

**HYDROGEOLOGIC REPORT
OXY CASCADE CANYON
SHELL 797-03A AND 797-03B
CUTTINGS DISPOSAL AREAS**

April 3, 2012

WALSH Project Number: 900546.0013.010



Environmental Scientists and Engineers, LLC

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April 3, 2012

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HYDROGEOLOGIC REPORT OXY CASCADE CANYON SHELL 797-03A AND 797-03B CUTTINGS DISPOSAL AREAS

1 INTRODUCTION

This hydrogeologic report was prepared by Walsh Environmental Scientists and Engineers, LLC (Walsh), on behalf of OXY USA WTP LP (Oxy) to define potential impacts to surface water and groundwater by proposed drill cuttings disposal at the Shell 797-03A and 797-03B cuttings disposal areas. Specifically, this report provides information requested in Sections 908b (7) A and B, 908b (9) A and B, and 908b (10) of the Colorado Oil and Gas Conservation Commission (COGCC) Rules and Regulations as amended April 1, 2009.

2 GEOLOGY AND HYDROLOGY

The following sections are summaries of the geology, hydrology, physical characteristics, and baseline information on the study areas obtained from published information, Oxy reports, and field inspections. Aerial images and topographic maps showing the disposal areas are provided in Appendix A.

2.1 Regional Geology

The sites are located in the west-central part of Colorado on the Colorado Plateau, southwest of the White River geological uplift. Tertiary basalt flows cover much of the area south of the Colorado River. Land both south and north of the Colorado River contains bedrock of Cenozoic age including the Parachute Creek Member of the Green River Formation, which is an oil shale unit about 900 to 1,200 feet thick in this area. It consists of black, dark-brown, and dark gray, commonly laminated marlstone, which weathers to a light gray. The upper part of the member contains the thickest and richest oil-shale beds. The 2 to 6 foot thick Mahogany layer is a persistent bed of shale within the Mahogany zone, which forms a sheer 80 to 100 foot thick cliff or ledge of rich oil shale within the upper part of the Parachute Creek Member. Cliffs in the site area are capped by the Parachute Creek Member.

Glacial deposits are widely distributed throughout the upland areas, and alluvium and stream-laid gravel and boulders form a broad belt along the Colorado River and its tributaries [U.S. Department of Agriculture, Soil Conservation Service (USDA, 1988)]. The sites are located just west of the Grand Hogback which separates the Colorado Plateau physiographic province from the White River Plateau to the northeast and the Sawatch Range to the southeast (Tweto, 1979). The Colorado Plateau is a relatively stable shelf area with no major mountain building episodes since the late Precambrian. It contains thick sequences of sedimentary rocks ranging in age from the late Paleozoic through the Tertiary period (Press and Siever, 1974). The Colorado Plateau is punctuated with areas of Tertiary volcanic activity expressed by extrusive igneous deposits.

2.2 Site Geology

Bedrock at the sites consists of the Tertiary-aged lowermost Uinta Formation (sandstones and siltstones) and/or the upper Parachute Creek Member. The Parachute Creek Member in turn overlies the Tertiary-aged Wasatch and Ohio Creek formations, which outcrop in the lower valleys. These formations consist of siltstone, sandstone, claystone, and conglomerate. Bedrock exposed at the sites appears as a gray marlstone or shale, with portions that are massive, fractured, and fissile.

The bedrock at the sites is partially covered by alluvium and colluvium. This material is likely to be up to ten or more feet thick and will likely contain unconfined groundwater. Colluvium exposed in road cuts and excavations appears as a thin layer of cobbles in a sandy or loamy soil matrix on hill slopes grading into a thicker layer of fine alluvium near the bases of slopes. Streams in the area frequently have bedrock floors indicating an erosional environment.

2.3 Site Soil

Soil at the Shell 797-03A cuttings disposal site is mapped as Grobutte Very Channery Loam, 30-60% slopes. The Grobutte Very Channery Loam soil is a deep soil (60 inches to bedrock), and well drained loam formed in residuum derived dominantly from shale or sandstone. It consists of a very to extremely channery loam that is up to 60 inches thick which overlies a weathered bedrock and has a very severe water erosion hazard (USDA, 1988).

Soil at the Shell 797-03B cuttings disposal site is mapped as Happle Very Channery Loam, 3-12% slopes. The Happle Very Channery Loam soil is a deep soil (60 inches to bedrock), and is well drained loam from the Green River formation alluvium derived from shale. The soil profile consists of layers of very to extremely channery sandy loam with varying amounts of clay overlying weathered bedrock and is moderately vulnerable to erosion (USDA, 1988).

2.4 Site Hydrology

Hydrology at the sites consists of small intermittent or ephemeral drainages that start at higher elevations and coalesce into larger drainages in the valley floors.

- The 797-03A disposal area is located at the head of East Fork Baker Gulch at approximately 6,478 feet above mean sea level at its highest point. The East Fork Baker Gulch drainage is the nearest predominant hydrologic feature which is located approximately 372 feet to the southwest and about 160 feet lower in elevation.
- The 797-03B disposal area is located at the head of East Fork Baker Gulch at approximately 6,323 feet above mean sea level at its highest point. The East Fork Baker Gulch drainage is the nearest predominant hydrologic feature which is located approximately 400 feet to the southwest and about 40 feet lower in elevation.

The proposed cuttings disposal locations are located more than 40 feet above the uppermost aquifer, and are separated from it by loam soil and fractured bedrock. The nearest perennial surface water feature to the disposal sites is the East Fork of Conn Creek approximately 1 mile to the southwest, which flows into Cascade Canyon before flowing into the main fork of Conn Creek and eventually into the Colorado River. Adjacent ephemeral surface water features include small, intermittent streams which are typically fed by precipitation events and springs

within the area. The East Fork Baker Gulch drainage was observed to be dry during a site visit conducted by Walsh in the spring of 2012.

2.4.1 Upper Piceance Basin Aquifer

The general hydrology of the Piceance Basin is described in the *Groundwater Atlas of Colorado* (CGS, 2003). This report defines the Upper Piceance Basin aquifer in the Uinta Formation. It is found in the sandstones, fractures in the siltstone and marlstone, and in solution cavities and is perched above the Mahogany confining unit. The flow direction of this aquifer is towards the north over most of the Roan Plateau (CGS, 2003). The aquifer has a measured hydraulic conductivity of 0.8 to 1.2 feet per day and is less than 500 feet thick in the study area. The potentiometric elevation is expressed as springs along the cliff walls above the cuttings disposal areas which generally occur between 7,900 and 8,300 feet elevation. These springs, along with precipitation, provide recharge to the alluvial aquifers present beneath the valley floors and the cuttings disposal areas.

2.4.2 Alluvial Aquifer

Meteoric water is likely to infiltrate initially into the vadose zone and form localized and in some cases intermittent aquifers in the unconsolidated alluvium. This water is expected to be tributary to springs and creeks. However, the predominant aquifer located below the disposal areas is located quite deep and has very little transmissivity (Robson and Banta, 1995).

2.4.3 Deeper Aquifers

Deeper bedrock aquifers exist beneath the sites. The uppermost is the Mesaverde aquifer, which has a potentiometric surface of about 6,000 feet in the study area (CGS, 2003). The Mesaverde aquifer is over 450 feet beneath the Shell 797-03A pad and 300 feet beneath the Shell 797-03B pad. Springs in the vicinity are found at 6,500 feet and below. In the Piceance Basin, the Mesaverde group consists predominantly of sandstone with interbedded shale and coal (Robson and Banta, 1995). The aquifer is deeply buried in the Piceance Basin. As a result of overburden pressure, compaction, and cementation overall hydraulic conductivity and transmissivity is small, even though the aquifer is generally large in these areas (Robson and Banta, 1995).

2.4.4 Floodplain

The proposed cuttings disposal areas are located over 40 feet above the adjacent ephemeral drainages. Despite the relatively large acreage of up-gradient watersheds, the proposed cuttings disposal areas have soil types that have no frequency of flooding or ponding, indicating that neither of these areas are located within a floodplain (USDA, 1988).

2.4.5 Aquifer Water Quality

The water quality of the uppermost aquifer and/or the alluvial aquifer has been found in the area to be good, with about 350 to 400 milligrams per liter of total dissolved solids as measured in springs, seeps, and streams (Walsh, 2009) located in Sections 9 and 16, T6S, R97W, 6th PM. The groundwater expressed as springs is used by livestock and wildlife throughout the Roan Plateau and in the study area. According to (Robson and Banta, 1995), the water quality of the

Mesaverde aquifer in the Piceance basin is variable at best, and was found to have more than 10,000 milligrams per liter of dissolved solids.

2.4.6 Registered Wells in the Area

Walsh reviewed the Colorado Division of Water Resources' on-line database of water wells registered in the state:

- The Shell 797-03A and 797-03B pads have the same four registered monitoring wells within two miles.
 - All are privately owned monitoring wells.
 - The nearest registered water well is to the east in the SE ¼ of the NE ¼ of Section 1 and approximately 1.44 miles away (CDWR, 2011).
 - It is a monitoring well.
 - It is privately owned.
 - The well is located about 1,950 feet in elevation above the cuttings disposal areas; therefore, cuttings disposal in this area would not be expected to affect the well.

The identified wells are registered to private parties. Since there are no registered wells within one mile, and any potential release from the cuttings disposal areas would likely manifest at springs and streams down-gradient from the sites, no registered monitoring wells will be sampled as part of this project.

3 ENVIRONMENTAL IMPACT

This section discusses the potential environmental impacts that may result from the placement of cuttings at these locations.

3.1 Cutting Characteristics

Note that since no cuttings have been generated yet from this site, the attached cuttings data has been provided from Oxy as an example of typical drill cuttings and therefore typical analyte levels.

Prior to placement, the drill cuttings will be dried such that there is no free water in them. Multiple samples of typical drill cuttings were obtained by Oxy personnel and submitted to Environmental Science Corporation of Mount Juliet, Tennessee for analysis. Laboratory results show that most target analytes in the cuttings are below the COGCC concentration levels for soils that are to be left on site. The results of the sampling are tabulated in the data table and copies of the analytical reports are included in Appendix B. Exceedances in the samples included arsenic, sodium-adsorption ratio (SAR), pH, total petroleum hydrocarbons (TPH), and dibenzo(A,H)anthracene.

Arsenic concentrations ranged from 1.2 to 6.5 milligrams per kilogram (mg/kg) and averaged 4.4 mg/kg. The COGCC acceptable arsenic concentration level is 0.39 mg/kg. These elevated concentrations are consistent with the background arsenic concentrations found in the region.

SAR concentrations ranged from 48 to 98 and averaged about 75.4 and pH ranged from 9.5 to 11 and averaged about 10.2. These concentrations and/or measurements exceed the COGCC Concentrations Level of 12 for SAR and the range of 6 to 9 for pH as specified in Table 910-1. SAR and pH are plant growth inhibitors, and as the cuttings will be buried with at least three feet of soil, they will not have an environmental impact.

TPH concentrations ranged from 32.1 to 3,306.4 mg/kg and averaged about 497 mg/kg and one sample was identified to contain 0.028 mg/kg dibenzo(A,H)anthracene which exceeds the COGCC Concentrations Level of 0.022 mg/kg for dibenzo(A,H)anthracene as specified in Table 910-1. The cuttings samples were collected directly from the cuttings bin and are representative of “raw” unprocessed cuttings. The cuttings will be mixed with amendments and allowed sufficient time for biodegradation and volatilization to reduce TPH concentrations to sub-regulatory levels, and as a result will not pose an environmental impact. After amendments and stabilization time, confirmation sampling will be conducted to ensure Table 910-1 regulatory limits are achieved.

3.2 Cuttings Placement

Due to the severely water erodible soils, Oxy will utilize stormwater best management practices to address both run-on and run-off to minimize potential erosion. The cuttings will be placed into the reserve pits at each of the cuttings disposal area. The cuttings will be laid in twelve-inch layers, with six-inch layers of native soil placed between each layer of cuttings. The purpose of the native soil is to stabilize the cuttings and allow compaction of the material. The reserve pit used to dispose of the cuttings is approximately ten to twelve feet deep, and material will be placed up against the cut edge of the pads. Once the final grade has been reached, the cuttings will be compacted and a final cap of three feet of native soil will be placed on top of the drill cuttings such that the top of the material has a slope for drainage and to approximately match the local contours. The top twelve inches of the cap will consist of reclaimed topsoil that will be placed without compaction, seeded, and mulched for reclamation. After revegetation has been achieved in accordance with COGCC and Colorado Department of Public Health and Environment (CDPHE) Stormwater Regulations, the locations will be included in Oxy’s COGCC Stormwater program for the life of the facility.

3.3 Potential Groundwater Pathway

The potential pathway for groundwater to contact the cuttings is for either the cuttings to have been placed into groundwater, or for meteoric water to infiltrate the cuttings and flow through the cuttings, through the vadose zone, and into the alluvial or shallow aquifer(s). The excavated pit bottoms are at an elevation of 6,466 feet above sea level at the 797-03A pad and 6,311 feet above sea level at the 797-03B pad. The nearest surface water, which is an ephemeral drainage, is about 6,310 feet above sea level and is an influent stream that contributes to the alluvial aquifer. No indications of groundwater saturation were evident in the excavations conducted at the pads. Based on the site data, there are no indications that the cuttings will be in contact with groundwater.

Meteoric water can penetrate the cap and enter into the cuttings, leach soil constituents, and enter the aquifer(s). Local precipitation is 20 to 25 inches annually, and is predominantly in the form of winter snowfall. This snowfall rapidly melts in the spring, allowing a short timeframe for

infiltration. The remaining precipitation is in the form of summer rain showers, which are generally short-lived and typically result in rapid run-off and little infiltration, especially on steep slopes. Much of the summer precipitation is transpired by vegetation. The nearest ephemeral surface water feature is Baker's Gulch which is more than 370 feet horizontally and at least 160 feet vertically from the 797-03A proposed cuttings disposal area, and is at least 400 feet horizontally and at least 40 feet vertically from the 797-03B cuttings disposal area. Therefore, impacts to ground or surface water are not expected.

