

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



#7933

FOR OGCC USE ONLY

RECEIVED
4/11/2014

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): Pit Closure

OGCC Operator Number: <u>96155</u>	Contact Name and Telephone: <u>William Lambert</u>
Name of Operator: <u>Whiting Oil and Gas Corporation</u>	No: <u>303-837-4238</u>
Address: <u>1700 Broadway, Suite 2300</u>	Fax: <u>720-644-3637</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80290-2300</u>	
API Number: <u>05-103-11312</u>	County: <u>Rio Blanco #103</u>
Facility Name: _____	Facility Number: <u>335951</u>
Well Name: <u>Boies</u>	Well Number: <u>C-320-I1</u>
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SWSE, 32, 2S, 98W, 6th</u> Latitude: <u>39.828162</u> Longitude: <u>-108.414966</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): NA

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☒ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Glendive fine sandy loam

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Black Sulphur Creek ~433 feet

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input type="checkbox"/> Soils	_____	_____
<input type="checkbox"/> Vegetation	_____	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
See work plan associated with Remediation Number 7933.

Describe how source is to be removed:
N/A. Pit bottom analytical indicates no further action is needed (see attached Completion Report).

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
N/A. Pit bottom analytical indicates no further action is needed (see attached Completion Report).



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

Page 2

REMEDIAL WORKPLAN (Cont.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

N/A

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

N/A. The pits had been reclaimed during the summer of 2012 and the sampling activities did not disturb the reclamation.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☒ N If yes, describe:

N/A. Pit bottom analytical indicates no further action is needed (see attached Completion Report).

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

N/A. No waste was generated during the sampling event.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 11/11/13	Date Site Investigation Completed: 11/11/13	Date Remediation Plan Submitted: 4/12/13
Remediation Start Date: 11/11/13	Anticipated Completion Date: 11/11/13	Actual Completion Date: 11/11/13

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: William Lambert

Signed: William Lambert

Title: Environmental Professional II

Date: 3/21/2014

OGCC Approved: Jim Seidel

Title: EPS S&P

Date: 4/14/2014



InterTech

March, 2014

***NOTICE OF COMPLETION REPORT
BOIES C-320-I1 PITS
T2S R98W Section 32
Rio Blanco County, Colorado***

Prepared For:



**Whiting Oil and Gas Corporation
1700 Broadway, Suite 2300
Denver, CO 80290**

Prepared By:



InterTech

**InterTech Environmental & Engineering, LLC
743 Horizon Court, Suite 110
Grand Junction, Colorado 81506**

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EXECUTIVE SUMMARY

On November 11, 2013, activities associated with the closure sampling of two (2) pits located on the Boies C-32O-I1 (32O) well pad site, Remediation Number 7933, were initiated. Nine Whiting Oil and Gas Corporation (Whiting) drilling, reserve and production pits, including Boies 32O pits, were reclaimed during the summer of 2012. The lining materials were removed and the pits were backfilled; however, confirmation sampling from the bottom of the pits was not conducted at the time of closure.

Soil sample aliquots were collected from three (3) locations at the bottom of each of the 32O pits. Soils were collected using a track mounted drill rig to bore through the fill material. One pit bottom confirmation sample, consisting of the three (3) aliquots for the Southeast (SE) pit and one (1) pit bottom confirmation sample, consisting of the three (3) aliquots for the Northwest (NW) pit, was submitted to ALS Laboratories (ALS) for analysis of Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 analytes.

Analytical results received from the laboratory for the confirmation sample revealed concentrations of all 910-1 constituents to be within the allowable concentrations set by COGCC, except arsenic, Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR). A summary of the constituents exceeding regulatory concentrations is as follows:

Constituent	Units	Standard	Result	
			NW	SE
Arsenic	mg/kg	0.39	4.4	3.8
Electrical Conductivity	mmhos/cm	<4 or 2x background	12	14
Sodium Adsorption Ratio	unitless	<12	14	19

It is requested that background arsenic concentrations be taken into consideration for the completion of the pit closure. This request is in accordance with and pertaining to footnote 1 to the Table 910-1 of the COGCC 900 series Rule.

In addition, it is requested the depth of the sample compared to the root zone be taken into consideration when evaluating the SAR and EC as the pit bottom is buried under a minimum of three (3) feet of backfill cover.

1.0 - INTRODUCTION

This document was prepared to describe the procedures and protocol used for the closure sampling of the two (2) pits at the 32O pad site. The practices used are as described in the Whiting Pit Closure Work Plan, approved by COGCC and assigned Remediation Number 7933. The report provides the documentation necessary to demonstrate a comprehensive and diligent sampling of the pit. Samples were obtained as described and in accordance with all appropriate County, State and Federal rules and regulations.

1.1 - Site Description

The 32O pad site is located in the SW1/4 of the SE1/4 of Section 32 of Township 2 South and Range 98 West in Rio Blanco County, Colorado. The coordinates for the site are:

API/Facility ID	Easting	Northing
05-103-11312	721223	4411883

The well pad is situated on non-crop rangelands and Glendive fine sandy loam soils. Receiving waters include the perennial flowing Black Sulphur Creek. The estimated distance to the receiving waters is approximately 433 feet. Vegetation consists of sage brush and grassland communities. See Figure 1 for a Site Vicinity map (Appendix A).

2.0 - PIT CLOSURE SAMPLING EVENT

Whiting records indicate that the nine (9) pits were reclaimed during the summer of 2012. Closure practices included removal of the liner material and backfill; however, did not include confirmation samples being collected from the pit bottom.

The soils investigation was completed as described in the Whiting Oil & Gas Pit Closure Work Plan and further described below.

2.1 - Visual Observation of Soil Aliquots

All soils were observed for any visual indication of hydrocarbon impact. The following was noted from the soil aliquots collected from the 32O drilling and reserve pits.

Pit	Aliquot Location Within Pit	Aliquot Depth (feet below surface)	Soil Observation(s)
32O-NW	Northwest	10	Brown, no odor
	Middle	10	Brown, no odor
	Southeast	10	Brown, no odor
32O-SE	Northwest	10	Black, mild odor
	Middle	10	Brown, no odor
	Southeast	10	Brown, no odor

2.2 - PID Screening

Using a RAE Systems Photoionization Detector (PID), calibrated daily with Isobutylene per manufacture's recommendations, the three (3) aliquots were screened for Volatile Organic Compounds (VOCs). If the PID reading was above 100 parts per million (ppm) or visual screening indicated sub-soils had been impacted, the suspect aliquot was submitted separately

to the laboratory for analysis of Table 910-1 constituents. All aliquots with PID readings below 100 ppm were combined and submitted as one (1) composite sample.

Aliquot PID readings are as follows:

Pit	Aliquot Location Within Pit	PID Reading (ppm)
NW	Northwest	2.5
	Middle	2.0
	Southeast	1.4
SE	Northwest	4.2
	Middle	1.2
	Southeast	1.1

2.3 - Sample Collection

The NW pit was approximately 40 feet by 40 feet and the SE pit was approximately 40 feet by 100 feet. Whiting estimated the pits to be 10 feet in depth. Using a track mounted drill rig, flight augers bored through the fill material until native soil was reached. Pit bottom soil samples were collected from three (3) locations along the axis of each pit with a two (2) foot split spoon.

The sampled material was field screened, as described above, composited and then placed into laboratory specified sample containers. The samples were labeled with unique sample identification, sampler's name, date collected and the time of collection. Samples were then placed into a cooler with ice to cool to four (4) degrees (°) to preserve sample integrity. Samples were submitted to ALS laboratory via overnight courier for analysis of contaminants listed in COGCC Table 910-1.

All pertinent site and sampling activity information were recorded, in print, in a dedicated field notebook. Site conditions and sampling locations were recorded on a site plan, plotted relative to a known reference point or located by means of a handheld Global Positioning System (GPS) device, and will be photographed.

The sample name and aliquot coordinates are as follows:

Sample ID	Aliquot ID	Easting	Northing
WOG_32O_NW_PB_10	1 (Northwest)	721210	4411926
	2 (Middle)	721206	4411922
	3 (Southeast)	721200	4411916
WOG_32O_SE_PB_10	1 (Northwest)	721185	4411392
	2 (Middle)	721176	4411884
	3 (Southeast)	721172	4411881

3.0 - ANALYTICAL RESULTS AND INTERPRETATION

The confirmation sample analytical showed the 32O pit bottom samples to be below COGCC Table 910-1 standards for all constituents, except arsenic, EC and SAR. A summary of parameters for the pit bottom sample is as follows and a copy of the laboratory report is included in Appendix B:

Constituent	Table 910-1 Standard	Units	Results	
			NW	SE
Organic Compounds in Soil				
TPH - DRO			23	430
TPH - GRO			ND	23
TPH - Total	500	mg/kg	23	453
Benzene	0.17	mg/kg	ND	ND
Toluene	85	mg/kg	ND	ND
Ethylbenzene	100	mg/kg	ND	ND
Xylenes, Total	175	mg/kg	ND	ND
Acenaphthene	1,000	mg/kg	ND	ND
Anthracene	1,000	mg/kg	ND	ND
Benzo(a)anthracene	0.22	mg/kg	ND	ND
Benzo(b)fluoranthene	0.22	mg/kg	ND	ND
Benzo(k)fluoranthene	2.2	mg/kg	ND	ND
Benzo(a)pyrene	0.022	mg/kg	ND	ND
Chrysene	22	mg/kg	ND	ND
Dibenzo(a,h)anthracene	0.022	mg/kg	ND	ND
Fluoranthene	1,000	mg/kg	ND	ND
Fluorene	1,000	mg/kg	ND	ND
Indeno(1,2,3-cd)pyrene	0.22	mg/kg	ND	ND
Naphthalene	23	mg/kg	ND	ND
Pyrene	1,000	mg/kg	ND	ND
Inorganics in Soil				
Electrical Conductivity	<4 or 2 x background	mmhos/cm	12	14
Sodium Adsorption Ratio	<12	unitless	14	19
pH	6-9	unitless	7.4	7.6
Metals in Soil				
Arsenic	0.39	mg/kg	4.4	3.8
Barium	15,000	mg/kg	280	3,200
Cadmium	70	mg/kg	ND	ND
Chromium, Hexavalent	23	mg/kg	ND	ND
Chromium, Trivalent	120,000	mg/kg	26	28
Copper	3,100	mg/kg	12	12
Lead	400	mg/kg	15	17
Mercury	23	mg/kg	ND	0.027
Nickel	1,600	mg/kg	14	14
Selenium	390	mg/kg	ND	ND
Silver	390	mg/kg	ND	ND
Zinc	23,000	mg/kg	53	51
ND - Non Detect				
Exceeds COGCC Table 910-1 Standard				

3.1 - Analytical Interpretation

As illustrated above, the analytical results show the pit bottom soils meet COGCC Table 910-1 standards with the exception of arsenic, EC and SAR. Arsenic exceeds the allowable concentrations in Table 910-1; however, a study of the Boies Ranch area, completed in July 2011, revealed a mean background concentration of 6.4 mg/kg and a maximum value of 10.0

mg/kg. Background arsenic samples were not collected during the time of the pit closure as an area wide study had been completed in 2011. The study area included representative samples from areas near the 32O pits. Analytical results from the study are shown below and a map depicting the sampling locations is included in Appendix A.

Location	Sample ID	Sample Date	Constituent	Result	Unit
Boies_Ranch	SO_Boies_Background_Sect_1_1	7/27/2011	Arsenic, Total	10.0	mg/kg
	SO_Boies_Background_Sect_1_2			5.0*	
	SO_Boies_Background_Sect_2_1			5.0*	
	SO_Boies_Background_Sect_2_2			8.0	
	SO_Boies_Background_Sect_2_3			5.0*	
	SO_Boies_Background_Sect_3_1			5.0	
	SO_Boies_Background_Sect_3_2			6.0	
	SO_Boies_Background_Sect_3_3			6.0	
	SO_Boies_Background_Sect_3_4			8.0	
		Mean Value		6.4	mg/kg
		Highest Reported Value		10.0	mg/kg

*In instances where the laboratory indicated the constituent results were non-detect (ND), the Practical Quantitation Level (PQL) was used for the results value.

It is requested that background arsenic concentrations be taken into consideration for the completion of the pit closure. This request is in accordance with and pertaining to footnote 1 to the Table 910-1 of the COGCC 900 series Rule.

In addition, it is requested the depth of the sample compared to the root zone be taken into consideration when evaluating the SAR and EC. The pit bottom is over seven (7) feet below the root zone and, as such, the pit bottom is buried under a minimum of three (3) feet of backfill cover. Neither constituent will have an impact on vegetation growth.

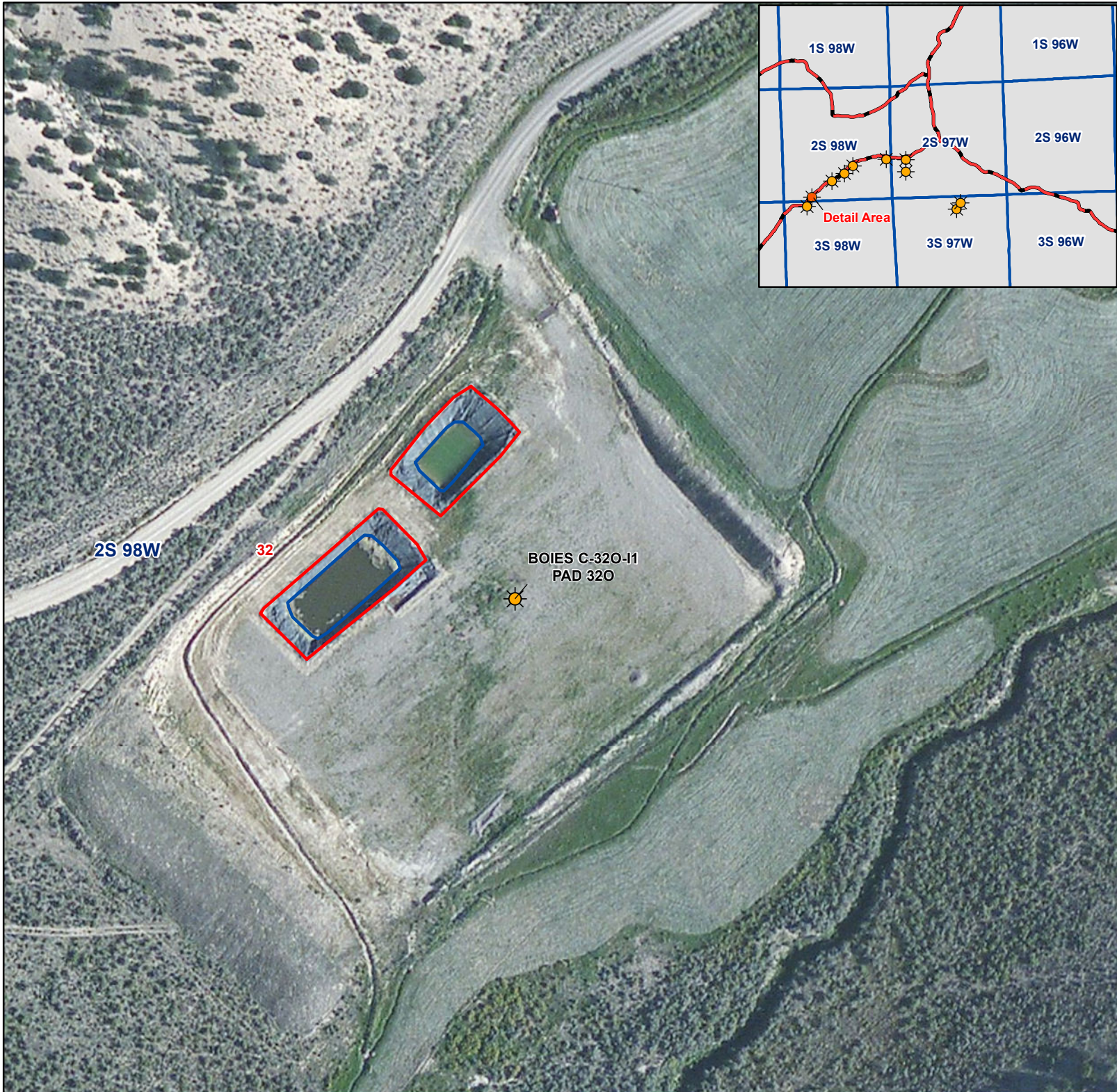


InterTech



APPENDIX A

Figures






Whiting Petroleum Corporation

**Boies C-320-I1
Pad C-320
Sec 32, T2S R98W**

December 5, 2012

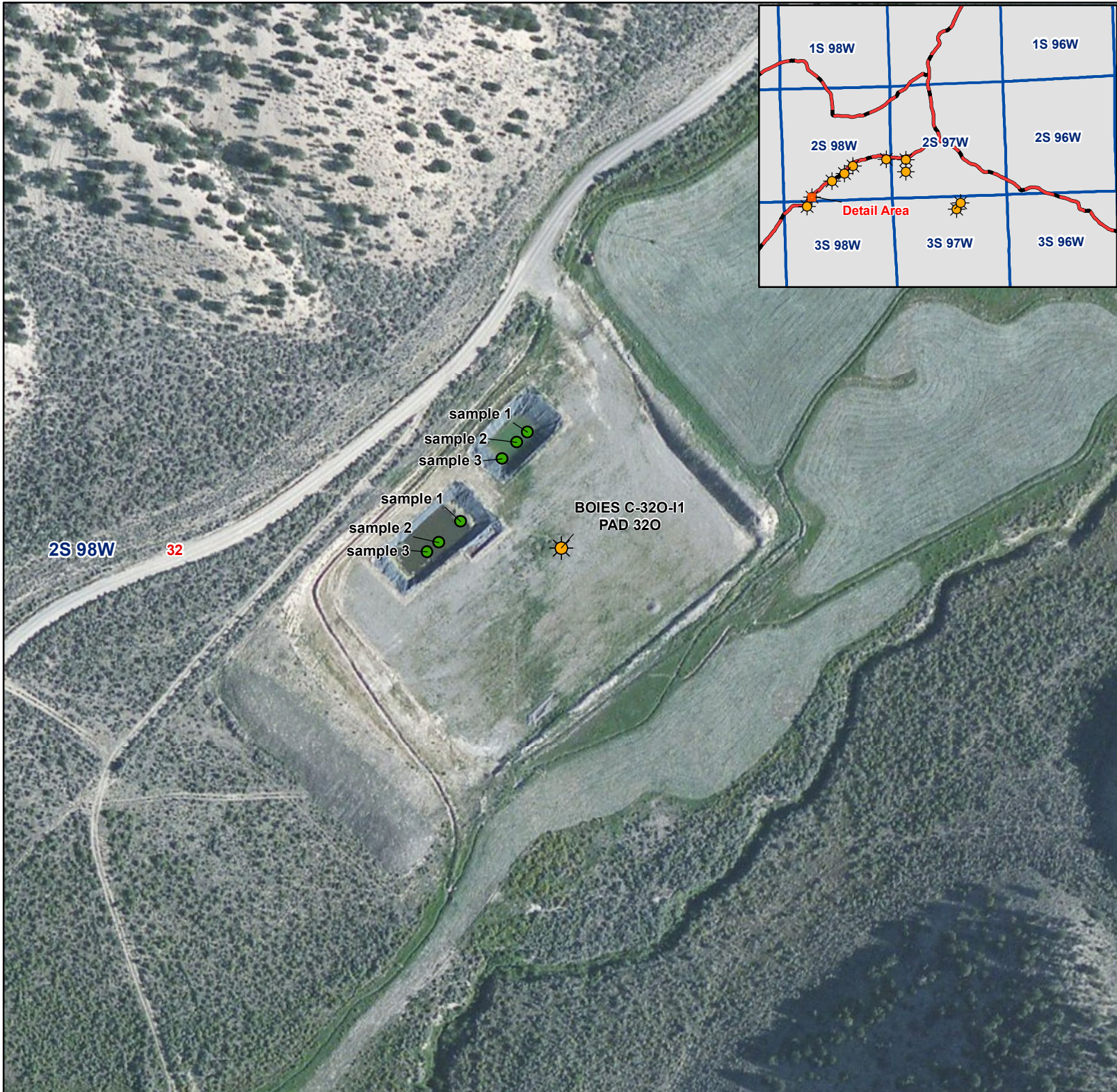
Explanation:

-  Whiting Well Location
-  Pit Bottom
-  Pit Perimeter



0 50 100
Feet

1:1,500





Whiting Petroleum Corporation

**Boies C-320-I1
Pad 320 Sample Locations
Sec 32, T2S R98W**

December 20, 2013

Explanation:

-  Whiting Well Location
-  Sample Location



0 110 220
Feet

1:2,000







Whiting Petroleum Corporation

**Boies C-320-I1
Pad 320 Setback Map
Sec 32, T2S R98W**

December 20, 2013

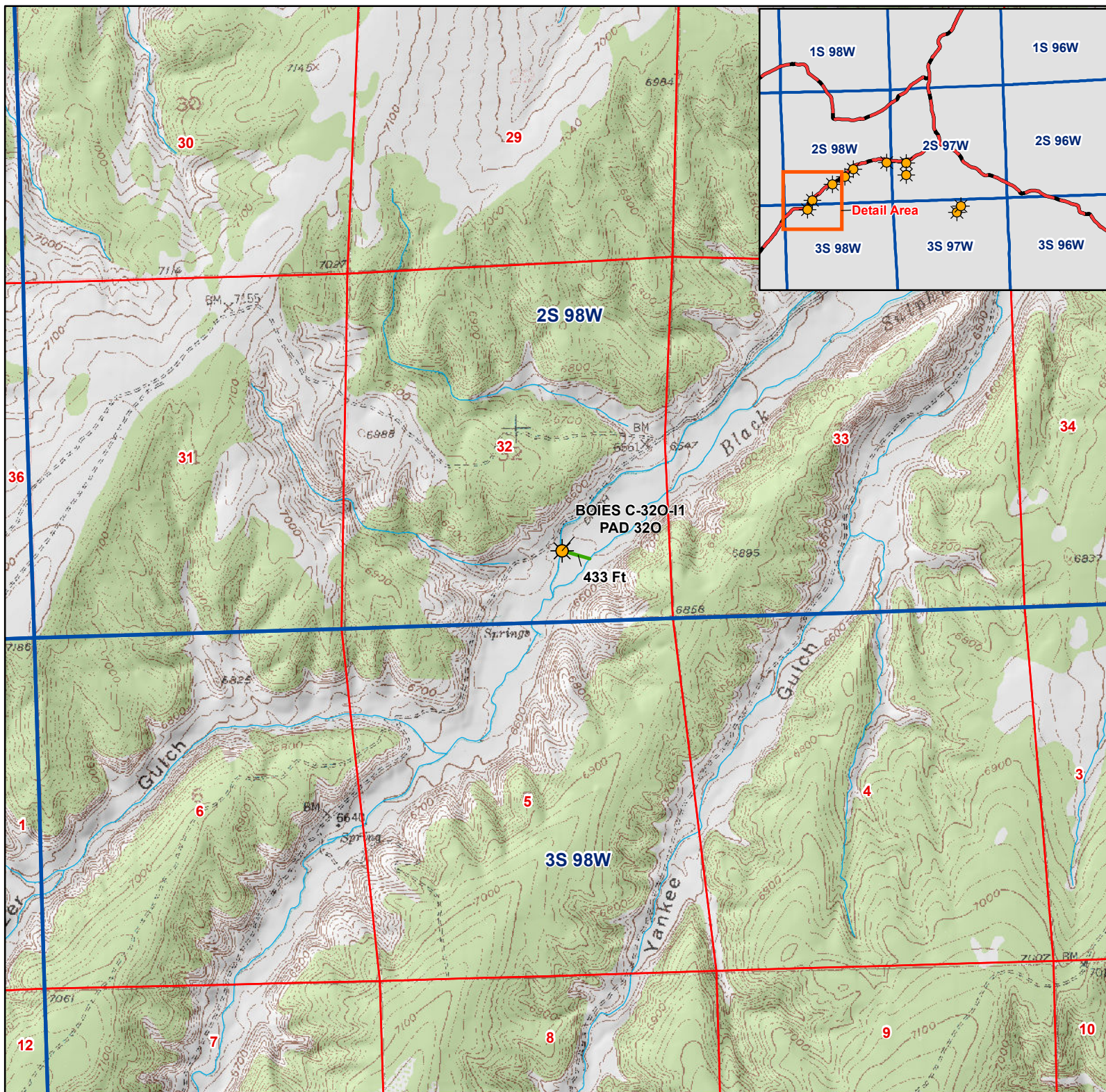
Explanation:

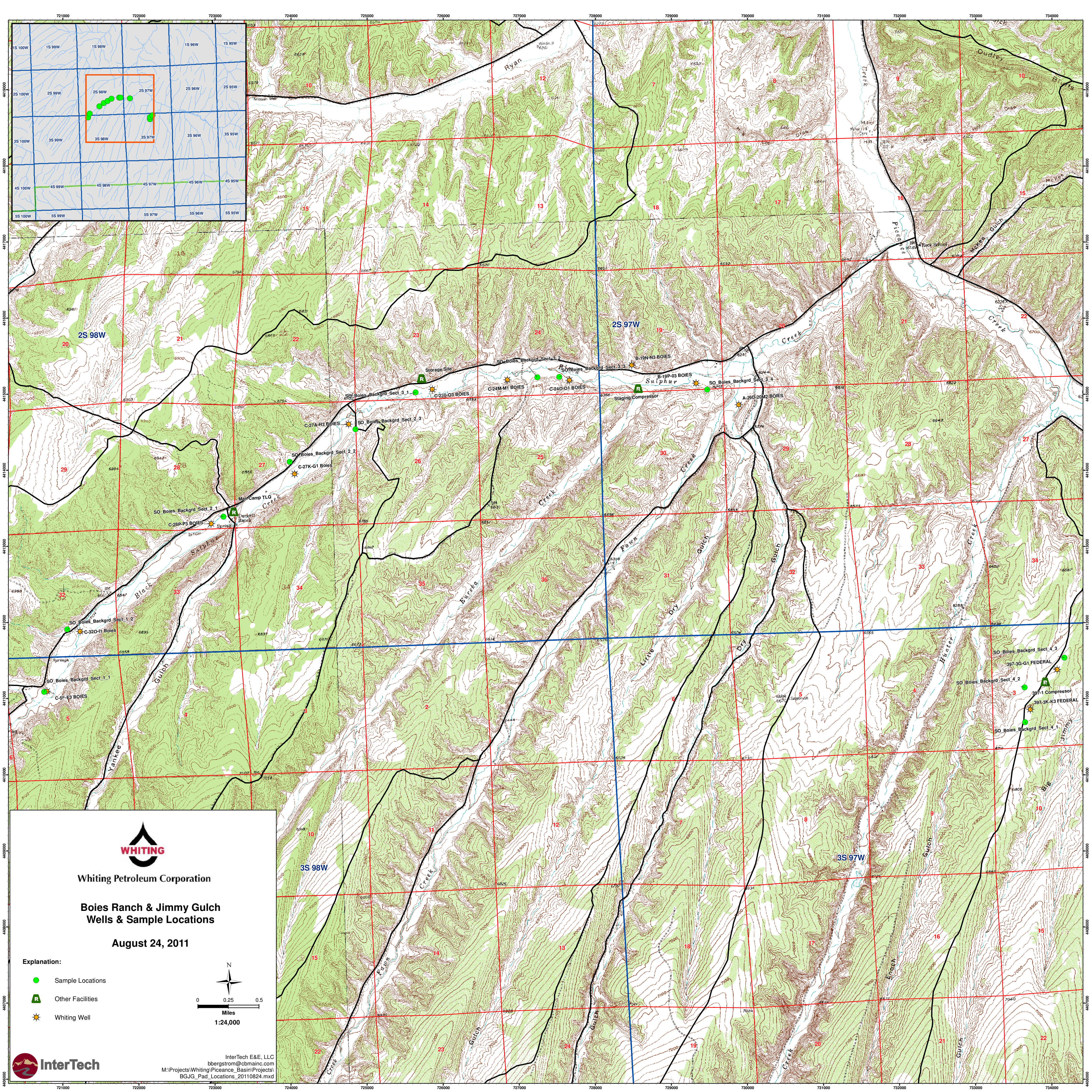
-  Whiting Well Location
-  Setback Distance



0 0.25 0.5
Miles

1:24,000








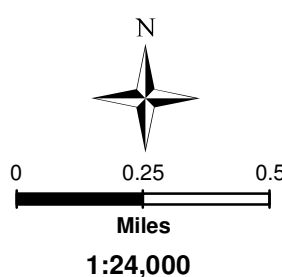
Whiting Petroleum Corporation

Boies Ranch & Jimmy Gulch Wells & Sample Locations

August 24, 2011

Explanation:

-  Sample Locations
-  Other Facilities
-  Whiting Well



InterTech E&E, LLC
bbergstrom@cbmainc.com
M:\Projects\Whiting\Piceance_Basin\Projects\
BGJG_Pad_Locations_20110824.mxd



InterTech



APPENDIX B

Laboratory Analytical Report



22-Nov-2013

Jana Sanders
InterTech
743 Horizon Court, Suite 110
Grand Junction, CO 81506

Re: **WOG-Boies Ranch Pits 11.11.13**

Work Order: **1311701**

Dear Jana,

ALS Environmental received 5 samples on 13-Nov-2013 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 30.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston
Project Manager



Certificate No: MN 532786

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: InterTech
Project: WOG-Boies Ranch Pits 11.11.13
Work Order: 1311701

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1311701-01	WOG_C_5_PB_6	Soil		11/11/2013 13:20	11/13/2013 10:00	<input type="checkbox"/>
1311701-02	WOG_28_P_3_PB_20	Soil		11/11/2013 15:15	11/13/2013 10:00	<input type="checkbox"/>
1311701-03	WOG_320_NW_PB_10	Soil		11/11/2013 16:20	11/13/2013 10:00	<input type="checkbox"/>
1311701-04	WOG_320_SE_PB_10	Soil		11/11/2013 16:50	11/13/2013 10:00	<input type="checkbox"/>
1311701-05	WOG_28_P_3_14	Soil		11/11/2013 15:00	11/13/2013 10:00	<input type="checkbox"/>

Client: InterTech
Project: WOG-Boies Ranch Pits 11.11.13
Work Order: 1311701

Case Narrative

Batch 53318, Method SVO_8270_S, Sample 1311701-05B: Surrogate recovery out of control due to matrix interference.

Client: InterTech
Project: WOG-Boies Ranch Pits 11.11.13
WorkOrder: 1311701

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius
none	
s.u.	Standard Units

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_C_5_PB_6

Lab ID: 1311701-01

Collection Date: 11/11/2013 01:20 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID						
DRO (C10-C28)	29		SW8015M		Prep Date: 11/15/2013	Analyst: CW
			5.6	mg/Kg-dry	1	11/15/2013 05:33 PM
Surr: 4-Terphenyl-d14	59.1		39-115	%REC	1	11/15/2013 05:33 PM
GASOLINE RANGE ORGANICS BY GC-FID						
GRO (C6-C10)	ND		SW8015		Prep Date: 11/14/2013	Analyst: CW
			3.4	mg/Kg-dry	1	11/14/2013 08:35 PM
Surr: Toluene-d8	106		50-150	%REC	1	11/14/2013 08:35 PM
MERCURY BY CVAA						
Mercury	0.024		SW7471		Prep Date: 11/15/2013	Analyst: LR
			0.017	mg/Kg-dry	1	11/15/2013 04:41 PM
METALS BY ICP-MS						
Arsenic	4.1		SW6020A		Prep Date: 11/18/2013	Analyst: ML
			2.3	mg/Kg-dry	5	11/19/2013 04:52 PM
Barium	400		2.3	mg/Kg-dry	5	11/19/2013 04:52 PM
Cadmium	ND		0.93	mg/Kg-dry	5	11/19/2013 04:52 PM
Chromium	39		2.3	mg/Kg-dry	5	11/19/2013 04:52 PM
Copper	15		2.3	mg/Kg-dry	5	11/19/2013 04:52 PM
Lead	14		2.3	mg/Kg-dry	5	11/20/2013 03:12 PM
Nickel	18		2.3	mg/Kg-dry	5	11/19/2013 04:52 PM
Selenium	ND		2.3	mg/Kg-dry	5	11/19/2013 04:52 PM
Silver	ND		2.3	mg/Kg-dry	5	11/19/2013 04:52 PM
Zinc	56		4.7	mg/Kg-dry	5	11/19/2013 04:52 PM
SOLUBLE CATIONS FOR SAR						
Calcium	140		SW6020A		Prep Date: 11/19/2013	Analyst: CES
			10	mg/L	20	11/20/2013 07:47 AM
Magnesium	77		4.0	mg/L	20	11/20/2013 07:47 AM
Sodium	460		4.0	mg/L	20	11/20/2013 07:47 AM
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	7.8		USDA H60 METHO		Prep Date: 11/19/2013	Analyst: CES
			0.010	none	1	11/18/2013
SEMI-VOLATILE ORGANIC COMPOUNDS						
Acenaphthene	ND		SW8270		Prep Date: 11/15/2013	Analyst: HL
			0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Anthracene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Benzo(a)anthracene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Benzo(a)pyrene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Benzo(b)fluoranthene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Benzo(k)fluoranthene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Chrysene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Dibenzo(a,h)anthracene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Fluoranthene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Fluorene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Indeno(1,2,3-cd)pyrene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_C_5_PB_6

Lab ID: 1311701-01

Collection Date: 11/11/2013 01:20 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Naphthalene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Pyrene	ND		0.0089	mg/Kg-dry	1	11/15/2013 09:45 PM
Surr: 2-Fluorobiphenyl	89.0		12-100	%REC	1	11/15/2013 09:45 PM
Surr: 4-Terphenyl-d14	97.6		25-137	%REC	1	11/15/2013 09:45 PM
Surr: Nitrobenzene-d5	86.0		37-107	%REC	1	11/15/2013 09:45 PM
VOLATILE ORGANIC COMPOUNDS			SW8260B		Prep Date: 11/14/2013	Analyst: RS
Benzene	ND		0.040	mg/Kg-dry	1	11/20/2013 03:22 AM
Ethylbenzene	ND		0.040	mg/Kg-dry	1	11/20/2013 03:22 AM
m,p-Xylene	ND		0.080	mg/Kg-dry	1	11/20/2013 03:22 AM
o-Xylene	ND		0.040	mg/Kg-dry	1	11/20/2013 03:22 AM
Toluene	ND		0.040	mg/Kg-dry	1	11/20/2013 03:22 AM
Xylenes, Total	ND		0.12	mg/Kg-dry	1	11/20/2013 03:22 AM
Surr: 1,2-Dichloroethane-d4	102		70-130	%REC	1	11/20/2013 03:22 AM
Surr: 4-Bromofluorobenzene	99.9		70-130	%REC	1	11/20/2013 03:22 AM
Surr: Dibromofluoromethane	87.4		70-130	%REC	1	11/20/2013 03:22 AM
Surr: Toluene-d8	99.6		70-130	%REC	1	11/20/2013 03:22 AM
ELECTRICAL CONDUCTIVITY (SAR)			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: JB
Electrical Conductivity @ Saturation	4.0		0.050	mmhos/cm @2	10	11/19/2013 05:30 PM
CHROMIUM, TRIVALENT			CALCULATION			Analyst: MB
Chromium, Trivalent	39		0.67	mg/Kg-dry	1	11/21/2013 09:30 AM
CHROMIUM, HEXAVALENT			SW7196A		Prep Date: 11/14/2013	Analyst: MB
Chromium, Hexavalent	ND		0.68	mg/Kg-dry	1	11/15/2013 03:30 PM
MOISTURE			A2540 G			Analyst: MEB
Moisture	25		0.050	% of sample	1	11/15/2013 05:45 PM
PH			SW9045D		Prep Date: 11/15/2013	Analyst: JB
pH	8.3			s.u.	1	11/15/2013 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_28_P_3_PB_20

Lab ID: 1311701-02

Collection Date: 11/11/2013 03:15 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID						
			SW8015M		Prep Date: 11/15/2013	Analyst: CW
DRO (C10-C28)	26		5.2	mg/Kg-dry	1	11/15/2013 06:33 PM
<i>Surr: 4-Terphenyl-d14</i>	<i>51.3</i>		<i>39-115</i>	<i>%REC</i>	1	11/15/2013 06:33 PM
GASOLINE RANGE ORGANICS BY GC-FID						
			SW8015		Prep Date: 11/14/2013	Analyst: CW
GRO (C6-C10)	ND		3.2	mg/Kg-dry	1	11/14/2013 07:48 PM
<i>Surr: Toluene-d8</i>	<i>102</i>		<i>50-150</i>	<i>%REC</i>	1	11/14/2013 07:48 PM
MERCURY BY CVAA						
			SW7471		Prep Date: 11/15/2013	Analyst: LR
Mercury	0.015		0.014	mg/Kg-dry	1	11/15/2013 04:50 PM
METALS BY ICP-MS						
			SW6020A		Prep Date: 11/18/2013	Analyst: ML
Arsenic	5.0		2.0	mg/Kg-dry	5	11/19/2013 05:05 PM
Barium	310		2.0	mg/Kg-dry	5	11/19/2013 05:05 PM
Cadmium	ND		0.81	mg/Kg-dry	5	11/19/2013 05:05 PM
Chromium	30		2.0	mg/Kg-dry	5	11/19/2013 05:05 PM
Copper	11		2.0	mg/Kg-dry	5	11/19/2013 05:05 PM
Lead	15		2.0	mg/Kg-dry	5	11/20/2013 03:18 PM
Nickel	16		2.0	mg/Kg-dry	5	11/19/2013 05:05 PM
Selenium	ND		2.0	mg/Kg-dry	5	11/19/2013 05:05 PM
Silver	ND		2.0	mg/Kg-dry	5	11/19/2013 05:05 PM
Zinc	51		4.0	mg/Kg-dry	5	11/19/2013 05:05 PM
SOLUBLE CATIONS FOR SAR						
			SW6020A		Prep Date: 11/19/2013	Analyst: CES
Calcium	29		10	mg/L	20	11/20/2013 07:53 AM
Magnesium	31		4.0	mg/L	20	11/20/2013 07:53 AM
Sodium	160		4.0	mg/L	20	11/20/2013 07:53 AM
SODIUM ADSORPTION RATIO						
			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: CES
Sodium Adsorption Ratio	4.9		0.010	none	1	11/18/2013
SEMI-VOLATILE ORGANIC COMPOUNDS						
			SW8270		Prep Date: 11/15/2013	Analyst: HL
Acenaphthene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Anthracene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Benzo(a)anthracene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Benzo(a)pyrene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Benzo(b)fluoranthene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Benzo(k)fluoranthene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Chrysene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Dibenzo(a,h)anthracene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Fluoranthene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Fluorene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Indeno(1,2,3-cd)pyrene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_28_P_3_PB_20

Lab ID: 1311701-02

Collection Date: 11/11/2013 03:15 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Naphthalene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Pyrene	ND		0.0083	mg/Kg-dry	1	11/15/2013 10:16 PM
Surr: 2-Fluorobiphenyl	81.8		12-100	%REC	1	11/15/2013 10:16 PM
Surr: 4-Terphenyl-d14	88.8		25-137	%REC	1	11/15/2013 10:16 PM
Surr: Nitrobenzene-d5	71.0		37-107	%REC	1	11/15/2013 10:16 PM
VOLATILE ORGANIC COMPOUNDS			SW8260B		Prep Date: 11/14/2013	Analyst: BG
Benzene	ND		0.038	mg/Kg-dry	1	11/20/2013 06:01 AM
Ethylbenzene	ND		0.038	mg/Kg-dry	1	11/20/2013 06:01 AM
m,p-Xylene	ND		0.076	mg/Kg-dry	1	11/20/2013 06:01 AM
o-Xylene	ND		0.038	mg/Kg-dry	1	11/20/2013 06:01 AM
Toluene	ND		0.038	mg/Kg-dry	1	11/20/2013 06:01 AM
Xylenes, Total	ND		0.11	mg/Kg-dry	1	11/20/2013 06:01 AM
Surr: 1,2-Dichloroethane-d4	95.8		70-130	%REC	1	11/20/2013 06:01 AM
Surr: 4-Bromofluorobenzene	101		70-130	%REC	1	11/20/2013 06:01 AM
Surr: Dibromofluoromethane	91.8		70-130	%REC	1	11/20/2013 06:01 AM
Surr: Toluene-d8	98.0		70-130	%REC	1	11/20/2013 06:01 AM
ELECTRICAL CONDUCTIVITY (SAR)			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: JB
Electrical Conductivity @ Saturation	1.2		0.050	mmhos/cm @2	10	11/19/2013 05:30 PM
CHROMIUM, TRIVALENT			CALCULATION			Analyst: MB
Chromium, Trivalent	30		0.63	mg/Kg-dry	1	11/21/2013 09:30 AM
CHROMIUM, HEXAVALENT			SW7196A		Prep Date: 11/14/2013	Analyst: MB
Chromium, Hexavalent	ND		0.62	mg/Kg-dry	1	11/15/2013 03:30 PM
MOISTURE			A2540 G			Analyst: MEB
Moisture	21		0.050	% of sample	1	11/15/2013 05:45 PM
PH			SW9045D		Prep Date: 11/15/2013	Analyst: JB
pH	8.6			s.u.	1	11/15/2013 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_320_NW_PB_10

Lab ID: 1311701-03

Collection Date: 11/11/2013 04:20 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID						
			SW8015M		Prep Date: 11/15/2013	Analyst: CW
DRO (C10-C28)	23		4.8	mg/Kg-dry	1	11/15/2013 08:02 PM
Surr: 4-Terphenyl-d14	57.5		39-115	%REC	1	11/15/2013 08:02 PM
GASOLINE RANGE ORGANICS BY GC-FID						
			SW8015		Prep Date: 11/14/2013	Analyst: CW
GRO (C6-C10)	ND		2.9	mg/Kg-dry	1	11/14/2013 08:11 PM
Surr: Toluene-d8	108		50-150	%REC	1	11/14/2013 08:11 PM
MERCURY BY CVAA						
			SW7471		Prep Date: 11/15/2013	Analyst: LR
Mercury	ND		0.016	mg/Kg-dry	1	11/15/2013 04:52 PM
METALS BY ICP-MS						
			SW6020A		Prep Date: 11/18/2013	Analyst: ML
Arsenic	4.4		2.3	mg/Kg-dry	5	11/19/2013 05:11 PM
Barium	280		2.3	mg/Kg-dry	5	11/19/2013 05:11 PM
Cadmium	ND		0.90	mg/Kg-dry	5	11/19/2013 05:11 PM
Chromium	26		2.3	mg/Kg-dry	5	11/19/2013 05:11 PM
Copper	12		2.3	mg/Kg-dry	5	11/19/2013 05:11 PM
Lead	15		2.3	mg/Kg-dry	5	11/20/2013 03:24 PM
Nickel	14		2.3	mg/Kg-dry	5	11/19/2013 05:11 PM
Selenium	ND		2.3	mg/Kg-dry	5	11/19/2013 05:11 PM
Silver	ND		2.3	mg/Kg-dry	5	11/19/2013 05:11 PM
Zinc	53		4.5	mg/Kg-dry	5	11/19/2013 05:11 PM
SOLUBLE CATIONS FOR SAR						
			SW6020A		Prep Date: 11/19/2013	Analyst: CES
Calcium	570		10	mg/L	20	11/20/2013 07:59 AM
Magnesium	220		4.0	mg/L	20	11/20/2013 07:59 AM
Sodium	1,600		4.0	mg/L	20	11/20/2013 07:59 AM
SODIUM ADSORPTION RATIO						
			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: CES
Sodium Adsorption Ratio	14		0.010	none	1	11/18/2013
SEMI-VOLATILE ORGANIC COMPOUNDS						
			SW8270		Prep Date: 11/15/2013	Analyst: HL
Acenaphthene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Anthracene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Benzo(a)anthracene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Benzo(a)pyrene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Benzo(b)fluoranthene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Benzo(k)fluoranthene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Chrysene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Dibenzo(a,h)anthracene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Fluoranthene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Fluorene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Indeno(1,2,3-cd)pyrene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_320_NW_PB_10

Lab ID: 1311701-03

Collection Date: 11/11/2013 04:20 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Naphthalene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Pyrene	ND		0.0076	mg/Kg-dry	1	11/15/2013 10:48 PM
Surr: 2-Fluorobiphenyl	71.4		12-100	%REC	1	11/15/2013 10:48 PM
Surr: 4-Terphenyl-d14	92.7		25-137	%REC	1	11/15/2013 10:48 PM
Surr: Nitrobenzene-d5	70.5		37-107	%REC	1	11/15/2013 10:48 PM
VOLATILE ORGANIC COMPOUNDS			SW8260B		Prep Date: 11/14/2013	Analyst: RS
Benzene	ND		0.035	mg/Kg-dry	1	11/20/2013 03:46 AM
Ethylbenzene	ND		0.035	mg/Kg-dry	1	11/20/2013 03:46 AM
m,p-Xylene	ND		0.070	mg/Kg-dry	1	11/20/2013 03:46 AM
o-Xylene	ND		0.035	mg/Kg-dry	1	11/20/2013 03:46 AM
Toluene	ND		0.035	mg/Kg-dry	1	11/20/2013 03:46 AM
Xylenes, Total	ND		0.10	mg/Kg-dry	1	11/20/2013 03:46 AM
Surr: 1,2-Dichloroethane-d4	104		70-130	%REC	1	11/20/2013 03:46 AM
Surr: 4-Bromofluorobenzene	99.2		70-130	%REC	1	11/20/2013 03:46 AM
Surr: Dibromofluoromethane	84.2		70-130	%REC	1	11/20/2013 03:46 AM
Surr: Toluene-d8	99.4		70-130	%REC	1	11/20/2013 03:46 AM
ELECTRICAL CONDUCTIVITY (SAR)			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: JB
Electrical Conductivity @ Saturation	12		0.050	mmhos/cm @2	10	11/19/2013 05:30 PM
CHROMIUM, TRIVALENT			CALCULATION			Analyst: MB
Chromium, Trivalent	26		0.58	mg/Kg-dry	1	11/21/2013 09:30 AM
CHROMIUM, HEXAVALENT			SW7196A		Prep Date: 11/14/2013	Analyst: MB
Chromium, Hexavalent	ND		0.57	mg/Kg-dry	1	11/15/2013 03:30 PM
MOISTURE			A2540 G			Analyst: MEB
Moisture	14		0.050	% of sample	1	11/15/2013 05:45 PM
PH			SW9045D		Prep Date: 11/15/2013	Analyst: JB
pH	7.4			s.u.	1	11/15/2013 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_320_SE_PB_10

Lab ID: 1311701-04

Collection Date: 11/11/2013 04:50 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID						
			SW8015M		Prep Date: 11/15/2013	Analyst: CW
DRO (C10-C28)	430		4.9	mg/Kg-dry	1	11/15/2013 07:02 PM
<i>Surr: 4-Terphenyl-d14</i>	66.8		39-115	%REC	1	11/15/2013 07:02 PM
GASOLINE RANGE ORGANICS BY GC-FID						
			SW8015		Prep Date: 11/14/2013	Analyst: CW
GRO (C6-C10)	23		3.0	mg/Kg-dry	1	11/14/2013 08:58 PM
<i>Surr: Toluene-d8</i>	106		50-150	%REC	1	11/14/2013 08:58 PM
MERCURY BY CVAA						
			SW7471		Prep Date: 11/15/2013	Analyst: LR
Mercury	0.027		0.020	mg/Kg-dry	1	11/15/2013 04:54 PM
METALS BY ICP-MS						
			SW6020A		Prep Date: 11/18/2013	Analyst: ML
Arsenic	3.8		2.1	mg/Kg-dry	5	11/19/2013 05:29 PM
Barium	3,200		11	mg/Kg-dry	25	11/20/2013 03:30 PM
Cadmium	ND		0.86	mg/Kg-dry	5	11/19/2013 05:29 PM
Chromium	28		2.1	mg/Kg-dry	5	11/19/2013 05:29 PM
Copper	12		2.1	mg/Kg-dry	5	11/19/2013 05:29 PM
Lead	17		11	mg/Kg-dry	25	11/20/2013 03:30 PM
Nickel	14		2.1	mg/Kg-dry	5	11/19/2013 05:29 PM
Selenium	ND		2.1	mg/Kg-dry	5	11/19/2013 05:29 PM
Silver	ND		2.1	mg/Kg-dry	5	11/19/2013 05:29 PM
Zinc	51		4.3	mg/Kg-dry	5	11/19/2013 05:29 PM
SOLUBLE CATIONS FOR SAR						
			SW6020A		Prep Date: 11/19/2013	Analyst: CES
Calcium	590		10	mg/L	20	11/20/2013 08:05 AM
Magnesium	170		4.0	mg/L	20	11/20/2013 08:05 AM
Sodium	2,100		4.0	mg/L	20	11/20/2013 08:05 AM
SODIUM ADSORPTION RATIO						
			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: CES
Sodium Adsorption Ratio	19		0.010	none	1	11/18/2013
SEMI-VOLATILE ORGANIC COMPOUNDS						
			SW8270		Prep Date: 11/15/2013	Analyst: HL
Acenaphthene	ND		0.16	mg/Kg-dry	20	11/19/2013 11:23 AM
Anthracene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Benzo(a)anthracene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Benzo(a)pyrene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Benzo(b)fluoranthene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Benzo(k)fluoranthene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Chrysene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Dibenzo(a,h)anthracene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Fluoranthene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Fluorene	ND		0.16	mg/Kg-dry	20	11/19/2013 11:23 AM
Indeno(1,2,3-cd)pyrene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Sample ID: WOG_320_SE_PB_10

Collection Date: 11/11/2013 04:50 PM

Work Order: 1311701

Lab ID: 1311701-04

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Naphthalene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Pyrene	ND		0.0079	mg/Kg-dry	1	11/15/2013 11:20 PM
Surr: 2-Fluorobiphenyl	76.0		12-100	%REC	20	11/19/2013 11:23 AM
Surr: 4-Terphenyl-d14	100		25-137	%REC	1	11/15/2013 11:20 PM
Surr: Nitrobenzene-d5	58.0		37-107	%REC	20	11/19/2013 11:23 AM
VOLATILE ORGANIC COMPOUNDS			SW8260B		Prep Date: 11/14/2013	Analyst: RS
Benzene	ND		0.036	mg/Kg-dry	1	11/20/2013 04:11 AM
Ethylbenzene	ND		0.036	mg/Kg-dry	1	11/20/2013 04:11 AM
m,p-Xylene	ND		0.073	mg/Kg-dry	1	11/20/2013 04:11 AM
o-Xylene	ND		0.036	mg/Kg-dry	1	11/20/2013 04:11 AM
Toluene	ND		0.036	mg/Kg-dry	1	11/20/2013 04:11 AM
Xylenes, Total	ND		0.11	mg/Kg-dry	1	11/20/2013 04:11 AM
Surr: 1,2-Dichloroethane-d4	102		70-130	%REC	1	11/20/2013 04:11 AM
Surr: 4-Bromofluorobenzene	101		70-130	%REC	1	11/20/2013 04:11 AM
Surr: Dibromofluoromethane	83.2		70-130	%REC	1	11/20/2013 04:11 AM
Surr: Toluene-d8	99.4		70-130	%REC	1	11/20/2013 04:11 AM
ELECTRICAL CONDUCTIVITY (SAR)			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: JB
Electrical Conductivity @ Saturation	14		0.050	mmhos/cm @2	10	11/19/2013 05:30 PM
CHROMIUM, TRIVALENT			CALCULATION			Analyst: MB
Chromium, Trivalent	28		0.61	mg/Kg-dry	1	11/21/2013 09:30 AM
CHROMIUM, HEXAVALENT			SW7196A		Prep Date: 11/14/2013	Analyst: MB
Chromium, Hexavalent	ND		0.60	mg/Kg-dry	1	11/15/2013 03:30 PM
MOISTURE			A2540 G			Analyst: MEB
Moisture	18		0.050	% of sample	1	11/15/2013 05:45 PM
PH			SW9045D		Prep Date: 11/15/2013	Analyst: JB
pH	7.6			s.u.	1	11/15/2013 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech
Project: WOG-Boies Ranch Pits 11.11.13
Sample ID: WOG_28_P_3_14
Collection Date: 11/11/2013 03:00 PM

Work Order: 1311701
Lab ID: 1311701-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID						
			SW8015M		Prep Date: 11/15/2013	Analyst: CW
DRO (C10-C28)	530		4.8	mg/Kg-dry	1	11/15/2013 07:33 PM
<i>Surr: 4-Terphenyl-d14</i>	<i>86.0</i>		<i>39-115</i>	<i>%REC</i>	1	11/15/2013 07:33 PM
GASOLINE RANGE ORGANICS BY GC-FID						
			SW8015		Prep Date: 11/14/2013	Analyst: CW
GRO (C6-C10)	48		3.0	mg/Kg-dry	1	11/14/2013 09:22 PM
<i>Surr: Toluene-d8</i>	<i>104</i>		<i>50-150</i>	<i>%REC</i>	1	11/14/2013 09:22 PM
MERCURY BY CVAA						
			SW7471		Prep Date: 11/15/2013	Analyst: LR
Mercury	0.019		0.015	mg/Kg-dry	1	11/15/2013 04:56 PM
METALS BY ICP-MS						
			SW6020A		Prep Date: 11/18/2013	Analyst: ML
Arsenic	5.2		2.2	mg/Kg-dry	5	11/19/2013 05:35 PM
Barium	2,300		11	mg/Kg-dry	25	11/20/2013 03:36 PM
Cadmium	ND		0.86	mg/Kg-dry	5	11/19/2013 05:35 PM
Chromium	45		2.2	mg/Kg-dry	5	11/19/2013 05:35 PM
Copper	13		2.2	mg/Kg-dry	5	11/19/2013 05:35 PM
Lead	17		11	mg/Kg-dry	25	11/20/2013 03:36 PM
Nickel	17		2.2	mg/Kg-dry	5	11/19/2013 05:35 PM
Selenium	ND		2.2	mg/Kg-dry	5	11/19/2013 05:35 PM
Silver	ND		2.2	mg/Kg-dry	5	11/19/2013 05:35 PM
Zinc	54		4.3	mg/Kg-dry	5	11/19/2013 05:35 PM
SOLUBLE CATIONS FOR SAR						
			SW6020A		Prep Date: 11/19/2013	Analyst: CES
Calcium	140		10	mg/L	20	11/20/2013 08:10 AM
Magnesium	75		4.0	mg/L	20	11/20/2013 08:10 AM
Sodium	570		4.0	mg/L	20	11/20/2013 08:10 AM
SODIUM ADSORPTION RATIO						
			USDA H60 METHO		Prep Date: 11/19/2013	Analyst: CES
Sodium Adsorption Ratio	9.7		0.010	none	1	11/18/2013
SEMI-VOLATILE ORGANIC COMPOUNDS						
			SW8270		Prep Date: 11/15/2013	Analyst: HL
Acenaphthene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Anthracene	0.021		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Benzo(a)anthracene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Benzo(a)pyrene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Benzo(b)fluoranthene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Benzo(k)fluoranthene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Chrysene	0.019		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Dibenzo(a,h)anthracene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Fluoranthene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Fluorene	0.11		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Indeno(1,2,3-cd)pyrene	ND		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 22-Nov-13

Client: InterTech

Project: WOG-Boies Ranch Pits 11.11.13

Work Order: 1311701

Sample ID: WOG_28_P_3_14

Lab ID: 1311701-05

Collection Date: 11/11/2013 03:00 PM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Naphthalene	ND		0.15	mg/Kg-dry	20	11/19/2013 11:55 AM
Pyrene	0.018		0.0077	mg/Kg-dry	1	11/15/2013 11:52 PM
Surr: 2-Fluorobiphenyl	79.6		12-100	%REC	1	11/15/2013 11:52 PM
Surr: 4-Terphenyl-d14	95.3		25-137	%REC	1	11/15/2013 11:52 PM
Surr: Nitrobenzene-d5	32.0	S	37-107	%REC	20	11/19/2013 11:55 AM
VOLATILE ORGANIC COMPOUNDS			SW8260B	Prep Date: 11/14/2013 Analyst: RS		
Benzene	ND		0.036	mg/Kg-dry	1	11/20/2013 04:36 AM
Ethylbenzene	0.078		0.036	mg/Kg-dry	1	11/20/2013 04:36 AM
m,p-Xylene	0.33		0.072	mg/Kg-dry	1	11/20/2013 04:36 AM
o-Xylene	ND		0.036	mg/Kg-dry	1	11/20/2013 04:36 AM
Toluene	ND		0.036	mg/Kg-dry	1	11/20/2013 04:36 AM
Xylenes, Total	0.37		0.11	mg/Kg-dry	1	11/20/2013 04:36 AM
Surr: 1,2-Dichloroethane-d4	103		70-130	%REC	1	11/20/2013 04:36 AM
Surr: 4-Bromofluorobenzene	105		70-130	%REC	1	11/20/2013 04:36 AM
Surr: Dibromofluoromethane	82.3		70-130	%REC	1	11/20/2013 04:36 AM
Surr: Toluene-d8	103		70-130	%REC	1	11/20/2013 04:36 AM
ELECTRICAL CONDUCTIVITY (SAR)			USDA H60 METHO	Prep Date: 11/19/2013 Analyst: JB		
Electrical Conductivity @ Saturation	4.4		0.050	mmhos/cm @2	10	11/19/2013 05:30 PM
CHROMIUM, TRIVALENT			CALCULATION	Analyst: MB		
Chromium, Trivalent	45		0.60	mg/Kg-dry	1	11/21/2013 09:30 AM
CHROMIUM, HEXAVALENT			SW7196A	Prep Date: 11/14/2013 Analyst: MB		
Chromium, Hexavalent	ND		0.58	mg/Kg-dry	1	11/15/2013 03:30 PM
MOISTURE			A2540 G	Analyst: MEB		
Moisture	16		0.050	% of sample	1	11/15/2013 05:45 PM
PH			SW9045D	Prep Date: 11/15/2013 Analyst: JB		
pH	7.6			s.u.	1	11/15/2013 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: InterTech

QC BATCH REPORT

Work Order: 1311701

Project: WOG-Boies Ranch Pits 11.11.13

Batch ID: 53319

Instrument ID GC8

Method: SW8015M

MBLK		Sample ID: DBLKS1-53319-53319				Units: mg/Kg		Analysis Date: 11/15/2013 03:33 PM		
Client ID:		Run ID: GC8_131115A				SeqNo: 2541318		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	ND	4.2								
Surr: 4-Terphenyl-d14	0.9783	0	1.667	0	58.7	39-115		0		

LCS		Sample ID: DLCSS1-53319-53319				Units: mg/Kg		Analysis Date: 11/15/2013 04:03 PM		
Client ID:		Run ID: GC8_131115A				SeqNo: 2541320		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	134.8	4.2	166.7	0	80.9	49-124		0		
Surr: 4-Terphenyl-d14	1.038	0	1.667	0	62.3	39-115		0		

MS		Sample ID: 1311701-01B MS				Units: mg/Kg		Analysis Date: 11/15/2013 04:33 PM		
Client ID: WOG_C_5_PB_6		Run ID: GC8_131115A				SeqNo: 2541321		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	286.5	8.1	323	21.33	82.1	49-130		0		
Surr: 4-Terphenyl-d14	2.095	0	3.23	0	64.8	39-115		0		

MSD		Sample ID: 1311701-01B MSD				Units: mg/Kg		Analysis Date: 11/15/2013 05:03 PM		
Client ID: WOG_C_5_PB_6		Run ID: GC8_131115A				SeqNo: 2541322		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	283.9	8.2	328.7	21.33	79.9	49-130	286.5	0.899	30	
Surr: 4-Terphenyl-d14	2.176	0	3.287	0	66.2	39-115	2.095	3.83	30	

The following samples were analyzed in this batch:

1311701-01B	1311701-02B	1311701-03B
1311701-04B	1311701-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
 Work Order: 1311701
 Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53295** Instrument ID **GC10** Method: **SW8015**

MBLK		Sample ID: MBLK-53295-53295				Units: µg/Kg		Analysis Date: 11/14/2013 02:42 PM		
Client ID:		Run ID: GC10_131114A				SeqNo: 2538860		Prep Date: 11/14/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	2,500								
Surr: Toluene-d8	5464	0	5000	0	109	50-150	0			

LCS		Sample ID: LCS-53295-53295				Units: µg/Kg		Analysis Date: 11/14/2013 01:31 PM		
Client ID:		Run ID: GC10_131114A				SeqNo: 2538859		Prep Date: 11/14/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	493200	2,500	500000	0	98.6	70-130	0			
Surr: Toluene-d8	5667	0	5000	0	113	50-150	0			

MS		Sample ID: 1311540-03A MS				Units: µg/Kg		Analysis Date: 11/14/2013 11:52 PM		
Client ID:		Run ID: GC10_131114A				SeqNo: 2538874		Prep Date: 11/14/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	485300	2,500	500000	0	97.1	70-130	0			
Surr: Toluene-d8	5665	0	5000	0	113	50-150	0			

MSD		Sample ID: 1311540-03A MSD				Units: µg/Kg		Analysis Date: 11/15/2013 12:15 PM		
Client ID:		Run ID: GC10_131114A				SeqNo: 2538875		Prep Date: 11/14/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	457200	2,500	500000	0	91.4	70-130	485300	5.97	30	
Surr: Toluene-d8	5426	0	5000	0	109	50-150	5665	4.32	30	

The following samples were analyzed in this batch:

1311701-01A	1311701-02A	1311701-03A
1311701-04A	1311701-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53274** Instrument ID **HG1** Method: **SW7471**

MBLK		Sample ID: MBLK-53274-53274				Units: mg/Kg		Analysis Date: 11/15/2013 03:52 PM		
Client ID:		Run ID: HG1_131115A				SeqNo: 2540480		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.001167	0.020								J

LCS		Sample ID: LCS-53274-53274				Units: mg/Kg		Analysis Date: 11/15/2013 03:54 PM		
Client ID:		Run ID: HG1_131115A				SeqNo: 2540481		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1728	0.020	0.1665		0	104	80-120	0		

MS		Sample ID: 1311526-11BMS				Units: mg/Kg		Analysis Date: 11/15/2013 04:23 PM		
Client ID:		Run ID: HG1_131115A				SeqNo: 2540495		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1463	0.013	0.1106	0.03146	104	75-125		0		

MSD		Sample ID: 1311526-11BMSD				Units: mg/Kg		Analysis Date: 11/15/2013 04:25 PM		
Client ID:		Run ID: HG1_131115A				SeqNo: 2540496		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1492	0.014	0.1142	0.03146	103	75-125	0.1463	1.93	35	

The following samples were analyzed in this batch:

1311701-01B	1311701-02B	1311701-03B
1311701-04B	1311701-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53357** Instrument ID **ICPMS2** Method: **SW6020A**

DUP		Sample ID: 1311782-01CDUP				Units: mg/L		Analysis Date: 11/20/2013 08:22 A		
Client ID:		Run ID: ICPMS2_131118A				SeqNo: 2546467		Prep Date: 11/19/2013		DF: 20
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	125.6	10	0	0	0	0-0	118	6.22		
Magnesium	49.46	4.0	0	0	0	0-0	45.2	9		
Sodium	770.8	4.0	0	0	0	0-0	727.4	5.79		

DUP		Sample ID: 1311782-01CDUP				Units: none		Analysis Date: 11/18/2013		
Client ID:		Run ID: SAR_131118B				SeqNo: 2547303		Prep Date: 11/19/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium Adsorption Ratio	14.75	0.010	0	0	0		14.44	2.12	50	

The following samples were analyzed in this batch:

1311701-01C	1311701-02C	1311701-03C
1311701-04C	1311701-05C	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53419** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK		Sample ID: MBLK-53419-53419				Units: mg/Kg		Analysis Date: 11/19/2013 08:29 A		
Client ID:		Run ID: ICPMS1_131118A				SeqNo: 2544317		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	ND	0.10								
Chromium	ND	0.25								
Copper	0.0765	0.25								J
Nickel	ND	0.25								
Selenium	ND	0.25								
Silver	ND	0.25								
Zinc	0.1017	0.50								J

MBLK		Sample ID: MBLK-53419-53419				Units: mg/Kg		Analysis Date: 11/19/2013 04:03 PM		
Client ID:		Run ID: ICPMS1_131119A				SeqNo: 2545176		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.001528	0.25								J

LCS		Sample ID: LCS-53419-53419				Units: mg/Kg		Analysis Date: 11/19/2013 08:35 A		
Client ID:		Run ID: ICPMS1_131118A				SeqNo: 2544319		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.345	0.25	5	0	86.9	80-120	0			
Barium	4.572	0.25	5	0	91.4	80-120	0			
Cadmium	4.429	0.10	5	0	88.6	80-120	0			
Chromium	5.275	0.25	5	0	106	80-120	0			
Copper	5.125	0.25	5	0	102	80-120	0			
Nickel	5.085	0.25	5	0	102	80-120	0			
Selenium	4.124	0.25	5	0	82.5	80-120	0			
Silver	4.988	0.25	5	0	99.8	80-120	0			
Zinc	4.558	0.50	5	0	91.2	80-120	0			

LCS		Sample ID: LCS-53419-53419				Units: mg/Kg		Analysis Date: 11/19/2013 04:09 PM		
Client ID:		Run ID: ICPMS1_131119A				SeqNo: 2545177		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	5.175	0.25	5	0	104	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53419** Instrument ID **ICPMS1** Method: **SW6020A**

MS		Sample ID: 1311748-06AMS				Units: mg/Kg		Analysis Date: 11/19/2013 07:47 PM		
Client ID:		Run ID: ICPMS1_131119A				SeqNo: 2545665		Prep Date: 11/18/2013		DF: 5
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	29.27	2.0	7.924	16.4	162	75-125	0			S

MS		Sample ID: 1311748-06AMS				Units: mg/Kg		Analysis Date: 11/20/2013 03:48 PM		
Client ID:		Run ID: ICPMS1_131120A				SeqNo: 2547145		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.558	0.40	7.924	2.03	82.4	75-125	0			
Cadmium	7.546	0.16	7.924	0.09984	94	75-125	0			
Copper	9.968	0.40	7.924	3.114	86.5	75-125	0			
Lead	13.85	0.40	7.924	4.482	118	75-125	0			
Nickel	12.18	0.40	7.924	5.127	89	75-125	0			
Selenium	6.4	0.40	7.924	0.2672	77.4	75-125	0			
Silver	8.201	0.40	7.924	0.008625	103	75-125	0			
Zinc	26.69	0.79	7.924	17.48	116	75-125	0			

MS		Sample ID: 1311748-06AMS				Units: mg/Kg		Analysis Date: 11/20/2013 06:03 PM		
Client ID:		Run ID: ICPMS1_131120A				SeqNo: 2547555		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	14.83	0.40	7.924	5.975	112	75-125	0			

MSD		Sample ID: 1311748-06AMSD				Units: mg/Kg		Analysis Date: 11/19/2013 07:53 PM		
Client ID:		Run ID: ICPMS1_131119A				SeqNo: 2545666		Prep Date: 11/18/2013		DF: 5
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	27.82	2.0	8.078	16.4	141	75-125	29.27	5.11	25	S

MSD		Sample ID: 1311748-06AMSD				Units: mg/Kg		Analysis Date: 11/20/2013 03:54 PM		
Client ID:		Run ID: ICPMS1_131120A				SeqNo: 2547146		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.498	0.40	8.078	2.03	80.1	75-125	8.558	0.707	25	
Cadmium	7.685	0.16	8.078	0.09984	93.9	75-125	7.546	1.83	25	
Copper	9.733	0.40	8.078	3.114	81.9	75-125	9.968	2.38	25	
Lead	12.63	0.40	8.078	4.482	101	75-125	13.85	9.2	25	
Nickel	11.86	0.40	8.078	5.127	83.3	75-125	12.18	2.67	25	
Selenium	6.372	0.40	8.078	0.2672	75.6	75-125	6.4	0.448	25	
Silver	8.271	0.40	8.078	0.008625	102	75-125	8.201	0.852	25	
Zinc	24.91	0.81	8.078	17.48	92	75-125	26.69	6.89	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53419** Instrument ID **ICPMS1** Method: **SW6020A**

MSD		Sample ID: 1311748-06AMSD				Units: mg/Kg		Analysis Date: 11/20/2013 06:09 PM		
Client ID:		Run ID: ICPMS1_131120A				SeqNo: 2547556		Prep Date: 11/18/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	12.86	0.40	8.078	5.975	85.2	75-125	14.83	14.2	25	

The following samples were analyzed in this batch:

1311701-01B	1311701-02B	1311701-03B
1311701-04B	1311701-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53318** Instrument ID **SVMS4** Method: **SW8270**

MBLK		Sample ID: SBLKS1-53318-53318				Units: µg/Kg		Analysis Date: 11/15/2013 03:41 PM		
Client ID:		Run ID: SVMS4_131115A				SeqNo: 2541621		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	ND	6.7								
Anthracene	ND	6.7								
Benzo(a)anthracene	ND	6.7								
Benzo(a)pyrene	ND	6.7								
Benzo(b)fluoranthene	ND	6.7								
Benzo(k)fluoranthene	ND	6.7								
Chrysene	ND	6.7								
Dibenzo(a,h)anthracene	ND	6.7								
Fluoranthene	ND	6.7								
Fluorene	ND	6.7								
Indeno(1,2,3-cd)pyrene	ND	6.7								
Naphthalene	ND	6.7								
Pyrene	ND	6.7								
<i>Surr: 2-Fluorobiphenyl</i>	1398	0	1667	0	83.9	12-100	0			
<i>Surr: 4-Terphenyl-d14</i>	1658	0	1667	0	99.5	25-137	0			
<i>Surr: Nitrobenzene-d5</i>	1363	0	1667	0	81.8	37-107	0			

LCS		Sample ID: SLCSS1-53318-53318				Units: µg/Kg		Analysis Date: 11/15/2013 03:01 PM		
Client ID:		Run ID: SVMS4_131115A				SeqNo: 2541620		Prep Date: 11/15/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	562	6.7	666.7	0	84.3	45-110	0			
Anthracene	631.3	6.7	666.7	0	94.7	55-105	0			
Benzo(a)anthracene	680	6.7	666.7	0	102	50-110	0			
Benzo(a)pyrene	614.7	6.7	666.7	0	92.2	50-110	0			
Benzo(b)fluoranthene	611	6.7	666.7	0	91.6	45-115	0			
Benzo(k)fluoranthene	603.7	6.7	666.7	0	90.5	45-115	0			
Chrysene	639.3	6.7	666.7	0	95.9	55-110	0			
Dibenzo(a,h)anthracene	675.3	6.7	666.7	0	101	40-125	0			
Fluoranthene	657.7	6.7	666.7	0	98.6	55-115	0			
Fluorene	596	6.7	666.7	0	89.4	50-110	0			
Indeno(1,2,3-cd)pyrene	691.7	6.7	666.7	0	104	40-120	0			
Naphthalene	538.3	6.7	666.7	0	80.7	40-105	0			
Pyrene	590	6.7	666.7	0	88.5	45-125	0			
<i>Surr: 2-Fluorobiphenyl</i>	1417	0	1667	0	85	12-100	0			
<i>Surr: 4-Terphenyl-d14</i>	1612	0	1667	0	96.7	25-137	0			
<i>Surr: Nitrobenzene-d5</i>	1391	0	1667	0	83.5	37-107	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
 Work Order: 1311701
 Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: 53318 Instrument ID SVMS4 Method: SW8270

MS					Sample ID: 1311751-04B MS			Units: µg/Kg		Analysis Date: 11/15/2013 04:58 PM	
Client ID:			Run ID: SVMS4_131115A			SeqNo: 2541622		Prep Date: 11/15/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	1548	19	1866	0	82.9	45-110	0				
Anthracene	1714	19	1866	0	91.8	55-105	0				
Benzo(a)anthracene	1796	19	1866	0	96.2	50-110	0				
Benzo(a)pyrene	1662	19	1866	0	89	50-110	0				
Benzo(b)fluoranthene	1615	19	1866	0	86.5	45-115	0				
Benzo(k)fluoranthene	1678	19	1866	0	89.9	45-115	0				
Chrysene	1688	19	1866	0	90.4	55-110	0				
Dibenzo(a,h)anthracene	1772	19	1866	0	94.9	40-125	0				
Fluoranthene	1889	19	1866	0	101	55-115	0				
Fluorene	1623	19	1866	0	86.9	50-110	0				
Indeno(1,2,3-cd)pyrene	1800	19	1866	0	96.4	40-120	0				
Naphthalene	1440	19	1866	0	77.1	40-105	0				
Pyrene	1660	19	1866	0	88.9	45-125	0				
Surr: 2-Fluorobiphenyl	3806	0	4665	0	81.6	12-100	0				
Surr: 4-Terphenyl-d14	4560	0	4665	0	97.7	25-137	0				
Surr: Nitrobenzene-d5	3760	0	4665	0	80.6	37-107	0				

MSD				Sample ID: 1311751-04B MSD			Units: µg/Kg		Analysis Date: 11/15/2013 05:30 PM		
Client ID:			Run ID: SVMS4_131115A			SeqNo: 2541623		Prep Date: 11/15/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	1555	19	1886	0	82.4	45-110	1548	0.455	30		
Anthracene	1745	19	1886	0	92.5	55-105	1714	1.82	30		
Benzo(a)anthracene	1860	19	1886	0	98.6	50-110	1796	3.52	30		
Benzo(a)pyrene	1734	19	1886	0	91.9	50-110	1662	4.26	30		
Benzo(b)fluoranthene	1695	19	1886	0	89.9	45-115	1615	4.86	30		
Benzo(k)fluoranthene	1740	19	1886	0	92.2	45-115	1678	3.58	30		
Chrysene	1738	19	1886	0	92.1	55-110	1688	2.92	30		
Dibenzo(a,h)anthracene	1833	19	1886	0	97.2	40-125	1772	3.4	30		
Fluoranthene	1936	19	1886	0	103	55-115	1889	2.43	30		
Fluorene	1639	19	1886	0	86.9	50-110	1623	1	30		
Indeno(1,2,3-cd)pyrene	1874	19	1886	0	99.3	40-120	1800	4.02	30		
Naphthalene	1430	19	1886	0	75.8	40-105	1440	0.639	30		
Pyrene	1687	19	1886	0	89.4	45-125	1660	1.62	30		
Surr: 2-Fluorobiphenyl	3864	0	4715	0	82	12-100	3806	1.52	40		
Surr: 4-Terphenyl-d14	4700	0	4715	0	99.7	25-137	4560	3.03	40		
Surr: Nitrobenzene-d5	3806	0	4715	0	80.7	37-107	3760	1.21	40		

The following samples were analyzed in this batch:

1311701-01B	1311701-02B	1311701-03B
1311701-04B	1311701-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53312** Instrument ID **VMS8** Method: **SW8260B**

MBLK				Sample ID: MBLK-53312-53312				Units: µg/Kg			Analysis Date: 11/16/2013 09:35 PM		
Client ID:			Run ID: VMS8_131116A				SeqNo: 2541313		Prep Date: 11/14/2013		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Benzene	ND	30											
Ethylbenzene	ND	30											
m,p-Xylene	29	60								J			
o-Xylene	ND	30											
Toluene	ND	30											
Xylenes, Total	ND	90											
Surr: 1,2-Dichloroethane-d4	933.5	0	1000	0	93.4	70-130		0					
Surr: 4-Bromofluorobenzene	1006	0	1000	0	101	70-130		0					
Surr: Dibromofluoromethane	950	0	1000	0	95	70-130		0					
Surr: Toluene-d8	1056	0	1000	0	106	70-130		0					

LCS					Sample ID: LCS-53312-53312		Units: µg/Kg		Analysis Date: 11/16/2013 05:55 PM		
Client ID:			Run ID: VMS8_131116A			SeqNo: 2541302		Prep Date: 11/14/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	972.5	30	1000	0	97.2	75-125	0				
Ethylbenzene	966	30	1000	0	96.6	75-125	0				
m,p-Xylene	1929	60	2000	0	96.4	80-125	0				
o-Xylene	962.5	30	1000	0	96.2	75-125	0				
Toluene	935	30	1000	0	93.5	70-125	0				
Xylenes, Total	2892	90	3000	0	96.4	75-125	0				
Surr: 1,2-Dichloroethane-d4	919	0	1000	0	91.9	70-130	0				
Surr: 4-Bromofluorobenzene	1026	0	1000	0	103	70-130	0				
Surr: Dibromofluoromethane	966	0	1000	0	96.6	70-130	0				
Surr: Toluene-d8	1038	0	1000	0	104	70-130	0				

MS				Sample ID: 1311701-02A MS			Units: µg/Kg		Analysis Date: 11/20/2013 08:53 A		
Client ID: WOG_28_P_3_PB_20			Run ID: VMS5_131119B			SeqNo: 2546396		Prep Date: 11/14/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	931.5	30	1000	0	93.2	75-125	0				
Ethylbenzene	950.5	30	1000	0	95	75-125	0				
m,p-Xylene	1926	60	2000	0	96.3	80-125	0				
o-Xylene	972	30	1000	0	97.2	75-125	0				
Toluene	939.5	30	1000	0	94	70-125	0				
Xylenes, Total	2898	90	3000	0	96.6	75-125	0				
Surr: 1,2-Dichloroethane-d4	939	0	1000	0	93.9	70-130	0				
Surr: 4-Bromofluorobenzene	1028	0	1000	0	103	70-130	0				
Surr: Dibromofluoromethane	948.5	0	1000	0	94.8	70-130	0				
Surr: Toluene-d8	982.5	0	1000	0	98.2	70-130	0				

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53312** Instrument ID **VMS8** Method: **SW8260B**

MSD				Sample ID: 1311701-02A MSD			Units: µg/Kg		Analysis Date: 11/20/2013 09:17 A	
Client ID: WOG_28_P_3_PB_20				Run ID: VMS5_131119B			SeqNo: 2546397		Prep Date: 11/14/2013	
									DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	926	30	1000	0	92.6	75-125	931.5	0.592	30	
Ethylbenzene	941.5	30	1000	0	94.2	75-125	950.5	0.951	30	
m,p-Xylene	1904	60	2000	0	95.2	80-125	1926	1.17	30	
o-Xylene	967.5	30	1000	0	96.8	75-125	972	0.464	30	
Toluene	929.5	30	1000	0	93	70-125	939.5	1.07	30	
Xylenes, Total	2872	90	3000	0	95.7	75-125	2898	0.936	30	
Surr: 1,2-Dichloroethane-d4	948	0	1000	0	94.8	70-130	939	0.954	30	
Surr: 4-Bromofluorobenzene	1003	0	1000	0	100	70-130	1028	2.41	30	
Surr: Dibromofluoromethane	941.5	0	1000	0	94.2	70-130	948.5	0.741	30	
Surr: Toluene-d8	966.5	0	1000	0	96.6	70-130	982.5	1.64	30	

The following samples were analyzed in this batch:

1311701-01A	1311701-02A	1311701-03A
1311701-04A	1311701-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53354** Instrument ID **WETCHEM** Method: **SW9045D**

LCS				Sample ID: LCS-53354-53354				Units: s.u.			Analysis Date: 11/15/2013 03:00 PM				
Client ID:				Run ID: WETCHEM_131115N				SeqNo: 2540254			Prep Date: 11/15/2013			DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				

pH 3.99 0 4 0 99.8 90-110 0

DUP				Sample ID: 1311682-01B DUP				Units: s.u.			Analysis Date: 11/15/2013 03:00 PM		
Client ID:				Run ID: WETCHEM_131115N				SeqNo: 2540256		Prep Date: 11/15/2013		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			

pH 8.53 0 0 0 0 0-0 8.6 0.817 20

DUP				Sample ID: 1311784-01B DUP				Units: s.u.			Analysis Date: 11/15/2013 03:00 PM				
Client ID:				Run ID: WETCHEM_131115N				SeqNo: 2540267			Prep Date: 11/15/2013			DF: 1	
Analyte				Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

pH 8.34 0 0 0 0 0-0 8.36 0.24 20

The following samples were analyzed in this batch:

1311701-01B	1311701-02B	1311701-03B
1311701-04B	1311701-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53357** Instrument ID **WETCHEM** Method: **USDA H60 Metho**

DUP		Sample ID: 1311782-01C DUP				Units: mmhos/cm @25°		Analysis Date: 11/19/2013 05:30 PM		
Client ID:		Run ID: WETCHEM_131119K		SeqNo: 2545429		Prep Date: 11/19/2013		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	5.24	0.050	0	0	0		4.98	5.09	50	

The following samples were analyzed in this batch:

1311701-01C	1311701-02C	1311701-03C
1311701-04C	1311701-05C	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
 Work Order: 1311701
 Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **53360** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK		Sample ID: MBLK-53360-53360				Units: mg/Kg		Analysis Date: 11/15/2013 03:30 PM		
Client ID:		Run ID: WETCHEM_1311150		SeqNo: 2540320		Prep Date: 11/14/2013		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent ND 0.50

LCS		Sample ID: LCS-53360-53360				Units: mg/Kg		Analysis Date: 11/15/2013 03:30 PM		
Client ID:		Run ID: WETCHEM_1311150		SeqNo: 2540319		Prep Date: 11/14/2013		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1.98 0.50 2 0 99 80-120 0

MS		Sample ID: 1311682-01B MS				Units: mg/Kg		Analysis Date: 11/15/2013 03:30 PM		
Client ID:		Run ID: WETCHEM_1311150		SeqNo: 2540304		Prep Date: 11/14/2013		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent ND 0.49 1.961 0.1059 -5.4 75-125 0 S

MS		Sample ID: 1311682-01B MSI				Units: mg/Kg		Analysis Date: 11/15/2013 03:30 PM		
Client ID:		Run ID: WETCHEM_1311150		SeqNo: 2540306		Prep Date: 11/14/2013		DF: 100		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 892.5 50 1181 0.1059 75.5 75-125 0

MSD		Sample ID: 1311682-01B MSD				Units: mg/Kg		Analysis Date: 11/15/2013 03:30 PM		
Client ID:		Run ID: WETCHEM_1311150		SeqNo: 2540305		Prep Date: 11/14/2013		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent ND 0.51 2.033 0.1059 -5.21 75-125 892.5 0 20 S

The following samples were analyzed in this batch:

1311701-01B	1311701-02B	1311701-03B
1311701-04B	1311701-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: InterTech
Work Order: 1311701
Project: WOG-Boies Ranch Pits 11.11.13

QC BATCH REPORT

Batch ID: **R130713** Instrument ID **MOIST** Method: **A2540 G**

MBLK		Sample ID: WBLKS-R130713				Units: % of sample		Analysis Date: 11/15/2013 05:45 PM		
Client ID:		Run ID: MOIST_131115C				SeqNo: 2542322		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture ND 0.050

LCS		Sample ID: LCS-R130713				Units: % of sample		Analysis Date: 11/15/2013 05:45 PM		
Client ID:		Run ID: MOIST_131115C				SeqNo: 2542318		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.050 100 0 100 99.5-100.5 0

DUP		Sample ID: 1311701-01B DUP				Units: % of sample		Analysis Date: 11/15/2013 05:45 PM		
Client ID: WOG_C_5_PB_6		Run ID: MOIST_131115C				SeqNo: 2542298		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 24.76 0.050 0 0 0 0-0 25.39 2.51 20

DUP		Sample ID: 1311734-03A DUP				Units: % of sample		Analysis Date: 11/15/2013 05:45 PM		
Client ID:		Run ID: MOIST_131115C				SeqNo: 2542307		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 47.46 0.050 0 0 0 0-0 47.08 0.804 20

The following samples were analyzed in this batch:

1311701-01B	1311701-02B	1311701-03B
1311701-04B	1311701-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Sample Receipt Checklist

Client Name: **INTERTECH**

Date/Time Received: **13-Nov-13 10:00**

Work Order: **1311701**

Received by: **DS**

Checklist completed by Diane Shaw 13-Nov-13
eSignature Date

Reviewed by: Ann Preston 15-Nov-13
eSignature Date

Matrices: Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>5.0 c</u>		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	<u>11/13/2013 2:55:35 PM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:			

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

ANALYTICAL SUMMARY REPORT

August 06, 2011

Whiting Petroleum Corporation
2500 County Road 26
Rifle, CO 81641

Workorder No.: G11070820

Quote ID: G228 - COGCC Table 910-1 for Soil - Normal TAT

Project Name: Soil_Sampling

Energy Laboratories Inc. Gillette WY received the following 9 samples for Whiting Petroleum Corporation on 07/28/2011 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G11070820-001	SO_Boies_Background_Sect_1_1	07/27/11 10:00	07/28/11	Soil	Metals by ICP/ICPMS, Total Cations, sat. paste Saturated Paste Electrical Conductivity Mercury in Solid by CVAA Diesel Range Organics Gasoline Range Organics Saturated Paste pH Digestion, Total Metals Digestion, Mercury by CVAA Saturated Paste Extraction Sodium Adsorption Ratio Volatile Organic Compounds - Short List
G11070820-002	SO_Boies_Background_Sect_1_2	07/27/11 10:30	07/28/11	Soil	Same As Above
G11070820-003	SO_Boies_Background_Sect_2_1	07/27/11 11:30	07/28/11	Soil	Same As Above
G11070820-004	SO_Boies_Background_Sect_2_2	07/27/11 11:00	07/28/11	Soil	Same As Above
G11070820-005	SO_Boies_Background_Sect_2_3	07/27/11 11:45	07/28/11	Soil	Same As Above
G11070820-006	SO_Boies_Background_Sect_3_1	07/27/11 12:00	07/28/11	Soil	Same As Above
G11070820-007	SO_Boies_Background_Sect_3_2	07/27/11 12:15	07/28/11	Soil	Same As Above
G11070820-008	SO_Boies_Background_Sect_3_3	07/27/11 13:00	07/28/11	Soil	Same As Above
G11070820-009	SO_Boies_Background_Sect_3_4	07/27/11 13:20	07/28/11	Soil	Same As Above

This report was prepared by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718. As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_1_1
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-001

Report Date: 08/06/11
Collection Date: 07/27/11 10:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192838

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE						
Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/01/11 15:39 / eli-b
Total Purgeable Hydrocarbons	ND	mg/kg	2.0		SW8015B	08/01/11 15:39 / eli-b
Surr: Trifluorotoluene	98.0	%REC	70-130		SW8015B	08/01/11 15:39 / eli-b
- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene. - Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.						
PETROLEUM HYDROCARBONS-SEMI-VOLATILE						
Diesel Range Organics (DRO)	ND	mg/kg	10		SW8015B	08/02/11 15:45 / eli-b
Total Extractable Hydrocarbons	31	mg/kg	10		SW8015B	08/02/11 15:45 / eli-b
Surr: o-Terphenyl	98.0	%REC	50-150		SW8015B	08/02/11 15:45 / eli-b
- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28. - Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.						
VOLATILE ORGANIC COMPOUNDS						
Benzene	ND	mg/kg	0.20		SW8260B	07/29/11 19:06 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/29/11 19:06 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/29/11 19:06 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/29/11 19:06 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/29/11 19:06 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/29/11 19:06 / eli-b
Surr: Dibromofluoromethane	100	%REC	70-132		SW8260B	07/29/11 19:06 / eli-b
Surr: 1,2-Dichloroethane-d4	84.0	%REC	60-136		SW8260B	07/29/11 19:06 / eli-b
Surr: Toluene-d8	104	%REC	75-138		SW8260B	07/29/11 19:06 / eli-b
Surr: p-Bromofluorobenzene	110	%REC	78-160		SW8260B	07/29/11 19:06 / eli-b
SATURATED PASTE						
Conductivity, sat. paste	1.13	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:44 / eli-h
pH, sat. paste	7.6	s.u.	0.1		ASAM10-3.2	08/02/11 07:51 / eli-h
Calcium, sat. paste	7.13	meq/L	0.05		SW6010B	08/03/11 13:00 / eli-h
Magnesium, sat. paste	2.29	meq/L	0.08		SW6010B	08/03/11 13:00 / eli-h
Sodium, sat. paste	1.69	meq/L	0.04		SW6010B	08/03/11 13:00 / eli-h
Sodium Adsorption Ratio (SAR)	0.8	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h
METALS, TOTAL						
Arsenic	10	mg/kg	5		SW6010B	08/02/11 14:37 / eli-h
Barium	321	mg/kg	5		SW6010B	08/02/11 14:37 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 14:37 / eli-h
Chromium	35	mg/kg	5		SW6010B	08/02/11 14:37 / eli-h
Copper	11	mg/kg	5		SW6010B	08/02/11 14:37 / eli-h
Lead	12	mg/kg	5		SW6010B	08/03/11 12:35 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 09:50 / eli-h
Nickel	15	mg/kg	5		SW6010B	08/02/11 14:37 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 14:37 / eli-h

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_1_1
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-001

Report Date: 08/06/11
Collection Date: 07/27/11 10:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192838

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:31 / eli-h
Zinc	42	mg/kg	5		SW6010B	08/02/11 14:37 / eli-h

Report
Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_1_2
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-002

Report Date: 08/06/11
Collection Date: 07/27/11 10:30
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192839

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE						
Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/01/11 16:14 / eli-b
Total Purgeable Hydrocarbons	ND	mg/kg	2.0		SW8015B	08/01/11 16:14 / eli-b
Surr: Trifluorotoluene	96.0	%REC	70-130		SW8015B	08/01/11 16:14 / eli-b
- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene. - Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.						
PETROLEUM HYDROCARBONS-SEMI-VOLATILE						
Diesel Range Organics (DRO)	ND	mg/kg	10		SW8015B	08/02/11 04:42 / eli-b
Total Extractable Hydrocarbons	10	mg/kg	10		SW8015B	08/02/11 04:42 / eli-b
Surr: o-Terphenyl	104	%REC	50-150		SW8015B	08/02/11 04:42 / eli-b
- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28. - Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.						
VOLATILE ORGANIC COMPOUNDS						
Benzene	ND	mg/kg	0.20		SW8260B	07/29/11 19:33 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/29/11 19:33 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/29/11 19:33 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/29/11 19:33 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/29/11 19:33 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/29/11 19:33 / eli-b
Surr: Dibromofluoromethane	99.0	%REC	70-132		SW8260B	07/29/11 19:33 / eli-b
Surr: 1,2-Dichloroethane-d4	86.0	%REC	60-136		SW8260B	07/29/11 19:33 / eli-b
Surr: Toluene-d8	103	%REC	75-138		SW8260B	07/29/11 19:33 / eli-b
Surr: p-Bromofluorobenzene	109	%REC	78-160		SW8260B	07/29/11 19:33 / eli-b
SATURATED PASTE						
Conductivity, sat. paste	0.51	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:45 / eli-h
pH, sat. paste	7.5	s.u.	0.1		ASAM10-3.2	08/02/11 07:52 / eli-h
Calcium, sat. paste	3.90	meq/L	0.05		SW6010B	08/03/11 13:03 / eli-h
Magnesium, sat. paste	0.73	meq/L	0.08		SW6010B	08/03/11 13:03 / eli-h
Sodium, sat. paste	1.13	meq/L	0.04		SW6010B	08/03/11 13:03 / eli-h
Sodium Adsorption Ratio (SAR)	0.7	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h
METALS, TOTAL						
Arsenic	ND	mg/kg	5		SW6010B	08/03/11 12:39 / eli-h
Barium	189	mg/kg	5		SW6010B	08/02/11 14:40 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 14:40 / eli-h
Chromium	29	mg/kg	5		SW6010B	08/02/11 14:40 / eli-h
Copper	13	mg/kg	5		SW6010B	08/02/11 14:40 / eli-h
Lead	14	mg/kg	5		SW6010B	08/03/11 12:39 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 09:52 / eli-h
Nickel	13	mg/kg	5		SW6010B	08/02/11 14:40 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 14:40 / eli-h

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_1_2
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-002

Report Date: 08/06/11
Collection Date: 07/27/11 10:30
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192839

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:34 / eli-h
Zinc	48	mg/kg	5		SW6010B	08/02/11 14:40 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_2_1
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-003

Report Date: 08/06/11
Collection Date: 07/27/11 11:30
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192840

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
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PETROLEUM HYDROCARBONS-VOLATILE

Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/01/11 16:50 / eli-b
Total Purgeable Hydrocarbons	ND	mg/kg	2.0		SW8015B	08/01/11 16:50 / eli-b
Surr: Trifluorotoluene	96.0	%REC	70-130		SW8015B	08/01/11 16:50 / eli-b

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.

- Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE

Diesel Range Organics (DRO)	ND	mg/kg	10		SW8015B	08/02/11 23:29 / eli-b
Total Extractable Hydrocarbons	53	mg/kg	10		SW8015B	08/02/11 23:29 / eli-b
Surr: o-Terphenyl	101	%REC	50-150		SW8015B	08/02/11 23:29 / eli-b

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.

- Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

VOLATILE ORGANIC COMPOUNDS

Benzene	ND	mg/kg	0.20		SW8260B	07/29/11 19:59 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/29/11 19:59 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/29/11 19:59 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/29/11 19:59 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/29/11 19:59 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/29/11 19:59 / eli-b
Surr: Dibromofluoromethane	93.0	%REC	70-132		SW8260B	07/29/11 19:59 / eli-b
Surr: 1,2-Dichloroethane-d4	80.0	%REC	60-136		SW8260B	07/29/11 19:59 / eli-b
Surr: Toluene-d8	100	%REC	75-138		SW8260B	07/29/11 19:59 / eli-b
Surr: p-Bromofluorobenzene	106	%REC	78-160		SW8260B	07/29/11 19:59 / eli-b

SATURATED PASTE

Conductivity, sat. paste	0.70	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:45 / eli-h
pH, sat. paste	7.6	s.u.	0.1		ASAM10-3.2	08/02/11 07:52 / eli-h
Calcium, sat. paste	4.30	meq/L	0.05		SW6010B	08/03/11 13:06 / eli-h
Magnesium, sat. paste	1.65	meq/L	0.08		SW6010B	08/03/11 13:06 / eli-h
Sodium, sat. paste	1.40	meq/L	0.04		SW6010B	08/03/11 13:06 / eli-h
Sodium Adsorption Ratio (SAR)	0.8	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h

METALS, TOTAL

Arsenic	ND	mg/kg	5		SW6010B	08/03/11 12:43 / eli-h
Barium	343	mg/kg	5		SW6010B	08/02/11 14:44 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 14:44 / eli-h
Chromium	36	mg/kg	5		SW6010B	08/02/11 14:44 / eli-h
Copper	13	mg/kg	5		SW6010B	08/02/11 14:44 / eli-h
Lead	14	mg/kg	5		SW6010B	08/03/11 12:43 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 09:54 / eli-h
Nickel	17	mg/kg	5		SW6010B	08/02/11 14:44 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 14:44 / eli-h

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_2_1
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-003

Report Date: 08/06/11
Collection Date: 07/27/11 11:30
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192840

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:37 / eli-h
Zinc	48	mg/kg	5		SW6010B	08/02/11 14:44 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_2_2
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-004

Report Date: 08/06/11
Collection Date: 07/27/11 11:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192841

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
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PETROLEUM HYDROCARBONS-VOLATILE

Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/01/11 20:22 / eli-b
Total Purgeable Hydrocarbons	ND	mg/kg	2.0		SW8015B	08/01/11 20:22 / eli-b
Surr: Trifluorotoluene	98.0	%REC	70-130		SW8015B	08/01/11 20:22 / eli-b

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.

- Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE

Diesel Range Organics (DRO)	ND	mg/kg	10		SW8015B	08/02/11 05:32 / eli-b
Total Extractable Hydrocarbons	45	mg/kg	10		SW8015B	08/02/11 05:32 / eli-b
Surr: o-Terphenyl	108	%REC	50-150		SW8015B	08/02/11 05:32 / eli-b

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.

- Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

VOLATILE ORGANIC COMPOUNDS

Benzene	ND	mg/kg	0.20		SW8260B	07/29/11 20:26 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/29/11 20:26 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/29/11 20:26 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/29/11 20:26 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/29/11 20:26 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/29/11 20:26 / eli-b
Surr: Dibromofluoromethane	109	%REC	70-132		SW8260B	07/29/11 20:26 / eli-b
Surr: 1,2-Dichloroethane-d4	95.0	%REC	60-136		SW8260B	07/29/11 20:26 / eli-b
Surr: Toluene-d8	116	%REC	75-138		SW8260B	07/29/11 20:26 / eli-b
Surr: p-Bromofluorobenzene	123	%REC	78-160		SW8260B	07/29/11 20:26 / eli-b

SATURATED PASTE

Conductivity, sat. paste	0.85	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:46 / eli-h
pH, sat. paste	7.6	s.u.	0.1		ASAM10-3.2	08/02/11 07:53 / eli-h
Calcium, sat. paste	5.84	meq/L	0.05		SW6010B	08/03/11 13:09 / eli-h
Magnesium, sat. paste	1.23	meq/L	0.08		SW6010B	08/03/11 13:09 / eli-h
Sodium, sat. paste	2.12	meq/L	0.04		SW6010B	08/03/11 13:09 / eli-h
Sodium Adsorption Ratio (SAR)	1.1	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h

METALS, TOTAL

Arsenic	8	mg/kg	5		SW6010B	08/02/11 14:48 / eli-h
Barium	267	mg/kg	5		SW6010B	08/02/11 14:48 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 14:48 / eli-h
Chromium	39	mg/kg	5		SW6010B	08/02/11 14:48 / eli-h
Copper	16	mg/kg	5		SW6010B	08/02/11 14:48 / eli-h
Lead	14	mg/kg	5		SW6010B	08/03/11 12:47 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 10:04 / eli-h
Nickel	18	mg/kg	5		SW6010B	08/02/11 14:48 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 14:48 / eli-h

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_2_2
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-004

Report Date: 08/06/11
Collection Date: 07/27/11 11:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192841

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:40 / eli-h
Zinc	53	mg/kg	5		SW6010B	08/02/11 14:48 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_2_3
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-005

Report Date: 08/06/11
Collection Date: 07/27/11 11:45
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192842

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
PETROLEUM HYDROCARBONS-VOLATILE						
Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/01/11 19:11 / eli-b
Total Purgeable Hydrocarbons	ND	mg/kg	2.0		SW8015B	08/01/11 19:11 / eli-b
Surr: Trifluorotoluene	91.0	%REC	70-130		SW8015B	08/01/11 19:11 / eli-b
- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene. - Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.						
PETROLEUM HYDROCARBONS-SEMI-VOLATILE						
Diesel Range Organics (DRO)	ND	mg/kg	10		SW8015B	08/02/11 20:58 / eli-b
Total Extractable Hydrocarbons	25	mg/kg	10		SW8015B	08/02/11 20:58 / eli-b
Surr: o-Terphenyl	106	%REC	50-150		SW8015B	08/02/11 20:58 / eli-b
- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28. - Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.						
VOLATILE ORGANIC COMPOUNDS						
Benzene	ND	mg/kg	0.20		SW8260B	07/29/11 23:04 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/29/11 23:04 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/29/11 23:04 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/29/11 23:04 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/29/11 23:04 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/29/11 23:04 / eli-b
Surr: Dibromofluoromethane	100	%REC	70-132		SW8260B	07/29/11 23:04 / eli-b
Surr: 1,2-Dichloroethane-d4	84.0	%REC	60-136		SW8260B	07/29/11 23:04 / eli-b
Surr: Toluene-d8	110	%REC	75-138		SW8260B	07/29/11 23:04 / eli-b
Surr: p-Bromofluorobenzene	120	%REC	78-160		SW8260B	07/29/11 23:04 / eli-b
SATURATED PASTE						
Conductivity, sat. paste	0.56	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:47 / eli-h
pH, sat. paste	7.6	s.u.	0.1		ASAM10-3.2	08/02/11 07:53 / eli-h
Calcium, sat. paste	4.34	meq/L	0.05		SW6010B	08/03/11 13:12 / eli-h
Magnesium, sat. paste	0.89	meq/L	0.08		SW6010B	08/03/11 13:12 / eli-h
Sodium, sat. paste	0.65	meq/L	0.04		SW6010B	08/03/11 13:12 / eli-h
Sodium Adsorption Ratio (SAR)	0.4	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h
METALS, TOTAL						
Arsenic	ND	mg/kg	5		SW6010B	08/03/11 12:58 / eli-h
Barium	201	mg/kg	5		SW6010B	08/02/11 14:51 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 14:51 / eli-h
Chromium	32	mg/kg	5		SW6010B	08/02/11 14:51 / eli-h
Copper	14	mg/kg	5		SW6010B	08/02/11 14:51 / eli-h
Lead	13	mg/kg	5		SW6010B	08/03/11 12:58 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 10:06 / eli-h
Nickel	15	mg/kg	5		SW6010B	08/02/11 14:51 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 14:51 / eli-h

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_2_3
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-005

Report Date: 08/06/11
Collection Date: 07/27/11 11:45
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192842

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:43 / eli-h
Zinc	47	mg/kg	5		SW6010B	08/02/11 14:51 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_1
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-006

Report Date: 08/06/11
Collection Date: 07/27/11 12:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192843

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
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PETROLEUM HYDROCARBONS-VOLATILE

Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/01/11 21:32 / eli-b
Total Purgeable Hydrocarbons	1.8	mg/kg	2.0	J	SW8015B	08/01/11 21:32 / eli-b
Surr: Trifluorotoluene	100	%REC	70-130		SW8015B	08/01/11 21:32 / eli-b

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE

Diesel Range Organics (DRO)	11	mg/kg	10		SW8015B	08/02/11 17:31 / eli-b
Total Extractable Hydrocarbons	55	mg/kg	10		SW8015B	08/02/11 17:31 / eli-b
Surr: o-Terphenyl	99.0	%REC	50-150		SW8015B	08/02/11 17:31 / eli-b

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

VOLATILE ORGANIC COMPOUNDS

Benzene	ND	mg/kg	0.20		SW8260B	07/29/11 23:31 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/29/11 23:31 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/29/11 23:31 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/29/11 23:31 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/29/11 23:31 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/29/11 23:31 / eli-b
Surr: Dibromofluoromethane	128	%REC	70-132		SW8260B	07/29/11 23:31 / eli-b
Surr: 1,2-Dichloroethane-d4	105	%REC	60-136		SW8260B	07/29/11 23:31 / eli-b
Surr: Toluene-d8	140	%REC	75-138	S	SW8260B	07/29/11 23:31 / eli-b
Surr: p-Bromofluorobenzene	151	%REC	78-160		SW8260B	07/29/11 23:31 / eli-b

SATURATED PASTE

Conductivity, sat. paste	0.65	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:47 / eli-h
pH, sat. paste	7.7	s.u.	0.1		ASAM10-3.2	08/02/11 07:54 / eli-h
Calcium, sat. paste	4.72	meq/L	0.05		SW6010B	08/03/11 13:15 / eli-h
Magnesium, sat. paste	1.94	meq/L	0.08		SW6010B	08/03/11 13:15 / eli-h
Sodium, sat. paste	1.05	meq/L	0.04		SW6010B	08/03/11 13:15 / eli-h
Sodium Adsorption Ratio (SAR)	0.6	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h

METALS, TOTAL

Arsenic	5	mg/kg	5		SW6010B	08/03/11 13:02 / eli-h
Barium	382	mg/kg	5		SW6010B	08/02/11 14:55 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 14:55 / eli-h
Chromium	37	mg/kg	5		SW6010B	08/02/11 14:55 / eli-h
Copper	23	mg/kg	5		SW6010B	08/02/11 14:55 / eli-h
Lead	14	mg/kg	5		SW6010B	08/03/11 13:02 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 10:16 / eli-h
Nickel	19	mg/kg	5		SW6010B	08/02/11 14:55 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 14:55 / eli-h

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix.

S - Spike recovery outside of advisory limits.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

J - Estimated value. The analyte was present but less than the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_1
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-006

Report Date: 08/06/11
Collection Date: 07/27/11 12:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192843

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:52 / eli-h
Zinc	63	mg/kg	5		SW6010B	08/02/11 14:55 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_2
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-007

Report Date: 08/06/11
Collection Date: 07/27/11 12:15
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192844

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
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PETROLEUM HYDROCARBONS-VOLATILE

Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/01/11 18:01 / eli-b
Total Purgeable Hydrocarbons	3.3	mg/kg	2.0		SW8015B	08/01/11 18:01 / eli-b
Surr: Trifluorotoluene	82.0	%REC	70-130		SW8015B	08/01/11 18:01 / eli-b

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.

- Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE

Diesel Range Organics (DRO)	ND	mg/kg	10		SW8015B	08/02/11 22:39 / eli-b
Total Extractable Hydrocarbons	50	mg/kg	10		SW8015B	08/02/11 22:39 / eli-b
Surr: o-Terphenyl	103	%REC	50-150		SW8015B	08/02/11 22:39 / eli-b

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.

- Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

VOLATILE ORGANIC COMPOUNDS

Benzene	ND	mg/kg	0.20		SW8260B	07/29/11 23:57 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/29/11 23:57 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/29/11 23:57 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/29/11 23:57 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/29/11 23:57 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/29/11 23:57 / eli-b
Surr: Dibromofluoromethane	111	%REC	70-132		SW8260B	07/29/11 23:57 / eli-b
Surr: 1,2-Dichloroethane-d4	98.0	%REC	60-136		SW8260B	07/29/11 23:57 / eli-b
Surr: Toluene-d8	114	%REC	75-138		SW8260B	07/29/11 23:57 / eli-b
Surr: p-Bromofluorobenzene	124	%REC	78-160		SW8260B	07/29/11 23:57 / eli-b

SATURATED PASTE

Conductivity, sat. paste	0.82	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:48 / eli-h
pH, sat. paste	7.8	s.u.	0.1		ASAM10-3.2	08/02/11 07:55 / eli-h
Calcium, sat. paste	5.94	meq/L	0.05		SW6010B	08/03/11 13:24 / eli-h
Magnesium, sat. paste	1.57	meq/L	0.08		SW6010B	08/03/11 13:24 / eli-h
Sodium, sat. paste	2.30	meq/L	0.04		SW6010B	08/03/11 13:24 / eli-h
Sodium Adsorption Ratio (SAR)	1.2	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h

METALS, TOTAL

Arsenic	6	mg/kg	5		SW6010B	08/03/11 13:06 / eli-h
Barium	354	mg/kg	5		SW6010B	08/02/11 14:59 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 14:59 / eli-h
Chromium	29	mg/kg	5		SW6010B	08/02/11 14:59 / eli-h
Copper	14	mg/kg	5		SW6010B	08/02/11 14:59 / eli-h
Lead	14	mg/kg	5		SW6010B	08/03/11 13:06 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 10:18 / eli-h
Nickel	16	mg/kg	5		SW6010B	08/02/11 14:59 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 14:59 / eli-h

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_2
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-007

Report Date: 08/06/11
Collection Date: 07/27/11 12:15
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192844

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:55 / eli-h
Zinc	46	mg/kg	5		SW6010B	08/02/11 14:59 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_3
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-008

Report Date: 08/06/11
Collection Date: 07/27/11 13:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192845

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
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PETROLEUM HYDROCARBONS-VOLATILE

Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/02/11 02:15 / eli-b
Total Purgeable Hydrocarbons	ND	mg/kg	2.0		SW8015B	08/02/11 02:15 / eli-b
Surr: Trifluorotoluene	82.0	%REC	70-130		SW8015B	08/02/11 02:15 / eli-b

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.
- Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE

Diesel Range Organics (DRO)	ND	mg/kg	10		SW8015B	08/02/11 09:44 / eli-b
Total Extractable Hydrocarbons	20	mg/kg	10		SW8015B	08/02/11 09:44 / eli-b
Surr: o-Terphenyl	103	%REC	50-150		SW8015B	08/02/11 09:44 / eli-b

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.
- Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

VOLATILE ORGANIC COMPOUNDS

Benzene	ND	mg/kg	0.20		SW8260B	07/30/11 00:23 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/30/11 00:23 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/30/11 00:23 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/30/11 00:23 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/30/11 00:23 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/30/11 00:23 / eli-b
Surr: Dibromofluoromethane	91.0	%REC	70-132		SW8260B	07/30/11 00:23 / eli-b
Surr: 1,2-Dichloroethane-d4	76.0	%REC	60-136		SW8260B	07/30/11 00:23 / eli-b
Surr: Toluene-d8	100	%REC	75-138		SW8260B	07/30/11 00:23 / eli-b
Surr: p-Bromofluorobenzene	109	%REC	78-160		SW8260B	07/30/11 00:23 / eli-b

SATURATED PASTE

Conductivity, sat. paste	0.49	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:48 / eli-h
pH, sat. paste	7.9	s.u.	0.1		ASAM10-3.2	08/02/11 07:55 / eli-h
Calcium, sat. paste	1.73	meq/L	0.05		SW6010B	08/03/11 13:27 / eli-h
Magnesium, sat. paste	0.83	meq/L	0.08		SW6010B	08/03/11 13:27 / eli-h
Sodium, sat. paste	2.74	meq/L	0.04		SW6010B	08/03/11 13:27 / eli-h
Sodium Adsorption Ratio (SAR)	2.4	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h

METALS, TOTAL

Arsenic	6	mg/kg	5		SW6010B	08/03/11 13:10 / eli-h
Barium	305	mg/kg	5		SW6010B	08/02/11 15:02 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 15:02 / eli-h
Chromium	33	mg/kg	5		SW6010B	08/02/11 15:02 / eli-h
Copper	17	mg/kg	5		SW6010B	08/02/11 15:02 / eli-h
Lead	12	mg/kg	5		SW6010B	08/03/11 13:10 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 10:21 / eli-h
Nickel	18	mg/kg	5		SW6010B	08/02/11 15:02 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 15:02 / eli-h

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_3
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-008

Report Date: 08/06/11
Collection Date: 07/27/11 13:00
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192845

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 15:58 / eli-h
Zinc	54	mg/kg	5		SW6010B	08/02/11 15:02 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_4
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-009

Report Date: 08/06/11
Collection Date: 07/27/11 13:20
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192846

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
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PETROLEUM HYDROCARBONS-VOLATILE

Gasoline Range Organics (GRO)	ND	mg/kg	2.0		SW8015B	08/02/11 03:25 / eli-b
Total Purgeable Hydrocarbons	18	mg/kg	2.0		SW8015B	08/02/11 03:25 / eli-b
Surr: Trifluorotoluene	96.0	%REC	70-130		SW8015B	08/02/11 03:25 / eli-b

- Note 1: Gasoline Range Organics(GRO) are defined as all hydrocarbons eluting between 2-Methylpentane and 1,2,4-Trimethylbenzene.

- Note 2: Total Purgeable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

PETROLEUM HYDROCARBONS-SEMI-VOLATILE

Diesel Range Organics (DRO)	21	mg/kg	10		SW8015B	08/02/11 10:35 / eli-b
Total Extractable Hydrocarbons	52	mg/kg	10		SW8015B	08/02/11 10:35 / eli-b
Surr: o-Terphenyl	94.0	%REC	50-150		SW8015B	08/02/11 10:35 / eli-b

- Note 1: Diesel Range Organics are defined as all hydrocarbons eluting between C10 and C28.

- Note 2: Total Extractable Hydrocarbons are defined as the total hydrocarbon response regardless of elution time.

VOLATILE ORGANIC COMPOUNDS

Benzene	ND	mg/kg	0.20		SW8260B	07/30/11 00:50 / eli-b
Ethylbenzene	ND	mg/kg	0.20		SW8260B	07/30/11 00:50 / eli-b
Toluene	ND	mg/kg	0.20		SW8260B	07/30/11 00:50 / eli-b
m+p-Xylenes	ND	mg/kg	0.20		SW8260B	07/30/11 00:50 / eli-b
o-Xylene	ND	mg/kg	0.20		SW8260B	07/30/11 00:50 / eli-b
Xylenes, Total	ND	mg/kg	0.20		SW8260B	07/30/11 00:50 / eli-b
Surr: Dibromofluoromethane	92.0	%REC	70-132		SW8260B	07/30/11 00:50 / eli-b
Surr: 1,2-Dichloroethane-d4	81.0	%REC	60-136		SW8260B	07/30/11 00:50 / eli-b
Surr: Toluene-d8	95.0	%REC	75-138		SW8260B	07/30/11 00:50 / eli-b
Surr: p-Bromofluorobenzene	106	%REC	78-160		SW8260B	07/30/11 00:50 / eli-b

SATURATED PASTE

Conductivity, sat. paste	0.38	mmhos/cm	0.05	D	ASAM10-3	08/02/11 09:49 / eli-h
pH, sat. paste	7.8	s.u.	0.1		ASAM10-3.2	08/02/11 07:56 / eli-h
Calcium, sat. paste	2.67	meq/L	0.05		SW6010B	08/03/11 13:31 / eli-h
Magnesium, sat. paste	0.84	meq/L	0.08		SW6010B	08/03/11 13:31 / eli-h
Sodium, sat. paste	0.70	meq/L	0.04		SW6010B	08/03/11 13:31 / eli-h
Sodium Adsorption Ratio (SAR)	0.5	unitless	0.1		USDA20b	08/03/11 10:49 / eli-h

METALS, TOTAL

Arsenic	8	mg/kg	5		SW6010B	08/02/11 15:13 / eli-h
Barium	245	mg/kg	5		SW6010B	08/02/11 15:13 / eli-h
Cadmium	ND	mg/kg	1		SW6010B	08/02/11 15:13 / eli-h
Chromium	28	mg/kg	5		SW6010B	08/02/11 15:13 / eli-h
Copper	14	mg/kg	5		SW6010B	08/02/11 15:13 / eli-h
Lead	11	mg/kg	5		SW6010B	08/03/11 13:15 / eli-h
Mercury	ND	mg/kg	0.5		SW7471A	08/02/11 10:23 / eli-h
Nickel	16	mg/kg	5		SW6010B	08/02/11 15:13 / eli-h
Selenium	ND	mg/kg	5		SW6010B	08/02/11 15:13 / eli-h

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Whiting Petroleum Corporation
Site Name: Boies_Ranch
Project: Soil_Sampling
Client Sample ID SO_Boies_Background_Sect_3_4
Location:
Samp FRQ/Type: SP
Lab ID: G11070820-009

Report Date: 08/06/11
Collection Date: 07/27/11 13:20
Date Received: 07/28/11
Sampled By: Scott Gustin
Matrix: Soil
Tracking Number: 192846

Analyses	Result	Units	RL	Qualifier	Method	Analysis Date / By
METALS, TOTAL						
Silver	ND	mg/kg	5		SW6010B	08/03/11 16:01 / eli-h
Zinc	47	mg/kg	5		SW6010B	08/02/11 15:13 / eli-h

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

Workorder Receipt Checklist



G11070820

Login completed by: Misty Voegelé

Date Received: 7/28/2011

Reviewed by: BL2000\kruff

Received by: mav

Reviewed Date: 7/28/2011

Carrier FedEx
name:

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature:	16.0°C From Field		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

Contact and Corrective Action Comments:

None

11070820

Modified Table 910-1

Organic Compounds in Soil

- TPH (total volatile and extractable petroleum hydrocarbons)

VOCs

Benzene

Toluene

Ethylbenzene

Xylenes (Total)

Metals

X Arsenic

X Barium

X Cadmium

X Chromium (III)

X Copper

X Lead (inorganic)

X Mercury

X Nickel (soluble salts)

X Selenium

X Silver

X Zinc

Physical Parameters

X Electrical Conductivity (EC)

- Sodium Adsorption Ratio (SAR)

- pH