



June 4, 2014

Ms. Theresa Santangelo-Dreiling
Colorado Department of Transportation
15285 South Golden Road
Building 47
Golden, Colorado 80401

Project No. 10014-013003.05

Subject: Site Characterization Report
Former Acorn Bulk Facility #33
400 South Santa Fe Avenue
Pueblo, Colorado
OPS Event ID Number: 11938

Dear Ms. Santangelo-Dreiling:

Bureau Veritas North America, Inc. (BVNA) is pleased to submit the Site Characterization Report (SCR) for the above-referenced site.

Thank you for the opportunity to provide these services. If you have any questions or comments about this report, please call us at (303) 988-2585.

Sincerely,

William Allen
Consultant
Health, Safety, and Environmental Services
Denver Regional Office

Agatha Linger
Project Manager
Health, Safety, and Environmental Services
Denver Regional Office

Attachments: SCR
Figures
Laboratory Reports
Supporting Documents
Narrative

CC: Colorado Department of Labor and Employment, Division of Oil and Public Safety

Bureau Veritas North America, Inc.

Health, Safety, and Environmental Services

165 South Union Boulevard, Suite 310

Lakewood, CO 80228

Main: (303) 988.2585

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www.us.bureauveritas.com



SCR



Department of Labor and Employment

Division of Oil and Public Safety

Remediation Section

633 17th Street, Suite 500

Denver, CO 80202-3660

303-318-8547 (technical assistance)

Website: www.colorado.gov/cdle/remediation

Select One Report from the list:

Site Characterization Report

Facility ID: 363
Event ID: 11938
Reporting Period: Qtr 2
Year: 2014
Submittal Date: June 4, 2014

SSF or ISRA submitted: November 18, 2013
SCR submitted: June 4, 2014
Original CAP submitted:

Version 1.2.1
September 30, 2013

Site Information

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

SITE INFORMATION					
Site Name:	Acorn Bulk Facility #33	Business on Site:	Retail Gas Station		
Site Address:	400 South Santa Fe				
City:	Pueblo	County:	Pueblo	Zip Code:	81003
Latitude:	° 00' 38"	Longitude:	-° 01' 05"		
PROPERTY OWNER INFORMATION					
Name:	Colorado Department of Transportation				
Address:	1480 Quail Lakes Loop				
City:	Colorado Springs	State:	Colorado	Zip Code:	80906
Phone Number:	719.546.5413	Fax Number:			
Contact Person:	Amber Billings	Email:	amber.billings@state.co.us		
RESPONSIBLE PARTY INFORMATION					
Name:	Colorado Department of Transportation				
Address:	1480 Quail Lakes Loop				
City:	Colorado Springs	State:	Colorado	Zip Code:	80906
Phone Number:	719.546.5413	Fax Number:			
Contact Person:	Amber Billings	Email:	amber.billings@state.co.us		
ENVIRONMENTAL CONSULTANT INFORMATION					
Name:	Bureau Veritas North America, Inc.				
Address:	165 South Union Boulevard				
City:	Lakewood	State:	Colorado	Zip Code:	80228
Phone Number:	303-988-2585	Fax Number:	303-988-2583		
Contact Person:	Agatha Linger	Email:	agatha.linger@us.bureauveritas.com		
RELEASE INFORMATION					
Date Release was Suspected	9/16/2013	Date OPS was notified of suspected release	9/17/2013		
Date Release was Confirmed	10/2/2013	Date OPS was notified of confirmed release	10/2/2013		
Product Released:	other	How was Release Discovered:	Tank Closure - Removal		
Source of Release:	Other	Quantity in Gallons:	Unknown		
Cause of Release:	Other				
Provide Brief Description of System Repair:					
PREVIOUS RELEASE INFORMATION					
Date of Prior Release	Event ID	Product	Quantity (Gallons)	Source of Release	Date NFA Letter Issued
TANK INFORMATION				RESPONSE	
Is the facility open and actively dispensing fuel?				No	
If the facility no longer dispenses fuel what is the current use of the property?				None	
Number of tanks in use (locate tanks, piping, and dispensers on site map)				0	
Number of tanks in temporary closure (locate tanks, piping, and dispensers on site map)				0	
Number of tanks removed (locate tanks, piping, and dispensers on site map)				6	
Tanks closed in place (locate tanks, piping, and dispensers on site map)				0	
Date(s) of tank closure				9/17/2013	
SITE LITHOLOGY AND AQUIFER PARAMETERS				RESPONSE	
Predominant lithology in the unsaturated zone				Sandy Clay	
Predominant lithology in the saturated zone				Gravelly Sand	
Date of hydraulic conductivity test. Include and label test data in 'Other Documents' tab.				5/19/2014	
Hydraulic conductivity of the impacted aquifer in cm/sec (estimated)				0.0018	
Estimated effective porosity in the saturated zone (%)				30%	
Hydraulic gradient				0.0013	
Estimated groundwater flow velocity in ft/day (1 cm/sec = approximately 2,835 ft/day)				0.02	
General flow direction during this reporting period				SSW	
Historically predominant flow direction				SW	
OTHER POTENTIAL SOURCES				RESPONSE	
Are there offsite sources that may account for the contamination found? If yes, detail in the narrative.				Yes	

Water Well and Surface Water Data Table

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Permit Number or Surface Water Designation*	Geographic Location (Lat/Long or T/R/S)	Approx. Direction From Site	Approx. Distance From Site (ft)	Listed Uses	Well Depth	Water Level	Top of Screen	Pumping Rate	Potential Point of Exposure?	Rationale for Elimination
23029F	20S/64W/31	WSW	830	1,8	1400				Yes	Downgradient
21050F	20S/64W/31	NNW	1000	4	30				No	Crossgradient
21051F	20S/64W/31	NNW	1000	Q	30				No	Crossgradient
24050F	20S/64W/31	NNW	1100	1					No	Crossgradient
26706	20S/64W/31	SSE	1200	8					No	Crossgradient
8292	20S/64W/31	SSE	1400	8	20				No	Crossgradient
526	20S/64W/31	SSE	2700	8	30				No	Crossgradient
20737	20S/64W/31	SSE	2800	8	38	15			No	Crossgradient
15008	20S/64W/31	SSW	2900	8	30	10			Yes	Downgradient
21047F	20S/64W/31	SSW	2900	Q	290				Yes	Downgradient
21046F	20S/64W/31	SSW	2900	Q	290				Yes	Downgradient
21048	20S/64W/31	SSW	2900	4	45	22			Yes	Downgradient
21045F	20S/64W/31	SSW	2900	Q	31				Yes	Downgradient
21049	20S/64W/31	SSW	2900	Q	31				Yes	Downgradient
21052	20S/64W/31	SSW	2900	3	31				Yes	Downgradient
43R	20S/64W/31	NW	3400	4	27	14			No	Crossgradient
26354	20S/64W/31	SW	3600	8	30	20			Yes	Downgradient
3680F	20S/64W/31	NE	4800	1	33	6			No	Crossgradient

Information from the Colorado Division of Water Resources. AT A MINIMUM, input an identifier and the distance from the site.

Colorado Division of Water Resources Listed Uses

0 STORAGE	A AUGMENTATION
1 IRRIGATION	B EXPORT FROM BASIN
2 MUNICIPAL	C CUMULATIVE ACCRETION TO RIVER
3 COMMERCIAL	D CUMULATIVE DEPLETION FROM RIVER
4 INDUSTRIAL	E EVAPORATIVE
5 RECREATION	F FEDERAL RESERVED
6 FISHERY	G GEOTHERMAL
7 FIRE	H HOUSEHOLD USE ONLY
8 DOMESTIC	K SNOW MAKING
9 STOCK	M MINIMUM STREAMFLOW
	N NET EFFECT ON RIVER
	P POWER GENERATION
	Q OTHER
	R RECHARGE
	S EXPORT FROM STATE
	T TRANSMOUNTAIN EXPORT
	W WILDLIFE
	X ALL BENEFICIAL USES

Groundwater Laboratory and Elevations Table

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Well ID	Date	Benzene (mg/L)	Toluene (mg/L)	Ethyl-Benzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	TVPH (mg/L)	TEPH (mg/L)	TOC (ft)	TOS (ft)	BOS (ft)	Well Diameter (in)	Water Table Elevation, Corrected for Product Thickness (ft)	Depth to Water (ft)	Depth to Product (ft)	Product Thickness (ft)	GW Above TOS	GW Column above BOS (ft)	Well Status (if not sampled)
A-01	08/08/12	0.0140	0.0160	0.0055	0.0180		4.1000	0.6600	4650.08			1.0	4639.89	10.19		0	YES	4639.89	
A-02E	08/08/12	0.0005	0.0050	0.0005	0.0015		0.0100	0.0100	4647.65			1.0	4640.54	7.11		0	YES	4640.54	
GW-1	09/17/13	0.0610	0.1000	1.4000	6.7000		89.0000	6.4000					-10.50	10.50		0	no	-10.50	
GW-2	09/19/13	2.7000	5.0000	0.0900	2.4000		30.0000	37.7000					-10.50	10.50		0	no	-10.50	
GW-3	09/19/13	3.0000	5.4000	0.0190	2.4000		49.0000	6.1100					-10.50	10.50		0	no	-10.50	
MW-07	02/07/13	0.0010	0.0010	0.0010	0.0010	0.0010	1.2000	0.3410	4650.92	4641.35	4631.35	2.0	4640.28	10.64		0	no	8.93	
MW-08	02/07/13	0.0010	0.0010	0.2200	0.2300	0.0010	8.1000	3.5000	4650.34	4640.92	4630.92	2.0	4640.22	10.12		0	no	9.30	
MW-15	05/15/14	0.0010	0.0010	0.0010	0.0010	0.0010	0.5000	0.1000	4647.00	4647.42	4631.58	2.0	4639.88	7.12		0	no	8.30	
MW-16	05/15/14	0.0010	0.0010	0.0077	0.0170	0.0010	9.6000	3.0100	4647.92	4648.24	4632.50	2.0	4639.55	8.37		0	no	7.05	
MW-17	05/14/14	0.0010	0.0010	0.0010	0.0010	0.0010	0.5000	0.2240	4648.16	4648.41	4633.07	2.0	4639.78	8.38		0	no	6.71	
MW-18	05/14/14	0.0010	0.0010	0.0010	0.0010	0.0010	0.5000	0.1000	4649.66	4650.02	4634.26	2.0	4639.74	9.92		0	no	5.48	
MW-19	05/14/14	0.0010	0.0010	0.0430	0.0190	0.0010	9.4000	2.4700	4649.54	4649.96	4634.22	2.0	4639.65	9.89		0	no	5.43	
MW-20	05/15/14	0.0010	0.0010	0.0010	0.0010	0.0010	0.5000	0.1000	4649.98	4650.32	4634.53	2.0	4639.61	10.37		0	no	5.08	

If concentration is less than the stated laboratory detection limit, list the detection limit (not ND); e.g. 0.0005

TOC = Surveyed elevation top of casing

TOS = Elevation top of screen

BOS = Elevation bottom of screen

mg/L = milligrams per liter

DRY =Dry

DES =Destroyed

INA =Inaccessible (mention why in the narrative)

NOP =Not on Monitoring Plan

FP =Free Product Present

Secondary Groundwater Parameters Table

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Click on a cell in the section in which you wish the additional row. Then click "New Row"														
Sample Location	Date	Dissolved Oxygen (mg/L)	Temp. (°C)	pH	Specific Conductance (µS/cm)	ORP (mV)	NO3- (mg/L)	Total Fe (mg/L)	Fe ⁺² (mg/L)	SO ₄ ⁻² (mg/L)	Alkalinity (mg/L)	Other* (units)	Other* (units)	Other* (units)
MW-07	02/06/13	0.87	15.9	7.3	925	37								
MW-08	02/06/13	2.12	15.7	7.5	646	-19								
MW-15	05/14/14	1.60	13.9	7.2	1640	-84								
MW-16	05/14/14	0.37	13.4	7.4	780	-93								
MW-17	05/14/14	2.19	14.9	7.3	1210	-55								
MW-18	05/14/14	0.60	15.9	6.9	1210	-65								
MW-19	05/14/14	0.38	16.0	6.9	1140	-75								
MW-20	05/14/14	0.50	15.7	7.0	1360	-73								

*List other analytes in header

Groundwater Contamination Trends

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Click on a cell in the section in which you wish the additional row. Then click "New Row"					Water Table Elevation, Corrected for Product Thickness (ft)	Depth to Water (ft)	Depth to Product (ft)	Product Thickness (ft)
Well Location	Well ID	Date	Benzene (mg/L)	TOC (ft)				
Source	MW-17	05/14/14	0.0010	4647.00	4639.88	7.12		0
Mid-plume	MW-19	05/14/14	0.0010	4649.54	4639.65	9.89		0
Downgradient	MW-20	05/15/14	0.0010	4649.98	4639.61	10.37		0

TOC = Surveyed elevation top of casing

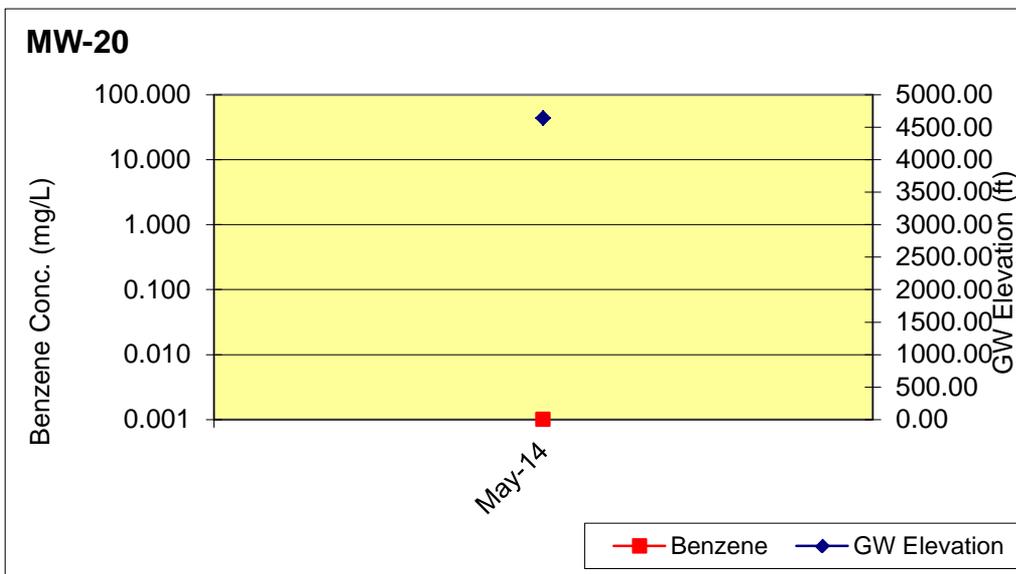
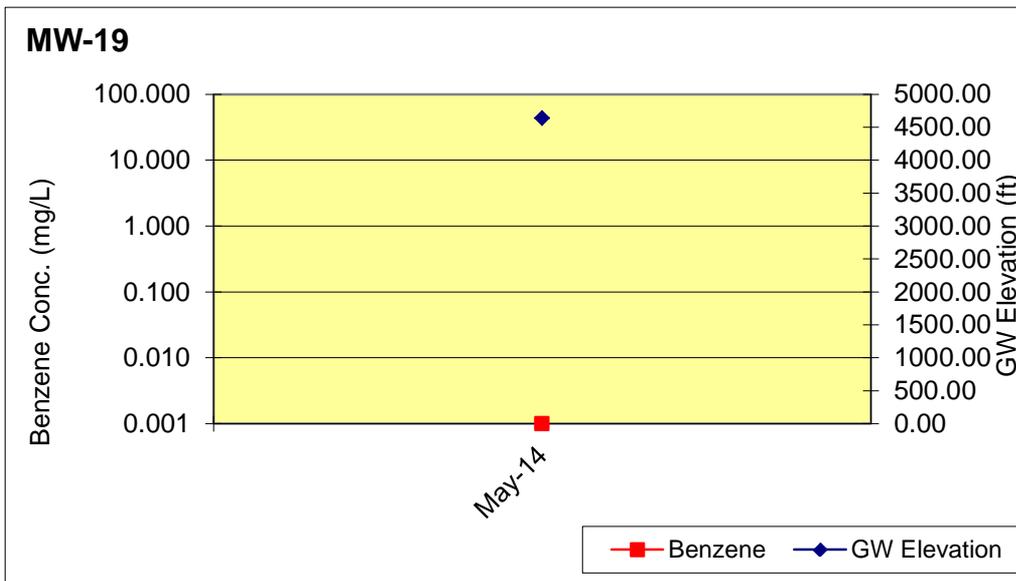
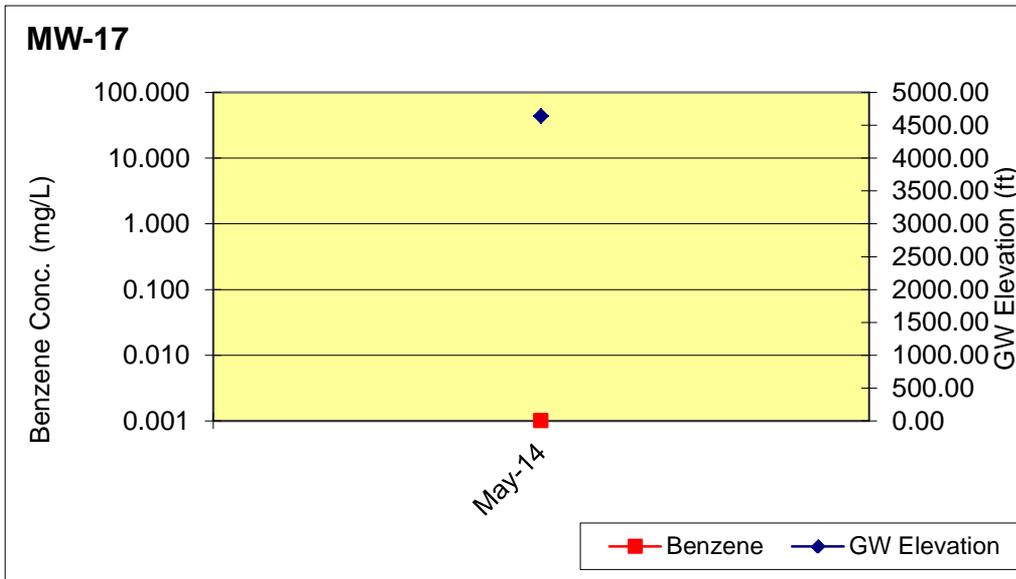
Corrective Action Summary	Date
Continuous System 1 Start Date	
Continuous System 1 End Date	
Continuous System 2 Start Date	
Continuous System 2 End Date	
In-situ Treatment Event 1	
In-situ Treatment Event 2	
In-situ Treatment Event 3	
In-situ Treatment Event 4	

Groundwater Contamination Trend Graphs

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014



Soil Analytical Results Table

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Click on a cell in the section in which you wish the additional row. Then click "New"

Sample Location	Date	Rationale	Sample Depth (ft)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	TVPH (mg/kg)	TEPH (mg/kg)	Oil & Grease (mg/kg)	Disposition of Contaminated Soil	*Confirmation for Sample Location(s)
A-01	08/01/12	DE	1.50	0.003	0.025	0.003	0.008	0.5	6.0			
A-01	08/01/12	DE	7.00	0.003	0.025	0.003	0.008	0.5	14.0			
A-01	08/01/12	DE	9.00	0.003	0.025	0.003	0.008	0.5	4.0			
A-02	08/01/12	DE	2.00	0.003	0.025	0.003	0.008	0.5	23.0			
A-02	08/01/12	DE	7.00	0.003	0.025	0.003	0.008	0.5	4.0			
A-02	08/01/12	DE	11.00	0.003	0.025	0.003	0.008	0.5	4.0			
A-03	08/01/12	DE	2.00	0.003	0.025	0.003	0.008	0.5	11.0			
A-03	08/01/12	DE	7.00	0.003	0.025	0.003	0.008	0.5	4.0			
A-03	08/01/12	DE	9.00	0.027	0.031	0.009	0.036	17.0	6.0			
A-04	08/01/12	DE	2.00	0.003	0.025	0.003	0.008	0.5	4.0			
A-04	08/01/12	DE	7.00	0.003	0.025	0.003	0.008	0.5	4.0			
A-04	08/01/12	DE	9.00	0.003	0.025	0.003	0.008	0.5	4.0			
AP-SB-01	03/18/13	DE	4.50	0.084	0.023	16.000	18.000	8.5	1900.0		EDO	
AP-SB-02	03/18/13	DE	6.00	0.006	0.016	0.048	0.053	4.8	4.3		EDO	
AP-SB-03	03/18/13	DE	7.50	0.005	0.180	0.200	0.470	400.0	350.0		EDO	
AP-SB-04	03/18/13	DE	8.50	0.002	0.003	0.003	0.009	0.5	4.2		EDO	
AP-SB-05	03/18/13	DE	4.50	0.003	0.003	0.012	0.009	3.1	4.6		EDO	
AP-SB-06	03/18/13	DE	11.00	0.005	0.005	0.099	0.022	13.0	29.0		EDO	
AP-SB-07	03/18/13	DE	8.50	0.005	0.130	0.029	0.270	2.6	4.0		EDO	
AP-SB-39	03/20/13	DE	4.50	0.006	0.015	0.014	0.042	10.0	5.0		EDO	
AP-SB-40	03/20/13	DE	2.75	0.002	0.003	0.003	0.009	0.5	4.0		EDO	

Soil Analytical Results Table

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Click on a cell in the section in which you wish the additional row. Then click "New"

Sample Location	Date	Rationale	Sample Depth (ft)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	TVPH (mg/kg)	TEPH (mg/kg)	Oil & Grease (mg/kg)	Disposition of Contaminated Soil	*Confirmation for Sample Location(s)
B-1	09/19/13	CS	10.00	0.002	0.003	0.003	0.009	0.5	5.8		EDO	
C-1	09/19/13	CS	8.00	0.002	0.003	0.003	0.009	0.5	13.0		EDO	P-5, EX-3
C-2	09/19/13	CS	8.00	0.002	0.003	0.003	0.009	1.3	5.8		EDO	P-5, EX-3
C-3	10/10/13	CS	3.50	0.002	0.003	0.003	0.009	0.5	180.0		EDO	P-6
D-1	09/05/13	DISP	2.00	0.002	0.003	0.003	0.009	0.5	50.0		EDO	
D-2	09/05/13	DISP	2.50	0.002	0.003	0.003	0.009	0.5	14.0		EDO	
D-3	09/05/13	DISP	3.00	0.002	0.003	0.003	0.009	20.0	1500.0		EDO	
D-4	09/05/13	DISP	2.50	0.002	0.003	0.003	0.009	0.5	5.4		EDO	
D-5	09/05/13	DISP	2.50	0.002	0.003	0.003	0.014	20.0	1400.0		EDO	
D-6	09/05/13	DISP	2.50	0.002	0.003	0.003	0.009	7.5	18.0		EDO	
EX-1	09/17/13	DE	10.00	0.022	0.006	0.007	2.000	2000.0	200.0		EDO	
EX-2	09/18/13	DE	9.00	0.002	0.003	0.006	0.009	230.0	420.0		EDO	
EX-3	09/18/13	DE	11.00	0.002	0.003	0.011	0.025	2600.0	160.0		EDO	
EX-4	09/19/13	DE	4.00	0.002	0.003	0.003	0.009	1.2	7.9		EDO	
EX-5	09/19/13	DE	8.00	0.050	0.013	1.600	1.200	2200.0	400.0		EDO	
EX-6	09/19/13	DE	8.00	0.008	0.003	0.011	0.092	650.0	89.0		EDO	
EX-7	09/23/13	DE	8.00	0.002	0.003	0.003	0.009	0.5	7.1		EDO	
EX-8	09/23/13	DE	5.00	0.058	0.004	0.078	0.018	45.0	22.0		EDO	
MW-07	01/23/13	DE	3.00	0.002	0.003	0.003	0.009	0.5	6.2		EDO	
MW-07	01/23/13	DE	9.00	0.002	0.003	0.003	0.009	0.5	7.9		EDO	
MW-07	01/23/13	DE	19.00	0.002	0.003	0.003	0.009	0.9	5.1		EDO	
MW-08	01/23/13	DE	3.50	0.002	0.003	0.003	0.009	0.6	7.9		EDO	
MW-08	01/23/13	DE	7.50	0.002	0.003	0.003	0.009	0.5	8.1		EDO	
MW-08	01/23/13	DE	12.50	0.021	0.029	0.950	0.520	410.0	130.0		EDO	
MW-15	05/07/14	DE	3.00	0.002	0.003	0.003	0.009	0.5	2.5		EDO	
MW-15	05/07/14	DE	9.00	0.002	0.003	0.003	0.009	4.2	2.1		EDO	
MW-16	05/07/14	DE	9.50	0.002	0.003	0.016	0.033	30.0	46.0		EDO	
MW-16	05/07/14	DE	13.50	0.002	0.003	0.003	0.009	47.0	17.0		EDO	
MW-17	05/06/14	DE	13.00	0.002	0.003	0.003	0.009	0.5	2.4		EDO	
MW-18	05/06/14	DE	3.50	0.002	0.003	0.003	0.009	1.0	15.0		EDO	

Soil Analytical Results Table

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Click on a cell in the section in which you wish the additional row. Then click "New"

Sample Location	Date	Rationale	Sample Depth (ft)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	TVPH (mg/kg)	TEPH (mg/kg)	Oil & Grease (mg/kg)	Disposition of Contaminated Soil	*Confirmation for Sample Location(s)
MW-18	05/06/14	DE	9.00	0.002	0.003	0.003	0.009	0.5	2.2		EDO	
MW-19	05/06/14	DE	14.00	0.002	0.003	0.013	0.009	46.0	28.0		EDO	
MW-20	05/07/14	DE	4.00	0.002	0.003	0.003	0.009	0.5	2.2		EDO	
MW-20	05/07/14	DE	14.00	0.002	0.003	0.003	0.009	0.5	2.1		EDO	
P-1	09/17/13	PIPE	2.50	0.002	0.003	0.003	0.009	2.8	4.0		EDO	
P-2	09/17/13	PIPE	2.50	0.002	0.003	0.003	0.009	2.2	4.4		EDO	
P-3	09/17/13	PIPE	2.50	0.002	0.003	0.003	0.009	0.5	4.4		EDO	
P-4	09/17/13	PIPE	2.50	0.002	0.003	0.003	0.009	0.5	4.0		EDO	
P-5	09/17/13	PIPE	2.50	0.002	0.003	0.003	0.009	0.5	9.6		EDO	
P-6	09/19/13	PIPE	2.50	0.008	0.130	0.140	7.000	5900.0	330.0		EDO	
SW-1	09/19/13	CS	9.50	0.002	0.003	0.003	0.009	0.5	6.1		EDO	
SW-2	09/19/13	CS	5.00	0.002	0.003	0.003	0.009	0.5	4.4		EDO	
SW-3	09/19/13	CS	8.00	0.002	0.003	0.003	0.009	0.5	6.8		EDO	
SW-4	09/19/13	CS	10.00	0.002	0.003	0.003	0.009	0.5	4.0		EDO	
SW-5	09/19/13	CS	9.00	0.002	0.003	0.003	0.009	0.5	4.0		EDO	
UST-1A	09/19/13	TANK	11.00	0.002	0.007	0.004	0.037	230.0	41.0		EDO	
UST-1B	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	2.9	4.6		EDO	
UST-1C	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	11.0	4.8		EDO	
UST-2A	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	8.6	21.0		EDO	
UST-2B	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	3.0	4.4		EDO	
UST-2C	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	14.0	10.0		EDO	
UST-3A	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	10.0	92.0		EDO	
UST-3B	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	4.0		EDO	
UST-3C	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	2.3	4.2		EDO	
UST-4A	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	17.0		EDO	
UST-4B	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	4.9		EDO	
UST-4C	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	4.6		EDO	
UST-5A	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	3.9	6.7		EDO	
UST-5B	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	4.9		EDO	
UST-5C	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	4.0		EDO	

Soil Analytical Results Table

Event ID: 11938

Reporting Period: Qtr 2

Year: 2014

Click on a cell in the section in which you wish the additional row. Then click "New"												
Sample Location	Date	Rationale	Sample Depth (ft)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	TVPH (mg/kg)	TEPH (mg/kg)	Oil & Grease (mg/kg)	Disposition of Contaminated Soil	*Confirmation for Sample Location(s)
UST-6A	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	5.0		EDO	
UST-6B	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	5.0		EDO	
UST-6C	09/19/13	TANK	11.00	0.002	0.003	0.003	0.009	0.5	4.3		EDO	

If concentration is less than the stated laboratory detection limit, list the detection limit (not ND); e.g. 0.0005

*List sample locations that exceeded RBSLs that the confirmation sample represents

Rationale:

- RC =Release confirmation
- TANK =Below USTs/ASTs
- DISP =Below dispensers
- EXC =Excavation UST/AST
- CS =Confirmation sample
- WC =Waste characterization
- SP =Spoils pile or load sample
- DE =Define extent
- PIPE =Below piping

Disposition of Contaminated Soil :

- LIP = Left in place
- SPO = Stock piled onsite
- EDO = Excavated and disposed offsite
- RUE = Replaced untreated to excavation
- TRE = Treated and returned to excavation
- WIRS = Within the influence of active remedial system

Soil PAH Analytical Table

Event ID: 11938

Reporting Period: Qtr 2

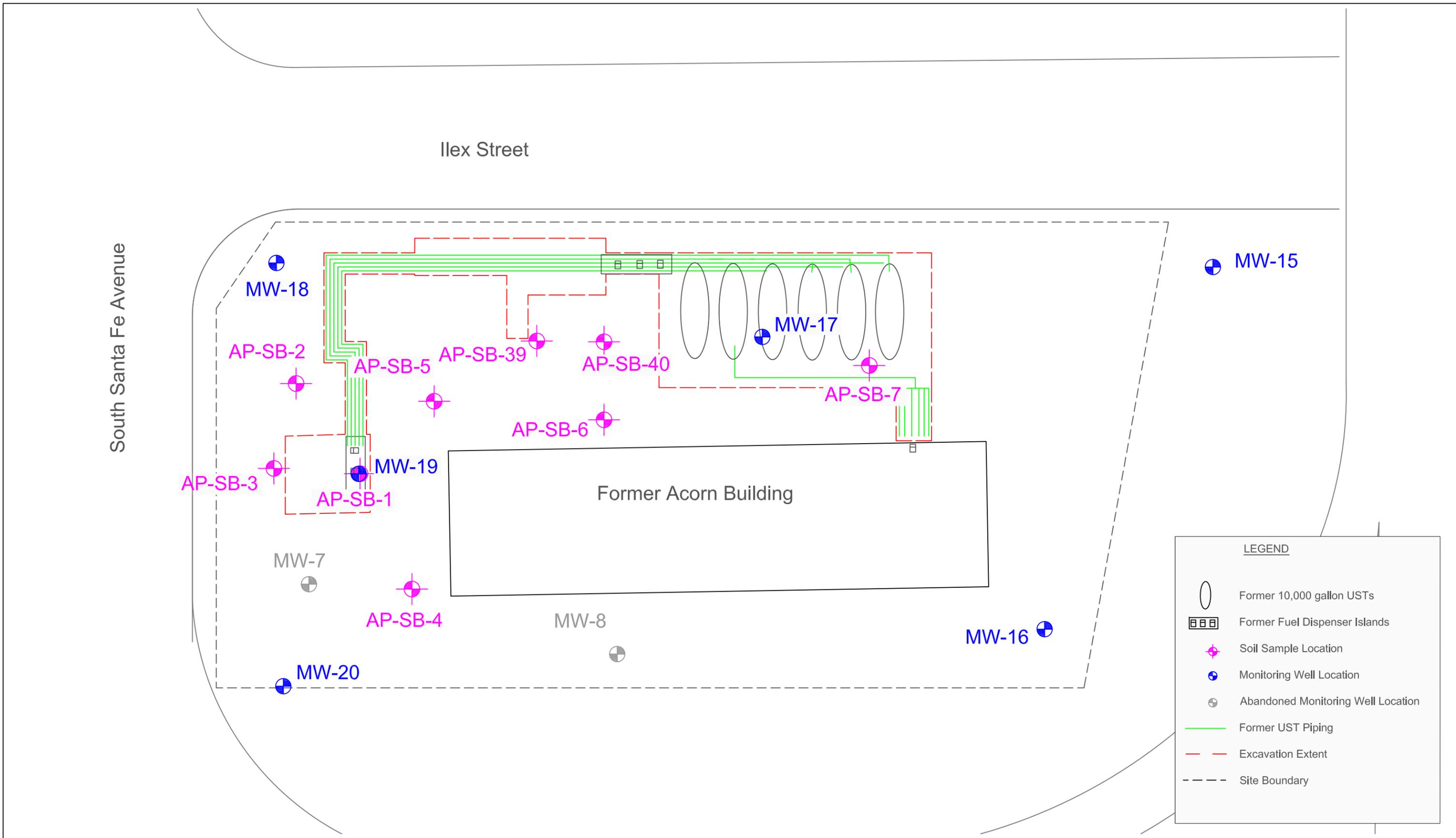
Year: 2014

Sample Location	EX-5	EX-1	AP-SB-01	P-6	Surficial RBSL	Subsurface RBSL
Date	9/19/2013	9/17/2013	3/18/2013	9/19/2013		
Sample Depth (ft)	8	10	5	3	(<3 ft)	(>3 ft)
TVPH (mg/kg)	2200.00	2000.00	8.50	5900.00	NA	NA
TEPH (mg/kg)	400.00	200.00	1900.00	330.00	NA	NA
TRPH (mg/kg)					NA	NA
Acenaphthene (mg/kg)	0.04	0.04	<0.330	0.02	3,600	>SAT
Acenaphthylene (mg/kg)	0.02	0.01	<0.330	<.0055	NTD	NTD
Anthracene (mg/kg)	<.0055	0.01	<0.330	0.01	18,000	>SAT
Benzo(a)-anthracene (mg/kg)	<.0055	0.01	<0.330	0.03	0.62	1.6
Benzo(a)-pyrene (mg/kg)	<.0055	0.01	<0.330	0.05	0.062	4.8
Benzo(b)-fluoranthene (mg/kg)	<.0055	<.0055	<0.330	0.02	0.62	4.5
Benzo(g,h,i)-perylene (mg/kg)	<.0055	<.0055	<0.330	0.01	NTD	NTD
Benzo(k)-fluoranthene (mg/kg)	<.0055	<.0055	<0.330	0.04	6.2	4.4
Chrysene (mg/kg)	<.0055	0.01	<0.330	0.03	62	1.5
Dibenzo(a,h)-anthracene (mg/kg)	<.0055	<.0055	<0.330	<.0055	0.062	14
Fluoranthene (mg/kg)	0.01	0.01	<0.330	0.06	2,300	>SAT
Fluorene (mg/kg)	0.04	0.04	<0.330	0.02	2,400	>SAT
Indeno(1,2,3-CD)-pyrene (mg/kg)	<.0055	<.0055	<0.330	0.02	0.62	>SAT
Naphthalene (mg/kg)	10.20	2.75	18.00	0.02	850	>SAT
Phenanthrene (mg/kg)	0.03	0.06	<0.330	0.07	NTD	NTD
Pyrene (mg/kg)	0.02	0.04	<0.330	0.07	1,800	>SAT

NTD = No toxicological data
>SAT = Greater than saturation

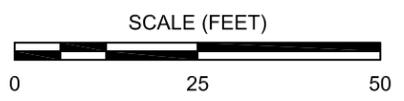


FIGURES



LEGEND

- Former 10,000 gallon USTs
- Former Fuel Dispenser Islands
- Soil Sample Location
- Monitoring Well Location
- Abandoned Monitoring Well Location
- Former UST Piping
- Excavation Extent
- Site Boundary



S I T E

Former Acorn Bulk Facility #33
 400 South Santa Fe Avenue
 Pueblo, Colorado

Project No. 10014-013003.05

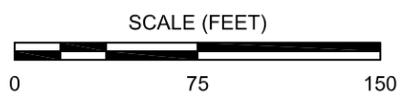
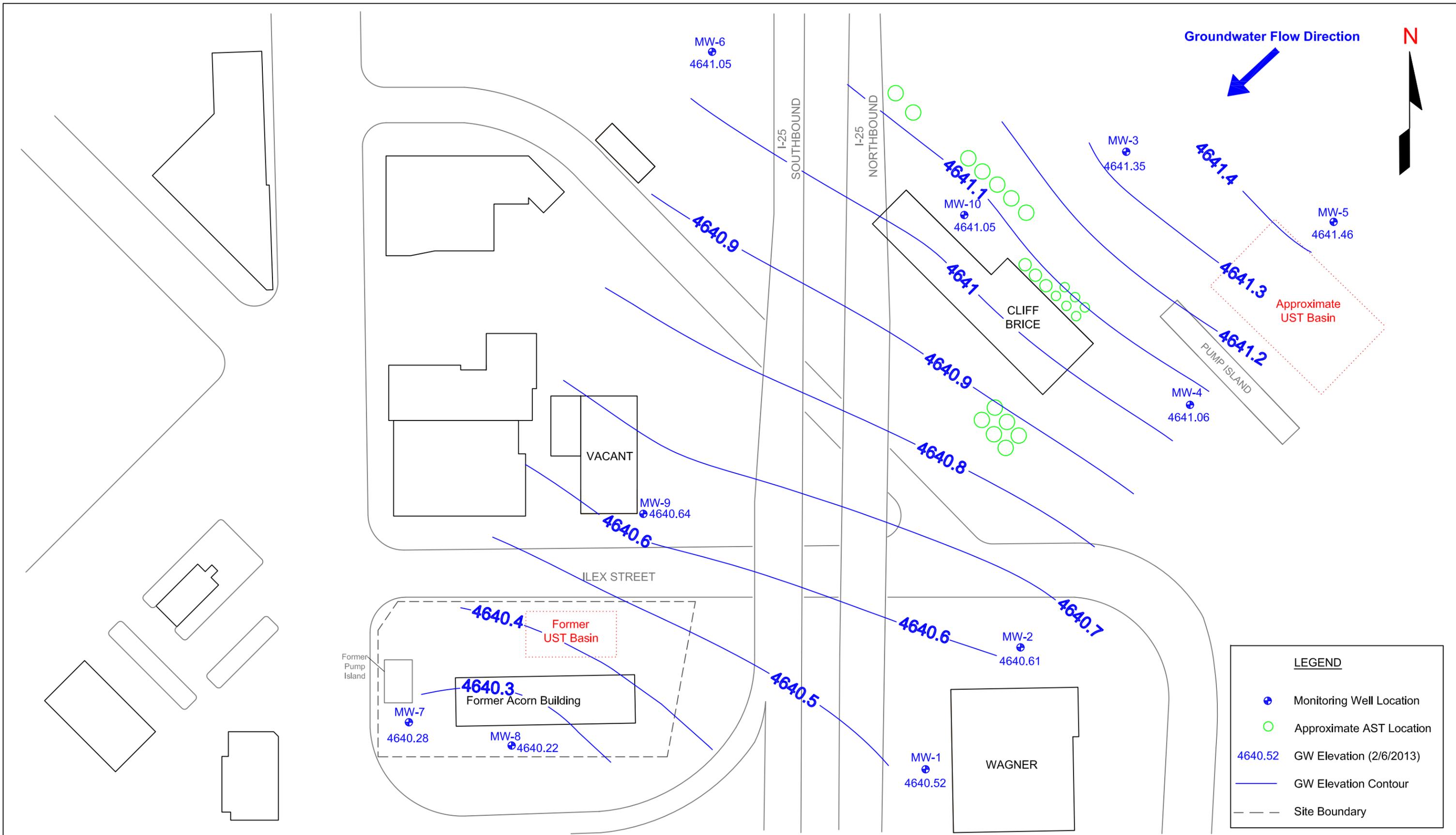
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Figure 1
Site Map



S I T E

Former Acorn Bulk Facility #33
 400 South Santa Fe Avenue
 Pueblo, Colorado

Project No. 10013-013003.02

Last Revision
 October 2013

Bureau Veritas

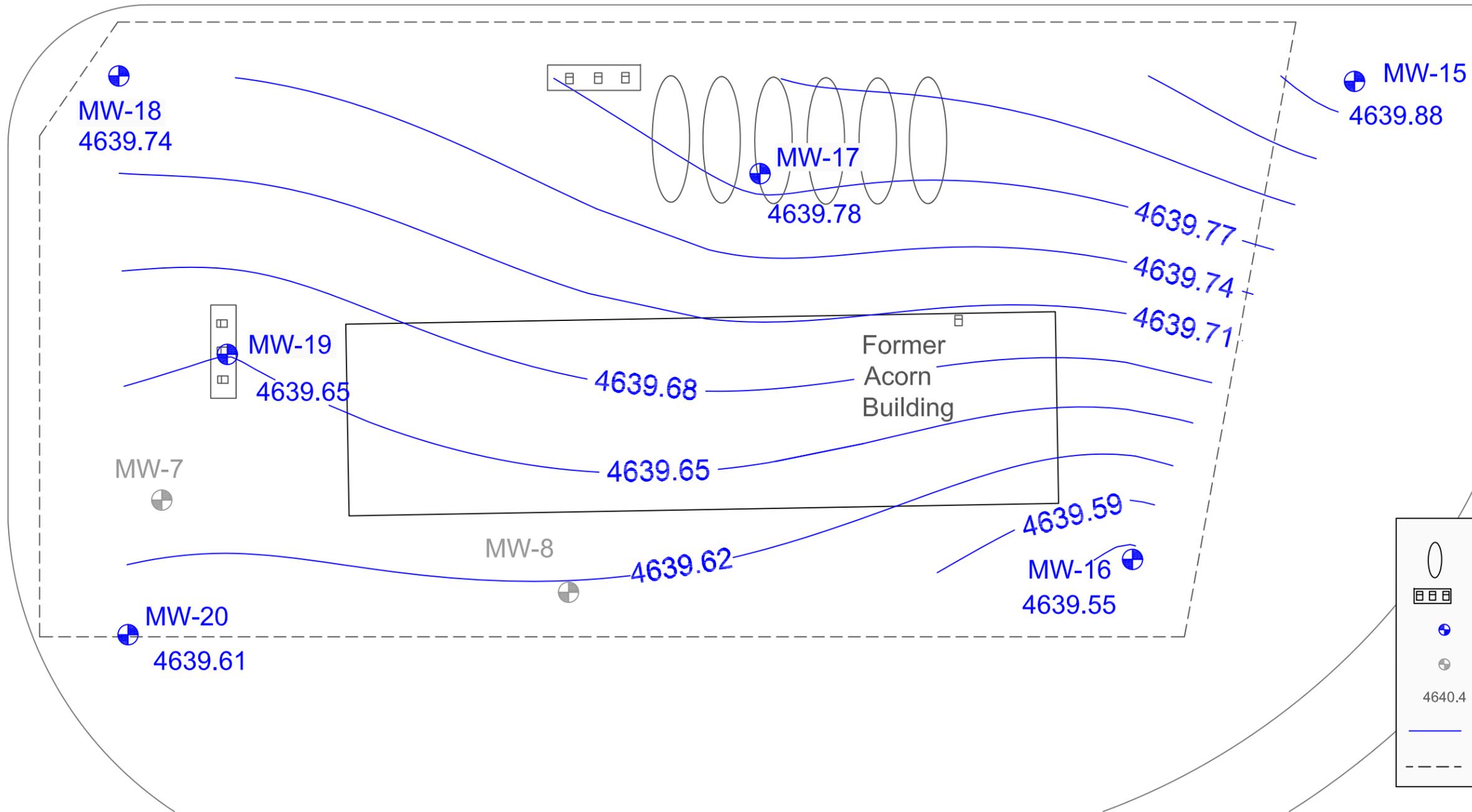
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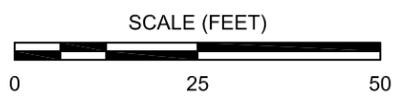
Figure 2
Potentiometric Surface Map
 (February 2013)

Groundwater Flow Direction



LEGEND

- Former 10,000 gallon USTs
- Former Fuel Dispensers
- Monitoring Well Location
- Abandoned Monitoring Well Location
- 4640.4 GW Elevation (5.14.2014)
- GW Elevation Contour
- Site Boundary



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Figure 2a

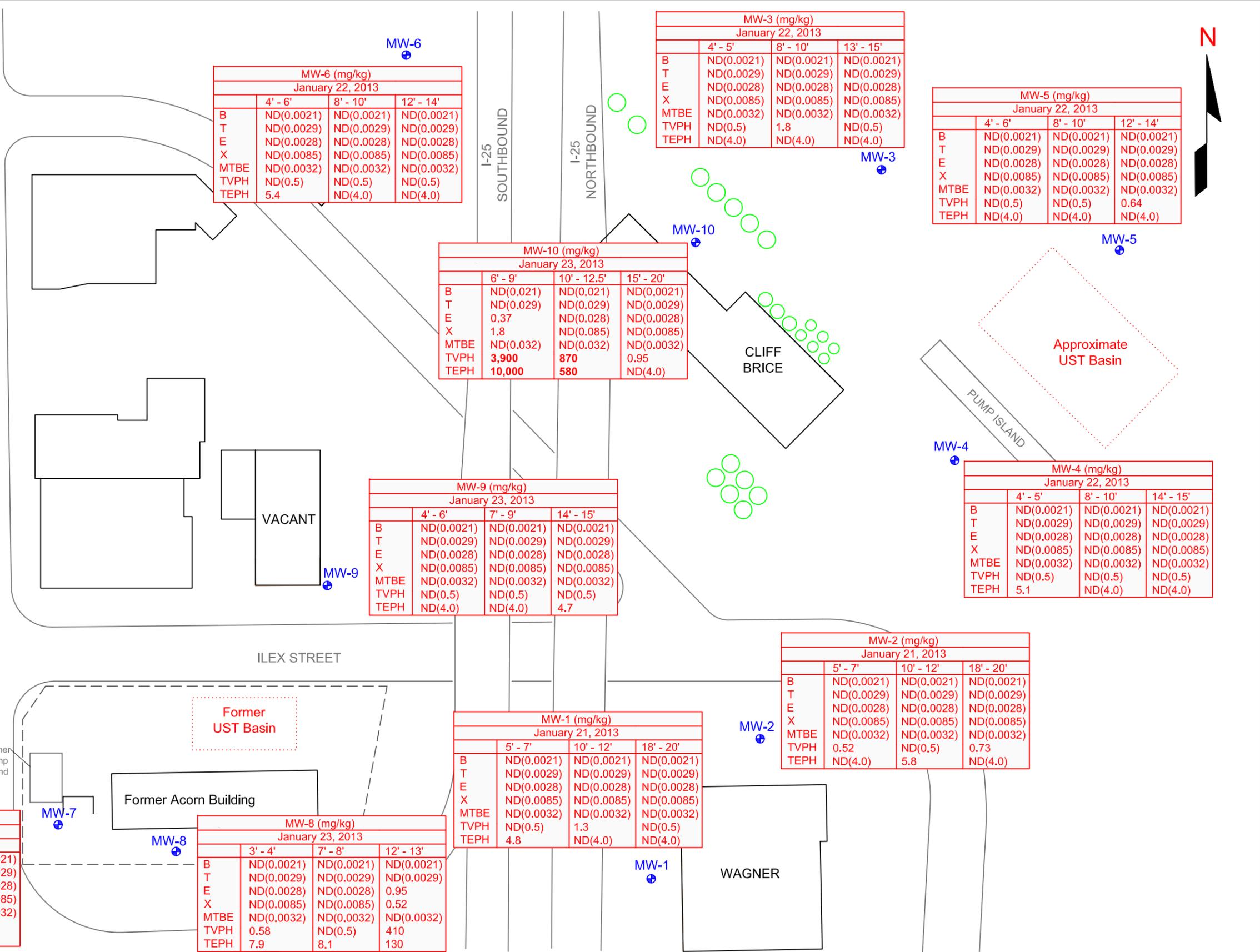
Site Potentiometric Surface Map
(May 2014)

LEGEND

- Monitoring Well Location
- Approximate AST Location
- Site Boundary

B Benzene
T Toluene
E Ethylbenzene
X Xylenes
MTBE Methyl *tert*-Butyl Ether
TVPH Total Volatile Petroleum Hydrocarbons
TEPH Total Extractable Petroleum Hydrocarbons
ND Not Detected (Reporting Limit in Parentheses)

Values in **BOLD** exceed OPS TPH Threshold Value of 500 mg/kg



MW-7 (mg/kg)
January 23, 2013

	2' - 4'	8' - 10'	18' - 20'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	ND(0.5)	ND(0.5)	0.92
TEPH	6.2	7.9	5.1

MW-8 (mg/kg)
January 23, 2013

	3' - 4'	7' - 8'	12' - 13'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	0.95
X	ND(0.0085)	ND(0.0085)	0.52
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	0.58	ND(0.5)	410
TEPH	7.9	8.1	130

MW-1 (mg/kg)
January 21, 2013

	5' - 7'	10' - 12'	18' - 20'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	ND(0.5)	1.3	ND(0.5)
TEPH	4.8	ND(4.0)	ND(4.0)

MW-2 (mg/kg)
January 21, 2013

	5' - 7'	10' - 12'	18' - 20'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	0.52	ND(0.5)	0.73
TEPH	ND(4.0)	5.8	ND(4.0)

MW-6 (mg/kg)
January 22, 2013

	4' - 6'	8' - 10'	12' - 14'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	ND(0.5)	ND(0.5)	ND(0.5)
TEPH	5.4	ND(4.0)	ND(4.0)

MW-10 (mg/kg)
January 23, 2013

	6' - 9'	10' - 12.5'	15' - 20'
B	ND(0.021)	ND(0.021)	ND(0.0021)
T	ND(0.029)	ND(0.029)	ND(0.0029)
E	0.37	ND(0.028)	ND(0.0028)
X	1.8	ND(0.085)	ND(0.0085)
MTBE	ND(0.032)	ND(0.032)	ND(0.0032)
TVPH	3,900	870	0.95
TEPH	10,000	580	ND(4.0)

MW-9 (mg/kg)
January 23, 2013

	4' - 6'	7' - 9'	14' - 15'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	ND(0.5)	ND(0.5)	ND(0.5)
TEPH	ND(4.0)	ND(4.0)	4.7

MW-3 (mg/kg)
January 22, 2013

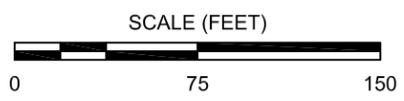
	4' - 5'	8' - 10'	13' - 15'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	ND(0.5)	1.8	ND(0.5)
TEPH	ND(4.0)	ND(4.0)	ND(4.0)

MW-5 (mg/kg)
January 22, 2013

	4' - 6'	8' - 10'	12' - 14'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	ND(0.5)	ND(0.5)	0.64
TEPH	ND(4.0)	ND(4.0)	ND(4.0)

MW-4 (mg/kg)
January 22, 2013

	4' - 5'	8' - 10'	14' - 15'
B	ND(0.0021)	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)	ND(0.0085)
MTBE	ND(0.0032)	ND(0.0032)	ND(0.0032)
TVPH	ND(0.5)	ND(0.5)	ND(0.5)
TEPH	5.1	ND(4.0)	ND(4.0)



S I T E

Former Acorn Bulk Facility #33
400 South Santa Fe Avenue
Pueblo, Colorado

Project No. 10013-013003.01 Last Revision April 2013

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Figure 3
Soil Analytical (Monitoring Well) Results Map (BTEX, MTBE, TVPH, TEPH)

MW-18 (mg/kg)		
May 6, 2014		
	3.5'	9'
B	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)
TVPH	0.95	ND(0.5)
TEPH	15	ND(2.2)

MW-15 (mg/kg)		
May 7, 2014		
	3'	9'
B	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)
TVPH	ND(0.5)	4.2
TEPH	ND(2.5)	ND(2.1)

MW-17 (mg/kg)	
May 6, 2014	
	13'
B	ND(0.0021)
T	ND(0.0029)
E	ND(0.0028)
X	ND(0.0085)
TVPH	ND(0.5)
TEPH	ND(2.4)

MW-19 (mg/kg)	
May 6, 2014	
	14'
B	ND(0.0021)
T	ND(0.0029)
E	0.013
X	ND(0.0085)
TVPH	46
TEPH	28

MW-16 (mg/kg)		
May 7, 2014		
	9.5'	13.5'
B	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)
E	0.016	ND(0.0028)
X	0.033	ND(0.0085)
TVPH	30	47
TEPH	46	17

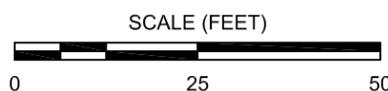
MW-20 (mg/kg)		
May 7, 2014		
	4'	14'
B	ND(0.0021)	ND(0.0021)
T	ND(0.0029)	ND(0.0029)
E	ND(0.0028)	ND(0.0028)
X	ND(0.0085)	ND(0.0085)
TVPH	ND(0.5)	ND(0.5)
TEPH	ND(2.2)	ND(2.1)

LEGEND

- Monitoring Well Location
- Abandoned Monitoring Well Location
- Former Dispenser Location
- Former UST location
- Site Boundary

B Benzene
T Toluene
E Ethylbenzene
X Xylene
TVPH Total Volatile Petroleum Hydrocarbons
TEPH Total Extractable Petroleum Hydrocarbons
ND Not Detected

Shallow samples not collected due to excavation backfill for MW-17 and MW-19



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Former Acorn Bulk Facility #33
 400 South Santa Fe Avenue
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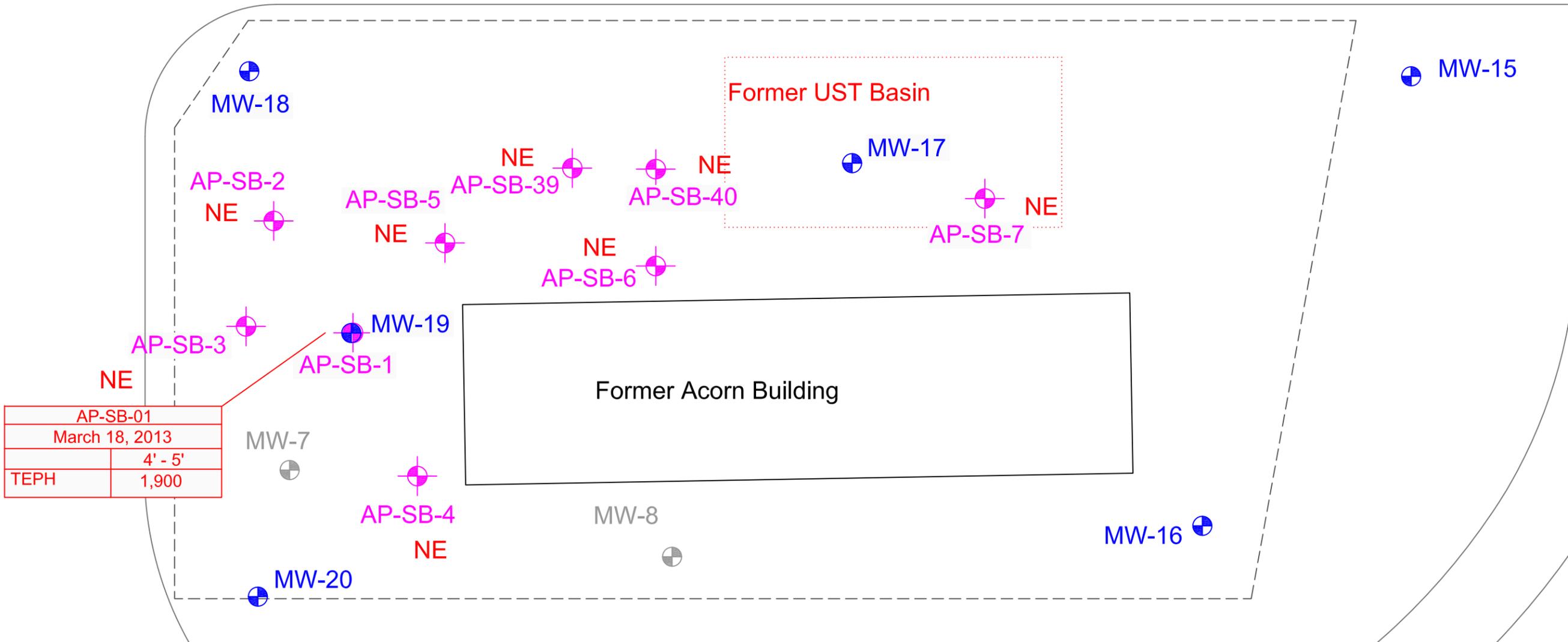
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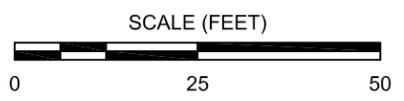
Figure 3a
 Soil Analytical Results Map May 2014

LEGEND

-  Soil Boring Location
-  Monitoring Well Location
-  Abandoned Monitoring Well Location
-  Site Boundary
- TVPH** Total Volatile Petroleum Hydrocarbons (TVPH)
- NE** Analytical results did not exceed applicable state standards
- Values expressed as mg/kg and exceed applicable state standards



AP-SB-01	
March 18, 2013	
	4' - 5'
TEPH	1,900



S I T E

Former Acorn Bulk Facility #33
400 South Santa Fe Avenue
Pueblo, Colorado

Project No. 10013-013003.01

Last Revision
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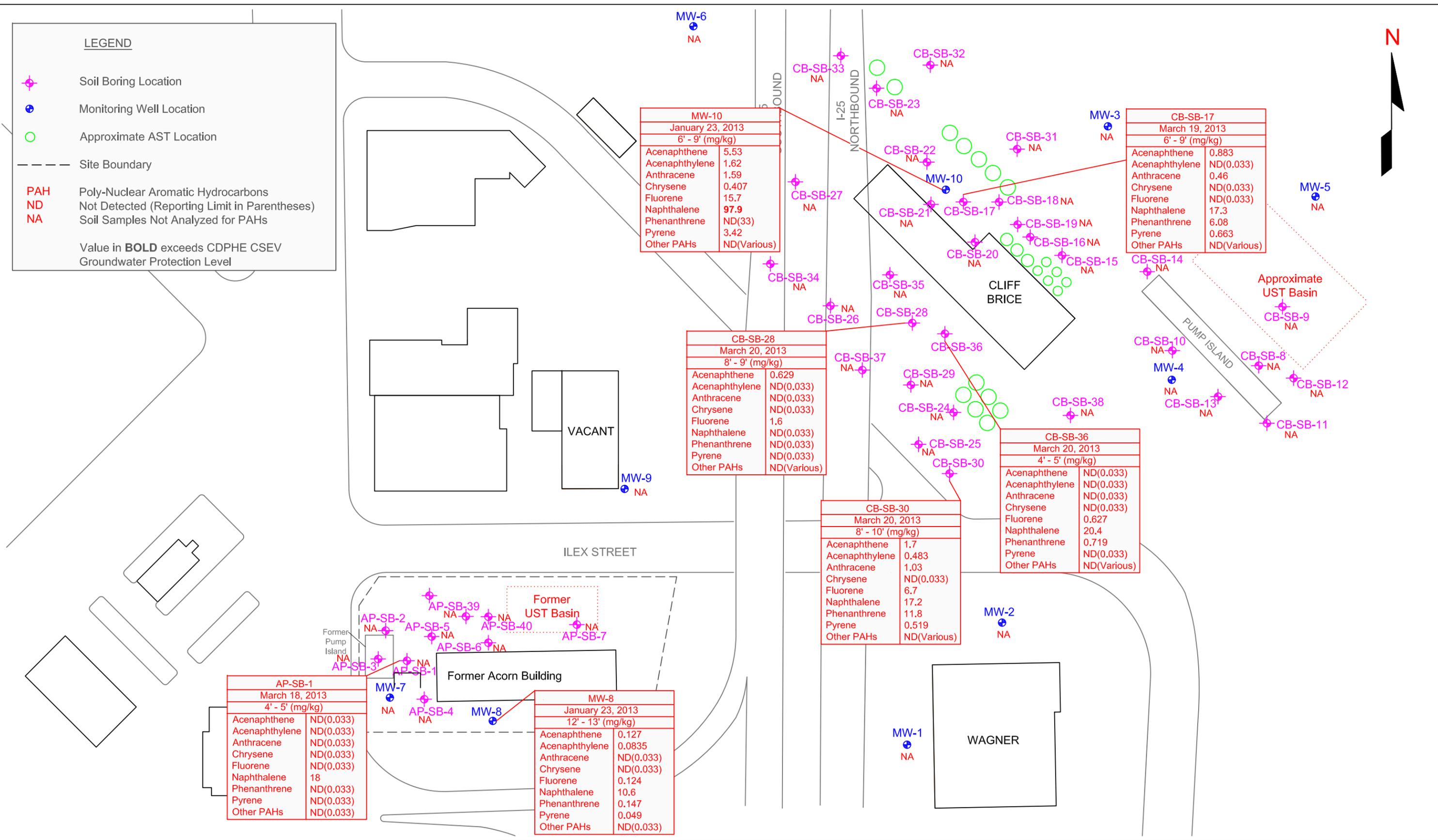


Figure 4
Soil Boring Analytical Exceedances Map

LEGEND

- Soil Boring Location
- Monitoring Well Location
- Approximate AST Location
- Site Boundary
- PAH: Poly-Nuclear Aromatic Hydrocarbons
- ND: Not Detected (Reporting Limit in Parentheses)
- NA: Soil Samples Not Analyzed for PAHs

Value in **BOLD** exceeds CDPHE CSEV Groundwater Protection Level



MW-10	
January 23, 2013	
6' - 9' (mg/kg)	
Acenaphthene	5.53
Acenaphthylene	1.62
Anthracene	1.59
Chrysene	0.407
Fluorene	15.7
Naphthalene	97.9
Phenanthrene	ND(33)
Pyrene	3.42
Other PAHs	ND(Various)

CB-SB-17	
March 19, 2013	
6' - 9' (mg/kg)	
Acenaphthene	0.883
Acenaphthylene	ND(0.033)
Anthracene	0.46
Chrysene	ND(0.033)
Fluorene	ND(0.033)
Naphthalene	17.3
Phenanthrene	6.08
Pyrene	0.663
Other PAHs	ND(Various)

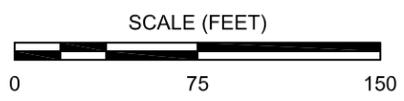
CB-SB-28	
March 20, 2013	
8' - 9' (mg/kg)	
Acenaphthene	0.629
Acenaphthylene	ND(0.033)
Anthracene	ND(0.033)
Chrysene	ND(0.033)
Fluorene	1.6
Naphthalene	ND(0.033)
Phenanthrene	ND(0.033)
Pyrene	ND(0.033)
Other PAHs	ND(Various)

CB-SB-36	
March 20, 2013	
4' - 5' (mg/kg)	
Acenaphthene	ND(0.033)
Acenaphthylene	ND(0.033)
Anthracene	ND(0.033)
Chrysene	ND(0.033)
Fluorene	0.627
Naphthalene	20.4
Phenanthrene	0.719
Pyrene	ND(0.033)
Other PAHs	ND(Various)

CB-SB-30	
March 20, 2013	
8' - 10' (mg/kg)	
Acenaphthene	1.7
Acenaphthylene	0.483
Anthracene	1.03
Chrysene	ND(0.033)
Fluorene	6.7
Naphthalene	17.2
Phenanthrene	11.8
Pyrene	0.519
Other PAHs	ND(Various)

AP-SB-1	
March 18, 2013	
4' - 5' (mg/kg)	
Acenaphthene	ND(0.033)
Acenaphthylene	ND(0.033)
Anthracene	ND(0.033)
Chrysene	ND(0.033)
Fluorene	ND(0.033)
Naphthalene	18
Phenanthrene	ND(0.033)
Pyrene	ND(0.033)
Other PAHs	ND(0.033)

MW-8	
January 23, 2013	
12' - 13' (mg/kg)	
Acenaphthene	0.127
Acenaphthylene	0.0835
Anthracene	ND(0.033)
Chrysene	ND(0.033)
Fluorene	0.124
Naphthalene	10.6
Phenanthrene	0.147
Pyrene	0.049
Other PAHs	ND(0.033)



SITE	Former Acorn Bulk Facility #33 400 South Santa Fe Avenue Pueblo, Colorado		CLIENT	 BUREAU VERITAS		Figure 5 Soil Analytical Results Map (PAHs)
	Project No. 10013-013003.01	Last Revision April 2013				

MW-18	
May 14, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	ND(0.001)
X	ND(0.001)
MTBE	ND(0.001)
TVPH	ND(0.5)
TEPH	ND(0.1)

MW-18

MW-7	
February 7, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	ND(0.001)
X	ND(0.001)
MTBE	ND(0.001)
TVPH	1.2
TEPH	0.341

MW-7

MW-20	
May 15, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	ND(0.001)
X	ND(0.001)
MTBE	ND(0.001)
TVPH	ND(0.5)
TEPH	ND(0.1)

MW-20

MW-19	
May 15, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	0.043
X	0.019
MTBE	ND(0.001)
TVPH	9.4
TEPH	2.47

MW-19

MW-8

MW-8	
February 7, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	0.22
X	0.23
MTBE	ND(0.001)
TVPH	8.1
TEPH	3.5

MW-17	
May 14, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	ND(0.001)
X	ND(0.001)
MTBE	ND(0.001)
TVPH	ND(0.5)
TEPH	0.224

MW-17

MW-16	
May 14, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	0.0077
X	0.017
MTBE	ND(0.001)
TVPH	9.6
TEPH	3.01

MW-16

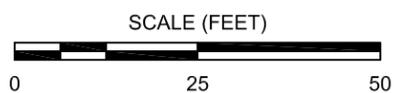
MW-15	
May 15, 2014	
mg/L	
B	ND(0.001)
T	ND(0.001)
E	ND(0.001)
X	ND(0.001)
MTBE	ND(0.001)
TVPH	ND(0.5)
TEPH	ND(0.1)

MW-15

LEGEND

- Groundwater Sample Location
- Former Dispenser Location
- Former UST location
- Site Boundary

B Benzene
T Toluene
E Ethylbenzene
X Xylene
MTBE Methyl *tert* butyl ether
TVPH Total Volatile Petroleum Hydrocarbons
TEPH Total Extractable Petroleum Hydrocarbons
ND Not Detected



**S
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 Former Acorn Bulk Facility #33
 400 South Santa Fe Avenue
 Pueblo, Colorado

Project No. 10014-013003.05

Last Revision
 May 2014



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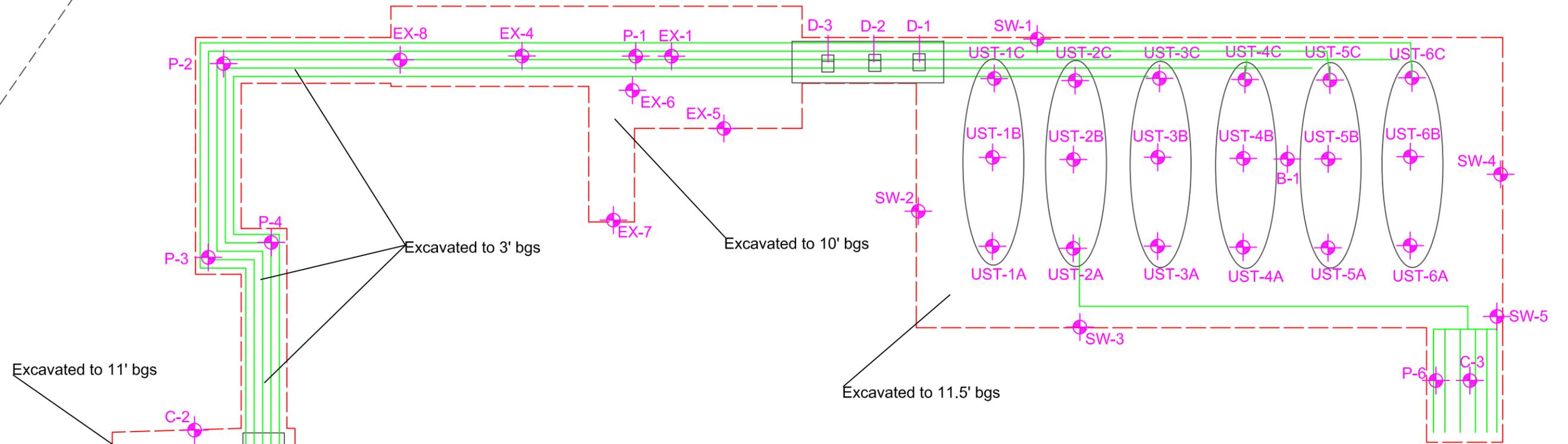
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Figure 6
 Groundwater Analytical Results Map

South Santa Fe Avenue

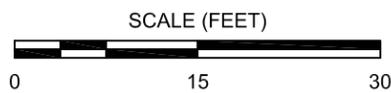
Ilex Street



Former Acorn Building
400 S. Santa Fe Avenue

LEGEND

-  Former 10,000 gallon USTs
-  Former Concrete Fuel Dispenser Islands
-  Former Fuel Dispensers
-  Soil Sample Location
-  Former UST Piping
-  Excavation Extent
-  Site Boundary



S I T E

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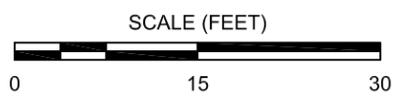
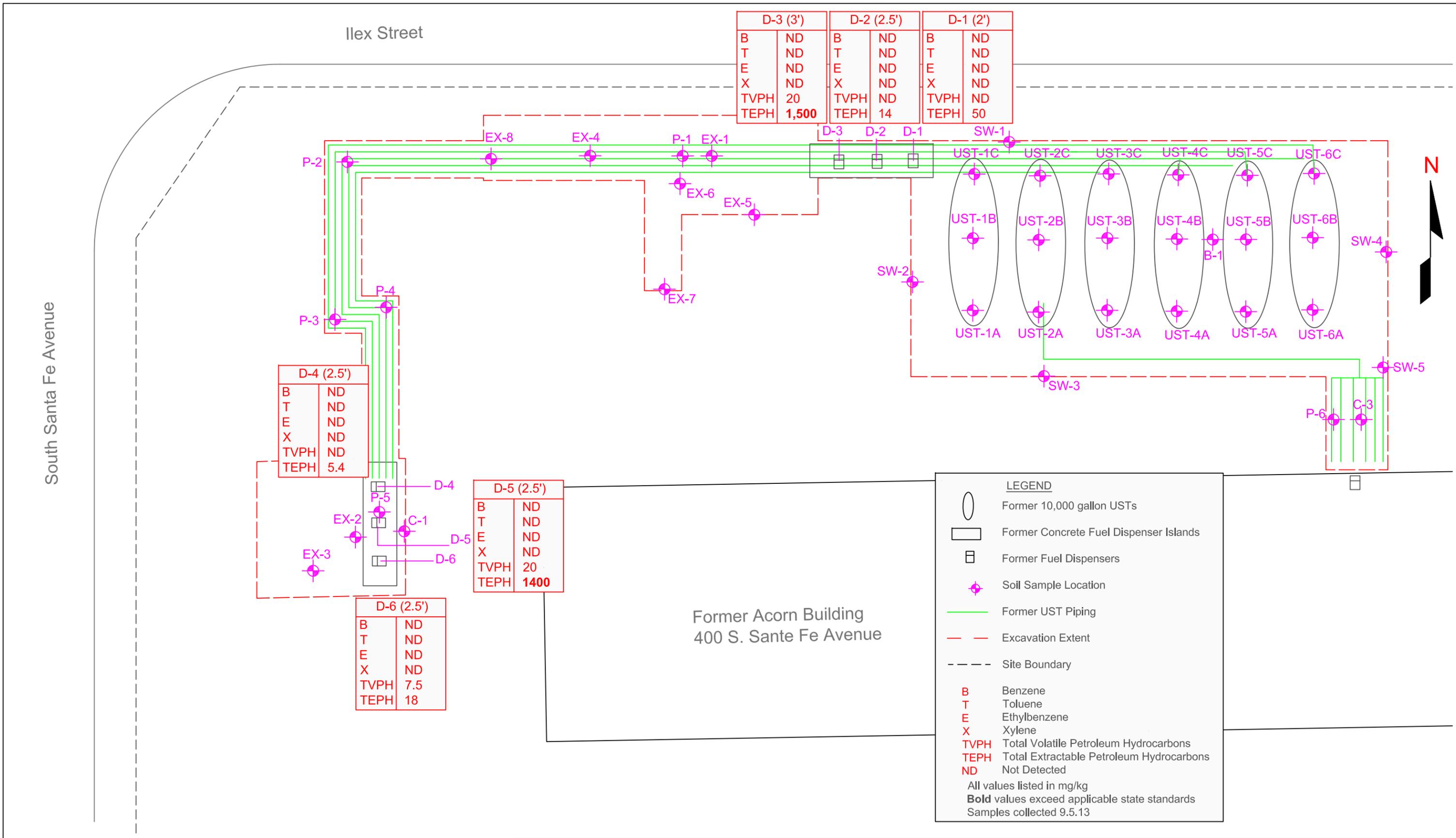
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C L I E N T



Figure 7

Excavation Soil Sample Locations
(September 2013)



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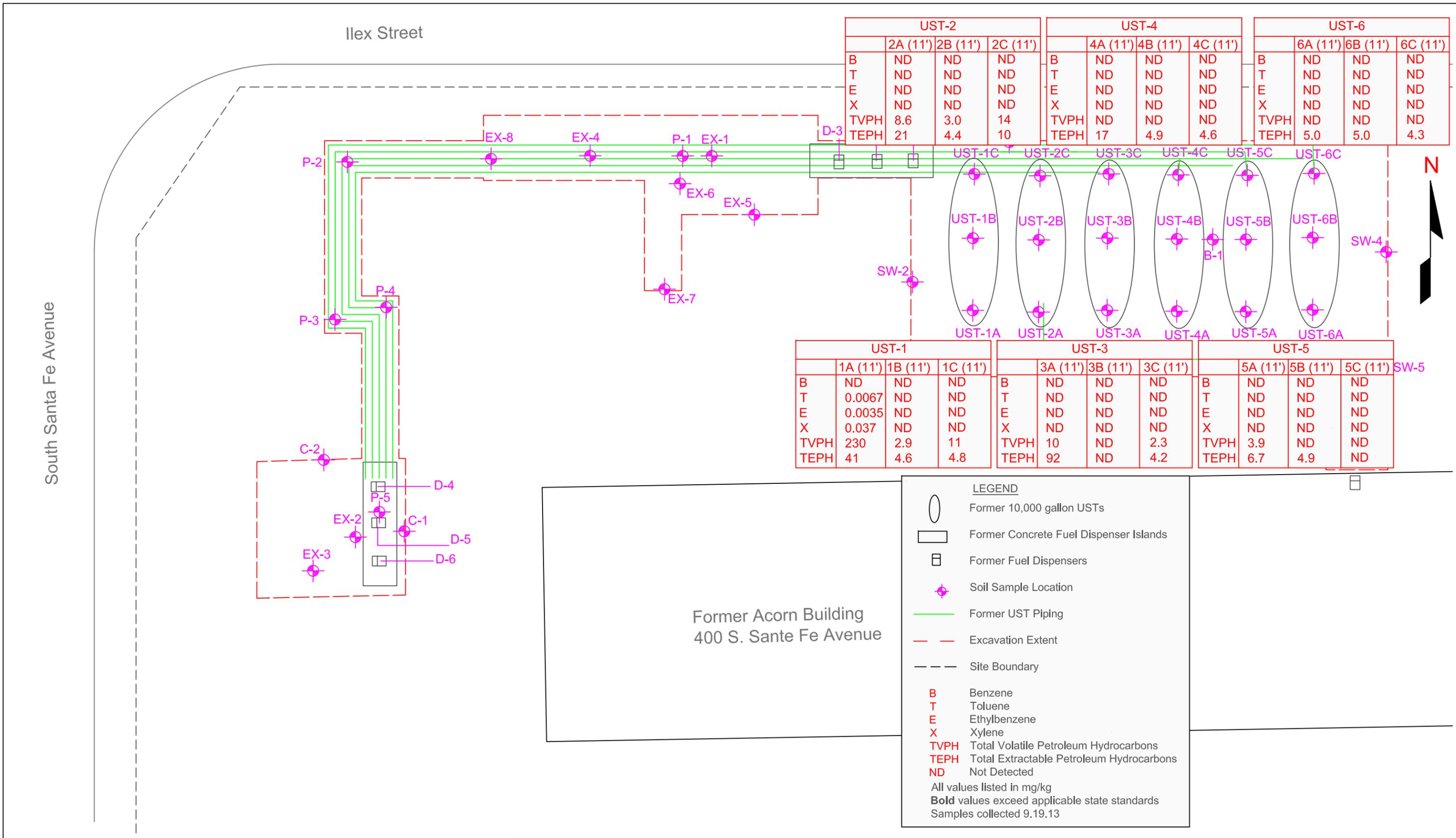
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Figure 7a
 Excavation Soil Analytical Results Map
 (Dispenser Samples)



UST-2				UST-4			UST-6		
	2A (11')	2B (11')	2C (11')	4A (11')	4B (11')	4C (11')	6A (11')	6B (11')	6C (11')
B	ND								
T	ND								
E	ND								
X	ND								
TVPH	8.6	3.0	14	ND	ND	ND	ND	ND	ND
TEPH	21	4.4	10	17	4.9	4.6	5.0	5.0	4.3

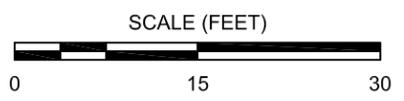
UST-1			UST-3			UST-5			
	1A (11')	1B (11')	1C (11')	3A (11')	3B (11')	3C (11')	5A (11')	5B (11')	5C (11')
B	ND								
T	0.0067	ND							
E	0.0035	ND							
X	0.037	ND							
TVPH	230	2.9	11	10	ND	2.3	3.9	ND	ND
TEPH	41	4.6	4.8	92	ND	4.2	6.7	4.9	ND

LEGEND

- Former 10,000 gallon USTs
- Former Concrete Fuel Dispenser Islands
- Former Fuel Dispensers
- Soil Sample Location
- Former UST Piping
- Excavation Extent
- Site Boundary

B Benzene
T Toluene
E Ethylbenzene
X Xylene
TVPH Total Volatile Petroleum Hydrocarbons
TEPH Total Extractable Petroleum Hydrocarbons
ND Not Detected

All values listed in mg/kg
Bold values exceed applicable state standards
 Samples collected 9.19.13



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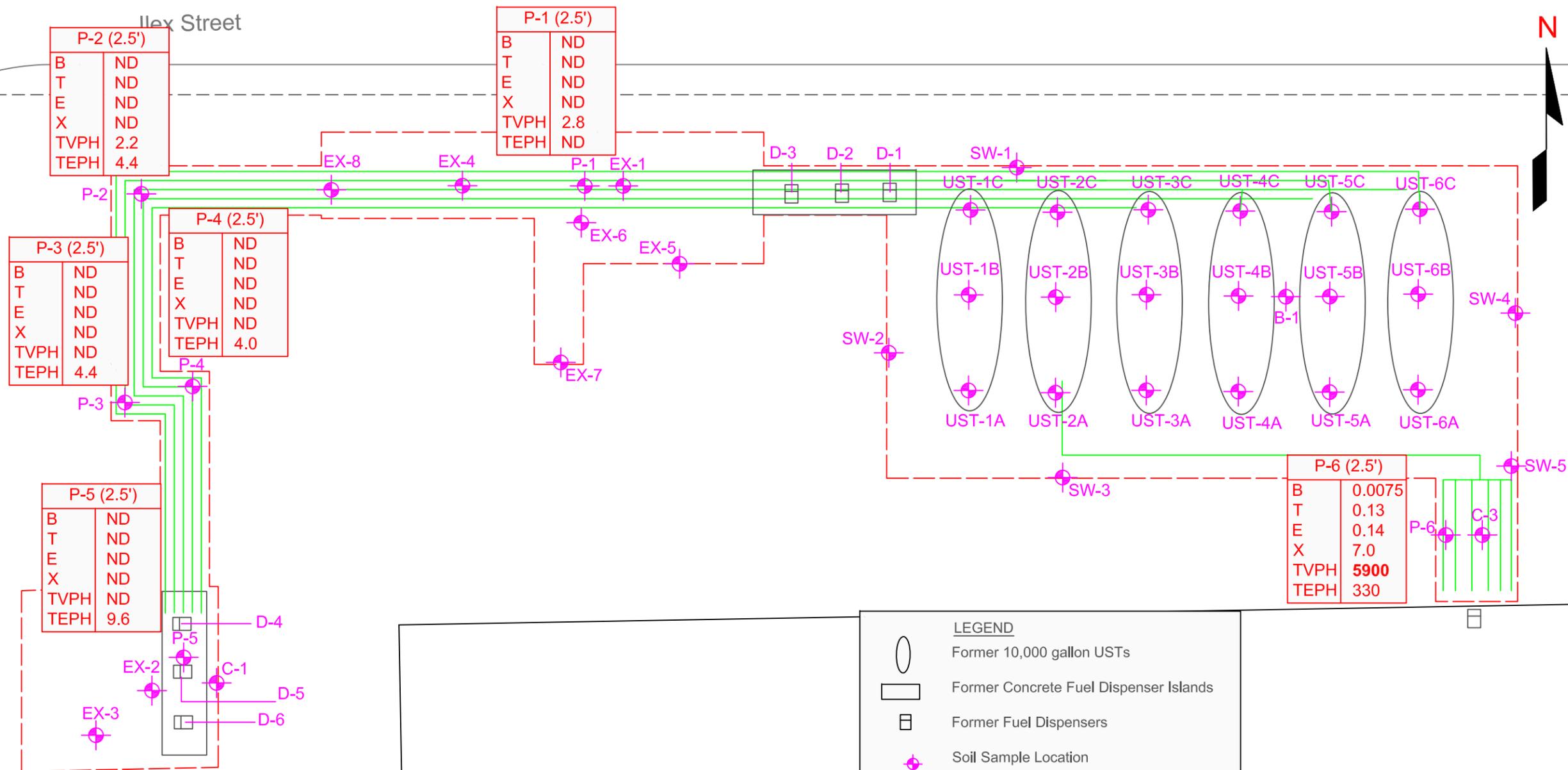


Figure 7b
 Excavation Soil Analytical Results Map
 (UST Samples)

South Santa Fe Avenue

Ilex Street

N



P-2 (2.5')

B	ND
T	ND
E	ND
X	ND
TVPH	2.2
TEPH	4.4

P-1 (2.5')

B	ND
T	ND
E	ND
X	ND
TVPH	2.8
TEPH	ND

P-3 (2.5')

B	ND
T	ND
E	ND
X	ND
TVPH	ND
TEPH	4.4

P-4 (2.5')

B	ND
T	ND
E	ND
X	ND
TVPH	ND
TEPH	4.0

P-5 (2.5')

B	ND
T	ND
E	ND
X	ND
TVPH	ND
TEPH	9.6

P-6 (2.5')

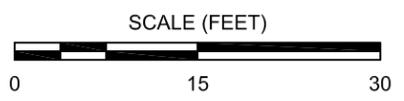
B	0.0075
T	0.13
E	0.14
X	7.0
TVPH	5900
TEPH	330

LEGEND

- Former 10,000 gallon USTs
- Former Concrete Fuel Dispenser Islands
- Former Fuel Dispensers
- Soil Sample Location
- Former UST Piping
- Excavation Extent
- Site Boundary

B Benzene
T Toluene
E Ethylbenzene
X Xylene
TVPH Total Volatile Petroleum Hydrocarbons
TEPH Total Extractable Petroleum Hydrocarbons
ND Not Detected

All values listed in mg/kg
Bold values exceed applicable state standards
 Samples collected 9.17.13 to 9.19.13



S I T E

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 Pueblo, Colorado

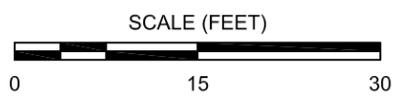
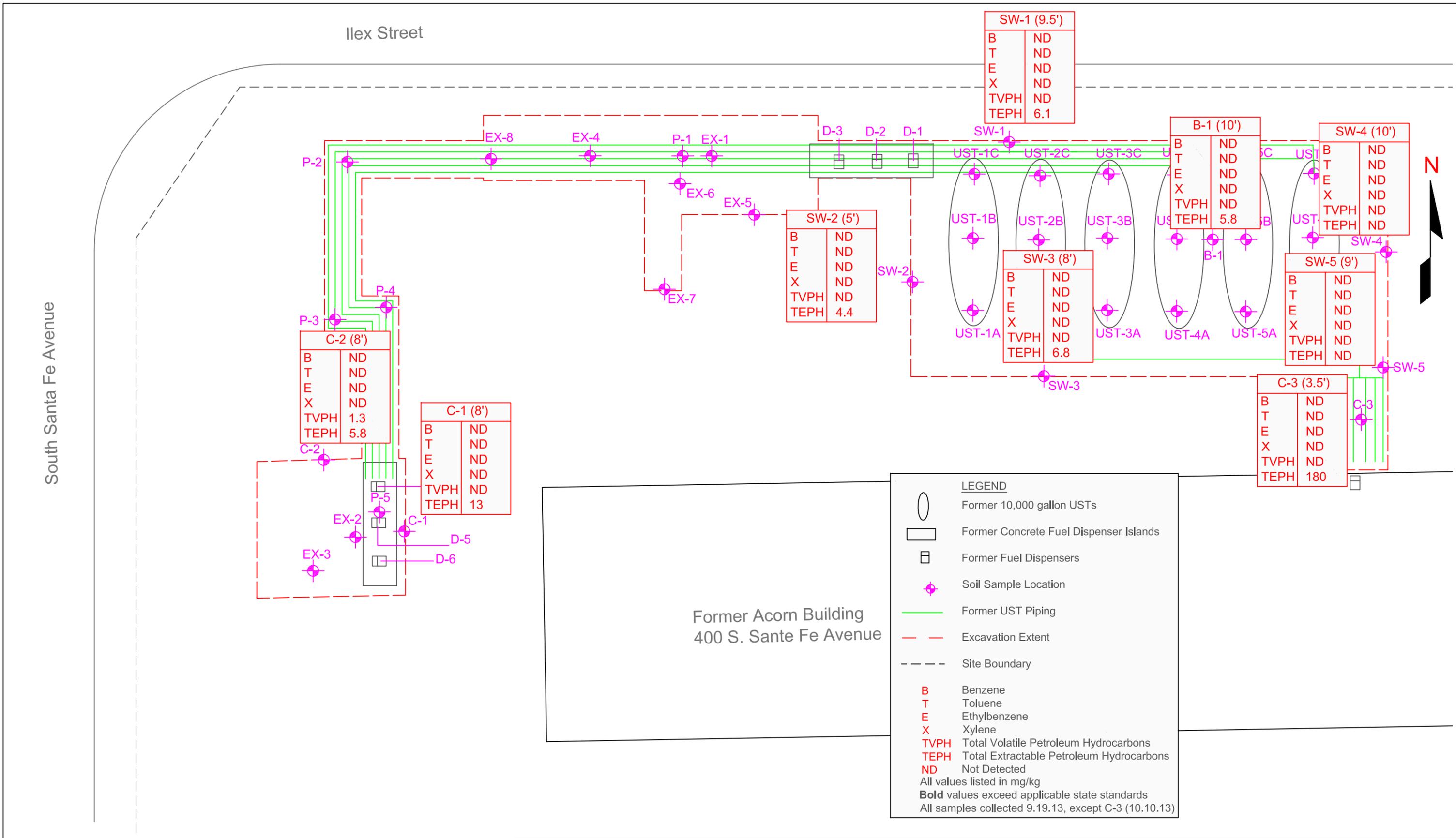
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Figure 7c
 Excavation Soil Analytical Results Map
 (Piping Samples)



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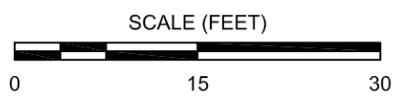
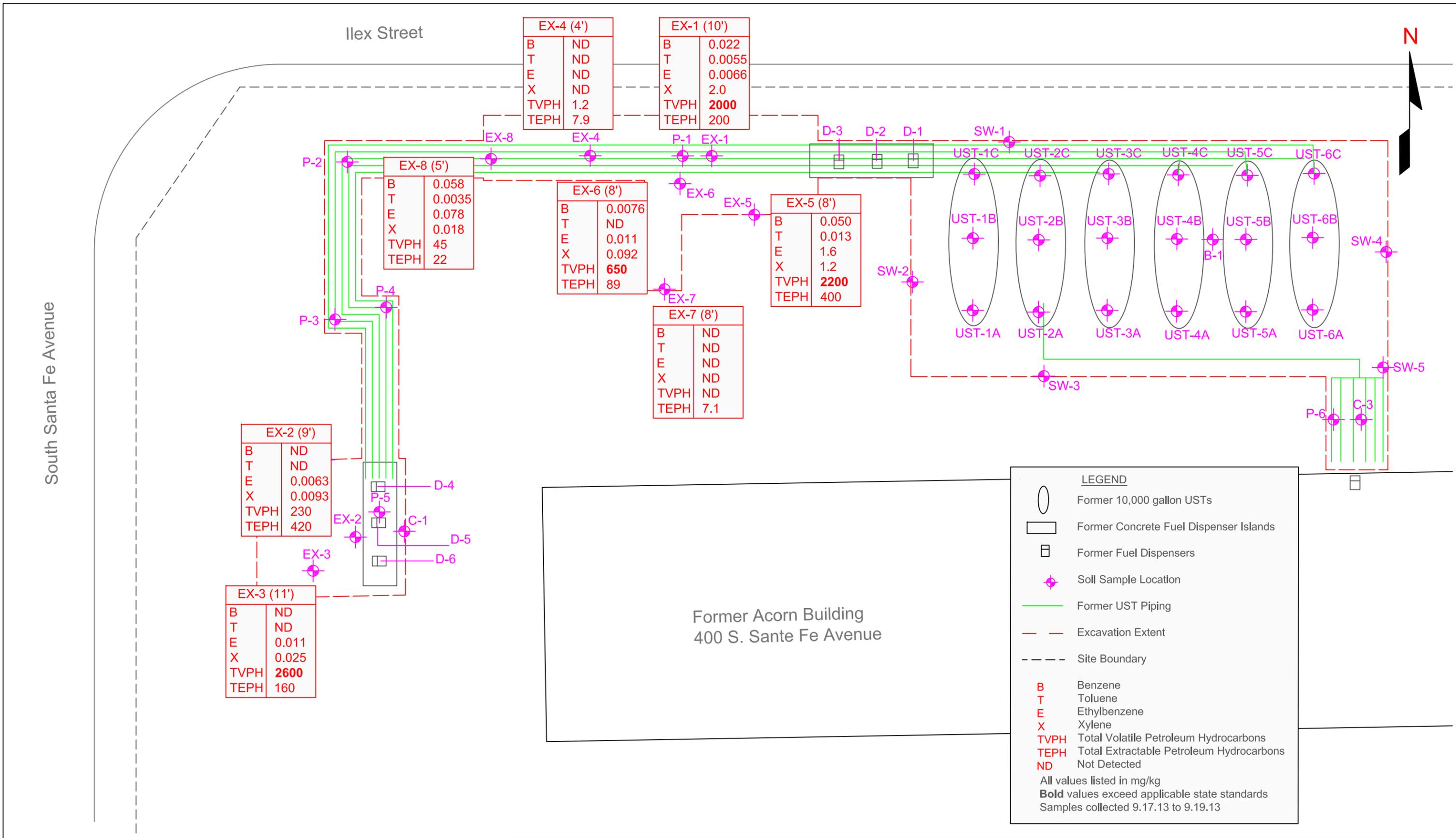
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Figure 7d

Excavation Soil Analytical Results Map
 (Sidewall, Bottom, and Confirmation Samples)



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Figure 7e
Excavation Soil Analytical Results Map
 (Excavation Samples)

South Santa Fe Avenue

Ilex Street

EX-1 (10')

Acenaphthene	0.0431
Acenaphthylene	0.0145
Anthracene	0.00748
Benzo (a) anthracene	0.00690
Benzo (b) fluoranthene	0.00735
Benzo (k) fluoranthene	ND
Benzo (g,h,i) perylene	ND
Benzo (a) pyrene	ND
Chrysene	0.00685
Dibenz (a,h) anthracene	ND
Fluoranthene	0.0145
Fluorene	0.0409
Indeno (1,2,3-cd) pyrene	ND
Naphthalene	2.75
Phenanthrene	0.0586
Pyrene	0.0355

EX-3 (11')

Acenaphthene	0.0224
Acenaphthylene	0.0102
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (b) fluoranthene	ND
Benzo (k) fluoranthene	ND
Benzo (g,h,i) perylene	ND
Benzo (a) pyrene	ND
Chrysene	ND
Dibenz (a,h) anthracene	ND
Fluoranthene	ND
Fluorene	0.0220
Indeno (1,2,3-cd) pyrene	ND
Naphthalene	3.94
Phenanthrene	0.0327
Pyrene	ND

EX-5 (8')

Acenaphthene	0.0397
Acenaphthylene	0.0176
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (b) fluoranthene	ND
Benzo (k) fluoranthene	ND
Benzo (g,h,i) perylene	ND
Benzo (a) pyrene	ND
Chrysene	ND
Dibenz (a,h) anthracene	ND
Fluoranthene	0.00684
Fluorene	0.0353
Indeno (1,2,3-cd) pyrene	ND
Naphthalene	10.2
Phenanthrene	0.0342
Pyrene	0.0150

D-3 (3')

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	0.0172
Benzo (a) anthracene	ND
Benzo (b) fluoranthene	ND
Benzo (k) fluoranthene	ND
Benzo (g,h,i) perylene	ND
Benzo (a) pyrene	ND
Chrysene	ND
Dibenz (a,h) anthracene	ND
Fluoranthene	ND
Fluorene	0.0185
Indeno (1,2,3-cd) pyrene	ND
Naphthalene	ND
Phenanthrene	0.515
Pyrene	0.354

P-6 (2.5')

Acenaphthene	0.0150
Acenaphthylene	ND
Anthracene	0.0149
Benzo (a) anthracene	0.0340
Benzo (b) fluoranthene	0.0489
Benzo (k) fluoranthene	0.0186
Benzo (g,h,i) perylene	0.0147
Benzo (a) pyrene	0.0377
Chrysene	0.0314
Dibenz (a,h) anthracene	ND
Fluoranthene	0.0609
Fluorene	0.0224
Indeno (1,2,3-cd) pyrene	0.0176
Naphthalene	0.0207
Phenanthrene	0.0673
Pyrene	0.0737

D-5 (2.5')

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (b) fluoranthene	ND
Benzo (k) fluoranthene	ND
Benzo (g,h,i) perylene	ND
Benzo (a) pyrene	ND
Chrysene	ND
Dibenz (a,h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1,2,3-cd) pyrene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

Former Acorn Building
400 S. Santa Fe Avenue

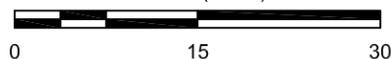
LEGEND

- Former 10,000 gallon USTs
- Former Concrete Fuel Dispenser Islands
- Former Fuel Dispensers
- Soil Sample Location
- Former UST Piping
- Excavation Extent
- Site Boundary
- ND** Not Detected

All values listed in mg/kg
Samples D-3 and D-5 collected on 9.5.13. All other samples collected 9.17.13 to 9.18.13



SCALE (FEET)



S I T E
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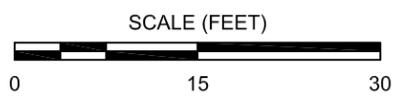
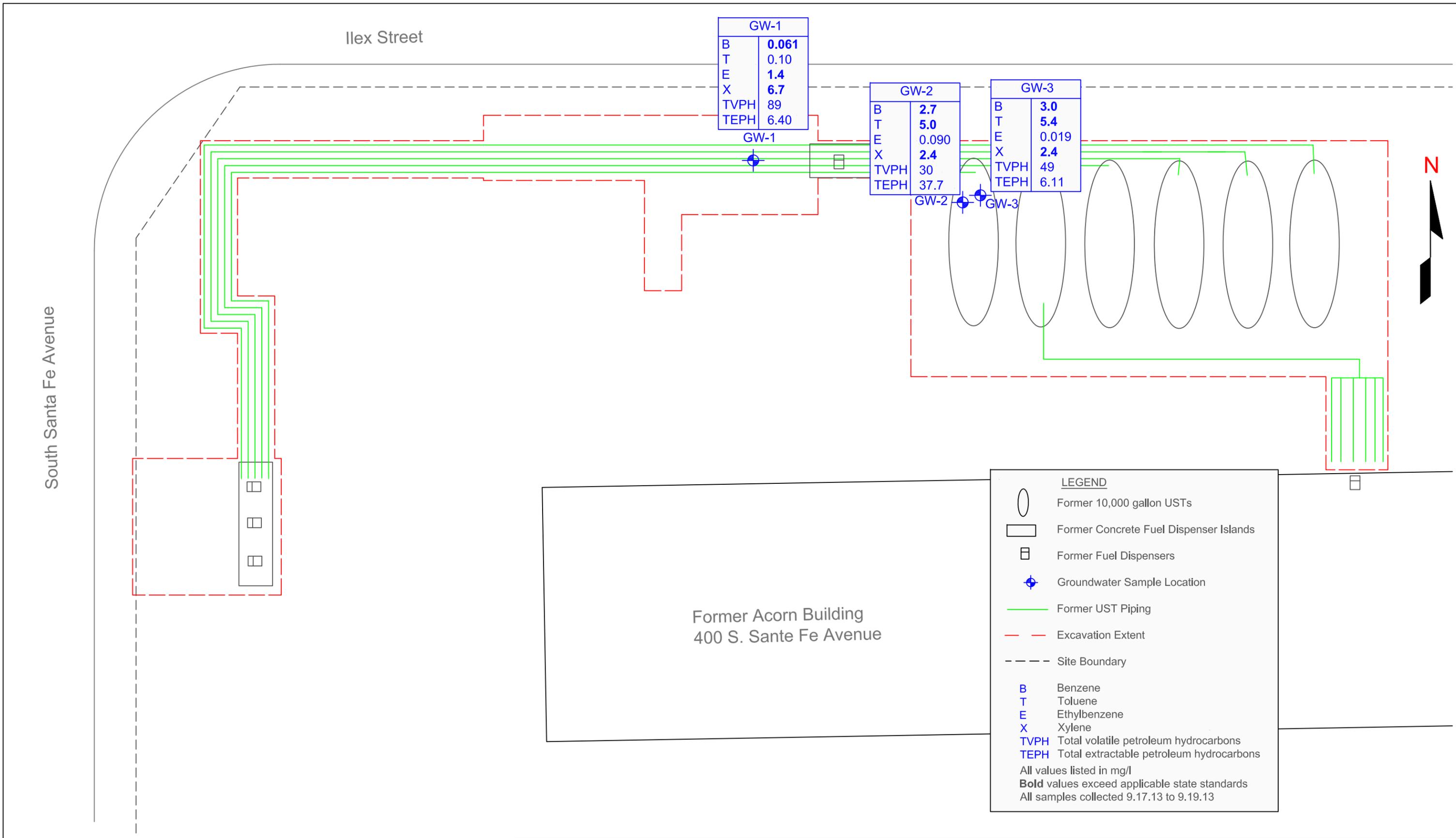
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Figure 7f
Excavation Soil Analytical Results Map
(PAH Results)



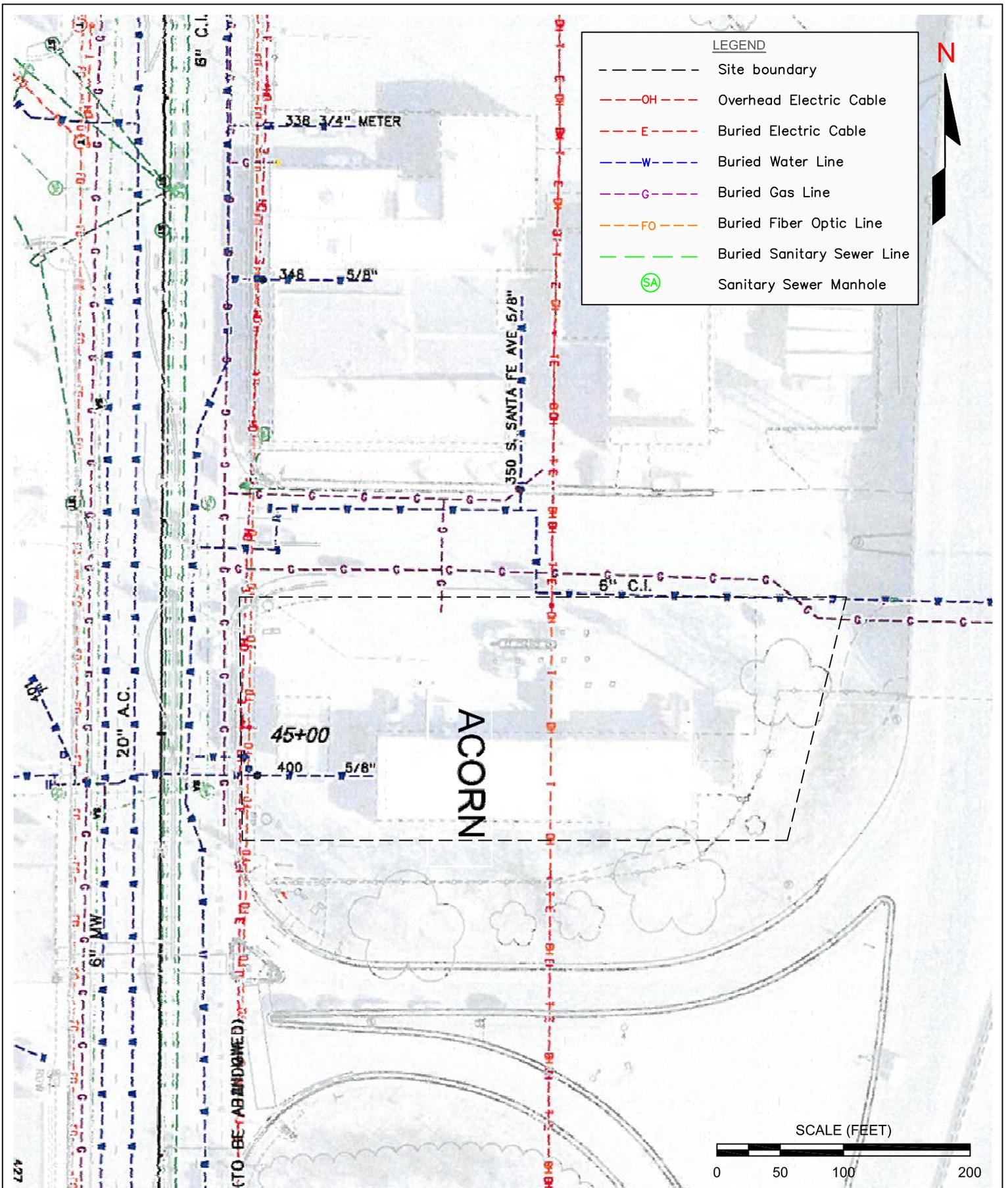


Figure 9
POE Location Figure



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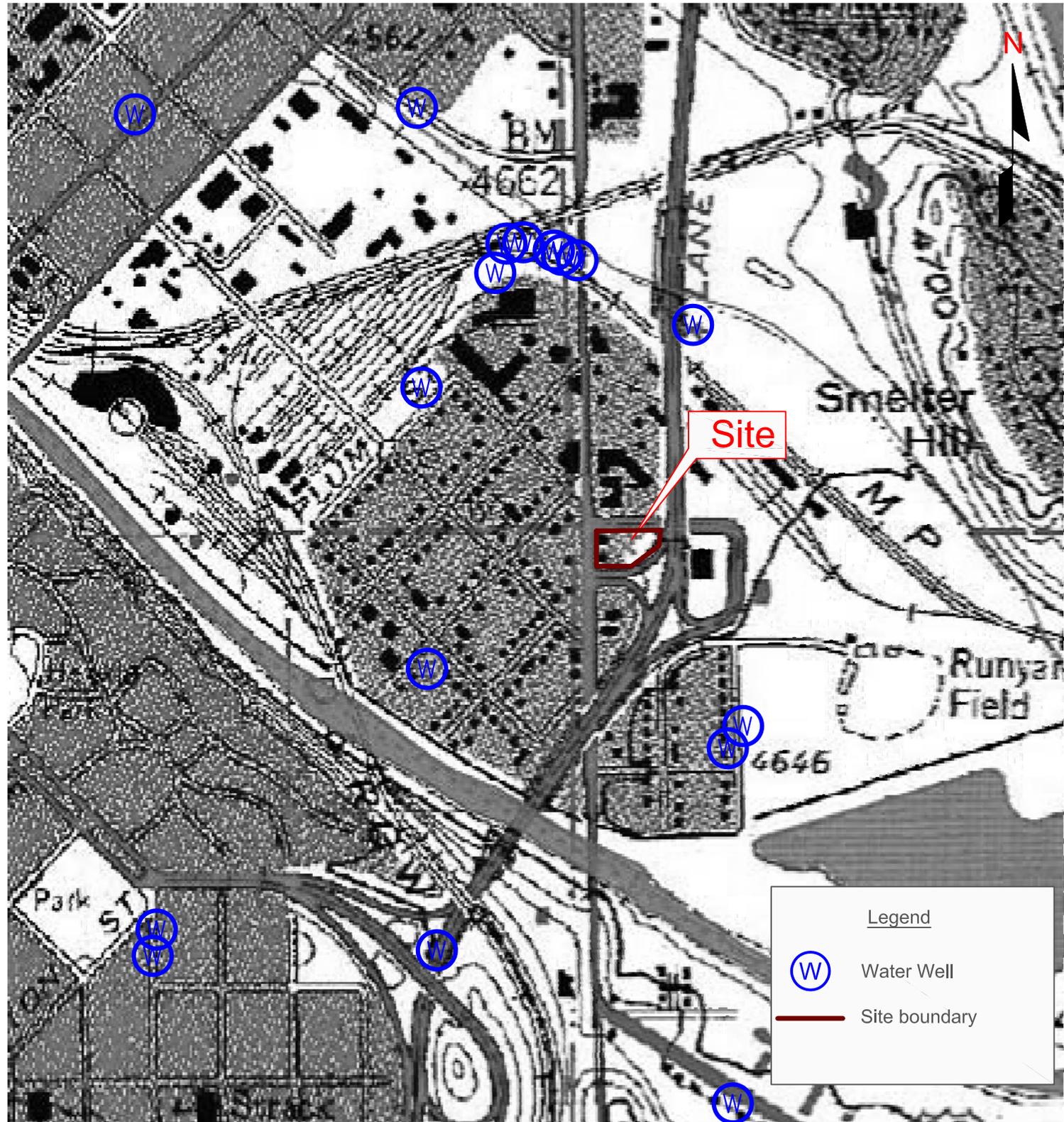


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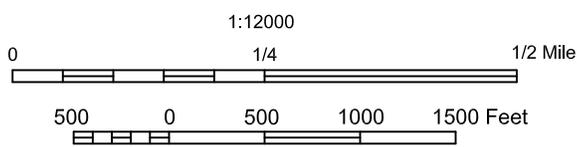
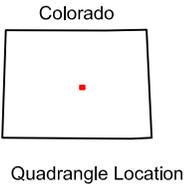
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Legend

-  Water Well
-  Site boundary



Portion of 7.5-minute Series
Topographic Map
United States Department of the Interior
Geological Survey

Figure 10
Water Well Location Map



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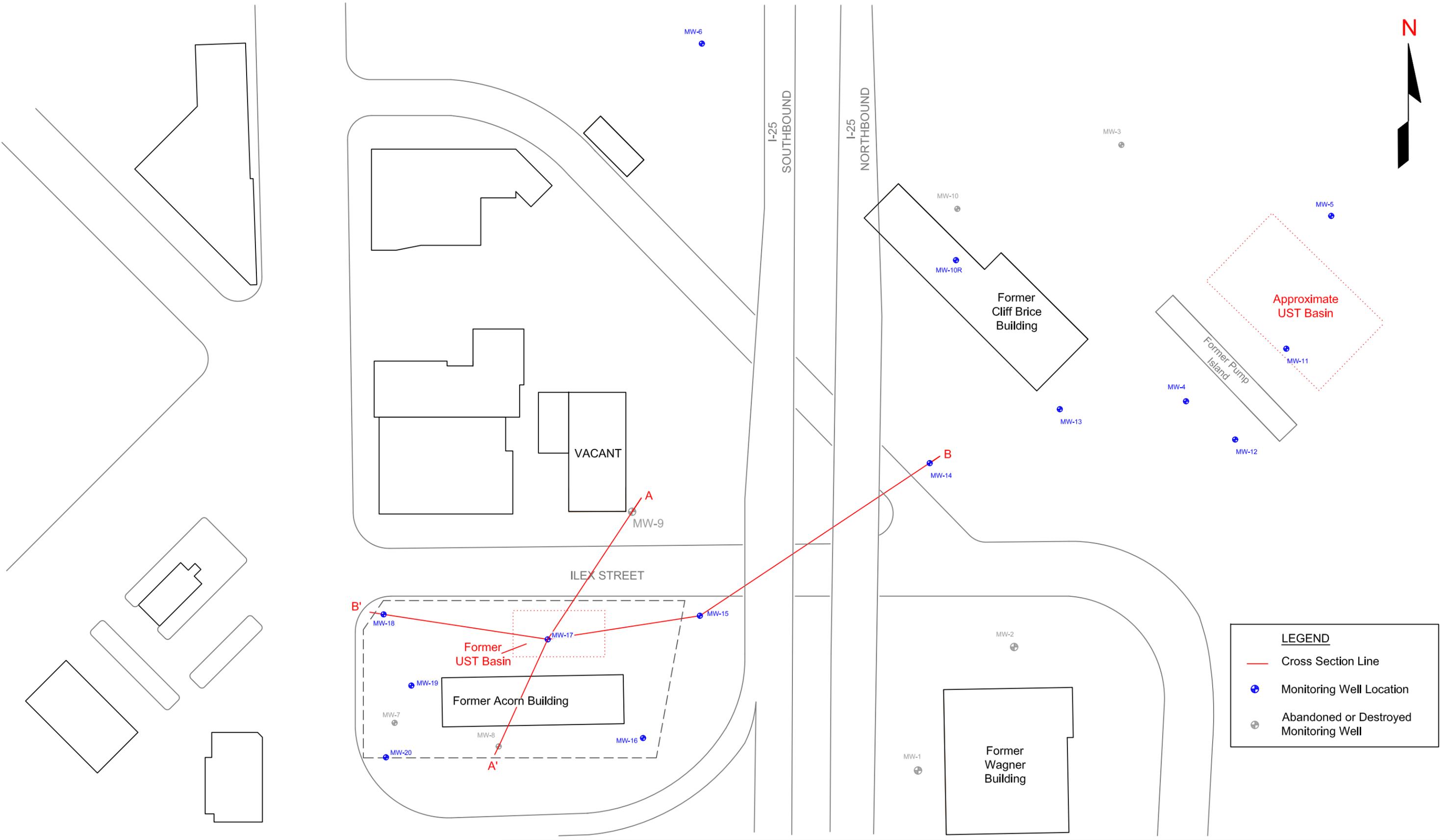
CLIENT



SITE

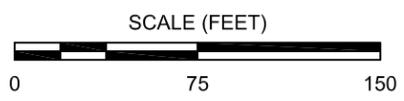
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LEGEND

-  Cross Section Line
-  Monitoring Well Location
-  Abandoned or Destroyed Monitoring Well



S I T E	CDOT Ilex Bridge Project Pueblo, Colorado	 Bureau Veritas North America, Inc. <i>Health, Safety, and Environmental Services</i> 165 South Union Blvd., Suite 310 Lakewood, Colorado 80228 303-988-2585 Telephone 303-988-2583 Fax	C L I E N T		Figure 11 Cross Section Diagram Map
	Project No. 10014-013003.05				

Legend

	Sandy Silt	4650	Elevation above mean sea level
	Silty Sand	B	Benzene
	Gravelly Sand	T	Toluene
	Silt	E	Ethylbenzene
	Sand	X	Xylene
	Sand and Gravel	GRO	Gasoline Range Organics
		DRO	Diesel Range Organics
		PID	Photoionization Detector
			Static Water Level
			Monitoring Well with screened interval

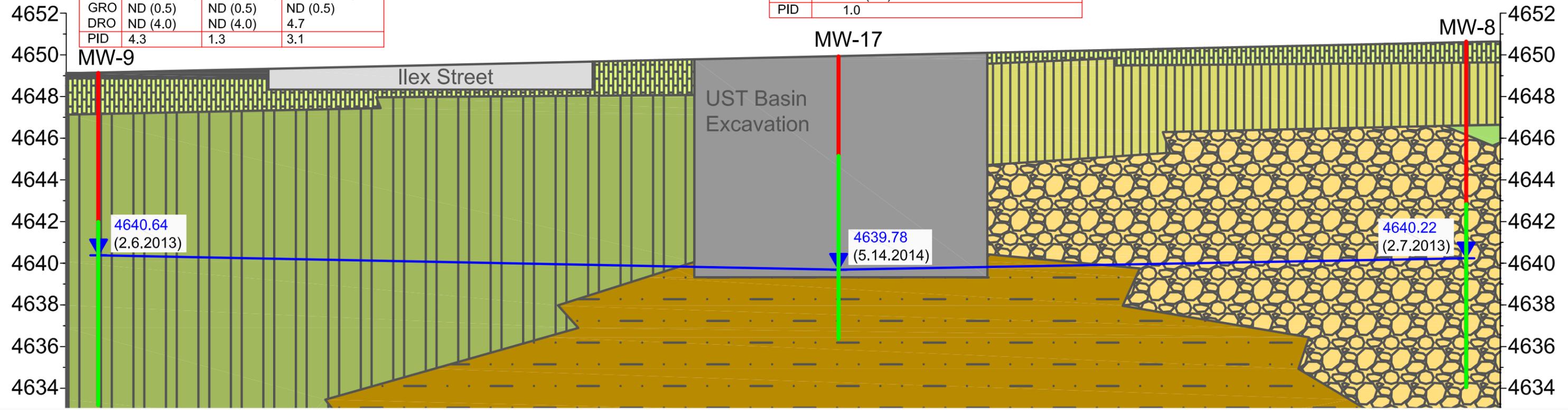
Horizontal scale is 1" : 15'



	5'	8'	14.5'
B	ND (0.0021)	ND (0.0021)	ND (0.0021)
T	ND (0.0029)	ND (0.0029)	ND (0.0029)
E	ND (0.0028)	ND (0.0028)	ND (0.0028)
X	ND (0.0085)	ND (0.0085)	ND (0.0085)
GRO	ND (0.5)	ND (0.5)	ND (0.5)
DRO	ND (4.0)	ND (4.0)	4.7
PID	4.3	1.3	3.1

	5'
B	ND (0.0021)
T	ND (0.0029)
E	ND (0.0028)
X	ND (0.0085)
GRO	ND (0.5)
DRO	ND (2.4)
PID	1.0

	3.5'	7.5'	12.5'
B	ND (0.0021)	ND (0.0021)	ND (0.0021)
T	ND (0.0029)	ND (0.0029)	ND (0.0029)
E	ND (0.0028)	ND (0.0028)	0.950
X	ND (0.0085)	ND (0.0085)	0.520
GRO	0.6	ND (0.5)	410.0
DRO	7.9	8.1	130.0
PID	3.0	4.9	228.0



Legend

-  Sandy Gravel 4650 Elevation above mean sea level
 -  Sandy Clay B Benzene
 -  Gravelly Sand T Toluene
 -  Clay E Ethylbenzene
 -  Sand X Xylene
 -  Clayey Sand GRO Gasoline Range Organics
 -  Cobbly Clay DRO Diesel Range Organics
-  Static Water Level
 Monitoring Well with screened interval
- Horizontal scale is 1" : 35'
- Value listed in **Bold** exceeds appropriate regulatory standard

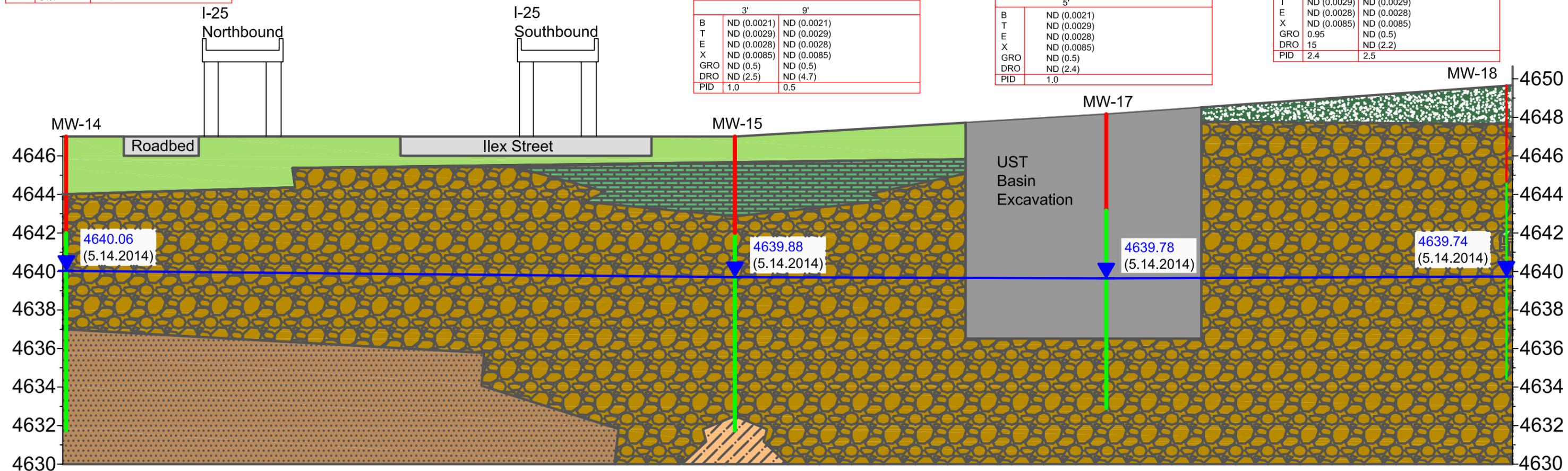


MW-14 Soil Samples (mg/kg) and PID Readings (ppm)		
	2.5'	9'
B	ND (0.0021)	ND (0.0021)
T	ND (0.0029)	0.011
E	ND (0.0028)	2.6
X	ND (0.0085)	0.47
GRO	0.8	910
DRO	ND (2.3)	87
PID	51.1	1140

MW-15 Soil Samples (mg/kg) and PID Readings (ppm)		
	3'	9'
B	ND (0.0021)	ND (0.0021)
T	ND (0.0029)	ND (0.0029)
E	ND (0.0028)	ND (0.0028)
X	ND (0.0085)	ND (0.0085)
GRO	ND (0.5)	ND (0.5)
DRO	ND (2.5)	ND (4.7)
PID	1.0	0.5

MW-17 Soil Sample (mg/kg) and PID Reading (ppm)		
	5'	
B	ND (0.0021)	
T	ND (0.0029)	
E	ND (0.0028)	
X	ND (0.0085)	
GRO	ND (0.5)	
DRO	ND (2.4)	
PID	1.0	

MW-18 Soil Samples (mg/kg) and PID Readings (ppm)		
	3.5'	9'
B	ND (0.0021)	ND (0.0021)
T	ND (0.0029)	ND (0.0029)
E	ND (0.0028)	ND (0.0028)
X	ND (0.0085)	ND (0.0085)
GRO	0.95	ND (0.5)
DRO	15	ND (2.2)
PID	2.4	2.5



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C L I E N T


Figure 11b
 Cross Section B - B'



LABORATORY REPORT



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TEL: (303) 850-7606 FAX: (303) 850-7609
Website: www.ecs-corp.com*

Agatha Linger
Bureau Veritas, Inc.
165 South Union Boulevard
Suite 310
Lakewood, CO 80228
Tel: (303) 988-2585
Fax: (303) 988-2583

May 09, 2014

Project Name: CDOT Acorn
Project No.: 10014-013003.05.002

Work Order: 1405020

Dear Agatha Linger:

Environmental Chemistry Services, Inc. received 10 sample(s) on 5/7/2014 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report, , unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call or email.

TEL: (303) 850-7606 ext:300
kris@ecs-corp.com

Sincerely,

A handwritten signature in purple ink, appearing to be "Kris Mascarenas", with a stylized flourish at the end.

Kris Mascarenas
Director of Client Services



Environmental Chemistry Services, Inc.
2 Oakwood Park Plaza; 100
Castle Rock, CO 80104-1885
TEL: (303) 850-7606 FAX: (303) 850-7609
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Case Narrative

WO#: 1405020
Date: 5/9/2014

CLIENT: Bureau Veritas, Inc.
Project: CDOT Acorn

This report in its entirety consists of the documents listed below. All documents contain the Environmental Chemistry Services, Inc. Work Order Number assigned to this report.

1. Paginated Report including: A Cover Letter, Case Narrative, Analytical Results, and Applicable Quality Control Reports.
2. Copies of the Chain of Custody Document(s) supplied with this sample set.
3. Electronic Data Deliverables (EDD) if requested.

Samples were analyzed for BTEX and TVPH by EPA Method 8260B. This is a gas chromatography/mass spectrometry method using purge and trap concentration and a capillary chromatography column. The surrogate standards are added to monitor purging efficiency.

Samples were analyzed for TPH-DRO (Diesel Range Organics) using EPA Method 8015.

Any comments or problems with the analytical events associated with this report are noted below.

Prep Comments for METHOD (3545A), all samples required Silica Gel Cleanup

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-01A

Client Sample ID: MW-15 (3')
Canister ID:
Collection Date: 5/7/2014 2:20:00 PM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/8/2014 8:33:00 PM
Toluene	ND	0.0029		mg/Kg	1	5/8/2014 8:33:00 PM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/8/2014 8:33:00 PM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/8/2014 8:33:00 PM
TVPH	ND	0.50		mg/Kg	1	5/8/2014 8:33:00 PM
Surr: Toluene-d8	107	50-150		%REC	1	5/8/2014 8:33:00 PM
Surr: Dibromofluoromethane	103	50-150		%REC	1	5/8/2014 8:33:00 PM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	ND	2.5		mg/Kg-dry	1	5/8/2014 3:25:00 PM
Surr: OTP	101	70-130		%REC	1	5/8/2014 3:25:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	20	1.0			1	5/9/2014 8:15:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-02A

Client Sample ID: MW-15 (9')
Canister ID:
Collection Date: 5/7/2014 2:10:00 PM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/8/2014 9:01:00 PM
Toluene	ND	0.0029		mg/Kg	1	5/8/2014 9:01:00 PM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/8/2014 9:01:00 PM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/8/2014 9:01:00 PM
TVPH	4.2	0.50		mg/Kg	1	5/8/2014 9:01:00 PM
Surr: Toluene-d8	105	50-150		%REC	1	5/8/2014 9:01:00 PM
Surr: Dibromofluoromethane	102	50-150		%REC	1	5/8/2014 9:01:00 PM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	ND	2.1		mg/Kg-dry	1	5/8/2014 3:45:00 PM
Surr: OTP	99.1	70-130		%REC	1	5/8/2014 3:45:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	6.5	1.0			1	5/9/2014 8:16:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-03A

Client Sample ID: MW-16 (9.5')
Canister ID:
Collection Date: 5/7/2014 12:00:00 PM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/9/2014 3:29:00 AM
Toluene	ND	0.0029		mg/Kg	1	5/9/2014 3:29:00 AM
Ethylbenzene	0.016	0.0028		mg/Kg	1	5/9/2014 3:29:00 AM
Xylenes, Total	0.033	0.0085		mg/Kg	1	5/9/2014 3:29:00 AM
TVPH	30	0.50		mg/Kg	1	5/9/2014 3:29:00 AM
Surr: Toluene-d8	102	50-150		%REC	1	5/9/2014 3:29:00 AM
Surr: Dibromofluoromethane	100	50-150		%REC	1	5/9/2014 3:29:00 AM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	46	2.2		mg/Kg-dry	1	5/8/2014 4:05:00 PM
Surr: OTP	110	70-130		%REC	1	5/8/2014 4:05:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	7.7	1.0			1	5/9/2014 8:17:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-04A

Client Sample ID: MW-16 (13.5')
Canister ID:
Collection Date: 5/7/2014 12:20:00 PM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/9/2014 8:50:00 AM
Toluene	ND	0.0029		mg/Kg	1	5/9/2014 8:50:00 AM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/9/2014 8:50:00 AM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/9/2014 8:50:00 AM
TVPH	47	0.50		mg/Kg	1	5/9/2014 8:50:00 AM
Surr: Toluene-d8	103	50-150		%REC	1	5/9/2014 8:50:00 AM
Surr: Dibromofluoromethane	99.8	50-150		%REC	1	5/9/2014 8:50:00 AM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	17	2.1		mg/Kg-dry	1	5/8/2014 4:25:00 PM
Surr: OTP	98.2	70-130		%REC	1	5/8/2014 4:25:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	6.7	1.0			1	5/9/2014 8:18:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-05A

Client Sample ID: MW-17 (13')
Canister ID:
Collection Date: 5/6/2014 11:15:00 AM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/8/2014 9:56:00 PM
Toluene	ND	0.0029		mg/Kg	1	5/8/2014 9:56:00 PM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/8/2014 9:56:00 PM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/8/2014 9:56:00 PM
TVPH	ND	0.50		mg/Kg	1	5/8/2014 9:56:00 PM
Surr: Toluene-d8	106	50-150		%REC	1	5/8/2014 9:56:00 PM
Surr: Dibromofluoromethane	101	50-150		%REC	1	5/8/2014 9:56:00 PM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	ND	2.4		mg/Kg-dry	1	5/8/2014 4:44:00 PM
Surr: OTP	98.8	70-130		%REC	1	5/8/2014 4:44:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	18	1.0			1	5/9/2014 8:19:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-06A

Client Sample ID: MW-18 (3.5')
Canister ID:
Collection Date: 5/6/2014 2:00:00 PM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/8/2014 10:24:00 PM
Toluene	ND	0.0029		mg/Kg	1	5/8/2014 10:24:00 PM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/8/2014 10:24:00 PM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/8/2014 10:24:00 PM
TVPH	0.95	0.50		mg/Kg	1	5/8/2014 10:24:00 PM
Surr: Toluene-d8	105	50-150		%REC	1	5/8/2014 10:24:00 PM
Surr: Dibromofluoromethane	100	50-150		%REC	1	5/8/2014 10:24:00 PM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	15	2.2		mg/Kg-dry	1	5/8/2014 5:04:00 PM
Surr: OTP	101	70-130		%REC	1	5/8/2014 5:04:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	9.3	1.0			1	5/9/2014 8:20:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-07A

Client Sample ID: MW-18 (9')
Canister ID:
Collection Date: 5/6/2014 2:05:00 PM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/8/2014 10:51:00 PM
Toluene	ND	0.0029		mg/Kg	1	5/8/2014 10:51:00 PM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/8/2014 10:51:00 PM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/8/2014 10:51:00 PM
TVPH	ND	0.50		mg/Kg	1	5/8/2014 10:51:00 PM
Surr: Toluene-d8	106	50-150		%REC	1	5/8/2014 10:51:00 PM
Surr: Dibromofluoromethane	101	50-150		%REC	1	5/8/2014 10:51:00 PM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	ND	2.2		mg/Kg-dry	1	5/8/2014 5:24:00 PM
Surr: OTP	94.1	70-130		%REC	1	5/8/2014 5:24:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	8.1	1.0			1	5/9/2014 8:21:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-08A

Client Sample ID: MW-19 (14')
Canister ID:
Collection Date: 5/6/2014 12:30:00 PM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B				Analyst: KM
Benzene	ND	0.0021		mg/Kg	1	5/8/2014 11:19:00 PM
Toluene	ND	0.0029		mg/Kg	1	5/8/2014 11:19:00 PM
Ethylbenzene	0.013	0.0028		mg/Kg	1	5/8/2014 11:19:00 PM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/8/2014 11:19:00 PM
TVPH	46	2.5	D	mg/Kg	5	5/9/2014 9:18:00 AM
Surr: Toluene-d8	95.9	50-150		%REC	1	5/8/2014 11:19:00 PM
Surr: Dibromofluoromethane	99.4	50-150		%REC	1	5/8/2014 11:19:00 PM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	28	2.2		mg/Kg-dry	1	5/8/2014 5:44:00 PM
Surr: OTP	92.1	70-130		%REC	1	5/8/2014 5:44:00 PM
PERCENT MOISTURE		Method: D2216				Analyst: KM
Percent Moisture	8.3	1.0			1	5/9/2014 8:22:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-09A

Client Sample ID: MW-20 (4')
Canister ID:
Collection Date: 5/7/2014 10:35:00 AM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0021		mg/Kg	1	5/8/2014 11:47:00 PM
Toluene	ND	0.0029		mg/Kg	1	5/8/2014 11:47:00 PM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/8/2014 11:47:00 PM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/8/2014 11:47:00 PM
TVPH	ND	0.50		mg/Kg	1	5/8/2014 11:47:00 PM
Surr: Toluene-d8	107	50-150		%REC	1	5/8/2014 11:47:00 PM
Surr: Dibromofluoromethane	99.9	50-150		%REC	1	5/8/2014 11:47:00 PM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	ND	2.2		mg/Kg-dry	1	5/8/2014 6:04:00 PM
Surr: OTP	87.9	70-130		%REC	1	5/8/2014 6:04:00 PM
PERCENT MOISTURE		Method: D2216			Analyst: KM	
Percent Moisture	9.4	1.0			1	5/9/2014 8:23:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 09-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405020
Project: CDOT Acorn
Lab ID: 1405020-10A

Client Sample ID: MW-20 (14')
Canister ID:
Collection Date: 5/7/2014 10:30:00 AM
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0021		mg/Kg	1	5/9/2014 12:15:00 AM
Toluene	ND	0.0029		mg/Kg	1	5/9/2014 12:15:00 AM
Ethylbenzene	ND	0.0028		mg/Kg	1	5/9/2014 12:15:00 AM
Xylenes, Total	ND	0.0085		mg/Kg	1	5/9/2014 12:15:00 AM
TVPH	ND	0.50		mg/Kg	1	5/9/2014 12:15:00 AM
Surr: Toluene-d8	106	50-150		%REC	1	5/9/2014 12:15:00 AM
Surr: Dibromofluoromethane	100	50-150		%REC	1	5/9/2014 12:15:00 AM
DIESEL RANGE ORGANICS IN SOIL		Method: SW8015B			SW3545A	Analyst: TSM
Diesel Range Organics C10-C28	ND	2.1		mg/Kg-dry	1	5/8/2014 6:24:00 PM
Surr: OTP	95.3	70-130		%REC	1	5/8/2014 6:24:00 PM
PERCENT MOISTURE		Method: D2216			Analyst: KM	
Percent Moisture	5.2	1.0			1	5/9/2014 8:24:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	



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 Website: www.ecs-corp.com

QC SUMMARY REPORT

Work Order: **1405020**

09-May-14

Client: Bureau Veritas, Inc.
Project: CDOT Acorn

BatchID: 29

Sample ID MB-29	SampType: MBLK	TestCode: DRO_S	Units: mg/Kg	Prep Date: 5/8/2014	RunNo: 1107						
Client ID: PBS	Batch ID: 29	TestNo: SW8015B	SW3545A	Analysis Date: 5/8/2014	SeqNo: 14982						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel Range Organics C10-C28 ND 2.0
 Surr: OTP 17 16.50 106 70 130

Sample ID LCS-29	SampType: LCS	TestCode: DRO_S	Units: mg/Kg	Prep Date: 5/8/2014	RunNo: 1107						
Client ID: LCSS	Batch ID: 29	TestNo: SW8015B	SW3545A	Analysis Date: 5/8/2014	SeqNo: 14983						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel Range Organics C10-C28 170 2.0 165.0 0 105 70 130
 Surr: OTP 16 16.50 96.6 70 130

Sample ID LCSD-29	SampType: LCSD	TestCode: DRO_S	Units: mg/Kg	Prep Date: 5/8/2014	RunNo: 1107						
Client ID: LCSS02	Batch ID: 29	TestNo: SW8015B	SW3545A	Analysis Date: 5/8/2014	SeqNo: 14984						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel Range Organics C10-C28 170 2.0 165.0 0 103 70 130 172.8 1.97 30
 Surr: OTP 17 16.50 102 73 130 0 30

Qualifiers: B Analyte detected in the associated Method Blank D Dilution was required. E Value above quantitation range
 H Holding times for preparation or analysis exceeded ND Not Detected at the RL O RSD is greater than RSDlimit
 R RPD outside accepted recovery limits RL Reporting Limit S Spike Recovery outside accepted reco



Environmental Chemistry Services, Inc.
 2 Oakwood Park Plaza; 100
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QC SUMMARY REPORT

Work Order: **1405020**

09-May-14

Client: Bureau Veritas, Inc.
Project: CDOT Acorn

BatchID: R1105

Sample ID MBLK	SampType: MBLK	TestCode: BTEX_S	Units: mg/Kg	Prep Date:	RunNo: 1105						
Client ID: PBS	Batch ID: R1105	TestNo: SW8260B		Analysis Date: 5/8/2014	SeqNo: 14948						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0021									
Toluene	ND	0.0029									
Ethylbenzene	ND	0.0028									
Xylenes, Total	ND	0.0085									
TVPH	ND	0.50									
Surr: Toluene-d8	0.053		0.05000		107	50	150				
Surr: Dibromofluoromethane	0.050		0.05000		99.7	50	150				

Sample ID LCS	SampType: LCS	TestCode: BTEX_S	Units: mg/Kg	Prep Date:	RunNo: 1105						
Client ID: LCSS	Batch ID: R1105	TestNo: SW8260B		Analysis Date: 5/8/2014	SeqNo: 14949						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.043	0.0021	0.05000	0	86.6	50	150				
Toluene	0.044	0.0029	0.05000	0	88.1	50	150				
Ethylbenzene	0.050	0.0028	0.05000	0	100	50	150				
Xylenes, Total	0.15	0.0085	0.1500	0	100	50	150				
TVPH	3.0	0.50	5.000	0	59.7	50	150				
Surr: Toluene-d8	0.053		0.05000		107	50	150				
Surr: Dibromofluoromethane	0.051		0.05000		102	50	150				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required.	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike Recovery outside accepted reco



Environmental Chemistry Services, Inc.
 2 Oakwood Park Plaza; 100
 Castle Rock, CO 80104-1885
 TEL: (303) 850-7606 FAX: (303) 850-7609
 Website: www.ecs-corp.com

QC SUMMARY REPORT

Work Order: **1405020**
09-May-14

Client: Bureau Veritas, Inc.
Project: CDOT Acorn

BatchID: R1105

Sample ID	LCSD	SampType:	LCSD	TestCode:	BTEX_S	Units:	mg/Kg	Prep Date:	RunNo:	1105	
Client ID:	LCSS02	Batch ID:	R1105	TestNo:	SW8260B	Analysis Date:	5/9/2014	SeqNo:	14950		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.042	0.0021	0.05000	0	84.4	50	150	0.04331	2.57	30	
Toluene	0.044	0.0029	0.05000	0	87.7	50	150	0.04406	0.455	30	
Ethylbenzene	0.049	0.0028	0.05000	0	98.4	50	150	0.05020	1.97	30	
Xylenes, Total	0.15	0.0085	0.1500	0	98.1	50	150	0.1500	1.97	30	
TVPH	3.5	0.50	5.000	0	70.3	50	150	2.984	16.4	30	
Surr: Toluene-d8	0.054		0.05000		108	50	150		0	30	
Surr: Dibromofluoromethane	0.050		0.05000		100	50	150		0	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required.	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike Recovery outside accepted reco



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Chain of Custody Record (COC)

COC # 13389

PROJECT INFORMATION		ANALYSES REQUESTED				TURN-AROUND-TIME (TAT)	REMARKS
Project Number: 10014-013003.05	Project Name: CDOT Acorn	NUMBER OF CONTAINERS	BTEX	GRD	DRD	<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush <input type="checkbox"/> Other	UBV Work Order Number: (for lab use only) 1405020
Report To: Agatha Linger							
Telephone:							
Fax / E-Mail:							

SAMPLE NUMBER / IDENTIFICATION	SAMPLE			Container & Size**	NUMBER OF CONTAINERS	BTEX	GRD	DRD	# PAHs (hold)	CANISTER ID	REMARKS	LAB #
	Date	Time	Matrix									
MW-15 (3')	5-7-14	1420	SO	4oz-C	1	✓	✓	✓	✓			1
MW-15 (9')		1410										2
MW-16 (9.5')		1200										3
MW-16 (13.5')		1220										4
MW-17 (13')	5-6-14	1115										5
MW-18 (3.5')		1400										6
MW-18 (9')		1405										7
MW-19 (14')		1230										8
MW-20 (4')	5-7-14	1035										9
MW-20 (14')	5-7-14	1030										10

Sampled By: <u>William Allen</u>		Shipment Method:		Airbill Number:	
SIGNATURE	PRINT NAME	COMPANY	DATE	TIME	
1a Relinquished By: <u>W Allen</u>	William Allen	BVNA	5-7-14	1820	
1b Received By: <u>[Signature]</u>	KRIS MASCARENAS	ECS	5-7-14	1820	
2a Relinquished By:					
2b Received By:					
3a Relinquished By:					
3b Received By:					

THE ABOVE SIGNED HAS READ AND UNDERSTANDS THE CREDIT TERMS AND CREDIT POLICIES OF ECS, INC. AND AGREES TO THE TERMS AND CONDITIONS AS SET FORTH IN THIS AGREEMENT.

*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste OT = Other Preservative: H = HCl N = Nitric SF = Sulfuric
 **Container: A = Amber B = Brass C = Clear Glass P = Plastic S = Soil Jar SU = Summa PF = PUF T = Tedlar TU = Tube OT = Other

Page _____ of _____



*Environmental Chemistry Services, Inc.
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Website: www.ecs-corp.com*

Agatha Linger
Bureau Veritas, Inc.
165 South Union Boulevard
Suite 310
Lakewood, CO 80228
Tel: (303) 988-2585
Fax: (303) 988-2583

May 16, 2014

Project Name: CDOT Acorn
Project No.: 10014-013003.05.003

Work Order: 1405042

Dear Agatha Linger:

Environmental Chemistry Services, Inc. received 7 sample(s) on 5/15/2014 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report, , unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call or email.

TEL: (303) 850-7606 ext:300
kris@ecs-corp.com

Sincerely,

A handwritten signature in purple ink, appearing to be "Kris Mascarenas", written in a cursive style.

Kris Mascarenas
Director of Client Services



Environmental Chemistry Services, Inc.
2 Oakwood Park Plaza; 100
Castle Rock, CO 80104-1885
TEL: (303) 850-7606 FAX: (303) 850-7609
Website: www.ecs-corp.com

Case Narrative

WO#: 1405042
Date: 5/16/2014

CLIENT: Bureau Veritas, Inc.
Project: CDOT Acorn

This report in its entirety consists of the documents listed below. All documents contain the Environmental Chemistry Services, Inc. Work Order Number assigned to this report.

1. Paginated Report including: A Cover Letter, Case Narrative, Analytical Results, and Applicable Quality Control Reports.
2. Copies of the Chain of Custody Document(s) supplied with this sample set.
3. Electronic Data Deliverables (EDD) if requested.

Samples were analyzed for BTEX/MTBE and TVPH by EPA Method 8260B. This is a gas chromatography/mass spectrometry method using purge and trap concentration and a capillary chromatography column. The surrogate standards are added to monitor purging efficiency.

Any comments or problems with the analytical events associated with this report are noted below.

Environmental Chemistry Services, Inc.

Date: 16-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405042
Project: CDOT Acorn
Lab ID: 1405042-01A

Client Sample ID: MW-15
Canister ID:
Collection Date: 5/15/2014 10:45:00 AM
Matrix: WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX/MTBE AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0010		mg/L	1	5/16/2014 12:53:00 AM
Toluene	ND	0.0010		mg/L	1	5/16/2014 12:53:00 AM
Ethyl benzene	ND	0.0010		mg/L	1	5/16/2014 12:53:00 AM
Xylenes, Total	ND	0.0010		mg/L	1	5/16/2014 12:53:00 AM
Methyl tert-butyl ether	ND	0.0010		mg/L	1	5/16/2014 12:53:00 AM
TVPH	ND	0.50		mg/L	1	5/16/2014 12:53:00 AM
Surr: Dibromofluoromethane	97.3	50-150		%REC	1	5/16/2014 12:53:00 AM
Surr: Toluene-d8	95.8	50-150		%REC	1	5/16/2014 12:53:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 16-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405042
Project: CDOT Acorn
Lab ID: 1405042-02A

Client Sample ID: MW-16
Canister ID:
Collection Date: 5/14/2014 3:00:00 PM
Matrix: WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX/MTBE AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0010		mg/L	1	5/16/2014 1:19:00 AM
Toluene	ND	0.0010		mg/L	1	5/16/2014 1:19:00 AM
Ethyl benzene	0.0077	0.0010		mg/L	1	5/16/2014 1:19:00 AM
Xylenes, Total	0.017	0.0010		mg/L	1	5/16/2014 1:19:00 AM
Methyl tert-butyl ether	ND	0.0010		mg/L	1	5/16/2014 1:19:00 AM
TVPH	9.6	0.50		mg/L	1	5/16/2014 1:19:00 AM
Surr: Dibromofluoromethane	99.0	50-150		%REC	1	5/16/2014 1:19:00 AM
Surr: Toluene-d8	95.2	50-150		%REC	1	5/16/2014 1:19:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 16-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405042
Project: CDOT Acorn
Lab ID: 1405042-03A

Client Sample ID: MW-17
Canister ID:
Collection Date: 5/14/2014 3:30:00 PM
Matrix: WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX/MTBE AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0010		mg/L	1	5/16/2014 1:45:00 AM
Toluene	ND	0.0010		mg/L	1	5/16/2014 1:45:00 AM
Ethyl benzene	ND	0.0010		mg/L	1	5/16/2014 1:45:00 AM
Xylenes, Total	ND	0.0010		mg/L	1	5/16/2014 1:45:00 AM
Methyl tert-butyl ether	ND	0.0010		mg/L	1	5/16/2014 1:45:00 AM
TVPH	ND	0.50		mg/L	1	5/16/2014 1:45:00 AM
Surr: Dibromofluoromethane	96.1	50-150		%REC	1	5/16/2014 1:45:00 AM
Surr: Toluene-d8	94.9	50-150		%REC	1	5/16/2014 1:45:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 16-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405042
Project: CDOT Acorn
Lab ID: 1405042-04A

Client Sample ID: MW-18
Canister ID:
Collection Date: 5/14/2014 3:55:00 PM
Matrix: WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX/MTBE AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0010		mg/L	1	5/16/2014 2:12:00 AM
Toluene	ND	0.0010		mg/L	1	5/16/2014 2:12:00 AM
Ethyl benzene	ND	0.0010		mg/L	1	5/16/2014 2:12:00 AM
Xylenes, Total	ND	0.0010		mg/L	1	5/16/2014 2:12:00 AM
Methyl tert-butyl ether	ND	0.0010		mg/L	1	5/16/2014 2:12:00 AM
TVPH	ND	0.50		mg/L	1	5/16/2014 2:12:00 AM
Surr: Dibromofluoromethane	95.4	50-150		%REC	1	5/16/2014 2:12:00 AM
Surr: Toluene-d8	95.3	50-150		%REC	1	5/16/2014 2:12:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 16-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405042
Project: CDOT Acorn
Lab ID: 1405042-05A

Client Sample ID: MW-19
Canister ID:
Collection Date: 5/15/2014 9:20:00 AM
Matrix: WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX/MTBE AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0010		mg/L	1	5/16/2014 2:38:00 AM
Toluene	ND	0.0010		mg/L	1	5/16/2014 2:38:00 AM
Ethyl benzene	0.043	0.0010		mg/L	1	5/16/2014 2:38:00 AM
Xylenes, Total	0.019	0.0010		mg/L	1	5/16/2014 2:38:00 AM
Methyl tert-butyl ether	ND	0.0010		mg/L	1	5/16/2014 2:38:00 AM
TVPH	9.4	0.50		mg/L	1	5/16/2014 2:38:00 AM
Surr: Dibromofluoromethane	97.3	50-150		%REC	1	5/16/2014 2:38:00 AM
Surr: Toluene-d8	95.4	50-150		%REC	1	5/16/2014 2:38:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 16-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405042
Project: CDOT Acorn
Lab ID: 1405042-06A

Client Sample ID: MW-20
Canister ID:
Collection Date: 5/15/2014 9:55:00 AM
Matrix: WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX/MTBE AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0010		mg/L	1	5/16/2014 3:04:00 AM
Toluene	ND	0.0010		mg/L	1	5/16/2014 3:04:00 AM
Ethyl benzene	ND	0.0010		mg/L	1	5/16/2014 3:04:00 AM
Xylenes, Total	ND	0.0010		mg/L	1	5/16/2014 3:04:00 AM
Methyl tert-butyl ether	ND	0.0010		mg/L	1	5/16/2014 3:04:00 AM
TVPH	ND	0.50		mg/L	1	5/16/2014 3:04:00 AM
Surr: Dibromofluoromethane	96.4	50-150		%REC	1	5/16/2014 3:04:00 AM
Surr: Toluene-d8	94.7	50-150		%REC	1	5/16/2014 3:04:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	

Environmental Chemistry Services, Inc.

Date: 16-May-14

Client: Bureau Veritas, Inc.
Work Order: 1405042
Project: CDOT Acorn
Lab ID: 1405042-07A

Client Sample ID: Trip Blank
Canister ID:
Collection Date: 5/15/2014
Matrix: WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
BTEX/MTBE AND TVPH		Method: SW8260B			Analyst: KM	
Benzene	ND	0.0010		mg/L	1	5/16/2014 3:31:00 AM
Toluene	ND	0.0010		mg/L	1	5/16/2014 3:31:00 AM
Ethyl benzene	ND	0.0010		mg/L	1	5/16/2014 3:31:00 AM
Xylenes, Total	ND	0.0010		mg/L	1	5/16/2014 3:31:00 AM
Methyl tert-butyl ether	ND	0.0010		mg/L	1	5/16/2014 3:31:00 AM
TVPH	ND	0.50		mg/L	1	5/16/2014 3:31:00 AM
Surr: Dibromofluoromethane	94.9	50-150		%REC	1	5/16/2014 3:31:00 AM
Surr: Toluene-d8	94.7	50-150		%REC	1	5/16/2014 3:31:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	D	Dilution was required.
	DF	Dilution Factor	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	N	Tentatively identified compounds
	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
	R	RPD outside accepted recovery limits	R	



Environmental Chemistry Services, Inc.
 2 Oakwood Park Plaza; 100
 Castle Rock, CO 80104-1885
 TEL: (303) 850-7606 FAX: (303) 850-7609
 Website: www.ecs-corp.com

QC SUMMARY REPORT

Work Order: **1405042**

16-May-14

Client: Bureau Veritas, Inc.

Project: CDOT Acorn

BatchID: R1124

Sample ID MBLK	SampType: MBLK	TestCode: BTEX_W	Units: mg/L	Prep Date:	RunNo: 1124						
Client ID: PBW	Batch ID: R1124	TestNo: SW8260B		Analysis Date: 5/15/2014	SeqNo: 15187						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.0010	0	0				0			
Toluene	ND	0.0010	0	0				0			
Ethyl benzene	ND	0.0010	0	0				0			
Xylenes, Total	ND	0.0010	0	0				0			
Methyl tert-butyl ether	ND	0.0010	0	0				0			
TVPH	ND	0.50	0	0				0			
Surr: Dibromofluoromethane	49		50.00		97.8	50	150				
Surr: Toluene-d8	48		50.00		95.5	50	150				

Sample ID LCS	SampType: LCS	TestCode: BTEX_W	Units: mg/L	Prep Date:	RunNo: 1124						
Client ID: LCSW	Batch ID: R1124	TestNo: SW8260B		Analysis Date: 5/15/2014	SeqNo: 15188						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.036	0.0010	0.050	0	72.3	50	150	0			
Toluene	0.046	0.0010	0.050	0	92.9	50	150	0			
Ethyl benzene	0.050	0.0010	0.050	0	99.3	50	150	0			
Xylenes, Total	0.15	0.0010	0.15	0	102	50	150	0			
Methyl tert-butyl ether	0.043	0.0010	0.050	0	86.5	30	160	0			
TVPH	3.0	0.50	5.0	0	60.3	50	150	0			
Surr: Dibromofluoromethane	49		50.00		98.8	50	150				
Surr: Toluene-d8	48		50.00		95.1	50	150				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required.	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike Recovery outside accepted reco



Environmental Chemistry Services, Inc.
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 Website: www.ecs-corp.com

QC SUMMARY REPORT

Work Order: **1405042**

16-May-14

Client: Bureau Veritas, Inc.

Project: CDOT Acorn

BatchID: R1124

Sample ID	LCSD	SampType:	LCSD	TestCode:	BTEX_W	Units:	mg/L	Prep Date:	RunNo:	1124	
Client ID:	LCSS02	Batch ID:	R1124	TestNo:	SW8260B	Analysis Date:	5/16/2014	SeqNo:	15189		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.036	0.0010	0.050	0	72.6	50	150	0.036	0.414	30	
Toluene	0.047	0.0010	0.050	0	93.9	50	150	0.046	1.03	30	
Ethyl benzene	0.051	0.0010	0.050	0	102	50	150	0.050	2.35	30	
Xylenes, Total	0.15	0.0010	0.15	0	103	50	150	0.15	0.824	30	
Methyl tert-butyl ether	0.044	0.0010	0.050	0	87.7	30	160	0.043	1.42	30	
TVPH	3.1	0.50	5.0	0	61.5	50	150	3.0	1.89	30	
Surr: Dibromofluoromethane	48		50.00		95.3	50	150		0	30	
Surr: Toluene-d8	47		50.00		94.5	50	150		0	30	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required.	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the RL	O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike Recovery outside accepted reco



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 Castle Rock, Colorado 80104
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 Fax: 303.850.7609
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Chain of Custody Record (COC)

COC # 13390

PROJECT INFORMATION		ANALYSES REQUESTED				TURN-AROUND-TIME (TAT)	REMARKS
Project Number: 10014-013003.05.003	Project Name: COOT Acorn	NUMBER OF CONTAINERS					UBV
Report To: A. Linger, W. Allen							
Telephone:							
Fax / E-Mail:							

SAMPLE NUMBER / IDENTIFICATION	SAMPLE			Container & Stop**	NUMBER OF CONTAINERS	BTEX	M+BZ	GRO	DRO	CANISTER ID	REMARKS	LAB #
	Date	Time	Matrix*									
MW-15	5-15-14	5:14:14	1045 AQ	1	2	✓	✓	✓	✓			1
MW-16	5-14-14	5:13:14	1520	1	1	✓	✓	✓	✓			2
MW-17	5-14-14	5:13:14	1530	1	1	✓	✓	✓	✓			3
MW-18	5-14-14	5:13:14	1555	1	1	✓	✓	✓	✓			4
MW-19	5-15-14	5:14:14	0920	1	1	✓	✓	✓	✓			5
MW-20	5-15-14	5:14:14	0955	1	1	✓	✓	✓	✓			6
trip blank						✓	✓	✓	✓			7

Sampled By: <u>William Allen</u>		Shipment Method:		Airbill Number:	
SIGNATURE	PRINT NAME	COMPANY	DATE	TIME	
1a Relinquished By: <u>[Signature]</u>	William Allen	BVNA	5-15-14	1330	
1b Received By: <u>[Signature]</u>	Kris Mascarenas	ECS	5-15-14	1330	
2a Relinquished By:					
2b Received By:					
3a Relinquished By:					
3b Received By:					

THE ABOVE SIGNED HAS READ AND UNDERSTANDS THE CREDIT TERMS AND CREDIT POLICIES OF ECS, INC. AND AGREES TO THE TERMS AND CONDITIONS AS SET FORTH IN THIS AGREEMENT.

*Matrix Key: AQ = Aqueous AR = Air SO = Soil WA = Waste OT = Other Preservative: H = HCl N = Nitric SF = Sulfuric
 **Container: A = Amber B = Brass C = Clear Glass P = Plastic S = Soil Jar SU = Summa PF = PUF T = Tedlar TU = Tube OT = Other

Page 1 of 1

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 19, 2014

ECS, Inc.

ECS, Inc.

2 Oakwood Park Plaza Suite 100

Castle Rock, CO 80104-1885

RE: 1405042

Enclosed are the results of analyses for samples received by Summit Scientific on 05/15/14 16:14. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'BS', with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury

President / Laboratory Manager



ECS, Inc.
2 Oakwood Park Plaza Suite 100
Castle Rock CO, 80104-1885

Project: 1405042

Project Number: [none]
Project Manager: ECS, Inc.

Reported:
05/19/14 16:47

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-15	1405081-01	Water	05/15/14 10:45	05/15/14 16:14
MW-16	1405081-02	Water	05/14/14 15:00	05/15/14 16:14
MW-17	1405081-03	Water	05/14/14 15:30	05/15/14 16:14
MW-18	1405081-04	Water	05/14/14 15:55	05/15/14 16:14
MW-19	1405081-05	Water	05/15/14 09:20	05/15/14 16:14
MW-20	1405081-06	Water	05/15/14 09:55	05/15/14 16:14

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ECS, Inc.
2 Oakwood Park Plaza Suite 100
Castle Rock CO, 80104-1885

Project: 1405042
Project Number: [none]
Project Manager: ECS, Inc.

Reported:
05/19/14 16:47

ADDRESS
Environmental Chemistry Services, Inc.
2 Oakwood Park Plaza, 100
Castle Rock, CO 80104-1885
TEL: (303) 656-7006
FAX: (303) 656-7009
Website: www.ecs-corp.com

PAGE 1 OF 1
1405042

CHAIN OF CUSTODY RECORD
COC ID: 192



Please Include Email Address of Report Recipient Whenever Possible!!!

SUB CONTRACTOR SJM		COMPANY Summit Scientific		SPECIAL INSTRUCTIONS/COMMENTS Please analyze for depth on a most 2 days in and for project 1405042. Inv (7/20/14 5:14)	
ADDRESS 741 Corporate Circle, Suite 1				ANALYTICAL PARAMETERS	
CITY, STATE, ZIP Golden, CO 80401				SW8015B	
PHONE (303) 277-9310		FAX		COMMENTS Metal Pesticides PBT, PAHs, PCBs Additional Sample Description, etc.	
ACCOUNT #		EMAIL			
NUMBER OF CONTAINERS					
ITEM	SAMPLE ID	Client Sample ID	Matrix Type	MATRIX	DATE COLLECTED
1	140504-018	MW-15	WQAU	Water	5/15/2014 10:50 AM 1 ✓
2	140504-028	MW-16	ULAMGU	Water	5/16/2014 3:00 PM 1 ✓
3	140504-038	MW-17	ULAMGU	Water	5/16/2014 3:30 PM 1 ✓
4	140504-048	MW-18	ULAMGU	Water	5/16/2014 3:50 PM 1 ✓
5	140504-058	MW-19	ULAMGU	Water	5/16/2014 4:20 AM 1 ✓
6	140504-068	MW-20	ULAMGU	Water	5/16/2014 4:50 AM 1 ✓

Relinquished By 	Received By 	Time 5/19/14 10:14	Time 10:14
Relinquished By 	Received By 	Time 5/19/14 10:14	Time 10:14
Relinquished By 	Received By 	Time 5/19/14 10:14	Time 10:14
TAT: Standard	RUSH	Not ED	Not ED
Note: RUSH requests will incur surcharges!			
REPORT TRANSMITTAL DESIRED		FOR LAB USE ONLY	
HARD COPY (per cent)		FAX	
E-MAIL		ONLINE	
Temp of samples		Temp in Cool?	
Comments			

Summit Scientific

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ECS, Inc.
 2 Oakwood Park Plaza Suite 100
 Castle Rock CO, 80104-1885

Project: 1405042
 Project Number: [none]
 Project Manager: ECS, Inc.

Reported:
 05/19/14 16:47

MW-15
1405081-01 (Water)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/14 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	1405103	05/16/14	05/17/14	EPA 8015	

Date Sampled: **05/15/14 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		80.7 %	44.8-129		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ECS, Inc.
 2 Oakwood Park Plaza Suite 100
 Castle Rock CO, 80104-1885

Project: 1405042
 Project Number: [none]
 Project Manager: ECS, Inc.

Reported:
 05/19/14 16:47

MW-16
1405081-02 (Water)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/14/14 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	3.01	0.100	mg/L	1	1405103	05/16/14	05/17/14	EPA 8015	

Date Sampled: **05/14/14 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		87.5 %	44.8-129		"	"	"	"	

Summit Scientific

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ECS, Inc.
 2 Oakwood Park Plaza Suite 100
 Castle Rock CO, 80104-1885

Project: 1405042

Project Number: [none]
 Project Manager: ECS, Inc.

Reported:
 05/19/14 16:47

MW-17
1405081-03 (Water)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/14/14 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	0.224	0.100	mg/L	1	1405103	05/16/14	05/17/14	EPA 8015	

Date Sampled: **05/14/14 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		83.5 %	44.8-129		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ECS, Inc.
 2 Oakwood Park Plaza Suite 100
 Castle Rock CO, 80104-1885

Project: 1405042
 Project Number: [none]
 Project Manager: ECS, Inc.

Reported:
 05/19/14 16:47

MW-18
1405081-04 (Water)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/14/14 15:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	1405103	05/16/14	05/17/14	EPA 8015	

Date Sampled: **05/14/14 15:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		86.6 %	44.8-129		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ECS, Inc.
 2 Oakwood Park Plaza Suite 100
 Castle Rock CO, 80104-1885

Project: 1405042
 Project Number: [none]
 Project Manager: ECS, Inc.

Reported:
 05/19/14 16:47

MW-19
1405081-05 (Water)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/14 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	2.47	0.100	mg/L	1	1405103	05/16/14	05/17/14	EPA 8015	

Date Sampled: **05/15/14 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		80.0 %	44.8-129		"	"	"	"	

Summit Scientific

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ECS, Inc.
 2 Oakwood Park Plaza Suite 100
 Castle Rock CO, 80104-1885

Project: 1405042
 Project Number: [none]
 Project Manager: ECS, Inc.

Reported:
 05/19/14 16:47

MW-20
1405081-06 (Water)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **05/15/14 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	1405103	05/16/14	05/17/14	EPA 8015	

Date Sampled: **05/15/14 09:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		85.5 %	44.8-129		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ECS, Inc.
 2 Oakwood Park Plaza Suite 100
 Castle Rock CO, 80104-1885

Project: 1405042
 Project Number: [none]
 Project Manager: ECS, Inc.

Reported:
 05/19/14 16:47

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1405103 - EPA 3520B

Blank (1405103-BLK1)

Prepared & Analyzed: 05/16/14

C10-C28 (DRO)	ND	0.100	mg/L							
<i>Surrogate: o-Terphenyl</i>	0.0205		"	0.0244		84.1	44.8-129			

LCS (1405103-BS1)

Prepared & Analyzed: 05/16/14

C10-C28 (DRO)	0.906	0.100	mg/L	1.00		90.5	70-130			
<i>Surrogate: o-Terphenyl</i>	0.0224		"	0.0244		91.6	44.8-129			

Duplicate (1405103-DUP1)

Source: 1405080-02

Prepared & Analyzed: 05/16/14

C10-C28 (DRO)	6.66	0.100	mg/L		6.63			0.507	200	
<i>Surrogate: o-Terphenyl</i>	0.0196		"	0.0244		80.4	44.8-129			

Matrix Spike (1405103-MS1)

Source: 1405080-01

Prepared & Analyzed: 05/16/14

C10-C28 (DRO)	0.857	0.100	mg/L	1.00	ND	85.5	10-159			
<i>Surrogate: o-Terphenyl</i>	0.0232		"	0.0244		95.0	44.8-129			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



ECS, Inc.
2 Oakwood Park Plaza Suite 100
Castle Rock CO, 80104-1885

Project: 1405042

Project Number: [none]
Project Manager: ECS, Inc.

Reported:
05/19/14 16:47

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-55209-1
Client Project/Site: CDOT Acorn

For:
Bureau Veritas North America, Inc.
165 South Union Blvd.
Suite 310
Lakewood, Colorado 80228

Attn: Mr. William Allen



Authorized for release by:
5/24/2014 4:15:25 AM

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Job ID: 280-55209-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: Bureau Veritas North America, Inc.

Project: CDOT Acorn

Report Number: 280-55209-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 5/8/2014 3:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 18.4° C.

DENSITY OF SOIL IN PLACE BY THE DRIVE-CYLINDER METHOD

Samples MW-15(10'-12') (280-55209-1) and MW-20(10'-12') (280-55209-3) were analyzed for Density of Soil in Place by the Drive-Cylinder Method in accordance with ASTM D2937. The samples were analyzed on 05/14/2014.

No difficulties were encountered during the Density of Soil analysis.

All quality control parameters were within the acceptance limits.

D 2974

Sample MW-18(14') (280-55209-2) was analyzed for D_2974 in accordance with D_2974. The samples were analyzed on 05/14/2014.

No difficulties were encountered during the D_2974 analysis.

All quality control parameters were within the acceptance limits.

D854

Samples MW-15(10'-12') (280-55209-1) and MW-20(10'-12') (280-55209-3) were analyzed for D854 in accordance with D854. The samples were analyzed on 05/14/2014.

No difficulties were encountered during the D854 analysis.

All quality control parameters were within the acceptance limits.

POROSITY

Samples MW-15(10'-12') (280-55209-1) and MW-20(10'-12') (280-55209-3) were analyzed for Porosity in accordance with Porosity. The samples were analyzed on 05/14/2014.

No difficulties were encountered during the Porosity analysis.

Case Narrative

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Job ID: 280-55209-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

All quality control parameters were within the acceptance limits.

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Definitions/Glossary

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Client Sample ID: MW-15(10'-12')

Lab Sample ID: 280-55209-1

Analyte	Result	Qualifier	NONE	NONE	Unit	Dil Fac	D	Method	Prep Type
In Place Density	1.90				g/cc	1		D2937	Total/NA
Specific Gravity	2.66				NONE	1		D854	Total/NA
Specific Gravity at 20 deg Celsius	2.66				NONE	1		D854	Total/NA
Porosity	28.5				%	1		LAB-BUR	Total/NA
Void Ratio	0.4				NONE	1		LAB-BUR	Total/NA

Client Sample ID: MW-18(14')

Lab Sample ID: 280-55209-2

Analyte	Result	Qualifier	NONE	NONE	Unit	Dil Fac	D	Method	Prep Type
Total Organic Matter	0.3				%	1		D2974	Total/NA
Moisture Content	8.0				%	1		D2974	Total/NA
Ash Content	99.7				%	1		D2974	Total/NA

Client Sample ID: MW-20(10'-12')

Lab Sample ID: 280-55209-3

Analyte	Result	Qualifier	NONE	NONE	Unit	Dil Fac	D	Method	Prep Type
In Place Density	1.68				g/cc	1		D2937	Total/NA
Specific Gravity	2.61				NONE	1		D854	Total/NA
Specific Gravity at 20 deg Celsius	2.61				NONE	1		D854	Total/NA
Porosity	35.4				%	1		LAB-BUR	Total/NA
Void Ratio	0.5				NONE	1		LAB-BUR	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Method Summary

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Method	Method Description	Protocol	Laboratory
D2937	Density of Soil in Place by the Drive-Cylinder Method	ASTM	TAL BUR
D2974	Moisture, Ash and Organic Matter	ASTM	TAL BUR
D854	Specific Gravity	ASTM	TAL BUR
LAB-BUR	Porosity	ASTM	TAL BUR

Protocol References:

ASTM = ASTM International

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990



Sample Summary

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-55209-1	MW-15(10'-12')	Solid	05/07/14 14:30	05/08/14 15:45
280-55209-2	MW-18(14')	Solid	05/06/14 14:05	05/08/14 15:45
280-55209-3	MW-20(10'-12')	Solid	05/07/14 10:20	05/08/14 15:45

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Client Sample Results

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Method: D2937 - Density of Soil in Place by the Drive-Cylinder Method

Client Sample ID: MW-15(10'-12')

Date Collected: 05/07/14 14:30

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-1

Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
In Place Density	1.90				g/cc			05/14/14 17:20	1

Client Sample ID: MW-20(10'-12')

Date Collected: 05/07/14 10:20

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-3

Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
In Place Density	1.68				g/cc			05/14/14 17:20	1

Method: D2974 - Moisture, Ash and Organic Matter

Client Sample ID: MW-18(14')

Date Collected: 05/06/14 14:05

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-2

Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Matter	0.3				%			05/14/14 17:24	1
Moisture Content	8.0				%			05/14/14 17:24	1
Ash Content	99.7				%			05/14/14 17:24	1

Method: D854 - Specific Gravity

Client Sample ID: MW-15(10'-12')

Date Collected: 05/07/14 14:30

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-1

Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Specific Gravity	2.66				NONE			05/14/14 17:19	1
Specific Gravity at 20 deg Celsius	2.66				NONE			05/14/14 17:19	1

Client Sample ID: MW-20(10'-12')

Date Collected: 05/07/14 10:20

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-3

Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Specific Gravity	2.61				NONE			05/14/14 17:19	1
Specific Gravity at 20 deg Celsius	2.61				NONE			05/14/14 17:19	1

Method: LAB-BUR - Porosity

Client Sample ID: MW-15(10'-12')

Date Collected: 05/07/14 14:30

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-1

Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Porosity	28.5				%			05/14/14 17:07	1
Void Ratio	0.4				NONE			05/14/14 17:07	1

Client Sample ID: MW-20(10'-12')

Date Collected: 05/07/14 10:20

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-3

Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Porosity	35.4				%			05/14/14 17:07	1
Void Ratio	0.5				NONE			05/14/14 17:07	1

TestAmerica Denver

QC Association Summary

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Geotechnical

Analysis Batch: 72121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-55209-1	MW-15(10'-12')	Total/NA	Solid	LAB-BUR	
280-55209-3	MW-20(10'-12')	Total/NA	Solid	LAB-BUR	

Analysis Batch: 72124

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-55209-1	MW-15(10'-12')	Total/NA	Solid	D854	
280-55209-3	MW-20(10'-12')	Total/NA	Solid	D854	

Analysis Batch: 72125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-55209-1	MW-15(10'-12')	Total/NA	Solid	D2937	
280-55209-3	MW-20(10'-12')	Total/NA	Solid	D2937	

Analysis Batch: 72126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-55209-2	MW-18(14')	Total/NA	Solid	D2974	

Lab Chronicle

Client: Bureau Veritas North America, Inc.
Project/Site: CDOT Acorn

TestAmerica Job ID: 280-55209-1

Client Sample ID: MW-15(10'-12')

Date Collected: 05/07/14 14:30

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D2937		1			72125	05/14/14 17:20	MAP	TAL BUR
Total/NA	Analysis	D854		1			72124	05/14/14 17:19	MAP	TAL BUR
Total/NA	Analysis	LAB-BUR		1			72121	05/14/14 17:07	MAP	TAL BUR

Client Sample ID: MW-18(14')

Date Collected: 05/06/14 14:05

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D2974		1			72126	05/14/14 17:24	MAP	TAL BUR

Client Sample ID: MW-20(10'-12')

Date Collected: 05/07/14 10:20

Date Received: 05/08/14 15:45

Lab Sample ID: 280-55209-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D2937		1			72125	05/14/14 17:20	MAP	TAL BUR
Total/NA	Analysis	D854		1			72124	05/14/14 17:19	MAP	TAL BUR
Total/NA	Analysis	LAB-BUR		1			72121	05/14/14 17:07	MAP	TAL BUR

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Login Sample Receipt Checklist

Client: Bureau Veritas North America, Inc.

Job Number: 280-55209-1

Login Number: 55209

List Source: TestAmerica Denver

List Number: 1

Creator: Broander, Laura L

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Bureau Veritas North America, Inc.

Job Number: 280-55209-1

Login Number: 55209

List Source: TestAmerica Burlington

List Number: 2

List Creation: 05/13/14 01:16 PM

Creator: Lavigne, Scott M

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	213369 & 213370
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.8°C & 21.4°C. IR GUN ID 181. CF = 0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	



Chain of Custody F

TAL-4124-280 (0508)

Sampler ID WA
 Temperature on Receipt 18.1 ± 0.3
R-S 5/18/14
 Drinking Water? Yes No

TestA
 THE LEADER IN I

Charge for TestAmerica Courier

Client: Bureau Veritas North America
 Address: 165 Union Blvd, Ste 310
 City: Wixom State: MI Zip Code: 48180
 Project Name and Location (State): CDOT Flex Bridge Puchig CO
 Contract/Purchase Order/Quote No.:

Project Manager: Agatha L. Linder
 Telephone Number (Area Code)/Fax Number: 303-988-2585
 Site Contact: _____ Lab Contact: _____
 Carrier/Waybill Number: _____

Lab Number: _____ Page _____ of _____

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives					Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt	
			Air	Aqueous	Soil	Sed.	Unpres.	H2SO4	HNO3	HCl	NaOH			ZnAc/NaOH
<u>MW-18 (H) WA</u>	<u>5-7-14</u>	<u>1430</u>												
<u>MW-15 (D-12)</u>	<u>5-7-14</u>	<u>1430</u>			<input checked="" type="checkbox"/>								<u>FOC-02974</u>	
<u>MW-18 (H)</u>	<u>5-6-14</u>	<u>1405</u>			<input checked="" type="checkbox"/>								<u>Specific Gravity</u>	
<u>MW-20 (D-12)</u>	<u>5-7-14</u>	<u>1020</u>			<input checked="" type="checkbox"/>								<u>Bulk Density</u>	
													<u>Total Porosity</u>	
													<u>Eff. Porosity</u>	

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Return To Client Disposal By Lab Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
 24 Hours 48 Hours 7 Days 14 Days 21 Days Other: STAT

1. Relinquished By: Wixom Date: 5/18/14 Time: 1400
 2. Relinquished By: Wixom Date: 5/18/14 Time: 1545
 3. Relinquished By: _____ Date: _____ Time: _____

1. Received By: _____ Date: 5/18/14 Time: 1400
 2. Received By: _____ Date: 5/18/14 Time: 1545
 3. Received By: _____ Date: _____ Time: _____

Comments: _____

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy





SUPPORTING DOCUMENTS



BORING NO: MW-15	WELL NO: MW-15	PROJECT NO: 10013-013003.02.002	PROJECT NAME: CDOT Ilex Bridge
BORING LOCATION: 400 South Santa Fe Avenue, Pueblo, Colorado		COORDINATES: N 9812.1924, E 9284.6124	
DRILLING CO: Vista Geoscience		DRILLER: Rich Freeman	LOGGED BY: William Allen
DRILLING EQUIP: Geoprobe 7720 DT		SCREEN INTERVAL: 5.08' - 15.08'	CHECKED BY: Agatha Linger
STATIC WATER LEVEL: 7.12		SCREEN MTL/SLOT: PVC / 0.01'	START DATE: 5/7/2014
BOREHOLE DIA: 8"		STICKUP: Flush-mounted	START TIME (hours): 1430
TOP of CASING ELEVATION: 4647.00		G.S. ELEVATION: 4647.42	FINISH DATE: 5/7/2014
RISER DIA/MTL/LGTH: 2" / PVC / 5'		DEV. METHODS: Bailer	FINISH TIME (hours): 1355

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN (PPM)	HEADSPACE	
0	Sand (0.0' - 1.5') Brown, slightly moist, medium dense, fine to medium grained, with silt										
2	Sandy Clay (1.5' - 3.5') Brown, moist, very stiff, medium plasticity, trace gravel			1	70%	HP	SM-M		1.0	0.4	<u>3' (mg/kg)</u> B: <0.0021 T: <0.0029 E: <0.0028 X: <0.0085 GRO: <0.5 DRO: <2.5
4	Gravelly Sand (3.5' - 14.5') Tan, slightly moist, loose, fine to coarse grained, some cobble										
6											
8											
10	Grades to saturated at 9.0' bgs			2	60%	HP	M-S		0.0	0.5	<u>9' (mg/kg)</u> B: <0.0021 T: <0.0029 E: <0.0028 X: <0.0085



BORING NO: MW-15		WELL NO: MW-15		PROJECT NO: 10013-013003.02.002		PROJECT NAME: CDOT Ilex Bridge					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
12				3	40%	HP	S		0.0	0.2	
14											
16	Clay (14.5' - 17.0') Dark brown, saturated, very soft, high plasticity			4	100%	HSA	S				
18	End of Boring at 17.0'										
20											



BORING NO: MW-16	WELL NO: MW-16	PROJECT NO: 10013-013003.02.002	PROJECT NAME: CDOT Ilex Bridge
BORING LOCATION: 400 South Santa Fe Avenue, Pueblo, Colorado		COORDINATES: N 9710.0984, E 9237.0756	
DRILLING CO: Vista Geoscience		DRILLER: Rich Freeman	LOGGED BY: William Allen
DRILLING EQUIP: Geoprobe 7720 DT		SCREEN INTERVAL: 5.08' - 15.08'	CHECKED BY: Agatha Linger
STATIC WATER LEVEL: 8.37'		SCREEN MTL/SLOT: PVC / 0.01'	START DATE: 5/7/2014
BOREHOLE DIA: 8"		STICKUP: Flush-mounted	START TIME (hours): 1150
TOP of CASING ELEVATION: 4647.92		G.S. ELEVATION: 4648.24	FINISH DATE: 5/7/2014
RISER DIA/MTL/LGTH: 2" / PVC / 5'		DEV. METHODS: Bailer	FINISH TIME (hours): 1230

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN (PPM)	HEADSPACE	
0	Gravelly Sand (0.0' - 3.0') Tan, slightly moist, loose, fine to coarse grained, trace silt										
2				1	60%	HP	SM		0.0	5.8	
4	Cobbly Sand (3.0' - 5.0') Tan, slightly moist, medium loose, fine to coarse grained, with gravel										
6	Gravelly Sand (5.0' - 7.0') Tan, moist, fine to coarse grained, some cobble										
8	Gravelly Sand (7.0' - 17.0') Tan, moist, dense, fine to coarse grained			2	70%	HP	SM-S		321.9	17.2	
10	Grades to saturated, stained black, petroleum hydrocarbon odor at 9.5' bgs										9.5' (mg/kg) B: <0.0021 T: <0.0029 E: 0.016 X: 0.033 GRO: 30 DRO: 46



BORING NO: MW-16		WELL NO: MW-16		PROJECT NO: 10013-013003.02.002		PROJECT NAME: CDOT Ilex Bridge					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
12	Grades to brown, no petroleum odor at 14.0'			3	50%	HP	S		467.2	795.0	<u>13.5' (mg/kg)</u> B: <0.0021 T: <0.0029 E: <0.0028 X: <0.0085 GRO: 47 DRO: 17
14				4	100%	HSA	S				
16	5										
18	End of Boring at 17.0'										
20											



BORING NO: MW-17	WELL NO: MW-17	PROJECT NO: 10014-013003.05.002	PROJECT NAME: CDOT Ilex Bridge
BORING LOCATION: 400 South Santa Fe Avenue, Pueblo, Colorado		COORDINATES: N 9792.4776, E 9157.3289	
DRILLING CO: Vista Geoscience		DRILLER: Rich Freeman	LOGGED BY: William Allen
DRILLING EQUIP: Geoprobe 7720 DT		SCREEN INTERVAL: 4.75' - 14.75'	CHECKED BY: Agatha Linger
STATIC WATER LEVEL: 8.38'		SCREEN MTL/SLOT: PVC / 0.01'	START DATE: 5/6/2014
BOREHOLE DIA: 8"		STICKUP: Flush-mounted	START TIME (hours): 1045
TOP of CASING ELEVATION: 4648.16		G.S. ELEVATION: 4648.41	FINISH DATE: 5/6/2014
RISER DIA/MTL/LGTH: 2" / PVC / 5'		DEV. METHODS: Bailer	FINISH TIME (hours): 1130

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN (PPM)	HEADSPACE	
0	Sand (0.0' - 7.0') Fill Tan, slightly moist, medium dense, fine to medium grain, with cobbles and gravel										
1				50%	HP	SM		0.4	1.2		
2	Sandy Gravel (7.0' - 12.0') Fill Brown, moist, loose, medium grained										
2				50%	HP	SM-S		0.2	1.7		
8	Gravelly Sand (7.0' - 17.0') Tan, moist, dense, fine to coarse grained Grades to saturated at 9.5' bgs										
10											



BORING NO: MW-17		WELL NO: MW-17		PROJECT NO: 10014-013003.05.002		PROJECT NAME: CDOT Ilex Bridge					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
12	Gravelly Sand (12.0' - 17.0') Dark brown, saturated, medium dense, fine to coarse grained, with cobbles			3	40%	HP	S		0.1	1.0	13' (mg/kg) B: <0.0021 T: <0.0029 E: <0.0028 X: <0.0085 GRO: <0.5 DRO: <2.4
14				4	100%	HSA	S				
16	5										
18	End of Boring at 17.0'										
20											



BORING NO: MW-18	WELL NO: MW-18	PROJECT NO: 10014-013003.05.002	PROJECT NAME: CDOT Ilex Bridge
BORING LOCATION: 400 South Santa Fe Avenue, Pueblo, Colorado		COORDINATES: N 9813.3421, E 9020.0566	
DRILLING CO: Vista Geoscience		DRILLER: Rich Freeman	LOGGED BY: William Allen
DRILLING EQUIP: Geoprobe 7720 DT		SCREEN INTERVAL: 5.06' - 15.06'	CHECKED BY: Agatha Linger
STATIC WATER LEVEL: 9.92'		SCREEN MTL/SLOT: PVC / 0.01'	START DATE: 5/6/2014
BOREHOLE DIA: 8"		STICKUP: Flush-mounted	START TIME (hours): 1340
TOP of CASING ELEVATION: 4649.66		G.S. ELEVATION: 4650.02	FINISH DATE: 5/6/2014
RISER DIA/MTL/LGTH: 2" / PVC / 5'		DEV. METHODS: Bailer	FINISH TIME (hours): 1410

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN (PPM)	HEADSPACE	
0	Clayey Sand (0.0' - 2.0') Brown, moist, medium dense, fine to medium grained										
2	Gravelly Sand (2.0' - 7.5') Tan, slightly moist, medium loose, fine to coarse grained			1	50%	HP	SM-M		2.4	2.1	
4	Grades to brown, moist, with clay at 4.2' bgs										3.5' (mg/kg) B: <0.0021 T: <0.0029 E: <0.0028 X: <0.0085 GRO: 0.95 DRO: 15
8	Sand (7.5' - 7.9') Tan, moist, dense, fine to medium grained, with silt, some debris (brick and trash) noted			2	60%	HP	M-S		2.5	0.3	
	Cobbly Clay (7.9' - 8.4') Brown, saturated, soft, low plasticity										9' (mg/kg) B: <0.0021 T: <0.0029 E: <0.0028 X: <0.0085 GRO: <0.5 DRO: <2.2
	Gravelly Sand (8.4' -17.0') Brown, saturated, dense, fine to coarse grained, some cobble										
10											



BORING NO: MW-18		WELL NO: MW-18		PROJECT NO: 10014-013003.05.002		PROJECT NAME: CDOT Ilex Bridge					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
12	Gravelly Sand (12.0' - 17.0') Dark brown, saturated, medium dense, fine to coarse grained, with cobbles			3	40%	HP	S		2.0	1.0	
14				4	100%	HSA	S				
16	5										
18	End of Boring at 17.0'										
20											



BORING NO: MW-19	WELL NO: MW-19	PROJECT NO: 10014-013003.05.002	PROJECT NAME: CDOT Ilex Bridge
BORING LOCATION: 400 South Santa Fe Avenue, Pueblo, Colorado		COORDINATES: N 9754.0766, E 9043.3761	
DRILLING CO: Vista Geoscience		DRILLER: Rich Freeman	LOGGED BY: William Allen
DRILLING EQUIP: Geoprobe 7720 DT		SCREEN INTERVAL: 4.98' - 14.98'	CHECKED BY: Agatha Linger
STATIC WATER LEVEL: 9.89'		SCREEN MTL/SLOT: PVC / 0.01'	START DATE: 5/6/2014
BOREHOLE DIA: 8"		STICKUP: Flush-mounted	START TIME (hours): 1205
TOP of CASING ELEVATION: 4649.54		G.S. ELEVATION: 4651.17	FINISH DATE: 5/6/2014
RISER DIA/MTL/LGTH: 2" / PVC / 5'		DEV. METHODS: Bailer	FINISH TIME (hours): 1300

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN (PPM)	HEADSPACE	
0	Gravelly Sand (0.0' -8.0') Fill Brown, slightly moist, medium dense, fine to coarse grained, trace cobble Grades to moist at 3.0' bgs										
2				1	50%	HP	SM-M		2.5	89.3	
4	Gravelly Sand (8.0' - 17.0') Tan, moist, medium loose, fine to coarse grained, with cobble Grades to saturated at 9.0' bgs										
6				2	30%	HP	M-S		299.3	751.0	
8											
10											



BUREAU
VERITAS

BORING NO: MW-19		WELL NO: MW-19		PROJECT NO: 10014-013003.05.002		PROJECT NAME: CDOT Ilex Bridge					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
12	Grades to stained black, petroleum odor at 13.5' bgs.			3	20%	HP	S		930.1	1456	14' (mg/kg) B: <0.0021 T: <0.0029 E: 0.013 X: <0.0085 GRO: 46 DRO:28
14				4	100%	HSA	S				
16	5										
18	End of Boring at 17.0'										
20											



BORING NO: MW-20	WELL NO: MW-20	PROJECT NO: 10014-013003.05.002	PROJECT NAME: CDOT Ilex Bridge
BORING LOCATION: 400 South Santa Fe Avenue, Pueblo, Colorado		COORDINATES: N 9694.0113, E 9022.0197	
DRILLING CO: Vista Geoscience		DRILLER: Rich Freeman	LOGGED BY: William Allen
DRILLING EQUIP: Geoprobe 7720 DT		SCREEN INTERVAL: 5.11' - 15.11'	CHECKED BY: Agatha Linger
STATIC WATER LEVEL: 10.37'		SCREEN MTL/SLOT: PVC / 0.01'	START DATE: 5/7/2014
BOREHOLE DIA: 8"		STICKUP: Flush-mounted	START TIME (hours): 940
TOP of CASING ELEVATION: 4649.96		G.S. ELEVATION: 4650.32	FINISH DATE: 5/7/2014
RISER DIA/MTL/LGTH: 2" / PVC / 5'		DEV. METHODS: Bailer	FINISH TIME (hours): 1040

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN (PPM)	HEADSPACE	
0	Sandy Clay (0.0' -3.0') Brown, slightly moist, stiff, medium plasticity										
2				1	10%	HP	SM-M		0.0	20.2	
4	Silty Sand (3.0' - 5.0') Tan, moist, medium dense, fine grained										
6	Cobbly Sand (5.0' - 17.5') Tan, slightly moist, medium loose, fine to coarse grained, with gravel, some silt										
8	Grades to moist at 7.0' bgs			2	10%	HP	SM-S		0.0	0.0	
10	Grades to saturated at 9.0' bgs										

4' (mg/kg)
 B: <0.0021
 T: <0.0029
 E: <0.0028
 X: <0.0085
 GRO: <0.5
 DRO: <2.2



BORING NO: MW-20		WELL NO: MW-20		PROJECT NO: 10014-013003.05.002		PROJECT NAME: CDOT Ilex Bridge					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES					PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
12	Grades to stained black, petroleum odor at 13.5' bgs.			3	10%	HP	S		0.0	0.5	14' (mg/kg) B: <0.0021 T: <0.0029 E: <0.0028 X: <0.0085 GRO: <0.5 DRO: <2.1
14				4	100%	HSA	S				
16	End of Boring at 17.0'										
18											
20											

Data Set: S:\office\Projects\Projects 2013 (ec)\00 - CDOT\10014-013003.05 CDOT Pueblo (Acorn) Site Characterization
 Title: CDOT ACORN MW-15
 Date: 05/27/14
 Time: 14:54:02

PROJECT INFORMATION

Company: Bureau Veritas North America
 Client: CDOT
 Project: 10014-013003.05
 Location: Pueblo
 Test Date: 5/19/14

AQUIFER DATA

Saturated Thickness: 8.29 ft
 Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-15

X Location: 0. ft
 Y Location: 0. ft

Initial Displacement: -1.283 ft
 Static Water Column Height: 8.29 ft
 Casing Radius: 0.08333 ft
 Well Radius: 0.1667 ft
 Well Skin Radius: 0.1667 ft
 Screen Length: 8.29 ft
 Total Well Penetration Depth: 13.38 ft
 Corrected Casing Radius (Bouwer-Rice Method): 0.1102 ft
 Gravel Pack Porosity: 0.25

No. of Observations: 101

Observation Data			
<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
1.936	-1.283	42.48	-0.121
2.155	-1.219	45.	-0.115
2.507	-1.194	47.64	-0.113
2.728	-1.177	50.46	-0.108
2.948	-1.146	53.46	-0.104
3.167	-1.122	56.64	-0.1
3.387	-1.092	60.	-0.096
3.607	-1.068	63.6	-0.091
3.826	-1.044	67.2	-0.086
4.045	-1.022	71.4	-0.086
4.263	-1.003	75.6	-0.084
4.501	-0.983	79.8	-0.085
4.751	-0.958	84.6	-0.085
5.001	-0.938	90.	-0.083
5.251	-0.917	94.8	-0.078
5.501	-0.897	100.8	-0.077
5.751	-0.88	106.8	-0.076
6.001	-0.864	112.8	-0.077
6.361	-0.84	119.4	-0.08
6.721	-0.815	126.6	-0.079
7.141	-0.788	134.4	-0.075
7.561	-0.767	142.2	-0.075
7.981	-0.741	150.6	-0.08
8.461	-0.715	159.6	-0.074
9.001	-0.691	169.2	-0.076
9.481	-0.666	178.8	-0.074
10.08	-0.636	189.6	-0.079
10.68	-0.612	201.	-0.074

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
11.28	-0.585	213.	-0.072
11.94	-0.558	225.6	-0.075
12.66	-0.528	238.8	-0.078
13.44	-0.503	253.2	-0.077
14.22	-0.478	268.2	-0.076
15.06	-0.453	283.9	-0.073
15.96	-0.424	300.6	-0.072
16.92	-0.401	318.6	-0.073
17.88	-0.378	337.2	-0.079
18.96	-0.347	357.6	-0.074
20.1	-0.325	378.6	-0.073
21.3	-0.299	400.8	-0.073
22.56	-0.276	424.8	-0.07
23.88	-0.253	450.	-0.073
25.32	-0.233	476.4	-0.073
26.82	-0.205	504.6	-0.076
28.38	-0.195	534.6	-0.076
30.06	-0.172	566.4	-0.075
31.86	-0.159	600.	-0.069
33.72	-0.15	636.	-0.074
35.88	-0.133	672.	-0.075
37.86	-0.128	714.	-0.075
40.08	-0.118		

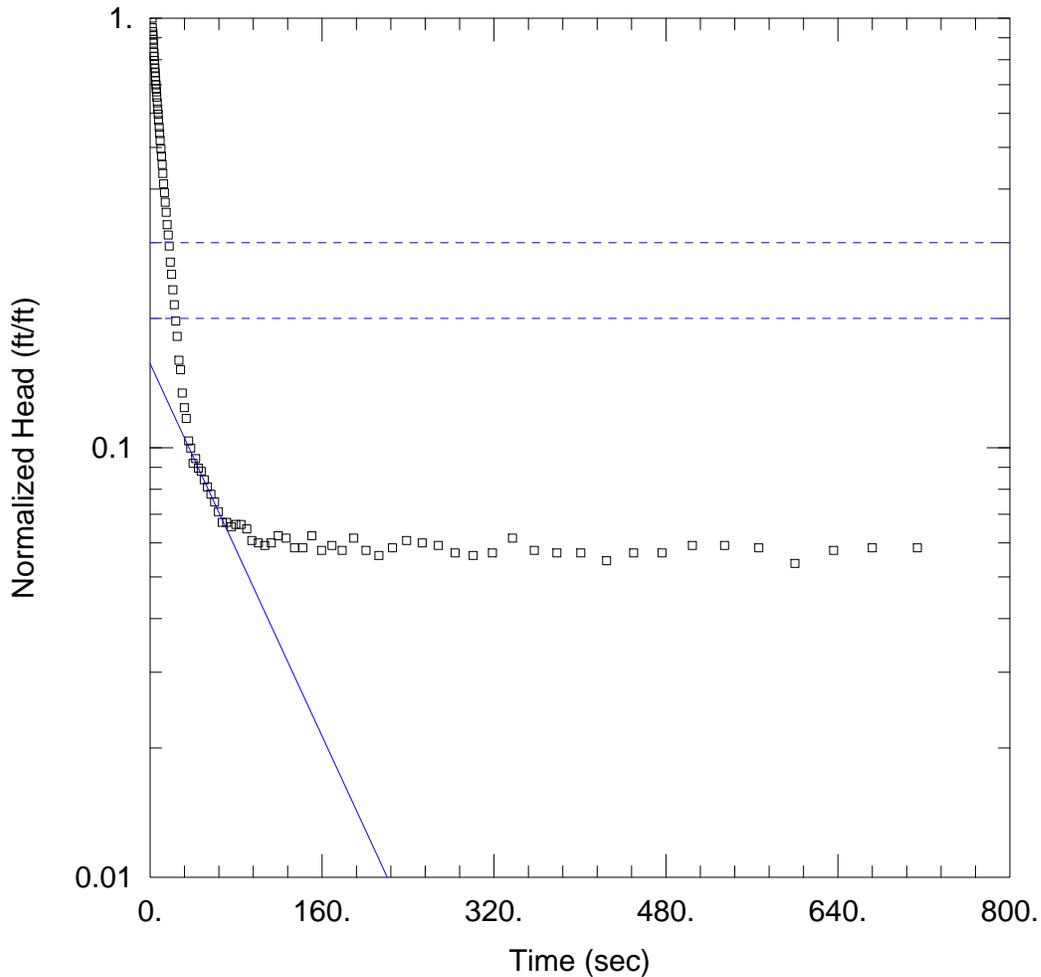
SOLUTION

Slug Test
 Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 ln(Re/rw): 3.292

VISUAL ESTIMATION RESULTSEstimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.0009176	cm/sec
y0	-0.2013	ft

$$T = K \cdot b = 0.2319 \text{ cm}^2/\text{sec}$$



CDOT ACORN MW-15

Data Set: S:\...\MW-15.aqt
 Date: 05/27/14

Time: 14:53:16

PROJECT INFORMATION

Company: Bureau Veritas North America
 Client: CDOT
 Project: 10014-013003.05
 Location: Pueblo
 Test Date: 5/19/14

AQUIFER DATA

Saturated Thickness: 8.29 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-15)

Initial Displacement: -1.283 ft
 Total Well Penetration Depth: 13.38 ft
 Casing Radius: 0.08333 ft

Static Water Column Height: 8.29 ft
 Screen Length: 8.29 ft
 Well Radius: 0.1667 ft
 Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
 K = 0.0009176 cm/sec

Solution Method: Bower-Rice
 y0 = -0.2013 ft

Data Set: S:\office\Projects\Projects 2013 (ec)\00 - CDOT\10014-013003.05 CDOT Pueblo (Acorn) Site Characterization
 Title: MW-16
 Date: 05/28/14
 Time: 13:02:22

PROJECT INFORMATION

Company: Bureau Veritas North America
 Client: CDOT ACORN
 Project: 10014-013003.05
 Location: Pueblo
 Test Date: 5/19/14

AQUIFER DATA

Saturated Thickness: 6.99 ft
 Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-16

X Location: 0. ft
 Y Location: 0. ft

Initial Displacement: 0.482 ft
 Static Water Column Height: 6.99 ft
 Casing Radius: 0.08333 ft
 Well Radius: 0.03333 ft
 Well Skin Radius: 0.03333 ft
 Screen Length: 6.99 ft
 Total Well Penetration Depth: 12.38 ft
 Corrected Casing Radius (Bouwer-Rice Method): 0.03975 ft
 Gravel Pack Porosity: 0.25

No. of Observations: 101

Observation Data			
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.006275	0.041	26.82	0.027
0.1255	-0.481	28.38	0.014
0.251	-0.324	30.06	0.015
0.501	-0.216	31.86	0.015
0.751	-0.143	33.72	0.015
1.001	-0.093	35.76	0.015
1.251	-0.059	37.86	0.015
1.501	-0.039	40.08	0.015
1.751	-0.024	42.48	0.013
2.001	-0.013	45.	0.015
2.251	-0.011	47.64	0.014
2.501	-0.007	50.46	0.013
2.751	-0.001	53.46	0.015
3.001	0.001	56.64	0.012
3.251	0.004	60.	0.015
3.501	0.004	63.6	0.014
3.751	0.004	67.2	0.014
4.001	0.005	71.4	0.016
4.251	0.005	75.6	0.014
4.501	0.006	79.8	0.012
4.751	0.008	84.6	0.013
5.001	0.007	90.	0.011
5.251	0.007	94.8	0.011
5.501	0.009	100.8	0.013
5.751	0.01	106.8	0.013
6.001	0.01	112.8	0.012
6.361	0.008	119.4	0.011
6.721	0.01	126.6	0.014

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
7.143	0.013	134.4	0.016
7.681	0.017	142.2	0.014
7.981	0.015	150.6	0.015
8.461	0.012	159.6	0.012
9.001	0.01	169.2	0.012
9.481	0.011	178.8	0.014
10.08	0.011	189.6	0.013
10.68	0.011	201.	0.016
11.28	0.01	213.	0.011
11.94	0.009	225.6	0.012
12.66	0.01	238.8	0.012
13.44	0.012	253.2	0.012
14.22	0.01	268.2	0.013
15.06	0.013	283.8	0.013
15.96	0.011	300.6	0.015
16.92	0.011	318.6	0.014
17.88	0.011	337.2	0.015
18.96	0.011	357.6	0.013
20.1	0.015	378.6	0.013
21.3	0.017	400.8	0.016
22.56	0.013	424.8	0.016
23.88	0.015	450.	0.015
25.42	0.018		

SOLUTION

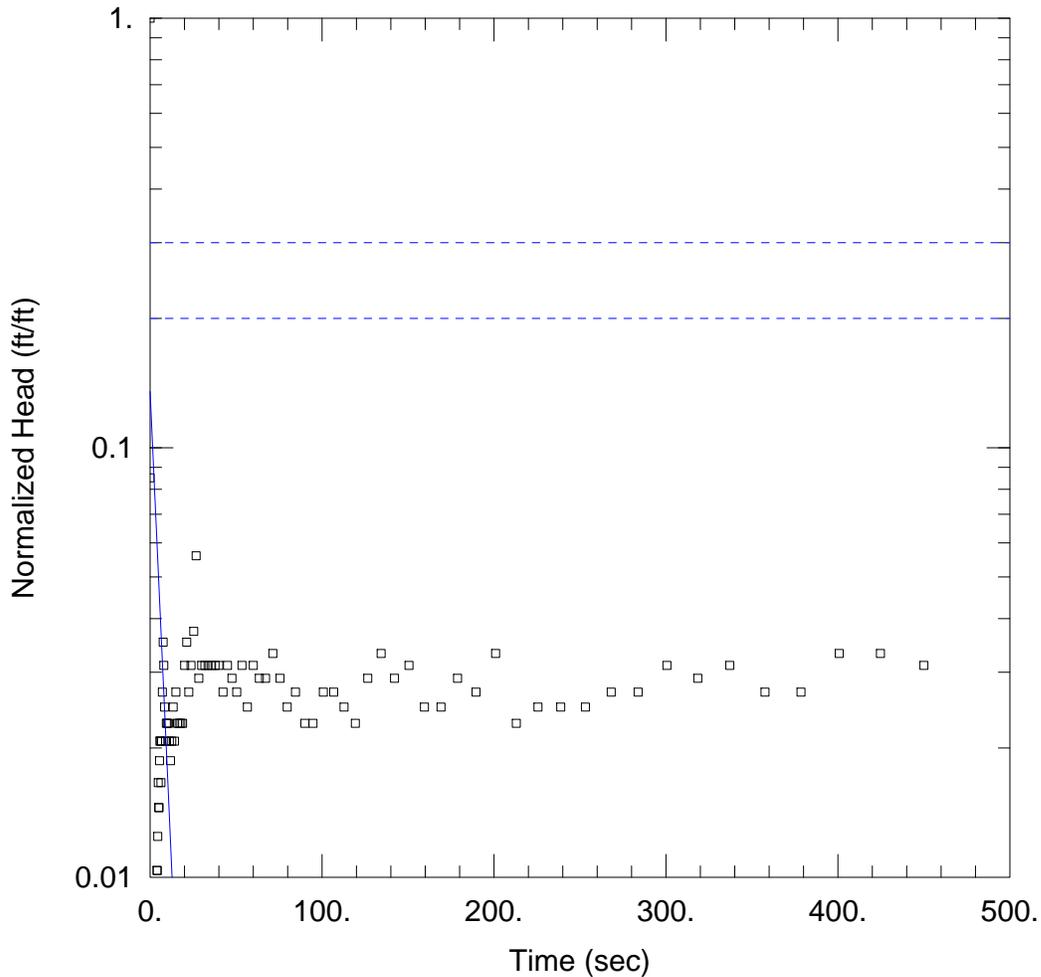
Slug Test
 Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 ln(Re/rw): 4.55

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.003177	cm/sec
y0	0.06509	ft

$T = K \cdot b = 0.6768 \text{ cm}^2/\text{sec}$



MW-16

Data Set: S:\...\MW-16.aqt
Date: 05/28/14

Time: 13:02:06

PROJECT INFORMATION

Company: Bureau Veritas North America
Client: CDOT ACORN
Project: 10014-013003.05
Location: Pueblo
Test Date: 5/19/14

AQUIFER DATA

Saturated Thickness: 6.99 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-16)

Initial Displacement: 0.482 ft
Total Well Penetration Depth: 12.38 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 6.99 ft
Screen Length: 6.99 ft
Well Radius: 0.03333 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
K = 0.003177 cm/sec

Solution Method: Bower-Rice
y0 = 0.06509 ft

Data Set: S:\office\Projects\Projects 2013 (ec)\00 - CDOT\10014-013003.05 CDOT Pueblo (Acorn) Site Characterization
 Title: MW-20
 Date: 05/28/14
 Time: 12:47:36

PROJECT INFORMATION

Company: Bureau Veritas North America
 Client: CDOT ACORN
 Project: 10014-013003.05
 Location: Pueblo
 Test Date: 5/19/14

AQUIFER DATA

Saturated Thickness: 5. ft
 Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-20

X Location: 0. ft
 Y Location: 0. ft

Initial Displacement: -0.446 ft
 Static Water Column Height: 5. ft
 Casing Radius: 0.08333 ft
 Well Radius: 0.3333 ft
 Well Skin Radius: 0.3333 ft
 Screen Length: 5. ft
 Total Well Penetration Depth: 10.39 ft
 Corrected Casing Radius (Bouwer-Rice Method): 0.1705 ft
 Gravel Pack Porosity: 0.25

No. of Observations: 89

Observation Data			
Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.001	-0.446	21.05	-0.003
0.25	-0.379	22.31	-0.003
0.5	-0.316	23.63	-0.001
0.75	-0.283	25.07	-0.001
1.	-0.244	26.57	-0.001
1.25	-0.204	28.13	-0.001
1.5	-0.174	29.81	-0.001
1.75	-0.151	32.15	-0.002
2.	-0.13	33.47	-0.002
2.25	-0.103	35.51	0.
2.5	-0.088	37.61	0.001
2.75	-0.078	39.83	0.001
3.	-0.066	42.23	-0.003
3.25	-0.057	44.75	0.001
3.662	-0.039	47.39	0.002
3.881	-0.036	50.21	0.
4.1	-0.031	53.21	-0.001
4.334	-0.029	56.39	0.001
4.553	-0.027	59.75	0.006
4.772	-0.025	63.35	0.001
5.	-0.019	66.95	-0.001
5.25	-0.018	71.15	0.002
5.5	-0.014	75.35	0.
5.75	-0.013	79.55	-0.001
6.11	-0.014	84.35	0.
6.47	-0.012	89.75	0.
6.89	-0.009	94.55	0.
7.31	-0.009	100.6	-0.003

<u>Time (sec)</u>	<u>Displacement (ft)</u>	<u>Time (sec)</u>	<u>Displacement (ft)</u>
7.73	-0.009	106.6	-0.002
8.21	-0.008	112.6	-0.004
8.75	-0.006	119.2	-0.002
9.23	-0.005	126.3	-0.005
9.83	-0.008	134.2	-0.006
10.43	-0.004	141.9	-0.007
11.03	0.	150.3	-0.004
11.69	-0.003	159.3	-0.007
12.41	-0.003	168.9	-0.006
13.19	0.004	178.6	-0.004
13.97	-0.007	189.3	-0.004
14.81	-0.001	200.8	-0.006
15.71	-0.005	212.8	-0.005
16.67	-0.005	225.3	-0.005
17.63	-0.004	238.6	-0.006
18.71	-0.006	252.9	-0.006
19.85	-0.004		

SOLUTION

Slug Test

Aquifer Model: Unconfined

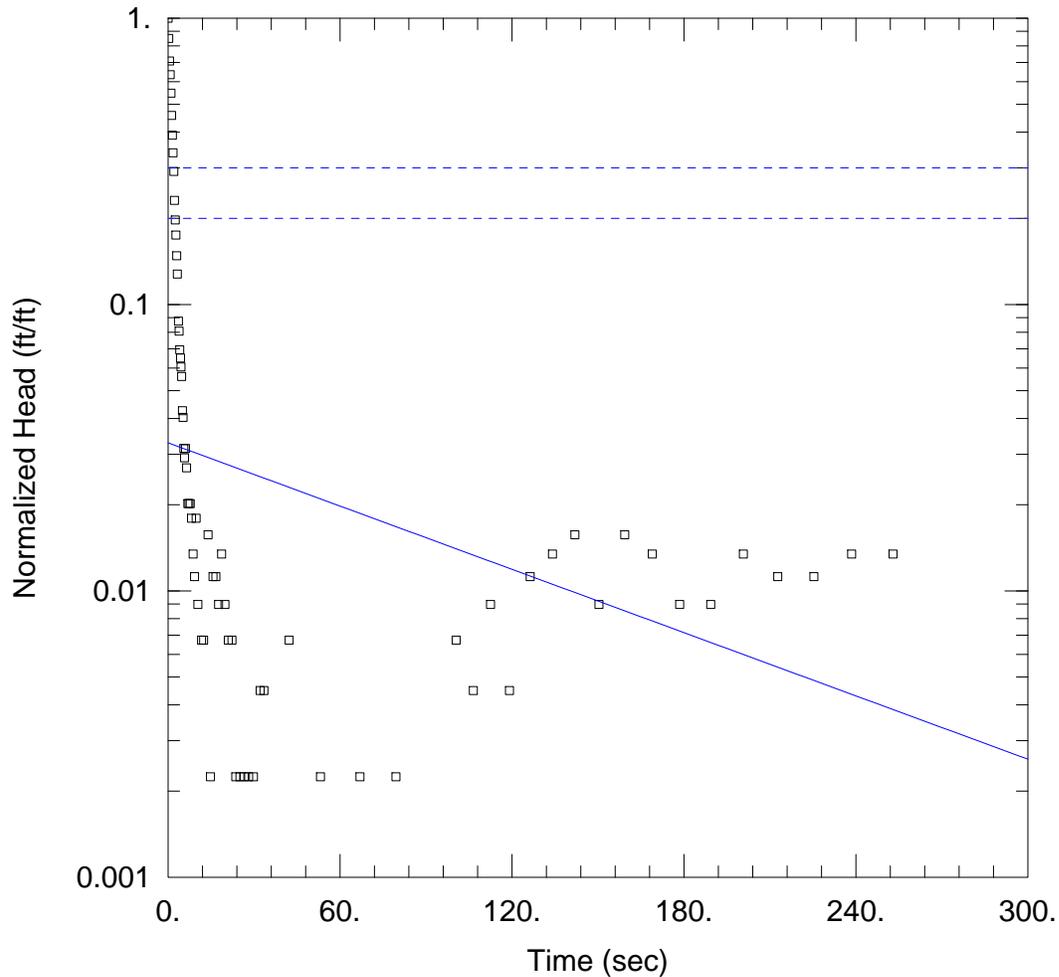
Solution Method: Bouwer-Rice

ln(Re/rw): 2.383

VISUAL ESTIMATION RESULTSEstimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.001791	cm/sec
y0	-0.01467	ft

$$T = K*b = 0.2729 \text{ cm}^2/\text{sec}$$



MW-20

Data Set: S:\...\MW-20.aqt
Date: 05/28/14

Time: 12:47:14

PROJECT INFORMATION

Company: Bureau Veritas North America
Client: CDOT ACORN
Project: 10014-013003.05
Location: Pueblo
Test Date: 5/19/14

AQUIFER DATA

Saturated Thickness: 5. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-20)

Initial Displacement: -0.446 ft
Total Well Penetration Depth: 10.39 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 5. ft
Screen Length: 5. ft
Well Radius: 0.3333 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
K = 0.001791 cm/sec

Solution Method: Bower-Rice
y0 = -0.01467 ft



NARRATIVE



**Subject: Site Characterization Report
Former Acorn Bulk Facility #33
400 South Santa Fe Avenue, Pueblo, Colorado
OPS Event No. 11938**

Background

The Acorn Bulk Facility #33 (the "site") was previously developed as a petroleum product storage and distribution center. Six underground storage tanks (USTs) were located north of the former building. Fill ports were used within the UST basin and seven dispensers were located to the north and west of the former building (Figure 7).

The *Phase I Environmental Site Assessment Report*, dated June 15, 2011, prepared by Pinyon Environmental, discussed the previous uses of the site. According to the Phase I ESA report, the site was developed with a residential building from at least 1905 until 1964. In 1970, the site was redeveloped as a gas station until the year 1983. From 1983 to 2013, the site was developed as a petroleum product storage and distribution center (Acorn). The report also discusses the property at 401 South Santa Fe Avenue (current tenant is Sonic Drive-In), located northwest of the site. According to the report, 401 South Santa Fe Avenue operated as a gasoline service station from 1930 to 1975 and is listed as part of the Colorado Voluntary Cleanup Program (VCUP), with a No Action Determination (NAD) classification. The Phase II ESA report indicated flow to the southeast toward the site.

The *Phase II Environmental Site Assessment Summary Report*, dated May 13, 2013, prepared by Bureau Veritas North America, Inc. (BVNA), discussed the results of soil and groundwater sampling investigations at the site and nearby properties. A total of two monitoring wells: MW-7 and MW-8 (Figure 3) and nine soil borings: AP-SB-1 through AP-SB-7, AP-SB-39, and AP-SB-40 (Figures 4 and 5) were installed at the site. Three soil samples were collected from each monitoring well location and one soil sample was collected from each soil boring location. Soil samples were analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), total volatile petroleum hydrocarbons (TVPH), and total extractable petroleum hydrocarbons (TEPH) (Figures 3 and 4). Concentrations of BTEX did not exceed Oil and Public Safety (OPS) Tier 1 Risk-Based Screening Levels (RBSLs); however, the TEPH concentration in AP-SB-01 exceeded the TPH threshold limit of 500 milligrams per kilogram (mg/kg). Additionally, AP-SB-1 and MW-8 were also analyzed for polycyclic aromatic hydrocarbons (PAHs); PAH results did not exceed regulatory standards (Figure 5).

Groundwater samples were collected on February 7, 2013 from monitoring wells MW-7 and MW-8 for analysis of BTEX, methyl tert-butyl ether (MtBE), TVPH, and TEPH. Concentrations did not exceed OPS Tier 1 RBSLs (Figure 6). Monitoring wells MW-7 and MW-8 were abandoned on July 17, 2013 prior to demolition of site structures in accordance with the Division of Water Resources Water Well Construction Rules.

During August and September of 2013, the structures associated with the former Acorn site building were demolished, with the exception of the foundation, concrete driving areas, and dispensers. The location of associated USTs, piping, concrete pads, and former pump dispensers are shown on Figure 7. Dispensers and associated piping were drained of remaining

Bureau Veritas North America, Inc.



fuel products. On August 5, 2013, six fuel dispensers were removed and one soil sample was collected from beneath each dispenser (D-1 through D-6) as depicted on Figures 7a and 7f. A sample was not collected from beneath the dispenser located along the north side of the building because the dispenser was mounted above-grade on the building slab. Piping to this dispenser was aboveground from the edge of the concrete loading dock to the dispenser, and below ground from the edge of the concrete to the UST. Concentrations of BTEX and TVPH in the dispenser soil samples did not exceed regulatory standards; however concentrations of TEPH exceeded the TPH threshold value in D-3 (1,500 mg/kg) at three feet bgs and in D-5 (1,400 mg/kg) at 2.5 feet bgs. Soil samples D-3 and D-5 were also analyzed for PAHs; PAH results did not exceed regulatory standards (Figure 7f). The dispenser area beneath D-3 was excavated to five feet bgs and the dispenser area below D-5 was excavated to approximately 11 feet bgs.

Following the collection of these soil samples, the remainder of the foundation and concrete driving areas were demolished and disposed off-site.

BVNA observed excavation activities from September 17 to September 23, 2013 (no work was performed at the site on September 21 and September 22). Concrete, traffic bollards, and piping overlaying the tanks were removed prior to September 17, 2013. Overlying soil and soil surrounding the sides of the USTs was removed and stockpiled, and excess fuel was vacuumed from the tanks. Per the terms of the site-specific health and safety plan (HASP), a tailgate safety meeting was held upon BVNA's arrival and prior to the initiation of excavation activities on subsequent days. Odors and staining were not noted in the soil surrounding the USTs.

Piping associated with the USTs was removed between September 17 and September 19, 2013. The piping was double-walled fiberglass, reinforced-epoxy construction. Soil samples were collected every 30 linear feet along the piping run and at each piping fitting. A total of six piping samples (P-1 through P-6) were collected (Figure 7c). Concentrations of BTEX and TEPH in the piping soil samples did not exceed regulatory standards; however concentrations of TVPH exceeded the TPH threshold value in P-6 (5,900 mg/kg) at 2.5 feet bgs. The P-6 soil sample was also analyzed for PAHs; PAH results did not exceed regulatory standards (Figure 7f). The area beneath P-6 was excavated to 3.5 feet bgs and a confirmation soil sample (C-3) was collected at the bottom. Concentrations of BTEX, TVPH, and TEPH in C-3 did not exceed regulatory standards.

Prior to UST removal, approximately 150 pounds of dry ice were placed into each UST. The dry ice was allowed to sublime in the tanks for approximately 1.5 hours. Mr. John (Jack) Sarver with OPS arrived on-site to oversee tank removal activities. Mr. Gary Micheli with the Pueblo Fire Department stated via telephone that the Pueblo Fire Department would not be on-site to approve tank removal; he also stated that the tanks could be removed if the lower explosive limit (LEL) percentage was lower than 10. Prior to removal, the oxygen content and lower explosive limit (LEL) were measured in each UST. Each of the six 10,000-gallon USTs were removed and transported off-site on September 18, 2013. Upon removal, the USTs were observed to be in good condition with no visible holes. The exterior of each UST was cleaned of loose soil and marked with the type of fuel that it previously contained (i.e., "gasoline," "diesel," "kerosene") and "Not Vapor Free". The USTs were transported to Dionisio Metal and Iron, Inc. in Pueblo, Colorado, where the tanks were destroyed for re-melt steel purposes.

Groundwater was encountered in the excavation beneath the USTs and was observed to contain a black sheen on the groundwater. Based on the observed good condition of the USTs and the lack of contamination in the surrounding soil, the observed sheen does not likely indicate a release from the tanks. On September 19, 2013, impacted groundwater was extracted from the location of each former UST using a vacuum unit and disposed off-site. The groundwater was extracted until sheen was no longer observed; approximately 500 gallons were extracted. Groundwater sample GW-2 was collected before impacted groundwater and sheen were



extracted from the UST basin and GW-3 was collected after impacted groundwater and sheen were extracted from the UST basin (Figure 8).

Following groundwater extraction activities, three soil samples were collected from beneath each UST (one at each end and one in the middle) for a total of 18 samples (Figure 7b). Additionally, confirmation bottom and sidewall soil samples were collected from the excavation (Figure 7d). Concentrations of BTEX, TVPH, and TEPH did not exceed regulatory standards in samples collected from beneath the USTs and excavation sidewalls and bottom.

Approximately 527 cubic yards (yd³) of petroleum-impacted soil were excavated from the site and disposed of off-site. During excavation activities, staining and odors were noted in three locations beneath or surrounding the piping:

- West of the UST basin and dispensers near soil sample P-1. Impacted soil was noted beneath the piping run. Based on visual observations and field screening measurements, the soil appeared to be more impacted with depth, indicating that the piping was not the source of contamination. Within the excavation, debris, including building materials and a concrete layer approximately 0.5 feet thick, was noted within the interval from approximately three to eight feet below ground surface (bgs). The area was excavated to the water table, which was encountered at approximately 10.5 feet bgs. A groundwater sample (GW-1) was collected beneath sample P-1 (Figure 8). To evaluate the extent of contamination in this area, the excavation was extended in each direction. To the north, the excavation was extended to approximately 10 feet south of the sidewalk associated with Ilex Street. Although the impacted soil appeared to potentially extend further to the north, it was not feasible to proceed further to the north and maintain the stability of Ilex Street and the sidewalk. The potentially impacted soil appeared to extend approximately 23 feet east, 34 feet west, and 23 feet south of sample P-1. Based on higher TPH concentrations in deeper soil samples than directly below the piping, the impacted soils and debris observed in this area appear to be due to historical on- or off-site sources.
- Near the piping termination below the dispensers near soil samples D-4 through D-6. This area was excavated to the depth of the water table (approximately 10.5 feet) until impacted soil appeared to have been removed; however, the excavation was limited to the west by the sidewalk associated with South Santa Fe Avenue. Two confirmation samples (C-1 and C-2) were collected from the sidewalls of the excavation (Figure 7d). Debris was also noted within this excavation as discussed above. Based on the observations of elevated TPH concentrations in deeper soil samples than directly below the piping, the impacted soils and debris observed in this area appear to be due to historical on- or off-site sources.
- Along the piping associated near D-7, which was mounted above grade at the former building. A small amount of impacted soil was removed and stockpiled, and the contamination did not appear to extend laterally or vertically, based on field observations and lab analysis. A confirmation sample (C-3) was collected from beneath the piping (Figure 7d).

On September 23, 2013, the excavations were backfilled with excavated soil and soil from demolition activities. The *Initial Site Risk Assessment Report* was prepared by BVNA and submitted to OPS on November 18, 2013. The OPS requested an investigation of petroleum contamination and a Site Characterization Report (SCR) for the site in a letter dated December 5, 2013.



Current Activities

On May 6 and May 7, 2014, BVNA mobilized to the site with Vista GeoScience of Golden, Colorado for the installation of six monitoring wells (MW-15 through MW-20). The monitoring well locations are shown on Figure 10. Prior to conducting field activities, the Utility Notification Center of Colorado (UNCC) was notified to provide confirmation of buried utility locations at the site. The approximate locations of buried utilities are shown on Figure 9. A site-specific HASP was developed for implementation during field activities.

Each of the six monitoring wells were continuously sampled utilizing a direct push drilling rig (Geoprobe®). The direct push drilling rig collected continuous soil samples from the ground surface to boring termination at approximately 15 feet bgs. The acetate liners were removed from the steel sampler for visual inspection, field screening, soil classification and documentation. A BVNA representative logged the soils in general accordance with the Unified Soil Classification System (USCS), which includes depth, moisture content, and visual or olfactory observations. Upon retrieval, soils were initially scanned for organic vapors using a photoionization detector (PID) equipped with a 10.6 electron volt (eV) probe. The PID, calibrated to an isobutylene standard, measures total concentrations of organic vapors, but cannot identify or quantify specific constituents. Soils were also placed in a sealed plastic bag for headspace analysis with the PID.

Geology is generally consistent at and around the site and consists of sands, gravels, and silts. Elevated PID readings (greater than 50 parts per million [ppm]) were observed in the saturated zone in MW-16 and MW-19. Cross-sectional diagrams are presented on Figures 11a and 11b.

Two soil samples were collected from each of the six monitoring well locations with the exception of MW-17 and MW-19, for a total of 10 soil samples for chemical analysis. Shallow soil samples were not collected from MW-17 and MW-19 due to the presence of backfill material in the former UST basin and the former dispenser locations where the wells were installed. Upon collection, the samples were placed in laboratory-provided sample containers, labeled, and immediately placed in a chilled cooler for delivery under standard chain of custody (COC) protocol to Environmental Chemistry Services, Inc. (ECS) in Castle Rock, Colorado for laboratory analysis for analysis of BTEX, TVPH by USEPA Method 8260B, and TEPH by USEPA Method 8015. Concentrations of BTEX did not exceed OPS Tier 1 RBSLs and concentrations of TVPH and TEPH did not exceed the TPH threshold value.

Soil samples were also collected from MW-15, MW-18 and MW-20 for geotechnical analysis to help determine soil type and feasibility of remedial options, if necessary. One soil sample was collected from MW-18 at 14 feet bgs for fraction of organic carbon (FOC) analysis. One undisturbed soil sample was collected at the saturated zone from MW-15 and MW-20 for bulk density, total porosity, and specific gravity analysis. Soil samples were submitted under standard COC protocol to Test America in Arvada, Colorado. The soil sample from MW-18 analyzed for FOC contained 0.3% total organic matter, 8% moisture content and 99.7% ash content. Density ranged from 1.68 grams per cubic centimeter (g/cc) in MW-20 to 1.90 g/cc in MW-15. Porosity ranged from 28.5% in MW-15 to 35.4% in MW-20. Specific gravity ranged from 2.61 in MW-20 to 2.66 in MW-15.

Permanent monitoring wells were installed following soil sample collection utilizing eight-inch hollow-stem augers to a depth of approximately 15 feet bgs. Each monitoring well was constructed with Schedule 40, two-inch diameter (nominal) polyvinyl chloride (PVC) casing and a 10 foot section of 0.010-inch slotted screen. After installing the PVC well casings, the annulus filled with collapsing sand and gravel to approximately 8 feet bgs. The annulus was then filled with washed silica sand to at least two feet above the top of screen. At least two feet of hydrated bentonite chips were installed above the sand and gravel and a traffic-rated monitoring well vault was concreted in-place at the ground surface.



Following completion of the monitoring well installation activities, BVNA subcontracted Falcon Surveying to survey the monitoring well locations and elevations. Soil cuttings and groundwater generated during drilling and monitoring well development activities were placed in United States Department of Transportation (USDOT)-approved 55-gallon steel drums for subsequent off-site disposal.

Upon completion of monitoring well installation activities, BVNA developed the monitoring wells by surging and purging at least ten casing volumes of water with new disposable polyethylene bailers on May 12 and 13, 2014. Prior to development activities, groundwater levels were measured in the monitoring wells at depths ranging from 7.12 feet below top of casing (BTOC) in MW-15 to 10.36 feet BTOC in MW-20. Down-hole equipment was decontaminated with a mixture of distilled water and Liquinox® (a non-phosphate detergent) followed by a distilled water rinse between each monitoring well.

On May 14 and 15, 2014, BVNA completed groundwater monitoring on MW-15 through MW-20. Prior to sampling, the static groundwater level was measured with an electronic water level meter in MW-15 through MW-20. The measurements were made relative to the north side of the well casing with an accuracy of ± 0.01 foot. The measured depths to groundwater ranged from 7.12 feet BTOC in MW-15 to 10.37 feet BTOC in MW-20. Based on measured groundwater elevations, groundwater flow appears to be to the south-southwest (Figure 2a). Dissolved oxygen was also measured in-situ prior to purging; measurements ranged from 0.38 milligrams per liter (mg/L) in MW-19 to 2.19 mg/L in MW-17.

A minimum of three casing volumes of groundwater was purged with new disposable polyethylene bailers from each of the wells sampled (MW-15 through MW-20). Field parameters including pH, temperature, and conductivity were measured to monitor that the groundwater quality had stabilized during purging. Field parameters were considered stable when there was a less than 0.2 pH unit change and 10% change for conductivity and temperature for three consecutive measurements. Groundwater samples were collected with bailers and poured directly into laboratory-supplied glass bottles, labeled, and immediately placed in a chilled cooler for delivery under standard COC protocol to ECS, for analysis of BTEX, methyl tert-butyl ether (MtBE), and TVPH by USEPA Method 8260B, and TEPH by USEPA Method 8015. ECS subcontracted the TEPH analysis to Summit Scientific in Golden, Colorado. Groundwater concentrations of BTEX, MTBE, TVPH and TEPH did not exceed applicable state standards in the samples collected from MW-15 through MW-20 (Figure 6).

On May 19, 2014, BVNA conducted rising-head slug test in MW-15, MW-16, and MW-20 to determine the aquifer hydraulic characteristics. A pressure transducer (In-Situ Level Troll 700) and digital data logger were utilized for the slug tests, along with a three-foot, 1.5-inch diameter solid PVC slug which produced a 0.25 gallon displacement. The AQTESOLV software program with the Bouwer-Rice Method (1976) was used to determine the hydraulic conductivity from the slug test data. The results indicated that the hydraulic conductivity at the site ranged from 1.791×10^{-3} centimeters per second (cm/sec) at MW-20 near the southwest corner of the site boundary, to 9.176×10^{-4} cm/sec at MW-15 located northeast of the site. The results are typical of sandy soils as were encountered during investigations.

Recommendations

Based on the removal of petroleum-impacted soil and groundwater and post excavation field observations and analytical results obtained during BVNA's investigations, soil and groundwater at the site are not impacted with petroleum hydrocarbons at concentrations above OPS Tier 1 RBSLs. Based on the results of investigations to date, BVNA recommends no further action at the site.