3.4 Potential Impacts to Aquifer

The top of the cuttings disposal areas will have a cap consisting of native vegetation and will be contoured to facilitate run-off and minimize infiltration. Native vegetation established on the cap will transpire infiltrated water, reducing infiltration into the cuttings. The cuttings have measured analytes below the COGCC Table 910-1 standards with the exception of SAR, pH, arsenic, dibenzo(A,H)anthracene, and TPH. The arsenic level is comparable to background levels, and the SAR and pH will be managed through burial and capping of the cuttings with three feet of native fill soil. The cuttings will be mixed with amendments and allowed sufficient holding time for volatilization to reduce dibenzo(A,H)anthracene and TPH concentrations to below COGCC limits, and as a result will not have an environmental impact. Some small fraction of the meteoric water could infiltrate into and through the cuttings and affect the aquifer. However, based on the minimal water infiltration, the absence of target contaminants in the cuttings, and the distance vertically from the potentiometric surface elevation and horizontally from surface water, any impact to groundwater is expected to be insignificant and/or undetectable.

3.5 Hydrologic Monitoring

With the exception of SAR, pH, arsenic, TPH, and dibenzo(A,H)anthracene the drill cuttings have target analyte levels that are below the COGCC standards for burial of exploration and production wastes, and minimal infiltration will reduce the chance for groundwater to contact the buried cuttings. Even though the drill cuttings are not expected to impact the environment, Oxy proposes to monitor surface water in the East Fork of Conn Creek strategically downstream of the sites for COGCC Table 910-1 water analytes plus field parameters (pH, temperature, and conductivity), and to monitor drill cuttings as they are placed into the cell for Table 910-1 parameters. Surface water will be monitored as described in the management plan (Oxy, 2011). Water results will be tabulated and water quality will be compared to background levels, and the results maintained in Oxy files for the facilities. Analytes that exceed Table 910-1 water standards will be reported to the COGCC. Drill cuttings will be monitored as described in the management plan (Oxy, 2011).

4 REFERENCES

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Colorado Geological Survey (CGS). 2003. *Groundwater Atlas of Colorado*. Special Publication 53. Ralf Topper, Karen Spray, William Bellis, Judith Hamilton, and Peter Barkmann.

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Appendix A – Figures

Figure 1 - Storage and Disposal Locations

Map Revised: February 27, 2012 Garfield County, Colorado

0 0.025 0.05 0.075 0.1 0.125 Miles

003

Shell 797-03B

Approximate surface water
sampling location






-  Shell 797-03A cuttings disposal location
-  Shell 797-03B cuttings disposal location
-  Proposed Shell 797-03A well pad
-  Existing well pad
-  Oxy responsible road

Figure 2 - Storage and Disposal Locations

Map Revised: February 27, 2012 Garfield County, Colorado

0 0.025 0.05 0.075 0.1 0.125 Miles

- Shell 797-03A cuttings disposal location
- Shell 797-03B cuttings disposal location
- Proposed Shell 797-03A well pad
- Existing well pad
- Oxy responsible road

Shell 797-03B

Approximate surface water
sampling location

003

Appendix B – Data Summary Table Laboratory Analytical Results

697-05C Cuttings

Rig: H&P 353

Samples obtained from the shaker table

Lab Report Number		L553659	L553659	L553659	L553659	L553659	L554205	L554205	L554221	L554221	L554746	L554746	L554746	L554746	L554746	L554746	L554746	L554746	Averages
Well Number		697-05-478	697-05-478	697-05-478	697-05-478	697-05-478	697-05-638	697-05-638	697-05-478	697-05-478	697-05-638	697-05-638	697-05-638	697-05-638	697-05-638	697-05-638	697-05-638	697-05-638	697-05C-Prod
Date		12/26/2011	12/27/2011	12/27/2011	12/27/2011	12/28/2011	01/03/2012	01/03/2012	12/28/2011	12/28/2011	01/04/2012	01/04/2012	01/04/2012	01/04/2012	01/04/2012	01/04/2012	01/04/2012	01/04/2012	02/01/2012
Depth		3700'	4700'	6000'	7000'	8000'	4000'	5000'	17100'	19120'	8415'	8000'	9000'	7000'	6000'				NA
MCL (mg/kg)																			
TPH (GRO and DRO)		500	88.42	440	220.48	803.3	602.1	503.7	601.8	3306.4	882.2	552.1	202.5	1803.7	54.74	32.1	496.75		
Benzene	0.17	0.025	0.1	0.014	0.036	0.047	0.13	0.17	0.15	0.12	0.046	0.064	0.067	0.024	0.028				
Toluene	85	0.018	0.03	0.02	0.056	0.12	0.081	0.048	0.23	0.13	0.039	0.073	0.086	0.02	0.015				
Ethylbenzene	100	0.0052	0.0024	0.0071	0.011	0.012	0.03	0.0063	0.01	0.012	0.0026	0.0047	0.0032	0.0025	0.0034				
Xylenes	175	0.017	0.016	0.033	0.06	0.16	0.1	0.027	0.18	0.1	0.032	0.054	0.08	0.016	0.014				
Organics in Soil (PAH's)																			
Acenaphthene	1000	U	0.0009	U	U	U	U	U	U	0.043	0.031	0.052	U	0.091	0.0014	0.0023			
Anthracene	1000	U	U	U	U	0.0029	U	U	U	0.03	0.032	0.044	U	U	0.0011	0.0021			
Benzol(a) anthracene	0.22	U	U	U	U	0.0012	U	U	U	0.033	0.036	U	0.011	0.069	0.0014	U			
Benzol(b) fluoranthene	0.22	U	U	U	U	0.002	U	U	U	0.029	0.036	0.038	U	0.063	0.0022	0.0018			
Benzol(k) fluoranthene	2.2	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U			
Benzol(a)pyrene	0.022	U	U	U	0.013	0.00077	U	U	U	0.012	0.017	0.018	U	0.035	U	U			
Chrysene	22	U	U	U	U	0.0029	U	U	U	0.077	0.081	0.13	U	0.2	0.0026	0.0026			
Dibenzol(a,h) anthracene	0.022	U	U	U	U	U	U	U	U	U	U	U	U	0.028	U	U			
Fluoranthene	1000	U	U	U	U	0.0016	0.0066	0.02	0.013	0.017	0.031	0.064	U	0.055	U	0.0034			
Flourene	1000	U	0.0016	0.0066	0.02	0.013	0.014	0.01	0.17	0.13	0.2	0.022	0.49	0.0087	0.0079	0.0079			
Indenol(2,3,C,D) pyrene	0.22	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U			
Naphthalene	23	0.024	0.034	0.032	0.076	0.058	0.15	0.15	0.15	1	0.7	0.97	0.11	2	0.052	0.087			
Pyrene	1000	U	0.00066	U	U	0.0028	0.013	U	U	U	0.059	0.048	0.0083	0.1	0.0025	0.0034			
Inorganics in Soil																			
EC	<4 mmhos/cm or 2X background	2.2	2.4	2.6	1.9	2.7	1.8	1.8	2.6	1.9	2.2	2	1.9	1.6	1.8				
SAR	<12	90	66	48	71	82	65	82	98	89	72	60	68	49	51				75.37
pH	6-9	11	11	9.8	11	10	11	11	9.7	10	9.5	10	10	11	10				10.16
Metals in Soils																			
Arsenic	0.39	2.8	4.3	0.96	2.6	2.6	5.5	3.1	1.2	2.1	5.4	3.1	6.5	3.5	1.3				4.43
Barium	15,000	310	140	230	200	120	190	160	130	120	180	160	180	120	170				
Cadmium	70	0.19	U	U	0.05	0.08	0.28	U	U	U	0.36	0.57	0.69	0.12	U				
Chromium III	120,000	14	11	6	10	6	11	10	3	5.4	6.3	11.0	4.4	7.5	8.3				
Chromium VI	23	U	U	U	U	U	U	U	0.8	U	U	U	1	U	U				
Copper	3100	14	23	13	34	10	48	25	16	12	14	26	31	89	5.7				
Lead	400	12	12	9.8	12	7.6	9.9	10	9.5	10	8.8	13	9.7	12	11				
Mercury	23	0.013	0.017	0.0078	0.015	0.012	0.019	0.011	0.012	0.0086	0.017	0.014	0.016	0.014	0.014				
Nickel	1600	14	9.2	5.4	10	6.6	13	12	12	12	9.9	16	15	9.7	11				
Selenium	390	4	4.2	2	3.5	2.8	U	U	1.9	1.6	U	U	0.54	U	U				
Silver	390	1.7	1.7	1.2	1	0.97	0.3	0.27	U	U	0.5	U	0.43	0.26	0.16				
Zinc	23,000	54	46	40	48	32	53	44	40	57	43	60	85	34	45				



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Blair Rollins
OXY USA Inc - Grand Junction, CO
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Grand Junction, CO 81506

Report Summary

Friday January 06, 2012

Report Number: L553659

Samples Received: 12/29/11

Client Project: 900546.0013.010

Description: CC-697-05-47B Cuttings

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 - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915, PA - 68-02979

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

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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings
Sample ID : CC-697-05-47B 3700FT
Collected By : CJB
Collection Date : 12/26/11 17:05

ESC Sample # : L553659-01

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/05/12	1
Chromium, Trivalent	14.	0.17	2.0	mg/kg		Calc.	01/01/12	1
ORP	24.			mV	T8	2580	01/04/12	1
pH	11.			su	T8	9045D	12/30/11	1
Sodium Adsorption Ratio	90.					Calc.	01/03/12	1
Specific Conductance	2200			umhos/cm		9050AMo	01/05/12	1
Mercury	0.013	0.00080	0.020	mg/kg	J	7471	01/02/12	1
Arsenic	2.8	0.32	1.0	mg/kg		6010B	01/01/12	1
Barium	310	0.050	0.25	mg/kg		6010B	01/01/12	1
Cadmium	0.19	0.040	0.25	mg/kg	J	6010B	01/01/12	1
Chromium	14.	0.085	0.50	mg/kg		6010B	01/01/12	1
Copper	14.	0.21	1.0	mg/kg		6010B	01/01/12	1
Lead	12.	0.090	0.25	mg/kg		6010B	01/01/12	1
Nickel	14.	0.26	1.0	mg/kg		6010B	01/01/12	1
Selenium	4.0	0.32	1.0	mg/kg		6010B	01/01/12	1
Silver	1.7	0.16	0.50	mg/kg		6010B	01/01/12	1
Zinc	54.	0.34	1.5	mg/kg		6010B	01/01/12	1
TPH (GC/FID) Low Fraction	0.42	0.25	0.50	mg/kg	J	8015D/G	12/30/11	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	96.7			% Rec.		602/801	12/30/11	5
Benzene	0.025	0.0017	0.0050	mg/kg		8260B	12/29/11	5
Toluene	0.018	0.0016	0.025	mg/kg	J	8260B	12/29/11	5
Ethylbenzene	0.0052	0.0019	0.0050	mg/kg		8260B	12/29/11	5
Total Xylenes	0.017	0.0023	0.015	mg/kg		8260B	12/29/11	5
Surrogate Recovery								
Toluene-d8	100.			% Rec.		8260B	12/29/11	5
Dibromofluoromethane	101.			% Rec.		8260B	12/29/11	5
a,a,a-Trifluorotoluene	98.9			% Rec.		8260B	12/29/11	5
4-Bromofluorobenzene	98.0			% Rec.		8260B	12/29/11	5
TPH (GC/FID) High Fraction	88.	15.	80.	mg/kg		3546/DR	12/30/11	20
Surrogate recovery (%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	12/30/11	20

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MDL = Minimum Detection Limit = LOD

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L553659-01 (PH) - 10.62@19.2c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

Sample ID : CC-697-05-47B 3700FT

Collected By : CJB
Collection Date : 12/26/11 17:05

ESC Sample # : L553659-01

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0038	0.030	mg/kg		8270C-S	01/02/12	5
Acenaphthene	U	0.0035	0.030	mg/kg		8270C-S	01/02/12	5
Acenaphthylene	U	0.0029	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(a)anthracene	U	0.0046	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(a)pyrene	U	0.0031	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(b)fluoranthene	U	0.0041	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(g,h,i)perylene	U	0.0062	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(k)fluoranthene	U	0.0067	0.030	mg/kg		8270C-S	01/02/12	5
Chrysene	U	0.0055	0.030	mg/kg		8270C-S	01/02/12	5
Dibenz(a,h)anthracene	U	0.0056	0.030	mg/kg		8270C-S	01/02/12	5
Fluoranthene	U	0.0052	0.030	mg/kg		8270C-S	01/02/12	5
Fluorene	U	0.0028	0.030	mg/kg		8270C-S	01/02/12	5
Indeno(1,2,3-cd)pyrene	U	0.0058	0.030	mg/kg		8270C-S	01/02/12	5
Naphthalene	0.024	0.0032	0.030	mg/kg	J	8270C-S	01/02/12	5
Phenanthrene	0.0064	0.0037	0.030	mg/kg	J	8270C-S	01/02/12	5
Pyrene	U	0.0030	0.030	mg/kg		8270C-S	01/02/12	5
1-Methylnaphthalene	0.011	0.0039	0.030	mg/kg	J	8270C-S	01/02/12	5
2-Methylnaphthalene	0.017	0.0029	0.030	mg/kg	J	8270C-S	01/02/12	5
2-Chloronaphthalene	U	0.0030	0.030	mg/kg		8270C-S	01/02/12	5
Surrogate Recovery								
Nitrobenzene-d5	73.1			% Rec.		8270C-S	01/02/12	5
2-Fluorobiphenyl	73.6			% Rec.		8270C-S	01/02/12	5
p-Terphenyl-d14	72.5			% Rec.		8270C-S	01/02/12	5

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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

ESC Sample # : L553659-02

Sample ID : CC-697-05-47B 4700FT

Site ID :

Collected By : CJB
Collection Date : 12/27/11 00:30

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/05/12	1
Chromium, Trivalent	11.	0.17	2.0	mg/kg		Calc.	01/01/12	1
ORP	24.			mV	T8	2580	01/04/12	1
pH	11.			su	T8	9045D	12/30/11	1
Sodium Adsorption Ratio	66.					Calc.	01/03/12	1
Specific Conductance	2400			umhos/cm		9050AMo	01/05/12	1
Mercury	0.017	0.00080	0.020	mg/kg	J	7471	01/02/12	1
Arsenic	4.3	0.32	1.0	mg/kg		6010B	01/01/12	1
Barium	140	0.050	0.25	mg/kg		6010B	01/01/12	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/01/12	1
Chromium	11.	0.085	0.50	mg/kg		6010B	01/01/12	1
Copper	23.	0.21	1.0	mg/kg		6010B	01/01/12	1
Lead	12.	0.090	0.25	mg/kg		6010B	01/01/12	1
Nickel	9.2	0.26	1.0	mg/kg		6010B	01/01/12	1
Selenium	4.2	0.32	1.0	mg/kg		6010B	01/01/12	1
Silver	1.7	0.16	0.50	mg/kg		6010B	01/01/12	1
Zinc	46.	0.34	1.5	mg/kg		6010B	01/01/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	12/30/11	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	95.0			% Rec.		602/801	12/30/11	5
Benzene	0.10	0.0017	0.0050	mg/kg		8260B	12/29/11	5
Toluene	0.030	0.0016	0.025	mg/kg		8260B	12/29/11	5
Ethylbenzene	0.0024	0.0019	0.0050	mg/kg	J	8260B	12/29/11	5
Total Xylenes	0.016	0.0023	0.015	mg/kg		8260B	12/29/11	5
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	12/29/11	5
Dibromofluoromethane	99.5			% Rec.		8260B	12/29/11	5
a,a,a-Trifluorotoluene	99.5			% Rec.		8260B	12/29/11	5
4-Bromofluorobenzene	96.7			% Rec.		8260B	12/29/11	5
TPH (GC/FID) High Fraction	440	15.	80.	mg/kg		3546/DR	01/04/12	20
Surrogate recovery (%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	01/04/12	20

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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

Sample ID : CC-697-05-47B 4700FT

Collected By : CJB
Collection Date : 12/27/11 00:30

ESC Sample # : L553659-02

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.00076	0.0060	mg/kg		8270C-S	01/02/12	1
Acenaphthene	0.00090	0.00071	0.0060	mg/kg	J	8270C-S	01/02/12	1
Acenaphthylene	U	0.00057	0.0060	mg/kg		8270C-S	01/02/12	1
Benzo(a)anthracene	U	0.00092	0.0060	mg/kg		8270C-S	01/02/12	1
Benzo(a)pyrene	U	0.00062	0.0060	mg/kg		8270C-S	01/02/12	1
Benzo(b)fluoranthene	U	0.00082	0.0060	mg/kg		8270C-S	01/02/12	1
Benzo(g,h,i)perylene	U	0.0012	0.0060	mg/kg		8270C-S	01/02/12	1
Benzo(k)fluoranthene	U	0.0013	0.0060	mg/kg		8270C-S	01/02/12	1
Chrysene	U	0.0011	0.0060	mg/kg		8270C-S	01/02/12	1
Dibenz(a,h)anthracene	U	0.0011	0.0060	mg/kg		8270C-S	01/02/12	1
Fluoranthene	U	0.0010	0.0060	mg/kg		8270C-S	01/02/12	1
Fluorene	0.0016	0.00055	0.0060	mg/kg	J	8270C-S	01/02/12	1
Indeno(1,2,3-cd)pyrene	U	0.0012	0.0060	mg/kg		8270C-S	01/02/12	1
Naphthalene	0.034	0.00065	0.0060	mg/kg		8270C-S	01/02/12	1
Phenanthrene	0.0040	0.00074	0.0060	mg/kg	J	8270C-S	01/02/12	1
Pyrene	0.00066	0.00059	0.0060	mg/kg	J	8270C-S	01/02/12	1
1-Methylnaphthalene	0.0088	0.00079	0.0060	mg/kg		8270C-S	01/02/12	1
2-Methylnaphthalene	0.017	0.00059	0.0060	mg/kg		8270C-S	01/02/12	1
2-Chloronaphthalene	U	0.00060	0.0060	mg/kg		8270C-S	01/02/12	1
Surrogate Recovery								
Nitrobenzene-d5	84.4			% Rec.		8270C-S	01/02/12	1
2-Fluorobiphenyl	72.4			% Rec.		8270C-S	01/02/12	1
p-Terphenyl-d14	70.3			% Rec.		8270C-S	01/02/12	1

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Blair Rollins
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760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

ESC Sample # : L553659-03

Sample ID : CC-697-05-47B 6000FT

Site ID :

Collected By : CJB
Collection Date : 12/27/11 10:21

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	7.1	20.	mg/kg	O	3060A/7	01/05/12	10
Chromium, Trivalent	5.7	0.17	20.	mg/kg	J	Calc.	01/01/12	1
ORP	40.			mV	T8	2580	01/04/12	1
pH	9.8			su	T8	9045D	12/30/11	1
Sodium Adsorption Ratio	48.					Calc.	01/03/12	1
Specific Conductance	2600			umhos/cm		9050AMo	01/05/12	1
Mercury	0.0078	0.00080	0.020	mg/kg	J	7471	01/02/12	1
Arsenic	0.96	0.32	1.0	mg/kg	J	6010B	01/01/12	1
Barium	230	0.050	0.25	mg/kg		6010B	01/01/12	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/01/12	1
Chromium	5.7	0.085	0.50	mg/kg		6010B	01/01/12	1
Copper	13.	0.21	1.0	mg/kg		6010B	01/01/12	1
Lead	9.8	0.090	0.25	mg/kg		6010B	01/01/12	1
Nickel	5.4	0.26	1.0	mg/kg		6010B	01/01/12	1
Selenium	2.0	0.32	1.0	mg/kg		6010B	01/01/12	1
Silver	1.2	0.16	0.50	mg/kg		6010B	01/01/12	1
Zinc	40.	0.34	1.5	mg/kg		6010B	01/01/12	1
TPH (GC/FID) Low Fraction	0.48	0.25	0.50	mg/kg	J	8015D/G	12/30/11	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	93.1			% Rec.		602/801	12/30/11	5
Benzene	0.014	0.0017	0.0050	mg/kg		8260B	12/29/11	5
Toluene	0.020	0.0016	0.025	mg/kg	J	8260B	12/29/11	5
Ethylbenzene	0.0071	0.0019	0.0050	mg/kg		8260B	12/29/11	5
Total Xylenes	0.033	0.0023	0.015	mg/kg		8260B	12/29/11	5
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	12/29/11	5
Dibromofluoromethane	98.9			% Rec.		8260B	12/29/11	5
a,a,a-Trifluorotoluene	100.			% Rec.		8260B	12/29/11	5
4-Bromofluorobenzene	96.5			% Rec.		8260B	12/29/11	5
TPH (GC/FID) High Fraction	220	15.	80.	mg/kg		3546/DR	12/30/11	20
Surrogate recovery (%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	12/30/11	20

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L553659-03 (CR6) - Diluted due to sample color interference.

L553659-03 (PH) - 9.80@19.4c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

Sample ID : CC-697-05-47B 6000FT

Collected By : CJB
Collection Date : 12/27/11 10:21

ESC Sample # : L553659-03

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0038	0.030	mg/kg	J3	8270C-S	01/02/12	5
Acenaphthene	U	0.0035	0.030	mg/kg		8270C-S	01/02/12	5
Acenaphthylene	U	0.0029	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(a)anthracene	U	0.0046	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(a)pyrene	U	0.0031	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(b)fluoranthene	U	0.0041	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(g,h,i)perylene	U	0.0062	0.030	mg/kg		8270C-S	01/02/12	5
Benzo(k)fluoranthene	U	0.0067	0.030	mg/kg	J3	8270C-S	01/02/12	5
Chrysene	U	0.0055	0.030	mg/kg		8270C-S	01/02/12	5
Dibenz(a,h)anthracene	U	0.0056	0.030	mg/kg		8270C-S	01/02/12	5
Fluoranthene	U	0.0052	0.030	mg/kg		8270C-S	01/02/12	5
Fluorene	0.0066	0.0028	0.030	mg/kg	J	8270C-S	01/02/12	5
Indeno(1,2,3-cd)pyrene	U	0.0058	0.030	mg/kg		8270C-S	01/02/12	5
Naphthalene	0.032	0.0032	0.030	mg/kg	J5J3	8270C-S	01/02/12	5
Phenanthrene	0.013	0.0037	0.030	mg/kg	JJ3	8270C-S	01/02/12	5
Pyrene	U	0.0030	0.030	mg/kg		8270C-S	01/02/12	5
1-Methylnaphthalene	0.035	0.0039	0.030	mg/kg	J5J3	8270C-S	01/02/12	5
2-Methylnaphthalene	0.056	0.0029	0.030	mg/kg	VJ3	8270C-S	01/02/12	5
2-Chloronaphthalene	U	0.0030	0.030	mg/kg		8270C-S	01/02/12	5
Surrogate Recovery								
Nitrobenzene-d5	56.8			% Rec.		8270C-S	01/02/12	5
2-Fluorobiphenyl	57.8			% Rec.		8270C-S	01/02/12	5
p-Terphenyl-d14	58.2			% Rec.		8270C-S	01/02/12	5

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MDL = Minimum Detection Limit = LOD

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L553659-03 (CR6) - Diluted due to sample color interference.

L553659-03 (PH) - 9.80@19.4c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

ESC Sample # : L553659-04

Sample ID : CC-697-05-47B 7000FT

Site ID :

Collected By : CJB
Collection Date : 12/27/11 19:40

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/05/12	1
Chromium, Trivalent	9.8	0.17	2.0	mg/kg		Calc.	01/01/12	1
ORP	19.			mV	T8	2580	01/04/12	1
pH	11.			su	T8	9045D	12/30/11	1
Sodium Adsorption Ratio	71.					Calc.	01/03/12	1
Specific Conductance	1900			umhos/cm		9050AMo	01/05/12	1
Mercury	0.015	0.00080	0.020	mg/kg	J	7471	01/02/12	1
Arsenic	2.6	0.32	1.0	mg/kg		6010B	01/01/12	1
Barium	200	0.050	0.25	mg/kg		6010B	01/01/12	1
Cadmium	0.050	0.040	0.25	mg/kg	J	6010B	01/01/12	1
Chromium	9.8	0.085	0.50	mg/kg		6010B	01/01/12	1
Copper	34.	0.21	1.0	mg/kg		6010B	01/01/12	1
Lead	12.	0.090	0.25	mg/kg		6010B	01/01/12	1
Nickel	10.	0.26	1.0	mg/kg		6010B	01/01/12	1
Selenium	3.5	0.32	1.0	mg/kg		6010B	01/01/12	1
Silver	1.0	0.16	0.50	mg/kg		6010B	01/01/12	1
Zinc	48.	0.34	1.5	mg/kg		6010B	01/01/12	1
TPH (GC/FID) Low Fraction	3.3	0.25	0.50	mg/kg		8015D/G	12/30/11	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	94.0			% Rec.		602/801	12/30/11	5
Benzene	0.036	0.0017	0.0050	mg/kg		8260B	12/29/11	5
Toluene	0.056	0.0016	0.025	mg/kg		8260B	12/29/11	5
Ethylbenzene	0.011	0.0019	0.0050	mg/kg		8260B	12/29/11	5
Total Xylenes	0.060	0.0023	0.015	mg/kg		8260B	12/29/11	5
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	12/29/11	5
Dibromofluoromethane	99.5			% Rec.		8260B	12/29/11	5
a,a,a-Trifluorotoluene	100.			% Rec.		8260B	12/29/11	5
4-Bromofluorobenzene	98.9			% Rec.		8260B	12/29/11	5
TPH (GC/FID) High Fraction	800	15.	80.	mg/kg		3546/DR	12/30/11	20
Surrogate recovery(%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	12/30/11	20

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

Note:

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Reported: 01/06/12 15:59 Printed: 01/06/12 16:29
L553659-04 (PH) - 10.68@19.1c



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

Sample ID : CC-697-05-47B 7000FT

Collected By : CJB
Collection Date : 12/27/11 19:40

ESC Sample # : L553659-04

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.015	0.12	mg/kg		8270C-S	01/02/12	20
Acenaphthene	U	0.014	0.12	mg/kg		8270C-S	01/02/12	20
Acenaphthylene	U	0.011	0.12	mg/kg		8270C-S	01/02/12	20
Benzo(a)anthracene	U	0.018	0.12	mg/kg		8270C-S	01/02/12	20
Benzo(a)pyrene	0.013	0.012	0.12	mg/kg	J	8270C-S	01/02/12	20
Benzo(b)fluoranthene	U	0.016	0.12	mg/kg		8270C-S	01/02/12	20
Benzo(g,h,i)perylene	U	0.025	0.12	mg/kg		8270C-S	01/02/12	20
Benzo(k)fluoranthene	U	0.027	0.12	mg/kg		8270C-S	01/02/12	20
Chrysene	U	0.022	0.12	mg/kg		8270C-S	01/02/12	20
Dibenz(a,h)anthracene	U	0.022	0.12	mg/kg		8270C-S	01/02/12	20
Fluoranthene	U	0.021	0.12	mg/kg		8270C-S	01/02/12	20
Fluorene	0.020	0.011	0.12	mg/kg	J	8270C-S	01/02/12	20
Indeno(1,2,3-cd)pyrene	U	0.023	0.12	mg/kg		8270C-S	01/02/12	20
Naphthalene	0.076	0.013	0.12	mg/kg	J	8270C-S	01/02/12	20
Phenanthrene	0.044	0.015	0.12	mg/kg	J	8270C-S	01/02/12	20
Pyrene	U	0.012	0.12	mg/kg		8270C-S	01/02/12	20
1-Methylnaphthalene	0.085	0.016	0.12	mg/kg	J	8270C-S	01/02/12	20
2-Methylnaphthalene	0.15	0.012	0.12	mg/kg		8270C-S	01/02/12	20
2-Chloronaphthalene	U	0.012	0.12	mg/kg		8270C-S	01/02/12	20
Surrogate Recovery								
Nitrobenzene-d5	0.00			% Rec.	J7	8270C-S	01/02/12	20
2-Fluorobiphenyl	0.00			% Rec.	J7	8270C-S	01/02/12	20
p-Terphenyl-d14	0.00			% Rec.	J7	8270C-S	01/02/12	20

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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

ESC Sample # : L553659-05

Sample ID : CC-697-05-47B 8000FT

Site ID :

Collected By : CJB
Collection Date : 12/28/11 08:30

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/05/12	1
Chromium, Trivalent	6.1	0.17	2.0	mg/kg		Calc.	01/01/12	1
ORP	39.			mV	T8	2580	01/04/12	1
pH	10.			su	T8	9045D	12/30/11	1
Sodium Adsorption Ratio	82.					Calc.	01/03/12	1
Specific Conductance	2700			umhos/cm		9050AMo	01/05/12	1
Mercury	0.012	0.00080	0.020	mg/kg	J	7471	01/02/12	1
Arsenic	2.6	0.32	1.0	mg/kg		6010B	01/01/12	1
Barium	120	0.050	0.25	mg/kg		6010B	01/01/12	1
Cadmium	0.080	0.040	0.25	mg/kg	J	6010B	01/01/12	1
Chromium	6.1	0.085	0.50	mg/kg		6010B	01/01/12	1
Copper	10.	0.21	1.0	mg/kg		6010B	01/01/12	1
Lead	7.6	0.090	0.25	mg/kg		6010B	01/01/12	1
Nickel	6.6	0.26	1.0	mg/kg		6010B	01/01/12	1
Selenium	2.8	0.32	1.0	mg/kg		6010B	01/01/12	1
Silver	0.97	0.16	0.50	mg/kg		6010B	01/01/12	1
Zinc	32.	0.34	1.5	mg/kg		6010B	01/01/12	1
TPH (GC/FID) Low Fraction	2.1	0.25	0.50	mg/kg		8015D/G	12/30/11	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	90.7			% Rec.		602/801	12/30/11	5
Benzene	0.047	0.0017	0.0050	mg/kg		8260B	12/29/11	5
Toluene	0.12	0.0016	0.025	mg/kg		8260B	12/29/11	5
Ethylbenzene	0.012	0.0019	0.0050	mg/kg		8260B	12/29/11	5
Total Xylenes	0.16	0.0023	0.015	mg/kg		8260B	12/29/11	5
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	12/29/11	5
Dibromofluoromethane	97.4			% Rec.		8260B	12/29/11	5
a,a,a-Trifluorotoluene	99.7			% Rec.		8260B	12/29/11	5
4-Bromofluorobenzene	98.6			% Rec.		8260B	12/29/11	5
TPH (GC/FID) High Fraction	600	15.	80.	mg/kg		3546/DR	01/04/12	20
Surrogate recovery (%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	01/04/12	20

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L553659-05 (PH) - 10.05@19.4c



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Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 06, 2012

Date Received : December 29, 2011
Description : CC-697-05-47B Cuttings

ESC Sample # : L553659-05

Sample ID : CC-697-05-47B 8000FT

Site ID :

Collected By : CJB
Collection Date : 12/28/11 08:30

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	0.0029	0.00076	0.0060	mg/kg	J	8270C-S	01/02/12	1
Acenaphthene	U	0.00071	0.0060	mg/kg		8270C-S	01/02/12	1
Acenaphthylene	0.0037	0.00057	0.0060	mg/kg	J	8270C-S	01/02/12	1
Benzo(a)anthracene	0.0012	0.00092	0.0060	mg/kg	J	8270C-S	01/02/12	1
Benzo(a)pyrene	0.00077	0.00062	0.0060	mg/kg	J	8270C-S	01/02/12	1
Benzo(b)fluoranthene	0.0020	0.00082	0.0060	mg/kg	J	8270C-S	01/02/12	1
Benzo(g,h,i)perylene	U	0.0012	0.0060	mg/kg		8270C-S	01/02/12	1
Benzo(k)fluoranthene	U	0.0013	0.0060	mg/kg		8270C-S	01/02/12	1
Chrysene	0.0029	0.0011	0.0060	mg/kg	J	8270C-S	01/02/12	1
Dibenz(a,h)anthracene	U	0.0011	0.0060	mg/kg		8270C-S	01/02/12	1
Fluoranthene	U	0.0010	0.0060	mg/kg		8270C-S	01/02/12	1
Fluorene	0.013	0.00055	0.0060	mg/kg		8270C-S	01/02/12	1
Indeno(1,2,3-cd)pyrene	U	0.0012	0.0060	mg/kg		8270C-S	01/02/12	1
Naphthalene	0.058	0.00065	0.0060	mg/kg		8270C-S	01/02/12	1
Phenanthrene	0.025	0.00074	0.0060	mg/kg		8270C-S	01/02/12	1
Pyrene	0.0028	0.00059	0.0060	mg/kg	J	8270C-S	01/02/12	1
1-Methylnaphthalene	0.037	0.00079	0.0060	mg/kg		8270C-S	01/02/12	1
2-Methylnaphthalene	0.13	0.00059	0.0060	mg/kg		8270C-S	01/02/12	1
2-Chloronaphthalene	U	0.00060	0.0060	mg/kg		8270C-S	01/02/12	1
Surrogate Recovery								
Nitrobenzene-d5	92.3			% Rec.		8270C-S	01/02/12	1
2-Fluorobiphenyl	73.9			% Rec.		8270C-S	01/02/12	1
p-Terphenyl-d14	69.7			% Rec.		8270C-S	01/02/12	1

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MDL = Minimum Detection Limit = LOD

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L553659-05 (PH) - 10.05@19.4c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L553659-01	WG572176	SAMP	Cadmium	R1986034	J
	WG572222	SAMP	o-Terphenyl	R1986852	J7
	WG572312	SAMP	Mercury	R1986533	J
	WG572228	SAMP	TPH (GC/FID) Low Fraction	R1984592	J
	WG572226	SAMP	Toluene	R1984937	J
	WG572207	SAMP	pH	R1985272	T8
	WG572145	SAMP	Naphthalene	R1986812	J
	WG572145	SAMP	Phenanthrene	R1986812	J
	WG572145	SAMP	1-Methylnaphthalene	R1986812	J
	WG572145	SAMP	2-Methylnaphthalene	R1986812	J
	WG572588	SAMP	ORP	R1988712	T8
L553659-02	WG572556	SAMP	o-Terphenyl	R1989072	J7
	WG572312	SAMP	Mercury	R1986533	J
	WG572226	SAMP	Ethylbenzene	R1984937	J
	WG572207	SAMP	pH	R1985272	T8
	WG572145	SAMP	Acenaphthene	R1986812	J
	WG572145	SAMP	Fluorene	R1986812	J
	WG572145	SAMP	Phenanthrene	R1986812	J
	WG572145	SAMP	Pyrene	R1986812	J
	WG572588	SAMP	ORP	R1988712	T8
L553659-03	WG572176	SAMP	Arsenic	R1986034	J
	WG572222	SAMP	o-Terphenyl	R1986852	J7
	WG572401	SAMP	Chromium, Hexavalent	R1989652	O
	WG572312	SAMP	Mercury	R1986533	J
	WG572228	SAMP	TPH (GC/FID) Low Fraction	R1984592	J
	WG572226	SAMP	Toluene	R1984937	J
	WG572207	SAMP	pH	R1985272	T8
	WG572145	SAMP	Anthracene	R1986812	J3
	WG572145	SAMP	Benzo(k)fluoranthene	R1986812	J3
	WG572145	SAMP	Fluorene	R1986812	J
	WG572145	SAMP	Naphthalene	R1986812	J5J3
	WG572145	SAMP	Phenanthrene	R1986812	JJ3
	WG572145	SAMP	1-Methylnaphthalene	R1986812	J5J3
	WG572145	SAMP	2-Methylnaphthalene	R1986812	VJ3
	WG572588	SAMP	ORP	R1988712	T8
	WG572176	SAMP	Chromium, Trivalent	R1986034	J
L553659-04	WG572176	SAMP	Cadmium	R1986034	J
	WG572222	SAMP	o-Terphenyl	R1986852	J7
	WG572312	SAMP	Mercury	R1986533	J
	WG572207	SAMP	pH	R1985272	T8
	WG572145	SAMP	Benzo(a)pyrene	R1986812	J
	WG572145	SAMP	Fluorene	R1986812	J
	WG572145	SAMP	Naphthalene	R1986812	J
	WG572145	SAMP	Phenanthrene	R1986812	J
	WG572145	SAMP	1-Methylnaphthalene	R1986812	J
	WG572145	SAMP	Nitrobenzene-d5	R1986812	J7
	WG572145	SAMP	2-Fluorobiphenyl	R1986812	J7
	WG572145	SAMP	p-Terphenyl-d14	R1986812	J7
L553659-05	WG572588	SAMP	ORP	R1988712	T8
	WG572176	SAMP	Cadmium	R1986034	J
	WG572556	SAMP	o-Terphenyl	R1989072	J7
	WG572312	SAMP	Mercury	R1986533	J
	WG572207	SAMP	pH	R1985272	T8
	WG572145	SAMP	Anthracene	R1986812	J
	WG572145	SAMP	Acenaphthylene	R1986812	J
	WG572145	SAMP	Benzo(a)anthracene	R1986812	J
	WG572145	SAMP	Benzo(a)pyrene	R1986812	J
	WG572145	SAMP	Benzo(b)fluoranthene	R1986812	J
	WG572145	SAMP	Chrysene	R1986812	J
	WG572145	SAMP	Pyrene	R1986812	J
	WG572588	SAMP	ORP	R1988712	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.
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.

Alternate billing information:

Analysis/Container/Preservative

Page _____ of _____
Main of Custody

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SCIENCE CORP.

Mt. Juliet, TN 37122

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PAHSIM	
pH	
Ni, Zn	

Shipped Via:

Sample # (lab only)

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or

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pH _____ Temp _____

4/9/63 4/5/52 4/9/74_{FLOW}

Other

Not necessary

⑤

1000



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Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

Report Summary

Wednesday January 11, 2012

Report Number: L554205

Samples Received: 01/04/12

Client Project: 900546.0013.010

Description: 697-05-63B Cuttings

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

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

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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 11, 2012

Date Received : January 04, 2012
Description : 697-05-63B Cuttings

Sample ID : 697-05-63B 4000 FT

Collected By : CJB
Collection Date : 01/03/12 02:00

ESC Sample # : L554205-01

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/11/12	1
Chromium, Trivalent	11.	0.17	0.50	mg/kg		Calc.	01/05/12	1
ORP	45.			mV		2580	01/05/12	1
pH	11.			su		9045D	01/05/12	1
Sodium Adsorption Ratio	65.					Calc.	01/05/12	1
Specific Conductance	1800			umhos/cm		9050AMo	01/05/12	1
Mercury	0.019	0.00080	0.020	mg/kg	J	7471	01/05/12	1
Arsenic	5.5	0.32	1.0	mg/kg		6010B	01/05/12	1
Barium	190	0.050	0.25	mg/kg		6010B	01/05/12	1
Cadmium	0.28	0.040	0.25	mg/kg		6010B	01/05/12	1
Chromium	11.	0.085	0.50	mg/kg		6010B	01/05/12	1
Copper	48.	0.21	1.0	mg/kg		6010B	01/05/12	1
Lead	9.9	0.090	0.25	mg/kg		6010B	01/05/12	1
Nickel	13.	0.26	1.0	mg/kg		6010B	01/05/12	1
Selenium	U	1.6	5.0	mg/kg	O	6010B	01/05/12	5
Silver	0.30	0.16	0.50	mg/kg	J	6010B	01/05/12	1
Zinc	53.	0.34	1.5	mg/kg		6010B	01/05/12	1
TPH (GC/FID) Low Fraction	3.7	0.25	0.50	mg/kg		8015D/G	01/05/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	97.7			% Rec.		602/801	01/05/12	5
Benzene	0.13	0.0017	0.0050	mg/kg		8260B	01/05/12	5
Toluene	0.081	0.0016	0.025	mg/kg		8260B	01/05/12	5
Ethylbenzene	0.030	0.0019	0.0050	mg/kg		8260B	01/05/12	5
Total Xylenes	0.10	0.0023	0.015	mg/kg		8260B	01/05/12	5
Surrogate Recovery								
Toluene-d8	99.4			% Rec.		8260B	01/05/12	5
Dibromofluoromethane	94.9			% Rec.		8260B	01/05/12	5
a,a,a-Trifluorotoluene	92.9			% Rec.		8260B	01/05/12	5
4-Bromofluorobenzene	88.9			% Rec.		8260B	01/05/12	5
TPH (GC/FID) High Fraction	500	38.	200	mg/kg		3546/DR	01/05/12	50
Surrogate recovery (%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	01/05/12	50

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

Note:

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Reported: 01/11/12 16:26 Printed: 01/11/12 16:26
L554205-01 (SV8270PAHSIM) - Dilution due to matrix
L554205-01 (PH) - 10.79@18.1c



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 11, 2012

Date Received : January 04, 2012
Description : 697-05-63B Cuttings

ESC Sample # : L554205-01

Sample ID : 697-05-63B 4000 FT

Site ID :

Collected By : CJB
Collection Date : 01/03/12 02:00

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.015	0.12	mg/kg		8270C-S	01/09/12	20
Acenaphthene	U	0.014	0.12	mg/kg		8270C-S	01/09/12	20
Acenaphthylene	U	0.011	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(a)anthracene	U	0.018	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(a)pyrene	U	0.012	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(b)fluoranthene	U	0.016	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(g,h,i)perylene	U	0.025	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(k)fluoranthene	U	0.027	0.12	mg/kg		8270C-S	01/09/12	20
Chrysene	U	0.022	0.12	mg/kg		8270C-S	01/09/12	20
Dibenz(a,h)anthracene	U	0.022	0.12	mg/kg		8270C-S	01/09/12	20
Fluoranthene	U	0.021	0.12	mg/kg		8270C-S	01/09/12	20
Fluorene	0.011	0.011	0.12	mg/kg	J	8270C-S	01/09/12	20
Indeno(1,2,3-cd)pyrene	U	0.023	0.12	mg/kg		8270C-S	01/09/12	20
Naphthalene	0.15	0.013	0.12	mg/kg		8270C-S	01/09/12	20
Phenanthrene	0.039	0.015	0.12	mg/kg	J	8270C-S	01/09/12	20
Pyrene	0.013	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
1-Methylnaphthalene	0.072	0.016	0.12	mg/kg	J	8270C-S	01/09/12	20
2-Methylnaphthalene	0.10	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
2-Chloronaphthalene	U	0.012	0.12	mg/kg		8270C-S	01/09/12	20
Surrogate Recovery								
Nitrobenzene-d5	0.00			% Rec.	J7	8270C-S	01/09/12	20
2-Fluorobiphenyl	0.00			% Rec.	J7	8270C-S	01/09/12	20
p-Terphenyl-d14	0.00			% Rec.	J7	8270C-S	01/09/12	20

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

Note:

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Reported: 01/11/12 16:26 Printed: 01/11/12 16:26
L554205-01 (SV8270PAHSIM) - Dilution due to matrix
L554205-01 (PH) - 10.79@18.1c



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 11, 2012

Date Received : January 04, 2012
Description : 697-05-63B Cuttings

Sample ID : 697-05-63B 5000 FT

Collected By : CJB
Collection Date : 01/03/12 06:00

ESC Sample # : L554205-02

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/11/12	1
Chromium, Trivalent	9.9	0.17	0.50	mg/kg		Calc.	01/05/12	1
ORP	25.			mV		2580	01/05/12	1
pH	11.			su		9045D	01/05/12	1
Sodium Adsorption Ratio	82.					Calc.	01/05/12	1
Specific Conductance	1800			umhos/cm		9050AMo	01/05/12	1
Mercury	0.011	0.00080	0.020	mg/kg	J	7471	01/05/12	1
Arsenic	3.1	0.32	1.0	mg/kg		6010B	01/05/12	1
Barium	160	0.050	0.25	mg/kg		6010B	01/05/12	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/05/12	1
Chromium	9.9	0.085	0.50	mg/kg		6010B	01/05/12	1
Copper	25.	0.21	1.0	mg/kg		6010B	01/05/12	1
Lead	10.	0.090	0.25	mg/kg		6010B	01/05/12	1
Nickel	12.	0.26	1.0	mg/kg		6010B	01/05/12	1
Selenium	U	1.6	5.0	mg/kg	O	6010B	01/05/12	5
Silver	0.27	0.16	0.50	mg/kg	J	6010B	01/05/12	1
Zinc	44.	0.34	1.5	mg/kg		6010B	01/05/12	1
TPH (GC/FID) Low Fraction	1.8	0.25	0.50	mg/kg		8015D/G	01/05/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	106.			% Rec.		602/801	01/05/12	5
Benzene	0.17	0.0017	0.0050	mg/kg		8260B	01/05/12	5
Toluene	0.048	0.0016	0.025	mg/kg		8260B	01/05/12	5
Ethylbenzene	0.0063	0.0019	0.0050	mg/kg		8260B	01/05/12	5
Total Xylenes	0.027	0.0023	0.015	mg/kg		8260B	01/05/12	5
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	01/05/12	5
Dibromofluoromethane	92.2			% Rec.		8260B	01/05/12	5
a,a,a-Trifluorotoluene	101.			% Rec.		8260B	01/05/12	5
4-Bromofluorobenzene	105.			% Rec.		8260B	01/05/12	5
TPH (GC/FID) High Fraction	600	3.8	20.	mg/kg		3546/DR	01/06/12	5
Surrogate recovery (%) o-Terphenyl	6600			% Rec.	J1	3546/DR	01/06/12	5

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Reported: 01/11/12 16:26 Printed: 01/11/12 16:26

L554205-02 (DRO) - Previous run also had high IS/SURR recovery. Matrix effect.

L554205-02 (PH) - 10.74@18.2c

L554205-02 (SV8270PAHSIM) - Dilution due to matrix



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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 11, 2012

Date Received : January 04, 2012
Description : 697-05-63B Cuttings

Sample ID : 697-05-63B 5000 FT

Collected By : CJB
Collection Date : 01/03/12 06:00

ESC Sample # : L554205-02

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.060	mg/kg		8270C-S	01/09/12	10
Acenaphthene	U	0.0071	0.060	mg/kg		8270C-S	01/09/12	10
Acenaphthylene	U	0.0057	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(a)anthracene	U	0.0092	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(a)pyrene	U	0.0062	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(b)fluoranthene	U	0.0082	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(g,h,i)perylene	U	0.012	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(k)fluoranthene	U	0.013	0.060	mg/kg		8270C-S	01/09/12	10
Chrysene	U	0.011	0.060	mg/kg		8270C-S	01/09/12	10
Dibenz(a,h)anthracene	U	0.011	0.060	mg/kg		8270C-S	01/09/12	10
Fluoranthene	U	0.010	0.060	mg/kg		8270C-S	01/09/12	10
Fluorene	0.010	0.0055	0.060	mg/kg	J	8270C-S	01/09/12	10
Indeno(1,2,3-cd)pyrene	U	0.012	0.060	mg/kg		8270C-S	01/09/12	10
Naphthalene	0.15	0.0065	0.060	mg/kg		8270C-S	01/09/12	10
Phenanthrene	0.026	0.0074	0.060	mg/kg	J	8270C-S	01/09/12	10
Pyrene	U	0.0059	0.060	mg/kg		8270C-S	01/09/12	10
1-Methylnaphthalene	0.044	0.0079	0.060	mg/kg	J	8270C-S	01/09/12	10
2-Methylnaphthalene	0.061	0.0059	0.060	mg/kg		8270C-S	01/09/12	10
2-Chloronaphthalene	U	0.0060	0.060	mg/kg		8270C-S	01/09/12	10
Surrogate Recovery								
Nitrobenzene-d5	36.4			% Rec.		8270C-S	01/09/12	10
2-Fluorobiphenyl	82.9			% Rec.		8270C-S	01/09/12	10
p-Terphenyl-d14	71.8			% Rec.		8270C-S	01/09/12	10

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Note:

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Reported: 01/11/12 16:26 Printed: 01/11/12 16:26

L554205-02 (DRO) - Previous run also had high IS/SURR recovery. Matrix effect.

L554205-02 (PH) - 10.74@18.2c

L554205-02 (SV8270PAHSIM) - Dilution due to matrix

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L554205-01	WG572755	SAMP	Selenium	R1990033	O
	WG572755	SAMP	Silver	R1990033	J
	WG572723	SAMP	o-Terphenyl	R1989492	J7
	WG572731	SAMP	Mercury	R1989973	J
	WG572719	SAMP	Fluorene	R1990253	J
	WG572719	SAMP	Phenanthrene	R1990253	J
	WG572719	SAMP	Pyrene	R1990253	J
	WG572719	SAMP	1-Methylnaphthalene	R1990253	J
	WG572719	SAMP	2-Methylnaphthalene	R1990253	J
	WG572719	SAMP	Nitrobenzene-d5	R1990253	J7
	WG572719	SAMP	2-Fluorobiphenyl	R1990253	J7
	WG572719	SAMP	p-Terphenyl-d14	R1990253	J7
L554205-02	WG572755	SAMP	Selenium	R1990033	O
	WG572755	SAMP	Silver	R1990033	J
	WG572886	SAMP	o-Terphenyl	R1991892	J1
	WG572731	SAMP	Mercury	R1989973	J
	WG572719	SAMP	Fluorene	R1990253	J
	WG572719	SAMP	Phenanthrene	R1990253	J
	WG572719	SAMP	1-Methylnaphthalene	R1990253	J

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

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
01/11/12 at 16:26:44

TSR Signing Reports: 134
R5 - Desired TAT

Sample: L554205-01 Account: OXYGJCO Received: 01/04/12 09:00 Due Date: 01/11/12 00:00 RPT Date: 01/11/12 16:26

Sample: L554205-02 Account: OXYGJCO Received: 01/04/12 09:00 Due Date: 01/11/12 00:00 RPT Date: 01/11/12 16:26



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Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

Report Summary

Friday January 13, 2012

Report Number: L554221

Samples Received: 01/04/12

Client Project: 900546.0013.010

Description: 697-05-47B Cuttings

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,
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REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 13, 2012

Date Received : January 04, 2012
Description : 697-05-47B Cuttings

ESC Sample # : L554221-01

Sample ID : 697-05-47B

Site ID :

Collected By : CJB
Collection Date : 12/28/11 17:00

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	0.80	0.71	2.0	mg/kg	J	3060A/7	01/11/12	1
Chromium, Trivalent	3.2	0.17	0.50	mg/kg		Calc.	01/06/12	1
ORP	59.			mV		2580	01/05/12	1
pH	9.7			su	T8	9045D	01/09/12	1
Sodium Adsorption Ratio	98.					Calc.	01/05/12	1
Specific Conductance	2600			umhos/cm		9050AMo	01/05/12	1
Mercury	0.012	0.00080	0.020	mg/kg	J	7471	01/05/12	1
Arsenic	1.2	0.32	1.0	mg/kg		6010B	01/06/12	1
Barium	130	0.050	0.25	mg/kg		6010B	01/06/12	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/06/12	1
Chromium	4.0	0.085	0.50	mg/kg		6010B	01/06/12	1
Copper	16.	0.21	1.0	mg/kg		6010B	01/06/12	1
Lead	9.5	0.090	0.25	mg/kg		6010B	01/06/12	1
Nickel	12.	0.26	1.0	mg/kg		6010B	01/06/12	1
Selenium	1.9	0.32	1.0	mg/kg		6010B	01/06/12	1
Silver	U	0.16	0.50	mg/kg		6010B	01/06/12	1
Zinc	40.	0.34	1.5	mg/kg		6010B	01/06/12	1
TPH (GC/FID) Low Fraction	6.4	0.25	0.50	mg/kg		8015D/G	01/05/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	92.6			% Rec.		602/801	01/05/12	5
Benzene	0.15	0.0017	0.0050	mg/kg		8260B	01/05/12	5
Toluene	0.23	0.0016	0.025	mg/kg		8260B	01/05/12	5
Ethylbenzene	0.010	0.0019	0.0050	mg/kg		8260B	01/05/12	5
Total Xylenes	0.18	0.0023	0.015	mg/kg		8260B	01/05/12	5
Surrogate Recovery								
Toluene-d8	99.7			% Rec.		8260B	01/05/12	5
Dibromofluoromethane	96.3			% Rec.		8260B	01/05/12	5
a,a,a-Trifluorotoluene	97.1			% Rec.		8260B	01/05/12	5
4-Bromofluorobenzene	80.7			% Rec.		8260B	01/05/12	5
TPH (GC/FID) High Fraction	3300	38.	200	mg/kg		3546/DR	01/05/12	50
Surrogate recovery(%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	01/05/12	50

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Note:

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Reported: 01/13/12 08:42 Printed: 01/13/12 08:42
L554221-01 (PH) - 9.69@20.9c



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Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 13, 2012

Date Received : January 04, 2012
Description : 697-05-47B Cuttings

Sample ID : 697-05-47B

Collected By : CJB
Collection Date : 12/28/11 17:00

ESC Sample # : L554221-01

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	0.030	0.0076	0.060	mg/kg	J	8270C-S	01/09/12	10
Acenaphthene	0.043	0.0071	0.060	mg/kg	J	8270C-S	01/09/12	10
Acenaphthylene	0.0082	0.0057	0.060	mg/kg	J	8270C-S	01/09/12	10
Benzo(a)anthracene	0.033	0.0092	0.060	mg/kg	J	8270C-S	01/09/12	10
Benzo(a)pyrene	0.012	0.0062	0.060	mg/kg	J	8270C-S	01/09/12	10
Benzo(b)fluoranthene	0.029	0.0082	0.060	mg/kg	J	8270C-S	01/09/12	10
Benzo(g,h,i)perylene	U	0.012	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(k)fluoranthene	U	0.013	0.060	mg/kg		8270C-S	01/09/12	10
Chrysene	0.077	0.011	0.060	mg/kg		8270C-S	01/09/12	10
Dibenz(a,h)anthracene	U	0.011	0.060	mg/kg		8270C-S	01/09/12	10
Fluoranthene	0.017	0.010	0.060	mg/kg	J	8270C-S	01/09/12	10
Fluorene	0.17	0.0055	0.060	mg/kg		8270C-S	01/09/12	10
Indeno(1,2,3-cd)pyrene	U	0.012	0.060	mg/kg		8270C-S	01/09/12	10
Naphthalene	1.0	0.13	1.2	mg/kg	J	8270C-S	01/06/12	200
Phenanthrene	0.43	0.0074	0.060	mg/kg		8270C-S	01/09/12	10
Pyrene	U	0.0059	0.060	mg/kg		8270C-S	01/09/12	10
1-Methylnaphthalene	0.59	0.16	1.2	mg/kg	J	8270C-S	01/06/12	200
2-Methylnaphthalene	2.0	0.12	1.2	mg/kg		8270C-S	01/06/12	200
2-Chloronaphthalene	U	0.12	1.2	mg/kg		8270C-S	01/06/12	200
Surrogate Recovery								
Nitrobenzene-d5	0.00			% Rec.	J7	8270C-S	01/06/12	200
2-Fluorobiphenyl	61.3			% Rec.		8270C-S	01/09/12	10
p-Terphenyl-d14	65.2			% Rec.		8270C-S	01/09/12	10

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

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L554221-01 (PH) - 9.69@20.9c



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 13, 2012

Date Received : January 04, 2012
Description : 697-05-47B Cuttings

Sample ID : 697-05-47B

Collected By : CJB
Collection Date : 12/28/11 19:20

ESC Sample # : L554221-02

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/11/12	1
Chromium, Trivalent	5.4	0.17	0.50	mg/kg		Calc.	01/06/12	1
ORP	52.			mV		2580	01/05/12	1
pH	10.			su	T8	9045D	01/09/12	1
Sodium Adsorption Ratio	89.					Calc.	01/05/12	1
Specific Conductance	1900			umhos/cm		9050AMo	01/05/12	1
Mercury	0.0086	0.00080	0.020	mg/kg	J	7471	01/05/12	1
Arsenic	2.1	0.32	1.0	mg/kg		6010B	01/06/12	1
Barium	120	0.050	0.25	mg/kg		6010B	01/06/12	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/06/12	1
Chromium	5.4	0.085	0.50	mg/kg		6010B	01/06/12	1
Copper	12.	0.21	1.0	mg/kg		6010B	01/06/12	1
Lead	10.	0.090	0.25	mg/kg		6010B	01/06/12	1
Nickel	12.	0.26	1.0	mg/kg		6010B	01/06/12	1
Selenium	1.6	0.32	1.0	mg/kg		6010B	01/06/12	1
Silver	U	0.16	0.50	mg/kg		6010B	01/06/12	1
Zinc	57.	0.34	1.5	mg/kg		6010B	01/06/12	1
TPH (GC/FID) Low Fraction	2.2	0.25	0.50	mg/kg		8015D/G	01/06/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	94.1			% Rec.		602/801	01/06/12	5
Benzene	0.12	0.0017	0.0050	mg/kg		8260B	01/05/12	5
Toluene	0.13	0.0016	0.025	mg/kg		8260B	01/05/12	5
Ethylbenzene	0.012	0.0019	0.0050	mg/kg		8260B	01/05/12	5
Total Xylenes	0.10	0.0023	0.015	mg/kg		8260B	01/05/12	5
Surrogate Recovery								
Toluene-d8	97.9			% Rec.		8260B	01/05/12	5
Dibromofluoromethane	96.6			% Rec.		8260B	01/05/12	5
a,a,a-Trifluorotoluene	95.4			% Rec.		8260B	01/05/12	5
4-Bromofluorobenzene	76.7			% Rec.		8260B	01/05/12	5
TPH (GC/FID) High Fraction	880	38.	200	mg/kg		3546/DR	01/05/12	50
Surrogate recovery (%) o-Terphenyl	0.00			% Rec.	J7	3546/DR	01/05/12	50

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L554221-02 (PH) - 10.09@19.8c



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Blair Rollins
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 13, 2012

Date Received : January 04, 2012
Description : 697-05-47B Cuttings

Sample ID : 697-05-47B

Collected By : CJB
Collection Date : 12/28/11 19:20

ESC Sample # : L554221-02

Site ID :

Project # : 900546.0013.010

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	0.032	0.015	0.12	mg/kg	J	8270C-S	01/09/12	20
Acenaphthene	0.031	0.014	0.12	mg/kg	J	8270C-S	01/09/12	20
Acenaphthylene	U	0.011	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(a)anthracene	0.036	0.018	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(a)pyrene	0.017	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(b)fluoranthene	0.036	0.016	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(g,h,i)perylene	U	0.025	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(k)fluoranthene	U	0.027	0.12	mg/kg		8270C-S	01/09/12	20
Chrysene	0.081	0.022	0.12	mg/kg	J	8270C-S	01/09/12	20
Dibenz(a,h)anthracene	U	0.022	0.12	mg/kg		8270C-S	01/09/12	20
Fluoranthene	0.031	0.021	0.12	mg/kg	J	8270C-S	01/09/12	20
Fluorene	0.13	0.011	0.12	mg/kg		8270C-S	01/09/12	20
Indeno(1,2,3-cd)pyrene	U	0.023	0.12	mg/kg		8270C-S	01/09/12	20
Naphthalene	0.70	0.13	1.2	mg/kg	J	8270C-S	01/06/12	200
Phenanthrene	0.32	0.015	0.12	mg/kg		8270C-S	01/09/12	20
Pyrene	0.059	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
1-Methylnaphthalene	0.42	0.16	1.2	mg/kg	J	8270C-S	01/06/12	200
2-Methylnaphthalene	1.1	0.12	1.2	mg/kg	J	8270C-S	01/06/12	200
2-Chloronaphthalene	U	0.12	1.2	mg/kg		8270C-S	01/06/12	200
Surrogate Recovery								
Nitrobenzene-d5	0.00			% Rec.	J7	8270C-S	01/06/12	200
2-Fluorobiphenyl	0.00			% Rec.	J7	8270C-S	01/09/12	20
p-Terphenyl-d14	0.00			% Rec.	J7	8270C-S	01/09/12	20

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MDL = Minimum Detection Limit = LOD

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L554221-02 (PH) - 10.09@19.8c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L554221-01	WG572723	SAMP	o-Terphenyl	R1989492	J7
	WG573347	SAMP	Chromium, Hexavalent	R1996232	J
	WG572731	SAMP	Mercury	R1989973	J
	WG573141	SAMP	pH	R1993572	T8
	WG572719	SAMP	Anthracene	R1990253	J
	WG572719	SAMP	Acenaphthene	R1990253	J
	WG572719	SAMP	Acenaphthylene	R1990253	J
	WG572719	SAMP	Benzo(a)anthracene	R1990253	J
	WG572719	SAMP	Benzo(a)pyrene	R1990253	J
	WG572719	SAMP	Benzo(b)fluoranthene	R1990253	J
	WG572719	SAMP	Fluoranthene	R1990253	J
	WG572719	SAMP	Naphthalene	R1990253	J
	WG572719	SAMP	1-Methylnaphthalene	R1990253	J
	WG572719	SAMP	Nitrobenzene-d5	R1990253	J7
	WG572723	SAMP	o-Terphenyl	R1989492	J7
	WG572731	SAMP	Mercury	R1989973	J
	WG573141	SAMP	pH	R1993572	T8
L554221-02	WG572719	SAMP	Anthracene	R1990253	J
	WG572719	SAMP	Acenaphthene	R1990253	J
	WG572719	SAMP	Benzo(a)anthracene	R1990253	J
	WG572719	SAMP	Benzo(a)pyrene	R1990253	J
	WG572719	SAMP	Benzo(b)fluoranthene	R1990253	J
	WG572719	SAMP	Chrysene	R1990253	J
	WG572719	SAMP	Fluoranthene	R1990253	J
	WG572719	SAMP	Naphthalene	R1990253	J
	WG572719	SAMP	Pyrene	R1990253	J
	WG572719	SAMP	1-Methylnaphthalene	R1990253	J
	WG572719	SAMP	2-Methylnaphthalene	R1990253	J
	WG572719	SAMP	Nitrobenzene-d5	R1990253	J7
	WG572719	SAMP	2-Fluorobiphenyl	R1990253	J7
	WG572719	SAMP	p-Terphenyl-d14	R1990253	J7

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

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
01/13/12 at 08:42:42

TSR Signing Reports: 134
R5 - Desired TAT

Sample: L554221-01 Account: OXYGJCO Received: 01/04/12 09:00 Due Date: 01/11/12 00:00 RPT Date: 01/13/12 08:42

Sample: L554221-02 Account: OXYGJCO Received: 01/04/12 09:00 Due Date: 01/11/12 00:00 RPT Date: 01/13/12 08:42



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Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

Report Summary

Sunday January 15, 2012

Report Number: L554746

Samples Received: 01/06/12

Client Project: 900546.0013

Description: CC 697-05-63B

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

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

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REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B

Sample ID : CC697-05-63B

Collected By : CJB
Collection Date : 01/04/12 08:45

ESC Sample # : L554746-01

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/11/12	1
Chromium, Trivalent	6.3	0.17	2.0	mg/kg		Calc.	01/13/12	1
ORP	-31.			mV	T8	2580	01/10/12	1
pH	9.5			su	T8	9045D	01/09/12	1
Sodium Adsorption Ratio	72.					Calc.	01/11/12	1
Specific Conductance	2200			umhos/cm		9050AMo	01/10/12	1
Mercury	0.017	0.00080	0.020	mg/kg	J	7471	01/10/12	1
Arsenic	5.4	0.32	1.0	mg/kg		6010B	01/13/12	1
Barium	180	0.050	0.25	mg/kg		6010B	01/13/12	1
Cadmium	0.36	0.040	0.25	mg/kg		6010B	01/13/12	1
Chromium	6.3	0.085	0.50	mg/kg		6010B	01/13/12	1
Copper	14.	0.21	1.0	mg/kg		6010B	01/13/12	1
Lead	8.8	0.090	0.25	mg/kg	B	6010B	01/13/12	1
Nickel	9.9	0.26	1.0	mg/kg		6010B	01/13/12	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/13/12	1
Silver	0.50	0.16	0.50	mg/kg	J	6010B	01/13/12	1
Zinc	43.	0.34	1.5	mg/kg		6010B	01/13/12	1
TPH (GC/FID) Low Fraction	2.1	0.25	0.50	mg/kg		8015D/G	01/08/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	85.0			% Rec.		602/801	01/08/12	5
Benzene	0.046	0.0017	0.0050	mg/kg		8260B	01/08/12	5
Toluene	0.039	0.0016	0.025	mg/kg		8260B	01/08/12	5
Ethylbenzene	0.0026	0.0019	0.0050	mg/kg	J	8260B	01/08/12	5
Total Xylenes	0.032	0.0023	0.015	mg/kg		8260B	01/08/12	5
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	01/08/12	5
Dibromofluoromethane	88.5			% Rec.		8260B	01/08/12	5
a,a,a-Trifluorotoluene	100.			% Rec.		8260B	01/08/12	5
4-Bromofluorobenzene	103.			% Rec.		8260B	01/08/12	5
TPH (GC/FID) High Fraction	550	3.8	20.	mg/kg		3546/DR	01/11/12	5
Surrogate recovery (%) o-Terphenyl	7990			% Rec.	J1	3546/DR	01/11/12	5

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L554746-01 (PH) - 9.48@17.0c

L554746-01 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B

Sample ID : CC697-05-63B

Collected By : CJB
Collection Date : 01/04/12 08:45

ESC Sample # : L554746-01

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	0.044	0.015	0.12	mg/kg	J	8270C-S	01/09/12	20
Acenaphthene	0.052	0.014	0.12	mg/kg	J	8270C-S	01/09/12	20
Acenaphthylene	U	0.011	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(a)anthracene	U	0.018	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(a)pyrene	0.018	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(b)fluoranthene	0.038	0.016	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(g,h,i)perylene	U	0.025	0.12	mg/kg		8270C-S	01/09/12	20
Benzo(k)fluoranthene	U	0.027	0.12	mg/kg		8270C-S	01/09/12	20
Chrysene	0.13	0.022	0.12	mg/kg		8270C-S	01/09/12	20
Dibenz(a,h)anthracene	U	0.022	0.12	mg/kg		8270C-S	01/09/12	20
Fluoranthene	0.064	0.021	0.12	mg/kg	J	8270C-S	01/09/12	20
Fluorene	0.20	0.011	0.12	mg/kg		8270C-S	01/09/12	20
Indeno(1,2,3-cd)pyrene	U	0.023	0.12	mg/kg		8270C-S	01/09/12	20
Naphthalene	0.97	0.013	0.12	mg/kg		8270C-S	01/09/12	20
Phenanthrene	0.56	0.015	0.12	mg/kg		8270C-S	01/09/12	20
Pyrene	0.048	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
1-Methylnaphthalene	0.52	0.016	0.12	mg/kg		8270C-S	01/09/12	20
2-Methylnaphthalene	2.1	0.012	0.12	mg/kg		8270C-S	01/09/12	20
2-Chloronaphthalene	U	0.012	0.12	mg/kg		8270C-S	01/09/12	20
Surrogate Recovery								
Nitrobenzene-d5	0.00			% Rec.	J7	8270C-S	01/09/12	20
2-Fluorobiphenyl	0.00			% Rec.	J7	8270C-S	01/09/12	20
p-Terphenyl-d14	0.00			% Rec.	J7	8270C-S	01/09/12	20

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L554746-01 (PH) - 9.48@17.0c

L554746-01 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

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OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 8000 FT
Collected By : CJB
Collection Date : 01/04/12 00:45

ESC Sample # : L554746-02

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/11/12	1
Chromium, Trivalent	11.	0.17	2.0	mg/kg		Calc.	01/13/12	1
ORP	-29.			mV	T8	2580	01/10/12	1
pH	10.			su	T8	9045D	01/09/12	1
Sodium Adsorption Ratio	60.					Calc.	01/11/12	1
Specific Conductance	2000			umhos/cm		9050AMo	01/10/12	1
Mercury	0.014	0.00080	0.020	mg/kg	J	7471	01/10/12	1
Arsenic	3.1	0.32	1.0	mg/kg		6010B	01/13/12	1
Barium	160	0.050	0.25	mg/kg		6010B	01/13/12	1
Cadmium	0.57	0.040	0.25	mg/kg		6010B	01/13/12	1
Chromium	11.	0.085	0.50	mg/kg		6010B	01/13/12	1
Copper	26.	0.21	1.0	mg/kg		6010B	01/13/12	1
Lead	13.	0.090	0.25	mg/kg	B	6010B	01/13/12	1
Nickel	16.	0.26	1.0	mg/kg		6010B	01/13/12	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/13/12	1
Silver	U	0.16	0.50	mg/kg		6010B	01/13/12	1
Zinc	60.	0.34	1.5	mg/kg		6010B	01/13/12	1
TPH (GC/FID) Low Fraction	2.5	0.25	0.50	mg/kg		8015D/G	01/08/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	90.6			% Rec.		602/801	01/08/12	5
Benzene	0.064	0.0017	0.0050	mg/kg		8260B	01/08/12	5
Toluene	0.073	0.0016	0.025	mg/kg		8260B	01/08/12	5
Ethylbenzene	0.0047	0.0019	0.0050	mg/kg	J	8260B	01/08/12	5
Total Xylenes	0.054	0.0023	0.015	mg/kg		8260B	01/08/12	5
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	01/08/12	5
Dibromofluoromethane	87.3			% Rec.		8260B	01/08/12	5
a,a,a-Trifluorotoluene	97.7			% Rec.		8260B	01/08/12	5
4-Bromofluorobenzene	110.			% Rec.		8260B	01/08/12	5
TPH (GC/FID) High Fraction	200	0.77	4.0	mg/kg	J6	3546/DR	01/11/12	1
Surrogate recovery(%) o-Terphenyl	2170			% Rec.	J1	3546/DR	01/11/12	1

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Reported: 01/15/12 15:47 Printed: 01/15/12 15:47

L554746-02 (DRO) - Surrogate failure due to matrix interference; confirmed by MS/D

L554746-02 (PH) - 10.23@17.5c



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 8000 FT
Collected By : CJB
Collection Date : 01/04/12 00:45

ESC Sample # : L554746-02

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.060	mg/kg		8270C-S	01/09/12	10
Acenaphthene	U	0.0071	0.060	mg/kg		8270C-S	01/09/12	10
Acenaphthylene	U	0.0057	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(a)anthracene	0.011	0.0092	0.060	mg/kg	J	8270C-S	01/09/12	10
Benzo(a)pyrene	U	0.0062	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(b)fluoranthene	U	0.0082	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(g,h,i)perylene	U	0.012	0.060	mg/kg		8270C-S	01/09/12	10
Benzo(k)fluoranthene	U	0.013	0.060	mg/kg		8270C-S	01/09/12	10
Chrysene	U	0.011	0.060	mg/kg		8270C-S	01/09/12	10
Dibenz(a,h)anthracene	U	0.011	0.060	mg/kg		8270C-S	01/09/12	10
Fluoranthene	U	0.010	0.060	mg/kg		8270C-S	01/09/12	10
Fluorene	0.022	0.0055	0.060	mg/kg	J	8270C-S	01/09/12	10
Indeno(1,2,3-cd)pyrene	U	0.012	0.060	mg/kg		8270C-S	01/09/12	10
Naphthalene	0.11	0.0065	0.060	mg/kg		8270C-S	01/09/12	10
Phenanthrene	0.040	0.0074	0.060	mg/kg	J	8270C-S	01/09/12	10
Pyrene	0.0083	0.0059	0.060	mg/kg	J	8270C-S	01/09/12	10
1-Methylnaphthalene	0.090	0.0079	0.060	mg/kg		8270C-S	01/09/12	10
2-Methylnaphthalene	0.19	0.0059	0.060	mg/kg		8270C-S	01/09/12	10
2-Chloronaphthalene	U	0.0060	0.060	mg/kg		8270C-S	01/09/12	10
Surrogate Recovery								
Nitrobenzene-d5	114.			% Rec.		8270C-S	01/09/12	10
2-Fluorobiphenyl	96.1			% Rec.		8270C-S	01/09/12	10
p-Terphenyl-d14	93.7			% Rec.		8270C-S	01/09/12	10

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L554746-02 (DRO) - Surrogate failure due to matrix interference; confirmed by MS/D

L554746-02 (PH) - 10.23@17.5c



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REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 9000 FT
Collected By : CJB
Collection Date : 01/04/12 05:45

ESC Sample # : L554746-03

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	1.0	0.71	2.0	mg/kg	J	3060A/7	01/11/12	1
Chromium, Trivalent	4.4	0.17	2.0	mg/kg		Calc.	01/13/12	1
ORP	-23.			mV	T8	2580	01/10/12	1
pH	10.			su	T8	9045D	01/09/12	1
Sodium Adsorption Ratio	68.					Calc.	01/11/12	1
Specific Conductance	1900			umhos/cm		9050AMo	01/10/12	1
Mercury	0.016	0.00080	0.020	mg/kg	J	7471	01/10/12	1
Arsenic	6.5	0.32	1.0	mg/kg		6010B	01/13/12	1
Barium	180	0.050	0.25	mg/kg		6010B	01/13/12	1
Cadmium	0.69	0.040	0.25	mg/kg		6010B	01/13/12	1
Chromium	5.4	0.085	0.50	mg/kg		6010B	01/13/12	1
Copper	31.	0.21	1.0	mg/kg		6010B	01/13/12	1
Lead	9.7	0.090	0.25	mg/kg	B	6010B	01/13/12	1
Nickel	15.	0.26	1.0	mg/kg		6010B	01/13/12	1
Selenium	0.54	0.32	1.0	mg/kg	J	6010B	01/13/12	1
Silver	0.43	0.16	0.50	mg/kg	J	6010B	01/13/12	1
Zinc	85.	0.34	1.5	mg/kg		6010B	01/13/12	1
TPH (GC/FID) Low Fraction	3.7	0.25	0.50	mg/kg		8015D/G	01/08/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	93.1			% Rec.		602/801	01/08/12	5
Benzene	0.067	0.0017	0.0050	mg/kg		8260B	01/08/12	5
Toluene	0.086	0.0016	0.025	mg/kg		8260B	01/08/12	5
Ethylbenzene	0.0032	0.0019	0.0050	mg/kg	J	8260B	01/08/12	5
Total Xylenes	0.080	0.0023	0.015	mg/kg		8260B	01/08/12	5
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	01/08/12	5
Dibromofluoromethane	89.9			% Rec.		8260B	01/08/12	5
a,a,a-Trifluorotoluene	101.			% Rec.		8260B	01/08/12	5
4-Bromofluorobenzene	110.			% Rec.		8260B	01/08/12	5
TPH (GC/FID) High Fraction	1800	3.8	20.	mg/kg		3546/DR	01/11/12	5
Surrogate recovery (%) o-Terphenyl	23600			% Rec.	J1	3546/DR	01/11/12	5

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Reported: 01/15/12 15:47 Printed: 01/15/12 15:48

L554746-03 (SV8270PAHSIM) - Dilution due to matrix

L554746-03 (PH) - 10.20@18.1c

L554746-03 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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Tax I.D. 62-0814289

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REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 9000 FT
Collected By : CJB
Collection Date : 01/04/12 05:45

ESC Sample # : L554746-03

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.015	0.12	mg/kg		8270C-S	01/09/12	20
Acenaphthene	0.091	0.014	0.12	mg/kg	J	8270C-S	01/09/12	20
Acenaphthylene	0.022	0.011	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(a)anthracene	0.069	0.018	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(a)pyrene	0.035	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(b)fluoranthene	0.063	0.016	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(g,h,i)perylene	0.032	0.025	0.12	mg/kg	J	8270C-S	01/09/12	20
Benzo(k)fluoranthene	U	0.027	0.12	mg/kg		8270C-S	01/09/12	20
Chrysene	0.20	0.022	0.12	mg/kg		8270C-S	01/09/12	20
Dibenz(a,h)anthracene	0.028	0.022	0.12	mg/kg	J	8270C-S	01/09/12	20
Fluoranthene	0.055	0.021	0.12	mg/kg	J	8270C-S	01/09/12	20
Fluorene	0.49	0.011	0.12	mg/kg		8270C-S	01/09/12	20
Indeno(1,2,3-cd)pyrene	U	0.023	0.12	mg/kg		8270C-S	01/09/12	20
Naphthalene	2.0	0.013	0.12	mg/kg		8270C-S	01/09/12	20
Phenanthrene	1.0	0.015	0.12	mg/kg		8270C-S	01/09/12	20
Pyrene	0.10	0.012	0.12	mg/kg	J	8270C-S	01/09/12	20
1-Methylnaphthalene	1.3	0.016	0.12	mg/kg		8270C-S	01/09/12	20
2-Methylnaphthalene	5.3	0.012	0.12	mg/kg		8270C-S	01/09/12	20
2-Chloronaphthalene	U	0.012	0.12	mg/kg		8270C-S	01/09/12	20
Surrogate Recovery								
Nitrobenzene-d5	0.00			% Rec.	J7	8270C-S	01/09/12	20
2-Fluorobiphenyl	0.00			% Rec.	J7	8270C-S	01/09/12	20
p-Terphenyl-d14	0.00			% Rec.	J7	8270C-S	01/09/12	20

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Reported: 01/15/12 15:47 Printed: 01/15/12 15:48

L554746-03 (SV8270PAHSIM) - Dilution due to matrix

L554746-03 (PH) - 10.20@18.1c

L554746-03 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 7000 FT
Collected By : CJB
Collection Date : 01/03/12 17:45

ESC Sample # : L554746-04

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/13/12	1
Chromium, Trivalent	7.5	0.17	2.0	mg/kg		Calc.	01/09/12	1
ORP	-32.			mV	T8	2580	01/10/12	1
pH	11.			su	T8	9045D	01/09/12	1
Sodium Adsorption Ratio	49.					Calc.	01/11/12	1
Specific Conductance	1600			umhos/cm		9050AMo	01/10/12	1
Mercury	0.014	0.00080	0.020	mg/kg	J	7471	01/10/12	1
Arsenic	3.5	0.32	1.0	mg/kg		6010B	01/09/12	1
Barium	120	0.050	0.25	mg/kg		6010B	01/09/12	1
Cadmium	0.12	0.040	0.25	mg/kg	J	6010B	01/09/12	1
Chromium	7.5	0.085	0.50	mg/kg		6010B	01/09/12	1
Copper	89.	0.21	1.0	mg/kg		6010B	01/09/12	1
Lead	12.	0.090	0.25	mg/kg		6010B	01/09/12	1
Nickel	9.7	0.26	1.0	mg/kg		6010B	01/09/12	1
Selenium	U	1.6	5.0	mg/kg	O	6010B	01/09/12	5
Silver	0.26	0.16	0.50	mg/kg	J	6010B	01/09/12	1
Zinc	34.	0.34	1.5	mg/kg		6010B	01/09/12	1
TPH (GC/FID) Low Fraction	0.74	0.25	0.50	mg/kg		8015D/G	01/08/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	93.6			% Rec.		602/801	01/08/12	5
Benzene	0.024	0.0017	0.0050	mg/kg		8260B	01/08/12	5
Toluene	0.020	0.0016	0.025	mg/kg	J	8260B	01/08/12	5
Ethylbenzene	0.0025	0.0019	0.0050	mg/kg	J	8260B	01/08/12	5
Total Xylenes	0.016	0.0023	0.015	mg/kg		8260B	01/08/12	5
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	01/08/12	5
Dibromofluoromethane	88.6			% Rec.		8260B	01/08/12	5
a,a,a-Trifluorotoluene	98.5			% Rec.		8260B	01/08/12	5
4-Bromofluorobenzene	109.			% Rec.		8260B	01/08/12	5
TPH (GC/FID) High Fraction	54.	0.77	4.0	mg/kg		3546/DR	01/11/12	1
Surrogate recovery(%) o-Terphenyl	780.			% Rec.	J1	3546/DR	01/11/12	1

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L554746-04 (PH) - 10.76@18.2c

L554746-04 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 7000 FT
Collected By : CJB
Collection Date : 01/03/12 17:45

ESC Sample # : L554746-04

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	0.0011	0.00076	0.0060	mg/kg	J	8270C-S	01/11/12	1
Acenaphthene	0.0014	0.00071	0.0060	mg/kg	J	8270C-S	01/11/12	1
Acenaphthylene	0.0022	0.00057	0.0060	mg/kg	J	8270C-S	01/11/12	1
Benzo(a)anthracene	0.0014	0.00092	0.0060	mg/kg	J	8270C-S	01/11/12	1
Benzo(a)pyrene	U	0.00062	0.0060	mg/kg		8270C-S	01/11/12	1
Benzo(b)fluoranthene	0.0022	0.00082	0.0060	mg/kg	J	8270C-S	01/11/12	1
Benzo(g,h,i)perylene	U	0.0012	0.0060	mg/kg		8270C-S	01/11/12	1
Benzo(k)fluoranthene	U	0.0013	0.0060	mg/kg		8270C-S	01/11/12	1
Chrysene	0.0026	0.0011	0.0060	mg/kg	J	8270C-S	01/11/12	1
Dibenz(a,h)anthracene	U	0.0011	0.0060	mg/kg		8270C-S	01/11/12	1
Fluoranthene	U	0.0010	0.0060	mg/kg		8270C-S	01/11/12	1
Fluorene	0.0087	0.00055	0.0060	mg/kg		8270C-S	01/11/12	1
Indeno(1,2,3-cd)pyrene	U	0.0012	0.0060	mg/kg		8270C-S	01/11/12	1
Naphthalene	0.052	0.00065	0.0060	mg/kg		8270C-S	01/11/12	1
Phenanthrene	0.015	0.00074	0.0060	mg/kg		8270C-S	01/11/12	1
Pyrene	0.0025	0.00059	0.0060	mg/kg	J	8270C-S	01/11/12	1
1-Methylnaphthalene	0.031	0.00079	0.0060	mg/kg		8270C-S	01/11/12	1
2-Methylnaphthalene	0.058	0.00059	0.0060	mg/kg		8270C-S	01/11/12	1
2-Chloronaphthalene	U	0.00060	0.0060	mg/kg		8270C-S	01/11/12	1
Surrogate Recovery								
Nitrobenzene-d5	75.3			% Rec.		8270C-S	01/11/12	1
2-Fluorobiphenyl	79.3			% Rec.		8270C-S	01/11/12	1
p-Terphenyl-d14	57.8			% Rec.		8270C-S	01/11/12	1

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MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

Note:

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L554746-04 (PH) - 10.76@18.2c

L554746-04 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 6000 FT
Collected By : CJB
Collection Date : 01/03/12 12:15

ESC Sample # : L554746-05

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.71	2.0	mg/kg		3060A/7	01/13/12	1
Chromium, Trivalent	8.3	0.17	2.0	mg/kg		Calc.	01/09/12	1
ORP	-16.			mV	T8	2580	01/10/12	1
pH	10.			su	T8	9045D	01/09/12	1
Sodium Adsorption Ratio	51.					Calc.	01/11/12	1
Specific Conductance	1800			umhos/cm		9050AMo	01/10/12	1
Mercury	0.014	0.00080	0.020	mg/kg	J	7471	01/10/12	1
Arsenic	1.3	0.32	1.0	mg/kg		6010B	01/09/12	1
Barium	170	0.050	0.25	mg/kg		6010B	01/09/12	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/09/12	1
Chromium	8.3	0.085	0.50	mg/kg		6010B	01/09/12	1
Copper	5.7	0.21	1.0	mg/kg		6010B	01/09/12	1
Lead	11.	0.090	0.25	mg/kg		6010B	01/09/12	1
Nickel	11.	0.26	1.0	mg/kg		6010B	01/09/12	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/09/12	1
Silver	0.16	0.16	0.50	mg/kg	J	6010B	01/09/12	1
Zinc	45.	0.34	1.5	mg/kg		6010B	01/09/12	1
TPH (GC/FID) Low Fraction	1.1	0.25	0.50	mg/kg		8015D/G	01/08/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene (FID)	94.4			% Rec.		602/801	01/08/12	5
Benzene	0.028	0.0017	0.0050	mg/kg		8260B	01/08/12	5
Toluene	0.015	0.0016	0.025	mg/kg	J	8260B	01/08/12	5
Ethylbenzene	0.0034	0.0019	0.0050	mg/kg	J	8260B	01/08/12	5
Total Xylenes	0.014	0.0023	0.015	mg/kg	J	8260B	01/08/12	5
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	01/08/12	5
Dibromofluoromethane	92.1			% Rec.		8260B	01/08/12	5
a,a,a-Trifluorotoluene	101.			% Rec.		8260B	01/08/12	5
4-Bromofluorobenzene	109.			% Rec.		8260B	01/08/12	5
TPH (GC/FID) High Fraction	31.	0.77	4.0	mg/kg		3546/DR	01/10/12	1
Surrogate recovery (%) o-Terphenyl	266.			% Rec.	J1	3546/DR	01/10/12	1

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 01/15/12 15:47 Printed: 01/15/12 15:48

L554746-05 (DRO) - matrix interference, MS confirms high surrogate

L554746-05 (PH) - 10.46@18.0c



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

REPORT OF ANALYSIS

Daniel Padilla
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

January 15, 2012

Date Received : January 06, 2012
Description : CC 697-05-63B
Sample ID : 697-05-63B 6000 FT
Collected By : CJB
Collection Date : 01/03/12 12:15

ESC Sample # : L554746-05

Site ID :

Project # : 900546.0013

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons								
Anthracene	0.0021	0.00076	0.0060	mg/kg	J	8270C-S	01/11/12	1
Acenaphthene	0.0023	0.00071	0.0060	mg/kg	J	8270C-S	01/11/12	1
Acenaphthylene	0.0054	0.00057	0.0060	mg/kg	J	8270C-S	01/11/12	1
Benzo(a)anthracene	U	0.00092	0.0060	mg/kg		8270C-S	01/11/12	1
Benzo(a)pyrene	U	0.00062	0.0060	mg/kg		8270C-S	01/11/12	1
Benzo(b)fluoranthene	0.0018	0.00082	0.0060	mg/kg	J	8270C-S	01/11/12	1
Benzo(g,h,i)perylene	U	0.0012	0.0060	mg/kg		8270C-S	01/11/12	1
Benzo(k)fluoranthene	U	0.0013	0.0060	mg/kg		8270C-S	01/11/12	1
Chrysene	0.0026	0.0011	0.0060	mg/kg	J	8270C-S	01/11/12	1
Dibenz(a,h)anthracene	U	0.0011	0.0060	mg/kg		8270C-S	01/11/12	1
Fluoranthene	0.0034	0.0010	0.0060	mg/kg	J	8270C-S	01/11/12	1
Fluorene	0.0079	0.00055	0.0060	mg/kg		8270C-S	01/11/12	1
Indeno(1,2,3-cd)pyrene	U	0.0012	0.0060	mg/kg		8270C-S	01/11/12	1
Naphthalene	0.087	0.00065	0.0060	mg/kg		8270C-S	01/11/12	1
Phenanthrene	0.021	0.00074	0.0060	mg/kg		8270C-S	01/11/12	1
Pyrene	0.0034	0.00059	0.0060	mg/kg	J	8270C-S	01/11/12	1
1-Methylnaphthalene	0.064	0.00079	0.0060	mg/kg		8270C-S	01/11/12	1
2-Methylnaphthalene	0.094	0.00059	0.0060	mg/kg		8270C-S	01/11/12	1
2-Chloronaphthalene	U	0.00060	0.0060	mg/kg		8270C-S	01/11/12	1
Surrogate Recovery								
Nitrobenzene-d5	78.4			% Rec.		8270C-S	01/11/12	1
2-Fluorobiphenyl	71.3			% Rec.		8270C-S	01/11/12	1
p-Terphenyl-d14	60.5			% Rec.		8270C-S	01/11/12	1

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 01/15/12 15:47 Printed: 01/15/12 15:48

L554746-05 (DRO) - matrix interference, MS confirms high surrogate

L554746-05 (PH) - 10.46@18.0c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L554746-01	WG573253	SAMP	Lead	R1999212	B
	WG573253	SAMP	Silver	R1999212	J
	WG573544	SAMP	o-Terphenyl	R1996993	J1
	WG573149	SAMP	Mercury	R1994836	J
	WG573183	SAMP	Ethylbenzene	R1992397	J
	WG573142	SAMP	pH	R1993172	T8
	WG573130	SAMP	Anthracene	R1993453	J
	WG573130	SAMP	Acenaphthene	R1993453	J
	WG573130	SAMP	Benzo(a)pyrene	R1993453	J
	WG573130	SAMP	Benzo(b)fluoranthene	R1993453	J
	WG573130	SAMP	Fluoranthene	R1993453	J
	WG573130	SAMP	Pyrene	R1993453	J
	WG573130	SAMP	Nitrobenzene-d5	R1993453	J7
	WG573130	SAMP	2-Fluorobiphenyl	R1993453	J7
	WG573130	SAMP	p-Terphenyl-d14	R1993453	J7
	WG573400	SAMP	ORP	R1994952	T8
L554746-02	WG573253	SAMP	Lead	R1999212	B
	WG573544	SAMP	TPH (GC/FID) High Fraction	R1996993	J6
	WG573544	SAMP	o-Terphenyl	R1996993	J1
	WG573149	SAMP	Mercury	R1994836	J
	WG573183	SAMP	Ethylbenzene	R1992397	J
	WG573142	SAMP	pH	R1993172	T8
	WG573130	SAMP	Benzo(a)anthracene	R1993453	J
	WG573130	SAMP	Fluorene	R1993453	J
	WG573130	SAMP	Phenanthrene	R1993453	J
	WG573130	SAMP	Pyrene	R1993453	J
	WG573400	SAMP	ORP	R1994952	T8
L554746-03	WG573253	SAMP	Lead	R1999212	B
	WG573253	SAMP	Selenium	R1999212	J
	WG573253	SAMP	Silver	R1999212	J
	WG573544	SAMP	o-Terphenyl	R1996993	J1
	WG573347	SAMP	Chromium, Hexavalent	R1996232	J
	WG573149	SAMP	Mercury	R1994836	J
	WG573183	SAMP	Ethylbenzene	R1992397	J
	WG573142	SAMP	pH	R1993172	T8
	WG573130	SAMP	Acenaphthene	R1993453	J
	WG573130	SAMP	Acenaphthylene	R1993453	J
	WG573130	SAMP	Benzo(a)anthracene	R1993453	J
	WG573130	SAMP	Benzo(a)pyrene	R1993453	J
	WG573130	SAMP	Benzo(b)fluoranthene	R1993453	J
	WG573130	SAMP	Benzo(g,h,i)perylene	R1993453	J
	WG573130	SAMP	Dibenz(a,h)anthracene	R1993453	J
	WG573130	SAMP	Fluoranthene	R1993453	J
	WG573130	SAMP	Pyrene	R1993453	J
	WG573130	SAMP	Nitrobenzene-d5	R1993453	J7
	WG573130	SAMP	2-Fluorobiphenyl	R1993453	J7
	WG573130	SAMP	p-Terphenyl-d14	R1993453	J7
L554746-04	WG573400	SAMP	ORP	R1994952	T8
	WG573146	SAMP	Cadmium	R1994233	J
	WG573146	SAMP	Selenium	R1994233	O
	WG573146	SAMP	Silver	R1994233	J
	WG573544	SAMP	o-Terphenyl	R1996993	J1
	WG573149	SAMP	Mercury	R1994836	J
	WG573183	SAMP	Toluene	R1992397	J
	WG573183	SAMP	Ethylbenzene	R1992397	J
	WG573142	SAMP	pH	R1993172	T8
	WG573134	SAMP	Anthracene	R1995752	J
	WG573134	SAMP	Acenaphthene	R1995752	J
	WG573134	SAMP	Acenaphthylene	R1995752	J
	WG573134	SAMP	Benzo(a)anthracene	R1995752	J
	WG573134	SAMP	Benzo(b)fluoranthene	R1995752	J
	WG573134	SAMP	Chrysene	R1995752	J
	WG573134	SAMP	Pyrene	R1995752	J
	WG573400	SAMP	ORP	R1994952	T8
L554746-05	WG573146	SAMP	Silver	R1994233	J
	WG573093	SAMP	o-Terphenyl	R1995812	J1
	WG573149	SAMP	Mercury	R1994836	J
	WG573183	SAMP	Toluene	R1992397	J
	WG573183	SAMP	Ethylbenzene	R1992397	J

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
	WG573183	SAMP	Total Xylenes	R1992397	J
	WG573142	SAMP	pH	R1993172	T8
	WG573134	SAMP	Anthracene	R1995752	J
	WG573134	SAMP	Acenaphthene	R1995752	J
	WG573134	SAMP	Acenaphthylene	R1995752	J
	WG573134	SAMP	Benzo(b)fluoranthene	R1995752	J
	WG573134	SAMP	Chrysene	R1995752	J
	WG573134	SAMP	Fluoranthene	R1995752	J
	WG573134	SAMP	Pyrene	R1995752	J
	WG573400	SAMP	ORP	R1994952	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
B	(EPA) - The indicated compound was found in the associated method blank as well as the laboratory sample.
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

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
01/15/12 at 15:48:04

TSR Signing Reports: 134
R5 - Desired TAT

Sample: L554746-01 Account: OXYGJCO Received: 01/06/12 09:00 Due Date: 01/13/12 00:00 RPT Date: 01/15/12 15:47
Sample: L554746-02 Account: OXYGJCO Received: 01/06/12 09:00 Due Date: 01/13/12 00:00 RPT Date: 01/15/12 15:47
Sample: L554746-03 Account: OXYGJCO Received: 01/06/12 09:00 Due Date: 01/13/12 00:00 RPT Date: 01/15/12 15:47
Sample: L554746-04 Account: OXYGJCO Received: 01/06/12 09:00 Due Date: 01/13/12 00:00 RPT Date: 01/15/12 15:47
Sample: L554746-05 Account: OXYGJCO Received: 01/06/12 09:00 Due Date: 01/13/12 00:00 RPT Date: 01/15/12 15:47

OXY USA Inc. - Grand Junction, CO

760 Horizon Dr., Ste 101

Grand Junction, CO 81506

Alternate billing information:
CO Table 910

Report to: Daniel Padilla / Blair Rollins
Email to: daniel_padilla@oxy.com, blai

Project Description: LC 697-05-63B
City/State: Paradise
Client Project #: 906546.0013.010
ESC Key: OXYGJCO-TABLE910
Phone: (970) 263-3601
FAX:

Collected by: CS
Site/Facility ID#: P.O.#:

Collected by (Signature): [Signature]
Rush? (Lab MUST Be Notified)
Same Day.....200%
Next Day.....100%
Two Day.....50%
Date Results Needed:
Email? No Yes
FAX? No Yes
No. of Cnts

Packed on Ice N

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cnts	V8260BTEX, GRO	DRO, SV8270PAHSIM	SAR, SPCON, pH	MRCRA8 + Cu, Ni, Zn	CR3, CR6SS	Remarks/Contaminant	Sample # (lab only)
LC 697-05-63B	Grab	SS	TD	11/4/12	8:45	3	X	X	X	X	X		LC 55474601
697-05-63B	Grab	SS	800'	11/4/12	0045	3	X	X	X	X	X		02
697-05-63B	Grab	SS	900'	11/4/12	5:45	3	X	X	X	X	X		03
697-05-63B	Grab	SS	7000	11/31/12	1345	3	X	X	X	X	X		04
697-05-63B	Grab	SS	6000	11/31/12	1215	3	X	X	X	X	X		05

Chain of Custody
Page 1 of 1
Prepared by: **E049**

ENVIRONMENTAL SCIENCE CORP.

12065 Lebanon Road
Mt Juliet, TN 37122

Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

CoCode OXYGJCO (lab use only)
Template/Prelogin T74772

Shipped Via:

Remarks/Contaminant

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

pH _____ Temp _____
Flow _____ Other _____

Remarks:

5010 0623 5604

Relinquished by: (Signature)	Date: 11/5/12	Time: 5:50	Received by: (Signature)	Samples returned via: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: (lab use only)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.2	Bottles Received: 15-862
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 1-6-12	Time: 0900
				pH Checked:	NCF: