



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

September 3, 2014

Mr. Derek Johnson
Linn Energy, LLC
235 Callahan Avenue
Parachute, Colorado 81635

Subject: Additional O-32 Reserve Pit Soil Sample Results

Dear Derek:

Nicholson GeoSolutions LLC was retained by Linn Energy, LLC (Linn) to conduct additional sampling of the soils beneath the former reserve pit on the O-32 well pad in the Garden Gulch area, Garfield County, Colorado.

Six samples were previously collected from the pit bottom and walls on August 3, 2014. The combined TPH exceeded the standard for confirmation samples O-32 P1 (1,703.5 mg/kg) and O-32-P6 (1,130 mg/kg). For the spoils sample, TPH exceeded the standard at a combined 761 mg/kg. Arsenic ranged from 6.1 to 16 mg/kg for the seven samples.

In response to the sample results, additional impacted materials were excavated from the pit and stored in a bermed area on the well pad. Two additional discrete soil samples were collected in the same locations as previous samples O32-P1 and O32-P6 on August 24, 2014 to evaluate compliance with the standards. In addition to the confirmation samples, an additional composite sample of the excavated spoils was also collected.

Figure 1 shows the approximate extent of the pit and the locations of the six confirmation samples collected. All samples were analyzed for Total Volatile Petroleum Hydrocarbons (TVPH – gasoline range), Total Extractable Petroleum Hydrocarbons (TEPH – diesel and motor oil range), BTEX (benzene, toluene, ethylbenzene, and xylenes), sodium adsorption ratio (SAR), pH, conductivity, metals, and PAHs to evaluate compliance with the Table 910-1 standards and treatment options.

Table 1 provides analytical results for the soil samples collected. The laboratory analytical report is contained in Appendix A. All results are below the standards for the additional confirmation samples and spoils sample, except for arsenic. Arsenic ranged from 9.2 to 19 mg/kg for the three samples. SAR and pH also exceeded the standards for confirmation sample

O32-P1; however, these samples were collected from greater than 3 feet depth so no action is required based on these results.

Nicholson GeoSolutions LLC



David K. Nicholson, P.G.
Principal Geologist

Table 1 O-32 Sample Results – August 24, 2014

Parameter	Table 910-1 Standards	O32-P1	O32-P6	O32-SPOILS
sp. conductance (mmhos/cm)	<4	2.1	0.27	1.8
pH (standard units)	6-9	9.1	8.2	8.0
SAR (ratio)	<12	52	3.4	12
TVPH – gasoline range	500 ¹	<0.5	<0.5	<0.5
TEPH – diesel/motor oil range	500 ¹	<80	123	290
benzene	0.17	<0.0025	<0.0025	<0.0025
toluene	85	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025	<0.0025	<0.0025
xylenes	175	<0.0075	<0.0075	<0.0075
PAHs	various	All ok	All ok	All ok
arsenic	0.39	14	19	9.2

¹The standard is 500 for the combined total of TVPH and TEPH

Values in bold type exceed standards

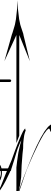
All units in mg/kg except where indicated



Figure 1

August
2014

GeoSolutions
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Legend

- Sample Location
- Pit Boundary

0 75 150 300 Feet 1" = 150'

Berry Petroleum

**O-32
Pit Investigation**

APPENDIX A
Laboratory Report



12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

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Est. 1970

Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Friday August 29, 2014

Report Number: L717970

Samples Received: 08/26/14

Client Project:

Description: Pit Reclamation

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

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Dave Nicholson
 Berry Petroleum Company - Denver, C
 1999 Broadway, Suite 3700
 Denver, CO 80202

August 29, 2014

Date Received : August 26, 2014
 Description : Pit Reclamation
 Sample ID : O-32 P1
 Collected By :
 Collection Date : 08/24/14 14:00

ESC Sample # : L717970-03
 Site ID :
 Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium,Hexavalent	BDL	2.0	mg/kg	3060A/7196A	08/28/14	1
ORP	140		mV	2580 B-2011	08/27/14	1
pH	9.1		su	9045D	08/28/14	1
Sodium Adsorption Ratio	52.			Calc.	08/29/14	1
Specific Conductance	2100		umhos/cm	9050AMod	08/27/14	1
Mercury	0.021	0.020	mg/kg	7471	08/27/14	1
Arsenic	14.	2.0	mg/kg	6010B	08/28/14	1
Barium	560	0.50	mg/kg	6010B	08/28/14	1
Boron	BDL	10.	mg/kg	6010B	08/28/14	1
Cadmium	BDL	0.50	mg/kg	6010B	08/28/14	1
Chromium	18.	1.0	mg/kg	6010B	08/28/14	1
Copper	15.	2.0	mg/kg	6010B	08/28/14	1
Lead	12.	0.50	mg/kg	6010B	08/28/14	1
Nickel	9.4	2.0	mg/kg	6010B	08/28/14	1
Selenium	BDL	2.0	mg/kg	6010B	08/28/14	1
Silver	BDL	5.0	mg/kg	6010B	08/28/14	5
Zinc	26.	5.0	mg/kg	6010B	08/28/14	1
Benzene	BDL	0.0025	mg/kg	8021	08/26/14	5
Toluene	BDL	0.025	mg/kg	8021	08/26/14	5
Ethylbenzene	BDL	0.0025	mg/kg	8021	08/26/14	5
Total Xylene	BDL	0.0075	mg/kg	8021	08/26/14	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015	08/26/14	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.3		% Rec.	8015	08/26/14	5
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021	08/26/14	5
Diesel and Oil Ranges						
C10-C28 Diesel Range	BDL	40.	mg/kg	8015	08/27/14	10
C28-C40 Oil Range	BDL	40.	mg/kg	8015	08/27/14	10
Surrogate Recovery						
o-Terphenyl	59.4		% Rec.	8015	08/27/14	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 L717970-03 (DRORLA) - cannot run lower due to extraction prep
 L717970-03 (PH) - 9.1@20.6c



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 Collected By :
 Collection Date : 08/24/14 14:00

ESC Sample # : L717970-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	08/27/14	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/27/14	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	08/27/14	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	08/27/14	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	08/27/14	1
Surrogate Recovery						
p-Terphenyl-d14	79.3		% Rec.	8270C-SIM	08/27/14	1
Nitrobenzene-d5	88.0		% Rec.	8270C-SIM	08/27/14	1
2-Fluorobiphenyl	76.0		% Rec.	8270C-SIM	08/27/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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L717970-03 (DRORLA) - cannot run lower due to extraction prep

L717970-03 (PH) - 9.1@20.6c



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Dave Nicholson
 Berry Petroleum Company - Denver, C
 1999 Broadway, Suite 3700
 Denver, CO 80202

August 29, 2014

Date Received : August 26, 2014
 Description : Pit Reclamation
 Sample ID : O-32 P6
 Collected By :
 Collection Date : 08/24/14 14:10

ESC Sample # : L717970-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium,Hexavalent	BDL	2.0	mg/kg	3060A/7196A	08/28/14	1
ORP	150		mV	2580 B-2011	08/27/14	1
pH	8.2		su	9045D	08/28/14	1
Sodium Adsorption Ratio	3.4			Calc.	08/29/14	1
Specific Conductance	270		umhos/cm	9050AMod	08/27/14	1
Mercury	0.033	0.020	mg/kg	7471	08/27/14	1
Arsenic	19.	2.0	mg/kg	6010B	08/28/14	1
Barium	400	0.50	mg/kg	6010B	08/28/14	1
Boron	BDL	10.	mg/kg	6010B	08/28/14	1
Cadmium	BDL	0.50	mg/kg	6010B	08/28/14	1
Chromium	20.	1.0	mg/kg	6010B	08/28/14	1
Copper	23.	2.0	mg/kg	6010B	08/28/14	1
Lead	13.	0.50	mg/kg	6010B	08/28/14	1
Nickel	16.	2.0	mg/kg	6010B	08/28/14	1
Selenium	BDL	2.0	mg/kg	6010B	08/28/14	1
Silver	BDL	1.0	mg/kg	6010B	08/28/14	1
Zinc	50.	5.0	mg/kg	6010B	08/28/14	1
Benzene	BDL	0.0025	mg/kg	8021	08/26/14	5
Toluene	BDL	0.025	mg/kg	8021	08/26/14	5
Ethylbenzene	BDL	0.0025	mg/kg	8021	08/26/14	5
Total Xylene	BDL	0.0075	mg/kg	8021	08/26/14	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015	08/26/14	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015	08/26/14	5
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021	08/26/14	5
Diesel and Oil Ranges						
C10-C28 Diesel Range	61.	40.	mg/kg	8015	08/27/14	10
C28-C40 Oil Range	62.	40.	mg/kg	8015	08/27/14	10
Surrogate Recovery						
o-Terphenyl	66.5		% Rec.	8015	08/27/14	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Acenaphthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Acenaphthylene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Benzo(a)anthracene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 L717970-04 (PH) - 8.2@20.6c



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August 29, 2014

Date Received : August 26, 2014
 Description : Pit Reclamation
 Sample ID : O-32 P6
 Collected By :
 Collection Date : 08/24/14 14:10

ESC Sample # : L717970-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.0030	mg/kg	8270C-SIM	08/27/14	5
Benzo(b)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Benzo(g,h,i)perylene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Benzo(k)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Chrysene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Dibenz(a,h)anthracene	BDL	0.0030	mg/kg	8270C-SIM	08/27/14	5
Fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Fluorene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Indeno(1,2,3-cd)pyrene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Naphthalene	BDL	0.10	mg/kg	8270C-SIM	08/27/14	5
Phenanthrene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Pyrene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
1-Methylnaphthalene	BDL	0.10	mg/kg	8270C-SIM	08/27/14	5
2-Methylnaphthalene	0.11	0.10	mg/kg	8270C-SIM	08/27/14	5
2-Chloronaphthalene	BDL	0.10	mg/kg	8270C-SIM	08/27/14	5
Surrogate Recovery						
p-Terphenyl-d14	74.1		% Rec.	8270C-SIM	08/27/14	5
Nitrobenzene-d5	84.4		% Rec.	8270C-SIM	08/27/14	5
2-Fluorobiphenyl	75.2		% Rec.	8270C-SIM	08/27/14	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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 L717970-04 (PH) - 8.2@20.6c



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REPORT OF ANALYSIS

Dave Nicholson
 Berry Petroleum Company - Denver, C
 1999 Broadway, Suite 3700
 Denver, CO 80202

August 29, 2014

Date Received : August 26, 2014
 Description : Pit Reclamation
 Sample ID : O-32 SPOILS
 Collected By :
 Collection Date : 08/24/14 14:20

ESC Sample # : L717970-05

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium,Hexavalent	BDL	2.0	mg/kg	3060A/7196A	08/28/14	1
ORP	170		mV	2580 B-2011	08/27/14	1
pH	8.0		su	9045D	08/28/14	1
Sodium Adsorption Ratio	12.			Calc.	08/29/14	1
Specific Conductance	1800		umhos/cm	9050AMod	08/27/14	1
Mercury	BDL	0.020	mg/kg	7471	08/27/14	1
Arsenic	9.2	2.0	mg/kg	6010B	08/28/14	1
Barium	220	0.50	mg/kg	6010B	08/28/14	1
Boron	BDL	10.	mg/kg	6010B	08/28/14	1
Cadmium	BDL	0.50	mg/kg	6010B	08/28/14	1
Chromium	18.	1.0	mg/kg	6010B	08/28/14	1
Copper	20.	2.0	mg/kg	6010B	08/28/14	1
Lead	11.	0.50	mg/kg	6010B	08/28/14	1
Nickel	15.	2.0	mg/kg	6010B	08/28/14	1
Selenium	BDL	2.0	mg/kg	6010B	08/28/14	1
Silver	BDL	1.0	mg/kg	6010B	08/28/14	1
Zinc	46.	5.0	mg/kg	6010B	08/28/14	1
Benzene	BDL	0.0025	mg/kg	8021	08/26/14	5
Toluene	BDL	0.025	mg/kg	8021	08/26/14	5
Ethylbenzene	BDL	0.0025	mg/kg	8021	08/26/14	5
Total Xylene	BDL	0.0075	mg/kg	8021	08/26/14	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	8015	08/26/14	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.2		% Rec.	8015	08/26/14	5
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	08/26/14	5
Diesel and Oil Ranges						
C10-C28 Diesel Range	150	40.	mg/kg	8015	08/27/14	10
C28-C40 Oil Range	140	40.	mg/kg	8015	08/27/14	10
Surrogate Recovery						
o-Terphenyl	139.		% Rec.	8015	08/27/14	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Acenaphthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Acenaphthylene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Benzo(a)anthracene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5

BDL - Below Detection Limit
 Det. Limit - Practical Quantitation Limit(PQL)
 L717970-05 (PH) - 8.0@20.5c



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August 29, 2014

Date Received : August 26, 2014
Description : Pit Reclamation

ESC Sample # : L717970-05

Sample ID : O-32 SPOILS

Site ID :

Collected By :
Collection Date : 08/24/14 14:20

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.0030	mg/kg	8270C-SIM	08/27/14	5
Benzo(b)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Benzo(g,h,i)perylene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Benzo(k)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Chrysene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Dibenz(a,h)anthracene	BDL	0.0030	mg/kg	8270C-SIM	08/27/14	5
Fluoranthene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Fluorene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Indeno(1,2,3-cd)pyrene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
Naphthalene	0.13	0.10	mg/kg	8270C-SIM	08/27/14	5
Phenanthrene	0.044	0.030	mg/kg	8270C-SIM	08/27/14	5
Pyrene	BDL	0.030	mg/kg	8270C-SIM	08/27/14	5
1-Methylnaphthalene	BDL	0.10	mg/kg	8270C-SIM	08/27/14	5
2-Methylnaphthalene	0.18	0.10	mg/kg	8270C-SIM	08/27/14	5
2-Chloronaphthalene	BDL	0.10	mg/kg	8270C-SIM	08/27/14	5
Surrogate Recovery						
p-Terphenyl-d14	67.9		% Rec.	8270C-SIM	08/27/14	5
Nitrobenzene-d5	81.4		% Rec.	8270C-SIM	08/27/14	5
2-Fluorobiphenyl	68.8		% Rec.	8270C-SIM	08/27/14	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L717970-05 (PH) - 8.0@20.5c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L717970-01	WG739964	SAMP	o-Terphenyl	R2982771	J2
L717970-04	WG739555	SAMP	Benzo(a)pyrene	R2982060	U
	WG739555	SAMP	Dibenz(a,h)anthracene	R2982060	U
L717970-05	WG739555	SAMP	Benzo(a)pyrene	R2982060	U
	WG739555	SAMP	Dibenz(a,h)anthracene	R2982060	U

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits
U	BDL (EPA) - Below Detectable Limits: Indicates that the compound was analyzed but not detected.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
08/29/14 at 19:36:32

TSR Signing Reports: 134
R4 - Rush: Three Day

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L717970-01 Account: BERPETDCO Received: 08/26/14 09:00 Due Date: 08/29/14 00:00 RPT Date: 08/29/14 18:28

Sample: L717970-02 Account: BERPETDCO Received: 08/26/14 09:00 Due Date: 08/29/14 00:00 RPT Date: 08/29/14 18:28

Sample: L717970-03 Account: BERPETDCO Received: 08/26/14 09:00 Due Date: 08/29/14 00:00 RPT Date: 08/29/14 18:28

Sample: L717970-04 Account: BERPETDCO Received: 08/26/14 09:00 Due Date: 08/29/14 00:00 RPT Date: 08/29/14 18:28

Sample: L717970-05 Account: BERPETDCO Received: 08/26/14 09:00 Due Date: 08/29/14 00:00 RPT Date: 08/29/14 18:28



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Quality Assurance Report
 Level II

L717970

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 1-800-767-5859
 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

August 29, 2014

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG739440	08/26/14 14:14
Ethylbenzene	< .0005	mg/kg			WG739440	08/26/14 14:14
Toluene	< .005	mg/kg			WG739440	08/26/14 14:14
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG739440	08/26/14 14:14
Total Xylene	< .0015	mg/kg			WG739440	08/26/14 14:14
a,a,a-Trifluorotoluene(FID)		% Rec.	100.0	59-128	WG739440	08/26/14 14:14
a,a,a-Trifluorotoluene(PID)		% Rec.	105.0	54-144	WG739440	08/26/14 14:14
1-Methylnaphthalene	< .02	mg/kg			WG739555	08/27/14 02:56
2-Chloronaphthalene	< .02	mg/kg			WG739555	08/27/14 02:56
2-Methylnaphthalene	< .02	mg/kg			WG739555	08/27/14 02:56
Acenaphthene	< .006	mg/kg			WG739555	08/27/14 02:56
Acenaphthylene	< .006	mg/kg			WG739555	08/27/14 02:56
Anthracene	< .006	mg/kg			WG739555	08/27/14 02:56
Benzo(a)anthracene	< .006	mg/kg			WG739555	08/27/14 02:56
Benzo(a)pyrene	< .006	mg/kg			WG739555	08/27/14 02:56
Benzo(b)fluoranthene	< .006	mg/kg			WG739555	08/27/14 02:56
Benzo(g,h,i)perylene	< .006	mg/kg			WG739555	08/27/14 02:56
Benzo(k)fluoranthene	< .006	mg/kg			WG739555	08/27/14 02:56
Chrysene	< .006	mg/kg			WG739555	08/27/14 02:56
Dibenz(a,h)anthracene	< .006	mg/kg			WG739555	08/27/14 02:56
Fluoranthene	< .006	mg/kg			WG739555	08/27/14 02:56
Fluorene	< .006	mg/kg			WG739555	08/27/14 02:56
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG739555	08/27/14 02:56
Naphthalene	< .02	mg/kg			WG739555	08/27/14 02:56
Phenanthrene	< .006	mg/kg			WG739555	08/27/14 02:56
Pyrene	< .006	mg/kg			WG739555	08/27/14 02:56
2-Fluorobiphenyl		% Rec.	78.90	38.2-135	WG739555	08/27/14 02:56
Nitrobenzene-d5		% Rec.	71.00	28.4-151	WG739555	08/27/14 02:56
p-Terphenyl-d14		% Rec.	78.20	34.2-141	WG739555	08/27/14 02:56
Specific Conductance	3.90	umhos/cm			WG739508	08/27/14 15:31
Mercury	< .02	mg/kg			WG739616	08/27/14 17:36
Chromium,Hexavalent	< 2	mg/kg			WG739590	08/28/14 11:06
C10-C28 Diesel Range	< 4	mg/kg			WG739550	08/27/14 12:14
C28-C40 Oil Range	< 4	mg/kg			WG739550	08/27/14 12:14
o-Terphenyl		% Rec.	86.50	50-150	WG739550	08/27/14 12:14
Arsenic	< 2	mg/kg			WG739899	08/28/14 16:27
Barium	< .5	mg/kg			WG739899	08/28/14 16:27
Boron	< 10	mg/kg			WG739899	08/28/14 16:27
Cadmium	< .5	mg/kg			WG739899	08/28/14 16:27
Chromium	< 1	mg/kg			WG739899	08/28/14 16:27
Copper	< 2	mg/kg			WG739899	08/28/14 16:27
Lead	< .5	mg/kg			WG739899	08/28/14 16:27
Nickel	< 2	mg/kg			WG739899	08/28/14 16:27
Selenium	< 2	mg/kg			WG739899	08/28/14 16:27
Silver	< 1	mg/kg			WG739899	08/28/14 16:27
Zinc	< 5	mg/kg			WG739899	08/28/14 16:27

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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
C10-C28 Diesel Range	< 4	mg/kg			WG739964	08/29/14 10:39
C28-C40 Oil Range	< 4	mg/kg			WG739964	08/29/14 10:39
o-Terphenyl		% Rec.	79.40	50-150	WG739964	08/29/14 10:39

Analyte	Units	Duplicate			Limit	Ref Samp	Batch
		Result	Duplicate	RPD			
ORP	mV	150.	150.	2.63	20	L717852-01	WG739507
ORP	mV	48.0	50.0	4.08	20	L718004-01	WG739507
Specific Conductance	umhos/cm	160.	160.	3.08	20	L717067-02	WG739508
Specific Conductance	umhos/cm	1900	1800	3.81	20	L717970-05	WG739508
Mercury	mg/kg	0.0420	0.0360	15.0	20	L717652-02	WG739616
Chromium,Hexavalent	mg/kg	0.0	0.0	0.0	20	L718093-06	WG739590
Chromium,Hexavalent	mg/kg	0.0	0.0	0.0	20	L717908-01	WG739590
pH	su	8.00	8.00	0.125	1	L717970-01	WG739843
pH	su	9.10	9.10	0.0	1	L718026-13	WG739843

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0469	93.7	70-130	WG739440
Ethylbenzene	mg/kg	.05	0.0492	98.3	70-130	WG739440
Toluene	mg/kg	.05	0.0480	96.1	70-130	WG739440
Total Xylene	mg/kg	.15	0.149	99.7	70-130	WG739440
a,a,a-Trifluorotoluene (FID)				99.90	59-128	WG739440
a,a,a-Trifluorotoluene (PID)				104.0	54-144	WG739440
TPH (GC/FID) Low Fraction	mg/kg	5.5	4.99	90.6	63.5-137	WG739440
a,a,a-Trifluorotoluene (FID)				101.0	59-128	WG739440
a,a,a-Trifluorotoluene (PID)				112.0	54-144	WG739440
1-Methylnaphthalene	mg/kg	.08	0.0539	67.4	48.9-127	WG739555
2-Chloronaphthalene	mg/kg	.08	0.0561	70.2	48.8-125	WG739555
2-Methylnaphthalene	mg/kg	.08	0.0537	67.1	45.7-131	WG739555
Acenaphthene	mg/kg	.08	0.0537	67.2	48.7-127	WG739555
Acenaphthylene	mg/kg	.08	0.0529	66.1	47.9-128	WG739555
Anthracene	mg/kg	.08	0.0544	68.0	51.3-136	WG739555
Benzo(a)anthracene	mg/kg	.08	0.0525	65.6	55-126	WG739555
Benzo(a)pyrene	mg/kg	.08	0.0517	64.6	51.9-127	WG739555
Benzo(b)fluoranthene	mg/kg	.08	0.0538	67.2	54-125	WG739555
Benzo(g,h,i)perylene	mg/kg	.08	0.0553	69.2	53.8-136	WG739555
Benzo(k)fluoranthene	mg/kg	.08	0.0527	65.8	53.9-132	WG739555
Chrysene	mg/kg	.08	0.0547	68.3	55.7-133	WG739555
Dibenz(a,h)anthracene	mg/kg	.08	0.0550	68.8	52.6-137	WG739555
Fluoranthene	mg/kg	.08	0.0516	64.5	54-132	WG739555
Fluorene	mg/kg	.08	0.0534	66.8	48.7-127	WG739555
Indeno(1,2,3-cd)pyrene	mg/kg	.08	0.0546	68.2	53.8-138	WG739555
Naphthalene	mg/kg	.08	0.0537	67.2	42-127	WG739555
Phenanthrene	mg/kg	.08	0.0532	66.6	49.6-126	WG739555
Pyrene	mg/kg	.08	0.0530	66.3	54-129	WG739555

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
2-Fluorobiphenyl				66.50	38.2-135	
Nitrobenzene-d5				63.10	28.4-151	
p-Terphenyl-d14				63.50	34.2-141	
ORP	mV	100	110.	110.	90-110	WG739507
Specific Conductance	umhos/cm	1040	1000	96.2	85-115	WG739508
Mercury	mg/kg	12.4	11.8	95.0	71.6-128	WG739616
Chromium,Hexavalent	mg/kg	187	200.	107.	80-120	WG739590
C10-C28 Diesel Range	mg/kg	60	39.1	65.1	50-100	WG739550
o-Terphenyl				81.30	50-150	WG739550
pH	su	6.33	6.30	99.5	98.3-101.7	WG739843
Arsenic	mg/kg	237	252.	106.	83.1-117	WG739899
Barium	mg/kg	252	240.	95.0	84.1-116	WG739899
Boron	mg/kg	118	94.2	80.0	74-126	WG739899
Cadmium	mg/kg	191	202.	106.	83.2-117	WG739899
Chromium	mg/kg	128	130.	101.	81.3-118	WG739899
Copper	mg/kg	123	125.	101.	83.7-116	WG739899
Lead	mg/kg	103	108.	104.	83.1-117	WG739899
Nickel	mg/kg	118	117.	99.0	82-118	WG739899
Selenium	mg/kg	110	117.	106.	78.7-122	WG739899
Silver	mg/kg	47.3	46.3	98.0	66.2-134	WG739899
Zinc	mg/kg	183	185.	101.	82-118	WG739899

Analyte	Units	Laboratory Control Sample Duplicate		%Rec	Limit	RPD	Limit	Batch
		Result	Ref					
Benzene	mg/kg	0.0469	0.0469	94.0	70-130	0.0900	20	WG739440
Ethylbenzene	mg/kg	0.0488	0.0492	98.0	70-130	0.670	20	WG739440
Toluene	mg/kg	0.0474	0.0480	95.0	70-130	1.24	20	WG739440
Total Xylene	mg/kg	0.148	0.149	99.0	70-130	1.03	20	WG739440
a,a,a-Trifluorotoluene(FID)				99.80	59-128			WG739440
a,a,a-Trifluorotoluene(PID)				103.0	54-144			WG739440
TPH (GC/FID) Low Fraction	mg/kg	5.11	4.99	93.0	63.5-137	2.46	20	WG739440
a,a,a-Trifluorotoluene(FID)				101.0	59-128			WG739440
a,a,a-Trifluorotoluene(PID)				113.0	54-144			WG739440
1-Methylnaphthalene	mg/kg	0.0614	0.0539	77.0	48.9-127	12.9	20	WG739555
2-Chloronaphthalene	mg/kg	0.0622	0.0561	78.0	48.8-125	10.2	20	WG739555
2-Methylnaphthalene	mg/kg	0.0610	0.0537	76.0	45.7-131	12.7	20	WG739555
Acenaphthene	mg/kg	0.0596	0.0537	74.0	48.7-127	10.3	20	WG739555
Acenaphthylene	mg/kg	0.0587	0.0529	73.0	47.9-128	10.5	20	WG739555
Anthracene	mg/kg	0.0596	0.0544	74.0	51.3-136	9.19	20	WG739555
Benzo(a)anthracene	mg/kg	0.0576	0.0525	72.0	55-126	9.26	20	WG739555
Benzo(a)pyrene	mg/kg	0.0567	0.0517	71.0	51.9-127	9.26	20	WG739555
Benzo(b)fluoranthene	mg/kg	0.0585	0.0538	73.0	54-125	8.44	20	WG739555
Benzo(g,h,i)perylene	mg/kg	0.0557	0.0553	70.0	53.8-136	0.640	20	WG739555
Benzo(k)fluoranthene	mg/kg	0.0592	0.0527	74.0	53.9-132	11.7	20	WG739555

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Chrysene	mg/kg	0.0605	0.0547	76.0	55.7-133	10.1	20	WG739555
Dibenz(a,h)anthracene	mg/kg	0.0551	0.0550	69.0	52.6-137	0.120	20	WG739555
Fluoranthene	mg/kg	0.0562	0.0516	70.0	54-132	8.66	20	WG739555
Fluorene	mg/kg	0.0591	0.0534	74.0	48.7-127	10.1	20	WG739555
Indeno(1,2,3-cd)pyrene	mg/kg	0.0545	0.0546	68.0	53.8-138	0.230	20	WG739555
Naphthalene	mg/kg	0.0597	0.0537	75.0	42-127	10.5	20	WG739555
Phenanthrene	mg/kg	0.0585	0.0532	73.0	49.6-126	9.44	20	WG739555
Pyrene	mg/kg	0.0589	0.0530	74.0	54-129	10.5	20	WG739555
2-Fluorobiphenyl				71.30	38.2-135			WG739555
Nitrobenzene-d5				69.50	28.4-151			WG739555
p-Terphenyl-d14				67.60	34.2-141			WG739555
ORP	mV	110.	110.	110.	90-110	0.0	20	WG739507
Specific Conductance	umhos/	1000	1000	96.0	85-115	0.0	20	WG739508
Chromium, Hexavalent	mg/kg	200.	200.	107.	80-120	0.0	20	WG739590
C10-C28 Diesel Range o-Terphenyl	mg/kg	43.8	39.1	73.0 86.40	50-100 50-150	11.3	20	WG739550 WG739550
pH	su	6.30	6.30	100.	98.3-101.7	0.0	20	WG739843
Arsenic	mg/kg	260.	252.	110.	83.1-117	3.00	20	WG739899
Barium	mg/kg	243.	240.	97.0	84.1-116	2.00	20	WG739899
Boron	mg/kg	94.9	94.2	80.0	74-126	1.00	20	WG739899
Cadmium	mg/kg	208.	202.	109.	83.2-117	3.00	20	WG739899
Chromium	mg/kg	132.	130.	103.	81.3-118	2.00	20	WG739899
Copper	mg/kg	126.	125.	102.	83.7-116	1.00	20	WG739899
Lead	mg/kg	110.	108.	107.	83.1-117	2.00	20	WG739899
Nickel	mg/kg	119.	117.	101.	82-118	2.00	20	WG739899
Selenium	mg/kg	117.	117.	106.	78.7-122	0.0	20	WG739899
Silver	mg/kg	49.8	46.3	105.	66.2-134	7.00	20	WG739899
Zinc	mg/kg	183.	185.	100.	82-118	1.00	20	WG739899

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Benzene	mg/kg	0.228	0.000624	.05	91.0	49.7-127	L717673-03	WG739440
Ethylbenzene	mg/kg	0.236	0.00246	.05	93.0	40.8-141	L717673-03	WG739440
Toluene	mg/kg	0.234	0.00107	.05	93.0	49.8-132	L717673-03	WG739440
Total Xylene	mg/kg	0.719	0.0164	.15	94.0	41.2-140	L717673-03	WG739440
a,a,a-Trifluorotoluene(FID)					99.70	59-128		WG739440
a,a,a-Trifluorotoluene(PID)					104.0	54-144		WG739440
TPH (GC/FID) Low Fraction	mg/kg	21.3	0.648	5.5	75.0	28.5-138	L717673-03	WG739440
a,a,a-Trifluorotoluene(FID)					98.10	59-128		WG739440
a,a,a-Trifluorotoluene(PID)					109.0	54-144		WG739440
Mercury	mg/kg	0.461	0.0360	.5	85.0	80-120	L717652-02	WG739616
1-Methylnaphthalene	mg/kg	0.0548	0.0	.08	68.0	41.8-133	L717590-04	WG739555

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
2-Chloronaphthalene	mg/kg	0.0571	0.0	.08	71.0	42.4-129	L717590-04	WG739555
2-Methylnaphthalene	mg/kg	0.0538	0.0	.08	67.0	37.5-137	L717590-04	WG739555
Acenaphthene	mg/kg	0.0564	0.0	.08	70.0	39.4-132	L717590-04	WG739555
Acenaphthylene	mg/kg	0.0575	0.0	.08	72.0	41.3-132	L717590-04	WG739555
Anthracene	mg/kg	0.0585	0.0	.08	73.0	36.7-144	L717590-04	WG739555
Benzo(a)anthracene	mg/kg	0.0601	0.00146	.08	73.0	28-144	L717590-04	WG739555
Benzo(a)pyrene	mg/kg	0.0608	0.00143	.08	74.0	23.8-147	L717590-04	WG739555
Benzo(b)fluoranthene	mg/kg	0.0589	0.00211	.08	71.0	18.2-147	L717590-04	WG739555
Benzo(g,h,i)perylene	mg/kg	0.0581	0.00118	.08	71.0	9.2-155	L717590-04	WG739555
Benzo(k)fluoranthene	mg/kg	0.0564	0.000674	.08	70.0	26.5-143	L717590-04	WG739555
Chrysene	mg/kg	0.0636	0.00148	.08	78.0	27.4-150	L717590-04	WG739555
Dibenz(a,h)anthracene	mg/kg	0.0558	0.0	.08	70.0	13.8-150	L717590-04	WG739555
Fluoranthene	mg/kg	0.0600	0.00247	.08	72.0	23.2-158	L717590-04	WG739555
Fluorene	mg/kg	0.0569	0.0	.08	71.0	30.8-139	L717590-04	WG739555
Indeno(1,2,3-cd)pyrene	mg/kg	0.0581	0.000912	.08	72.0	10.7-155	L717590-04	WG739555
Naphthalene	mg/kg	0.0552	0.000949	.08	68.0	34.9-133	L717590-04	WG739555
Phenanthrene	mg/kg	0.0547	0.00102	.08	67.0	20.2-150	L717590-04	WG739555
Pyrene	mg/kg	0.0604	0.00213	.08	73.0	22.6-151	L717590-04	WG739555
2-Fluorobiphenyl					83.70	38.2-135		WG739555
Nitrobenzene-d5					93.00	28.4-151		WG739555
p-Terphenyl-d14					81.40	34.2-141		WG739555
Chromium, Hexavalent	mg/kg	19.8	0.0	20	99.0	75-125	L717970-03	WG739590
Arsenic	mg/kg	101.	5.23	100	95.0	75-125	L717972-08	WG739899
Lead	mg/kg	106.	10.8	100	95.0	75-125	L717972-08	WG739899
C10-C28 Diesel Range	mg/kg	47.0	11.0	60	60.0	50-100	L718370-09	WG739964
C28-C40 Oil Range	mg/kg	12.8	7.26	60	9.30*	50-100	L718370-09	WG739964
o-Terphenyl					84.70	50-150		WG739964

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.223	0.228	88.9	49.7-127	2.36	23.5	L717673-03	WG739440
Ethylbenzene	mg/kg	0.226	0.236	89.4	40.8-141	4.37	23.8	L717673-03	WG739440
Toluene	mg/kg	0.224	0.234	89.3	49.8-132	4.42	23.5	L717673-03	WG739440
Total Xylene	mg/kg	0.690	0.719	89.8	41.2-140	4.09	23.7	L717673-03	WG739440
a,a,a-Trifluorotoluene(FID)				99.40	59-128				WG739440
a,a,a-Trifluorotoluene(PID)				103.0	54-144				WG739440
TPH (GC/FID) Low Fraction	mg/kg	21.4	21.3	75.5	28.5-138	0.390	23.6	L717673-03	WG739440
a,a,a-Trifluorotoluene(FID)				99.10	59-128				WG739440
a,a,a-Trifluorotoluene(PID)				110.0	54-144				WG739440
Mercury	mg/kg	0.486	0.461	90.1	80-120	5.00	20	L717652-02	WG739616
1-Methylnaphthalene	mg/kg	0.0545	0.0548	68.2	41.8-133	0.500	20.9	L717590-04	WG739555
2-Chloronaphthalene	mg/kg	0.0557	0.0571	69.6	42.4-129	2.49	20	L717590-04	WG739555
2-Methylnaphthalene	mg/kg	0.0531	0.0538	66.3	37.5-137	1.44	20.4	L717590-04	WG739555
Acenaphthene	mg/kg	0.0541	0.0564	67.6	39.4-132	4.08	20	L717590-04	WG739555
Acenaphthylene	mg/kg	0.0555	0.0575	69.3	41.3-132	3.65	20	L717590-04	WG739555
Anthracene	mg/kg	0.0556	0.0585	69.5	36.7-144	5.08	20.7	L717590-04	WG739555
Benzo(a)anthracene	mg/kg	0.0555	0.0601	67.5	28-144	7.95	24.7	L717590-04	WG739555
Benzo(a)pyrene	mg/kg	0.0545	0.0608	66.3	23.8-147	10.9	25.3	L717590-04	WG739555

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



YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
 Dave Nicholson
 1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
 Level II

L717970

12065 Lebanon Rd.
 Mt. Juliet, TN 37122
 (615) 758-5858
 1-800-767-5859
 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

August 29, 2014

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzo(b)fluoranthene	mg/kg	0.0545	0.0589	65.4	18.2-147	7.88	29.5	L717590-04	WG739555
Benzo(g,h,i)perylene	mg/kg	0.0530	0.0581	64.8	9.2-155	9.11	29.2	L717590-04	WG739555
Benzo(k)fluoranthene	mg/kg	0.0539	0.0564	66.5	26.5-143	4.56	26.1	L717590-04	WG739555
Chrysene	mg/kg	0.0583	0.0636	71.1	27.4-150	8.62	25.7	L717590-04	WG739555
Dibenz(a,h)anthracene	mg/kg	0.0530	0.0558	66.3	13.8-150	5.02	25.8	L717590-04	WG739555
Fluoranthene	mg/kg	0.0537	0.0600	64.0	23.2-158	11.2	26	L717590-04	WG739555
Fluorene	mg/kg	0.0551	0.0569	68.9	30.8-139	3.16	20	L717590-04	WG739555
Indeno(1,2,3-cd)pyrene	mg/kg	0.0536	0.0581	65.9	10.7-155	8.11	26.9	L717590-04	WG739555
Naphthalene	mg/kg	0.0568	0.0552	69.8	34.9-133	2.78	20.4	L717590-04	WG739555
Phenanthrene	mg/kg	0.0515	0.0547	63.1	20.2-150	6.07	24.6	L717590-04	WG739555
Pyrene	mg/kg	0.0544	0.0604	65.4	22.6-151	10.3	25.1	L717590-04	WG739555
2-Fluorobiphenyl				71.50	38.2-135				WG739555
Nitrobenzene-d5				87.70	28.4-151				WG739555
p-Terphenyl-d14				69.60	34.2-141				WG739555
Chromium,Hexavalent	mg/kg	19.8	19.8	99.0	75-125	0.0	20	L717970-03	WG739590
Arsenic	mg/kg	102.	101.	96.7	75-125	1.00	20	L717972-08	WG739899
Lead	mg/kg	106.	106.	95.6	75-125	0.0	20	L717972-08	WG739899
C10-C28 Diesel Range	mg/kg	37.6	47.0	44.3*	50-100	22.3*	20	L718370-09	WG739964
C28-C40 Oil Range	mg/kg	9.28	12.8	3.38*	50-100	32.1*	20	L718370-09	WG739964
o-Terphenyl				74.80	50-150				WG739964

Post Spike

Serial Dilution

Batch number /Run number / Sample number cross reference

WG739440: R2981533: L717970-01 02 03 04 05
 WG739555: R2981629 R2982060 R2982560: L717970-01 02 03 04 05
 WG739507: R2981852: L717970-01 02 03 04 05
 WG739508: R2981877: L717970-01 02 03 04 05
 WG739616: R2981957: L717970-01 02 03 04 05
 WG739590: R2982170: L717970-01 02 03 04 05
 WG739550: R2982179 R2982636: L717970-03 04 05
 WG739843: R2982189: L717970-01 02 03 04 05
 WG739899: R2982530: L717970-01 02 03 04 05
 WG739964: R2982771: L717970-01 02
 WG739902: R2982945: L717970-01 02 03 04 05

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

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

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

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