

3R - 124

2010 AGWMR

MAR 2011



2010 ANNUAL GROUNDWATER REPORT

Rowland Gas COM #1

3RP-124

**Unit P, Section 25, Township 30N, Range 12W
San Juan County, New Mexico**

PREPARED FOR:

**Mr. Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Street
Santa Fe, New Mexico 87505
(505) 476-3488**

March 2011

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2010 XTO GROUNDWATER REPORT

ROWLAND GAS COM #1 3RP-124

SITE DETAILS

LEGALS - TWN: 30N

RNG: 12W

SEC: 25

UNIT: P

OCD HAZARD RANKING: 20

LAND TYPE: FEE

LATITUDE: 36.77894

LONGITUDE: 108.04329

INTRODUCTION

XTO Energy Inc. (XTO) acquired the Rowland Gas Com #1 well site from Amoco Production Company (Amoco) in January 1998. This is a gas producing well in the Dakota Sandstone and is currently active. There is a nearby irrigation ditch to the immediate west of this location. A topographic map is included as **Figure 1**.

HISTORY

XTO learned that in August 1993 Amoco excavated and attempted to remediate an unlined production pit. During excavation groundwater was encountered at 13 feet below ground surface. Envirotech's Pit Closure Report is included as **Attachment 1**. Monitoring wells MW-1, MW-2, MW-3, MW-4 and MW-5 were installed in May 1996. Completion Diagrams and Borehole Logs are presented as **Figure 3-7**. Groundwater analytical results from monitoring wells MW-1, MW-2 and MW-3 were below the New Mexico Water Quality Control Commission (WQCC) standards for benzene, toluene, ethyl benzene and total xylene (BTEX), and sampling was discontinued by Amoco in 1996 in accordance with the New Mexico Oil Conservation Division (OCD) approved Groundwater Management Plan. Groundwater from monitoring wells MW-4 and MW-5 returned BTEX concentrations in excess of WQCC standards. It was presumed that monitoring well MW-5 was installed in a location within or immediately adjacent to an abandoned dehydrator unit with an associated pit. At that time possible downgradient migration had not been fully delineated. Installation of an additional monitoring well was recommended.

Monitoring well MW-6 was installed in June 1997 to further delineate possible down gradient migration of hydrocarbon impact. Completion Diagram and Borehole Logs are presented as **Figure 8**. Initial groundwater sampling of monitoring well MW-6 revealed BTEX concentrations that were non-detect or below WQCC standards and sampling of monitoring well MW-6 was discontinued by Amoco.

During a site visit in 1998 after the XTO acquisition it was discovered that monitoring well MW-4 had been damaged during location equipment upgrades. Monitoring well MW-4 was replaced in June 1998 with monitoring well MW-4R. Monitoring well MW-4R was positioned closer to the production pit excavation. Completion Diagram and Borehole Logs for the replacement monitoring well are presented as **Figure 9**.

An annual groundwater report for years 1996-1998 was submitted to the OCD in February 1999. It was recommended that monitoring wells MW-4R and MW-5 be sampled on an annual basis until results indicate otherwise. It was also suggested that monitoring well MW-3 be re-sampled annually to verify no further migration from the production pit.

2010 XTO GROUNDWATER REPORT

Monitoring wells MW-3 and MW-6 were sampled for BTEX annually through 2000. The samples returned results of non-detect for all BTEX constituents during this sampling period. Monitoring well MW-4R was sampled for BTEX annually through 2002, returning results consistently beneath detection levels for BTEX. Monitoring well MW-5 was sampled annually for BTEX through 2005 with laboratory results showing levels of BTEX exceeding WQCC standards.

The 2005 annual groundwater report was submitted to the OCD in January of 2006 requesting discontinued sampling for BTEX in all monitoring wells except monitoring well MW-5. Annual sampling was proposed in monitoring well MW-5 until the results indicated that an alternative sampling frequency would be warranted.

The 2006 annual groundwater report was submitted to the OCD in February of 2007 proposing continued annual sampling of monitoring well MW-5 until BTEX concentrations in groundwater are below closure standards.

The 2007 annual groundwater report was submitted to the OCD in February of 2008 proposing quarterly sampling of monitoring well MW-5 to monitor decreasing BTEX concentrations.

The 2008 annual groundwater report was submitted to the OCD in April of 2009 proposing quarterly sampling of monitoring well MW-5 to monitor decreasing BTEX concentrations.

The 2009 Annual Groundwater Report was submitted to Mr. Glenn Von Gonten with the OCD in March of 2010. The 2009 Annual Groundwater Report proposed the continued quarterly sampling of monitoring well MW-5 until four (4) consecutive quarters returned results below the WQCC standards for all BTEX constituents.

A summary of water level data and laboratory results from historical and current groundwater monitoring is presented in **Table 1** and **Table 2**. Copies of the laboratory data sheets and associated quality assurance/quality control data for 2010 are presented as **Attachment 2**.

METHODOLOGY

Quarterly groundwater samples were collected and submitted for laboratory analysis of BTEX in monitoring well MW-5 during 2010.

Water Level Measurements

Static groundwater level monitoring includes recording depth to groundwater measurements with a Keck oil/water interface probe. The interface probe is decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement. These data are recorded as Depth to Water (DTW) and Total Depth (TD) in feet on Table 1.

Groundwater Sampling

Prior to sampling groundwater, depth to groundwater and total depth of wells is measured with a Keck oil/water interface probe. Presence of any free-phase crude oil is also investigated using the interface probe. The interface probe is decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement. The

2010 XTO GROUNDWATER REPORT

volume of water in the wells is calculated, and a minimum of three casing volumes of water is purged from each well using a disposable bailer or a permanent decontaminated PVC bailer. As water is extracted, pH, electric conductivity and temperature are monitored. Wells are purged until these properties stabilize, indicating that the purge water is representative of aquifer conditions. Stabilization is defined as three consecutive stable readings for each water property (± 0.4 units for pH, ± 10 percent for electric conductivity and $\pm 2^\circ$ C for temperature). All purge water is disposed of into tanks on site.

Once each monitoring well is properly purged, groundwater samples are collected by filling at least two 40-milliliter (ml) glass vials. The pre-cleaned and pre-preserved (with hydrochloric acid or mercuric chloride) vials are filled and capped with no air inside to prevent degradation of the sample. Samples are labeled with the date and time of collection, well designation, project name, collector's name and parameters to be analyzed. They are immediately sealed and packed on ice. The samples are shipped to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico in a sealed cooler via bus before designated holding times expire. In September of 2010, XTO began sending samples to Environmental Science Corporation (ESC) based out of Mt. Juliet, Tennessee. Samples were sealed in a cooler with ice, and shipped via Fed-Ex overnight to ESC for analysis. Proper chain-of-custody (COC) procedures are followed with logs documenting the date and time sampled, sample number, type of sample, sampler's name, preservative used, analyses required and sampler's signature. Field notes from 2010 are included as **Attachment 3**.

Groundwater Contour Maps

Top of casing well elevations were surveyed using a surveyor's level; and groundwater elevations obtained from monitoring wells during site visits were used to draft groundwater contour maps. Contours were inferred based on groundwater elevations obtained and observation of physical characteristics at the site (topography, proximity to irrigation ditches, etc.).

RESULTS

Laboratory results from monitoring well MW-5 showed an increase in benzene concentrations when compared to levels from 2009. Groundwater elevations were consistent when compared to groundwater results obtained in 2009.

Field data collected during site monitoring activities indicate a groundwater gradient that is likely influenced by a nearby irrigation ditch located immediately west of the location. In March and June when the irrigation ditch is running, the groundwater gradient trends to the south-west, which is the general direction of the flow in the irrigation ditch. The groundwater flow direction is more in a north-east direction in September, and trends towards the north-west in December due to the absence of water in the adjacent irrigation ditch. **Figure 2** illustrates the estimated groundwater gradients during 2010.

CONCLUSIONS

Based on the laboratory results obtained during 2010, BTEX concentrations are increasing in the groundwater in monitoring well MW-5. The benzene levels increased sharply in March of 2010, but began declining again in the second and third quarter, before rebounding in the fourth quarter. Overall, the benzene concentrations decreased in monitoring well MW-5 from the first quarter to the third quarter. Xylene concentrations rebounded from levels below the WQCC standards in the first quarter, to 630 ppb in the

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fourth quarter of 2010. Xylene levels showed an overall upward trend in 2010. Groundwater levels fluctuated with the irrigation season in 2010 as they did in 2009, but water levels were consistently higher in each quarter in 2010 when compared to numbers obtained in 2009. Water levels were up in 2010 an average of 0.454 feet per quarter when compared to data obtained in 2009. Water levels were up 0.86 feet in the third quarter alone, coinciding with an above average year for precipitation, according to the National Weather Service. The above average rainfall may have flushed BTEX into the groundwater from surrounding soil, causing the abnormal spike in the BTEX concentrations in 2010.

RECOMMENDATIONS

Continued quarterly sampling of groundwater for BTEX constituents in monitoring well MW-5 until WQCC standards have been met for four (4) consecutive quarters.

XTO recommends that hydrogen peroxide be applied to the groundwater aquifer using monitoring well MW-5 as an injection point. This will serve to oxygenate the aquifer and enhance the bio-remediation taking place at this well site. The hydrogen peroxide will be added pursuant to the work plan prepared by LT Environmental, included as ***Attachment 3***.

Following OCD approval for closure, all monitoring well locations will be abandoned in accordance with the monitoring well abandonment plan.

TABLE 1
GROUNDWATER LEVELS AND ELEVATIONS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet) (BTOC)	Groundwater Elevation (feet relative to site)
MW-3	6/14/1996	14.39	87.29
MW-3	5/26/1999	15.29	86.39
MW-3	6/30/2000	15.51	86.17
MW-3	6/28/2006	13.81	87.87
MW-3	6/15/2007	13.10	88.58
MW-3	12/26/2007	14.52	87.16
MW-3	3/12/2008	14.35	87.33
MW-3	6/2/2008	12.82	88.86
MW-3	9/22/2008	12.16	89.52
MW-3	12/5/2008	13.30	88.38
MW-3	3/2/2009	14.90	86.78
MW-3	6/10/2009	13.10	88.58
MW-3	9/15/2009	12.28	89.40
MW-3	12/10/2009	12.88	88.80
MW-3	3/15/2010	14.73	86.95
MW-3	6/23/2010	12.62	89.06
MW-3	9/15/2010	11.97	89.71
MW-3	12/13/2010	13.36	88.32
MW-4	6/14/1996	13.72	-
MW-4	6/24/1997	14.02	-
MW-4R	6/26/1998	11.52	86.55
MW-4R	5/26/1999	11.28	86.79
MW-4R	6/30/2000	11.69	86.38
MW-4R	5/16/2001	13.07	85.00
MW-4R	9/25/2001	11.81	86.26
MW-4R	12/19/2001	12.66	85.41
MW-4R	2/19/2002	13.97	84.10
MW-4R	6/28/2006	9.87	88.20
MW-4R	6/15/2007	9.02	89.05
MW-4R	12/26/2007	10.69	87.38

TABLE 1
GROUNDWATER LEVELS AND ELEVATIONS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet) (BTOC)	Groundwater Elevation (feet relative to site)
MW-4R	3/12/2008	11.10	86.97
MW-4R	6/2/2008	8.94	89.13
MW-4R	9/22/2008	8.28	89.79
MW-4R	12/5/2008	10.08	87.99
MW-4R	3/2/2009	11.84	86.23
MW-4R	6/10/2009	9.33	88.74
MW-4R	9/15/2009	8.52	89.55
MW-4R	12/10/2009	10.59	87.48
MW-4R	3/15/2010	11.67	86.40
MW-4R	6/23/2010	8.88	89.19
MW-4R	9/15/2010	8.35	89.72
MW-4R	12/13/2010	10.33	87.74

MW-5	6/14/1996	10.40	87.25
MW-5	6/24/1997	10.27	87.38
MW-5	6/26/1998	10.34	87.31
MW-5	5/26/1999	10.03	87.62
MW-5	6/30/2000	10.78	86.87
MW-5	5/16/2001	12.52	85.13
MW-5	6/26/2002	10.87	86.78
MW-5	6/30/2003	10.96	86.69
MW-5	6/21/2004	9.85	87.80
MW-5	6/27/2005	9.32	88.33
MW-5	6/28/2006	9.35	88.30
MW-5	6/15/2007	8.51	89.14
MW-5	12/26/2007	10.17	87.48
MW-5	3/12/2008	11.26	86.39
MW-5	6/2/2008	8.38	89.27
MW-5	9/22/2008	7.65	90.00
MW-5	12/5/2008	10.30	87.35
MW-5	3/2/2009	12.14	85.51
MW-5	6/10/2009	8.80	88.85

TABLE 1
GROUNDWATER LEVELS AND ELEVATIONS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet) (BTOC)	Groundwater Elevation (feet relative to site)
MW-5	9/15/2009	8.94	88.71
MW-5	12/10/2009	10.92	86.73
MW-5	3/15/2010	11.72	85.93
MW-5	6/23/2010	8.10	89.55
MW-5	9/15/2010	7.80	89.85
MW-5	12/13/2010	10.62	87.03

MW-6	6/24/1997	15.55	84.65
MW-6	5/26/1999	15.79	84.41
MW-6	6/30/2000	15.90	84.30
MW-6	6/28/2006	13.59	86.61
MW-6	6/15/2007	12.81	87.39
MW-6	12/26/2007	14.11	86.09
MW-6	3/12/2008	13.29	86.91
MW-6	6/2/2008	11.94	88.26
MW-6	9/22/2008	11.60	88.60
MW-6	12/5/2008	12.55	87.65
MW-6	3/2/2009	13.78	86.42
MW-6	6/10/2009	12.14	88.06
MW-6	9/15/2009	11.67	88.53
MW-6	12/10/2009	12.78	87.42
MW-6	3/15/2010	13.57	86.63
MW-6	6/23/2010	11.77	88.43
MW-6	9/15/2010	11.33	88.87
MW-6	12/13/2010	12.55	87.65

Notes:

BTOC = below top of casing

TABLE 2
GROUNDWATER RESULTS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)
NMWQCC Groundwater Standard		10	750	750	620
MW-3	6/14/1996	ND	ND	ND	ND
MW-3	5/26/1999	ND	NA	NA	NA
MW-3	6/30/2000	ND	ND	ND	ND
MW-4	6/14/1996	94.3	2.71	ND	106.4
MW-4	6/24/1997	44.7	0.5	0.4	3
MW-4R	6/26/1998	13.4	ND	ND	0.6
MW-4R	5/26/1999	16.4	0.9	2.1	72.2
MW-4R	6/30/2000	ND	ND	ND	ND
MW-4R	5/16/2001	ND	ND	ND	ND
MW-4R	9/25/2001	ND	ND	ND	ND
MW-4R	12/19/2001	ND	ND	ND	ND
MW-4R	2/19/2002	ND	ND	ND	ND
MW-5	6/14/1996	25.4	732	953	9,070
MW-5	6/24/1997	58.8	2.5	2.8	6,290
MW-5	6/26/1998	1270	89	41.4	3,200
MW-5	5/26/1999	174	129	252	990
MW-5	6/30/2000	38	6.4	750	6,390
MW-5	5/16/2001	49	34	700	4,480
MW-5	6/26/2002	84	ND	630	3,460
MW-5	6/30/2003	51	ND	420	2,600
MW-5	6/21/2004	39	19	490	1,200
MW-5	6/27/2005	18	44	420	1,900
MW-5	6/28/2006	60	ND	360	1,500
MW-5	6/15/2007	55	ND	240	620
MW-5	12/26/2007	ND	ND	ND	ND
MW-5	3/12/2008	28	3.6	88	290
MW-5	6/2/2008	61	4.6	300	890
MW-5	9/22/2008	10	ND	97	260
MW-5	12/5/2008	32	4.8	170	410

TABLE 2
GROUNDWATER RESULTS
ROWLAND GAS COM #1
XTO ENERGY, INC.

Well ID	Date	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)
NMWQCC Groundwater Standard		10	750	750	620
MW-5	3/2/2009	180	7.8	480	1,400
MW-5	6/10/2009	120	ND	240	590
MW-5	9/15/2009	32	< 5.0	160	380
MW-5	12/10/2009	45	< 5.0	58	110
MW-5	3/15/2010	340	< 5.0	48	110
MW-5	6/23/2010	270	13	130	350
MW-5	9/15/2010	120	<25	130	370
MW-5	12/13/2010	270	12	230	630
MW-6	6/24/1997	ND	0.6	0.5	5.4
MW-6	5/26/1999	NA	NA	NA	NA
MW-6	6/30/2000	ND	ND	ND	ND

Notes:

NA = Not Analyzed

ND - not detected above the laboratory detection limit

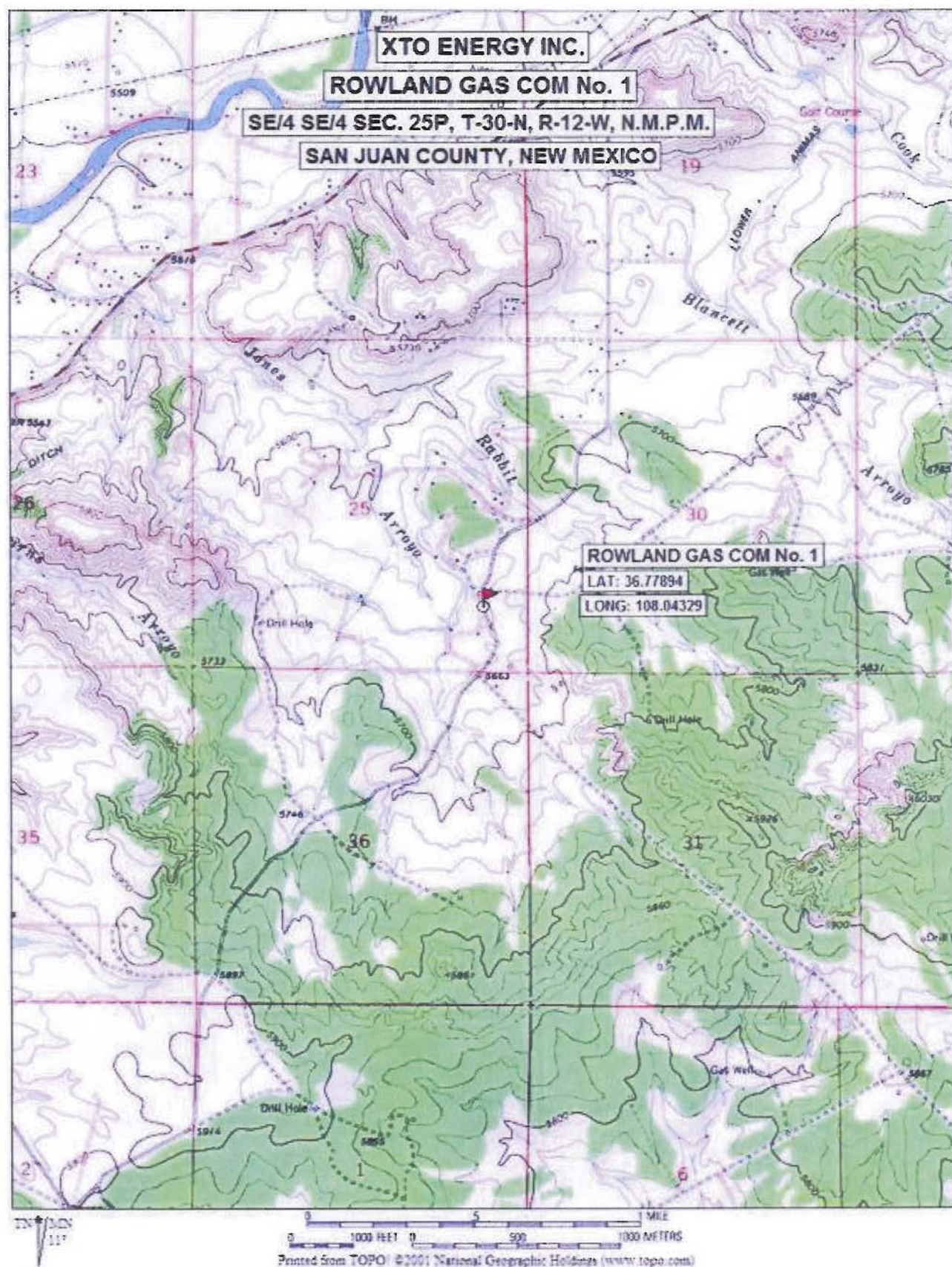
ug/l - micrograms per liter

< - indicates the result was less than the laboratory detection limit

NMWQCC - New Mexico Water Quality Control Commission

BOLD values exceed the NMWQCC Standard







CR 3100

FENCE

FENCE

BERM

PROD TANK

BERM

TANK PIT

MW-6
TOC = 101.85
GWEL = 88.48

ORIGINAL
PRODUCT TANK PIT
EXCAVATION

MW-4R
TOC = 98.07
GWEL = 86.40

MW-5
TOC = 97.65
GWEL = 84.08
B = 340
T = <5.0
E = 48
X = 110

METER RUN

SEP

MW-3
TOC = 101.68
GWEL = 86.95

ORIGINAL
SEPARATOR PIT
EXCAVATION

WELL HEAD

IRRIGATION DITCH

FLOW
DIRECTION

LEGEND

- MW-1 APPROXIMATE LOCATION OF MONITOR WELL AND NUMBER
- - - POTENTIOMETRIC SURFACE OF GROUNDWATER
- ← GROUNDWATER FLOW DIRECTION

TOC TOP OF CASING ELEVATION
GWEL GROUNDWATER ELEVATION
B BENZENE IN ug/L
T TOLUENE IN ug/L
E ETHYLBENZENE IN ug/L
X TOTAL XYLENES IN ug/L

0 50 100 FT.

ROWLAND GC#1
GROUNDWATER POTENTIOMETRIC
SURFACE MAP (03/15/10)
XTO ENERGY



03/2010



CR 3100

FENCE

FENCE

BERM

PROD
TANK

BERM

TANK
PIT

MW-6
TOC = 101.85
GWEL = 90.08

90

89.5

SEP

MW-3
TOC = 101.68
GWEL = 89.06

ORIGINAL
SEPARATOR PIT
EXCAVATION



WELL HEAD

ORIGINAL
PRODUCT TANK PIT
EXCAVATION

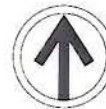
MW-4R
TOC = 98.07
GWEL = 89.19

MW-5
TOC = 97.65
GWEL = 89.55
B = 270
T = 13
E = 130
X = 360

METER RUN

IRRIGATION DITCH

FLOW
DIRECTION



0 50 100 FT.

LEGEND

MW-1

APPROXIMATE LOCATION OF MONITOR WELL AND NUMBER
POTENTIOMETRIC SURFACE OF GROUNDWATER

GROUNDWATER FLOW DIRECTION

TOC TOP OF CASING ELEVATION (IN FEET)

GWEL GROUNDWATER ELEVATION (IN FEET)

B BENZENE IN ug/L

T TOLUENE IN ug/L

E ETHYLBENZENE IN ug/L

X TOTAL XYLENES IN ug/L

ROWLAND GC#1
GROUNDWATER POTENTIOMETRIC
SURFACE MAP (06/23/10)
XTO ENERGY



07/2010

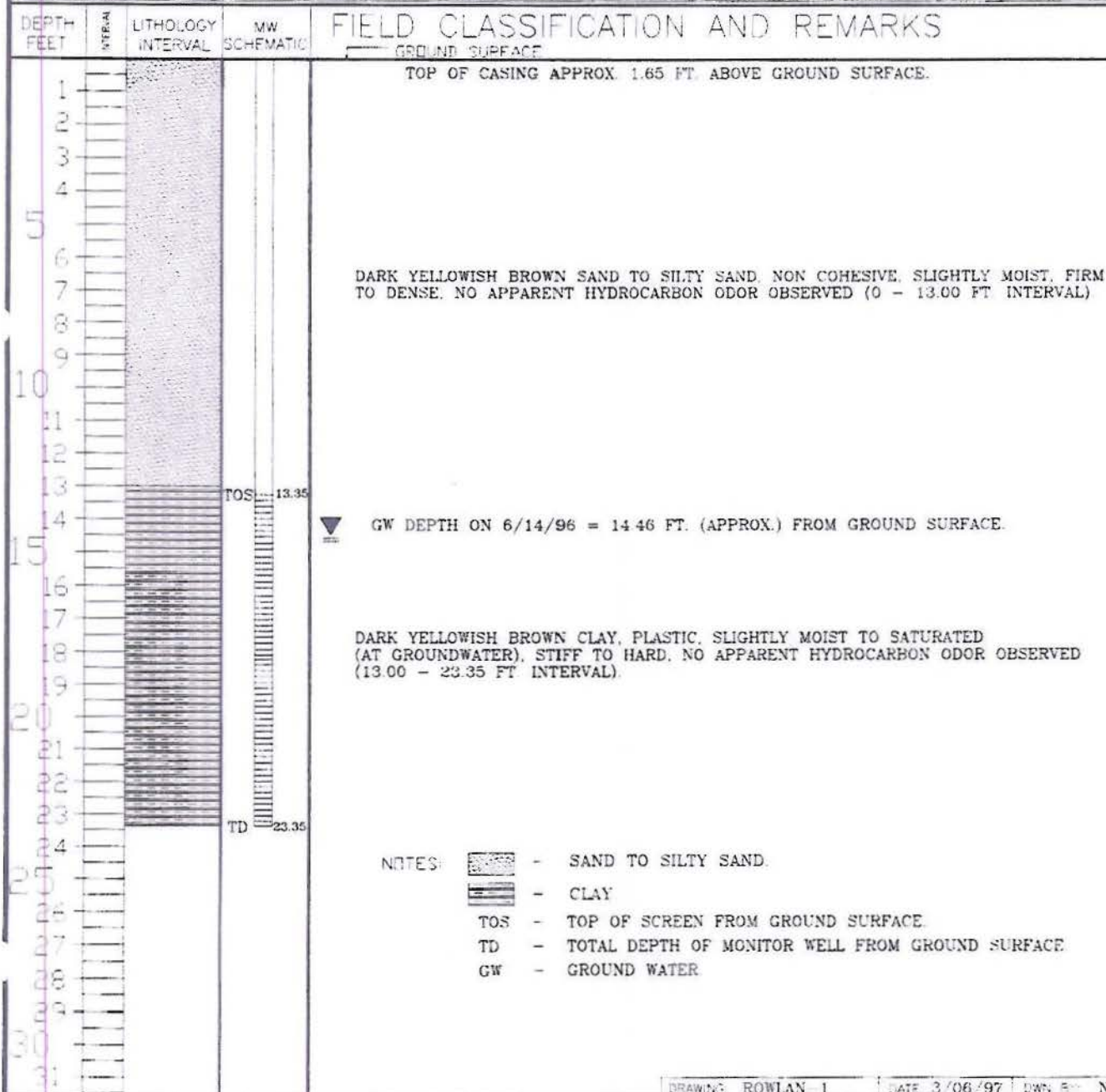
BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

BORING #..... BH - 1
MW #..... 1
PAGE #..... 1
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N18E, 201 FEET FROM WELL HEAD.



BLAGG ENGINEERING, Inc.

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BORE / TEST HOLE REPORT

BORING #..... BH - 2
MW #..... 2
PAGE #..... 2
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N23E, 156 FEET FROM WELL HEAD.

DEPTH
FEET

LITHOLOGY
INTERVAL

MW
SCHEMATIC

FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APPROX. 1.90 FT. ABOVE GROUND SURFACE.

DARK YELLOWISH BROWN SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM TO DENSE, NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 13.5 FT. INTERVAL).

TOS 13.1



GW DEPTH ON 6/14/96 = 13.54 FT. (APPROX.) FROM GROUND SURFACE.

DARK YELLOWISH BROWN CLAY, PLASTIC, SATURATED (AT GROUNDWATER), STIFF TO HARD, NO APPARENT HYDROCARBON ODOR OBSERVED (13.5 - 18.1 FT. INTERVAL).

TD 18.1

NOTES:



- SAND TO SILTY SAND.



- CLAY

TOS

- TOP OF SCREEN FROM GROUND SURFACE.

TD

- TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE

GW

- GROUND WATER.

DRAWING ROWLAN-2

DATE 3/06/97

DWN BY NJV

BLAGG ENGINEERING, Inc.

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BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N5E, 156 FEET FROM WELL HEAD.

BORING #..... BH - 3
MW #..... 3
PAGE #..... 3
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV

DEPTH
FEET

LITHOLOGY
INTERVAL

MW
SCHEMATIC

FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE


TOP OF CASING APPROX. 1.90 FT. ABOVE GROUND SURFACE.

DARK YELLOWISH BROWN SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM TO DENSE, NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 11.5 FT. INTERVAL).

▼ GW DEPTH ON 6/14/96 = 12.49 FT. (APPROX.) FROM GROUND SURFACE.

DARK YELLOWISH BROWN CLAY, PLASTIC, SATURATED (AT GROUNDWATER), STIFF TO HARD, NO APPARENT HYDROCARBON ODOR OBSERVED (11.5 - 18.1 FT. INTERVAL).

NOTES

 - SAND TO SILTY SAND.

 - CLAY.

TOS - TOP OF SCREEN FROM GROUND SURFACE.

TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.

GW - GROUND WATER.

DRAWING: ROWLAN-3

DATE: 3/06/97 DWN BY: NJV

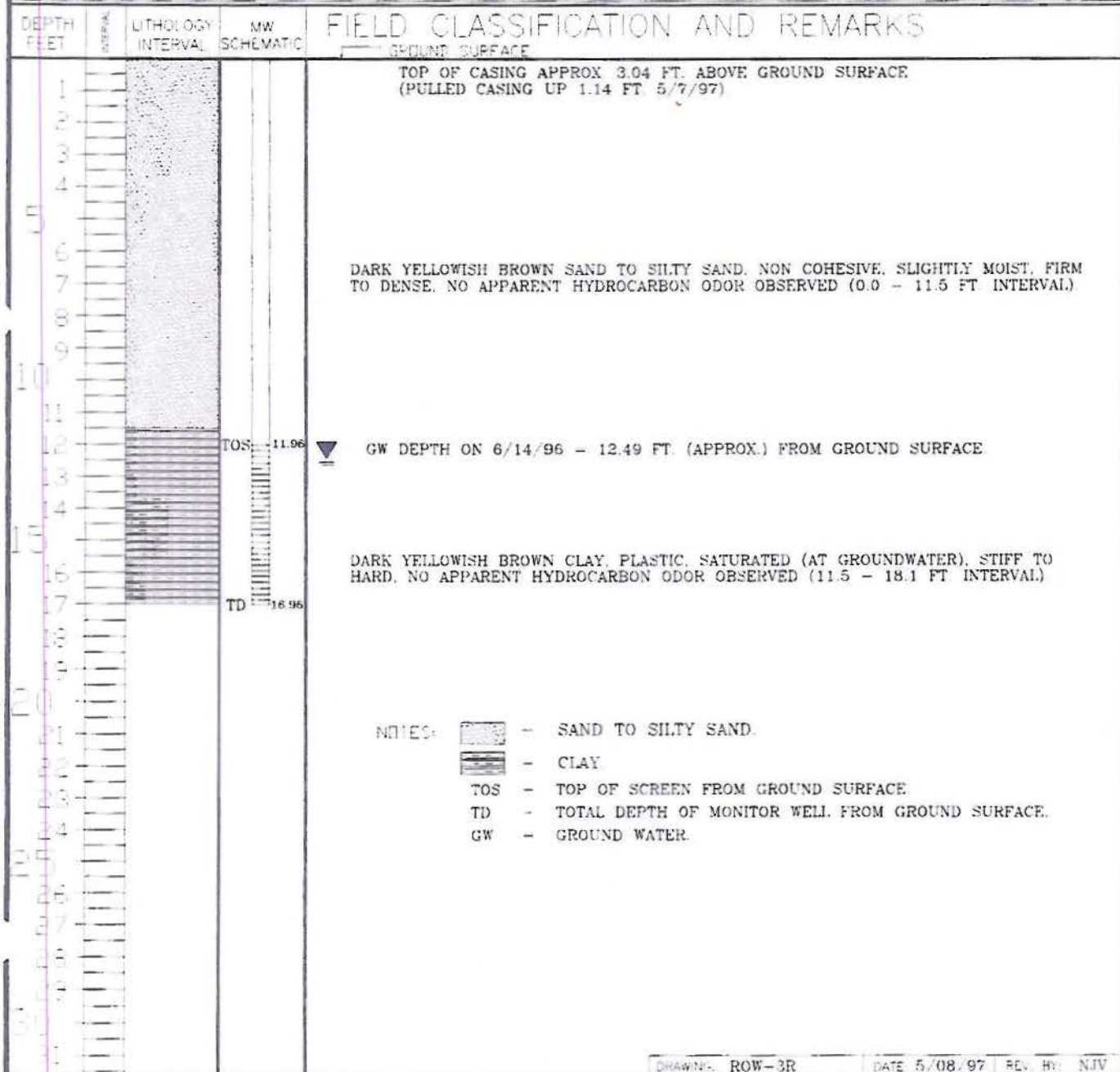
BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N5E. 156 FEET FROM WELL HEAD.

BORING #..... BH - 3
MW #..... 3
PAGE #..... 3A
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV



BLAGG ENGINEERING, Inc.

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BORE / TEST HOLE REPORT

BORING #..... BH - 4
MW #..... 4
PAGE #..... 4
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N1E, 216 FEET FROM WELL HEAD.

DEPTH FEET LITHOLOGY INTERVAL MW SCHEMATIC FIELD CLASSIFICATION AND REMARKS



GROUND SURFACE

TOP OF CASING APPROX. 4.90 FT ABOVE GROUND SURFACE

DARK YELLOWISH BROWN SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM TO DENSE, NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 10.0 FT. INTERVAL), LIGHT TO DARK MEDIUM GRAY, STRONG HYDROCARBON ODOR OBSERVED (10.0 - 11.5 FT. INTERVAL).

GW DEPTH ON 6/14/96 = 11.82 FT. (APPROX.) FROM GROUND SURFACE

DARK MEDIUM GRAY CLAY, PLASTIC, SATURATED, STIFF TO HARD, STRONG HYDROCARBON ODOR OBSERVED (11.5 - 17.1 FT. INTERVAL).

- NOTES:
-  - SAND TO SILTY SAND.
 -  - CLAY.
 - TOS - TOP OF SCREEN FROM GROUND SURFACE.
 - TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.
 - GW - GROUND WATER

BLAGG ENGINEERING, Inc.

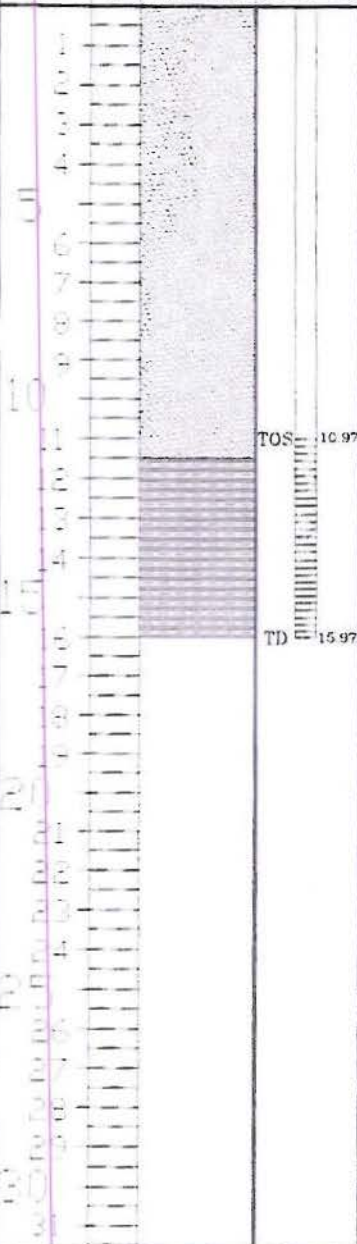
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHROBE)
BORING LOCATION: N1E, 216 FEET FROM WELL HEAD.

BORING #..... BH - 4
MW #..... 4
PAGE #..... 4A
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV

FIELD CLASSIFICATION AND REMARKS



TOP OF CASING APPROX 3.03 FT. ABOVE GROUND SURFACE
(PULLED CASING UP 1.13 FT. 5/7/97).

DARK YELLOWISH BROWN SAND TO SILTY SAND. NON COHESIVE. SLIGHTLY MOIST. FIRM TO DENSE. NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 10.0 FT. INTERVAL).
LIGHT TO DARK MEDIUM GRAY. STRONG HYDROCARBON ODOR OBSERVED (10.0 - 11.5 FT. INTERVAL)

GW DEPTH ON 6/24/97 - 10.99 FT. (APPROX.) FROM GROUND SURFACE.

DARK MEDIUM GRAY CLAY. PLASTIC. SATURATED. STIFF TO HARD. STRONG HYDROCARBON ODOR OBSERVED (11.5 - 17.1 FT. INTERVAL).

- NOTES:
- SAND TO SILTY SAND.
 - CLAY.
 - TOS - TOP OF SCREEN FROM GROUND SURFACE.
 - TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.
 - GW - GROUND WATER.

BLAGG ENGINEERING, Inc.

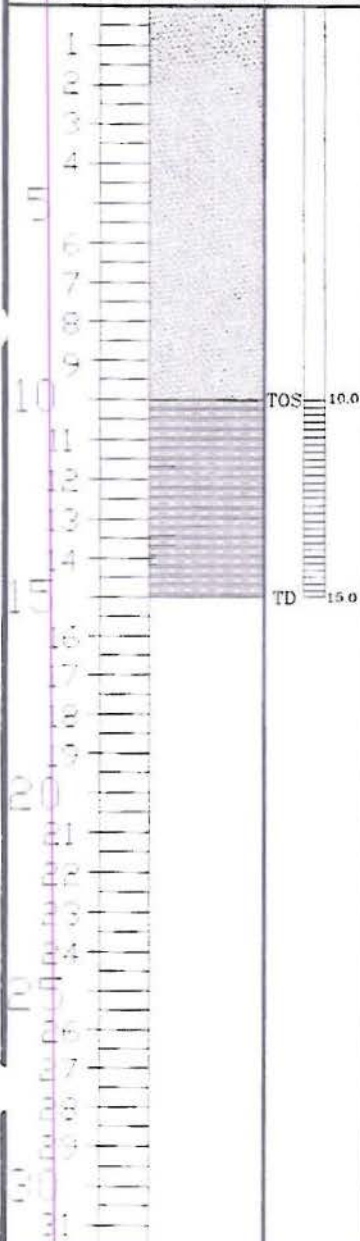
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N20W 171 FEET FROM WELL HEAD.

BORING #..... BH..... 5
MW #..... 5
PAGE #..... 5
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV

DEPTH FEET LITHOLOGY INTERVAL MW SCHEMATIC FIELD CLASSIFICATION AND REMARKS



GROUND SURFACE
TOP OF CASING FLUSH WITH GROUND SURFACE (ADDED 1.95 FT. EXTENSION FOR SAMPLING PURPOSES)

DARK YELLOWISH BROWN SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM TO DENSE, NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 8.0 FT. INTERVAL), LIGHT TO DARK MEDIUM GRAY, STRONG HYDROCARBON ODOR OBSERVED (8.0 - 10.0 FT. INTERVAL).

▼ GW DEPTH ON 6/14/96 = 8.45 FT. (APPROX.) FROM GROUND SURFACE.

DARK MEDIUM GRAY CLAY, PLASTIC, SATURATED, STIFF TO HARD, STRONG HYDROCARBON ODOR OBSERVED (10.0 - 15.0 FT. INTERVAL).

NOTES: - SAND TO SILTY SAND.
 - CLAY
TOS - TOP OF SCREEN FROM GROUND SURFACE.
TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.
GW - GROUND WATER.

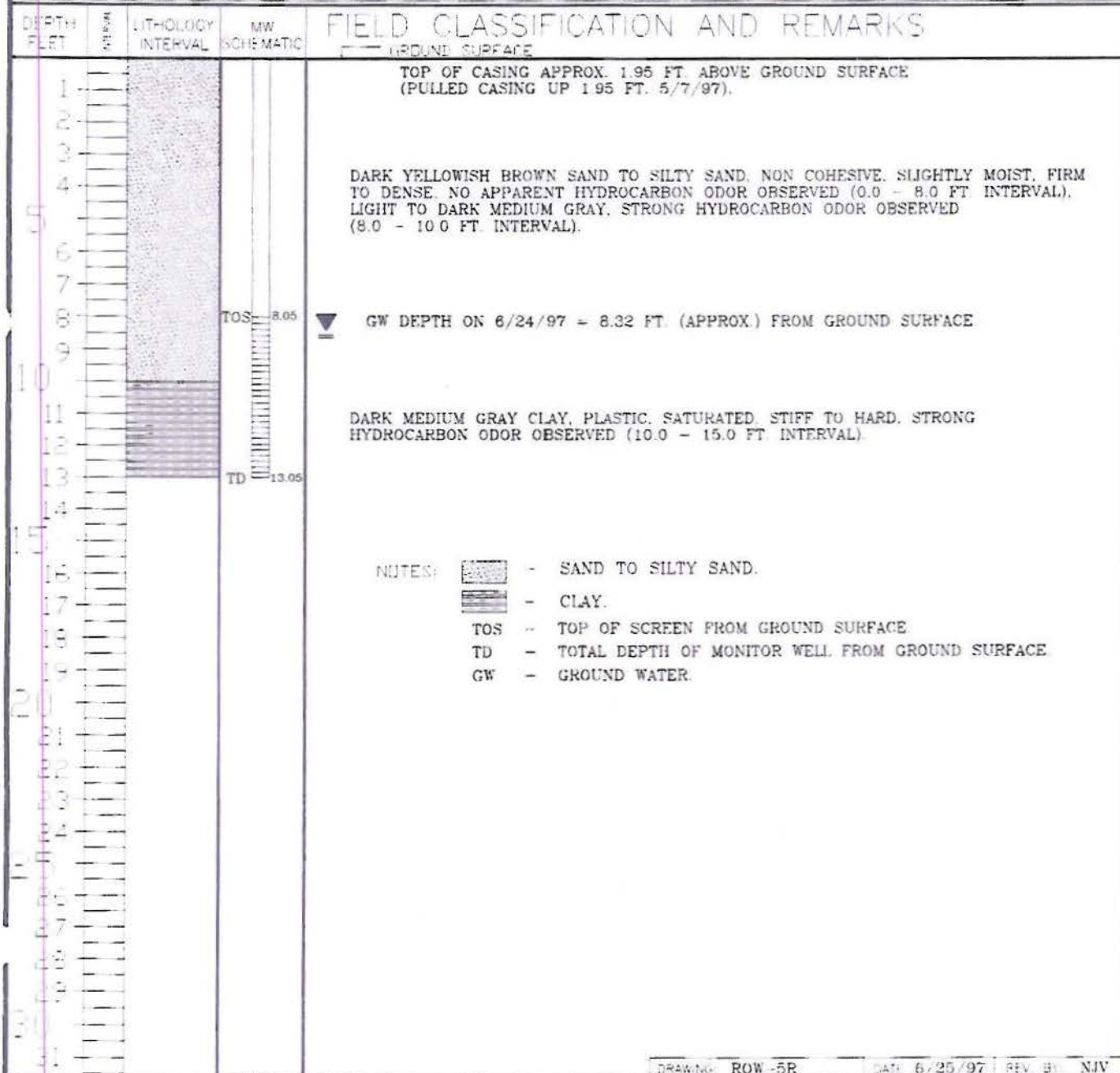
BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N20W, 171 FEET FROM WELL HEAD

BORING #..... BH - 5
MW #..... 5
PAGE #..... 5A
DATE STARTED 5/30/96
DATE FINISHED 6/03/96
OPERATOR..... JCB
PREPARED BY NJV



BLAGG ENGINEERING, Inc.

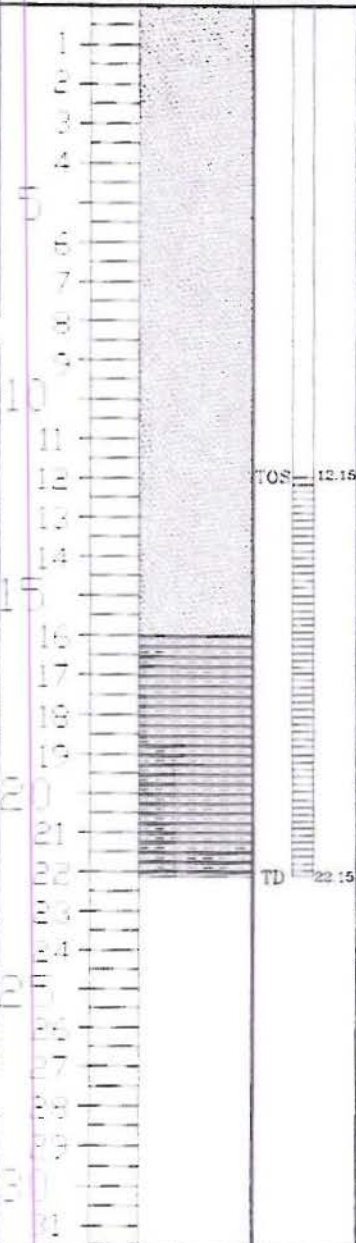
P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N10.5E. 258 FEET FROM WELL HEAD

BORING #..... BH - 6
MW #..... 6
PAGE #..... 6
DATE STARTED 6/17/97
DATE FINISHED 6/17/97
OPERATOR..... JCB
PREPARED BY NJV

FIELD CLASSIFICATION AND REMARKS



TOP OF CASING APPROX. 2.85 FT ABOVE GROUND SURFACE

DARK YELLOWISH BROWN SAND TO SILTY SAND. NON COHESIVE TO SLIGHTLY PLASTIC. SLIGHTLY MOIST, FIRM TO DENSE. NO APPARENT HYDROCARBON ODOR OBSERVED (0.0 - 16.0 FT. INTERVAL).

GW DEPTH ON 6/24/97 = 12.70 FT. (APPROX.) FROM GROUND SURFACE

LIGHT OLIVE GRAY CLAY. HIGHLY PLASTIC. SATURATED. STIFF TO HARD. NO APPARENT HYDROCARBON ODOR DETECTED (16.0 - 22.15 FT INTERVAL).

- NOTES:
- SAND TO SILTY SAND
 - CLAY
 - TOS - TOP OF SCREEN FROM GROUND SURFACE
 - TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE
 - GW - GROUND WATER

BLAGG ENGINEERING, Inc.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

LOCATION NAME: ROWLAND GC # 1
CLIENT: AMOCO PRODUCTION COMPANY
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: N9.5W, 189 FEET FROM WELL HEAD.

BORING #..... BH - 4R
MW #..... 4R
PAGE #..... 4R
DATE STARTED 6/19/98
DATE FINISHED 6/19/98
OPERATOR..... JCB
PREPARED BY NJV

DEPTH
FEET

LITHOLOGY
INTERVAL

MW
SCHEMATIC

FIELD CLASSIFICATION AND REMARKS

GROUND SURFACE

TOP OF CASING APPROX. 0.91 FT. ABOVE GROUND SURFACE.



DARK YELLOWISH BROWN SAND TO SILTY SAND, NON COHESIVE, SLIGHTLY MOIST, FIRM TO DENSE, NO APPARENT HYDROCARBON ODOR DETECTED (0.0 - 10.5 FT. INTERVAL).

TOS 9.09

GW DEPTH ON 6/26/98 = 10.61 FT. (APPROX.) FROM GROUND SURFACE.

DARK MEDIUM GRAY CLAY, PLASTIC, SATURATED, STIFF TO HARD, HYDROCARBON ODOR DETECTED (10.5 - 19.09 FT. INTERVAL).

TD 19.09

NOTES:  - SAND TO SILTY SAND.
 - CLAY.
TOS - TOP OF SCREEN FROM GROUND SURFACE.
TD - TOTAL DEPTH OF MONITOR WELL FROM GROUND SURFACE.
GW - GROUND WATER.

DRAWING: ROW-4R

DATE: 6/22/98 ORN. BY: NJV

5798 US HWY. 64, FARMINGTON, NM 87401
(505) 832-0615

C4923
94923

JOB No: 92140
PAGE No: 1 of 1

LOCATION: LEASE: Rolling WELL: GC 1 QD: -
SEC: 25 TWP: 30N RNG: 12W BM: Nm CNTY: Madison ST: Nm PIT: P800
CONTRACTOR: Bill Miller
EQUIPMENT USED: Truck

DATE STARTED: 8/2/93
DATE FINISHED: 8/3/93
ENVIRONMENTAL SPECIALIST: NJ

SOIL REMEDIATION: QUANTITY: 16 X 16 X 13
DISPOSAL FACILITY: CROWN H MESA COMPOST
LAND USE: PARTIAL RESIDENTIAL
SURFACE CONDITIONS: UNKNOWN

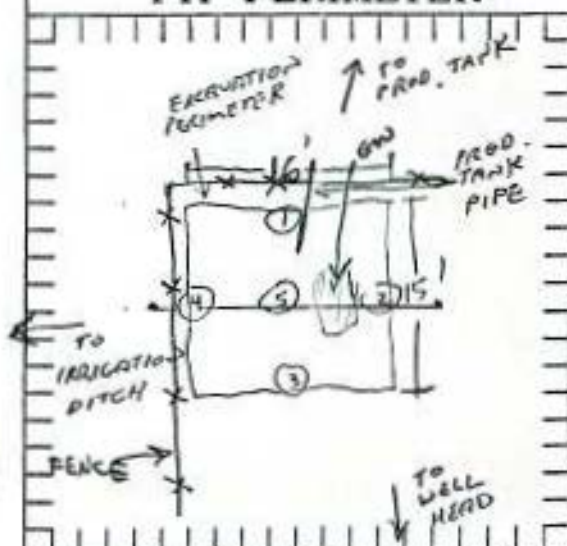
FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY 60 YARDS N10°W FROM WELLHEAD

DEPTH TO GROUNDWATER: 13'
NEAREST WATER SOURCE: < 750 FT.
NEAREST SURFACE WATER: < 100 FT.

DK. YELLOWISH BROWN TO MEDIUM DK. GRAY SAND, NON-COHESIVE, SLIGHTLY MOIST, LOOSE TO TUFF, AND STRONG odor in all BUT @ 9'. GROUNDWATER CONTAINED A SLIGHT SMOEL IN ITS SURFACE.

SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm

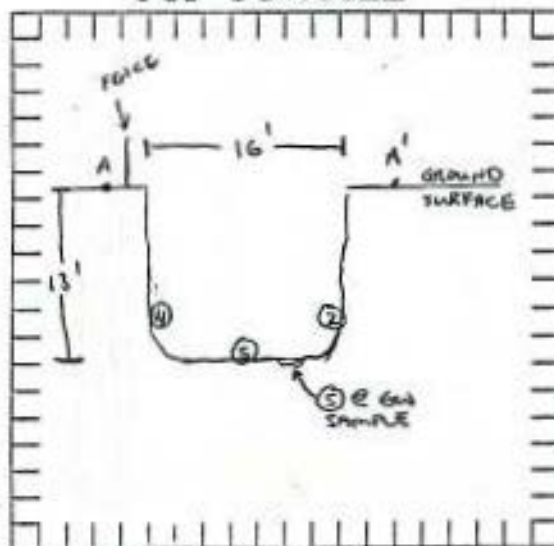
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0 FEET
PIT PERIMETER

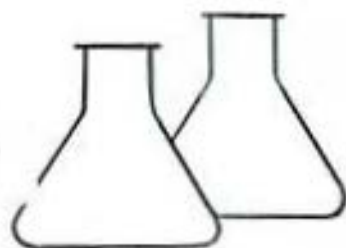
OVM RESULTS

SAMPLE ID	FIELD HEADSPACE PD (mm)
10E9 ¹	1511
10E9 ¹	1403
10E9 ¹	1675
10E9 ¹	20.6
10E9 ¹	1654
(10E9w)(13 ¹)	
RTK SAMPLE	

PIT PROFILE



TRAVEL NOTES: CALLOUT: 7/30/93 ONSITE: 8/2/93



ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020 AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	5 @ GW (13')	Date Reported:	08-04-93
Laboratory Number:	5816	Date Sampled:	08-02-93
Sample Matrix:	Water	Date Received:	08-02-93
Preservative:	HgCl & Cool	Date Analyzed:	08-03-93
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	183	0.2
Toluene	1.1	0.4
Ethylbenzene	0.3	0.2
p,m-Xylene	2.1	0.4
o-Xylene	32.3	0.3

SURROGATE RECOVERIES:	Parameter	Percent-Recovery
	Trifluorotoluene	93 %
	Bromofluorobenzene	87 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: Roland GC #1 Production Pit C4923

Kevin L. Cleaver
Analyst

Morgan D. Young
Review

COVER LETTER

Tuesday, March 23, 2010

Kim Champlin
XTO Energy
382 County Road 3100
Aztec, NM 87410

TEL: (505) 333-3100

FAX (505) 333-3280

RE: XTO Ground Water

Order No.: 1003404

Dear Kim Champlin:


Hall Environmental Analysis Laboratory, Inc. received 2 sample(s) on 3/17/2010 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology.

Please do not hesitate to contact HEAL for any additional information or clarifications.

Sincerely,


Andy Freeman, Laboratory Manager

NM Lab # NM9425 NM0901
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX



Hall Environmental Analysis Laboratory, Inc.

Date: 23-Mar-10

CLIENT: XTO Energy
Project: XTO Ground Water

Lab Order: 1003404

Lab ID: 1003404-01
Client Sample ID: MW-5 EJ Johnson C #001

Collection Date: 3/15/2010 11:04:00 AM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.0		µg/L	1	3/18/2010 1:17:32 AM
Toluene	ND	1.0		µg/L	1	3/18/2010 1:17:32 AM
Ethylbenzene	ND	1.0		µg/L	1	3/18/2010 1:17:32 AM
Xylenes, Total	ND	2.0		µg/L	1	3/18/2010 1:17:32 AM
Surr: 4-Bromofluorobenzene	103	65.9-130		%REC	1	3/18/2010 1:17:32 AM

Lab ID: 1003404-02
Client Sample ID: MW-5 Rowland GC #1

Collection Date: 3/15/2010 12:21:00 PM
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	340	5.0		µg/L	5	3/18/2010 1:47:39 AM
Toluene	ND	5.0		µg/L	5	3/18/2010 1:47:39 AM
Ethylbenzene	48	5.0		µg/L	5	3/18/2010 1:47:39 AM
Xylenes, Total	110	10		µg/L	5	3/18/2010 1:47:39 AM
Surr: 4-Bromofluorobenzene	108	65.9-130		%REC	5	3/18/2010 1:47:39 AM

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- E Estimated value
- J Analyte detected below quantitation limits
- NC Non-Chlorinated
- PQL Practical Quantitation Limit

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: XTO Energy
 Project: XTO Ground Water

Work Order: 1003404

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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Method: EPA Method 8021B: Volatiles

Sample ID: 5ML RB

MBLK

Batch ID: R37811 Analysis Date: 3/17/2010 8:38:02 AM

Benzene	ND	µg/L	1.0
Toluene	ND	µg/L	1.0
Ethylbenzene	ND	µg/L	1.0
Xylenes, Total	ND	µg/L	2.0

Sample ID: 100NG BTEX LCS

LCS

Batch ID: R37811 Analysis Date: 3/17/2010 6:13:43 PM

Benzene	20.32	µg/L	1.0	20	0	102	85.9	113
Toluene	19.57	µg/L	1.0	20	0	97.8	86.4	113
Ethylbenzene	19.47	µg/L	1.0	20	0	97.3	83.5	118
Xylenes, Total	58.05	µg/L	2.0	60	0	96.8	83.4	122

Qualifiers:

E Estimated value
 J Analyte detected below quantitation limits
 ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded
 NC Non-Chlorinated
 R RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name **XTO ENERGY**

Date Received:

3/17/2010

Work Order Number **1003404**

Received by: **TLS**

Checklist completed by:

Signature



3/17/10

Date

Sample ID labels checked by:

Initials



Matrix:

Carrier name: Greyhound

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>	
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>	Not Shipped <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Water - VOA vials have zero headspace?	No VOA vials submitted <input type="checkbox"/>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Water - Preservation labels on bottle and cap match?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	

Number of preserved
bottles checked for
pH:

<2 >12 unless noted
below.

Container/Temp Blank temperature?

3.8°

<6° C Acceptable

If given sufficient time to cool.

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Client: XTO
Kim Champlin
 Mailing Address: 382 CR 3100
AZtec, NM 87410
 Phone #: 505-333-3207
 email or Fax#:
 QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
 Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

☒ Standard ☐ Rush

Project Name:

XTO Groundwater

Project #:

Project Manager:

Ashlet Ager

Sampler: Devin Hermann

On Ice: ☒ Yes ☐ No

Sample Temperature: 38

[illegible]

Date:	Time:	Relinquished by:
3/16/10	18:30	FWZ

Received by:	Date	Time
19	2/17/12	835

Remarks:	Please forward results to aager@ltenv.com
----------	--



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

[illegible]

COVER LETTER

Tuesday, July 06, 2010

Kim Champlin
XTO Energy
382 County Road 3100
Aztec, NM 87410

TEL: (505) 333-3207

FAX (505) 333-3280

RE: XTO Groundwater

Order No.: 1006834

Dear Kim Champlin:

Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 6/24/2010 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites.

Reporting limits are determined by EPA methodology.

Please do not hesitate to contact HEAL for any additional information or clarifications.

Sincerely,



Andy Freeman, Laboratory Manager

NM Lab # NM9425 NM0901
AZ license # AZ0682
ORELAP Lab # NM100001
Texas Lab# T104704424-08-TX



Hall Environmental Analysis Laboratory, Inc.

Date: 06-Jul-10

CLIENT: XTO Energy

Client Sample ID: Rowland GC #1 MW-5

Lab Order: 1006834

Collection Date: 6/23/2010 3:07:00 PM

Project: XTO Groundwater

Date Received: 6/24/2010

Lab ID: 1006834-01

Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	13		µg/L	5	7/2/2010 12:33:23 AM
Benzene	270	5.0		µg/L	5	7/2/2010 12:33:23 AM
Toluene	13	5.0		µg/L	5	7/2/2010 12:33:23 AM
Ethylbenzene	130	5.0		µg/L	5	7/2/2010 12:33:23 AM
Xylenes, Total	350	10		µg/L	5	7/2/2010 12:33:23 AM
1,2,4-Trimethylbenzene	95	5.0		µg/L	5	7/2/2010 12:33:23 AM
1,3,5-Trimethylbenzene	11	5.0		µg/L	5	7/2/2010 12:33:23 AM
Surr: 4-Bromofluorobenzene	107	65.9-130		%REC	5	7/2/2010 12:33:23 AM

Qualifiers:

* Value exceeds Maximum Contaminant Level
E Estimated value
J Analyte detected below quantitation limits
NC Non-Chlorinated
PQL Practical Quantitation Limit

B Analyte detected in the associated Method Blank
H Holding times for preparation or analysis exceeded
MCL Maximum Contaminant Level
ND Not Detected at the Reporting Limit
S Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: XTO Energy
Project: XTO Groundwater

Work Order: 1006834

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
---------	--------	-------	-----	--------	---------	------	----------	-----------	------	----------	------

Method: EPA Method 8021B: Volatiles

Sample ID: 5ML RB

MBLK

Batch ID: R39611 Analysis Date: 7/1/2010 9:56:08 AM

Methyl tert-butyl ether (MTBE)	ND	µg/L	2.5
Benzene	ND	µg/L	1.0
Toluene	ND	µg/L	1.0
Ethylbenzene	ND	µg/L	1.0
Xylenes, Total	ND	µg/L	2.0
1,2,4-Trimethylbenzene	ND	µg/L	1.0
1,3,5-Trimethylbenzene	ND	µg/L	1.0

Sample ID: 100NG BTEX LCS

LCS

Batch ID: R39611 Analysis Date: 7/1/2010 7:30:24 PM

Methyl tert-butyl ether (MTBE)	20.75	µg/L	2.5	20	0	104	82.5	129
Benzene	22.32	µg/L	1.0	20	0	112	87.9	121
Toluene	20.50	µg/L	1.0	20	0	103	83	124
Ethylbenzene	19.85	µg/L	1.0	20	0	99.3	81.7	122
Xylenes, Total	62.17	µg/L	2.0	60	0	104	85.6	121
1,2,4-Trimethylbenzene	19.47	µg/L	1.0	20	0	97.3	85.7	112
1,3,5-Trimethylbenzene	21.03	µg/L	1.0	20	0	105	90.5	120

Qualifiers:

E Estimated value
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit

H Holding times for preparation or analysis exceeded
NC Non-Chlorinated
R RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name XTO ENERGY

Date Received:

6/24/2010

Work Order Number 1006834

Received by: TLS

KS

Checklist completed by:

Signature

Date

6/24/10 Sample ID labels checked by:

Initials

Matrix:

Carrier name: Greyhound

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☒

No ☐

Not Present ☐

Not Shipped ☐

Custody seals intact on sample bottles?

Yes ☒

No ☐

N/A ☐

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Number of preserved bottles checked for pH:

Water - VOA vials have zero headspace?

No VOA vials submitted ☐

Yes ☒

No ☐

Water - Preservation labels on bottle and cap match?

Yes ☒

No ☐

N/A ☐

Water - pH acceptable upon receipt?

Yes ☒

No ☐

N/A ☐

<2 >12 unless noted below.

Container/Temp Blank temperature?

4.3°

<6° C Acceptable

If given sufficient time to cool.

COMMENTS:

Client contacted

Date contacted:

Person contacted

Contacted by:

Regarding:

Comments:

Corrective Action

Client: XTO

Kim Champlin

Mailing Address: 382 CR 3100
Aztec, NM 87410

Phone #: 505-333-3207

email or Fax#:

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other _____

☐ EDD (Type) _____

☒ Standard ☐ Rush

XTO Ground Water

Project Manager:

Ashley Ager

Sampler: Brooke Herb

On Ice ☒ Yes ☐ No

Sample Temperature 4.

Date	Time	Matrix	Sample Request ID
------	------	--------	-------------------

Container Type and #	Material	Quantity	Remarks
1
2
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99
100

Preservative
Type

HFAI No.

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)

BCRA & Metals

Anions (F, Cl, NO₃, NO₂, PO₄, SO₄)

3081 Pesticides / 8082 PCB's

8260B (VOA)

(WOL) 70007

9268




RTPK 0071

[illegible]

Air Bubbles (Y or N)

Date:	Time:	Relinquished by:
6/23/10	2100	<i>[Signature]</i>

Date:	Time:	Relinquished by:
-------	-------	------------------

Received by:  Date  Time 

Received by: Date Time

Remarks:

Please Forward Results to
aqger@itenv.com



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Mt. Juliet, TN 37122
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Est. 1970

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

Report Summary

Wednesday September 22, 2010

Report Number: L479159

Samples Received: 09/16/10

Client Project: XTO1002

Description: Rowland Gas COM #1

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Daphne Richards , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Where applicable, sampling conducted by ESC is performed per guidance provided
in laboratory standard operating procedures: 060302, 060303, and 060304.



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REPORT OF ANALYSIS

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

September 22, 2010

Date Received : September 16, 2010
Description : Rowland Gas COM #1
Sample ID : MW-5
Collected By : Brooke Herb
Collection Date : 09/15/10 13:11

ESC Sample # : L479159-01

Site ID :

Project # : XTO1002

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.12	0.0025	mg/l	8021B	09/21/10	5
Toluene	BDL	0.025	mg/l	8021B	09/21/10	5
Ethylbenzene	0.13	0.0025	mg/l	8021B	09/21/10	5
Total Xylene	0.37	0.0075	mg/l	8021B	09/21/10	5
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021B	09/21/10	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 09/22/10 09:05 Printed: 09/22/10 10:07








[illegible]

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquisher by: (Signature) 	Date: 7/15/10	Time: 1430	Received by: (Signature) 	Samples returned via: FedEx_X_UPS_Other_ 434198101060	Condition (lab use only) E
Relinquisher by: (Signature) 	Date: 7/15/10	Time: 1430	Received by: (Signature) 	Temp: 3.7°C	Bottles Received: 2V
Relinquisher by: (Signature) 	Date: 7/16/10	Time: 0900	Received for lab by: (Signature) 	Date: 7/16/10	Time: 0900
				pH Checked:	NCF: 



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James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

Report Summary

Thursday December 16, 2010

Report Number: L493530

Samples Received: 12/14/10

Client Project: XT01002

Description: XTO GW Monitoring

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Daphne Richards, ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

James McDaniel
XTO Energy - San Juan Division
382 Road 3100
Aztec, NM 87410

December 16, 2010

Date Received : December 14, 2010
Description : XTO GW Monitoring
Sample ID : ROWLAND MW-S
Collected By : Julie Linn
Collection Date : 12/13/10 10:43

ESC Sample # : L493530-01
Site ID : ROWLAND GC 1
Project # : XT01002

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.27	0.0050	mg/l	8021B	12/15/10	10
Toluene	0.012	0.0050	mg/l	8021B	12/14/10	1
Ethylbenzene	0.23	0.00050	mg/l	8021B	12/14/10	1
Total Xylene	0.63	0.015	mg/l	8021B	12/15/10	10
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene (PID)	102.		% Rec.	8021B	12/14/10	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 12/16/10 16:53 Printed: 12/16/10 16:54

Summary of Remarks For Samples Printed
12/16/10 at 16:54:04

TSR Signing Reports: 288
R5 - Desired TAT

Charge \$10.00 Shipping Fee on every project-DV 12-14-10

Sample: L493530-01 Account: XTORNM Received: 12/14/10 09:00 Due Date: 12/21/10 00:00 RPT Date: 12/16/10 16:53



YOUR LAB OF CHOICE

XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

L493530

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December 16, 2010

Analyte	Result	Laboratory Blank Units	% Rec	Limit	Batch	Date Analyzed
Ethylbenzene	< .0005	mg/l			WG513175	12/14/10 16:45
Toluene	< .005	mg/l			WG513175	12/14/10 16:45
a,a,a-Trifluorotoluene (PID)		% Rec.	99.44	55-122	WG513175	12/14/10 16:45
Benzene	< .0005	mg/l			WG513363	12/15/10 11:50
Total Xylene	< .0015	mg/l			WG513363	12/15/10 11:50
a,a,a-Trifluorotoluene (PID)		% Rec.	101.2	55-122	WG513363	12/15/10 11:50

Analyte	Units	Laboratory Control Sample Known Val	Result	% Rec	Limit	Batch
Ethylbenzene	mg/l	.05	0.0478	95.6	80-116	WG513175
Toluene	mg/l	.05	0.0464	92.9	79-112	WG513175
a,a,a-Trifluorotoluene (PID)				98.06	55-122	WG513175
Benzene	mg/l	.05	0.0443	88.6	79-114	WG513363
Total Xylene	mg/l	.15	0.148	98.9	84-118	WG513363
a,a,a-Trifluorotoluene (PID)				99.08	55-122	WG513363

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Ethylbenzene	mg/l	0.0504	0.0478	101.	80-116	5.27	20	WG513175
Toluene	mg/l	0.0474	0.0464	95.0	79-112	2.09	20	WG513175
a,a,a-Trifluorotoluene (PID)				99.78	55-122			WG513175
Benzene	mg/l	0.0457	0.0443	91.0	79-114	3.13	20	WG513363
Total Xylene	mg/l	0.148	0.148	99.0	84-118	0.200	20	WG513363
a,a,a-Trifluorotoluene (PID)				98.65	55-122			WG513363

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Ethylbenzene	mg/l	0.0478	0	.05	95.6	39-141	L493210-18	WG513175
Toluene	mg/l	0.0465	0	.05	93.0	35-148	L493210-18	WG513175
a,a,a-Trifluorotoluene (PID)					98.89	55-122		WG513175
Benzene	mg/l	0.0682	0.0220	.05	92.5	35-147	L493534-01	WG513363
Total Xylene	mg/l	0.584	0.420	.15	109.	33-151	L493534-01	WG513363
a,a,a-Trifluorotoluene (PID)					93.81	55-122		WG513363

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Ethylbenzene	mg/l	0.0488	0.0478	97.7	39-141	2.15	20	L493210-18	WG513175
Toluene	mg/l	0.0472	0.0465	94.4	35-148	1.52	20	L493210-18	WG513175
a,a,a-Trifluorotoluene (PID)				100.3	55-122				WG513175
Benzene	mg/l	0.0670	0.0682	90.1	35-147	1.77	20	L493534-01	WG513363
Total Xylene	mg/l	0.574	0.584	103.	33-151	1.65	20	L493534-01	WG513363
a,a,a-Trifluorotoluene (PID)				94.10	55-122				WG513363

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

XTO Energy - San Juan Division
James McDaniel
382 Road 3100

Aztec, NM 87410

Quality Assurance Report
Level II

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December 16, 2010

Batch number / Run number / Sample number cross reference

WG513175: R1505050: L493530-01
WG513363: R1505529: L493530-01

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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December 16, 2010

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

[illegible]

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other_____

pH _____ Temp _____

Remarks:

Flow	Other
1	2
3	4
5	6
7	8
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67	68
69	70
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73	74
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77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

Relinquisher by: (Signature) <i>[Signature]</i>	Date: <i>12/13/10</i>	Time: <i>1600</i>	Received by: (Signature) <i>[Signature]</i>	Samples returned via: FedEx_X_ UPS_ Other_	Condition (lab use only)
Relinquisher by: (Signature)	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: <i>3.4°</i>	Bottles Received: <i>2</i>
Relinquisher by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: <i>12/14/10</i>	pH Checked: <i>0900</i> NCF: