chromatography"
8082	NPW S	"Polychlorinated Biphenyls (PCBs) by Gas Chromatography"
8260B	NPW S	"Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)"
8270C	NPW S	"Semivolatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)"
8310	NPW S	"Polynuclear Aromatic Hydrocarbons"
9045C	S	"Soil and Waste pH"
9060	NPW	"Total Organic Carbon"
9067	NPW S	"Phenolics (Spectrophotometric, MBTH With Distillation)"
9095	S	Paint Filter
Walkley/Black	S	FOC/TOC WB
SM2320 B	DW NPW	"Alkalinity"
SM2540 B	NPW	"Total Solids Dried at 103-105° C"
SM2540 C	DW NPW	"Total Dissolved Solids Dried at 180° C"
SM2540 D	NPW	"Total Suspended Solids Dried at 103-105° C"
SM4500-H+B	DW NPW	"pH Value"
SM4500-NH3 C	NPW S	"4500-NH3" Ammonia
SM4500-Norg C	NPW S	"4500-Norg" Total Kjeldahl Nitrogen (TKN)
SM5310 B	DW	"5310" Total Organic Carbon (TOC)
8000B	NPW S	"Determinative Chromatographic Separations"
8000C	NPW S	"Determinative Chromatographic Separations"

Criteria for Standard Operating Procedures

HEAL has Standard Operating Procedures (SOPs) for each of the test methods listed above. These SOPs are based upon the listed methods and detail the specific procedure and equipment utilized as well as the quality requirements necessary to prove the integrity of the data. SOPs are reviewed or revised every twelve months or sooner if necessary. The review/revision is documented in the Master SOP Logbook filed in the QA/QC Office. All SOPs are available in the LIMS linked under the specific test method. Administrative SOPs, which are not linked in the LIMS, are available on desktops throughout the laboratory in the link to administrative SOPs folder.

Each HEAL test method SOP shall include or reference the following topics where applicable:

- Identification of the test method;
- Applicable matrix or matrices;
- Limits of detection and quantitation;
- Scope and application, including parameters to be analyzed;
- Summary of the test method;
- Definitions;
- Interferences;
- Safety;
- Equipment and supplies;
- Reagents and standards;
- Sample collection, preservation, shipment and storage;
- Quality control parameters;
- Calibration and standardization;
- Procedure;
- Data analysis and calculations;
- Method performance;
- Pollution prevention;
- Data assessment and acceptance criteria for quality control measures;
- Corrective actions for out-of-control data;
- Contingencies for handling out-of-control or unacceptable data;
- Waste management;
- References; and
- Any tables, diagrams, flowcharts and validation data.

7.0 Calibration

All equipment and instrumentation used at HEAL are operated, maintained and calibrated according to manufacturers guidelines, as well as criteria set forth in applicable analytical methodology. Personnel who have been properly trained in their procedures perform operation and calibration. Brief descriptions of the calibration processes for our major laboratory equipment and instruments are found below.

Thermometers

The thermometers in the laboratory are used to measure the temperatures of the refrigerators/freezers, ovens, water baths, hot blocks, ambient laboratory conditions, TCLP Extractions, digestion blocks and samples at the time of log-in. All NIST traceable thermometers are either removed from use upon their documented expiration date or they are checked annually with a NIST certified thermometer and a correction factor is noted on each thermometer log. See the most current Login SOP for detailed procedures on this calibration procedure.

Dickson Data Loggers are used to record sample and standard storage refrigerators over the weekend when the appropriate staff is not available to record the temperatures. These data loggers are shipped back to the manufacturer once a year to be re-calibrated.

Refrigerators/Freezers

Each laboratory refrigerator or freezer contains a thermometer capable of measuring to a minimum precision of 1°C. The thermometers are kept with the bulb immersed in liquid. Each workday, the temperatures of the refrigerators are recorded in a designated logbook to insure that the refrigerators are within the required designated range. Samples are stored separately from the standards to reduce the risk of contamination.

See the current catastrophic Failure SOP for the procedure regarding how to handle failed refrigerators or freezers.

Ovens

The ovens contain thermometers graduated by 1° C. The ovens are calibrated quarterly against NIST thermometers and checked daily as required and in which ever way is dictated by or appropriate for the method in use.

Analytical and Table Top Balances

The table top balances are capable of weighing to a minimum precision of 0.01 grams. The analytical balances are capable of weighing to a minimum precision of 0.0001 grams. Records are kept of daily calibration checks for the balances in use. Working weights are used in these checks. The balances are annually certified by an outside source and the certifications are on file with the QA/QCO.

Balances, unless otherwise indicated by method specific SOPs, will be checked daily with at least two weights that will bracket the working range of the balance for the day. Daily balance checks will be done using working weights that are calibrated annually against Class S weights. Class S weights are calibrated as required by an external provider. The Class S weights are used once a year or more frequently if required, to assign values to the Working Weights. During the daily balance checks the working weights are compared to their assigned values and must pass in order to validate the calibration of the balance. The assigned values for the working weights, as well as the daily checks, are recorded in the balance logbook for each balance.

Instrument Calibration

An instrument calibration is the relationship between the known concentrations of a set of calibration standards introduced into an analytical instrument and the measured response they produce. Calibration curve standards are a prepared series of aliquots at various known concentrations levels from a primary source reference standard. Specific mathematical types of calibration techniques are outlined in SW-846 8000B and/or 8000C. The entire initial calibration must be performed prior to sample analyses.

The lowest standard in the calibration curve must be at or below the required reporting limit.

Refer to the current SOP to determine the minimum requirement for calibration points.

Most compounds tend to be linear and a linear approach should be favored when linearity is suggested by the calibration data. Non-linear calibration should be considered only when a linear approach cannot be applied. It is not acceptable to use an alternate calibration procedure when a compound fails to perform in the usual manner. When this occurs it is indicative of instrument issues or operator error.

If a non-linear calibration curve fit is employed, a minimum of six calibration levels must be used for second-order (quadratic) curves.

When more than 5 levels of standards are analyzed in anticipation of using second-order calibration curves, all calibration points **MUST** be used regardless of the calibration option employed. The highest or lowest calibration point may be excluded for the purpose of

narrowing the calibration range, and meeting the requirements for a specific calibration option. Otherwise, unjustified exclusion of calibration data is expressly forbidden.

Analytical methods vary in QC acceptance criteria. HEAL follows the method specific guidelines for QC acceptance. The specific acceptance criteria are outlined in the analytical methods and its corresponding SOP.

pH Meter

The pH meter measures to a precision of 0.01 pH units. The pH calibration logbook contains the calibration before each use, or each day, if used more than once per day. It is calibrated using a minimum of 3 certified buffers. Also available with the pH meter is a magnetic stirrer with a temperature sensor. See the current pH SOP (SM4500 H+ B) for specific details regarding calibration of the pH probe.

Other Analytical Instrumentation and Equipment

The conductivity probe is calibrated as needed and checked daily when in use.

Eppendorf (or equivalent brands) pipettes are checked gravimetrically prior to use.

Standards

All of the source reference standards used are ordered from a reliable commercial vendor. A Certificate of Analysis (CoA), which verifies the quality of the standard, accompanies the standards from the vendor. The Certificates of Analysis are dated and stored on file by the Technical Directors or their designee. These standards are traceable to the National Institute of Standards (NIST). When salts are purchased and used as standards the certificate of purity must be obtained from the vendor and filed with the CoAs.

All standard solutions, calibration curve preparations, and all other quality control solutions are labeled in a manner that can be traced back to the original source reference standard. All source reference standards are entered into the LIMS with an appropriate description of the standard. Dilutions of the source reference standard (or any mixes of the source standards) are fully tracked in the LIMS. Standards are labeled with the date opened for use, and an expiration date.

As part of the quality assurance procedures at HEAL, analysts strictly adhere to manufacture recommendations for storage times/expiration dates and policies of analytical standards and quality control solutions.

Reagents

HEAL ensures that the reagents used are of acceptable quality for their intended purpose. This is accomplished by ordering high quality reagents and adhering to good laboratory practices so as to minimize contamination or chemical degradation. All reagents must meet any specifications noted in the analytical method. Refer to the current Purchase of Consumables SOP for details on how this is accomplished and documented.

Upon receipt, all reagents are assigned a separate ID number, and logged into the LIMS. All reagents shall be labeled with the date received into the laboratory and again with the date opened for use. Recommended shelf life shall be documented and controlled. Dilutions or solutions prepared shall be clearly labeled, dated, and initialed. These solutions are traceable back to their primary reagents.

All gases used with an instrument shall meet specifications of the manufacturer. All safety requirements that relate to maximum and/or minimum allowed pressure, fitting types, and leak test frequency, shall be followed. When a new tank of gas is placed in use, it shall be checked for leaks and the date put in use will be written in the instrument maintenance logbook.

HEAL continuously monitors the quality of the reagent water and provides the necessary indicators for maintenance of the purification systems in order to assure that the quality of laboratory reagent water meets established criteria for all analytical methods.

Reagent blank samples are also analyzed to ensure that no contamination is present at detectable levels. The frequency of reagent blank analysis is typically the same as calibration verification samples. Refrigerator storage blanks are stored in the volatiles refrigerator for a period of one week and analyzed and replaced once a week.

8.0 Maintenance

Maintenance logbooks are kept for each major instrument and all support equipment in order to document all repair and maintenance. In the front of the logbook, the following information is included:

Unique name of the item or equipment
Manufacturer
Type of Instrument
Model Number
Serial Number
Date received and date placed into service
Location of Instrument
Condition of instrument upon receipt

For routine maintenance, the following information shall be included in the log:

Maintenance Date
Maintenance Description
Maintenance Performed by Initials

A manufacturer service agreement (or equivalent) covers most major instrumentation to assure prompt and reliable response to maintenance needs beyond HEAL instrument operator capabilities.

Refer to the current Maintenance and Troubleshooting SOP for each section in the laboratory for further information.

9.0 Data Integrity

For HEAL's policy on ethics and data integrity see section 3.0 of this document. Upon being hired and annually thereafter, all employees at HEAL undergo documented data integrity training. All new employees sign an Ethics and Data Integrity Agreement, documenting their understanding of the high standards of integrity required at HEAL and outlining their responsibilities in regards to ethics and data integrity. See Appendix H for a copy of this agreement.

In instances of ethical concern analysts are required to report the known or suspected concern to their Technical Director, the Laboratory Manager or the QA/QCO. This will be done in a confidential and receptive environment, allowing all employees to privately discuss ethical issues or report items of ethical concern.

Once reported and documented the ethical concern will be immediately elevated to the Laboratory Manager and the need for an investigation, analyst remediation or termination will be determined on a case by case basis.

All reported instances of ethical concern will be thoroughly documented and handled in a manner sufficient to rectify any breaches in data integrity with an emphasis on preventing similar incidences from happening in the future.

10.0 Quality Control

Internal Quality Control Checks

HEAL utilizes various internal quality control checks, including duplicates, matrix spikes, matrix spike duplicates, method blanks, laboratory control spikes, laboratory control spike duplicates, surrogates, internal standards, calibration standards, quality control charts, proficiency tests and calculated measurement uncertainty.

Refer to the current method SOP to determine the frequency and requirements of all quality controls. In the event that the frequency of analysis is not indicated in the method specific SOP, duplicate samples, laboratory control spikes (LCS), Method Blanks (MB) and matrix spikes and matrix spike duplicates (MS/MSD) are analyzed for every batch of twenty samples.

When sample volume is limited on a test that requires an MS/MSD an LCSD shall be analyzed to demonstrate precision and accuracy and when possible a sample duplicate will be analyzed.

Duplicates are identical tests repeated for the same sample or matrix spike in order to determine the precision of the test method. A Relative Percent Difference (RPD) is calculated as a measure of this precision. Unless indicated in the SOP, the default acceptance limit is $\leq 20\%$.

Matrix Spikes and Matrix Spike Duplicates are spiked samples (MS/MSD) that are evaluated with a known added quantity of a target compound. This is to help determine the accuracy of the analyses and to determine the matrix affects on analyte recovery. A percent recovery is calculated to assess the quality of the accuracy. In the event that the acceptance criteria is not outlined in the SOP, a default limits of 70-130% will be utilized. When an MSD is employed an RPD is calculated and when not indicated in the SOP shall be acceptable at $\leq 30\%$.

When appropriate for the method, a Method Blank should be analyzed with each batch of samples processed to assess contamination levels in the laboratory. MBs consist of all the reagents measured and treated as they are with samples, except without the samples. This enables the laboratory to ensure clean reagents and procedures. Guidelines should be in place for accepting or rejecting data based on the level of contamination in the blank. In the event that these guidelines are not dictated by the SOP or in client specific work plans, the MB should be less than the MDL reported for the analyte being reported.

A Laboratory Control Spike and Laboratory Control Spike Duplicate (LCS/LCSD) are reagent blanks, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is generally used to establish intra-laboratory or analyst-specific precision and bias or to assess the performance of all or a portion of the measurement system. Guidelines are outlined in each

SOP for the frequency and pass/fail requirements for LCS and LCSDs. These limits can be set utilizing control charts as discussed below.

Surrogates are utilized when dictated by method and are substances with properties that mimic the analytes of interest. The surrogate is an analyte that is unlikely to be found in environmental samples. Refer to the appropriate Method and SOP for guidelines on pass/fail requirements for surrogates.

Internal Standards are utilized when dictated by the method and are known amounts of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method. Refer to the appropriate Method and SOP for guidelines on pass/fail requirements for Internal Standards.

Proficiency Test (PT) Samples are samples provided by an unbiased third party. They are typically analyzed twice a year, or at any other interval defined in the method SOP. They contain a pre-determined concentration of the target compound, which is unknown to HEAL. HEAL's management and all analysts shall ensure that all PT samples are handled in the same manner as real environmental samples utilizing the same staff, methods, procedures, equipment, facilities and frequency of analysis as used for routine analysis of that analyte. When analyzing a PT, HEAL shall employ the same calibration, laboratory quality control and acceptance criteria, sequence of analytical steps, number of replicates and other procedures as used when analyzing routine samples.

With regards to analyzing PT Samples HEAL shall not send any PT sample, or portion of a PT sample, to another laboratory for any analysis for which we seek accreditation, or are accredited. HEAL shall not knowingly receive any PT sample or portion of a PT sample from another laboratory for any analysis for which the sending laboratory seeks accreditation, or is accredited. Laboratory management or staff will not communicate with any individual at another laboratory concerning the PT sample. Laboratory management or staff shall not attempt to obtain the assigned value of any PT sample from the PT Provider.

Calibration standards are standards run to calibrate. Once the calibration is established the same standards can be analyzed as Continuing Calibration Verifications (CCV), used to confirm the consistency of the instrumentation. Calibration standards can be utilized at the beginning and end of each batch, or more frequently as required. Typically Continuing Calibration Blanks (CCB) are run in conjunction with CCVs. Refer to the current method SOP for frequency and pass/fail requirements of CCVs and CCBs.

Control Limits are limits of acceptable ranges of the values of quality control checks. If a value falls outside the appropriate range, immediate evaluation and assessment of the procedure is required. Data generated with laboratory control samples that fall outside of the established control limits are judged to be generated during an "out-of-control" situation. These data are considered suspect and shall be repeated or reported with qualifiers.

Control limits should be established and updated according to the requirements of the method being utilized. When the method does not specify, and control limits are to be generated or updated for a test, the following guidelines shall be utilized.

Control Limits should be updated periodically and at least annually. The Limits should be generated utilizing the most recent 20-40 data values and Control Charts should be printed when these limits are updated in the LIMS. The data values used shall not reuse values that were included in the previous Control Limit update. The data values shall also be reviewed by the LIMS for any Grubbs Outliers, and if identified, the outliers must be removed prior to generating new limits. Once new Control Limits have been established and updated in the LIMS, the printed Control Chart shall be reviewed by the appropriate technical director and primary analyst performing the analysis for possible trends and compared to the previous Control Charts. The technical director initials the control charts, indicating that they have reviewed and determined the updated Limits to be accurate and appropriate. These initialed charts are then filed in the QA/QCO office.

Calculated Measurement Uncertainty is calculated annually using LCSs in order to determine the laboratory specific uncertainty associated with each test method. These uncertainty values are available to our clients upon request and are utilized as a trending tool internally to determine the effectiveness of new variables introduced into the procedure over time.

Precision, Accuracy, Detection Levels

Precision

The laboratory uses sample duplicates, laboratory control spike duplicates and matrix spike duplicates to assess precision in terms of relative percent difference (RPD). HEAL requires the RPD to fall within the 99% confidence interval of established control charts or an RPD of less than 30% if control charts are not available. RPD's greater than these limits are considered out-of-control and require an appropriate response.

$$RPD = \frac{2 \times (\text{Sample Result} - \text{Duplicate Result})}{(\text{Sample Result} + \text{Duplicate Result})} \times 100$$

Accuracy

The accuracy of an analysis refers to the difference between the calculated value and the actual value of a measurement. The accuracy of a laboratory result is evaluated by comparing the measured amount of QC reference material recovered from a sample and the known amount added. Control limits can be established for each analytical method and sample matrix. Recoveries are assessed to determine the method efficiency and/or the matrix effect.

Analytical accuracy is expressed as the percent recovery (%R) of an analyte or parameter. A known amount of analyte is added to an environmental sample before the sample is prepared and subsequently analyzed. The equation used to calculate percent recovery is:

$$\% \text{Recovery} = \{(\text{concentration}^* \text{ recovered}) / (\text{concentration}^* \text{ added})\} \times 100$$

*or amount

HEAL requires that the Percent Recovery to fall within the 99 % confidence interval of established control limits. A value that falls outside of the confidence interval requires a warning and process evaluation. The confidence intervals are calculated by determining the mean and sample standard deviation. If control limits are not available, the range of 70 to 130% is used unless the specific method dictates otherwise. Percent Recoveries outside of this range mandate additional action such as analyses by Method of Standard Additions, additional sample preparation(s) where applicable, method changes, out-of-control action or data qualification.

Detection Limit

Current practices at HEAL define the Detection Limit (DL) as the smallest amount that can be detected above the baseline noise in a procedure within a stated confidence level.

HEAL presently utilizes an Instrument Detection Limit (IDL), a Method Detection Limit (MDL), and a Practical Quantitation Limit (PQL). The relationship between these levels is approximately
IDL: MDL: PQL = 1:5:5.

The IDL is a measure of the sensitivity of an analytical instrument. The IDL is the amount which, when injected, produces a detectable signal in 99% of the analyses at that concentration. An IDL can be considered the minimum level of analyte concentration that is detectable above random baseline noise.

The MDL is a measure of the sensitivity of an analytical method. An MDL determination (as required in 40CFR part 136 Appendix B) consists of replicate spiked samples carried through all necessary preparation steps. The spike concentration is three times the standard deviation of three replicates of spikes. At least seven replicates are spiked and analyzed and their standard deviation (s) calculated. Routine variability is critical in passing the 10 times rule and is best achieved by running the MDLs over different days and when possible over several calibration events. The method detection limit (MDL) can be calculated using the standard deviation according to the formula:

$$MDL = s * t(99\%)$$

Where t (99%) is the student's t value for the 99% confidence interval. It depends on the number of trials used in calculating the sample standard deviation, so choose the appropriate value according to the number of trials.

Number of Trials	t(99%)
6	3.36
7	3.14
8	3.00
9	2.90

The calculated MDL must not be less than 10 times the spiked amount or the study must be performed again with a lower concentration.

The PQL is significant because different laboratories can produce different MDLs although they may employ the same analytical procedures, instruments and sample matrices. The PQL is about two to five times the MDL and represents a practical, and routinely achievable, reporting level with a good certainty that the reported value is reliable. It is often determined by regulatory limits. The reported PQL for a sample is dependent on the dilution factor utilized during sample analysis.

Quality Control Parameter Calculations

Mean

The sample mean is also known as the arithmetic average. It can be calculated by adding all of the appropriate values together, and dividing this sum by the number of values.

$$\text{Average} = (\Sigma x_i) / n$$

x_i = the value x in the i^{th} trial
 n = the number of trials

Standard Deviation

The sample standard deviation, represented by s, is a measure of dispersion. The dispersion is considered to be the difference between the average and each of the values x_i . The variance, s^2 , can be calculated by summing the squares of the

differences and dividing by the number of differences. The sample standard deviation, s , can be found by taking the square root of the variance.

$$\text{Standard deviation} = s = \left[\frac{\sum (x_i - \text{average})^2}{(n - 1)} \right]^{1/2}$$

Percent Recovery (MS, MSD, LCS and LCSD)

$$\text{Percent Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{(\text{Spike Added})} \times 100$$

Control Limits

Control Limits are calculated by the LIMS using the average percent recovery (x), and the standard deviation (s).

$$\text{Upper Control Limit} = x + 3s$$

$$\text{Lower Control Limit} = x - 3s$$

These control limits approximate a 99% confidence interval around the mean recovery.

RPD (Relative Percent Difference)

Analytical precision is expressed as a percentage of the difference between the results of duplicate samples for a given analyst. Relative percent difference (RPD) is calculated as follows:

$$\text{RPD} = \frac{2 \times (\text{Sample Result} - \text{Duplicate Result})}{(\text{Sample Result} + \text{Duplicate Result})} \times 100$$

Uncertainty Measurements

Uncertainty, as defined by ISO, is the parameter associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurement. Ultimately uncertainty measurements are used to state how good a test result is and to allow the end user of data to properly interpret their reported data. All procedures allow for some uncertainty. For most analyses the components and estimates of uncertainty are reduced by following well established test methods. To further reduce uncertainty, results are generally not reported below

the lowest calibration point (PQL) or above the highest calibration point (UQL). Understanding that there are many influence quantities affecting a measurement result, so many in fact that it is impossible to identify all of them, HEAL calculates measurement uncertainty at least annually using LCSs. These estimations of measurement uncertainty are kept on file in the method folders in the QA/QC office.

Measurement Uncertainty contributors are those that may be determined statistically. These shall be generated by estimating the overall uncertainty in the entire analytical process by measuring the dispersion of values obtained from laboratory control samples over time. At least 20 of the most recent LCS data points are gathered. The standard deviation (s) is calculated using these LCSs data points. Since it can be assumed that the possible estimated values of the spikes are approximately normally distributed with approximate standard deviation (s), the unknown value of the spike is believed to lie in 95% confidence interval, corresponding to an uncertainty range of $\pm 2(s)$.

Calculate standard deviation (s) and 95% confidence interval according to the following formulae:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}}$$

Where: s = standard deviation
x = number in series
 $\bar{x}$ = calculated mean of series
n = number of samples taken

95% confidence = $2 \times s$

Example: Assuming that after gathering 20 of the most recent LCS results for Bromide, we have calculated the standard deviations of the values and achieved a result of 0.0326, our measurement uncertainty for Bromide (at 95% confidence = $2 \times s$) is 0.0652.

Calibration Calculations

1. Response Factor or Calibration Factor:

$$RF = ((A_x)(C_{is})) / ((A_{is})(C_x))$$

$$CF = (A_x) / (C_x)$$

a. Average RF or CF

$$RF_{AVE} = \Sigma RF_i / n$$

b. Standard Deviation

$$s = \text{SQRT} \{ [\Sigma (RF_i - RF_{AVE})^2] / (n-1) \}$$

c. Relative Standard Deviation

$$RSD = s / RF_{AVE}$$

Where:

A_x = Area of the compound

C_x = Concentration of the compound

A_{is} = Area of the internal standard

C_{is} = Concentration of the internal standard

n = number of pairs of data

RF_i = Response Factor (or other determined value)

RF_{AVE} = Average of all the response factors

Σ = the sum of all the individual values

2. Linear Regression

$$y = mx + b$$

a. Slope (m)

$$m = (n \Sigma x_i y_i - (n \Sigma x_i)(n \Sigma y_i)) / (n \Sigma x_i^2 - (\Sigma x_i)^2)$$

b. Intercept (b)

$$b = y_{AVE} - m(x_{AVE})$$

c. Correlation Coefficient (cc)

$$CC (r) = \{ \Sigma ((x_i - x_{ave}) * (y_i - y_{ave})) \} / \{ \text{SQRT}((\Sigma (x_i - x_{ave})^2) * (\Sigma (y_i - y_{ave})^2)) \}$$

Or

$$CC(r) = [(\sum w * \sum wxy) - (\sum wx * \sum wy)] / (\text{sqrt}((\sum w * \sum wx^2) - (\sum wx * \sum wx)) * [(\sum w * \sum wy^2) - (\sum wy * \sum wy)]))$$

d. Coefficient of Determination

$$COD(r^2) = CC * CC$$

Where:

y = Response (Area) Ratio A_x/A_{is}

x = Concentration Ratio C_x/C_{is}

m = slope

b = intercept

n = number of replicate x,y pairs

x_i = individual values for independent variable

y_i = individual values for dependent variable

Σ = the sum of all the individual values

x_{ave} = average of the x values

y_{ave} = average of the y values

w = weighting factor, for equal weighting w=1

3. Quadratic Regression

$$y = ax^2 + bx + c$$

a. Coefficient of Determination

$$COD(r^2) = (\Sigma(y_i - y_{ave})^2 - \{[(n-1)/(n-p)] * [\Sigma(y_i - Y_i)^2]\}) / \Sigma(y_i - y_{ave})^2$$

Where:

y = Response (Area) Ratio A_x/A_{is}

x = Concentration Ratio C_x/C_{is}

a = x^2 coefficient

b = x coefficient

c = intercept

y_i = individual values for each dependent variable

x_i = individual values for each independent variable

y_{ave} = average of the y values

n = number of pairs of data

p = number of parameters in the polynomial equation (i.e., 3 for third order, 2 for second order)

$$Y_i = ((2*a*(C_x/C_{is})^2 - b^2 + b + (4*a*c))/(4a))$$

b. Coefficients (a,b,c) of a Quadratic Regression

$$a = \frac{S_{(x_2y)}S_{(xx)} - S_{(xy)}S_{(xx2)}}{S_{(xx)}S_{(x_2x_2)} - [S_{(xx2)}]^2}$$

$$b = \frac{S_{(xy)}S_{(x_2x_2)} - S_{(x_2y)}S_{(xx2)}}{S_{(xx)}S_{(x_2x_2)} - [S_{(xx2)}]^2}$$

$$c = [(\Sigma yw)/n] - b*[(\Sigma xw)/n] - a*[\Sigma(x^2w)/n]$$

Where:

n = number of replicate x,y pairs

x = x values

y = y values

$$w = S^{-2} / (\Sigma S^{-2}/n)$$

$$S_{(xx)} = (\Sigma x^2w) - [(\Sigma xw)^2 / n]$$

$$S_{(xy)} = (\Sigma xyw) - [(\Sigma xw)(\Sigma yw) / n]$$

$$S_{(xx2)} = (\Sigma x^3w) - [(\Sigma xw)(\Sigma x^2w) / n]$$

$$S_{(x_2y)} = (\Sigma x^2yw) - [(\Sigma x^2w)(\Sigma yw) / n]$$

$$S_{(x_2x_2)} = (\Sigma x^4w) - [(\Sigma x^2w)^2 / n]$$

Or If unweighted calibration, w=1

$$S_{(xx)} = (Sx^2) - [(Sx)^2 / n]$$

$$S_{(xy)} = (Sxy) - [(Sx)(Sy) / n]$$

$$S_{(xx2)} = (Sx^3) - [(Sx)(Sx^2) / n]$$

$$S_{(x_2y)} = (Sx^2y) - [(Sx^2)(Sy) / n]$$

$$S_{(x_2x_2)} = (Sx^4) - [(Sx^2)^2 / n]$$

11.0 Data Reduction, Validation, Reporting, and Record Keeping

All data reported must be of the highest possible accuracy and quality. During the processes of data reduction, validation, and report generation, all work is thoroughly checked to insure that error is minimized.

Data Reduction

The analyst who generated the data usually performs the data reduction. The calculations include evaluation of surrogate recoveries (where applicable), and other miscellaneous calculations related to the sample quantitation.

If the results are computer generated, then the formulas must be confirmed by hand calculations, at minimum, one per batch.

See the current Data Validation SOP for details regarding data reduction.

Validation

A senior analyst, most often the section supervisor, validates the data. All data undergoes peer review. If an error is detected it is brought to the analyst attention to rectify and further checks ensure that all data for that batch is sound. Previous and/or common mistakes are stringently monitored throughout the validation process. Data is reported using appropriate significant figure criteria. In most cases, two significant digits are utilized, but three significant digits can be used in QC calculations. Significant digits are not rounded until after the last step of a sample calculation. All final reports undergo a review by the laboratory manager, or the project manager or their designee, to provide a logical review of all results before they are released to the client.

If data is to be manually transferred from one medium to another, the transcribed data is checked by a peer. This includes data typing, computer data entry, chromatographic data transfer, data table inclusion to a cover letter, or when data results are combined with other data fields.

All hand written data from run logs, analytical standard logbooks, hand entered data logbooks, or on instrument generated chromatograms, are systematically archived should the need for future retrieval arise.

See the current Data Validation SOP for detail regarding data validation.

Reports and Records

All records at HEAL are retained and maintained through the procedures outlined in the most recent version of the Records Control SOP.

The reports are compiled by the Laboratory Information Management System (LIMS). Most data is transferred directly from the instruments to the LIMS. After being processed by the analyst and reviewed by a data reviewer, final reports are approved and signed by the senior laboratory management. A comparative analysis of the data is performed at this point. For example, if TKN and NH₃ are analyzed on the same sample the NH₃ result should never be greater than the TKN result. Lab results and reports are released only to appropriately designated individuals. Release of the data can be by fax, email, electronic deliverables or mailed hard copy.

When a project is completed, the project file folder is stored with a hard copy of the report, relevant supporting data, and the quality assurance/control worksheets. These folders are kept on file and are arranged by project number. Additionally, all electronic data is backed up daily on the HEAL main server. The backup includes raw data, chromatograms and report documents. Hard copies of chromatograms are stored separately according to the instrument and the analysis date. All records and analytical data reports are retained in a secure location as permanent records for a minimum period of five years (unless specified otherwise in a client contract). Access to archived information shall be documented with an access log. Access to archived electronic reports and data will be protected by a project manager password. In the event that HEAL transfers ownership or terminates business practices, complete records will be maintained or transferred according to the client's instructions.

After issuance, the original report shall remain unchanged. If a correction to the report is necessary, then an additional document shall be issued. This document shall have a title of "Addendum to Test Report or Correction to Original Report", or equivalent. Demonstration of original report integrity comes in two forms. First, the report date is included on each page of the final report. Second, each page is numbered in sequential order, making the addition or omission of any data page(s) readily detectable.

12.0 Corrective Action

Refer to the most recent version of the Data Validation SOP for the procedure utilized in filling out a Corrective Action Report. A blank copy of the corrective action report is available in the Appendix.

The limits that have been defined for data acceptability also form the basis for corrective action initiation. Initiation of corrective action occurs when the data generated from continuing calibration standard, sample surrogate recovery, laboratory control spike, matrix spike or sample duplicates exceed acceptance criteria. If corrective action is necessary, the analyst or the section supervisor will coordinate to take the following steps to determine and correct the measurement system deficiency:

Check all calculations and data measurements systems (Calibrations, reagents, instrument performance checks etc.).

Assure that proper procedures were followed.

Unforeseen problems that arise during sample preparation and/or sample analysis that lead to treating a sample differently from documented procedures shall be documented with a corrective action report. The section supervisor and laboratory manager shall be made aware of the problem at the time of the occurrence. See the appropriate SOP regarding departures from documented procedures.

Continuing calibration standards below acceptance criteria can not be used for reporting analytical data unless method specific criteria states otherwise.

Continuing calibration standards above acceptance criteria can be used to report data so long as the failure is isolated to a single standard and the corresponding samples are non-detect for the failing analyte.

Samples with non-compliant surrogate recoveries should be reanalyzed unless deemed unnecessary by the supervisor for matrix, historical data or other analysis related anomalies.

Laboratory and Matrix Spike acceptance criteria vary significantly depending on method and matrix. Analysts and supervisors meet and discuss appropriate corrective action measures as spike failures occur.

Sample duplicates with RPD values outside control limits require supervisor evaluation and possible reanalysis.

A second mechanism for initiation of corrective action is that resulting from Quality Assurance performance audits, system audits, inter and intra-laboratory comparison studies. Corrective Actions initiated through this mechanism will be monitored and coordinated by the laboratory QA/QCO.

All corrective action forms are entered in the LIMS and included with the raw data for peer review, signed by the technical director of the section and included in the case narrative to the client whose samples were affected. All Corrective action forms in the LIMS are reviewed by the QA/QCO.

13.0 Quality Assurance Audits, Reports and Complaints

Internal/External Systems' Audits, Performance Evaluations, and Complaints

Several procedures are used to assess the effectiveness of the quality control system. One of these methods includes internal performance evaluations, which are conducted by the use of control samples, replicate measurements and control charts. Another method is external performance audits, which are conducted by the use of inter-laboratory checks, such as participation in laboratory evaluation programs and performance evaluation samples available from a NELAC accredited Proficiency Standard Vendor.

Proficiency samples will be obtained twice per year from an appropriate vendor for all tests and matrices for which we are accredited and for which there are PTs available. HEAL participates in soil, waste water, drinking water and underground storage tank PT studies. Copies of results are available upon request. HEAL's management and all analysts shall ensure that all PT samples are handled in the same manner as real environmental samples utilizing the same staff, methods, procedures, equipment, facilities and frequency of analysis as used for routine analysis of that analyte. When analyzing a PT, HEAL shall employ the same calibration, laboratory quality control and acceptance criteria, sequence of analytical steps, number of replicates and other procedures as used when analyzing routine samples.

With regards to analyzing PT Samples HEAL shall not send any PT sample, or portion of a PT sample, to another laboratory for any analysis for which we seeks accreditation, or are accredited. HEAL shall not knowingly receive any PT sample or portion of a PT sample from another laboratory for any analysis for which the sending laboratory seeks accreditation, or is accredited. Laboratory management or staff will not communicate with any individual at another laboratory concerning the PT sample. Laboratory management or staff shall no attempt to obtain the assigned value of any PT sample from the PT Provider.

Internal Audits are performed annually by the QA/QCO in accordance with the current Internal Audit SOP. They are performed using the guidelines outlined below:

The system audit consists of a qualitative inspection of the QA system in the laboratory and an assessment of the adequacy of the physical facilities for sampling, calibration, and measurement. This audit includes a careful evaluation and review of laboratory quality control procedures. Including but not limited to:

1. Review of staff qualifications, demonstration of capability, and personnel training programs
2. Storage and handling of reagents, standards and samples
3. Standard preparation logbook and LIMS procedures
4. Extraction logbooks
5. Raw data logbooks
6. Analytical logbooks or batch printouts and instrument maintenance logbooks

7. Data review procedures
8. Corrective action procedures
9. Review of data packages is performed regularly by the lab manager/QA Officer.

The QA/QCO will conduct these audits on an annual basis.

Management Reviews

HEAL management shall periodically, and at least annually, conduct a review of the laboratory's quality system and environmental testing activities to ensure their continuing suitability and effectiveness, and to introduce necessary changes or improvements. The review shall take account of:

1. the suitability and implementation of policies and procedures
2. reports from managerial and supervisory personnel
3. the outcome of recent internal audits
4. corrective and preventive actions
5. assessments by external bodies
6. the results of inter-laboratory comparisons or proficiency tests
7. changes in volume and type of work
8. client feed back
9. complaints
10. other relevant factors, such as laboratory health and safety, QC activities, resources and staff training.

Findings from management reviews and the actions that arise from them shall be recorded and any corrective actions that arise shall be completed in an appropriate and agreed upon timescale.

Complaints

Complaints from clients are documented and given to the laboratory manager. The lab manager shall review the information and contact the client. If doubt is raised concerning the laboratories policies or procedures, then an audit of the section or sections may be performed. All records of complaints and subsequent actions shall be maintained in the client compliant logbook for 5 years unless otherwise stated.

Internal and External Reports

The QA/QCO is responsible for preparation and submission of quality assurance reports to the appropriate management personnel as problems and issues arise. These reports include the assessment of measurement systems, data precision and accuracy, and the results of performance and system audits. Additionally, they also include significant QA

problems, corrective actions, and recommended resolution measures. Reports of these Quality Assurance Audits describe the particular activities audited, procedures utilized in the examination and evaluation of laboratory records, and data validation procedures. Finally, there are procedures for evaluating the performance of Quality Control and Quality Assurance activities, and laboratory deficiencies and the implementation of corrective actions with the review requirements.

References (Analytical Protocols Utilized at HEAL)

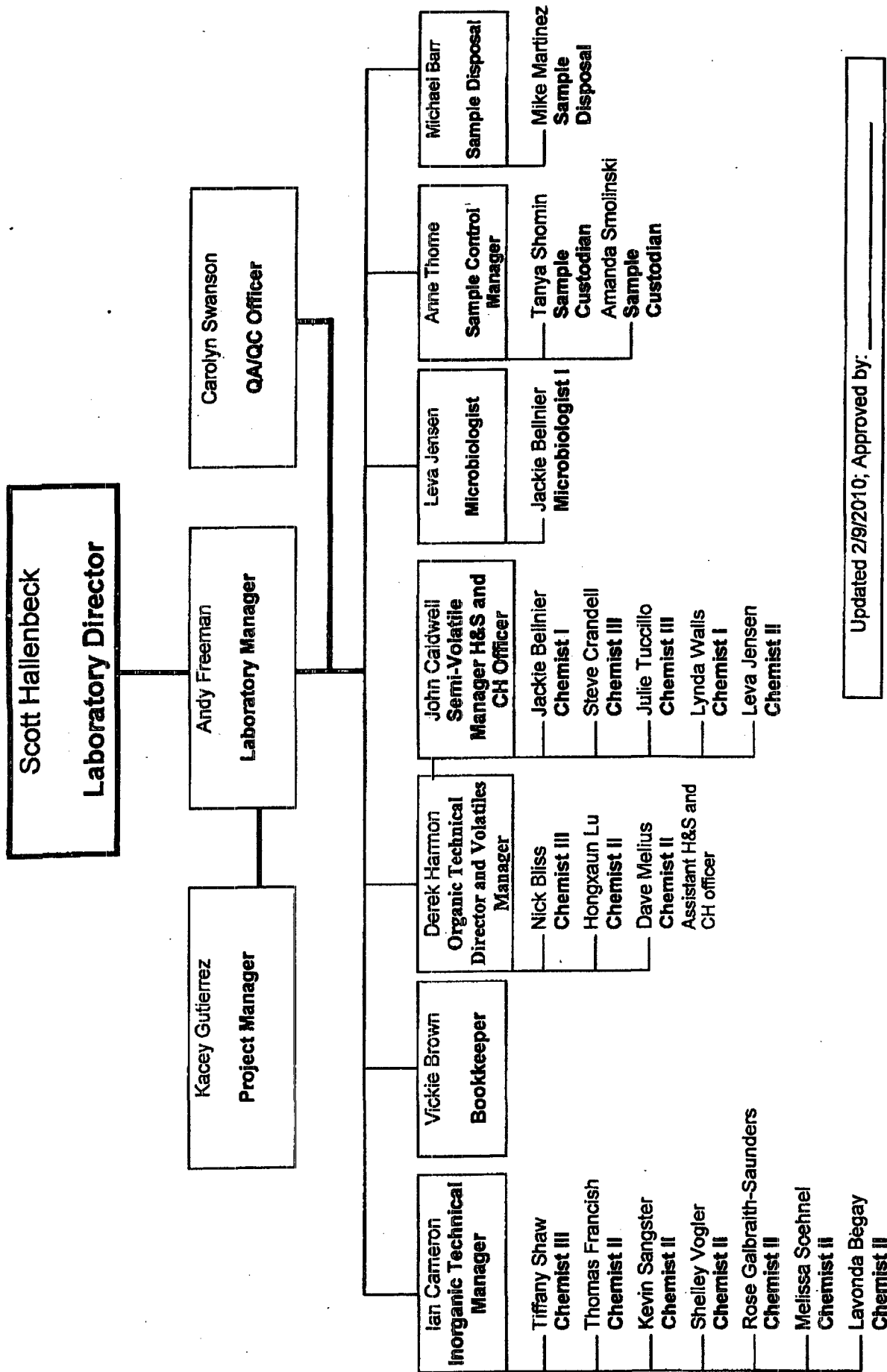
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5. Diagnosis & Improvement of Saline & Alkali Soils, Agriculture Handbook No. 60, USDA, 1954
6. Handbook on Reference Methods for Soil Testing, The Council on Soil Testing & Plant Analysis, 1980 and 1992
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14. Methods for the Determination of Metals in Environmental Samples, USEPA, EPA-600/4-91-010, June 1991
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18. Environmental Perspective on the Emerging Oil Shale Industry, EPA Oil & Shale Research Group.
19. Polycyclic Aromatic Hydrocarbons in Water Systems, CRC Press, Inc.
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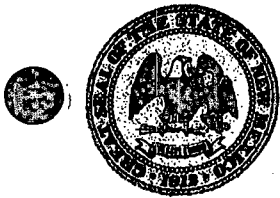
Appendix A

Personnel Chart / Organizational Structure

Diagram of Organizational Structure



Updated 2/9/2010; Approved by: _____



BILL RICHARDSON
Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Water & Wastewater Infrastructure
Development Division
DRINKING WATER BUREAU
525 Camino de Los Marquez, Suite 4
Santa Fe, New Mexico 87505
Phone (505) 476-8620 • Fax (505) 476-8656
Toll Free 1-877-654-8720
www.nmenv.state.nm.us/dwb



RON CURRY
Secretary

Sarah Cottrell
Deputy Secretary

Karen E. Gallegos
Director

June 17, 2010

Andy Freeman
Hall Environmental Analysis Laboratory, Inc.
4901 Hawkins Road NE, Suite D
Albuquerque, NM 87109

Dear Mr. Freeman:

The Drinking Water Bureau of the New Mexico Environment Department (NMED-DWB) has received and reviewed your NELAP certification /accreditation information from the state of Oregon. The documentation is acceptable and your New Mexico certification is now valid through February 28, 2011.

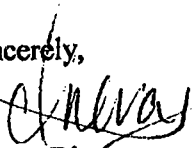
This certification is to perform drinking water analysis in compliance with the Federal Safe Drinking Water Act, pursuant to 40CFR Part 141, and the New Mexico Environment Department Drinking Water Regulations for the Primary Regulated contaminants, including contaminants as listed in your Oregon Scope Accreditation.

You must advise NMED-DWB of any change in your accreditation by the State of Oregon and continue to provide this office with performance evaluation results. You are also required to provide evidence of renewal of accreditation by the state of Oregon to continue certification past February 28, 2011.

Laboratories certified by New Mexico can be purged from the list if there is no evidence that they are performing drinking water compliance sample analysis for public water supply systems in New Mexico.

If you have any questions or require additional information, please contact me at 505-476-8648.

Sincerely,


Oneva Rivera

Data/ Lab Coordinator

oneva.rivera@state.nm.us



OREGON

Environmental Laboratory Accreditation Program



NELAP Recognized

Hall Environmental Analysis Laboratory, Inc.

NM100001

4901 Hawkins Rd. NE, Suite D

Albuquerque, NM 87109

IS GRANTED APPROVAL BY ORELAP UNDER THE 2003 NELAP STANDARDS, TO
PERFORM ANALYSES ON ENVIRONMENTAL SAMPLES IN MATRICES AS LISTED
BELOW:

Air	Drinking Water	Non Potable Water	Solids and Chem. Waste	Tissue
Chemistry	Chemistry	Chemistry	Chemistry	

AND AS RECORDED IN THE LIST OF APPROVED ANALYTES, METHODS, ANALYTIC
TECHNIQUES, AND FIELDS OF TESTING ISSUED CONCURRENTLY WITH THIS CERTIFICATE AND
REVISED AS NECESSARY.

ACCREDITED STATUS DEPENDS ON SUCCESSFUL ONGOING PARTICIPATION IN THE
PROGRAM AND CONTINUED COMPLIANCE WITH THE STANDARDS.

CUSTOMERS ARE URGED TO VERIFY THE LABORATORY'S CURRENT ACCREDITATION STATUS

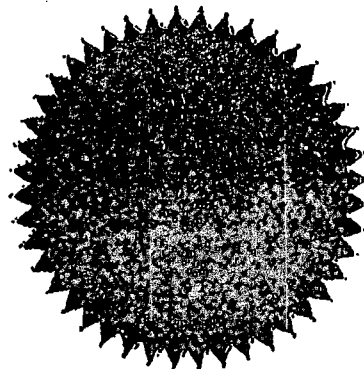
Charles W. Schell for
Irene E. Ronning Ph.D.

Oregon State Public Health Laboratory
ORELAP Administrator
3160 NW. 229th Ave, Suite 100
Hillsboro, OR 97124

ISSUE DATE: 03/01/2010

EXPIRATION DATE: 02/28/2011

Certificate No: NM100001 - 007





Oregon

Environmental Laboratory Accreditation Program



Department of Agriculture, Laboratory Division
Department of Environmental Quality, Laboratory Division
Department of Human Services, Public Health Laboratory

NELAP Recognized

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Rd. NE, Suite D
Albuquerque NM 87109

Issue Date: 03/01/2010 Expiration Date: 02/28/2011

As of 03/01/2010 this list supercedes all previous lists for this certificate number.
Customers. Please verify the current accreditation standing with ORELAP.

MATRIX: Drinking Water

Reference

✓ EPA 200.7 5

Analyte Code

Analyte

1000	Aluminum
1016	Boron
1020	Beryllium
1026	Bromine
1030	Cadmium
1036	Calcium
1040	Chromium
1056	Copper
1070	Iron
1076	Lead
1086	Magnesium
1090	Manganese
1100	Molybdenum
1106	Nickel
1126	Potassium
1990	Silica as SiO ₂
1150	Silver
1166	Sodium
1176	Tin
1180	Titanium
1186	Vanadium
1190	Zinc

Code

10014001

Description

ICP - metals

✓ EPA 245.1 3

10038609

Mercury by Cold Vapor Atomic Absorption

Analyte Code

Analyte

1096	Mercury
------	---------

✓ EPA 300.0

10053006

Ion chromatography - anions.

Analyte Code

Analyte

1676	Chloride
1730	Fluoride
1810	Nitrate as N
1870	Orthophosphate as P
2000	Sulfate

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

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✓ EPA 5030B

10163409

Purge and trap for aqueous samples

Analyte Code	Analyte
--------------	---------

125

Extraction/Preparation

✓ EPA 504.1

10083008

EDB/DBCP/TCP micro-extraction, GC/ECD

Analyte Code	Analyte
--------------	---------

4670

1,2-Dibromo-3-chloropropane (DBCP)

4685

1,2-Dibromoethane (EDB, Ethylene dibromide)

✓ EPA 524.2 4.1

10088809

Volatile Organic Compounds GC/MS Capillary Column

Analyte Code	Analyte
--------------	---------

5105

1,1,1,2-Tetrachloroethane

5160

1,1,1-Trichloroethane

5110

1,1,2,2-Tetrachloroethane

5165

1,1,2-Trichloroethane

4830

1,1-Dichloroethane

4840

1,1-Dichloroethylene

4670

1,1-Dichloropropene

5150

1,2,3-Trichlorobenzene

5180

1,2,4-Trichlorobenzene

5165

1,2,4-Trichlorobenzene

5210

1,2,4-Trichlorobenzene

4810

1,2-Dichlorobenzene

4635

1,2-Dichlorobenzene (Ethylene dichloride)

4665

1,2-Dichloropropane

5215

1,3,5-Trimethylbenzene

4815

1,3-Dichlorobenzene

4880

1,3-Dichloropropane

4620

1,4-Dichlorobenzene

4635

2-Chlorotoluene

4640

4-Chlorotoluene

4376

Benzene

4385

Bromobenzene

4390

Bromochloromethane

4395

Bromodichloromethane

4400

Bromoform

4455

Carbon tetrachloride

4476

Chlorobenzene

4675

Chlorodibromomethane

4485

Chloroethane (Ethyl chloride)

4506

Chloroform

4645

cis-1,2-Dichloroethylene

4680

cis-1,3-Dichloropropane

4595

Dibromomethane (Methylene bromide)

4785

Ethylbenzene

4835

Hexachlorobutadiene

4900

Isopropylbenzene

4950

Methyl bromide (Bromomethane)

4980

Methyl chloride (Chloromethane)

5000

Methyl tert-butyl ether (MTBE)

4975

Methylene chloride (Dichloromethane)

4435

n-Butylbenzene

5090

n-Propylbenzene

4440

sec-Butylbenzene

5100

Styrene

4445

tert-Butylbenzene

5115

Tetrachloroethylene (Perchloroethylene)

5140

Toluene

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Rd. NE, Suite D
Albuquerque NM 87109

Issue Date: 03/01/2010 Expiration Date: 02/28/2011

As of 03/01/2010 this list supercedes all previous lists for this certificate number.
Customers. Please verify the current accreditation standing with ORELAP.

Analyte Code	Analyte
4700	trans-1,2-Dichloroethylene
4885	trans-1,3-Dichloropropylene
5170	Trichloroethane (Trichloroethylene)
5175	Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)
5235	Vinyl chloride
5280	Xylene (total)

✓ SM 2320 B 20th ED 20045209 Alkalinity by Titration

Analyte Code	Analyte
1505	Alkalinity as CaCO ₃

✓ SM 2540 C 20th ED 20050004 Total Dissolved Solids

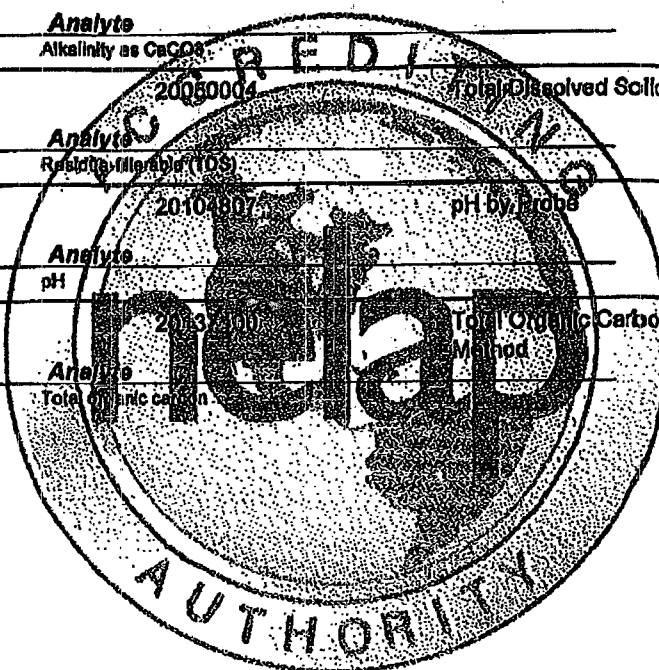
Analyte Code	Analyte
1866	Residual Chlorine (RC)

✓ SM 4500-H+ B 20th ED 20104807 pH by Probe

Analyte Code	Analyte
1900	pH

✓ SM 5310 B 20th ED 20131001 Total Organic Carbon by Combustion Infra-red Method

Analyte Code	Analyte
2040	Total Organic Carbon



ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

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Customers. PLEASE verify the current accreditation standing with ORELAP.

MATRIX: Non-Potable Water

Reference	Code	Description
✓ EPA 300.0	10053006	Ion chromatography - anions.

Analyte Code Analyte

1640	Bromide
1676	Chloride
1780	Fluoride
1810	Nitrate as N
1820	Nitrate-nitrite
1840	Nitrite as N
1870	Orthophosphate as P
2000	Sulfate

✓ EPA 3005A

10138207

Acid Digestion of waters for Total Recoverable or Dissolved Metals

Analyte Code**Analyte**

125

Extraction/Preparation

✓ EPA 3510C

10138208

Separation Funnel liquid-liquid extraction

Analyte Code**Analyte**

125

Extraction/Preparation

✓ EPA 5030B

10153409

Purge and trap for aqueous samples

Analyte Code**Analyte**

125

Extraction/Preparation

✓ EPA 6010B

10155809

ICP-AES

Analyte Code**Analyte**

1000	Aluminum
1005	Antimony
1010	Arsenic
1015	Barium
1020	Beryllium
1025	Boron
1030	Cadmium
1035	Calcium
1040	Chromium
1050	Cobalt
1070	Iron
1075	Lead
1085	Magnesium
1090	Manganese
1100	Molybdenum
1105	Nickel
1125	Potassium
1140	Selenium
1150	Silver
1155	Sodium
1165	Thallium
1175	Tin
1180	Titanium
3035	Uranium
1185	Vanadium
1190	Zinc

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Rd. NE, Suite D
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Customers. Please verify the current accreditation standing with ORELAP.

✓ EPA 7470A	10165807	Mercury In Liquid Waste by Cold Vapor Atomic Absorption
Analyte Code	Analyte	
1095	Mercury	
✓ EPA 8015B	10173601	Non-halogenated organics using GC/FID
Analyte Code	Analyte	
9399	Diesel range organics (DRO)	
9408	Gasoline range organics (GRO)	
9499	Motor Oil	
✓ EPA 8021B	10174808	Aromatic and Halogenated Volatiles by GC with RID and/or ECD Purge & Trap
Analyte Code	Analyte	
5210	1,2,4-Trimethylbenzene	
5215	1,3,5-Trimethylbenzene	
4375	Benzene	
4765	Ethylbenzene	
5240	m-p-Xylene	
6000	Methyl tert-butyl ether (MTBE)	
5250	o-Xylene	
5140	Toluene	
5280	Xylene (Total)	
✓ EPA 8081A	10174806	Organochlorine Pesticides by GC/ECD
Analyte Code	Analyte	
7355	4,4'-DDT	
7360	4,4'-DDE	
7365	4,4'-DDT	
7025	Aldrin	
7110	alpha-BHC (alpha-Hexachlorocyclohexane)	
7115	beta-BHC (beta-Hexachlorocyclohexane)	
7105	delta-BHC	
7470	Dieldrin	
7510	Endosulfan I	
7515	Endosulfan II	
7520	Endosulfan sulfate	
7540	Endrin	
7530	Endrin aldehyde	
7120	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	
7685	Heptachlor	
7690	Heptachlor epoxide	
7610	Methoxychlor	
✓ EPA 8082	10179007	Polychlorinated Biphenyls (PCBs) by GC/ECD
Analyte Code	Analyte	
8880	Aroclor-1016 (PCB-1016)	
8885	Aroclor-1221 (PCB-1221)	
8890	Aroclor-1232 (PCB-1232)	
8895	Aroclor-1242 (PCB-1242)	
8900	Aroclor-1248 (PCB-1248)	
8905	Aroclor-1254 (PCB-1254)	
8910	Aroclor-1260 (PCB-1260)	
✓ EPA 8280B	10184802	Volatile Organic Compounds by purge and trap GC/MS
Analyte Code	Analyte	
5105	1,1,1,2-Tetrachloroethane	

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00036

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

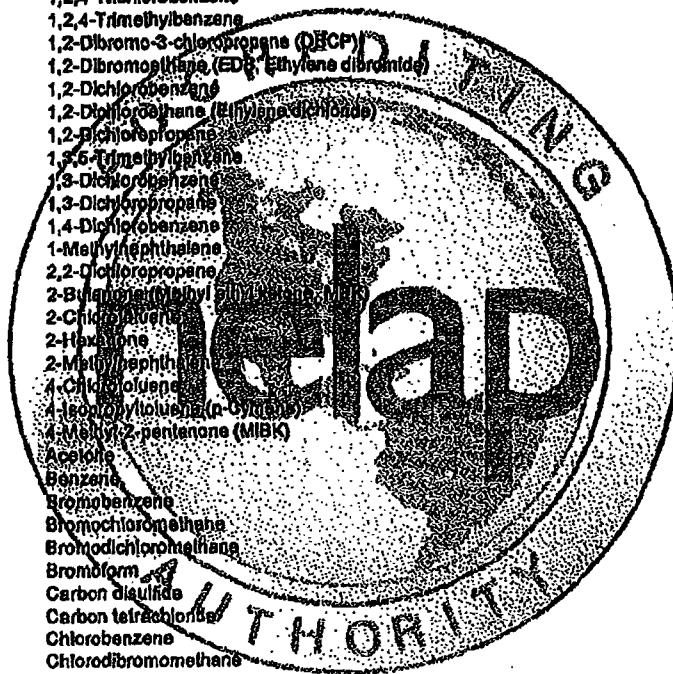
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Customers. Please verify the current accreditation standing with ORELAP.

Analyte Code	Analyte
5180	1,1,1-Trichloroethane
5110	1,1,2,2-Tetrachloroethane
5185	1,1,2-Trichloroethane
4630	1,1-Dichloroethane
4640	1,1-Dichloroethylene
4670	1,1-Dichloropropene
5160	1,2,3-Trichlorobenzene
5180	1,2,3-Trichloropropene
5155	1,2,4-Trichlorobenzene
5210	1,2,4-Trimethylbenzene
4670	1,2-Dibromo-3-chloropropane (DBCP)
4685	1,2-Dibromomethane (EDB; Ethylene dibromide)
4610	1,2-Dichlorobenzene
4635	1,2-Dichloroethane (Ethylene dichloride)
4655	1,2-Dichloropropene
5215	1,3,5-Trimethylbenzene
4615	1,3-Dichlorobenzene
4660	1,3-Dichloropropane
4620	1,4-Dichlorobenzene
6380	1-Methylnaphthalene
4665	2,2-Dichloropropane
4410	2-Butanone (Methyl ethyl ketone, MEK)
4535	2-Chlorobutane
4680	2-Hexanone
6385	2-Methylnaphthalene
4540	4-Chlorotoluene
4910	4-Isopropyltoluene (p-Cymene)
4985	4-Methyl-2-pentanone (MIBK)
4315	Acetone
4375	Benzene
4385	Bromobenzene
4390	Bromochloromethane
4395	Bromodichloromethane
4400	Bromoform
4450	Carbon disulfide
4455	Carbon tetrachloride
4475	Chlorobenzene
4575	Chlorodibromomethane
4485	Chloroethane (Ethyl chloride)
4505	Chloroform
4645	cis-1,2-Dichloroethylene
4680	cis-1,3-Dichloropropene
4595	Dibromomethane (Methylene bromide)
4625	Dichlorodifluoromethane (Freon-12)
4765	Ethylbenzene
4635	Hexachlorobutadiene
4900	Isopropylbenzene
5240	m+p-xylene
4650	Methyl bromide (Bromomethane)
4980	Methyl chloride (Chloromethane)
5000	Methyl tert-butyl ether (MTBE)
4975	Methylene chloride (Dichloromethane)
5005	Naphthalene
4435	n-Butylbenzene
5080	n-Propylbenzene
5250	o-Xylene
4440	sec-Butylbenzene
5100	Styrene
4445	tert-Butylbenzene
5115	Tetrachloroethylene (Perchloroethylene)
5140	Toluene



ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Rd. NE, Suite D
Albuquerque NM 87109

Issue Date: 03/01/2010

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Customers. Please verify the current accreditation standing with ORELAP.

Analyte Code	Analyte
4700	trans-1,2-Dichloroethylene
4886	trans-1,3-Dichloropropylene
6170	Trichloroethene (Trichloroethylene)
6175	Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)
6235	Vinyl chloride
6260	Xylene (total)

✓ EPA 8270C

10185805

Semivolatile Organic compounds by GC/MS

Analyte Code	Analyte
5155	1,2,4-Trichlorobenzene
4810	1,2-Dichlorobenzene
4815	1,3-Dichlorobenzene
4820	1,4-Dichlorobenzene
6835	2,4,5-Trichlorophenol
6840	2,4,6-Trichlorophenol
6000	2,4-Dichlorophenol
6130	2,4-Dimethylphenol
6176	2,4-Dichlorophenol
6185	2,4-Dinitrofluorene (2,4-DNTF)
6190	2,6-Dinitrofluorene (2,6-DNTF)
5795	2-Chlorophenyl phenyl ether
5800	2-Chlorophenol
6380	2-Methyl-4,6-dinitrophenol (4,6-DNT-2-methylphenol)
6385	2-Methylphenyl phenyl ether
6400	2-Methylphenol (o-Cresol)
6460	2-Nitroaniline
6480	2-Nitrophenol
6412	3,4,4-Methylphenol
6945	3,3-Dichlorobenzidine
6485	3-Nitroaniline
5880	4-Bromophenyl phenyl ether
5700	4-Chloro-3-methylphenol
5745	4-Chloroaniline
6825	4-Chlorophenyl phenyl ether
6470	4-Nitroaniline
6500	4-Nitrophenol
5500	Acenaphthene
6505	Acenaphthylene
5545	Aniline
5555	Anthracene
5582	Azobenzene
5575	Benzo(a)anthracene
5580	Benzo(a)pyrene
5580	Benzo(g,h,i)perylene
5800	Benzo(k)fluoranthene
5585	Benzo(b)fluoranthene
5587	Benzo(f)fluoranthene
5810	Benzole acid
5830	Benzyl alcohol
5760	bis(2-Chloroethoxy)methane
5765	bis(2-Chloroethyl) ether
5780	bis(2-Chloroisopropyl) ether
5970	Butyl benzyl phthalate
5980	Carbazole
5555	Chrysene
6085	Di(2-ethylhexyl) phthalate (bis(2-Ethylhexyl)phthalate, DEHP)
5895	Dibenz(a,h) anthracene
5805	Dibenzofuran
6070	Diethyl phthalate
6135	Dimethyl phthalate

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Rd. NE, Suite D
Albuquerque NM 87109

Issue Date: 03/01/2010

Expiration Date: 02/28/2011

As of 03/01/2010 this list supercedes all previous lists for this certificate number.
Customers. Please verify the current accreditation standing with ORELAP.

Analyte Code	Analyte
8825	Di-n-butyl phthalate
8200	Di-n-octyl phthalate
8286	Fluoranthene
8270	Fluorene
8275	Hexachlorobenzene
4835	Hexachlorobutadiene
8285	Hexachlorocyclopentadiene
4840	Hexachloroethane
8315	Indeno(1,2,3-cd) pyrene
8320	Isophorone
5005	Naphthalene
8018	Nitrobenzene
8548	n-Nitrosodipropylamine
8536	n-Nitrosodiphenylamine
8605	Pentachlorophenol
8815	Phenanthrene
8825	Phenol
8865	Pyrene
8095	Pyridine

✓ EPA 8310

Analyte Code	Analyte
6380	1-Methylnaphthalene
5500	Acenaphthene
5505	Acenaphthylene
5555	Anthracene
5575	Benzo(a)anthracene
5590	Benzo(a)pyrene
5590	Benzo(b)fluoranthene
5590	Benzo(k)fluoranthene
5585	Benzo(b)fluoranthene
5585	Chrysene
5595	Dibenz(a,h)anthracene
6285	Fluoranthene
8270	Fluorene
8315	Indeno(1,2,3-cd) pyrene
5005	Naphthalene
8815	Phenanthrene
8865	Pyrene

✓ EPA 8060A

10244801

Total Organic Carbon

Analyte Code	Analyte
2040	Total organic carbon

✓ SM 2540 C 20th ED

20050004

Total Dissolved Solids

Analyte Code	Analyte
1855	Residue-filterable (TDS)

✓ SM 4500-H+ B 20th ED

20104807

pH by Probe

Analyte Code	Analyte
1900	pH

✓ SM 4500-NH3 C 20th ED

20108405

Ammonia Nitrogen by Titration

Analyte Code	Analyte
1815	Ammonia as N

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00036

Certificate: NM100001 - 007

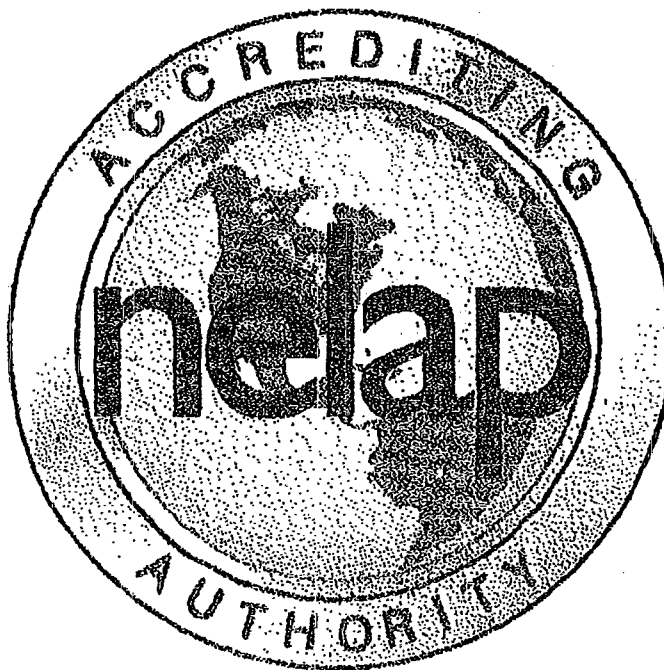
Hall Environmental Analysis Laboratory, Inc.

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Issue Date: 03/01/2010 Expiration Date: 02/28/2011

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✓ SM 4500-Norg C 20th ED	20110802	Nitrogen (Organic) by Semi-micro Kjeldahl Method
<u>Analyte Code</u>	<u>Analyte</u>	
1795	Kjeldahl nitrogen - total	



ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00036

Certificate: NM100001 - 007

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MATRIX Solids		
Reference	Code	Description
✓EPA 3060B	10135801	Acid Digestion of Sediments, Sludges, and soils
Analyte Code	Analyte	
125	Extraction/Preparation	
✓EPA 3540C	10140202	Soxhlet Extraction
Analyte Code	Analyte	
125	Extraction/Preparation	
✓EPA 3545A	10141001	Pressurized Fluid Extraction (PFE)
Analyte Code	Analyte	
125	Extraction/Preparation	
✓EPA 5035	10154004	Closed System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples
Analyte Code	Analyte	
125	Extraction/Preparation	
✓EPA 6010B	10155001	IC - AES
Analyte Code	Analyte	
1000	Aluminum	
1005	Antimony	
1010	Arsenic	
1015	Barium	
1020	Beryllium	
1025	Boron	
1030	Cadmium	
1035	Calcium	
1040	Chromium	
1050	Cobalt	
1055	Copper	
1070	Iron	
1075	Lead	
1085	Magnesium	
1090	Manganese	
1100	Molybdenum	
1105	Nickel	
1125	Potassium	
1140	Selenium	
1150	Silver	
1155	Sodium	
1165	Thallium	
1175	Tin	
1180	Titanium	
3035	Uranium	
1185	Vanadium	
1190	Zinc	
✓EPA 7471A	10166208	Mercury in Solid Waste by Cold Vapor Atomic Absorption
Analyte Code	Analyte	
1085	Mercury	

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00036

Certificate: NM100001 - 007

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Expiration Date: 02/28/2011

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Customers. Please verify the current accreditation standing with ORELAP.

✓ EPA 8015B 10173601 Non-halogenated organics using GC/FID

Analyte Code	Analyte
9399	Diesel range organics (DRO)
9408	Gasoline range organics (GRO)
9499	Motor Oil

✓ EPA 8021B 10174808 Aromatic and Halogenated Volatiles by GC with PID and/or ECD Purge & Trap

Analyte Code	Analyte
4375	Benzene
4765	Ethylbenzene
5240	m+p-xylene
5000	Methyl tert-butyl ether (MTBE)
5250	o-Xylene
5140	Toluene
5260	Xylene (total)

✓ EPA 8081A 10178608 Organochlorine Pesticides by GC/ECD

Analyte Code	Analyte
7355	4,4'-DDT
7360	4,4'-DDE
7385	4,4'-DDD
7025	Aldrin
7110	alpha-BHC (alpha-Hexachlorocyclopentadiene)
7115	beta-BHC (beta-Hexachlorocyclopentadiene)
7105	delta-BHC
7470	Dieldrin
7510	Endosulfan I
7515	Endosulfan II
7520	Endosulfan sulfate
7540	Endrin
7530	Endrin aldehyde
7120	gamma-BHC (Lindane; gamma-Hexachlorocyclopentadiene)
7885	Heptachlor
7890	Heptachlor epoxide
7810	Methoxychlor

✓ EPA 8082 10179007 Polychlorinated Biphenyls (PCBs) by GC/ECD

Analyte Code	Analyte
8880	Aroclor-1016 (PCB-1016)
8885	Aroclor-1221 (PCB-1221)
8890	Aroclor-1232 (PCB-1232)
8895	Aroclor-1242 (PCB-1242)
8900	Aroclor-1248 (PCB-1248)
8905	Aroclor-1254 (PCB-1254)
8910	Aroclor-1260 (PCB-1260)

✓ EPA 8260B 10184802 Volatile Organic Compounds by purge and trap GC/MS

Analyte Code	Analyte
5105	1,1,1,2-Tetrachloroethane
5160	1,1,1-Trichloroethane
5110	1,1,2,2-Tetrachloroethane
5165	1,1,2-Trichloroethane
4630	1,1-Dichloroethane
4640	1,1-Dichloroethylene
4670	1,1-Dichloropropane
5150	1,2,3-Trichlorobenzene

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

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Analyte Code	Analyte
5180	1,2,3-Trichloropropane
5155	1,2,4-Trichlorobenzene
5210	1,2,4-Trimethylbenzene
4570	1,2-Dibromo-3-chloropropane (DBCP)
4585	1,2-Dibromoethane (EDB, Ethylene dibromide)
4610	1,2-Dichlorobenzene
4635	1,2-Dichloroethane (Ethylene dichloride)
4655	1,2-Dichloropropane
5215	1,3,6-Trimethylbenzene
4615	1,3-Dichlorobenzene
4680	1,3-Dichloropropane
4620	1,4-Dichlorobenzene
6380	1-Methylnaphthalene
4665	2,2-Dichloropropane
4410	2-Butanone (Methyl ethyl ketone, MEK)
4535	2-Chloropropane
4860	2-Hexanone
6385	2-Methylnaphthalene
4540	4-Chlorophenol
4910	4-Isopropyltoluene (p-Cymene)
4995	4-Methyl-2-pentanone (MIBK)
4315	Acetone
4375	Benzene
4385	Bromobenzene
4390	Bromochloromethane
4395	Bromodichloromethane
4400	Bromofluoromethane
4450	Carbon disulfide
4455	Carbon tetrachloride
4475	Chlorobenzene
4575	Chlorodibromomethane
4485	Chloroethane (Ethyl chloride)
4505	Chloroform
4645	cis-1,2-Dichloroethylene
4680	cis-1,3-Dichloropropene
4595	Dibromomethane (Methylene bromide)
4625	Dichlorodifluoromethane (Freon 22)
4765	Ethylbenzene
4835	Hexachlorobutadiene
4800	Isopropylbenzene
5240	m+p-xylene
4950	Methyl bromide (Bromomethane)
4980	Methyl chloride (Chloromethane)
5000	Methyl tert-butyl ether (MTBE)
4975	Methylene chloride (Dichloromethane)
5005	Naphthalene
4435	n-Butylbenzene
5090	n-Propylbenzene
5250	o-Xylene
4440	sec-Butylbenzene
5100	Styrene
4445	tert-Butylbenzene
5115	Tetrachloroethylene (Perchloroethylene)
5140	Toluene
4700	trans-1,2-Dichloroethylene
4885	trans-1,3-Dichloropropylene
5170	Trichloroethene (Trichloroethylene)
5175	Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)
5235	Vinyl chloride
5260	Xylene (total)



ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

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Customers. Please verify the current accreditation standing with ORELAP.

✓ EPA 8270C

10185805

Semivolatile Organic compounds by GC/MS

Analyte Code	Analyte
5155	1,2,4-Trichlorobenzene
4810	1,2-Dichlorobenzene
4815	1,3-Dichlorobenzene
4820	1,4-Dichlorobenzene
6835	2,4,6-Trichlorophenol
6840	2,4,6-Trichlorophenol
6000	2,4-Dichlorophenol
6130	2,4-Dimethylphenol
6175	2,4-Dinitrophenol
6185	2,4-Dinitrotoluene (2,4-DNT)
6190	2,6-Dinitrotoluene (2,6-DNT)
5795	2-Chlorophenol
5800	2-Chlorophenol
6360	2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)
6365	2-Methylphenol
6400	2-Methylphenol (o-Cresol)
6460	2-Nitroaniline
6490	2-Nitrophenol
6412	3,4-Methylphenol
5848	3,3'-Dichlorodiphenyl ether
6465	3-Nitroaniline
6680	4-Bromophenyl phenyl ether
5700	4-Chlorophenyl phenyl ether
5745	4-Chloroaniline
5825	4-Chlorophenyl phenyl ether
6470	4-Nitroaniline
6500	4-Nitrophenol
5500	Acenaphthene
5505	Acenaphthylene
5545	Aniline
5555	Anthracene
5582	Azobenzene
5575	Benzo(a)anthracene
5580	Benzo(a)pyrene
5590	Benzo(g,h,i)perylene
5600	Benzo(k)fluoranthene
5585	Benzo(b)fluoranthene
5810	Benzoic acid
5830	Benzyl alcohol
5780	bis(2-Chloroethoxy)methane
5785	bis(2-Chloroethyl) ether
5780	bis(2-Chloroisopropyl) ether
5670	Butyl benzyl phthalate
5680	Carbazole
5855	Chrysene
6065	Di(2-ethylhexyl) phthalate (bis(2-Ethylhexyl)phthalate, DEHP)
5895	Dibenz(a,h) anthracene
5905	Dibenzofuran
6070	Diethyl phthalate
6135	Dimethyl phthalate
5925	Di-n-butyl phthalate
6200	Di-n-octyl phthalate
6285	Fluoranthene
6270	Fluorene
6275	Hexachlorobenzene
4835	Hexachlorobutadiene
6285	Hexachlorocyclopentadiene
4840	Hexachloroethane

ORELAP Fields of Accreditation

ORELAP ID: NM100001

EPA CODE: NM00035

Certificate: NM100001 - 007

Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Rd. NE, Suite D
Albuquerque NM 87109

Issue Date: 03/01/2010

Expiration Date: 02/28/2011

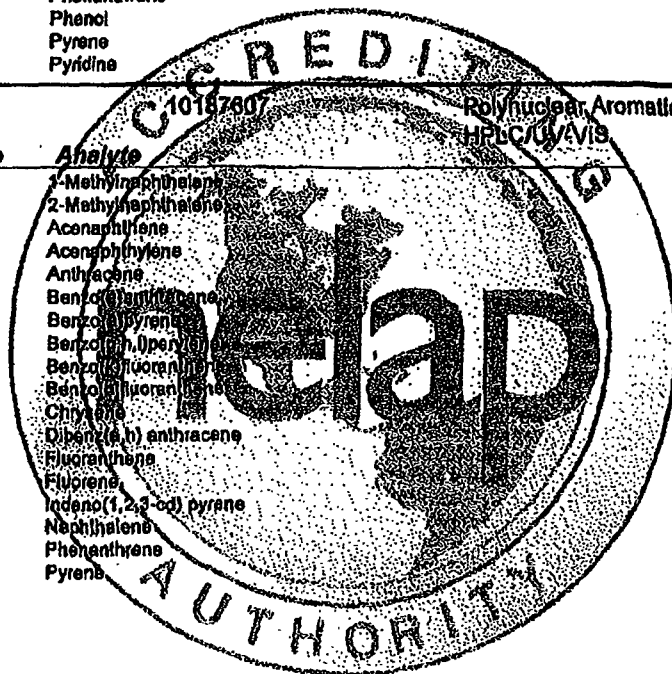
As of 03/01/2010 this list supercedes all previous lists for this certificate number.
Customers. Please verify the current accreditation standing with ORELAP.

Analyte Code	Analyte
6315	Indeno(1,2,3-cd) pyrene
6320	Isophorone
6005	Naphthalene
6016	Nitrobenzene
6530	n-Nitrosodimethylamine
6545	n-Nitrosodi-n-propylamine
6535	n-Nitrosodiphenylamine
6605	Pentachlorophenol
6616	Phenanthrene
6625	Phenol
6665	Pyrene
6065	Pyridine

✓ EPA 8310

Analyte Code	Analyte
6360	1-Methylnaphthalene
6365	2-Methylnaphthalene
5500	Acenaphthene
5505	Acenaphthylene
5555	Anthracene
5575	Benzo(a)anthracene
5580	Benzo(b)fluorene
5590	Benzo(k)fluorene
5600	Benzo(a)pyrene
5665	Benzo(b)fluorene
5665	Chrysene
5695	Dibenz(a,h)anthracene
6265	Fluoranthene
6270	Fluorene
6315	Indeno(1,2,3-cd) pyrene
6005	Naphthalene
6616	Phenanthrene
6665	Pyrene

Poly Nuclear Aromatic Hydrocarbons by
HPLC/UV/VIS



Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Protecting Texas by Reducing and Preventing Pollution

June 30, 2010

CERTIFIED MAIL

91 7108 2133 3935 2006 9293

Ms. Carolyn Swanson
Hall Environmental Analysis Laboratory, Inc.
4901 Hawkins Road NE, Suite D
Albuquerque, NM 87109-4337

Dear Ms. Swanson:

I am writing to congratulate you and the staff of Hall Environmental Analysis Laboratory, Inc. Based on your application and primary NELAP accreditation from the State of Oregon, pursuant to authorization from the Executive Director of the Texas Commission on Environmental Quality, the Program Manager of the Quality Assurance Section has issued your laboratory secondary NELAP accreditation according to the attached Fields of Accreditation.

I am enclosing the accreditation certificate and Fields of Accreditation listing. Please review the enclosures for accuracy and completeness. Your laboratory's accreditation is valid for one year, contingent on continued compliance with the requirements of the State of Texas as well as those of your primary Accreditation Authority.

If I may be of further assistance, please contact me at (512) 239-3754 or e-mail at fjamison@tceq.state.tx.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank Jamison", written over a horizontal line.

Frank Jamison
Records Specialist

Enclosures



Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to



Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Road NE, Suite D

Albuquerque, NM 87109-4337

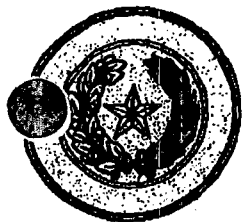
in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Certificate Number: T104704424-10-1
Effective Date: 7/1/2010
Expiration Date: 6/30/2011

A handwritten signature in black ink, appearing to read "M. P. V. D. J.", written over a horizontal line.

Executive Director Texas Commission on
Environmental Quality



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Road NE, Suite D
Albuquerque, NM 87109-4337

Certificate: T104704424-10-1
Expiration Date: 6/30/2011
Issue Date: 7/1/2010

These fields of accreditation supersede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: Drinking Water

Method EPA 200.7

Analyte	AB	Analyte ID	Method ID
Aluminum	OR	1000	10013806
Barium	OR	1015	10013806
Beryllium	OR	1020	10013806
Boron	OR	1025	10013806
Cadmium	OR	1030	10013806
Calcium	OR	1035	10013806
Chromium	OR	1040	10013806
Copper	OR	1055	10013806
Iron	OR	1070	10013806
Lead	OR	1075	10013806
Magnesium	OR	1085	10013806
Manganese	OR	1090	10013806
Molybdenum	OR	1100	10013806
Nickel	OR	1105	10013806
Potassium	OR	1125	10013806
Silver	OR	1150	10013806
Sodium	OR	1155	10013806
Tin	OR	1175	10013806
Titanium	OR	1180	10013806
Vanadium	OR	1185	10013806
Zinc	OR	1190	10013806

Method EPA 245.1

Analyte	AB	Analyte ID	Method ID
Mercury	OR	1095	10036609

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Chloride	OR	1575	10053006
Fluoride	OR	1730	10053006
Nitrate as N	OR	1810	10053006



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Hall Environmental Analysis Laboratory, Inc.

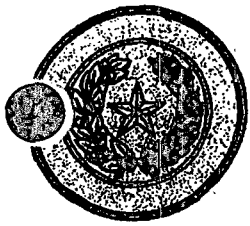
**4901 Hawkins Road NE, Suite D
Albuquerque, NM 87109-4337**

Certificate: T104704424-10-1
Expiration Date: 6/30/2011
Issue Date: 7/1/2010

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Matrix: *Drinking Water*

Nitrite as N	OR	1840	10053006
Orthophosphate as P	OR	1870	10053006
Sulfate	OR	2000	10053006
Method EPA 504.1			
Analyte	AB	Analyte ID	Method ID
1,2-Dibromo-3-chloropropane (DBCP)	OR	4570	10082801
1,2-Dibromoethane (EDB, Ethylene dibromide)	OR	4585	10082801
Method EPA 524.2			
Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	OR	5160	10089006
1,1,2-Trichloroethane	OR	5165	10089006
1,1-Dichloroethylene (1,1-Dichloroethene)	OR	4640	10089006
1,2,4-Trichlorobenzene	OR	5155	10089006
1,2-Dichlorobenzene	OR	4610	10089006
1,2-Dichloroethane	OR	4635	10089006
1,2-Dichloropropane	OR	4655	10089006
1,4-Dichlorobenzene	OR	4620	10089006
Benzene	OR	4375	10089006
Carbon tetrachloride	OR	4455	10089006
Chlorobenzene	OR	4475	10089006
cis-1,2-Dichloroethylene	OR	4645	10089006
Dichloromethane (DCM, Methylene chloride)	OR	4650	10089006
Ethylbenzene	OR	4765	10089006
Styrene	OR	5100	10089006
Tetrachloroethylene (Perchloroethylene)	OR	5115	10089006
Toluene	OR	5140	10089006
trans-1,2-Dichloroethylene	OR	4700	10089006
Trichloroethene (Trichloroethylene)	OR	5170	10089006
Vinyl chloride	OR	5235	10089006
Xylene (total)	OR	5260	10089006



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



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Certificate: T104704424-10-1
Expiration Date: 6/30/2011
Issue Date: 7/1/2010

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Matrix: *Drinking Water*

Method SM 2540 C

Analyte

AB
OR

Analyte ID
1955

Method ID
20004404

Residue-filterable (TDS)



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



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Certificate:

T104704424-10-1

Expiration Date:

6/30/2011

Issue Date:

7/1/2010

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Matrix: Non Potable Water

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	OR	1540	10053006
Chloride	OR	1575	10053006
Fluoride	OR	1730	10053006
Nitrate as N	OR	1810	10053006
Nitrite as N	OR	1840	10053006
Orthophosphate as P	OR	1870	10053006
Sulfate	OR	2000	10053006

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	OR	1000	10155201
Antimony	OR	1005	10155201
Arsenic	OR	1010	10155201
Barium	OR	1015	10155201
Beryllium	OR	1020	10155201
Boron	OR	1025	10155201
Cadmium	OR	1030	10155201
Calcium	OR	1035	10155201
Chromium	OR	1040	10155201
Cobalt	OR	1050	10155201
Iron	OR	1070	10155201
Lead	OR	1075	10155201
Magnesium	OR	1085	10155201
Manganese	OR	1090	10155201
Molybdenum	OR	1100	10155201
Nickel	OR	1105	10155201
Potassium	OR	1125	10155201
Selenium	OR	1140	10155201
Silver	OR	1150	10155201
Sodium	OR	1155	10155201



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



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Albuquerque, NM 87109-4337

Certificate: T104704424-10-1
Expiration Date: 6/30/2011
Issue Date: 7/1/2010

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Matrix: Non Potable Water

Thallium	OR	1165	10155201
Tin	OR	1175	10155201
Titanium	OR	1180	10155201
Vanadium	OR	1185	10155201
Zinc	OR	1190	10155201
Method EPA 7470			
Analyte	AB	Analyte ID	Method ID
Mercury	OR	1095	10165603
Method EPA 8015			
Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	OR	9369	10173203
Gasoline range organics (GRO)	OR	9408	10173203
Method EPA 8021			
Analyte	AB	Analyte ID	Method ID
1,2,4-Trimethylbenzene	OR	5210	10174400
1,3,5-Trimethylbenzene	OR	5215	10174400
Benzene	OR	4375	10174400
Ethylbenzene	OR	4765	10174400
m+p-xylene	OR	5240	10174400
Methyl tert-butyl ether (MTBE)	OR	5000	10174400
o-Xylene	OR	5250	10174400
Toluene	OR	5140	10174400
Xylene (total)	OR	5260	10174400
Method EPA 8081			
Analyte	AB	Analyte ID	Method ID
4,4'-DDD	OR	7355	10178402
4,4'-DDE	OR	7360	10178402
4,4'-DDT	OR	7365	10178402
Heptachlor epoxide	OR	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	OR	7110	10178402
beta-BHC (beta-Hexachlorocyclohexane)	OR	7115	10178402



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Road NE, Suite D
Albuquerque, NM 87109-4337

Certificate: T104704424-10-1
Expiration Date: 6/30/2011
Issue Date: 7/1/2010

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Matrix: Non Potable Water

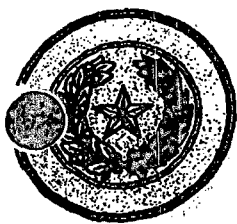
delta-BHC (delta-Hexachlorocyclohexane)	OR	7105	10178402
Dieldrin	OR	7470	10178402
Endosulfan I	OR	7510	10178402
Endosulfan II	OR	7515	10178402
Endosulfan sulfate	OR	7520	10178402
Endrin	OR	7540	10178402
Endrin aldehyde	OR	7530	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	OR	7120	10178402
Heptachlor	OR	7685	10178402
Heptachlor epoxide	OR	7690	10178402
Methoxychlor	OR	7810	10178402

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	OR	8880	10179007
Aroclor-1221 (PCB-1221)	OR	8885	10179007
Aroclor-1232 (PCB-1232)	OR	8890	10179007
Aroclor-1242 (PCB-1242)	OR	8895	10179007
Aroclor-1248 (PCB-1248)	OR	8900	10179007
Aroclor-1254 (PCB-1254)	OR	8905	10179007
Aroclor-1260 (PCB-1260)	OR	8910	10179007

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	OR	5105	10184404
1,1,1-Trichloroethane	OR	5160	10184404
1,1,2,2-Tetrachloroethane	OR	5110	10184404
1,1,2-Trichloroethane	OR	5165	10184404
1,1-Dichloroethane	OR	4630	10184404
1,1-Dichloroethylene (1,1-Dichloroethene)	OR	4640	10184404
1,1-Dichloropropene	OR	4670	10184404
1,2,3-Trichlorobenzene	OR	5150	10184404
1,2,3-Trichloropropane	OR	5180	10184404



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Expiration Date:

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Issue Date:

7/1/2010

Matrix: Non Potable Water

1,2,4-Trichlorobenzene	OR	5155	10184404
1,2,4-Trimethylbenzene	OR	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	OR	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	OR	4585	10184404
1,2-Dichlorobenzene	OR	4610	10184404
1,2-Dichloroethane	OR	4635	10184404
1,2-Dichloropropane	OR	4655	10184404
1,3,5-Trimethylbenzene	OR	5215	10184404
1,3-Dichlorobenzene	OR	4615	10184404
1,3-Dichloropropane	OR	4660	10184404
1,4-Dichlorobenzene	OR	4620	10184404
2,2-Dichloropropane	OR	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	OR	4410	10184404
2-Chlorotoluene	OR	4535	10184404
2-Hexanone	OR	4860	10184404
4-Chlorotoluene	OR	4540	10184404
4-Isopropyltoluene	OR	4915	10184404
4-Methyl-2-pentanone (MIBK)	OR	4995	10184404
Acetone	OR	4315	10184404
Benzene	OR	4375	10184404
Bromobenzene	OR	4385	10184404
Bromochloromethane	OR	4390	10184404
Bromodichloromethane	OR	4395	10184404
Bromoform	OR	4400	10184404
Bromomethane (Methyl bromide)	OR	4950	10184404
Carbon disulfide	OR	4450	10184404
Carbon tetrachloride	OR	4455	10184404
Chlorobenzene	OR	4475	10184404
Chloroethane	OR	4485	10184404
Chloroform	OR	4505	10184404



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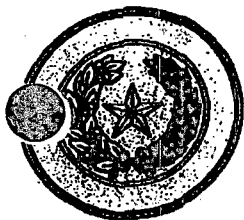
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Matrix: Non Potable Water

Chloromethane (Methyl chloride)	OR	4960	10184404
cis-1,2-Dichloroethylene	OR	4645	10184404
cis-1,3-Dichloropropylene	OR	4680	10184404
Dibromochloromethane	OR	4575	10184404
Dibromomethane	OR	4595	10184404
Dichlorodifluoromethane	OR	4625	10184404
Ethylbenzene	OR	4765	10184404
Hexachlorobutadiene	OR	4835	10184404
Isopropylbenzene	OR	4900	10184404
m+p-xylene	OR	5240	10184404
Methyl tert-butyl ether (MTBE)	OR	5000	10184404
Methylene chloride	OR	4975	10184404
Naphthalene	OR	5005	10184404
n-Butylbenzene	OR	4435	10184404
n-Propylbenzene	OR	5090	10184404
o-Xylene	OR	5250	10184404
sec-Butylbenzene	OR	4440	10184404
Styrene	OR	5100	10184404
tert-Butylbenzene	OR	4445	10184404
Tetrachloroethylene (Perchloroethylene)	OR	5115	10184404
Toluene	OR	5140	10184404
trans-1,2-Dichloroethylene	OR	4700	10184404
trans-1,3-Dichloropropylene	OR	4685	10184404
Trichloroethene (Trichloroethylene)	OR	5170	10184404
Trichlorofluoromethane	OR	5175	10184404
Vinyl chloride	OR	5235	10184404
Xylene (total)	OR	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4-Trichlorobenzene	OR	5155	10185203
1,2-Dichlorobenzene	OR	4610	10185203



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Matrix: Non Potable Water

1,3-Dichlorobenzene	OR	4615	10185203
1,4-Dichlorobenzene	OR	4620	10185203
2,4,5-Trichlorophenol	OR	6835	10185203
2,4,6-Trichlorophenol	OR	6840	10185203
2,4-Dichlorophenol	OR	6000	10185203
2,4-Dimethylphenol	OR	6130	10185203
2,4-Dinitrophenol	OR	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	OR	6185	10185203
2,6-Dinitrotoluene (2,6-DNT)	OR	6190	10185203
1-Chloronaphthalene	OR	5795	10185203
2-Chlorophenol	OR	5800	10185203
2-Methyl-4,6-dinitrophenol	OR	6360	10185203
2-Methylnaphthalene	OR	6385	10185203
2-Methylphenol (o-Cresol)	OR	6400	10185203
2-Nitroaniline	OR	6460	10185203
2-Nitrophenol	OR	6490	10185203
3,3'-Dichlorobenzidine	OR	5945	10185203
3-Methylphenol (m-Cresol)	OR	6405	10185203
3-Nitroaniline	OR	6465	10185203
4-Bromophenyl phenyl ether	OR	5660	10185203
4-Chloro-3-methylphenol	OR	5700	10185203
4-Chloroaniline	OR	5745	10185203
4-Chlorophenyl phenylether	OR	5825	10185203
4-Methylphenol (p-Cresol)	OR	6410	10185203
4-Nitroaniline	OR	6470	10185203
4-Nitrophenol	OR	6500	10185203
Acenaphthene	OR	5500	10185203
Acenaphthylene	OR	5505	10185203
Acridine	OR	5545	10185203
Anthracene	OR	5555	10185203



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Matrix: Non Potable Water

Azobenzene	OR	5562	10185203
Benzo(a)anthracene	OR	5575	10185203
Benzo(a)pyrene	OR	5580	10185203
Benzo(b)fluoranthene	OR	5585	10185203
Benzo(g,h,i)perylene	OR	5590	10185203
Benzo(k)fluoranthene	OR	5600	10185203
Benzoic acid	OR	5610	10185203
Benzyl alcohol	OR	5630	10185203
bis(2-Chloroethoxy)methane	OR	5760	10185203
bis(2-Chloroethyl) ether	OR	5765	10185203
bis(2-Chloroisopropyl) ether	OR	5780	10185203
bis(2-Ethylhexyl) phthalate (DEHP)	OR	6255	10185203
Butyl benzyl phthalate	OR	5670	10185203
Carbazole	OR	5680	10185203
Chrysene	OR	5855	10185203
Dibenz(a,h) anthracene	OR	5895	10185203
Dibenzofuran	OR	5905	10185203
Diethyl phthalate	OR	6070	10185203
Dimethyl phthalate	OR	6135	10185203
Di-n-butyl phthalate	OR	5925	10185203
Di-n-octyl phthalate	OR	6200	10185203
Fluoranthene	OR	6265	10185203
Fluorene	OR	6270	10185203
Hexachlorobenzene	OR	6275	10185203
Hexachlorobutadiene	OR	4835	10185203
Hexachlorocyclopentadiene	OR	6285	10185203
Hexachloroethane	OR	4840	10185203
Indeno(1,2,3-cd) pyrene	OR	6315	10185203
Isophorone	OR	6320	10185203
Naphthalene	OR	5005	10185203



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Matrix: Non Potable Water

Nitrobenzene	OR	5015	10185203
n-Nitrosodi-n-propylamine	OR	6545	10185203
n-Nitrosodiphenylamine	OR	6535	10185203
Pentachlorophenol	OR	6605	10185203
Phenanthrene	OR	6615	10185203
Phenol	OR	6625	10185203
Pyrene	OR	6665	10185203
Pyridine	OR	5095	10185203



Analyte	AB	Analyte ID	Method ID
Acenaphthene	OR	5500	10187607
Acenaphthylene	OR	5505	10187607
Anthracene	OR	5555	10187607
Benzo(a)anthracene	OR	5575	10187607
Benzo(a)pyrene	OR	5580	10187607
Benzo(b)fluoranthene	OR	5585	10187607
Benzo(g,h,i)perylene	OR	5590	10187607
Benzo(k)fluoranthene	OR	5600	10187607
Chrysene	OR	5855	10187607
Dibenz(a,h) anthracene	OR	5895	10187607
Fluoranthene	OR	6265	10187607
Fluorene	OR	6270	10187607
Indeno(1,2,3-cd) pyrene	OR	6315	10187607
Naphthalene	OR	5005	10187607
Phenanthrene	OR	6615	10187607
Pyrene	OR	6665	10187607



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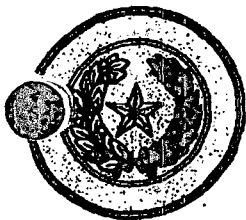
Matrix: Solid & Hazardous Material

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	OR	1000	10155201
Antimony	OR	1005	10155201
Arsenic	OR	1010	10155201
Barium	OR	1015	10155201
Beryllium	OR	1020	10155201
Boron	OR	1025	10155201
Cadmium	OR	1030	10155201
Calcium	OR	1035	10155201
Chromium	OR	1040	10155201
Cobalt	OR	1050	10155201
Copper	OR	1055	10155201
Iron	OR	1070	10155201
Lead	OR	1075	10155201
Magnesium	OR	1085	10155201
Manganese	OR	1090	10155201
Molybdenum	OR	1100	10155201
Nickel	OR	1105	10155201
Potassium	OR	1125	10155201
Selenium	OR	1140	10155201
Silver	OR	1150	10155201
Sodium	OR	1155	10155201
Thallium	OR	1165	10155201
Tin	OR	1175	10155201
Titanium	OR	1180	10155201
Vanadium	OR	1185	10155201
Zinc	OR	1190	10155201

Method EPA 7471

Analyte	AB	Analyte ID	Method ID
Mercury	OR	1095	10166004



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Matrix: Solid & Hazardous Material

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	OR	9369	10173203
Gasoline range organics (GRO)	OR	9408	10173203

Method EPA 8021

Analyte	AB	Analyte ID	Method ID
Benzene	OR	4375	10174400
Ethylbenzene	OR	4765	10174400
m+p-xylene	OR	5240	10174400
Methyl tert-butyl ether (MTBE)	OR	5000	10174400
o-Xylene	OR	5250	10174400
Toluene	OR	5140	10174400
Xylene (total)	OR	5260	10174400

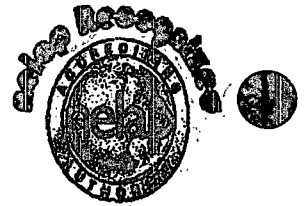
Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	OR	7355	10178402
4,4'-DDE	OR	7360	10178402
4,4'-DDT	OR	7365	10178402
Aldrin	OR	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	OR	7110	10178402
beta-BHC (beta-Hexachlorocyclohexane)	OR	7115	10178402
delta-BHC (delta-Hexachlorocyclohexane)	OR	7105	10178402
Dieldrin	OR	7470	10178402
Endosulfan I	OR	7510	10178402
Endosulfan II	OR	7515	10178402
Endosulfan sulfate	OR	7520	10178402
Endrin	OR	7540	10178402
Endrin aldehyde	OR	7530	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	OR	7120	10178402
Heptachlor	OR	7685	10178402
Heptachlor epoxide	OR	7690	10178402



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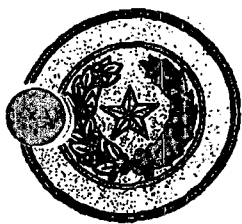
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Matrix: Solid & Hazardous Material

Methoxychlor	OR	7810	10178402
Method EPA 8082			
Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	OR	8880	10179007
Aroclor-1221 (PCB-1221)	OR	8885	10179007
Aroclor-1232 (PCB-1232)	OR	8890	10179007
Aroclor-1242 (PCB-1242)	OR	8895	10179007
Aroclor-1248 (PCB-1248)	OR	8900	10179007
Aroclor-1254 (PCB-1254)	OR	8905	10179007
Aroclor-1260 (PCB-1260)	OR	8910	10179007
Method EPA 8260			
Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	OR	5105	10184404
1,1,1-Trichloroethane	OR	5160	10184404
1,1,2,2-Tetrachloroethane	OR	5110	10184404
1,1,2-Trichloroethane	OR	5165	10184404
1,1-Dichloroethane	OR	4630	10184404
1,1-Dichloroethylene (1,1-Dichloroethene)	OR	4640	10184404
1,1-Dichloropropene	OR	4670	10184404
1,2,3-Trichlorobenzene	OR	5150	10184404
1,2,3-Trichloropropane	OR	5180	10184404
1,2,4-Trichlorobenzene	OR	5155	10184404
1,2,4-Trimethylbenzene	OR	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	OR	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	OR	4585	10184404
1,2-Dichlorobenzene	OR	4610	10184404
1,2-Dichloroethane	OR	4635	10184404
1,2-Dichloropropane	OR	4655	10184404
1,3,5-Trimethylbenzene	OR	5215	10184404
1,3-Dichlorobenzene	OR	4615	10184404
1,3-Dichloropropane	OR	4660	10184404



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Expiration Date:

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Issue Date:

7/1/2010

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Matrix: Solid & Hazardous Material

1,4-Dichlorobenzene	OR	4620	10184404
2,2-Dichloropropane	OR	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	OR	4410	10184404
2-Chlorotoluene	OR	4535	10184404
2-Hexanone	OR	4860	10184404
4-Chlorotoluene	OR	4540	10184404
4-Isopropyltoluene	OR	4915	10184404
4-Methyl-2-pentanone (MIBK)	OR	4995	10184404
Acetone	OR	4315	10184404
Benzene	OR	4375	10184404
Bromobenzene	OR	4385	10184404
Bromochloromethane	OR	4390	10184404
Bromodichloromethane	OR	4395	10184404
Bromoform	OR	4400	10184404
Bromomethane (Methyl bromide)	OR	4950	10184404
Carbon disulfide	OR	4450	10184404
Carbon tetrachloride	OR	4455	10184404
Chlorobenzene	OR	4475	10184404
Chloroethane	OR	4485	10184404
Chloroform	OR	4505	10184404
Chloromethane (Methyl chloride)	OR	4960	10184404
cis-1,2-Dichloroethylene	OR	4645	10184404
cis-1,3-Dichloropropylene	OR	4680	10184404
Dibromochloromethane	OR	4575	10184404
Dibromomethane	OR	4595	10184404
Dichlorodifluoromethane	OR	4625	10184404
Ethylbenzene	OR	4765	10184404
1,2-Dichlorobutadiene	OR	4835	10184404
Isopropylbenzene	OR	4900	10184404
m+p-xylene	OR	5240	10184404



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Matrix: Solid & Hazardous Material

Methyl tert-butyl ether (MTBE)	OR	5000	10184404
Methylene chloride	OR	4975	10184404
Naphthalene	OR	5005	10184404
n-Butylbenzene	OR	4435	10184404
n-Propylbenzene	OR	5090	10184404
o-Xylene	OR	5250	10184404
sec-Butylbenzene	OR	4440	10184404
Styrene	OR	5100	10184404
tert-Butylbenzene	OR	4445	10184404
Tetrachloroethylene (Perchloroethylene)	OR	5115	10184404
Toluene	OR	5140	10184404
trans-1,2-Dichloroethylene	OR	4700	10184404
trans-1,3-Dichloropropylene	OR	4685	10184404
Trichloroethene (Trichloroethylene)	OR	5170	10184404
Trichlorofluoromethane	OR	5175	10184404
Vinyl chloride	OR	5235	10184404
Xylene (total)	OR	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4-Trichlorobenzene	OR	5155	10185203
1,2-Dichlorobenzene	OR	4610	10185203
1,3-Dichlorobenzene	OR	4615	10185203
1,4-Dichlorobenzene	OR	4620	10185203
2,4,5-Trichlorophenol	OR	6835	10185203
2,4,6-Trichlorophenol	OR	6840	10185203
2,4-Dichlorophenol	OR	6000	10185203
2,4-Dimethylphenol	OR	6130	10185203
2,4-Dinitrophenol	OR	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	OR	6185	10185203
2,6-Dinitrotoluene (2,6-DNT)	OR	6190	10185203
2-Chloronaphthalene	OR	5795	10185203



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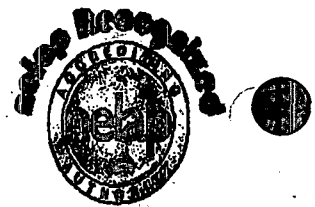
Matrix: Solid & Hazardous Material

2-Chlorophenol	OR	5800	10185203
2-Methyl-4,6-dinitrophenol	OR	6360	10185203
2-Methylnaphthalene	OR	6385	10185203
2-Methylphenol (o-Cresol)	OR	6400	10185203
2-Nitroaniline	OR	6460	10185203
2-Nitrophenol	OR	6490	10185203
3,3'-Dichlorobenzidine	OR	5945	10185203
3-Methylphenol (m-Cresol)	OR	6405	10185203
3-Nitroaniline	OR	6465	10185203
4-Bromophenyl phenyl ether	OR	5660	10185203
4-Chloro-3-methylphenol	OR	5700	10185203
4-Chloroaniline	OR	5745	10185203
4-Chlorophenyl phenylether	OR	5825	10185203
4-Methylphenol (p-Cresol)	OR	6410	10185203
4-Nitroaniline	OR	6470	10185203
4-Nitrophenol	OR	6500	10185203
Acenaphthene	OR	5500	10185203
Acenaphthylene	OR	5505	10185203
Aniline	OR	5545	10185203
Anthracene	OR	5555	10185203
Azobenzene	OR	5562	10185203
Benzo(a)anthracene	OR	5575	10185203
Benzo(a)pyrene	OR	5580	10185203
Benzo(b)fluoranthene	OR	5585	10185203
Benzo(g,h,i)perylene	OR	5590	10185203
Benzo(k)fluoranthene	OR	5600	10185203
Benzoic acid	OR	5610	10185203
Benzyl alcohol	OR	5630	10185203
bis(2-Chloroethoxy)methane	OR	5760	10185203
bis(2-Chloroethyl) ether	OR	5765	10185203



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Road NE, Suite D
Albuquerque, NM 87109-4337

Certificate:

T104704424-10-1

Expiration Date:

6/30/2011

Issue Date:

7/1/2010

These fields of accreditation supersede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: Solid & Hazardous Material

bis(2-Chloroisopropyl) ether	OR	5780	10185203
bis(2-Ethylhexyl) phthalate (DEHP)	OR	6255	10185203
Butyl benzyl phthalate	OR	5670	10185203
Carbazole	OR	5680	10185203
Chrysene	OR	5855	10185203
Dibenz(a,h) anthracene	OR	5895	10185203
Dibenzofuran	OR	5905	10185203
Diethyl phthalate	OR	6070	10185203
Dimethyl phthalate	OR	6135	10185203
Di-n-butyl phthalate	OR	5925	10185203
Di-n-octyl phthalate	OR	6200	10185203
Fluoranthene	OR	6265	10185203
Fluorene	OR	6270	10185203
Hexachlorobenzene	OR	6275	10185203
Hexachlorobutadiene	OR	4835	10185203
Hexachlorocyclopentadiene	OR	6285	10185203
Hexachloroethane	OR	4840	10185203
Indeno(1,2,3-cd) pyrene	OR	6315	10185203
Isophorone	OR	6320	10185203
Naphthalene	OR	5005	10185203
Nitrobenzene	OR	5015	10185203
n-Nitrosodimethylamine	OR	6530	10185203
n-Nitrosodi-n-propylamine	OR	6545	10185203
n-Nitrosodiphenylamine	OR	6535	10185203
Pentachlorophenol	OR	6605	10185203
Phenanthrene	OR	6615	10185203
Phenol	OR	6625	10185203
Pyrene	OR	6665	10185203
Pyridine	OR	5095	10185203

Method EPA 8310

Analyte

AB

Analyte ID

Method ID



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



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4901 Hawkins Road NE, Suite D
Albuquerque, NM 87109-4337

Certificate:

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7/1/2010

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Matrix: Solid & Hazardous Material

Acenaphthene	OR	5500	10187607
Acenaphthylene	OR	5505	10187607
Anthracene	OR	5555	10187607
Benzo(a)anthracene	OR	5575	10187607
Benzo(a)pyrene	OR	5580	10187607
Benzo(b)fluoranthene	OR	5585	10187607
Benzo(g,h,i)perylene	OR	5590	10187607
Benzo(k)fluoranthene	OR	5600	10187607
Chrysene	OR	5855	10187607
Benzo(a,h)anthracene	OR	5895	10187607
Fluoranthene	OR	6265	10187607
Fluorene	OR	6270	10187607
Indeno(1,2,3-cd)pyrene	OR	6315	10187607
Naphthalene	OR	5005	10187607
Phenanthrene	OR	6615	10187607
Pyrene	OR	6665	10187607

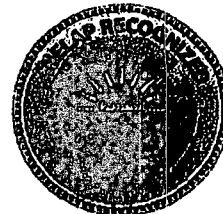


State of Utah
GARY R HERBERT
Governor
GREGORY S BELL
Lieutenant Governor

Utah Department of Health
David N. Sundwall, MD
Executive Director

Disease Control and Prevention
Patrick F. Luedtke, MD, MPH.
Director Unified State Labs: Public Health

Bureau of Laboratory Improvement
David B Mendenhall, MPA, MT (ASCP)
Bureau Director



STATE OF UTAH DEPARTMENT OF HEALTH

ENVIRONMENTAL LABORATORY CERTIFICATION PROGRAM CERTIFICATION

is hereby granted to

Hall Environmental Analysis Laboratory, Inc.

4901 Hawkins Rd. NE
Albuquerque NM 87109-4337

Scope of accreditation is limited to the
State of Utah Accredited Fields of Accreditation
Which accompanies this Certificate

Continued accredited status depends on successful
Ongoing participation in the program

EPA Number: NM00035
Expiration Date: 2/28/2011

Patrick F. Luedtke, MD, MPH.
Director Unified State Laboratories: Public Health



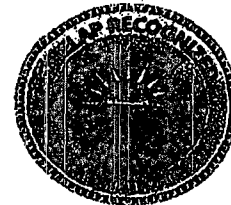


State of Utah
GARY R HERBERT
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Patrick F. Luedtke, MD, MPH.
Director Unified State Laboratories: Public Health

Bureau of Laboratory Improvement
David B Mendenhall, MPA, MT (ASCP)
Bureau Director



3/11/2010

Hall Environmental Analysis Laboratory, Inc.
Andy Freeman
4901 Hawkins Rd. NE
Albuquerque NM 87109-4337

ID # HEAL
EPA ID: NM00035

Director,

In recognition of your NELAP accreditation and in compliance with the ELCP requirements, the laboratory listed is certified for environmental monitoring under the Clean Water Act and authorized to perform the following methods, for the analytes and matrix listed:

Non-Potable Water

Inorganics and Metals

300.0 [1993]	Bromide
300.0 [1993]	Chloride
300.0 [1993]	Fluoride
300.0 [1993]	Nitrate
300.0 [1993]	Nitrite
300.0 [1993]	ortho-Phosphate
300.0 [1993]	Sulfate
300.0 [1993]	Nitrate/Nitrite

The effective date of this certificate letter is: 3/1/2010.

The analytes by method which a laboratory is authorized to perform at any given time will be those indicated in the most recent certificate letter. The most recent certification letter supersedes all previous certification or authorization letters. It is the certified laboratory's responsibility to review this letter for discrepancies. The certified laboratory must document any discrepancies in this letter and send notice to this bureau within 15 days of receipt. This certificate letter will be recalled in the event your laboratory's certification is revoked.

Respectfully,

Patrick F. Luedtke, MD, MPH.

Director Unified State Laboratories: Public Health

The expiration for the laboratory's certification is 2/28/2011. The Utah Environmental Laboratory Certification Program (ELCP) encourages clients and data users to verify the most current certification letter for the authorized method.





State of Utah
GARY R HERBERT
 Governor
GREGORY S BELL
 Lieutenant Governor

Utah Department of Health
 David N. Sundwall, MD
 Executive Director

Disease Control and Prevention
 Patrick F. Luedtke, MD, MPH.
 Director Unified State Labs: Public Health

Bureau of Laboratory Improvement
 David B Mendenhall, MPA, MT (ASCP)
 Bureau Director



3/11/2010

Hall Environmental Analysis Laboratory, Inc.
 Andy Freeman
 4901 Hawkins Rd. NE
 Albuquerque NM 87109-4337

ID # HEAL
 EPA ID: NM00035

Director,

In recognition of your NELAP accreditation and in compliance with the ELCP requirements, the laboratory listed is certified for environmental monitoring under the Resource Conservation and Recovery Act and authorized to perform the following methods, for the analytes and matrix listed:

Metal Digestion

	Solid	Non-Potable Water	
3005 A	☐	☒	Acid Digestion Total Recoverable or Dissolved Metals

Metals

	Solid	Non-Potable Water	
6010 B	☐	☒	Aluminum
6010 B	☐	☒	Antimony
6010 B	☐	☒	Arsenic
6010 B	☐	☒	Barium
6010 B	☐	☒	Beryllium
6010 B	☐	☒	Boron
6010 B	☐	☒	Cadmium
6010 B	☐	☒	Calcium
6010 B	☐	☒	Chromium
6010 B	☐	☒	Cobalt
6010 B	☐	☒	Iron
6010 B	☐	☒	Lead
6010 B	☐	☒	Magnesium
6010 B	☐	☒	Manganese
6010 B	☐	☒	Molybdenum
6010 B	☐	☒	Nickel
6010 B	☐	☒	Potassium
6010 B	☐	☒	Selenium
6010 B	☐	☒	Silver
6010 B	☐	☒	Sodium
6010 B	☐	☒	Thallium
6010 B	☐	☒	Tin
6010 B	☐	☒	Titanium
6010 B	☐	☒	Vanadium

The expiration for the laboratory's certification is 2/28/2011. The Utah Environmental Laboratory Certification Program (ELCP) encourages clients and data users to verify the most current certification letter for the authorized method.



Metals

	Solid	Non-Potable Water	
6010 B	☐	☒	Zinc

Organic Extraction

	Solid	Non-Potable Water	
3510 C	☐	☒	Separatory Funnel Liquid-Liquid Extractions

Organic Instrumentation

	Solid	Non-Potable Water	
8015 B	☐	☒	Diesel Range Organics (DROs)
8015 B	☐	☒	Gasoline Range Organics (GROs)
8260 B	☐	☒	1,1,1,2-Tetrachloroethane
8260 B	☐	☒	1,1,1-Trichloroethane
8260 B	☐	☒	1,1,2,2-Tetrachloroethane
8260 B	☐	☒	1,1,2-Trichloroethane
8260 B	☐	☒	1,1-Dichloroethane
8260 B	☐	☒	1,1-Dichloroethylene (-ethene)
8260 B	☐	☒	1,1-Dichloropropene
8260 B	☐	☒	1,2,3-Trichlorobenzene
8260 B	☐	☒	1,2,3-Trichloropropane
8260 B	☐	☒	1,2,4-Trichlorobenzene
8260 B	☐	☒	1,2,4-Trimethylbenzene
8260 B	☐	☒	1,2-Dibromo-3-chloropropane (DBCP, Dibromochloropropane)
8260 B	☐	☒	1,2-Dibromoethane (EDB, Ethylene dibromide)
8260 B	☐	☒	1,2-Dichlorobenzene
8260 B	☐	☒	1,2-Dichloroethane
8260 B	☐	☒	1,2-Dichloropropane
8260 B	☐	☒	1,3,5-Trimethylbenzene
8260 B	☐	☒	1,3-Dichlorobenzene
8260 B	☐	☒	1,3-Dichloropropane
8260 B	☐	☒	1,4-Dichlorobenzene
8260 B	☐	☒	2,2-Dichloropropane
8260 B	☐	☒	2-Chlorotoluene
8260 B	☐	☒	2-Hexanone
8260 B	☐	☒	2-Methylnaphthalene
8260 B	☐	☒	4-Chlorotoluene
8260 B	☐	☒	4-Methyl-2-pentanone (MIBK, Isopropylacetone, Hexone)
8260 B	☐	☒	Acetone
8260 B	☐	☒	Benzene
8260 B	☐	☒	Bromobenzene
8260 B	☐	☒	Bromochloromethane
8260 B	☐	☒	Bromodichloromethane
8260 B	☐	☒	Bromoform
8260 B	☐	☒	Carbon Disulfide
8260 B	☐	☒	Carbon Tetrachloride
8260 B	☐	☒	Chlorobenzene
8260 B	☐	☒	Chlorodibromomethane [Dibromochloromethane]
8260 B	☐	☒	Chloroethane
8260 B	☐	☒	Chloroform
8260 B	☐	☒	cis-1,2-Dichloroethane (-ethylene)
8260 B	☐	☒	cis-1,3-dichloropropene

The expiration for the laboratory's certification is 2/28/2011. The Utah Environmental Laboratory Certification Program (ELCP) encourages clients and data users to verify the most current certification letter for the authorized method.

Organic Instrumentation

	Solid	Non-Potable Water	
8260 B	☐	☒	Dibromomethane
8260 B	☐	☒	Dichlorodifluoromethane
8260 B	☐	☒	Dichloromethane (DCM, Methylene chloride)
8260 B	☐	☒	Ethylbenzene
8260 B	☐	☒	Hexachlorobutadiene
8260 B	☐	☒	Isopropylbenzene
8260 B	☐	☒	Methyl bromide [Bromomethane]
8260 B	☐	☒	Methyl chloride [Chloromethane]
8260 B	☐	☒	Methyl Ethyl Ketone (MEK, 2-Butanone)
8260 B	☐	☒	Methyl-t-Butyl Ether (MTBE)
8260 B	☐	☒	Naphthalene
8260 B	☐	☒	n-Butylbenzene
8260 B	☐	☒	n-Propylbenzene
8260 B	☐	☒	ortho-Xylene
8260 B	☐	☒	p-Isopropyltoluene
8260 B	☐	☒	sec-Butylbenzene
8260 B	☐	☒	Styrene
8260 B	☐	☒	tert-Butylbenzene
8260 B	☐	☒	Tetrachloroethylene (Perchloroethylene -ethene)
8260 B	☐	☒	Toluene
8260 B	☐	☒	trans-1,2-Dichloroethylene (-ethene)
8260 B	☐	☒	trans-1,3-Dichloropropylene (-propene)
8260 B	☐	☒	Trichloroethene (Trichloroethylene)
8260 B	☐	☒	Trichlorofluoromethane
8260 B	☐	☒	Vinyl Chloride
8260 B	☐	☒	Volatile Organic Compounds
8260 B	☐	☒	Xylenes, Total
8270 C	☐	☒	1,2,4-Trichlorobenzene
8270 C	☐	☒	1,2-Dichlorobenzene
8270 C	☐	☒	1,3-Dichlorobenzene
8270 C	☐	☒	1,4-Dichlorobenzene
8270 C	☐	☒	2,4,5-Trichlorophenol
8270 C	☐	☒	2,4,6-Trichlorophenol
8270 C	☐	☒	2,4-Dichlorophenol
8270 C	☐	☒	2,4-Dimethylphenol
8270 C	☐	☒	2,4-Dinitrophenol
8270 C	☐	☒	2,4-Dinitrotoluene (2,4-DNT)
8270 C	☐	☒	2,6-Dinitrotoluene (2,6-DNT)
8270 C	☐	☒	2-Chloronaphthalene
8270 C	☐	☒	2-Chlorophenol
8270 C	☐	☒	2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)
8270 C	☐	☒	2-Methylnaphthalene
8270 C	☐	☒	2-Methylphenol (o-cresol, 2-Hydroxytoluene)
8270 C	☐	☒	2-Nitroaniline
8270 C	☐	☒	2-Nitrophenol
8270 C	☐	☒	3,3'-Dichlorobenzidine
8270 C	☐	☒	3-Nitroaniline
8270 C	☐	☒	4-Bromophenyl Phenyl Ether
8270 C	☐	☒	4-Chloro-3-methylphenol
8270 C	☐	☒	4-Chloroaniline
8270 C	☐	☒	4-Chlorophenyl Phenyl Ether

The expiration for the laboratory's certification is 2/28/2011. The Utah Environmental Laboratory Certification Program (ELCP) encourages clients and data users to verify the most current certification letter for the authorized method.

Organic Instrumentation

	Solid	Non-Potable Water	
8270 C	☐	☒	4-Nitroaniline
8270 C	☐	☒	4-Nitrophenol
8270 C	☐	☒	Acenaphthene
8270 C	☐	☒	Acenaphthylene
8270 C	☐	☒	Aniline
8270 C	☐	☒	Anthracene
8270 C	☐	☒	Azobenzene
8270 C	☐	☒	Benzo(a)anthracene
8270 C	☐	☒	Benzo(a)pyrene
8270 C	☐	☒	Benzo(b)fluoranthene
8270 C	☐	☒	Benzo(g,h,i)perylene
8270 C	☐	☒	Benzo(k)fluoranthene
8270 C	☐	☒	Benzoic Acid
8270 C	☐	☒	Benzyl alcohol
8270 C	☐	☒	bis(2-chloroethoxy)methane
8270 C	☐	☒	bis(2-Chloroethyl)ether
8270 C	☐	☒	bis(2-chloroisopropyl)ether
8270 C	☐	☒	bis(2-Ethylhexyl) phthalate (DEHP)
8270 C	☐	☒	Butyl Benzyl Phthalate
8270 C	☐	☒	Carbazole
8270 C	☐	☒	Chrysene
8270 C	☐	☒	Dibenzo(a,h)anthracene
8270 C	☐	☒	Dibenzofuran
8270 C	☐	☒	Diethyl Phthalate
8270 C	☐	☒	Dimethyl Phthalate
8270 C	☐	☒	DI-n-butyl phthalate
8270 C	☐	☒	DI-n-octyl Phthalate
8270 C	☐	☒	Fluoranthene
8270 C	☐	☒	Fluorene
8270 C	☐	☒	Hexachlorobenzene
8270 C	☐	☒	Hexachlorobutadiene
8270 C	☐	☒	Hexachlorocyclopentadiene
8270 C	☐	☒	Hexachloroethane
8270 C	☐	☒	Indeno(1,2,3-cd)pyrene
8270 C	☐	☒	Isophorone
8270 C	☐	☒	Naphthalene
8270 C	☐	☒	Nitrobenzene
8270 C	☐	☒	n-Nitroso-di-n-Propylamine
8270 C	☐	☒	n-Nitrosodiphenylamine
8270 C	☐	☒	Pentachlorophenol
8270 C	☐	☒	Phenanthrene
8270 C	☐	☒	Phenol
8270 C	☐	☒	Pyrene
8270 C	☐	☒	Pyridine
8270 C	☐	☒	Semivolatile Organic Compounds

Volatile Organic Preparation

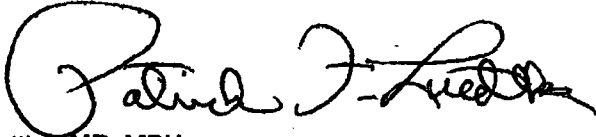
	Solid	Non-Potable Water	
5030 B	☐	☒	Purge-and-Trap for Aqueous Samples

The expiration for the laboratory's certification is 2/28/2011. The Utah Environmental Laboratory Certification Program (ELCP) encourages clients and data users to verify the most current certification letter for the authorized method.

The effective date of this certificate letter is: 3/1/2010.

The analytes by method which a laboratory is authorized to perform at any given time will be those indicated in the most recent certificate letter. The most recent certification letter supersedes all previous certification or authorization letters. It is the certified laboratory's responsibility to review this letter for discrepancies. The certified laboratory must document any discrepancies in this letter and send notice to this bureau within 15 days of receipt. This certificate letter will be recalled in the event your laboratory's certification is revoked.

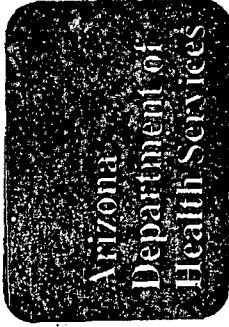
Respectfully,



Patrick F. Luedtke, MD, MPH.

Director Unified State Laboratories: Public Health

The expiration for the laboratory's certification is 2/28/2011. The Utah Environmental Laboratory Certification Program (ELCP) encourages clients and data users to verify the most current certification letter for the authorized method.



ENVIRONMENTAL LABORATORY LICENSE

Issued to:

Laboratory Director: Scott Hallenbeck
Owner/Representative: Andy Freeman

Hall Environmental Analysis Laboratory
AZ0682

is in compliance with Environmental Laboratory's applicable standards for the State of Arizona and maintains on file a List of Parameters for which the laboratory is certified to perform analysis.

PERIOD OF LICENSURE FROM: 10/20/2010 TO: 10/19/2011



A handwritten signature in black ink, likely belonging to Steven D. Baker.

Steven D. Baker, Chief
Office of Laboratory Services
Bureau of State Laboratory Services

**Arizona Department of Health Services
Office of Laboratory Licensure, Certification & Training
250 North 17th Avenue, Phoenix, AZ 85007**

Page: 1

Wednesday, September 22 2010

AZ License: AZ0682

Lab Name: Hall Environmental Analysis Laboratory,

Lab Director: Mr. Scott Hallenbeck

Phone: (505) 345-3975

Fax: (505) 345-4107

Program	HW			
	Parameter	EPA Method	Billing Code	Cert Date
	Aluminum	EPA 6010B	MTL3	10/20/05
	Aromatic & Halogenated Vocs By Gc	EPA 8021B	OC8	10/20/05
	Arsenic	EPA 6010B	MTL3	10/20/05
	Barium	EPA 6010B	MTL3	10/20/05
	Beryllium	EPA 6010B	MTL3	10/20/05
	C10-C32 Hydrocarbons	8015AZ1	OC4	03/21/07
	Cadmium	EPA 6010B	MTL3	10/20/05
	Calcium	EPA 6010B	MTL3	10/20/05
	Chromium, Total	EPA 6010B	MTL3	10/20/05
	Closed System Purge And Trap Extract. Vocs	EPA 5035A	PREP2	12/05/06
	Copper	EPA 6010B	MTL3	10/20/05
	Dissolved In Water	EPA 3005A	PREP1	08/21/08
	Iron	EPA 6010B	MTL3	10/20/05
	Lead	EPA 6010B	MTL3	10/20/05
	Magnesium	EPA 6010B	MTL3	10/20/05
	Manganese	EPA 6010B	MTL3	10/20/05
	Mercury	EPA 7470A	MTL5	10/20/05
	Mercury	EPA 7471A	MTL5	10/20/05
	Nickel	EPA 6010B	MTL3	10/20/05
	Paahs	EPA 8310	OC13	03/21/07
	Pcbs By Gc	EPA 8082	OC9	03/21/07
	Potassium	EPA 6010B	MTL3	10/20/05
	Pressurized Fluid Extraction	EPA 3545	PREP2	12/05/06
	Purge And Trap For Aqueous Samples	EPA 5030C	PREP2	12/05/06
	Sediments, Sludges And Soils	EPA 3050B	PREP1	06/05/07
	Selenium	EPA 6010B	MTL3	09/06/06
	Semivolatile Compounds By Gc/Ms	EPA 8270C	OC16	07/26/07
	Separatory Funnel Liquid-Liquid Extraction	EPA 3510C	PREP2	06/05/07
	Silver	EPA 6010B	MTL3	10/20/05
	Sodium	EPA 6010B	MTL3	10/20/05
	Vocs By Gc/Ms	EPA 8260B	OC8	10/20/05
	Zinc	EPA 6010B	MTL3	10/20/05
Total Licensed Parameters in this Program:		32		
Program	SDW			
	Parameter	EPA Method	Billing Code	Cert Date
	Alkalinity	SM 2320B	NIA1	02/26/08
	Antimony	EPA 200.8	MTL7	09/22/10
	Arsenic	EPA 200.8	MTL7	09/22/10

**Arizona Department of Health Services
Office of Laboratory Licensure, Certification & Training
250 North 17th Avenue, Phoenix, AZ 85007**

Page: 2

Wednesday, September 22 2010

License: AZ0682

Lab Name: Hall Environmental Analysis Laboratory,

Program SDW			
Parameter	EPA Method	Billing Code	Cert Date
Copper	EPA 200.8	MTL7	09/22/10
Edb/Dbcp	EPA 504.1 (1.1)	OC4	06/20/08
Edb/Dbcp - Additional	EPA 504.1 (1.1)	OC34	06/20/08
Lead	EPA 200.8	MTL7	09/22/10
Selenium	EPA 200.8	MTL7	09/22/10
Thallium	EPA 200.8	MTL7	09/22/10
Uranium	EPA 200.8	MTL7	09/22/10

Total Licensed Parameters in this Program: 10

Program WW			
Parameter	EPA Method	Billing Code	Cert Date
Alkalinity, Total	SM 2320B	NIA1	07/26/07
Chloride	EPA 300.0	NIIIA1	07/26/07
Fluoride	EPA 300.0	NIIIA1	07/26/07
Nitrate (As N)	EPA 300.0	NIIIA1	07/26/07
Nitrite (As N)	EPA 300.0	NIIIA1	07/26/07
Orthophosphate	EPA 300.0	NIIIA1	07/26/07
Residue, Filterable	SM 2540C	NIA8	07/26/07
Specific Conductance	EPA 120.1	NIA7	02/27/09
Sulfate	EPA 300.0	NIIIA1	07/26/07

Total Licensed Parameters in this Program: 9

Instruments	Quantity	Date
GAS CHROMATOGRAPH/MASS SPECTROMETER	3	08/11/08
GAS CHROMATOGRAPH	2	09/06/06
HIGH PERFORMANCE LIQUID CHROMATOGRAPH	2	08/11/08
ION CHROMATOGRAPH	2	08/11/08
INDUCTIVELY COUPLED PLASMA SPECTROMETER	1	08/11/05
INDUCTIVELY COUPLED PLASMA/MASS SPECTROMETER	1	09/15/10
MERCURY ANALYZER	1	08/11/05

Softwares	
VARIAN STAR - GCMS	
PERKIN ELMER - ICP	
PERKIN ELMER - ICP/MS	
VARIAN GALAXIE AND CUSTOM WRITTEN-GC	

Chemical Analytical Reports

<u>Title</u>	<u>Tab Number</u>
2010 Semi-Annual Monitoring Event.....	1
2010 Annual Monitoring Event	2
San Juan River Semi-Annual Analysis.....	3
Tank #33 Analysis.....	4

Chain-of-Custody Record

Client: Western Refining Southwest, Inc
Bloomfield Refinery
 Mailing Address: #50 Rd 4990
Bloomfield, NM 87413
 Phone #: 505-632-4161
 email or Fax#: 505-632-3911
 QA/QC Package:
☒ Standard
☐ Other _____
☐ EDD (Type) _____

Turn-Around Time: ☒ Standard ☐ Rush
 Project Name: Semi-Annual
North Barrier Wall - 2010
 Project #:
 Project Manager:
 Sampler: Pat CML



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 Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	TPH Method 8015B (Gas/Heath)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX/MTBE only	8270 (Semi-VOA)	8015B - DRD	Air Bubbles (Y or N)
4-7-10	9:30a	H ₂ O	OW 25+70	5-VOA	HCL	1	X						X			
			/	1-500ml Amber		1										
	9:45a		OW 23+90	5-VOA	HCL	2	X						X			
			/	1-500ml Amber		2										
	11:00a		OW 23+10	5-VOA	HCL	3	X						X			
			/	1-500ml Amber		3										
	11:20a		OW 22+00	5-VOA	HCL	4	X						X			
			/	1-500ml Amber		4										
	12:45		OW 19+50	5-VOA	HCL	5	X						X			
			/	1-500ml Amber		5										
	1:00p		OW 16+60	5-VOA	HCL	6	X						X			
			/	1-500ml Amber		6										

Date: 4-7-10 Time: 3:30p Relinquished by: Cindy Huntado
 Date: 4-8-10 Time: 10:30 Received by: [Signature]
 Remarks: Pg 1 of 2

Chain-of-Custody Record		Turn-Around Time:
Client: <u>Western Refining Southwest, Inc</u>	☒ Standard ☐ Rush	
<u>Blountfield Refinery</u>	Project Name:	
Mailing Address: <u>#50 Rd 4990</u>	<u>North Barrier Way -</u>	<u>Semi-Annual</u>
<u>Blountfield, NM 87413</u>	Project #:	<u>2010</u>
Phone #: <u>505-632-4161</u>		

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Project Name: Semi-Annual
North Barrier Walk - 2010

Project #:

Phone #: 505-632-4161

email or Fax#: 505-632-3911

QA/QC Package:

☐ Standard☐ Other☐ EDD (Type)

Project Manager:

Sampler: Ch-RuK

Date	Time	Matrix	Sample Request ID
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Time	Matrix
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
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21	0
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98	0
99	0

Sample Request ID

Container Type and #	Preservative Type
1	1
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3	3
4	4
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10	10
11	11
12	12
13	13
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95	95
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97	97
98	98
99	99
100	100

4.710	220	120	OW 0+60	5-10A	HCL	7
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1-50000 Arbei	7
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5-VOL	HCC	8
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○			
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[illegible]

Date:	Time:	Relinquished by: ,	Received by: ,	Date:	Time:
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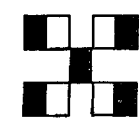
4/2/10 3:30pm
med. student

Date:	Time:	Relinquished by:	Received by:	Date	Time
				10-30	10:10

1

Remarks:

P920f2



HALL ENVIRONMENTAL ANALYSIS LABORATORY

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Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

[illegible]

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. We reserves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
 Mailing Address: # 50 Rd 4990
Bloomfield NM 87413
 Phone #: 505-632-4161
 email or Fax#: 505-632-3911
 QA/QC Package:
☒ Standard
☐ Other
☐ EDD (Type) _____
☒ Level 4 (Full Validation)

Turn-Around Time: ☒ Standard ☐ Rush
 Project Name: Semi-Annual 2010
 Project #: _____

Project Manager: _____
 Sampler: GA-RMK
 Sample ID: 1004470

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	TPH Method 8015B (Gas Density)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	DRO-Boils	Air Bubbles (Y or N)
4-8-10	920A	16D	MW# 1	5-VOA	HCL	X							X			
				1-500ml												
	955A		MW #13	5-VOA	HCL	X							X			
				1-500ml												
	1015A		MW 33	5-VOA	HCL	X							X			
				1-500ml												
	1020A		MW33 FD	5-VOA	HCL	X							X			
				1-500ml												
	111A		MW 8	5-VOA	HCL	X							X			
				1-500ml												
	1120A		MW 30	5-VOA	HCL	X							X			
				1-500ml												
				1-500ml												

Date: 4-8-10 Time: 235a
 Relinquished by: Cindy Hurtado
 Date: 4-8-10 Time: 945
 Received by: _____
 Date: _____ Time: _____



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ANALYSIS LABORATORY**

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Analysis Request

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4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Project Manager:

Sampler:

On the 27th of May 1900

Sample Request ID

4-13-10
JPM
14

Scap 1

2 days

Seq 2 FD

Relinquished by:

Date , Time

9:55 4/14/10 Date Time

Date _____ Time _____

Remarks:

Trip Blank-7 4/14/10

03/11/15

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.

Chain-of-Custody Record

Client: Western Refining

Mailing Address: #50 CR 4998
Bloomfield, NM 87413

Phone #: 505-632-4161
 email or Fax#: 505-632-3911

QA/QC Package:
☒ Standard
☐ NELAP
☐ EDD (Type) _____

Accreditation
☒ Level 4 (Full Validation)
☐ Other _____

Turn-Around Time: _____

☒ Standard ☐ Rush

Project Name:
Annual

Project #:
North Boundary Banner Well - CW

Project Manager:
Cindy + Bob

On-site: _____

Sample Temperature: _____

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEATING LOG
8-17-10	8:15	H ₂ O	CW 0+60	4-VOA	HCL	11
				1-500 ml	per test	11
	1:55		CW 25+95	4-VOA	HCL	12
				1-500 ml	per test	12
	2:05		Field Blank	3-VOA	HCL	13

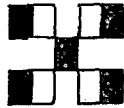
Date: 8-17-10 Time: 3:05

Relinquished by: Cindy Hurdado

Date: 8-18-10 Time: 10:25

Received by: _____

Received by: _____



HALL ENVIRONMENTAL ANALYSIS LABORATORY

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Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE	8270 (Semi-VOA)	Deo - 8015	Air Bubbles (Y or N)
									X		X	
									X		X	
									X		X	

Remarks:

Chain of Custody Record

Client: Western Refining

Mailing Address: #50 CR 499

Bloomfield NM

Phone #: 505-632-4161

email or Fax#: 505-632-3911

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Refinery Wells- 8-2010

Project #:

Project Manager:

Sampler:

[Signature]

On Site: ☒ Yes ☐ No

Sample Temperature:

1000000

Container Type and #	Preservative Type	HEATING
5-VOL HCL	HCL	3
1-500ml Antu	Antu	3
1-500ml HNO3	HNO3	3
2-250ml filtered HNO3	filtered HNO3	5
1-500ml		3
1-250ml H2SO4	H2SO4	3

8-19-10 910 H2O MW# 29FD

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

[Signature]

Date: 8-19-10 Time: 3pm

Relinquished by: Cindy Hurtado

Date: 8-19-10 Time: 10:50

Received by: [Signature]

Date: 8-20-10 Time: 10:50

Received by: [Signature]

Received by: [Signature]

Date: 8-20-10 Time: 10:50

Received by: [Signature]

Date: 8-20-10 Time: 10:50

Received by: [Signature]

Date: 8-20-10 Time: 10:50

Remarks:

Pg 2 of 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMBs (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH Method 8015B (Gas/Diesel)	X
TPH (Method 418.1)	
EDB (Method 504.1)	
8310 (PNA or PAH)	
RCRA 8 Metals Total	X
Anions (F, Cl, NO3, NO2, PO4, SO4)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	X
8270 (Semi-VOA)	
DRO - B015	X
NPCC Dissolved Metals	X
Cation / Anion Balance	X
Alkalinity / CO2	X
Air Bubbles (Y or N)	

Western Refining

Bloomfield, NM 87413

email or Fax#: 505-632-3911

☐ Standard ☒ Level 4 (Full Validation)

☐ NELAP

□ EVU (Type)

Sample Request ID

—

2

3

107

Date	Time
------	------

01/07

Remarks:

[illegible]

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.

Chain-of-Custody Record					
Client: Western Refining		Turn-Around Time: _____ ☒ Standard ☐ Rush Project Name: _____			
Mailing Address: #50 CR 4990 Blomfield, NM 87413 Phone #: 505-632-4161 email or Fax#: 505-632-3911		Refinery Wells- 8-2010 Project #: Project Manager:			
QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation) Accreditation ☐ NELAP ☐ Other _____ ☐ EDD (Type) _____		Sampler: <u>AK Rmk</u> On Ice: <u>Yes</u> No _____ Sample Temperature: _____ Heat No: <u>1008836</u>			
Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type
23-10	930	H2O	RW 23	5-10A	HCL
/	/	/	/	1-500ml	Ambic
/	/	/	/	1-500ml	HNO3
/	/	/	/	2-250ml	Fitted HNO3
/	/	/	/	1-500ml	
/	/	/	/	1-250ml	H2SO4
1015			RW 9	5-10A	HCL
/	/	/	/	1-500ml	Ambic
/	/	/	/	1-500ml	HNO3
/	/	/	/	2-250ml	Fitted HNO3
/	/	/	/	1-500ml	
/	/	/	/	1-250ml	H2SO4
Date:	Time:	Relinquished by:	Received by:		
23-10	310P	Underintado			
Date:	Time:	Relinquished by:	Received by:	Date	Time
				8/21/10	1000

2

as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

[illegible]

Analysis=Request

Chain-of-Custody Record

Client: Western Refining

Mailing Address: #50CR 84990
Bloomfield, NM 87413
 Phone #: 505-632-4161
 email or Fax#: 505-632-3991

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)
 Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Date	Time	Matrix	Sample Request ID
8/23/10	1050	H ₂ O	RW #18
/	/	/	/
/	/	/	/
/	/	/	/
/	/	/	/
/	/	/	/
/	/	/	/
/	/	/	/
/	/	/	/
/	/	/	/

Date: 8/23-10 310p
 Relinquished by: Cindy Hurtado
 Date: _____
 Relinquished by: _____

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Refining Wells-8-2010
 Project #:

Project Manager:

Sample: QPK
 On Ice ☒ Yes ☐ No
 Sample Temperature: 10000210

Container Type and #	Preservative Type	HEAT NO
5-VOL	HCL	3
1-500ml	None	3
1-500ml	HNO ₃	3
2-250ml	Filtered HNO ₃	3
1-500ml		3
1-250ml	Asay	3

Received by: Cindy Hurtado Date: 8/24/10 Time: 1000
 Received by: _____ Date: _____ Time: _____



HALL ENVIRONMENTAL ANALYSIS LABORATORY

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Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	
BTEX + MTBE + TPH (Gas only)	X
TPH Method 8015B (Gas Diesel)	
TPH (Method 418.1)	
EDB (Method 504.1)	
8310 (PNA or PAH)	
RCRA 8 Metals <u>Total</u>	X
Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	X
8270 (Semi-VOA)	
<u>DROBOLIS</u>	X
<u>WRC Distilled Metals</u>	
<u>Cation/Anion Balance</u>	
<u>Alkalinity/CO₂</u>	
Air Bubbles (Y or N)	

Remarks: pg 2 of 2

Chain of Custody Record

Client: Western Refining

Mailing Address: 50 CR 4990

Bloomfield, NM 87413

Phone #: 505-632-4161

email or Fax#: 505-632-3911

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Sampler:

On Ice ☒ Yes ☐ No

Sample Temperature: 0.1

Container Type and #
Preservative Type
HEAT No.
1008987

Sample Request ID

Matrix

Date Time

8/24/10 840 H2O MW 27 F17

1-5000 HCL 5

1-5000 HNO3 5

1-2500 Filtered HNO3 5

1-5000 H2SO4 5

1-2500 HCL 5

TRIP BLANK #3

Relinquished by:

Date Time

Ernest Hurtado

8/24/10 245

Relinquished by:

Date Time

Ernest Hurtado

8/24/10 245

Received by:

Date Time

Ernest Hurtado

8/25/10 10:10

Received by:

Date Time

Ernest Hurtado

8/25/10 10:10

Remarks: pg 2 of 2



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Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH Method 8015B (Gas/Diesel)	X
TPH (Method 418.1)	
EDB (Method 504.1)	
8310 (PNA or PAH)	
RCRA 8 Metals Total	X
Anions (F, Cl, NO3, NO2, PO4, SO4)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	X
8270 (Semi-VOA)	
D20-2015	X
Water Dissolved Metals	
Cation/Anion Balance	
Alkalinity / CO2	
Air Bubbles (Y or N)	

[illegible]

3073

is as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
 Mailing Address: #50 Rd 4990
Bloomfield, NM 87410
 Phone #: 505-632-4161
 email or Fax#: 505-632-3911

QA/QC Package:
☐ Standard
☐ Other _____
☐ EDD (Type) _____

Turn-Around Time: ☒ Standard ☐ Rush
 Project Name: Semi-Annual
San Juan River - 2010
 Project #:

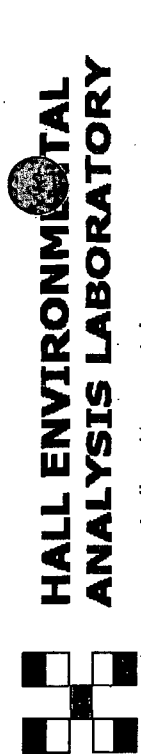
Project Manager:
 Sampler: PA-RNK
 Sample Entered: 4/13/10

Date	Time	Matrix	Sample Request ID
4-13-10	845	H ₂ O	N. of 45
/	/	/	/
/	/	/	/
/	/	/	/
4-13-10	830	H ₂ O	N. of 46
/	/	/	/
/	/	/	/
/	/	/	/

Date: 4-13-10 Time: 2pm
 Relinquished by: Cindy Hurtado
 Date: _____ Time: _____
 Relinquished by: _____

Container Type and #	Preservative Type	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA) <u>BTEX, MTBE only</u>	8270 (Semi-VOA)	DEO - 8015	WACC Dissolved Metals	Carbon/Anion + TDS + EC	Carbon Dioxide / Alkalinity
5-VOA	HCL	X							X		X			
1-500ml Amber												X		
2-125ml HNO ₃														
1-500ml														
1-125ml H ₂ SO ₄														
1-500ml HNO ₃														
5-VOA	HCL	X							X					
1-500ml Amber														
2-125ml HNO ₃														
1-500ml														
1-125ml H ₂ SO ₄														
1-500ml HNO ₃														
1-500ml														
1-125ml H ₂ SO ₄														
1-500ml HNO ₃														

Remarks:
 Received by: [Signature] Date: 4/14/10 Time: 9:55
 Received by: _____ Date: _____ Time: _____



HALL ENVIRONMENTAL ANALYSIS LABORATORY
 www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request														
BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA) <u>BTEX, MTBE only</u>	8270 (Semi-VOA)	DEO - 8015	WACC Dissolved Metals	Carbon/Anion + TDS + EC	Carbon Dioxide / Alkalinity
		X							X		X			
												X		
													X	
													X	
													X	
													X	
													X	
													X	
													X	
													X	
													X	
													X	

Chain-of-Custody Record		Turn-Around Time: _____
Client: <u>Western Refining</u>	☒ Standard ☐ Rush	Project Name: <u>TK #33 01-2010</u>
Mailing Address: <u>Bloomfield Refining</u>	Project #: _____	
Phone #: <u>505-632-4161</u>	Project Manager: _____	Sampler: <u>EA</u>
email or Fax#: <u>505-632-3911</u>	QA/QC Package: ☐ Standard ☒ Level 4 (Full Validation) ☐ Other _____ ☐ EDD (Type) _____	On: <u>1/2/01</u> Yes <u>EA</u> No <u>EA</u>

Western Refining
Bloomfield Refining

D-1000000, NM 87413

email or Fax#: 505-632-3911

☐ Standard ☒ Level 4 (Full Validation)

☐ Other

Sample Request ID

IF#33

—

0.00117

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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.



www.hallenvironmental.com

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Analysis Request

BTEX + MTBE + TMB's (8021)

BTEX + MTBE + TPH (Gas only)

TPH Method 8015B (Gas/Diesel)

TPH (Method 418.1)

EDB (Method 504.1)

8310 (PNA or PAH)

BCBA & Motels

(b) (7)(C), (b) (7)(D)

0001 Pesticides / 0002 PCBs

8260B (VOA) B16r, m18c only

8270 (Semi-VOA)

Air Bubbles (Y or N)

Circumstance	Percentage (%)
If someone is attacking you	~85
If someone is threatening you	~75
If someone is harassing you	~65
If someone is insulting you	~55
If someone is annoying you	~45