3R - 285

REPORTS

DATE:

2001

3R285

BURLINGTON RESOURCES

SAN JUAN DIVISION

March 27, 2001

Certified: 70993400001842165308

RECEIVED

APR 01 2002

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Bill Olson
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

RE: 2001 Annual Groundwater Investigation and Remediation Reports
San Juan Basin, New Mexico

Dear Mr. Olson:

As required in Burlington Resources' approved Groundwater Investigation and Remediation Plan dated August, 1998, enclosed are the 2001 annual reports for Burlington's groundwater impact sites in the San Juan Basin. Separate reports are enclosed for the following locations:

Cozzens B#1
Hampton #4M
Johnson Federal #4 Metering Station
Standard Oil Com. #1
Maddox Com 1A

If you have questions or additional information is needed, please contact me at (505) 326-9537.

Sincerely,

Gregg Wurtz
Sr. Environmental Representative

Attachments - Groundwater Investigation and Remediation Reports

cc: Denny Foust - NMOCD Aztec
Bruce Gantner - BR
WFS - Mark Harvey (Cozzens B#1, Hampton #4M)
EPFS - Scott Pope (Johnson Fed. #4, Standard Oil Com.#1)
Facility and Correspondence Files

3401 East 30th Street, 87402-8807, P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700, Fax 505-326-9833

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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

BURLINGTON RESOURCES 2001 ANNUAL GROUNDWATER REPORT

Maddox Com. 1A

SITE DETAILS

Location: Unit Letter I, Section 17, Township 30N, Range 8W; San Juan County, New Mexico
Land Type: Federal

2000 ACTIVITIES

A spill occurred at Burlington Resources (BR) Maddox Com 1A on 12/5/99. The spill released approximately 170 bbls of condensate with 110 bbls being recovered. The spill was contained on location. The NMOCD was notified on 12/17/00 of a possible impact to the groundwater at the site. A soil remediation program was started immediately to remediate the site. In the process of soil excavation a second source of contamination was identified and most likely a historic pit. Ground water was encountered at 15 feet during the excavation process. BR is in contact with the potentially responsible parties for sharing the environmental responsibility. Approximately 2000 cu. yds. of impacted soil was removed from the location south and southeast of the current storage tank and wellhead. The excavation was approximately 40 yds x 20 yds x 15 feet deep at the deepest. Impacted soils were excavated until all apparent source materials had been removed except for an area under the south side of the current storage tank location. Prior to backfilling, a potassium permanganate solution (i.e.,Oxy-1) chemical was applied to the bottom and sides of the excavation to stimulate bioremediation.

BR installed a source monitoring well (MW-1) in May 2000 within area excavated and two downgradient wells MW-2 and MW-3 in January 2000. Groundwater data was collected quarterly and is provided in Table 1 including laboratory reports. The source well was analyzed in the second quarter for a complete list of WCCC parameters incorrectly and a new analysis was performed in the forth quarter of 2000. A map of the site is included as Figure 1. A new laboratory was added for analysis, ACZ Laboratories in Steamboat Colorado, starting in the fourth quarter.

Activities 2001

The quarterly ground water monitoring and trend analysis was completed in 2001.

CONCLUSIONS

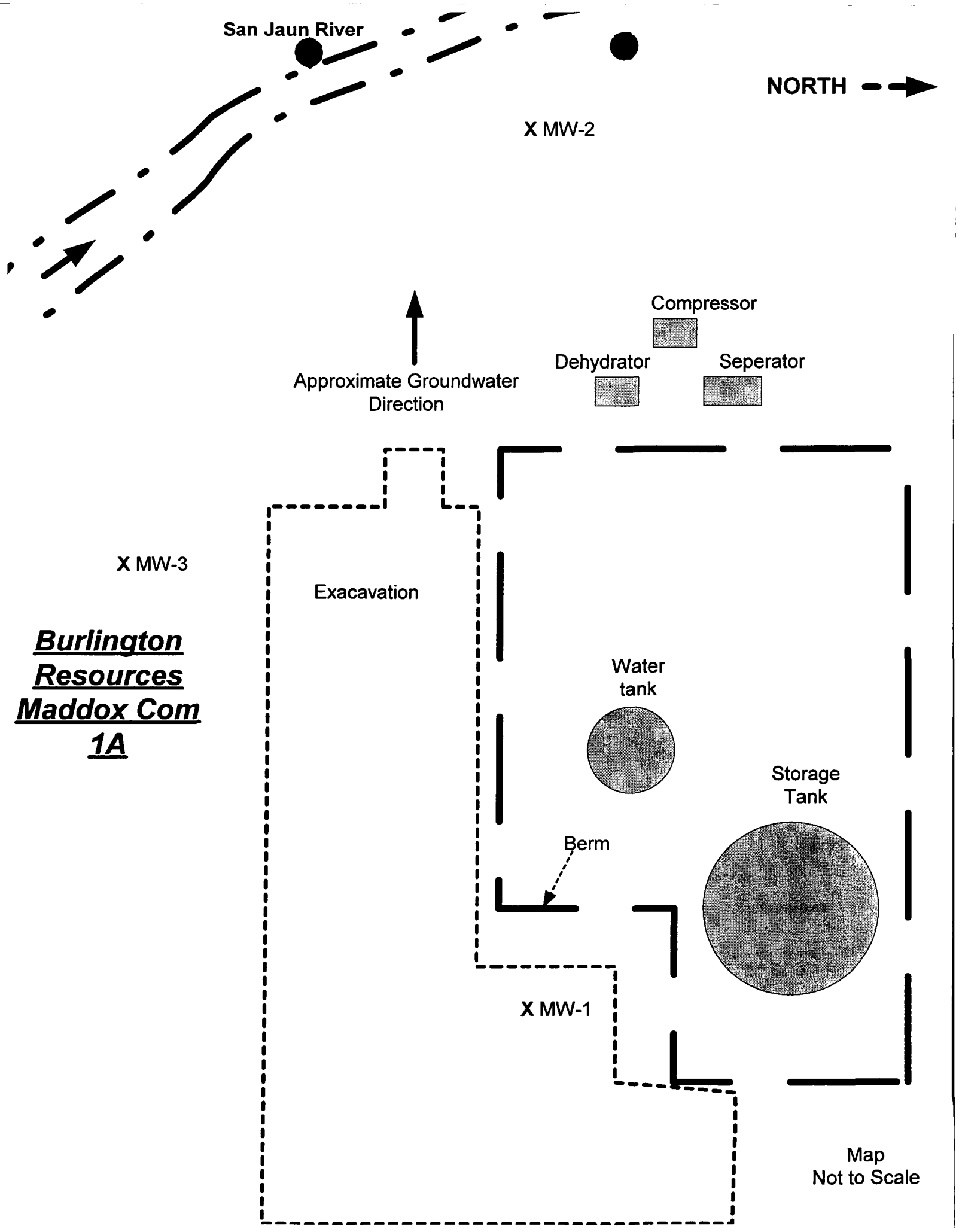
Analytical results of ground water sampling from the monitoring wells in 2000 showed that in MW-1 (i.e., source well) initial levels of benzene, toluene, ethylbenzene and total xylenes were above New Mexico Groundwater Standards and the downgradient wells MW-2 and MW-3 were non-detect. Subsequent sampling events for the remaining quarters in 2000 showed that the levels of benzene, toluene, ethylbenzene and total xylenes were below the New Mexico Groundwater Standards in all wells. The general chemistry analysis completed in 2000 for the source well shows elevated levels for Chloride, TDS, and Sulfate. These are typical elevated concentrations for sodium sulfate type water that is naturally occurs in this area and are not considered potential impacts from BR operations.

The quarterly ground water analyses completed in 2001 show a minor increasing trend of total BTEX in MW-1 with two elevated results of benzene in the third and forth quarters of 2001. The downgradient wells detected levels of constituents of concern that are below the NM standards. No trend could be determined by the limited amount of data and the inconsistent levels detected on the downgradient wells.

RECOMMENDATIONS

- Burlington Resources proposes to continue quarterly sampling at this site and submit for closure after four quarters of below NM water quality standard results are achieved.

Attachments: Figure 1 - Site Map
Table 1 - Groundwater Sampling Results Summary
2001 Groundwater Analytical Results
Spill report, excavation log, and Drilling Log/Wellbore Diagrams


San Jaun River
NORTH
X MW-2
Compressor
Dehydrator
Seperator
Approximate Groundwater Direction
X MW-3
Exacavation
Burlington Resources Maddox Com 1A
Water tank
Storage Tank
Berm
X MW-1
Map Not to Scale

2001 GROUNDWATER ANALYTICAL RESULTS

Table 1

Groundwater Monitoring Well Sampling

Well Name	MW #	Sample Date	B (ppb)	T (ppb)	E (ppb)	X (ppb)	BTEX (ppb)	DTW (1) (ft)
Standard			*10*	*750*	*750*	*620*		
Maddox Com1A	MW-1	Well not installed						
		5/16/2000	**1700**	500	**2200**	**19000**	23400	13.47
		9/22/2000	16	10	43	34	103	13.85
ACZ labs		12/18/2000	<0.5	<1.0	<1.0	<1.0	0	13.57
ACZ labs		3/28/2001	9.8	<0.2	1.3	2.4	13.5	lost
ACZ labs	h2s odor	6/29/2001	8.3	0.7	<0.2	1.5	10.5	12.75
ACZ labs	h2s odor	9/17/2001	24.7	<0.2	0.9	2.5	28.1	13.64
ACZ labs	h2s odor	12/19/2001	17.2	2.3	<0.2	13.9	33.4	13.61
	MW-2	1/18/2000	<0.5	<0.5	<0.5	<0.5	0	12.71
		5/16/2000	<0.5	<0.5	<0.5	<0.5	0	15.63
		9/22/2000	<0.5	<0.5	<0.5	<0.5	0	15.53
ACZ labs		12/18/2000	<0.5	<1.0	<1.0	<1.0	0	15.55
ACZ labs		3/28/2001	<0.2	<0.2	<0.2	<0.2	<0.2	Lost
ACZ labs	h2s odor	6/29/2001	0.6	9.5	1	10.4	21.5	14.59
ACZ labs		9/17/2001	<0.2	0.6J	<0.2	1	1	15.47
ACZ labs		12/19/2001	2.4	1.3	9.1	38.4	51.2	15.57
	MW-3	1/18/2000	<0.5	<0.5	<0.5	<0.5	0	10.98
		5/16/2000	<0.5	<0.5	<0.5	<0.5	0	13.40
		9/22/2000	<0.5	<0.5	<0.5	<0.5	0	13.70
ACZ labs		12/18/2000	<0.5	<1.0	<1.0	<1.0	0	13.69
ACZ labs		3/28/2001	<0.2	<0.2	<0.2	<0.2	<0.2	Lost
ACZ labs		6/29/2001	<0.2	<0.2	<0.2	<0.2	<0.2	12.64
ACZ labs	h2s odor	9/17/2001	<0.2	0.3 J	<0.2	0.5 J	<0.2	13.59
ACZ labs		12/19/2001	<0.2	<0.2	<0.2	20.9	20.9	13.59

J = Analyte concentration detected as a value between MDL and PQL

(1) measured from top of casing

L31380

5

Chain of Custody Record

PHILIP ENVIRONMENTAL

4000 Monroe Road
Farmington, NM 87401

(505) 326-2262 Phone
(505) 326-2388 FAX

COC Serial No. C 2831

Project Name B.R. well Sampling
Project Number 62800258 Phase . Task 0301 .
Samplers C. Maez
Laboratory Name ACZ LABS
Location Steamboat Springs Co.

Sample Number (and depth)	Date	Time	Matrix	Total Number of Bottles	Type of Analysis and Bottle: BTEX 8021	Comments
MADDOX MW 1	3-28-01	1025	H_2O	2	X	MADDOX COM #1A
MADDOX MW 2	3-28-01	1145	H_2O	2	X	MADDOX COM #1A
MADDOX MW 3	3-28-01	1105	H_2O	2	X	MADDOX COM #1A

Relinquished by:

Signature	Date	Time
Chris A. Maez	3-28-01	1600

Received By:

Signature	Date	Time

Samples Iced: ☑ Yes ☐ No

Carrier: UPS

Airbill No.

Preservatives (ONLY for Water Samples)

- ☐ Cyanide ..... Sodium hyroxide (NaOH)
- ☐ Volatile Organic Analysis ..... Hydrochloric acid (HCl)
- ☐ Metals ..... Nitric acid (HNO_3)
- ☐ TPH (418.1) ..... Sulfuric acid (H_2SO_4)
- ☑ Other (Specify) HCL
- ☐ Other (Specify) _____

Shipping and Lab Notes:

PE-176 4/95

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.

Project ID: B.R. Well Sampling
Sample ID: Maddox MW 1

ACZ ID: *L31380-05*
Date Sampled: 03/28/01 25:00
Date Received: 03/31/2001
Sample Matrix: Ground Water

Benzene, Toluene, Ethylbenzene & Xylenes

Analysis Method: M8020
Extract Method: Method

Analyst: smp
Extract Date: 4/3/01
Analysis Date: 4/3/01
Dilution Factor: 1

Compound

Parameter	CAS	Result	Qual	Units	MDL	PQL
Benzene	000071-43-2	9.8		ug/L	0.2	0.5
Ethylbenzene	000100-41-4	1.3		ug/L	0.2	1
Toluene	000108-88-3		U	ug/L	0.2	1
Xylenes	001330-20-7	2.4		ug/L	0.2	1

Surrogate Recoveries

Parameter	CAS	Result	Qual	Units	MDL	PQL
Bromofluorobenzene	00000460004	109		%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.

Project ID: B.R. Well Sampling
Sample ID: Maddox MW 2

ACZ ID: *L31380-06*
Date Sampled: 03/28/01 45:00
Date Received: 03/31/2001
Sample Matrix: Ground Water

Benzene, Toluene, Ethylbenzene & Xylenes

Analysis Method: M8020
Extract Method: Method

Analyst: smp
Extract Date: 4/2/01
Analysis Date: 4/2/01
Dilution Factor: 1

Compound

Parameter	CAS	Result	Qual	Units	MDL	PQL
Benzene	000071-43-2		U	ug/L	0.2	0.5
Ethylbenzene	000100-41-4		U	ug/L	0.2	1
Toluene	000108-88-3		U	ug/L	0.2	1
Xylenes	001330-20-7		U	ug/L	0.2	1

Surrogate Recoveries

Parameter	CAS	Result	Qual	Units	MDL	PQL
Bromofluorobenzene	00000460004	101		%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.

Project ID: B.R. Well Sampling
Sample ID: Maddox MW 3

ACZ ID: *L31380-07*
Date Sampled: 03/28/01 05:00
Date Received: 03/31/2001
Sample Matrix: Ground Water

Benzene, Toluene, Ethylbenzene & Xylenes

Analysis Method: M8020
Extract Method: Method

Analyst: smp
Extract Date: 4/2/01
Analysis Date: 4/2/01
Dilution Factor: 1

Compound

Parameter	CAS	Result	Qual	Units	MDL	PQL
Benzene	000071-43-2		U	ug/L	0.2	0.5
Ethylbenzene	000100-41-4		U	ug/L	0.2	1
Toluene	000108-88-3		U	ug/L	0.2	1
Xylenes	001330-20-7		U	ug/L	0.2	1

Surrogate Recoveries

Parameter	CAS	Result	Qual	Units	MDL	PQL
Bromofluorobenzene	00000460004	101		%	80	120

Well Development and Purging Data

Project No. 6178 | Development ☐ | Purging ☑ | Page 1 of 1

Task No. — | Well No. MW 1 | Site Name/Identification MADDOX | Site Address Rural San Juan CO

Client/Project Name Burlington Resources BR. well Sampling | Project Manager Lisa Wilson

Development Criteria
- ☑ 3 to 5 Casing Volumes of Water Removal
- ☑ Stabilization of Indicator Parameters
- ☐ Other

Water Volume Calculation
- Initial Depth of Well (feet) 20.94
- Initial Depth to Water (feet) 12.75
- Height of Water Column in Well (feet) 8.19
- Diameter (inches): Well ____ Gravel Pack ____

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	8.19	1.33X3	3.99
Gravel Pack			
Drilling Fluids			
Total			3.99

Instruments | **Serial No. (if applicable)**
- ☑ PH Meter — Hydac
- ☐ DO Monitor
- ☑ Conductivity Meter — Hydac
- ☑ Temperature Meter — Hydac
- ☐ Other

Methods of Development

Pump
- ☐ Centrifugal
- ☐ Submersible
- ☐ Peristaltic

Bailer
- ☑ Bottom Valve
- ☐ Double Check Valve
- ☐ Stainless-steel Kemmerer

☐ Other

Water Disposal
on site in pit

Sampling Activities
Type of Container VOA | No. of Containers 2
Parameters Sampled For BTEX

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
6-29-01	0943						1	1			21.5	6.85	6610		Gray Color Slight Septic odor
	0946						1	2			19.1	6.91	6420		" "
	0949						1	3			18.2	6.95	6260		" "
	0952						1	4			17.9	6.95	6210		" "
	0956					1321	1	5			17.4	6.98	6180		No Change
							1								

Circle the date and time that the development criteria are met.

Comments Sampled for BTEX 1000

Developer's Signature (s) Chris Mc[illegible] Date 6-29-01 Reviewer [illegible] Date 7/3/01

Well Development and Purging Data

Project No. 6178 | Development ☐ | Purging ☑ | Page 1 of 1

Task No. —— | Well No. MW2 | Site Name/Identification MADDOX Com #1A | Site Address Rural San Juan Co.

Client/Project Name Burlington Resources BR well Sampling | Project Manager LISA Linn

Development Criteria
- ☑ (3) to 5 Casing Volumes of Water Removal
- ☑ Stabilization of Indicator Parameters
- ☐ Other

Water Volume Calculation
Initial Depth of Well (feet) 22.45
Initial Depth to Water (feet) 14.59
Height of Water Column in Well (feet) 7.86
Diameter (inches): Well 2" Gravel Pack

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	7.86	1.28 x 3	3.84
Gravel Pack			
Drilling Fluids			
Total			3,84

Instruments / **Serial No. (if applicable)**
- ☑ PH Meter — Hydac
- ☐ DO Monitor
- ☑ Conductivity Meter — Hydac
- ☑ Temperature Meter — Hydac
- ☐ Other

Methods of Development
Pump: ☐ Centrifugal ☐ Submersible ☐ Peristaltic
Bailer: ☑ Bottom Valve ☐ Double Check Valve ☐ Stainless-steel Kemmerer
☐ Other

Water Disposal
on site in pit

Sampling Activities
Type of Container VOA | No. of Containers 2
Parameters Sampled For BTEX

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
6-29-01	1054						1	1			19.7	7.01	6560		Cloudy orange no odor
	1056						1	2			17.9	7.02	5820		Cloudy, Light Brown no odor
	1059						1	3			17.2	7.01	5940		Cloudy Light grey no odor
	1101						1	4			16.3	7.02	6100		1 h
	1103					15.24	1	5			16.1	7.02	6180		no change

Circle the date and time that the development criteria are met.

Comments Sampled for BTEX 1130

Developer's Signature (s) Chris A Mc | Date 6-29-01 | Reviewer [illegible] | Date 7/3/01

Well Development and Purging Data

Project No. 6178 Development ☐
Task No. — Purging ☑
Well No. MW 3 Site Name/Identification MADDOX Site Address Rural San Juan CO
Page 1 of 1
Client/Project Name Burlington Resources B.R. well Sampling Project Manager LISA winn

Development Criteria
☑ 3 to 5 Casing Volumes of Water Removal
☑ Stabilization of Indicator Parameters
☐ Other

Water Volume Calculation
Initial Depth of Well (feet) 22.35
Initial Depth to Water (feet) 12.64
Height of Water Column in Well (feet) 9.71
Diameter (inches): Well ____ Gravel Pack ____

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	9.71	1.58 x 3	4.74
Gravel Pack			
Drilling Fluids			
Total			4.74

Instruments (Serial No. (if applicable))
☑ PH Meter — Hydac
☐ DO Monitor
☑ Conductivity Meter — Hydac
☑ Temperature Meter — Hydac
☐ Other

Methods of Development
Pump
☐ Centrifugal
☐ Submersible
☐ Peristaltic
Bailer
☑ Bottom Valve
☐ Double Check Valve
☐ Stainless-steel Kemmerer
☐ Other

Water Disposal
On site in pit

Sampling Activities
Type of Container VOA No. of Containers 2
Parameters Sampled For BTEX

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
6-29-01	1018		X				1	1			20.9	2.03	10540		Cloudy No odor
	1021		X				1	2			18	2.00	9900		Cloudy Light Brown No Odor
	1025		X				1	3			16.9	2.01	10040		" "
	1028		X				1	4			16.5	2.02	10050		" "
	1032		X			12.09	1	5			16.7	2.11	10160		no Change

Circle the date and time that the development criteria are met.

Comments Sampled for BTEX 1045

Developer's Signature (s) Chris Mg Date 6-29-01 Reviewer J Winn Date 7/3/01

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Quote #: **ACZ Project #:**

CLIENT INFORMATION

Name to appear on Report and Invoice

Burlington Resources
P.O. Box 4289
Farmington N.M. 87499-4289
Attn: Greg Wurtz Tel: (505) 326 9537

Email:

Carbon Copy: Report X **Invoice** ___

GOLDEN Environmental MGT.
906 San Juan BLVD. Suite D
Farmington N.M. 87401
Attn: Lisa Winn Tel (505) 566-9116

Email:

PROJECT INFORMATION

Client Project name and/or PO#:
B.R. well Sampling

Shipping Company:
Tracking #:

ANALYSES REQUESTED *(required or attach bid/list)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	BTEX 8021							
Maddox com #1A MW 1	6-24-01 1000	GW	2	X							
Maddox com #1A MW 2	6-24-01 1130	GW	2	X							
Maddox com. #1A MW 3	6-24-01 1045	GW	2	X							

Matrix Options: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water)
SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

RELINQUSIHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME	PAGE ___ of ___
Chris M	6-26-01 1300			

FRMQA021.01.00.03

White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.

L32735

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Quote #: **ACZ Project #:**

CLIENT INFORMATION

Name to appear on Report and Invoice	Carbon Copy: Report X Invoice ___
Burlington Resources	GOLDEN Environmental MGT.
P.O. Box 4289	906 San Juan Blvd. Suite D
Farmington N.M. 87499-4289	Farmington N.M. 87401
Attn: Greg Wurtz Tel (505) 326 9537	Attn: Lisa Winn Tel (505) 566-9116
Email:	Email:

PROJECT INFORMATION

Client Project name and/or PO#: B.R. Well Sampling

Shipping Company:

Tracking #:

ANALYSES REQUESTED *(required or attach bid/list)*

	SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	BTEX 8021							
1	Maddox Com #1A MW 1	6-29-01 1000	GW	2	X							
2	Maddox Com #1A MW 2	6-29-01 1130	GW	2	X							
3	Maddox Com #1A MW 3	6-29-01 1045	GW	2	X							

Matrix Options	SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME	PAGE
[signature]	6-29-01 1300	[signature] /ACZ	6/30/01 10:30	of

FRMQA021.01.00.03

White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.
Project ID: B.R. well sampling
Sample ID: Maddox Com #1A MW 1

ACZ ID: ***L32735-01***
Date Sampled: *06/29/01 10:00*
Date Received: *06/30/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *smp*
Extract Date: *07/13/01 14:06*
Analysis Date: *07/13/01 14:06*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2	8.3		ug/L	0.2	0.5
Ethylbenzene	000100-41-4	0.7	J	ug/L	0.2	1
Toluene	000108-88-3		U	ug/L	0.2	1
Xylenes	001330-20-7	1.5		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	109	%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.

Project ID: B.R. well sampling
Sample ID: Maddox Com #1A MW 2

ACZ ID: *L32735-02*
Date Sampled: *06/29/01 11:30*
Date Received: *06/30/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *smp*
Extract Date: *07/13/01 14:56*
Analysis Date: *07/13/01 14:56*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2	0.6		ug/L	0.2	0.5
Ethylbenzene	000100-41-4	1		ug/L	0.2	1
Toluene	000108-88-3	9.5		ug/L	0.2	1
Xylenes	001330-20-7	10.4		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	99	%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.
Project ID: B.R. well sampling
Sample ID: Maddox Com #1A MW 3

ACZ ID: *L32735-03*
Date Sampled: *06/29/01 10:45*
Date Received: *06/30/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *smp*
Extract Date: *07/13/01 16:38*
Analysis Date: *07/13/01 16:38*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2		U	ug/L	0.2	0.5
Ethylbenzene	000100-41-4		U	ug/L	0.2	1
Toluene	000108-88-3		U	ug/L	0.2	1
Xylenes	001330-20-7		U	ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	98	%	80	120

Well Development and Purging Data

Project No. 6178 | Development ☐ | Purging ☑ | Page 1 of 1

Task No.

Well No. MW1 | Site Name/Identification MADDOX Com #1A | Site Address Rural San Juan Co.

Client/Project Name Burlington Resources BR well Sampling | Project Manager Lisa Winn

Development Criteria
- ☑ (3) to 5 Casing Volumes of Water Removal
- ☑ Stabilization of Indicator Parameters
- ☐ Other

Water Volume Calculation
- Initial Depth of Well (feet) 20.94
- Initial Depth to Water (feet) 13.64
- Height of Water Column in Well (feet) 7.3
- Diameter (inches): Well 2" Gravel Pack

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	7.3	1.19 X 3	3.57
Gravel Pack			
Drilling Fluids			
Total			3.57

Instruments / **Serial No. (if applicable)**
- ☑ PH Meter — Hydac
- ☐ DO Monitor
- ☑ Conductivity Meter — Hydac
- ☑ Temperature Meter — Hydac
- ☐ Other

Methods of Development

Pump
- ☐ Centrifugal
- ☐ Submersible
- ☐ Peristaltic

Bailer
- ☑ Bottom Valve
- ☐ Double Check Valve
- ☐ Stainless-steel Kemmerer

☐ Other

Water Disposal onsite in pit

Sampling Activities
Type of Container VOA | No. of Containers 2
Parameters Sampled For BTEX

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
9-17-01	1220		X				1	1			21.2	6.37	5590		Cloudy Mild Septic Odor
	1228		X				1	2			20	6.67	5930		Cloudy Light Brown Mild Septic Odor
	1229		X				1	3			19.6	6.73	6100		" "
	1231		X				1	4			19.1	6.97	6580		" "
	1233		X			14.24	1	5			18.5	6.80	6450		100 Change

Circle the date and time that the development criteria are met.

Comments Sampled for BTEX 1245

Developer's Signature (s) Chris A. Mercy Date 9-17-01 Reviewer [signature] Date 9/26/01

Well Development and Purging Data

Project No. 6128 Development ☐
Task No. Purging ☑
Well No. MW 2 Site Name/Identification MADDOX COM #1A Site Address Rural San Juan CO
Client/Project Name Burlington Resources BR well Sampling Project Manager Lisa Linn

Page 1 of 1

Development Criteria
☑ 3 to 5 Casing Volumes of Water Removal
☑ Stabilization of Indicator Parameters
☐ Other

Water Volume Calculation
Initial Depth of Well (feet) 22.35
Initial Depth to Water (feet) 15.47
Height of Water Column in Well (feet) 6.88
Diameter (inches): Well 2" Gravel Pack

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	6.88	1.12x3	3.36
Gravel Pack			
Drilling Fluids			
Total			3.36

Instruments
	Serial No. (if applicable)
☑ PH Meter	Hydac
☐ DO Monitor	
☑ Conductivity Meter	Hydac
☑ Temperature Meter	Hydac
☐ Other	

Methods of Development
Pump
☐ Centrifugal
☐ Submersible
☐ Peristaltic

Bailer
☑ Bottom Valve
☐ Double Check Valve
☐ Stainless-steel Kemmerer

☐ Other

Water Disposal
On site in pit

Sampling Activities
Type of Container VOA No. of Containers 2
Parameters Sampled For BTEX

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
9-17-01	1323		X				.25	.75			18.9	7.08	9220		Cloudy, light brown vegetation, mild septic odor
	1325		X				.25	1.5			18.7	6.98	8010		" "
	1327		X				.25	2.25			17.7	6.99	7650		" "
	1330		X				.25	3			17.3	7.06	7080		" "
	1332		X			17.31	.25	3.75			16.9	7.09	6940		no change

Circle the date and time that the development criteria are met.

Comments Sampled For BTEX 1345

Developer's Signature (s) Chris A Mann Date 9-17-01 Reviewer Linn Date 9/26/01

Well Development and Purging Data

Project No. 6178 Development ☐
Task No. Purging ☑
Well No. MW 3 Site Name/Identification MADDOX COM #1A Site Address Rural San Juan CO.
Client/Project Name Burlington Resources BR well Sampling Project Manager Lisa Winn

Page 1 of 1

Development Criteria
☑ 3 to 5 Casing Volumes of Water Removal
☑ Stabilization of Indicator Parameters
☐ Other

Water Volume Calculation
Initial Depth of Well (feet) 22.415
Initial Depth to Water (feet) 13.59
Height of Water Column in Well (feet) 8.86
Diameter (inches): Well 2" Gravel Pack

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	8.86	1.41 X 3	4.32
Gravel Pack			
Drilling Fluids			
Total			4.32

Instruments
	Serial No. (if applicable)
☑ PH Meter	Hydac
☐ DO Monitor	
☑ Conductivity Meter	Hydac
☑ Temperature Meter	Hydac
☐ Other	

Methods of Development
Pump
☐ Centrifugal
☐ Submersible
☐ Peristaltic

Bailer
☑ Bottom Valve
☐ Double Check Valve
☐ Stainless-steel Kemmerer

☐ Other

Water Disposal
on site in pit

Sampling Activities
Type of Container VOA No. of Containers 2
Parameters Sampled For BTEX

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
9-17-01	1253		X				1	1			20.4	8.16	6320		Cloudy Brown Mild Septic odor
	1255		X				1	2			18.9	7.92	6240		" "
	1257		X				1	3			18.5	7.72	6580		" "
	1259		X				1	4			18.3	7.59	6910		" "
	1301		X			14.04	1	5			18.2	7.57	6980		no change

Note the date and time that the development criteria are met.

Comments Sampled for BTEX 1315

Developer's Signature (s) Chris A Mayf Date 9-17-01 Reviewer J Winn Date 9/20/01

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.
Project ID: BR Well Sampling
Sample ID: MADDOX COM#1A MW1

ACZ ID: ***L33990-03***
Date Sampled: *09/17/01 12:45*
Date Received: *09/20/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *smp*
Extract Date: *09/27/01 17:29*
Analysis Date: *09/27/01 17:29*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2	24.7		ug/L	0.2	0.5
Ethylbenzene	000100-41-4	0.9	J	ug/L	0.2	1
Toluene	000108-88-3		U	ug/L	0.2	1
Xylenes	0001330-207	2.5		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	117	%	80	120

Note: BFB surr high due to sample co-elution.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.

Project ID: BR Well Sampling
Sample ID: MADDOX COM#1A MW2

ACZ ID: ***L33990-04***
Date Sampled: *09/17/01 13:45*
Date Received: *09/20/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *smp*
Extract Date: *09/27/01 18:13*
Analysis Date: *09/27/01 18:13*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2		U	ug/L	0.2	0.5
Ethylbenzene	000100-41-4		U	ug/L	0.2	1
Toluene	000108-88-3	0.6	J	ug/L	0.2	1
Xylenes	0001330-207	1		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	103	%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.

Project ID: BR Well Sampling
Sample ID: MADDOX COM#1A MW3

ACZ ID: ***L33990-05***
Date Sampled: *09/17/01 13:15*
Date Received: *09/20/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *smp*
Extract Date: *09/27/01 18:58*
Analysis Date: *09/27/01 18:58*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2		U	ug/L	0.2	0.5
Ethylbenzene	000100-41-4		U	ug/L	0.2	1
Toluene	000108-88-3	0.3	J	ug/L	0.2	1
Xylenes	0001330-207	0.5	J	ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	104	%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Reference

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

SURR	Surrogate	*LFM*	Laboratory Fortified Matrix
INTS	Internal Standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
LCSS	Laboratory Control Sample - Soil	*MS/MSD*	Matrix Spike/Matrix Spike Duplicate
LCSW	Laboratory Control Sample - Water	*PBS*	Prep Blank - Soil
LFB	Laboratory Fortified Blank	*PBW*	Prep Blank - Water

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.

ACZ Qualifiers (Qual)

B	Analyte detected in daily blank
J	Analyte concentration detected at a value between MDL and PQL
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality contreol sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.
E	Analyte concentration exceeds calibration range.
P	Analyte concentration differs from second detector by more than 40%.
M	Analyte concentration is estimated due to matrix interferences.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
(3) EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update II, September 1994.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculation
(2) Organic analyses are reported on an "as received" basis.

REPIN03.11.00.01

☐ Development
☑ Purging

WELL DEVELOPMENT AND PURGING DATA FORM

Well Number MW 1

Page 1 of 1

Project Name B.R well Sampling

Project Manager Lisa Winn

Project No. 151200138

Client Company Burlington Resources

Site Name MADDOX

Site Address Rural San Juan CO

Development Criteria

☑ 3 to 5 Casing Volumes of Water Removal
☑ Stabilization of Indicator Parameters
☐ Other _____

Methods of Development

Pump	Bailer
☐ Centrifugal	☑ Bottom Valve
☐ Submersible	☐ Double Check Valve
☐ Peristaltic	☐ Stainless-steel Kemmerer

☐ Other _____

Water Volume Calculation

Initial Depth of Well (feet) 20.94
Initial Depth to Water (feet) 13.61
Height of Water Column in Well (feet) 7.33
Diameter (inches): Well ____ Gravel Pack ____

Item	Water Volume in Well		Gallons to be Removed
	Cubic Feet	Gallons	
Well Casing	7.33	1.19x3	3.57
Gravel Pack			
Drilling Fluids			
Total			3.57

Instruments

	Serial No. (If applicable)
☑ pH Meter	YSI 63
☐ DO Monitor	
☑ Conductivity Meter	YSI C3
☑ Temperature Meter	YSI 63
☐ Other	

Water Disposal

On site in pit

Water Removal Data

Date	Time	Development Method		Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons)		Product Volume Removed (gallons)		Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
		Pump	Bailer				Increment	Cumulative	Increment	Cumulative					
12-19-01	1025		X				.75	.75			13	7.16	4.67		Cloudy Light Brown Septic odor,
	1028		X				.25	1.5			14.7	7.33	5.54		Cloudy, Brown, Septic Odor
	1030		X				.75	2.25			15.5	7.19	5.35		" "
	1033		X				.25	3			15.3	7.20	5.62		" "
	1035		X			14.19	.75	3.25			15.3	7.48	5.88		No Change

Comments Sampled for BTEX 1043

Developer's Signature(s) Chris L. May Date 12-19-01 Reviewer [signature] Date 12/21/01

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☐ Development
☒ Purging

WELL DEVELOPMENT AND PURGING DATA FORM

Well Number MW 2

Page 1 of 1

Project Name B R well Sampling

Project Manager Lisa Winn

Project No. 15170003 8

Client Company Burlington Resources

Site Name MADDOX

Site Address Rural SAN JUAN CO.

Development Criteria
☒ 3 to 5 Casing Volumes of Water Removal
☒ Stabilization of Indicator Parameters
☐ Other

Methods of Development

Pump
☐ Centrifugal
☐ Submersible
☐ Peristaltic

Bailer
☒ Bottom Valve
☐ Double Check Valve
☐ Stainless-steel Kemmerer

☐ Other

Water Volume Calculation
Initial Depth of Well (feet) 22.35
Initial Depth to Water (feet) 15.57
Height of Water Column in Well (feet) 6.78
Diameter (inches): Well 2" Gravel Pack

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	6.78	1.10 x 3	3.3
Gravel Pack			
Drilling Fluids			
Total			3.3

Instruments — Serial No. (If applicable)
☒ pH Meter YSI 63
☐ DO Monitor
☒ Conductivity Meter YSI 63
☒ Temperature Meter YSI 63
☐ Other

Water Disposal
ON Site in pit

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
12-19-01	1144		X				.75	.75			14.7	7.14	4.72		Cloudy, Light Brown no odor
	1146		X				.75	1.5			14.4	7.24	5.11		" "
	1148		X				.75	2.25			14.4	7.39	5.26		" "
	1151		X				.75	3			14.7	7.47	5.28		" "
	1154		X			16.74	.75	3.75			14.6	7.48	5.29		no Change

Comments Sampled For BTEX 1200

Developer's Signature(s) [signature] Date 12-19-01 Reviewer [signature] Date 12/21/01

☐ Development
☑ Purging

WELL DEVELOPMENT AND PURGING DATA FORM

Well Number MW 3

Page 1 of 1

Project Name B.R. well Sampling Project Manager Lisa Winn Project No. 151700013A

Client Company Burlington Resources

Site Name MADDOX Site Address Rural San Juan CO.

Development Criteria

☑ 3 to 5 Casing Volumes of Water Removal
☑ Stabilization of Indicator Parameters
☐ Other _____

Methods of Development

Pump	Bailer
☐ Centrifugal	☑ Bottom Valve
☐ Submersible	☐ Double Check Valve
☐ Peristaltic	☐ Stainless-steel Kemmerer

☐ Other _____

Water Volume Calculation

Initial Depth of Well (feet) 22.45
Initial Depth to Water (feet) 13.59
Height of Water Column in Well (feet) 8.86
Diameter (inches): Well 2" Gravel Pack ____

Item	Water Volume in Well: Cubic Feet	Water Volume in Well: Gallons	Gallons to be Removed
Well Casing	8.86	1.44x3	4.32
Gravel Pack			
Drilling Fluids			
Total			4.32

Instruments

	Serial No. (If applicable)
☑ pH Meter	YSI 63
☐ DO Monitor	
☑ Conductivity Meter	YSI 63
☑ Temperature Meter	YSI 63
☐ Other _____	

Water Disposal

on site in pit

Water Removal Data

Date	Time	Development Method: Pump	Development Method: Bailer	Removal Rate (gal/min)	Intake Depth (feet)	Ending Water Depth (feet)	Water Volume Removed (gallons): Increment	Water Volume Removed (gallons): Cumulative	Product Volume Removed (gallons): Increment	Product Volume Removed (gallons): Cumulative	Temperature (°C)	pH	Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Comments
12-19-01	1058		X				1	1			14.1	8.13	5.41		Cloudy Light Grey no odor
	1100		X				1	2			14.5	8.00	5.77		" "
	1103		X				1	3			14.5	8.03	5.81		" "
	1106		X				1	4			14.3	7.95	5.93		" "
	1109		X			13.95	1	5			14.1	7.79	6.19		no Change

Comments Sampled for BTEX 1120

Developer's Signature(s) Chris A. Mancy Date 12-19-01 Reviewer [signature] Date 12/21/01

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ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.
Project ID: 1517000138
Sample ID: Maddox MW 1

ACZ ID: ***L35290-02***
Date Sampled: *12/19/01 10:43*
Date Received: *12/20/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *mwb*
Extract Date: *12/29/01 0:21*
Analysis Date: *12/29/01 0:21*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2	17.2		ug/L	0.2	0.5
Ethylbenzene	000100-41-4		U	ug/L	0.2	1
Toluene	000108-88-3	2.3		ug/L	0.2	1
Xylenes	0001330-207	13.9		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	100	%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.
Project ID: 1517000138
Sample ID: Maddox MW 2

ACZ ID: *L35290-03*
Date Sampled: *12/19/01 12:00*
Date Received: *12/20/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *mwb*
Extract Date: *12/29/01 1:08*
Analysis Date: *12/29/01 1:08*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2	2.4		ug/L	0.2	0.5
Ethylbenzene	000100-41-4	9.1		ug/L	0.2	1
Toluene	000108-88-3	1.3		ug/L	0.2	1
Xylenes	0001330-207	38.4		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	104	%	80	120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Organic Analytical Results

Burlington Resources, Inc.
Project ID: 1517000138
Sample ID: Maddox MW3

ACZ ID: *L35290-04*
Date Sampled: *12/19/01 11:20*
Date Received: *12/20/01*
Sample Matrix: *Ground Water*

Benzene, Toluene, Ethylbenzene & Xylene

Analysis Method: **M8021**
Extract Method: **Method**

Analyst: *mwb*
Extract Date: *12/29/01 1:53*
Analysis Date: *12/29/01 1:53*
Dilution Factor: *1*

Compound

Compound	CAS	Result	QUAL	Units	MDL	PQL
Benzene	000071-43-2		U	ug/L	0.2	0.5
Ethylbenzene	000100-41-4		U	ug/L	0.2	1
Toluene	000108-88-3		U	ug/L	0.2	1
Xylenes	0001330-207	20.9		ug/L	0.2	1

Surrogate Recoveries

Surrogate	CAS	% Recovery	Units	LCL	UCL
Bromofluorobenzene	000460-00-4	103	%	80	120

Spill report, Excavation Log, and Drilling Log/Wellbore Diagrams

PHILIP SERVICES CORP

PRODUCTION PIT REMEDIATION FORM

WELL NAME: MADDOX COM WELL NO.: 1A DP NO.:

OPERATOR NAME: BURLINGTON RESOURCES P/L DISTRICT: N/A

COORDINATES: LETTER: I SECTION: 17 TOWNSHIP: 30N RANGE: 8W

PIT TYPE: DEHYDRATOR: X LOCATION DRIP: LINE DRIP: OTHER:

FOREMAN NO.: N/A AREA: N/A

INITIAL REMEDIATION ACTIVITIES

DATE: 12/16/99 TIME: 0700

GROUND WATER ENCOUNTERED? ☒Y / ☐N

INSIDE NMOCD ZONE

FINAL EXCAVATION DIMENSIONS: LENGTH: 101' WIDTH: 52' DEPTH: 15'

APPROX. CUBIC YARDS: 2917 FINAL PID READING: → NORTH WALL - 35 PPM
EAST WALL - 21.9 PPM
SOUTH WALL - 61 PPM

REMEDIATION METHOD: ONSITE LANDFARM X

OFFSITE LANDFARM X LOCATION: STILL PENDING

OTHER

LANDFARM DIMENSIONS: LENGTH: WIDTH:

OUTSIDE NMOCD ZONE

FINAL SAMPLE DEPTH: FINAL PID READING:

EXCAVATION SAMPLING INFORMATION

IF PID READINGS ARE LESS THAN 100 PPM, SAMPLE TAKEN DURING EXCAVATION)

SAMPLE DATE: NO SAMPLE COLLECTED PER ED HASELY SAMPLE NOS N/A N/A

SAMPLE ANALYSIS: TPH METHOD 8015 MODIFIED

IF PID READINGS ARE GREATER THAN 100 PPM, NO SAMPLE WILL BE TAKEN DURING EXCAVATION. THE EXCAVATION WILL BE SAMPLED PRIOR TO BACKFILLING (SEE ADDITIONAL SAMPLING SECTION).

REMARKS: NO SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS PER ED HASELY SINCE THE WEST WALL DID NOT CLEANUP. FURTHER REMEDIATION METHODS ARE PENDING. SOME SOIL WAS LAND-FARMED ON LOCATION AND THE REST WAS STOCKPILED PENDING TRANSPORT TO OTHER LOCATIONS OF THE SAME LEASE IN THE IMMEDIATE AREA. INITIAL REMEDIATION ACTIVITIES WERE STARTED BY CF&M OILFIELD SERVICE.

SIGNATURE: Morgan Killion **DATE:** 1-21-00

RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # 1
Well # MW-2
Page of

Project Name: BR Maddox Drilling
Project Number: 62800132 Phase: 35
Project Location: Maddox [illegible] #14

Elevation:
Borehole Location:
GWL Depth:
Logged By: [illegible] Irby
Drilled By: [illegible]
Date/Time Started: [illegible]-10-99 9 am
Date/Time Completed: 1-10-99 11:30 Am

Well Logged By: C Irby
Personnel On-Site:
Contractors On-Site:
Client Personnel On-Site: Ed [illegible]

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (Feet)		Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0			Split spoon							Heated Headspace
									1.3	1.3 ppm
5	1		18"	Tan - Brn Sand [illegible] Sand - Thin [illegible], Root mark[illegible]						[illegible]
				Hit cobb[illegible] @ 8.5						
10	2		6	Tan Sand [illegible]					1	1.0 ppm
				No staining / No odor						
		▽ Water		Gravel / sand - wet - Could not retrieve samples						
15										
20				TD @ 20' Grav[illegible]						
25										
30										
35										
40										

Comments: 7 sack sand, 10' screen 10' Blank 5' Blank, Cap, Bottom Cap Well protector, 3 sack cement

Geologist Signature: Cecil Irby

MONITORING WELL INSTALLATION RECORD

Phillip Environmental Services Corp.
4200 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # 1
Well # MW-2
Page 1 of ___

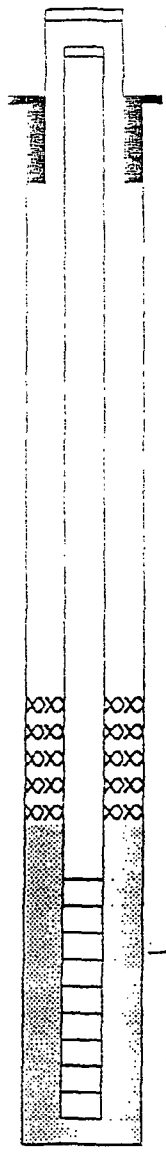
Project Name BR Maddox Drilling
Project Number 62800132 Phase 35
Project Location Maddox Com #1A

Elevation ___
Well Location ___
SWL Depth ___
Installed By [illegible]
Date/Time Started 1-19-95
Date/Time Completed 1-19-95

On-Site Geologist [illegible]
Personnel On-Site ___
Contractors On-Site ___
Client Personnel On-Site [illegible]

Depths in Reference to Ground Surface

Item	Material	Depth
Top of Protective Casing		
Bottom of Protective Casing		
Top of Permanent Borehole Casing		
Bottom of Permanent Borehole Casing		
Top of Concrete		
Bottom of Concrete		
Top of Grout		GS
Bottom of Grout		3
Top of Well Riser		
Bottom of Well Riser		9
Top of Well Screen		9
Bottom of Well Screen		19
Top of Peltonite Seal		3
Bottom of Peltonite Seal		6
Top of Gravel Pack		6
Bottom of Gravel Pack		19
Top of Natural Cave-In		
Bottom of Natural Cave-In		
Top of Groundwater		13,8
Total Depth of Borehole		19'



Top of Protective Casing ___
Top of Riser ___
Ground Surface ___

Top of Seal 3
Top of Gravel Pack 6
Top of Screen 9
13,8 water
Bottom of Screen 19'
Bottom of Borehole 19'

Comments: ___

Geologist Signature Cecil Ey

RECORD OF SUBSURFACE EXPLORATION

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # 2
Well # MW-3
Page of

Project Name BR Maddox Drilling
Project Number 62800132 Phase 35
Project Location [illegible] Com #1A
T31N-R9W-S17

Elevation
Borehole Location
GWL Depth
Logged By
Drilled By
Date/Time Started 1-10-99 11:25 Am
Date/Time Completed 1-10-99 1:00 Pm

Well Logged By
Personnel On-Site
Contractors On-Site
Client Personnel On-Site
Drilling Method
Air Monitoring Method PID

Depth (Feet)		Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0			Split Spoon							Heated Headspace 0 ppm
5							0		0 ppm	
5–7 (I)				Tan [illegible] [illegible]						
10				Gr[illegible] Cobbles @8' Moist						
11 (X)				No Sam[illegible]						
12 (▽)				No Staining/odor Sample too granular/wet to collect.			0			
20				TD @ 20' Gravel + Cobbles						
25										
30										
35										
40										

Comments: 7 Sacks Sand 10' Screen, 10' Blank 5' Blank, Cap Bottom Cap, Well Protector, 13 Sacks Cement

Geologist Signature [signature]

MONITORING WELL INSTALLATION RECORD

Philip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # 2
Well # MW-3
Page ____ of ____

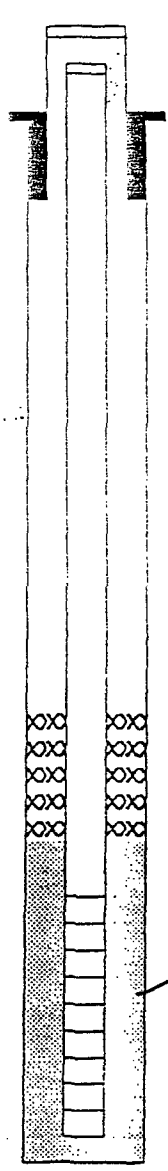
Project Name BR Maddox Drilling
Project Number 62800132 Phase 35
Project Location Maddox Land Farm

Elevation ____
Well Location ____
GWL Depth ____
Installed By [illegible]
Date/Time Started 1-10-99 1:PM
Date/Time Completed 1-10-99 2:PM

On-Site Geologist [illegible]
Personnel On-Site ____
Contractors On-Site ____
Client Personnel On-Site [illegible]

Depths in Reference to Ground Surface

Item	Material	Depth
Top of Protective Casing		
Bottom of Protective Casing		
Top of Permanent Borehole Casing		
Bottom of Permanent Borehole Casing		
Top of Concrete		
Bottom of Concrete		
Top of Grout		6½
Bottom of Grout		3
Top of Well Riser		
Bottom of Well Riser		9
Top of Well Screen		9
Bottom of Well Screen		19
Top of Peltonite Seal		3
Bottom of Peltonite Seal		6
Top of Gravel Pack		6
Bottom of Gravel Pack		20
Top of Natural Cave-In		
Bottom of Natural Cave-In		
Top of Groundwater		12.4
Total Depth of Borehole		20



Top of Protective Casing ____
Top of Riser ____
Ground Surface ____
Top of Seal 3
Top of Gravel Pack 6
Top of Screen 9
12'4"
Bottom of Screen 19'
Bottom of Borehole 19'

Comments: ____

Geologist Signature [illegible]

RECORD OF SUBSURFACE EXPLORATION

PHILIP SERVICES CORP.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # ______
Well # 1
Page 1 of ______

Project Number [illegible] Phase
Project Name Br Maddox
Project Location Cotton Wood

Elevation ______
Borehole Location ______
GWL Depth ~10.96
Drilled By V. & R Padilla
Well Logged By MNea
Date Started 4/27/00 0845
Date Completed 4/27/00 1112

Drilling Method 4 1/4 ID HSA
Air Monitoring Method PID

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (Inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: PPM BZ	BH	S	Drilling Conditions & Blow Counts
0				0-11 backfill material, light brown sand, medium to very fine with minor gravel.	SP					
5	1	5-6.5	3"	Sand is moderately well sorted and unconsolidated. Sand appears			0	0	0	1
10	2	10-11.5	12"	saturated @ approx 11.3'. Minor root material @ 11.5 bgs small (<2") HC stains	OL		0	0	46	8 blow counts
15	3	15-16.5	2"	brown clay saturated 15-20' cobbles, No sample recovery			0	0	0	18 refusal
20	4	20-21	0				0	0	0	22 refusal
25										
30										
35										
40										

Comments: ______

Geologist Signature ______

12/10/97\Drillog

MONITOR WELL INSTALLATION FORM

Borehole #
Well # MW-1
Page 1 of 1

Philip Services Corp.
4000 Monroe Rd.
Farmington, NM 87401
(505) 326-2262 FAX (505) 326-2388

Project Name [illegible]
Project Number 628-13 Phase
Site Location Cottonwood Campground

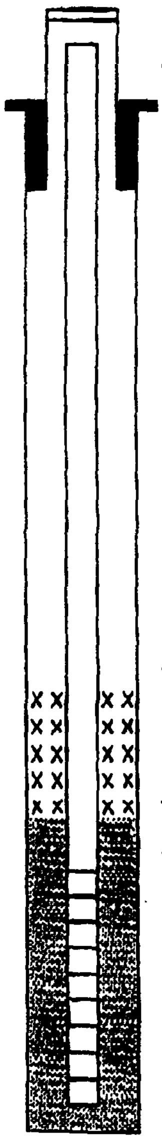
Elevation
Well Location
GWL Depth 10.92
Installed By K PADILLA

On-Site Geologist M Nee
Personnel On-Site Padilla LeFebre
Contractors On-Site
Client Personnel On-Site B Wurtz, E Hasely

Date/Time Started 4-27 0845
Date/Time Complete 4-27 1117

Depths in Reference to Ground Surface

Item	Material	Depth (feet)
Top of Protective Casing	STEEL	2.67
Bottom of Protective Casing	STEEL	2.33
Top of Permanent Borehole Casing	NA	
Bottom of Permanent Borehole Casing	NA	
Top of Concrete	NA	
Bottom of Concrete	NA	
Top of Grout	NA	
Bottom of Grout	NA	
Top of Well Riser	PVC	2.33
Bottom of Well Riser	PVC	-4.92
Top of Well Screen	PVC	-4.92
Bottom of Well Screen	PVC	-19.92
Top of Bentonite Seal	3/8 chips	0
Bottom of Bentonite Seal	3/8 chips	-3
Top of Gravel Pack	10-20	-3
Bottom of Gravel Pack	10-20	-20
Top of Natural Cave-In		
Bottom of Natural Cave-In		
Top of Groundwater		-10.96
Total Depth of Borehole		20.00



Top of Protective Casing 2.67'
Top of Riser (survey elev.) 2.33'
Ground Surface 0
Top of Seal 0
Top of Gravel Pack -3
Top of Screen -4.92
Bottom of Screen 19.92
Bottom of Borehole 20.00

Comment

Geologist Signature [signature]

MWINSTAL.wk1