



**Nicholson GeoSolutions LLC**

3433 East Lake Drive

Centennial, CO 80121

November 21, 2015

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

**Subject: CD-32 Reserve Pit Soil Sample Results**

Dear Derek:

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

Sampling was conducted on November 9<sup>th</sup>, 2015. Figure 1 shows the approximate extent of the pit and the locations of the seven confirmation samples collected. Table 1 provides the analytical results and the laboratory analytical report is contained in Appendix A.

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 COGCC Table 910-1 standards.

A PID was used to screen the bottom and sidewalls of the pit and select sample locations. The PID readings ranged from 1.1 to 2.2 ppm on the bottom and from 0.4 to 1.3 ppm on the sidewalls. Seven discrete soil samples (CD-32 P1 through CD-32 P7) were collected to evaluate compliance with the standards. All parameters for the samples were below the COGCC standards, except for arsenic. Arsenic ranged from 6.22 to 7.97 mg/kg for the seven samples, within the range of natural background concentrations for the Garden Gulch/Old Mountain area.

Nicholson GeoSolutions LLC

A handwritten signature in blue ink that reads "DK Nicholson".

David K. Nicholson, P.G.  
Principal Geologist

**Table 1 CD-32 Pit Sample Results – November 9, 2015**

Parameter	Table 910-1 Standards	CD-32 P1	CD-32 P2	CD-32 P3	CD-32 P4	CD-32 P5	CD-32 P6	CD-32 P7
sp. conductance (mmhos/cm)	<4	0.932	0.966	0.741	0.939	0.391	0.791	0.658
pH (standard units)	6-9	7.51	8.44	8.44	8.42	8.65	8.52	8.53
SAR (ratio)	<12	5.49	5.79	7.75	7.20	1.94	5.55	3.58
TVPH – gasoline range	500 <sup>1</sup>	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	33.8
TEPH – diesel/motor oil range	500 <sup>1</sup>	22.6	114.6	107.4	50.6	45.7	69.3	112.7
benzene	0.17	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	0.0028	0.00254	<0.0025	<0.0025	<0.0025	<0.0025	0.0578
xylenes	175	0.0116	0.00954	<0.0075	<0.0075	<0.0075	<0.0075	0.240
benzo(a)pyrene	0.022	<0.003	<0.003	<0.006	<0.006	<0.003	<0.006	<0.006
arsenic	0.39	<b>6.87</b>	<b>7.97</b>	<b>7.25</b>	<b>6.22</b>	<b>6.74</b>	<b>6.46</b>	<b>7.79</b>

<sup>1</sup>The 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

June  
2015

GeoSolutions  
NICHOLSON

### Legend

• Confirmation sample



Land Farm Perimeter

0 50 100 200 Feet 1" = 100'

**Linn Energy, LLC**

CD-32  
1.25 Acres

PIT INVESTIGATION



**APPENDIX A**  
**Laboratory Report**



12065 Lebanon Rd.  
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Est. 1970

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

## Report Summary

Friday November 20, 2015

Report Number: L800481

Samples Received: 11/12/15

Client Project:

Description: Linn Energy 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 - 1461-01,1461-02, 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

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

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# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
  
Sample ID : CD-32 P1  
  
Collected By : David Cox  
Collection Date : 11/09/15 11:45

ESC Sample # : L800481-01  
  
Site ID :  
  
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.00	mg/kg	3060A/7196A	11/14/15	1
ORP	155.		mV	2580 B-2011	11/14/15	1
pH	7.51	0.100	su	9045D	11/13/15	1
Sodium Adsorption Ratio	5.49			Calc	11/15/15	1
Specific Conductance	932.		umhos/cm	9050AMod	11/16/15	1
Mercury	0.0217	0.0200	mg/kg	7471A	11/16/15	1
Arsenic	6.87	2.00	mg/kg	6010B	11/15/15	1
Barium	389.	0.500	mg/kg	6010B	11/15/15	1
Boron	BDL	10.0	mg/kg	6010B	11/15/15	1
Cadmium	BDL	0.500	mg/kg	6010B	11/15/15	1
Chromium	15.7	1.00	mg/kg	6010B	11/15/15	1
Copper	19.7	2.00	mg/kg	6010B	11/15/15	1
Lead	13.9	0.500	mg/kg	6010B	11/15/15	1
Nickel	14.6	2.00	mg/kg	6010B	11/15/15	1
Selenium	BDL	2.00	mg/kg	6010B	11/15/15	1
Silver	BDL	1.00	mg/kg	6010B	11/15/15	1
Zinc	42.8	5.00	mg/kg	6010B	11/15/15	1
Benzene	BDL	0.00250	mg/kg	8021	11/13/15	5
Toluene	BDL	0.0250	mg/kg	8021	11/13/15	5
Ethylbenzene	0.00280	0.00250	mg/kg	8021	11/13/15	5
Total Xylene	0.0116	0.00750	mg/kg	8021	11/13/15	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	11/13/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015	11/13/15	1
a,a,a-Trifluorotoluene(PID)	90.7		% Rec.	8021	11/13/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	22.6	20.0	mg/kg	8015	11/13/15	5
C28-C40 Oil Range	BDL	20.0	mg/kg	8015	11/13/15	5
Surrogate Recovery						
o-Terphenyl	62.7		% Rec.	8015	11/13/15	5
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Acenaphthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Acenaphthylene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(a)anthracene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L800481-01 (SV8270PAHSIM) - Dilution due to matrix  
L800481-01 (DRORLA) - Cannot run at lower dilution due to viscosity of extract  
L800481-01 (PH) - 7.51 at 23.4c



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Collected By : David Cox  
Collection Date : 11/09/15 11:45

ESC Sample # : L800481-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.00300	mg/kg	8270C-SIM	11/14/15	5
Benzo(b)fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(g,h,i)perylene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(k)fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Chrysene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Dibenz(a,h)anthracene	BDL	0.00300	mg/kg	8270C-SIM	11/14/15	5
Fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Fluorene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Indeno(1,2,3-cd)pyrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Naphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
Phenanthrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Pyrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
1-Methylnaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
2-Methylnaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
2-Chloronaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
Surrogate Recovery						
p-Terphenyl-d14	53.5		% Rec.	8270C-SIM	11/14/15	5
Nitrobenzene-d5	75.6		% Rec.	8270C-SIM	11/14/15	5
2-Fluorobiphenyl	71.6		% Rec.	8270C-SIM	11/14/15	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 11/19/15 12:43 Revised: 11/20/15 12:51

L800481-01 (SV8270PAHSIM) - Dilution due to matrix

L800481-01 (DRORLA) - Cannot run at lower dilution due to viscosity of extract

L800481-01 (PH) - 7.51 at 23.4c



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# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P2  
Collected By : David Cox  
Collection Date : 11/09/15 12:00

ESC Sample # : L800481-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.00	mg/kg	3060A/7196A	11/14/15	1
ORP	151.		mV	2580 B-2011	11/14/15	1
pH	8.44	0.100	su	9045D	11/13/15	1
Sodium Adsorption Ratio	5.79			Calc	11/15/15	1
Specific Conductance	966.		umhos/cm	9050AMod	11/16/15	1
Mercury	0.0224	0.0200	mg/kg	7471A	11/16/15	1
Arsenic	7.97	2.00	mg/kg	6010B	11/15/15	1
Barium	366.	0.500	mg/kg	6010B	11/15/15	1
Boron	BDL	10.0	mg/kg	6010B	11/15/15	1
Cadmium	BDL	0.500	mg/kg	6010B	11/15/15	1
Chromium	16.5	1.00	mg/kg	6010B	11/15/15	1
Copper	21.3	2.00	mg/kg	6010B	11/15/15	1
Lead	15.0	0.500	mg/kg	6010B	11/15/15	1
Nickel	15.5	2.00	mg/kg	6010B	11/15/15	1
Selenium	BDL	2.00	mg/kg	6010B	11/15/15	1
Silver	BDL	1.00	mg/kg	6010B	11/15/15	1
Zinc	45.5	5.00	mg/kg	6010B	11/15/15	1
Benzene	BDL	0.00250	mg/kg	8021	11/14/15	5
Toluene	BDL	0.0250	mg/kg	8021	11/14/15	5
Ethylbenzene	0.00254	0.00250	mg/kg	8021	11/14/15	5
Total Xylene	0.00954	0.00750	mg/kg	8021	11/14/15	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	11/14/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.8		% Rec.	8015	11/14/15	1
a,a,a-Trifluorotoluene(PID)	90.3		% Rec.	8021	11/14/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	60.0	40.0	mg/kg	8015	11/13/15	10
C28-C40 Oil Range	54.6	40.0	mg/kg	8015	11/13/15	10
Surrogate Recovery						
o-Terphenyl	43.6		% Rec.	8015	11/13/15	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Acenaphthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Acenaphthylene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(a)anthracene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L800481-02 (PH) - 8.44 at 23.6c  
L800481-02 (SV8270PAHSIM) - Dilution due to matrix





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November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P2  
Collected By : David Cox  
Collection Date : 11/09/15 12:00

ESC Sample # : L800481-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.00300	mg/kg	8270C-SIM	11/14/15	5
Benzo(b)fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(g,h,i)perylene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(k)fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Chrysene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Dibenz(a,h)anthracene	BDL	0.00300	mg/kg	8270C-SIM	11/14/15	5
Fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Fluorene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Indeno(1,2,3-cd)pyrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Naphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
Phenanthrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Pyrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
1-Methylnaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
2-Methylnaphthalene	0.126	0.100	mg/kg	8270C-SIM	11/14/15	5
2-Chloronaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
Surrogate Recovery						
p-Terphenyl-d14	59.6		% Rec.	8270C-SIM	11/14/15	5
Nitrobenzene-d5	86.8		% Rec.	8270C-SIM	11/14/15	5
2-Fluorobiphenyl	76.5		% Rec.	8270C-SIM	11/14/15	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 11/19/15 12:43 Revised: 11/20/15 12:51

L800481-02 (PH) - 8.44 at 23.6c

L800481-02 (SV8270PAHSIM) - Dilution due to matrix



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# REPORT OF ANALYSIS

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Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P3  
Collected By : David Cox  
Collection Date : 11/09/15 12:15

ESC Sample # : L800481-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.00	mg/kg	3060A/7196A	11/14/15	1
ORP	137.		mV	2580 B-2011	11/14/15	1
pH	8.44	0.100	su	9045D	11/13/15	1
Sodium Adsorption Ratio	7.75			Calc	11/15/15	1
Specific Conductance	741.		umhos/cm	9050AMod	11/16/15	1
Mercury	0.0238	0.0200	mg/kg	7471A	11/16/15	1
Arsenic	7.25	2.00	mg/kg	6010B	11/15/15	1
Barium	490.	0.500	mg/kg	6010B	11/15/15	1
Boron	BDL	10.0	mg/kg	6010B	11/15/15	1
Cadmium	BDL	0.500	mg/kg	6010B	11/15/15	1
Chromium	15.2	1.00	mg/kg	6010B	11/15/15	1
Copper	20.1	2.00	mg/kg	6010B	11/15/15	1
Lead	16.7	0.500	mg/kg	6010B	11/15/15	1
Nickel	17.2	2.00	mg/kg	6010B	11/15/15	1
Selenium	BDL	2.00	mg/kg	6010B	11/15/15	1
Silver	BDL	1.00	mg/kg	6010B	11/15/15	1
Zinc	40.6	5.00	mg/kg	6010B	11/15/15	1
Benzene	BDL	0.00250	mg/kg	8021	11/14/15	5
Toluene	BDL	0.0250	mg/kg	8021	11/14/15	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	11/14/15	5
Total Xylene	BDL	0.00750	mg/kg	8021	11/14/15	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	11/14/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	11/14/15	1
a,a,a-Trifluorotoluene(PID)	92.3		% Rec.	8021	11/14/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	61.4	40.0	mg/kg	8015	11/13/15	10
C28-C40 Oil Range	46.0	40.0	mg/kg	8015	11/13/15	10
Surrogate Recovery						
o-Terphenyl	53.8		% Rec.	8015	11/13/15	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(a)anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L800481-03 (SV8270PAHSIM) - Dilution due to matrix  
L800481-03 (PH) - 8.44 at 23.7c



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Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P3  
Collected By : David Cox  
Collection Date : 11/09/15 12:15

ESC Sample # : L800481-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Benzo(b)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(g,h,i)perylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(k)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Chrysene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Dibenz(a,h)anthracene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Fluorene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Indeno(1,2,3-cd)pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Naphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Phenanthrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
1-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Chloronaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Surrogate Recovery						
p-Terphenyl-d14	53.9		% Rec.	8270C-SIM	11/14/15	10
Nitrobenzene-d5	73.3		% Rec.	8270C-SIM	11/14/15	10
2-Fluorobiphenyl	70.6		% Rec.	8270C-SIM	11/14/15	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 11/19/15 12:43 Revised: 11/20/15 12:51  
L800481-03 (SV8270PAHSIM) - Dilution due to matrix  
L800481-03 (PH) - 8.44 at 23.7c



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Tax I.D. 62-0814289

Est. 1970

# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P4  
Collected By : David Cox  
Collection Date : 11/09/15 12:30

ESC Sample # : L800481-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.00	mg/kg	3060A/7196A	11/14/15	1
ORP	135.		mV	2580 B-2011	11/14/15	1
pH	8.42	0.100	su	9045D	11/13/15	1
Sodium Adsorption Ratio	7.20			Calc	11/15/15	1
Specific Conductance	939.		umhos/cm	9050AMod	11/16/15	1
Mercury	0.0268	0.0200	mg/kg	7471A	11/16/15	1
Arsenic	6.22	2.00	mg/kg	6010B	11/15/15	1
Barium	451.	0.500	mg/kg	6010B	11/15/15	1
Boron	BDL	10.0	mg/kg	6010B	11/15/15	1
Cadmium	BDL	0.500	mg/kg	6010B	11/15/15	1
Chromium	16.4	1.00	mg/kg	6010B	11/15/15	1
Copper	19.3	2.00	mg/kg	6010B	11/15/15	1
Lead	14.8	0.500	mg/kg	6010B	11/15/15	1
Nickel	16.1	2.00	mg/kg	6010B	11/15/15	1
Selenium	BDL	2.00	mg/kg	6010B	11/15/15	1
Silver	BDL	1.00	mg/kg	6010B	11/15/15	1
Zinc	42.0	5.00	mg/kg	6010B	11/15/15	1
Benzene	BDL	0.00250	mg/kg	8021	11/14/15	5
Toluene	BDL	0.0250	mg/kg	8021	11/14/15	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	11/14/15	5
Total Xylene	BDL	0.00750	mg/kg	8021	11/14/15	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	11/14/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.3		% Rec.	8015	11/14/15	1
a,a,a-Trifluorotoluene(PID)	92.7		% Rec.	8021	11/14/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	50.6	40.0	mg/kg	8015	11/13/15	10
C28-C40 Oil Range	BDL	40.0	mg/kg	8015	11/13/15	10
Surrogate Recovery						
o-Terphenyl	48.0		% Rec.	8015	11/13/15	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(a)anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

L800481-04 (PH) - 8.42 at 24.2c

L800481-04 (SV8270PAHSIM) - Dilution due to matrix

L800481-04 (DRORLA) - Cannot run at lower dilution due to viscosity of extract





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# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
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November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P4  
Collected By : David Cox  
Collection Date : 11/09/15 12:30

ESC Sample # : L800481-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Benzo(b)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(g,h,i)perylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(k)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Chrysene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Dibenz(a,h)anthracene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Fluorene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Indeno(1,2,3-cd)pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Naphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Phenanthrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
1-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Chloronaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Surrogate Recovery						
p-Terphenyl-d14	61.1		% Rec.	8270C-SIM	11/14/15	10
Nitrobenzene-d5	75.1		% Rec.	8270C-SIM	11/14/15	10
2-Fluorobiphenyl	78.3		% Rec.	8270C-SIM	11/14/15	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 11/19/15 12:43 Revised: 11/20/15 12:51

L800481-04 (PH) - 8.42 at 24.2c

L800481-04 (SV8270PAHSIM) - Dilution due to matrix

L800481-04 (DRORLA) - Cannot run at lower dilution due to viscosity of extract



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# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P5  
Collected By : David Cox  
Collection Date : 11/09/15 12:40

ESC Sample # : L800481-05

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.00	mg/kg	3060A/7196A	11/14/15	1
ORP	131.		mV	2580 B-2011	11/14/15	1
pH	8.65	0.100	su	9045D	11/13/15	1
Sodium Adsorption Ratio	1.94			Calc	11/15/15	1
Specific Conductance	391.		umhos/cm	9050AMod	11/16/15	1
Mercury	0.0258	0.0200	mg/kg	7471A	11/16/15	1
Arsenic	6.74	2.00	mg/kg	6010B	11/15/15	1
Barium	431.	0.500	mg/kg	6010B	11/15/15	1
Boron	BDL	10.0	mg/kg	6010B	11/15/15	1
Cadmium	BDL	0.500	mg/kg	6010B	11/15/15	1
Chromium	15.0	1.00	mg/kg	6010B	11/15/15	1
Copper	17.0	2.00	mg/kg	6010B	11/15/15	1
Lead	15.4	0.500	mg/kg	6010B	11/15/15	1
Nickel	14.7	2.00	mg/kg	6010B	11/15/15	1
Selenium	BDL	2.00	mg/kg	6010B	11/15/15	1
Silver	BDL	1.00	mg/kg	6010B	11/15/15	1
Zinc	36.7	5.00	mg/kg	6010B	11/15/15	1
Benzene	BDL	0.00250	mg/kg	8021	11/14/15	5
Toluene	BDL	0.0250	mg/kg	8021	11/14/15	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	11/14/15	5
Total Xylene	BDL	0.00750	mg/kg	8021	11/14/15	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	11/14/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.8		% Rec.	8015	11/14/15	1
a,a,a-Trifluorotoluene(PID)	91.9		% Rec.	8021	11/14/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	19.2	16.1	mg/kg	8015	11/13/15	10
C28-C40 Oil Range	36.5	2.74	mg/kg	8015	11/13/15	10
Surrogate Recovery						
o-Terphenyl	66.3		% Rec.	8015	11/13/15	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Acenaphthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Acenaphthylene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(a)anthracene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

L800481-05 (DRORLA) - Cannot run at lower dilution due to viscosity of extract

L800481-05 (SV8270PAHSIM) - Dilution due to matrix

L800481-05 (PH) - 8.65 at 24.2c



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# REPORT OF ANALYSIS

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November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P5  
Collected By : David Cox  
Collection Date : 11/09/15 12:40

ESC Sample # : L800481-05

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.00300	mg/kg	8270C-SIM	11/14/15	5
Benzo(b)fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(g,h,i)perylene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Benzo(k)fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Chrysene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Dibenz(a,h)anthracene	BDL	0.00300	mg/kg	8270C-SIM	11/14/15	5
Fluoranthene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Fluorene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Indeno(1,2,3-cd)pyrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Naphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
Phenanthrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
Pyrene	BDL	0.0300	mg/kg	8270C-SIM	11/14/15	5
1-Methylnaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
2-Methylnaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
2-Chloronaphthalene	BDL	0.100	mg/kg	8270C-SIM	11/14/15	5
Surrogate Recovery						
p-Terphenyl-d14	56.8		% Rec.	8270C-SIM	11/14/15	5
Nitrobenzene-d5	80.3		% Rec.	8270C-SIM	11/14/15	5
2-Fluorobiphenyl	76.1		% Rec.	8270C-SIM	11/14/15	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 11/19/15 12:43 Revised: 11/20/15 12:51

L800481-05 (DRORLA) - Cannot run at lower dilution due to viscosity of extract

L800481-05 (SV8270PAHSIM) - Dilution due to matrix

L800481-05 (PH) - 8.65 at 24.2c



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# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P6  
Collected By : David Cox  
Collection Date : 11/09/15 12:55

ESC Sample # : L800481-06

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.00	mg/kg	3060A/7196A	11/14/15	1
ORP	125.		mV	2580 B-2011	11/14/15	1
pH	8.52	0.100	su	9045D	11/13/15	1
Sodium Adsorption Ratio	5.55			Calc	11/15/15	1
Specific Conductance	791.		umhos/cm	9050AMod	11/16/15	1
Mercury	0.0431	0.0200	mg/kg	7471A	11/16/15	1
Arsenic	6.46	2.00	mg/kg	6010B	11/15/15	1
Barium	477.	0.500	mg/kg	6010B	11/15/15	1
Boron	BDL	10.0	mg/kg	6010B	11/15/15	1
Cadmium	BDL	0.500	mg/kg	6010B	11/15/15	1
Chromium	14.5	1.00	mg/kg	6010B	11/15/15	1
Copper	19.1	2.00	mg/kg	6010B	11/15/15	1
Lead	16.5	0.500	mg/kg	6010B	11/15/15	1
Nickel	15.3	2.00	mg/kg	6010B	11/15/15	1
Selenium	BDL	2.00	mg/kg	6010B	11/15/15	1
Silver	BDL	1.00	mg/kg	6010B	11/15/15	1
Zinc	38.6	5.00	mg/kg	6010B	11/15/15	1
Benzene	BDL	0.00250	mg/kg	8021	11/17/15	5
Toluene	BDL	0.0250	mg/kg	8021	11/17/15	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	11/17/15	5
Total Xylene	BDL	0.00750	mg/kg	8021	11/17/15	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	11/17/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	102.		% Rec.	8015	11/17/15	1
a,a,a-Trifluorotoluene(PID)	94.6		% Rec.	8021	11/17/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	69.3	40.0	mg/kg	8015	11/13/15	10
C28-C40 Oil Range	BDL	40.0	mg/kg	8015	11/13/15	10
Surrogate Recovery						
o-Terphenyl	37.5		% Rec.	8015	11/13/15	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(a)anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

L800481-06 (SV8270PAHSIM) - Dilution due to matrix

L800481-06 (PH) - 8.52 at 24.1c

L800481-06 (DRORLA) - Cannot run at lower dilution due to viscosity of extract





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# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P6  
Collected By : David Cox  
Collection Date : 11/09/15 12:55

ESC Sample # : L800481-06

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Benzo(b)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(g,h,i)perylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(k)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Chrysene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Dibenz(a,h)anthracene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Fluorene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Indeno(1,2,3-cd)pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Naphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Phenanthrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
1-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Chloronaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Surrogate Recovery						
p-Terphenyl-d14	55.9		% Rec.	8270C-SIM	11/14/15	10
Nitrobenzene-d5	89.9		% Rec.	8270C-SIM	11/14/15	10
2-Fluorobiphenyl	78.9		% Rec.	8270C-SIM	11/14/15	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 11/19/15 12:43 Revised: 11/20/15 12:51

L800481-06 (SV8270PAHSIM) - Dilution due to matrix

L800481-06 (PH) - 8.52 at 24.1c

L800481-06 (DRORLA) - Cannot run at lower dilution due to viscosity of extract



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Est. 1970

# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
  
Sample ID : CD-32 P7  
  
Collected By : David Cox  
Collection Date : 11/09/15 13:10

ESC Sample # : L800481-07  
  
Site ID :  
  
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.00	mg/kg	3060A/7196A	11/14/15	1
ORP	121.		mV	2580 B-2011	11/14/15	1
pH	8.53	0.100	su	9045D	11/13/15	1
Sodium Adsorption Ratio	3.58			Calc	11/15/15	1
Specific Conductance	658.		umhos/cm	9050AMod	11/16/15	1
Mercury	0.0242	0.0200	mg/kg	7471A	11/16/15	1
Arsenic	7.79	2.00	mg/kg	6010B	11/15/15	1
Barium	369.	0.500	mg/kg	6010B	11/15/15	1
Boron	BDL	10.0	mg/kg	6010B	11/15/15	1
Cadmium	BDL	0.500	mg/kg	6010B	11/15/15	1
Chromium	13.6	1.00	mg/kg	6010B	11/15/15	1
Copper	19.3	2.00	mg/kg	6010B	11/15/15	1
Lead	13.9	0.500	mg/kg	6010B	11/15/15	1
Nickel	13.2	2.00	mg/kg	6010B	11/15/15	1
Selenium	BDL	2.00	mg/kg	6010B	11/15/15	1
Silver	BDL	1.00	mg/kg	6010B	11/15/15	1
Zinc	36.0	5.00	mg/kg	6010B	11/15/15	1
Benzene	BDL	0.00250	mg/kg	8021	11/17/15	5
Toluene	BDL	0.0250	mg/kg	8021	11/17/15	5
Ethylbenzene	0.0578	0.00250	mg/kg	8021	11/17/15	5
Total Xylene	0.240	0.00750	mg/kg	8021	11/17/15	5
TPH (GC/FID) Low Fraction	33.8	0.500	mg/kg	8015	11/17/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.1		% Rec.	8015	11/17/15	1
a,a,a-Trifluorotoluene(PID)	86.3		% Rec.	8021	11/17/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	51.8	40.0	mg/kg	8015	11/13/15	10
C28-C40 Oil Range	60.9	40.0	mg/kg	8015	11/13/15	10
Surrogate Recovery						
o-Terphenyl	52.3		% Rec.	8015	11/13/15	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Acenaphthylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(a)anthracene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10

BDL - Below Detection Limit  
Det. Limit - Practical Quantitation Limit(PQL)  
L800481-07 (PH) - 8.53 at 24.0c  
L800481-07 (SV8270PAHSIM) - Dilution due to matrix



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Tax I.D. 62-0814289

Est. 1970

# REPORT OF ANALYSIS

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

November 20, 2015

Date Received : November 12, 2015  
Description : Linn Energy Reclamation  
Sample ID : CD-32 P7  
Collected By : David Cox  
Collection Date : 11/09/15 13:10

ESC Sample # : L800481-07

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)pyrene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Benzo(b)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(g,h,i)perylene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Benzo(k)fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Chrysene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Dibenz(a,h)anthracene	BDL	0.00600	mg/kg	8270C-SIM	11/14/15	10
Fluoranthene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Fluorene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Indeno(1,2,3-cd)pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Naphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Phenanthrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
Pyrene	BDL	0.0600	mg/kg	8270C-SIM	11/14/15	10
1-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Methylnaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
2-Chloronaphthalene	BDL	0.200	mg/kg	8270C-SIM	11/14/15	10
Surrogate Recovery						
p-Terphenyl-d14	60.9		% Rec.	8270C-SIM	11/14/15	10
Nitrobenzene-d5	81.2		% Rec.	8270C-SIM	11/14/15	10
2-Fluorobiphenyl	77.3		% Rec.	8270C-SIM	11/14/15	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 11/19/15 12:43 Revised: 11/20/15 12:51

L800481-07 (PH) - 8.53 at 24.0c

L800481-07 (SV8270PAHSIM) - Dilution due to matrix

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L800481-01	WG828646	SAMP	Benzo(a)pyrene	R3093104	U
	WG828646	SAMP	Dibenz(a,h)anthracene	R3093104	U
L800481-02	WG828646	SAMP	Benzo(a)pyrene	R3093104	U
	WG828646	SAMP	Dibenz(a,h)anthracene	R3093104	U
L800481-03	WG828638	SAMP	o-Terphenyl	R3092940	J2
	WG828646	SAMP	Benzo(a)pyrene	R3093104	U
	WG828646	SAMP	Dibenz(a,h)anthracene	R3093104	U
L800481-04	WG828646	SAMP	Benzo(a)pyrene	R3093104	U
	WG828646	SAMP	Dibenz(a,h)anthracene	R3093104	U
	WG828638	SAMP	o-Terphenyl	R3092940	J2
L800481-05	WG828614	SAMP	Chromium,Hexavalent	R3093028	J6
	WG828646	SAMP	Benzo(a)pyrene	R3093104	U
	WG828646	SAMP	Dibenz(a,h)anthracene	R3093104	U
	WG828849	SAMP	Barium	R3093078	VJ3
	WG828638	SAMP	C10-C28 Diesel Range	R3092940	J
L800481-06	WG828638	SAMP	C28-C40 Oil Range	R3092940	J
	WG829590	SAMP	Ethylbenzene	R3093730	J3
	WG829590	SAMP	Total Xylene	R3093730	J3
	WG828646	SAMP	Benzo(a)pyrene	R3093104	U
	WG828646	SAMP	Dibenz(a,h)anthracene	R3093104	U
L800481-07	WG828638	SAMP	o-Terphenyl	R3092940	J2
	WG828646	SAMP	Benzo(a)pyrene	R3093104	U
	WG828646	SAMP	Dibenz(a,h)anthracene	R3093104	U



Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
U	BDL (EPA) - Below Detectable Limits: Indicates that the compound was analyzed but not detected.
V	(ESC) - Additional QC Info: The sample concentration is too high to evaluate accurate spike recoveries.

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.



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
C10-C28 Diesel Range	< 4	mg/kg			WG828638	11/13/15 10:31
C28-C40 Oil Range	< 4	mg/kg			WG828638	11/13/15 10:31
o-Terphenyl		% Rec.	83.50	50-150	WG828638	11/13/15 10:31
Chromium, Hexavalent	< 2	mg/kg			WG828614	11/14/15 15:05
Arsenic	< 2	mg/kg			WG828849	11/15/15 03:34
Barium	< .5	mg/kg			WG828849	11/15/15 03:34
Boron	< 10	mg/kg			WG828849	11/15/15 03:34
Cadmium	< .5	mg/kg			WG828849	11/15/15 03:34
Chromium	< 1	mg/kg			WG828849	11/15/15 03:34
Copper	< 2	mg/kg			WG828849	11/15/15 03:34
Lead	< .5	mg/kg			WG828849	11/15/15 03:34
Nickel	< 2	mg/kg			WG828849	11/15/15 03:34
Selenium	< 2	mg/kg			WG828849	11/15/15 03:34
Silver	< 1	mg/kg			WG828849	11/15/15 03:34
Zinc	< 5	mg/kg			WG828849	11/15/15 03:34
1-Methylnaphthalene	< .02	mg/kg			WG828646	11/14/15 00:57
2-Chloronaphthalene	< .02	mg/kg			WG828646	11/14/15 00:57
2-Methylnaphthalene	< .02	mg/kg			WG828646	11/14/15 00:57
Acenaphthene	< .006	mg/kg			WG828646	11/14/15 00:57
Acenaphthylene	< .006	mg/kg			WG828646	11/14/15 00:57
Anthracene	< .006	mg/kg			WG828646	11/14/15 00:57
Benzo(a)anthracene	< .006	mg/kg			WG828646	11/14/15 00:57
Benzo(a)pyrene	< .006	mg/kg			WG828646	11/14/15 00:57
Benzo(b)fluoranthene	< .006	mg/kg			WG828646	11/14/15 00:57
Benzo(g,h,i)perylene	< .006	mg/kg			WG828646	11/14/15 00:57
Benzo(k)fluoranthene	< .006	mg/kg			WG828646	11/14/15 00:57
Chrysene	< .006	mg/kg			WG828646	11/14/15 00:57
Dibenz(a,h)anthracene	< .006	mg/kg			WG828646	11/14/15 00:57
Fluoranthene	< .006	mg/kg			WG828646	11/14/15 00:57
Fluorene	< .006	mg/kg			WG828646	11/14/15 00:57
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG828646	11/14/15 00:57
Naphthalene	< .02	mg/kg			WG828646	11/14/15 00:57
Phenanthrene	< .006	mg/kg			WG828646	11/14/15 00:57
Pyrene	< .006	mg/kg			WG828646	11/14/15 00:57
2-Fluorobiphenyl		% Rec.	81.80	40.6-122	WG828646	11/14/15 00:57
Nitrobenzene-d5		% Rec.	81.30	22.1-146	WG828646	11/14/15 00:57
p-Terphenyl-d14		% Rec.	71.80	32.2-131	WG828646	11/14/15 00:57
Benzene	< .0005	mg/kg			WG828789	11/13/15 09:47
Ethylbenzene	< .0005	mg/kg			WG828789	11/13/15 09:47
Toluene	< .005	mg/kg			WG828789	11/13/15 09:47
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG828789	11/13/15 09:47
Total Xylene	< .0015	mg/kg			WG828789	11/13/15 09:47
a,a,a-Trifluorotoluene(FID)		% Rec.	100.0	59-128	WG828789	11/13/15 09:47
a,a,a-Trifluorotoluene(PID)		% Rec.	93.50	54-144	WG828789	11/13/15 09:47
Mercury	< .02	mg/kg			WG829052	11/16/15 10:21
Specific Conductance	1.18	umhos/cm			WG829097	11/16/15 12:31

\* Performance of this Analyte is outside of established criteria.

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



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG829590	11/17/15 12:46
Ethylbenzene	< .0005	mg/kg			WG829590	11/17/15 12:46
Toluene	< .005	mg/kg			WG829590	11/17/15 12:46
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG829590	11/17/15 12:46
Total Xylene	< .0015	mg/kg			WG829590	11/17/15 12:46
a,a,a-Trifluorotoluene(FID)		% Rec.	99.90	59-128	WG829590	11/17/15 12:46
a,a,a-Trifluorotoluene(PID)		% Rec.	92.20	54-144	WG829590	11/17/15 12:46

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Chromium,Hexavalent	mg/kg	0.00	0.00	0.00	20	L800481-05	WG828614
ORP	mV	106.	106.	0.00	20	L800677-01	WG828965
Specific Conductance	umhos/cm	930.	932.	0.215	20	L800481-01	WG829097
Specific Conductance	umhos/cm	169.	167.	1.19	20	L801058-03	WG829097
pH	su	7.51	7.51	0.00	1	L800481-01	WG828788

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
C10-C28 Diesel Range	mg/kg	60	51.1	85.1	50-100	WG828638
o-Terphenyl				84.60	50-150	WG828638
Chromium,Hexavalent	mg/kg	59.8	64.2	107.	80-120	WG828614
Arsenic	mg/kg	100	102.	102.	80-120	WG828849
Barium	mg/kg	100	104.	104.	80-120	WG828849
Boron	mg/kg	100	106.	106.	80-120	WG828849
Cadmium	mg/kg	100	105.	105.	80-120	WG828849
Chromium	mg/kg	100	105.	105.	80-120	WG828849
Copper	mg/kg	100	107.	107.	80-120	WG828849
Lead	mg/kg	100	106.	106.	80-120	WG828849
Nickel	mg/kg	100	104.	104.	80-120	WG828849
Selenium	mg/kg	100	108.	108.	80-120	WG828849
Silver	mg/kg	100	97.8	98.0	80-120	WG828849
Zinc	mg/kg	100	103.	103.	80-120	WG828849
1-Methylnaphthalene	mg/kg	.08	0.0671	83.9	50.6-122	WG828646
2-Chloronaphthalene	mg/kg	.08	0.0676	84.6	53.9-121	WG828646
2-Methylnaphthalene	mg/kg	.08	0.0668	83.6	50.4-120	WG828646
Acenaphthene	mg/kg	.08	0.0709	88.6	52.4-120	WG828646
Acenaphthylene	mg/kg	.08	0.0716	89.5	49.6-120	WG828646
Anthracene	mg/kg	.08	0.0598	74.7	50.3-130	WG828646
Benzo(a)anthracene	mg/kg	.08	0.0689	86.1	46.7-125	WG828646
Benzo(a)pyrene	mg/kg	.08	0.0597	74.6	42.3-119	WG828646
Benzo(b)fluoranthene	mg/kg	.08	0.0710	88.8	43.6-124	WG828646
Benzo(g,h,i)perylene	mg/kg	.08	0.0621	77.7	45.1-132	WG828646
Benzo(k)fluoranthene	mg/kg	.08	0.0660	82.5	46.1-131	WG828646
Chrysene	mg/kg	.08	0.0684	85.4	49.5-131	WG828646

\* Performance of this Analyte is outside of established criteria.

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



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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Dibenz(a,h)anthracene	mg/kg	.08	0.0629	78.7	44.8-133	WG828646
Fluoranthene	mg/kg	.08	0.0667	83.3	49.3-128	WG828646
Fluorene	mg/kg	.08	0.0699	87.4	50.6-121	WG828646
Indeno(1,2,3-cd)pyrene	mg/kg	.08	0.0632	79.1	46.1-135	WG828646
Naphthalene	mg/kg	.08	0.0608	76.0	49.6-115	WG828646
Phenanthrene	mg/kg	.08	0.0598	74.7	48.8-121	WG828646
Pyrene	mg/kg	.08	0.0669	83.6	44.7-130	WG828646
2-Fluorobiphenyl				93.30	40.6-122	WG828646
Nitrobenzene-d5				104.0	22.1-146	WG828646
p-Terphenyl-d14				77.00	32.2-131	WG828646
Benzene	mg/kg	.05	0.0531	106.	70-130	WG828789
Ethylbenzene	mg/kg	.05	0.0527	105.	70-130	WG828789
Toluene	mg/kg	.05	0.0509	102.	70-130	WG828789
Total Xylene	mg/kg	.15	0.163	108.	70-130	WG828789
a,a,a-Trifluorotoluene(PID)				101.0	54-144	WG828789
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.61	102.	63.5-137	WG828789
a,a,a-Trifluorotoluene(FID)				102.0	59-128	WG828789
Mercury	mg/kg	.3	0.245	82.0	80-120	WG829052
ORP	mV	100	94.0	94.0	90-110	WG828965
Specific Conductance	umhos/cm	915	947.	103.	90-110	WG829097
pH	su	6.72	6.72	100.	98.5-101.5	WG828788
Benzene	mg/kg	.05	0.0513	103.	70-130	WG829590
Ethylbenzene	mg/kg	.05	0.0507	101.	70-130	WG829590
Toluene	mg/kg	.05	0.0490	98.0	70-130	WG829590
Total Xylene	mg/kg	.15	0.157	105.	70-130	WG829590
a,a,a-Trifluorotoluene(PID)				102.0	54-144	WG829590
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.35	97.3	63.5-137	WG829590
a,a,a-Trifluorotoluene(FID)				104.0	59-128	WG829590

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
C10-C28 Diesel Range	mg/kg	51.4	51.1	86.0	50-100	0.610	20	WG828638
o-Terphenyl				82.30	50-150			WG828638
Chromium,Hexavalent	mg/kg	65.0	64.2	109.	80-120	1.24	20	WG828614
Arsenic	mg/kg	93.4	102.	93.0	80-120	8.00	20	WG828849
Barium	mg/kg	95.3	104.	95.0	80-120	9.00	20	WG828849
Boron	mg/kg	96.9	106.	97.0	80-120	9.00	20	WG828849
Cadmium	mg/kg	96.4	105.	96.0	80-120	8.00	20	WG828849
Chromium	mg/kg	96.5	105.	96.0	80-120	8.00	20	WG828849
Copper	mg/kg	97.6	107.	98.0	80-120	9.00	20	WG828849
Lead	mg/kg	98.0	106.	98.0	80-120	8.00	20	WG828849
Nickel	mg/kg	95.5	104.	95.0	80-120	9.00	20	WG828849

\* Performance of this Analyte is outside of established criteria.

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Selenium	mg/kg	98.9	108.	99.0	80-120	8.00	20	WG828849
Silver	mg/kg	90.2	97.8	90.0	80-120	8.00	20	WG828849
Zinc	mg/kg	94.3	103.	94.0	80-120	9.00	20	WG828849
1-Methylnaphthalene	mg/kg	0.0654	0.0671	82.0	50.6-122	2.59	20	WG828646
2-Chloronaphthalene	mg/kg	0.0660	0.0676	82.0	53.9-121	2.43	20	WG828646
2-Methylnaphthalene	mg/kg	0.0666	0.0668	83.0	50.4-120	0.380	20	WG828646
Acenaphthene	mg/kg	0.0703	0.0709	88.0	52.4-120	0.900	20	WG828646
Acenaphthylene	mg/kg	0.0673	0.0716	84.0	49.6-120	6.14	20	WG828646
Anthracene	mg/kg	0.0596	0.0598	74.0	50.3-130	0.240	20	WG828646
Benzo(a)anthracene	mg/kg	0.0705	0.0689	88.0	46.7-125	2.39	20	WG828646
Benzo(a)pyrene	mg/kg	0.0595	0.0597	74.0	42.3-119	0.260	20	WG828646
Benzo(b)fluoranthene	mg/kg	0.0616	0.0710	77.0	43.6-124	14.2	20	WG828646
Benzo(g,h,i)perylene	mg/kg	0.0560	0.0621	70.0	45.1-132	10.5	20	WG828646
Benzo(k)fluoranthene	mg/kg	0.0640	0.0660	80.0	46.1-131	3.09	20	WG828646
Chrysene	mg/kg	0.0691	0.0684	86.0	49.5-131	1.02	20	WG828646
Dibenz(a,h)anthracene	mg/kg	0.0577	0.0629	72.0	44.8-133	8.65	20	WG828646
Fluoranthene	mg/kg	0.0679	0.0667	85.0	49.3-128	1.76	20	WG828646
Fluorene	mg/kg	0.0691	0.0699	86.0	50.6-121	1.10	20	WG828646
Indeno(1,2,3-cd)pyrene	mg/kg	0.0575	0.0632	72.0	46.1-135	9.51	20	WG828646
Naphthalene	mg/kg	0.0600	0.0608	75.0	49.6-115	1.25	20	WG828646
Phenanthrene	mg/kg	0.0610	0.0598	76.0	48.8-121	2.09	20	WG828646
Pyrene	mg/kg	0.0680	0.0669	85.0	44.7-130	1.65	20	WG828646
2-Fluorobiphenyl				86.90	40.6-122			WG828646
Nitrobenzene-d5				105.0	22.1-146			WG828646
p-Terphenyl-d14				78.70	32.2-131			WG828646
Benzene	mg/kg	0.0539	0.0531	108.	70-130	1.56	20	WG828789
Ethylbenzene	mg/kg	0.0535	0.0527	107.	70-130	1.54	20	WG828789
Toluene	mg/kg	0.0516	0.0509	103.	70-130	1.43	20	WG828789
Total Xylene	mg/kg	0.165	0.163	110.	70-130	1.28	20	WG828789
a,a,a-Trifluorotoluene(PID)				103.0	54-144			WG828789
TPH (GC/FID) Low Fraction	mg/kg	4.96	5.61	90.0	63.5-137	12.3	20	WG828789
a,a,a-Trifluorotoluene(FID)				102.0	59-128			WG828789
Mercury	mg/kg	0.283	0.245	94.0	80-120	14.0	20	WG829052
ORP	mV	95.0	94.0	95.0	90-110	1.06	20	WG828965
Specific Conductance	umhos/	948.	947.	104.	90-110	0.106	20	WG829097
pH	su	6.72	6.72	100.	98.5-101.5	0.00	1	WG828788
Benzene	mg/kg	0.0536	0.0513	107.	70-130	4.45	20	WG829590
Ethylbenzene	mg/kg	0.0530	0.0507	106.	70-130	4.43	20	WG829590
Toluene	mg/kg	0.0511	0.0490	102.	70-130	4.27	20	WG829590
Total Xylene	mg/kg	0.163	0.157	109.	70-130	4.00	20	WG829590
a,a,a-Trifluorotoluene(PID)				102.0	54-144			WG829590
TPH (GC/FID) Low Fraction	mg/kg	5.60	5.35	102.	63.5-137	4.57	20	WG829590
a,a,a-Trifluorotoluene(FID)				103.0	59-128			WG829590

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Quality Assurance Report  
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Tax I.D. 62-0814289

Est. 1970

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Chromium,Hexavalent	mg/kg	7.24	0.00	20	36.2*	75-125	L800481-05	WG828614
1-Methylnaphthalene	mg/kg	0.115	0.0408	.007999	92.2	28.4-137	L800481-04	WG828646
2-Chloronaphthalene	mg/kg	0.0618	0.00	.007999	77.2	38.6-126	L800481-04	WG828646
2-Methylnaphthalene	mg/kg	0.162	0.0730	.007999	112.	26.6-137	L800481-04	WG828646
Acenaphthene	mg/kg	0.0682	0.00	.007999	85.3	31.9-130	L800481-04	WG828646
Acenaphthylene	mg/kg	0.0695	0.00	.007999	86.9	33.7-129	L800481-04	WG828646
Anthracene	mg/kg	0.0542	0.00	.007999	67.7	26.5-141	L800481-04	WG828646
Benzo(a)anthracene	mg/kg	0.0500	0.00	.007999	62.5	18.3-136	L800481-04	WG828646
Benzo(a)pyrene	mg/kg	0.0432	0.00	.007999	54.0	16.9-135	L800481-04	WG828646
Benzo(b)fluoranthene	mg/kg	0.0412	0.00	.007999	51.5	10-134	L800481-04	WG828646
Benzo(g,h,i)perylene	mg/kg	0.0369	0.00	.007999	46.1	14.1-140	L800481-04	WG828646
Benzo(k)fluoranthene	mg/kg	0.0448	0.00	.007999	56.0	18.2-138	L800481-04	WG828646
Chrysene	mg/kg	0.0512	0.00	.007999	64.0	17.1-145	L800481-04	WG828646
Dibenz(a,h)anthracene	mg/kg	0.0379	0.00	.007999	47.3	18.5-138	L800481-04	WG828646
Fluoranthene	mg/kg	0.0565	0.00	.007999	70.6	15.4-144	L800481-04	WG828646
Fluorene	mg/kg	0.0656	0.00	.007999	82.0	23.5-136	L800481-04	WG828646
Indeno(1,2,3-cd)pyrene	mg/kg	0.0367	0.00	.007999	45.8	14.5-142	L800481-04	WG828646
Naphthalene	mg/kg	0.135	0.0529	.007999	103.	29.2-128	L800481-04	WG828646
Phenanthrene	mg/kg	0.0682	0.0139	.007999	67.8	20.1-134	L800481-04	WG828646
Pyrene	mg/kg	0.0528	0.00	.007999	66.0	11-148	L800481-04	WG828646
2-Fluorobiphenyl					93.30	40.6-122		WG828646
Nitrobenzene-d5					104.0	22.1-146		WG828646
p-Terphenyl-d14					64.40	32.2-131		WG828646
Benzene	mg/kg	0.161	0.00125	.05	63.9	49.7-127	L800481-01	WG828789
Ethylbenzene	mg/kg	0.118	0.00280	.05	46.1	40.8-141	L800481-01	WG828789
Toluene	mg/kg	0.168	0.00127	.05	66.7	49.8-132	L800481-01	WG828789
Total Xylene	mg/kg	0.500	0.0116	.15	65.1	41.2-140	L800481-01	WG828789
a,a,a-Trifluorotoluene(PID)					94.10	54-144		WG828789
TPH (GC/FID) Low Fraction	mg/kg	15.9	0.461	5.5	56.2	28.5-138	L800481-01	WG828789
a,a,a-Trifluorotoluene(FID)					97.30	59-128		WG828789
Arsenic	mg/kg	108.	6.74	100	101.	75-125	L800481-05	WG828849
Barium	mg/kg	570.	431.	100	139.*	75-125	L800481-05	WG828849
Boron	mg/kg	102.	2.55	100	100.	75-125	L800481-05	WG828849
Cadmium	mg/kg	105.	0.258	100	105.	75-125	L800481-05	WG828849
Chromium	mg/kg	114.	15.1	100	99.0	75-125	L800481-05	WG828849
Copper	mg/kg	123.	17.0	100	106.	75-125	L800481-05	WG828849
Lead	mg/kg	125.	15.4	100	109.	75-125	L800481-05	WG828849
Nickel	mg/kg	123.	14.7	100	108.	75-125	L800481-05	WG828849
Selenium	mg/kg	105.	-0.873	100	105.	75-125	L800481-05	WG828849
Silver	mg/kg	99.9	-0.478	100	100.	75-125	L800481-05	WG828849
Zinc	mg/kg	132.	36.7	100	96.0	75-125	L800481-05	WG828849
Mercury	mg/kg	0.294	0.0283	.3	89.0	75-125	L799437-03	WG829052
TPH (GC/FID) Low Fraction	mg/kg	21.5	0.0949	5.5	77.8	28.5-138	L800481-06	WG829590
a,a,a-Trifluorotoluene(FID)					99.90	59-128		WG829590
Benzene	mg/kg	0.243	0.00	.05	97.1	49.7-127	L800481-06	WG829590
Ethylbenzene	mg/kg	0.198	0.00	.05	79.0	40.8-141	L800481-06	WG829590
Toluene	mg/kg	0.215	0.00	.05	86.0	49.8-132	L800481-06	WG829590
Total Xylene	mg/kg	0.627	0.000990	.15	83.4	41.2-140	L800481-06	WG829590
a,a,a-Trifluorotoluene(PID)					98.50	54-144		WG829590

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Quality Assurance Report  
Level II

November 20, 2015

L800481

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Chromium,Hexavalent	mg/kg	7.24	7.24	36.2*	75-125	0.00	20	L800481-05	WG828614
1-Methylnaphthalene	mg/kg	0.109	0.115	85.1	28.4-137	5.06	20	L800481-04	WG828646
2-Chloronaphthalene	mg/kg	0.0639	0.0618	79.8	38.6-126	3.32	20	L800481-04	WG828646
2-Methylnaphthalene	mg/kg	0.146	0.162	90.9	26.6-137	10.9	20	L800481-04	WG828646
Acenaphthene	mg/kg	0.0674	0.0682	84.3	31.9-130	1.14	20	L800481-04	WG828646
Acenaphthylene	mg/kg	0.0670	0.0695	83.7	33.7-129	3.78	20	L800481-04	WG828646
Anthracene	mg/kg	0.0523	0.0542	65.4	26.5-141	3.41	21.2	L800481-04	WG828646
Benzo(a)anthracene	mg/kg	0.0490	0.0500	61.3	18.3-136	1.95	24.6	L800481-04	WG828646
Benzo(a)pyrene	mg/kg	0.0414	0.0432	51.8	16.9-135	4.22	25.2	L800481-04	WG828646
Benzo(b)fluoranthene	mg/kg	0.0384	0.0412	48.0	10-134	6.98	30.9	L800481-04	WG828646
Benzo(g,h,i)perylene	mg/kg	0.0351	0.0369	43.9	14.1-140	4.86	25.5	L800481-04	WG828646
Benzo(k)fluoranthene	mg/kg	0.0432	0.0448	54.0	18.2-138	3.68	25.6	L800481-04	WG828646
Chrysene	mg/kg	0.0484	0.0512	60.5	17.1-145	5.69	24.2	L800481-04	WG828646
Dibenz(a,h)anthracene	mg/kg	0.0364	0.0379	45.6	18.5-138	3.87	24.3	L800481-04	WG828646
Fluoranthene	mg/kg	0.0540	0.0565	67.4	15.4-144	4.54	27.1	L800481-04	WG828646
Fluorene	mg/kg	0.0675	0.0656	84.4	23.5-136	2.87	20	L800481-04	WG828646
Indeno(1,2,3-cd)pyrene	mg/kg	0.0351	0.0367	43.8	14.5-142	4.46	25.8	L800481-04	WG828646
Naphthalene	mg/kg	0.125	0.135	89.8	29.2-128	7.93	20	L800481-04	WG828646
Phenanthrene	mg/kg	0.0660	0.0682	65.1	20.1-134	3.26	23.6	L800481-04	WG828646
Pyrene	mg/kg	0.0499	0.0528	62.4	11-148	5.52	26.1	L800481-04	WG828646
2-Fluorobiphenyl				90.70	40.6-122				WG828646
Nitrobenzene-d5				98.80	22.1-146				WG828646
p-Terphenyl-d14				63.30	32.2-131				WG828646
Benzene	mg/kg	0.156	0.161	61.9	49.7-127	3.17	23.5	L800481-01	WG828789
Ethylbenzene	mg/kg	0.119	0.118	46.6	40.8-141	1.01	23.8	L800481-01	WG828789
Toluene	mg/kg	0.144	0.168	57.2	49.8-132	15.2	23.5	L800481-01	WG828789
Total Xylene	mg/kg	0.440	0.500	57.2	41.2-140	12.6	23.7	L800481-01	WG828789
a,a,a-Trifluorotoluene(PID)				97.00	54-144				WG828789
TPH (GC/FID) Low Fraction	mg/kg	17.3	15.9	61.3	28.5-138	8.38	23.6	L800481-01	WG828789
a,a,a-Trifluorotoluene(FID)				97.60	59-128				WG828789
Arsenic	mg/kg	100.	108.	93.8	75-125	7.00	20	L800481-05	WG828849
Barium	mg/kg	422.	570.	0*	75-125	30.0*	20	L800481-05	WG828849
Boron	mg/kg	96.1	102.	93.6	75-125	6.00	20	L800481-05	WG828849
Cadmium	mg/kg	98.3	105.	98.0	75-125	6.00	20	L800481-05	WG828849
Chromium	mg/kg	103.	114.	87.8	75-125	11.0	20	L800481-05	WG828849
Copper	mg/kg	113.	123.	96.3	75-125	9.00	20	L800481-05	WG828849
Lead	mg/kg	113.	125.	98.1	75-125	9.00	20	L800481-05	WG828849
Nickel	mg/kg	110.	123.	95.7	75-125	11.0	20	L800481-05	WG828849
Selenium	mg/kg	99.6	105.	100.	75-125	5.00	20	L800481-05	WG828849
Silver	mg/kg	93.6	99.9	94.0	75-125	7.00	20	L800481-05	WG828849
Zinc	mg/kg	117.	132.	80.1	75-125	12.0	20	L800481-05	WG828849
Mercury	mg/kg	0.321	0.294	97.7	75-125	9.00	20	L799437-03	WG829052
TPH (GC/FID) Low Fraction	mg/kg	20.5	21.5	74.1	28.5-138	4.87	23.6	L800481-06	WG829590
a,a,a-Trifluorotoluene(FID)				102.0	59-128				WG829590
Benzene	mg/kg	0.219	0.243	87.5	49.7-127	10.4	23.5	L800481-06	WG829590
Ethylbenzene	mg/kg	0.152	0.198	60.8	40.8-141	26.1*	23.8	L800481-06	WG829590
Toluene	mg/kg	0.179	0.215	71.7	49.8-132	18.1	23.5	L800481-06	WG829590
Total Xylene	mg/kg	0.491	0.627	65.3	41.2-140	24.2*	23.7	L800481-06	WG829590
a,a,a-Trifluorotoluene(PID)				99.20	54-144				WG829590

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Post Spike

Serial Dilution

Batch number /Run number / Sample number cross reference

WG828638: R3092940: L800481-01 02 03 04 05 06 07  
WG828614: R3093028: L800481-01 02 03 04 05 06 07  
WG828733: R3093063: L800481-01 02 03 04 05 06 07  
WG828849: R3093078: L800481-01 02 03 04 05 06 07  
WG828646: R3093104: L800481-01 02 03 04 05 06 07  
WG828789: R3093119: L800481-01 02 03 04 05  
WG829052: R3093248: L800481-01 02 03 04 05 06 07  
WG828965: R3093361: L800481-01 02 03 04 05 06 07  
WG829097: R3093453: L800481-01 02 03 04 05 06 07  
WG828788: R3093512: L800481-01 02 03 04 05 06 07  
WG829590: R3093730: L800481-06 07

\* \* 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.