

FORM
4
Rev 12/06

Page 2

TECHNICAL INFORMATION PAGE



FOR OGCC USE ONLY

1. OGCC Operator Number: 66571 API Number: _____
2. Name of Operator: OXY USA WTP LP OGCC Facility ID # _____
3. Well/Facility Name: Cascade Creek 697-15-01 Well/Facility Number: 335921
4. Location (QtrQtr, Sec, Twp, Rng, Meridian): N4NW, Sec 15, T6S, R97W, 6th PM

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5. **DESCRIBE PROPOSED OR COMPLETED OPERATIONS**

OXY USA WTP LP (Oxy) proposes to permanently dispose of drill cuttings at the Oxy 697-15-01 Annex Pad. The cuttings will be generated from drilling activities located at Oxy's 608-41, 608-43-31, 609-33, and 697-05C pads. Oxy has prepared the attached Drill Cuttings Materials Management Plan outlining its cuttings disposal and storage plan at the 697-15-01 Annex pad. All activities are located on Oxy property.

Oxy requests review and if appropriate, approval of the proposed cuttings disposal plan.

**REVISED HYDROGEOLOGIC REPORT
OXY CASCADE CANYON
#697-15-01 WELL PAD**

August 16, 2011

WALSH Project Number: 900546.0005.010

REVISED HYDROGEOLOGIC REPORT OXY CASCADE CANYON #697-15-01 WELL PAD

August 16, 2011

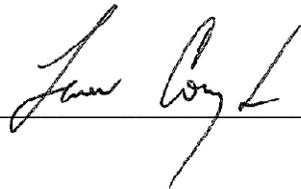
Prepared for: **OXY USA WTP LP**
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WALSH Project Number: 900546.0005.010

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REVISED HYDROGEOLOGIC REPORT

OXY CASCADE CANYON

#697-15-01 WELL PAD

1 INTRODUCTION

This revised 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 Cascade Creek 697-15-01 well pad. Specifically this report provides information requested in Sections 980b(7) A and B, 988b(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 area obtained from published information, Oxy reports, and field inspections.

2.1 Regional Geology

The site is 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 2-6 foot thick Mahogany bed is a persistent bed of very rich oil shale within the Mahogany zone, which forms a sheer 80-100 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 site is 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 site 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 site appears as a gray marlstone or shale, with portions that are massive, fractured, and fissile.

The bedrock at the site 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 site is mapped as the Parachute-Irigul-Rhone association, 25-50% slopes. The Parachute soil is moderately deep and well drained loam formed in residuum derived dominantly from sandstone or hard siltstone. It has 10 inches of grayish brown loam overlying up to 15 inches of very channery loam overlying rippable fractured siltstone. The Irigul soil is shallow and well drained, formed in residuum derived from sandstone or hard shale. It typically has about 6 inches of brown channery loam overlying about 7 inches of brown very channery loam, which overlies hard shale. It has moderate permeability and very low water capacity, and has a very severe water erosion hazard. The Rhone loam is a deep-well-drained soil formed in colluvium derived from sandstone and shale. It is very dark grayish brown loam to 10 inches overlying grayish brown channery loam to 39 inches, overlying brown very channery loam to 55 inches overlying rippable, fractured siltstone. The soils in this unit are a good source of reconstruction materials for disturbed areas (USDA, 1988).

2.4 Site Hydrology

Hydrology at the site consists of small intermittent or ephemeral drainages in the higher elevations that coalesce into larger drainages in the valley floors. The study area is on a plateau that is about 9,000 feet above mean sea level at its highest points, with the study area between 8,360 and 8,390 feet above mean sea level (Figure 1). A small, unnamed, intermittent tributary to Cascade Canyon is the predominant hydrologic feature near the site.

The proposed disposal cell is located at least 150 feet above the uppermost aquifer, and is separated from it by loam soil and fractured bedrock. The nearest ephemeral stream is about 800 feet horizontally to the south and about 150 feet vertically below the pad. The nearest perennial surface water is a spring located about 1,500 feet directly east of the pad, which forms a stream channel with intermittent flow that flows within about 800 feet of the pad (Figure 1).

2.4.1 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, creeks, and the underlying shallow aquifer.

2.4.2 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 aquifer has a measured hydraulic conductivity of 0.8 to 1.2 feet per day. It is less than 500 feet thick in the study area. The potentiometric contour is shown to be approximately 7,800 to 8,000 feet in the study area. Springs in the vicinity are found generally at about 8,200 feet elevation, as is the spring east of the pad (Figure 1), suggesting that the actual potentiometric surface is at or near that elevation in the study area. The Mahogany confining unit outcrops as cliffs and has a top elevation of about 8,000 feet in the study area. The flow direction of the uppermost aquifer is generally to the southwest at the study area, although it is towards the north over most of the Roan Plateau (CGS, 2003).

2.4.3 Deeper Aquifers

Deeper bedrock aquifers exist beneath the site. The uppermost is the lower Piceance Basin aquifer, which has a potentiometric elevation of about 7,800 feet and is over 500 feet beneath the study area. Its measured hydraulic conductivity is 0.1 to 1.1 feet per day. Beneath this is the Mesaverde aquifer, which has a potentiometric surface of about 6,000 feet in the study area (CGS, 2003).

2.4.4 Floodplain

The pit proposed to be used for drill cuttings is located about 150 feet in elevation above the adjacent ephemeral drainage. The area drained by this drainage upstream from the disposal cell is about 240 acres. This indicates that the site is not located in or near a floodplain.

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 350-400 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.

2.5 Registered Wells in the Area

Walsh reviewed the Colorado Division of Water Resources' on-line database of water wells registered in the state. There are no registered water wells within one mile of the site (CDWR, 2011). The nearest registered water wells are in and near the southeast corner of Section 15, 6,000 to 8,700 feet (over one mile) southeast of the pad and in a separate drainage basin. These are registered to private parties. The nearest registered well located downgradient from the pad is four miles away. Since there are no registered wells within one mile and any potential release from the disposal cell would likely manifest at springs and streams downgradient from the site, no registered monitoring wells will be sampled as part of this project.

3 ENVIRONMENTAL IMPACT

This section discusses the potential environmental impact of the cuttings placed at the site.

3.1 Cutting Characteristics

Prior to placement, the drill cuttings will be dried such that there is no free water in them. A sample of typical drill cuttings was 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 (Table 1). The exceptions are arsenic, which was found at 6.7 milligrams per kilogram (mg/kg), and sodium-adsorption ratio (SAR) found at 42. The COGCC arsenic concentration level is 0.39 mg/kg and the SAR level is less than 12. The arsenic level found in cuttings is consistent with background levels found in the area. SAR is a plant growth inhibitor, and as the cuttings will be buried with at least three feet of soil, it will not have an environmental impact. Laboratory results are attached in Appendix B.

3.2 Cutting Placement

Due to the severely water erodible soils, Oxy will utilize stormwater best management practices to address both runoff and runoff to minimize potential erosion. The cuttings will be placed into the reserve pit 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 is ten feet deep, and material will be placed up against the cut edge of the pad. 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 location will be placed into 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 bottom is at an elevation of about 8,300 feet above sea level, and the nearest surface water (likely to be an expression of the alluvial and/or shallow bedrock aquifer) is about 8,190 feet above sea level. No groundwater or indications of periodic saturation were evident in the excavations so far made on the pad and annex. These facts indicate that the cuttings will not be in contact with standing 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 result in rapid runoff and little infiltration, especially on steep slopes. Much of the summer precipitation is transpired by

vegetation. The nearest perennial surface water is the spring and perennial stream about 800 feet southeast of the pad.

3.4 Potential Impacts to Aquifer

The top of the cuttings cell will have a cap consisting of native vegetation and will be contoured to facilitate runoff and minimize infiltration. Native vegetation established on the cuttings 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, and arsenic (Table 1). The arsenic 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. 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 groundwater and horizontally from surface water, any impact to groundwater is expected to be insignificant and/or undetectable.

3.5 Hydrologic Monitoring

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 unnamed tributary to Cascade Creek southeast of the site 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 facility. 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

Colorado Division of Water Resources (CDWR). On-line. Accessed January 5, 2011. Web address is: <http://water.state.co.us/DataMaps/GISandMaps/Pages/default.aspx>

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

Colorado Oil and Gas Conservation Commission (COGCC). 2009. 900 Series Rules - Exploration and Production Waste Management. <http://cogcc.state.co.us/>

OXY USA WTP LP. 2011. *Drill Cuttings Materials Management Plan, 697-15-01 Well Pad*.

Press, Frank and Siever, Raymond. 1974. *Earth*. W.H. Freeman and Company, San Francisco.

Tweto, Ogden. 1979. *Geologic Map of Colorado*.

United States Department of Agriculture (USDA). 1988. *Soil Survey of the Douglas Plateau Area*.

Appendix A – Figure and Table

- Proposed Cuttings Disposal
- Pond
- OXY owned Pad
- OXY Responsible Road
- Facilities
- OXY Guard Shack
- Locked Gate
- Unimproved Public Road
- Gravel Public Road
- Paved Public Road

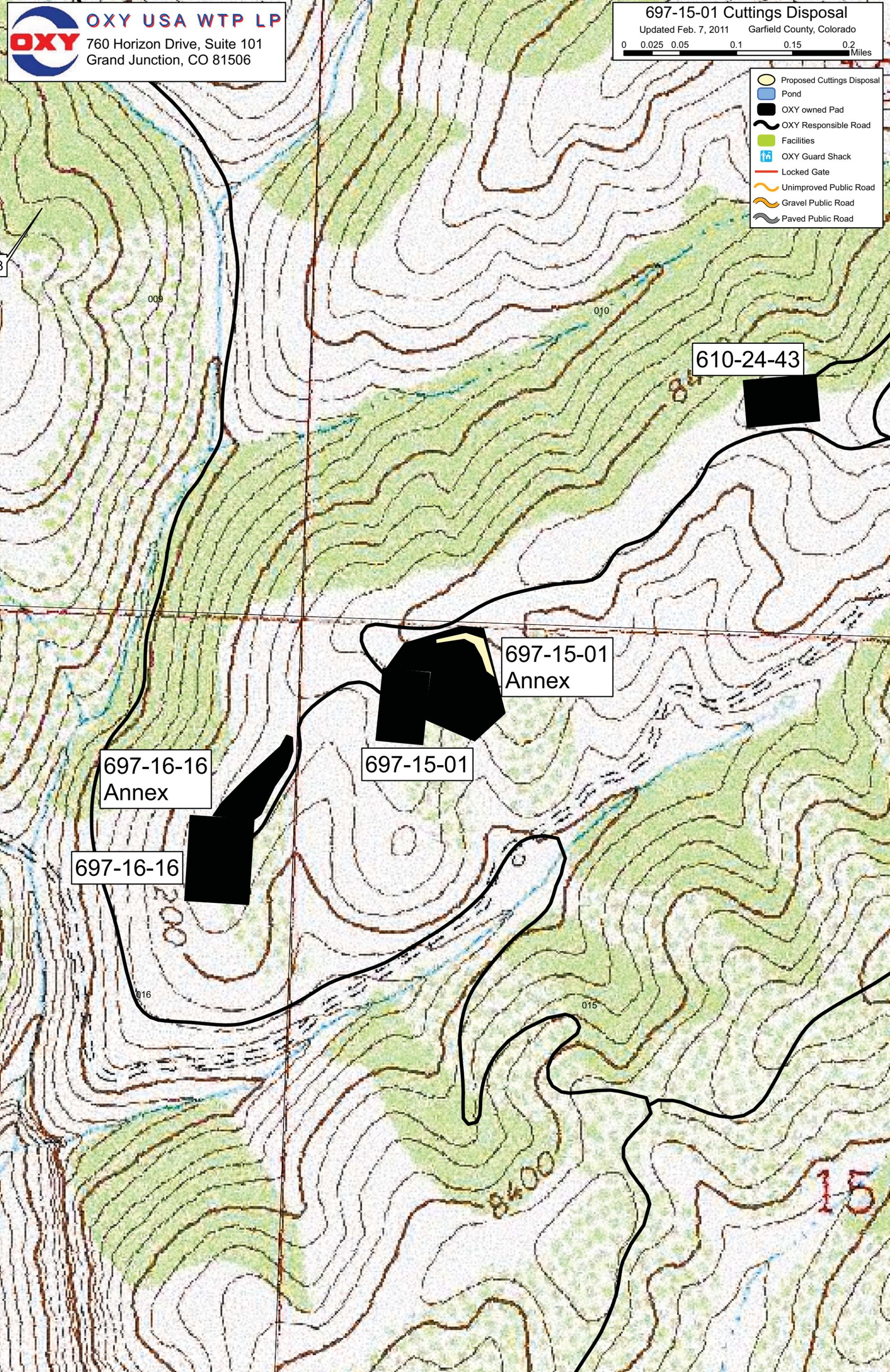


TABLE 1 – CUTTINGS SAMPLE ANALYTICAL RESULTS SUMMARY

Analyte	COGCC Table 910-1 MCL (mg/kg)	697-15-01 Cuttings (Dec 3, 2010) (mg/kg)
Organics in Soil		
TPH* (GRO and DRO)	500	33
Benzene	0.17	0.052
Toluene	85	0.055
Ethylbenzene	100	0.0079
Xylenes	175	0.027
Organics in Soil (PAH's)		
Acenaphthene	1000	<0.033
Anthracene	1000	<0.033
Benzo(A)anthracene	0.22	<0.033
Benzo(B)fluoranthene	0.22	<0.033
Benzo(K)fluoranthene	2.2	<0.033
Benzo(A)pyrene	0.022	<0.033
Chrysene	22	<0.033
Dibenzo(A,H)anthracene	0.022	<0.033
Fluoranthene	1000	<0.033
Flourene	1000	<0.033
Indeno(1,2,3,C,D)pyrene	0.22	<0.033
Napthalene	23	0.088
Pyrene	1000	<0.033
Inorganics in Soil		
Electrical conductivity	<4 mmhos/cm or 2X background	2.9 (mmhos/cm)
SAR	< 12	42
pH	6-9	8.8
Arsenic	0.39	6.7
Barium	15000	160
Cadmium	70	0.047
Chromium	12000	16
Chromium VI	23	BDL
Copper	3100	21
Lead	400	16
Mercury	23	0.0087
Nickel	1600	11
Selenium	390	2.3
Silver	390	BDL
Zinc	23000	67

*Note - only DRO present in TPH

COGCC - Colorado Oil and Gas Conservation Commission

MCL - maximum contaminant level - COGCC Table 910-1 concentration levels

TPH - total petroleum hydrocarbons

GRO - Gasoline-range organics

DRO - diesel-range organics

PAH - polynuclear aromatic hydrocarbons

BOLD - indicates analyte above MCL

Appendix B – Laboratory Analytical Data



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Tax I.D. 62-0814289

Est. 1970

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

Report Summary

Wednesday December 15, 2010

Report Number: L492094

Samples Received: 12/04/10

Client Project:

Description: 697-15-03B

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

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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

December 15, 2010

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

Date Received : December 04, 2010
 Description : 697-15-03B

Sample ID : 01 CUTTINGS 9130 FT

Collected By : Mark Schneider
 Collection Date : 12/03/10 05:30

ESC Sample # : L492094-01

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium,Hexavalent	U	0.31	2.0	mg/kg		3060A/7	12/09/10	1
ORP	21.			mV		2580	12/06/10	1
pH	8.8			su		9045D	12/08/10	1
Sodium Adsorption Ratio	42.					Calc.	12/10/10	1
Specific Conductance	2900			umhos/cm		9050AMo	12/08/10	1
Mercury	0.0087	0.0015	0.020	mg/kg	J	7471	12/09/10	1
Arsenic	6.7	0.32	1.0	mg/kg		6010B	12/15/10	1
Barium	160	0.050	0.25	mg/kg		6010B	12/15/10	1
Cadmium	0.047	0.040	0.25	mg/kg	J	6010B	12/15/10	1
Chromium	16.	0.085	0.50	mg/kg		6010B	12/15/10	1
Copper	21.	0.21	1.0	mg/kg		6010B	12/15/10	1
Lead	16.	0.090	0.25	mg/kg		6010B	12/15/10	1
Nickel	11.	0.26	1.0	mg/kg		6010B	12/15/10	1
Selenium	2.3	0.32	1.0	mg/kg		6010B	12/15/10	1
Silver	U	0.16	0.50	mg/kg		6010B	12/15/10	1
Zinc	67.	0.34	1.5	mg/kg		6010B	12/15/10	1
Benzene	0.052	0.00090	0.0025	mg/kg		8021/80	12/06/10	5
Toluene	0.055	0.0015	0.025	mg/kg		8021/80	12/06/10	5
Ethylbenzene	0.0079	0.0013	0.0025	mg/kg		8021/80	12/06/10	5
Total Xylene	0.027	0.0028	0.0075	mg/kg		8021/80	12/06/10	5
TPH (GC/FID) Low Fraction	U	0.14	0.50	mg/kg		GRO	12/06/10	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	97.6			% Rec.		8021/80	12/06/10	5
a,a,a-Trifluorotoluene(PID)	101.			% Rec.		8021/80	12/06/10	5
TPH (GC/FID) High Fraction	33.	0.77	4.0	mg/kg		3546/DR	12/13/10	1
Surrogate recovery(%)								
o-Terphenyl	189.			% Rec.	J1	3546/DR	12/13/10	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0093	0.033	mg/kg		8270C	12/08/10	1
Acenaphthene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Acenaphthylene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	12/08/10	1
Benzo(a)pyrene	U	0.0074	0.033	mg/kg		8270C	12/08/10	1
Benzo(b)fluoranthene	U	0.0078	0.033	mg/kg		8270C	12/08/10	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: 12/15/10 15:50 Printed: 12/15/10 15:51

L492094-01 (PH) - 8.8@18.3c

L492094-01 (DRO) - Previous run also had high IS/SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

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

December 15, 2010

Date Received : December 04, 2010
 Description : 697-15-03B

ESC Sample # : L492094-01

Sample ID : 01 CUTTINGS 9130 FT

Site ID :

Collected By : Mark Schneider
 Collection Date : 12/03/10 05:30

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Benzo(g,h,i)perylene	U	0.0095	0.033	mg/kg		8270C	12/08/10	1
Benzo(k)fluoranthene	U	0.012	0.033	mg/kg		8270C	12/08/10	1
Chrysene	U	0.0091	0.033	mg/kg		8270C	12/08/10	1
Dibenz(a,h)anthracene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Fluoranthene	U	0.0079	0.033	mg/kg		8270C	12/08/10	1
Fluorene	U	0.0095	0.033	mg/kg		8270C	12/08/10	1
Indeno(1,2,3-cd)pyrene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Naphthalene	0.088	0.016	0.033	mg/kg		8270C	12/08/10	1
Phenanthrene	0.016	0.0073	0.033	mg/kg	J	8270C	12/08/10	1
Pyrene	U	0.0089	0.033	mg/kg		8270C	12/08/10	1
Surrogate Recovery								
Nitrobenzene-d5	65.0			% Rec.		8270C	12/08/10	1
2-Fluorobiphenyl	97.3			% Rec.		8270C	12/08/10	1
p-Terphenyl-d14	79.8			% Rec.		8270C	12/08/10	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
 RDL = Reported Detection Limit = LOQ = PQL = EQL
 Note:

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Reported: 12/15/10 15:50 Printed: 12/15/10 15:51
 L492094-01 (PH) - 8.8@18.3c
 L492094-01 (DRO) - Previous run also had high IS/SURR recovery. Matrix effect.

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L492094-01	WG511903	SAMP	Cadmium	R1505669	J
	WG512487	SAMP	o-Terphenyl	R1503110	J1
	WG512081	SAMP	Mercury	R1501459	J
	WG511610	SAMP	Phenanthrene	R1500372	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

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
12/15/10 at 15:51:27

TSR Signing Reports: 134
R5 - Desired TAT

Sample: L492094-01 Account: OXYGJCO Received: 12/04/10 09:00 Due Date: 12/10/10 00:00 RPT Date: 12/15/10 15:50



YOUR LAB OF CHOICE

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

Quality Assurance Report
 Level II

L492094

12065 Lebanon Rd.
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 (615) 758-5858
 1-800-767-5859
 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

December 15, 2010

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG511652	12/05/10 20:18
Ethylbenzene	< .0005	mg/kg			WG511652	12/05/10 20:18
Toluene	< .005	mg/kg			WG511652	12/05/10 20:18
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG511652	12/05/10 20:18
Total Xylene	< .0015	mg/kg			WG511652	12/05/10 20:18
a,a,a-Trifluorotoluene(FID)		% Rec.	96.59	59-128	WG511652	12/05/10 20:18
a,a,a-Trifluorotoluene(PID)		% Rec.	104.7	54-144	WG511652	12/05/10 20:18
Acenaphthene	< .033	mg/kg			WG511610	12/08/10 10:07
Acenaphthylene	< .033	mg/kg			WG511610	12/08/10 10:07
Anthracene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(a)anthracene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(a)pyrene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(b)fluoranthene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(g,h,i)perylene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(k)fluoranthene	< .033	mg/kg			WG511610	12/08/10 10:07
Chrysene	< .033	mg/kg			WG511610	12/08/10 10:07
Dibenz(a,h)anthracene	< .033	mg/kg			WG511610	12/08/10 10:07
Fluoranthene	< .033	mg/kg			WG511610	12/08/10 10:07
Fluorene	< .033	mg/kg			WG511610	12/08/10 10:07
Indeno(1,2,3-cd)pyrene	< .033	mg/kg			WG511610	12/08/10 10:07
Naphthalene	< .033	mg/kg			WG511610	12/08/10 10:07
Phenanthrene	< .033	mg/kg			WG511610	12/08/10 10:07
Pyrene	< .033	mg/kg			WG511610	12/08/10 10:07
2-Fluorobiphenyl		% Rec.	107.4	37-123	WG511610	12/08/10 10:07
Nitrobenzene-d5		% Rec.	103.7	19-129	WG511610	12/08/10 10:07
p-Terphenyl-d14		% Rec.	136.7	34-149	WG511610	12/08/10 10:07
pH	4.30	su			WG512076	12/08/10 11:53
Specific Conductance	0.870	umhos/cm			WG512282	12/08/10 17:57
Chromium,Hexavalent	< 2	mg/kg			WG511936	12/09/10 08:54
Mercury	< .02	mg/kg			WG512081	12/09/10 10:13
TPH (GC/FID) High Fraction	< 4	ppm			WG512487	12/11/10 10:29
o-Terphenyl		% Rec.	91.43	50-150	WG512487	12/11/10 10:29
Arsenic	< 1	mg/kg			WG511903	12/15/10 10:23
Barium	< .25	mg/kg			WG511903	12/15/10 10:23
Cadmium	< .25	mg/kg			WG511903	12/15/10 10:23
Chromium	< .5	mg/kg			WG511903	12/15/10 10:23
Copper	< 1	mg/kg			WG511903	12/15/10 10:23
Lead	< .25	mg/kg			WG511903	12/15/10 10:23
Nickel	< 1	mg/kg			WG511903	12/15/10 10:23
Selenium	< 1	mg/kg			WG511903	12/15/10 10:23
Silver	< .5	mg/kg			WG511903	12/15/10 10:23
Zinc	< 1.5	mg/kg			WG511903	12/15/10 13:27

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December 15, 2010

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
ORP	mV	14.0	21.0	40.0*	20	L492056-04	WG511786
ORP	mV	5.00	8.00	46.2*	20	L492124-03	WG511786
pH	su	8.50	8.40	1.18*	1	L492052-02	WG512076
pH	su	9.70	9.60	1.04*	1	L492329-03	WG512076
Specific Conductance	umhos/cm	11000	11000	2.30	20	L491699-01	WG512282
Specific Conductance	umhos/cm	1100	1300	14.9	20	L492329-03	WG512282
Chromium,Hexavalent	mg/kg	0	0	0	20	L492056-06	WG511936
Chromium,Hexavalent	mg/kg	0	0	0	20	L492198-02	WG511936
Mercury	mg/kg	0	0.0110	NA	20	L492079-16	WG512081
Arsenic	mg/kg	16.0	23.0	33.5*	20	L492079-22	WG511903
Barium	mg/kg	51.0	56.0	9.35	20	L492079-22	WG511903
Cadmium	mg/kg	0	0	0	20	L492079-22	WG511903
Chromium	mg/kg	27.0	31.0	15.3	20	L492079-22	WG511903
Nickel	mg/kg	29.0	34.3	17.1	20	L492079-22	WG511903
Selenium	mg/kg	1.80	0.800	76.0*	20	L492079-22	WG511903
Silver	mg/kg	0	0	0	20	L492079-22	WG511903
Zinc	mg/kg	110.	130.	18.5	20	L492079-22	WG511903
Copper	mg/kg	10.0	13.1	23.9*	20	L492079-22	WG511903
Lead	mg/kg	19.0	27.0	35.3*	20	L492079-22	WG511903

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0523	105.	76-113	WG511652
Ethylbenzene	mg/kg	.05	0.0568	114.	78-115	WG511652
Toluene	mg/kg	.05	0.0515	103.	76-114	WG511652
Total Xylene	mg/kg	.15	0.160	107.	81-118	WG511652
a,a,a-Trifluorotoluene(FID)				97.20	59-128	WG511652
a,a,a-Trifluorotoluene(PID)				104.2	54-144	WG511652
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.76	123.	67-135	WG511652
a,a,a-Trifluorotoluene(FID)				105.3	59-128	WG511652
a,a,a-Trifluorotoluene(PID)				114.7	54-144	WG511652
ORP	mV	229	220.	96.1	95.6-104.37	WG511786
Acenaphthene	mg/kg	.167	0.177	106.	44-117	WG511610
Acenaphthylene	mg/kg	.167	0.181	108.	43-118	WG511610
Anthracene	mg/kg	.167	0.187	112.	42-127	WG511610
Benzo(a)anthracene	mg/kg	.167	0.174	104.	45-127	WG511610
Benzo(a)pyrene	mg/kg	.167	0.177	106.	46-123	WG511610
Benzo(b)fluoranthene	mg/kg	.167	0.160	95.5	43-126	WG511610
Benzo(g,h,i)perylene	mg/kg	.167	0.191	114.	43-128	WG511610
Benzo(k)fluoranthene	mg/kg	.167	0.169	101.	40-126	WG511610
Chrysene	mg/kg	.167	0.187	112.	44-129	WG511610
Dibenz(a,h)anthracene	mg/kg	.167	0.194	116.	43-127	WG511610
Fluoranthene	mg/kg	.167	0.191	114.	44-125	WG511610
Fluorene	mg/kg	.167	0.180	108.	45-121	WG511610
Indeno(1,2,3-cd)pyrene	mg/kg	.167	0.191	114.	43-127	WG511610

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Naphthalene	mg/kg	.167	0.154	92.2	32-113	WG511610
Phenanthrene	mg/kg	.167	0.174	104.	43-124	WG511610
Pyrene	mg/kg	.167	0.186	111.	47-128	WG511610
2-Fluorobiphenyl				110.9	37-123	WG511610
Nitrobenzene-d5				103.8	19-129	WG511610
p-Terphenyl-d14				124.6	34-149	WG511610
pH	su	6.92	7.00	101.	97.98-102.02	WG512076
Specific Conductance	umhos/cm	406	390.	96.1	85-115	WG512282
Chromium, Hexavalent	mg/kg	100	93.9	93.9	50-143	WG511936
Mercury	mg/kg	8.77	6.36	72.5	71.6-127.7	WG512081
TPH (GC/FID) High Fraction	ppm	60	58.7	97.9	50-150	WG512487
o-Terphenyl				89.47	50-150	WG512487
Arsenic	mg/kg	192	170.	88.5	78.6-120.8	WG511903
Barium	mg/kg	420	384.	91.4	78.8-121.4	WG511903
Cadmium	mg/kg	70.1	61.4	87.6	78.5-121.5	WG511903
Chromium	mg/kg	168	158.	94.0	80.4-120.2	WG511903
Copper	mg/kg	122	122.	100.	81.6-119.7	WG511903
Lead	mg/kg	113	96.6	85.5	77.3-122.1	WG511903
Nickel	mg/kg	74.1	67.0	90.4	78.8-121.2	WG511903
Selenium	mg/kg	176	163.	92.6	75.6-125.0	WG511903
Silver	mg/kg	115	103.	89.6	66-133.9	WG511903
Zinc	mg/kg	437	405.	92.7	78.5-121.7	WG511903

Analyte	Units	Laboratory Control Sample Duplicate		Limit	RPD	Limit	Batch	
		Result	Ref					%Rec
TPH (GC/FID) Low Fraction	mg/kg	6.69	6.76	122.	67-135	0.940	20	WG511652
a,a,a-Trifluorotoluene(FID)				105.0	59-128			WG511652
a,a,a-Trifluorotoluene(PID)				115.3	54-144			WG511652
Benzene	mg/kg	0.0509	0.0523	102.	76-113	2.57	20	WG511652
Ethylbenzene	mg/kg	0.0549	0.0568	110.	78-115	3.43	20	WG511652
Toluene	mg/kg	0.0508	0.0515	102.	76-114	1.31	20	WG511652
Total Xylene	mg/kg	0.155	0.160	103.	81-118	3.23	20	WG511652
a,a,a-Trifluorotoluene(FID)				97.27	59-128			WG511652
a,a,a-Trifluorotoluene(PID)				104.1	54-144			WG511652
ORP	mV	220.	220.	96.0	95.6-104.37	0	20	WG511786
Acenaphthene	mg/kg	0.179	0.177	107.	44-117	0.844	21	WG511610
Acenaphthylene	mg/kg	0.178	0.181	106.	43-118	1.94	20	WG511610
Anthracene	mg/kg	0.182	0.187	109.	42-127	2.68	21	WG511610
Benzo(a)anthracene	mg/kg	0.174	0.174	104.	45-127	0.162	21	WG511610
Benzo(a)pyrene	mg/kg	0.175	0.177	105.	46-123	1.07	20	WG511610
Benzo(b)fluoranthene	mg/kg	0.152	0.160	91.0	43-126	4.59	27	WG511610
Benzo(g,h,i)perylene	mg/kg	0.182	0.191	109.	43-128	4.64	20	WG511610

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzo(k)fluoranthene	mg/kg	0.198	0.169	119.	40-126	15.9	32	WG511610
Chrysene	mg/kg	0.183	0.187	110.	44-129	2.41	22	WG511610
Dibenz(a,h)anthracene	mg/kg	0.164	0.194	98.0	43-127	16.8	20	WG511610
Fluoranthene	mg/kg	0.170	0.191	102.	44-125	11.3	22	WG511610
Fluorene	mg/kg	0.175	0.180	105.	45-121	2.69	20	WG511610
Indeno(1,2,3-cd)pyrene	mg/kg	0.167	0.191	100.	43-127	13.3	21	WG511610
Naphthalene	mg/kg	0.154	0.154	92.0	32-113	0.196	26	WG511610
Phenanthrene	mg/kg	0.167	0.174	100.	43-124	4.06	21	WG511610
Pyrene	mg/kg	0.181	0.186	108.	47-128	2.56	20	WG511610
2-Fluorobiphenyl				114.2	37-123			WG511610
Nitrobenzene-d5				105.7	19-129			WG511610
p-Terphenyl-d14				115.4	34-149			WG511610
pH	su	7.00	7.00	101.	97.98-102.02	0	20	WG512076
Specific Conductance	umhos/	390.	390.	96.0	85-115	0	20	WG512282
Chromium,Hexavalent	mg/kg	88.7	93.9	89.0	50-143	5.70	20	WG511936
TPH (GC/FID) High Fraction	ppm	56.9	58.7	95.0	50-150	3.14	25	WG512487
o-Terphenyl				87.27	50-150			WG512487

Analyte	Units	MS Res	Matrix Spike			Limit	Ref Samp	Batch
			Ref Res	TV	% Rec			
Benzene	mg/kg	0.217	0.00660	.05	84.2	32-137	L492056-02	WG511652
Ethylbenzene	mg/kg	0.195	0.00320	.05	76.8	10-150	L492056-02	WG511652
Toluene	mg/kg	0.202	0	.05	81.0	20-142	L492056-02	WG511652
Total Xylene	mg/kg	0.541	0.0240	.15	68.9	16-141	L492056-02	WG511652
a,a,a-Trifluorotoluene(FID)					94.44	59-128		WG511652
a,a,a-Trifluorotoluene(PID)					99.99	54-144		WG511652
TPH (GC/FID) Low Fraction	mg/kg	15.4	0	5.5	55.9	55-109	L492056-02	WG511652
a,a,a-Trifluorotoluene(FID)					96.70	59-128		WG511652
a,a,a-Trifluorotoluene(PID)					105.1	54-144		WG511652
Chromium,Hexavalent	mg/kg	2.38	0	20	11.9*	50-150	L492056-02	WG511936
Acenaphthene	mg/kg	0.164	0	.167	98.3	38-121	L491986-03	WG511610
Acenaphthylene	mg/kg	0.153	0	.167	91.8	39-120	L491986-03	WG511610
Anthracene	mg/kg	0.154	0	.167	92.5	35-133	L491986-03	WG511610
Benzo(a)anthracene	mg/kg	0.164	0	.167	98.2	35-136	L491986-03	WG511610
Benzo(a)pyrene	mg/kg	0.175	0	.167	105.	37-131	L491986-03	WG511610
Benzo(b)fluoranthene	mg/kg	0.203	0	.167	122.	29-145	L491986-03	WG511610
Benzo(g,h,i)perylene	mg/kg	0.141	0	.167	84.5	10-139	L491986-03	WG511610
Benzo(k)fluoranthene	mg/kg	0.164	0	.167	98.3	31-140	L491986-03	WG511610
Chrysene	mg/kg	0.172	0	.167	103.	34-137	L491986-03	WG511610
Dibenz(a,h)anthracene	mg/kg	0.152	0	.167	91.2	21-132	L491986-03	WG511610
Fluoranthene	mg/kg	0.151	0	.167	90.2	34-132	L491986-03	WG511610
Fluorene	mg/kg	0.170	0	.167	102.	38-126	L491986-03	WG511610
Indeno(1,2,3-cd)pyrene	mg/kg	0.156	0	.167	93.4	17-134	L491986-03	WG511610
Naphthalene	mg/kg	0.138	0	.167	82.8	24-122	L491986-03	WG511610
Phenanthrene	mg/kg	0.161	0	.167	96.6	38-128	L491986-03	WG511610
Pyrene	mg/kg	0.156	0	.167	93.5	35-141	L491986-03	WG511610

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
2-Fluorobiphenyl					86.83	37-123		
Nitrobenzene-d5					74.07	19-129		
p-Terphenyl-d14					83.05	34-149		
Mercury	mg/kg	0.244	0.0110	.25	93.2	70-130	L492079-16	WG512081
Arsenic	mg/kg	77.5	23.0	50	109.	75-125	L492079-22	WG511903
Barium	mg/kg	92.0	56.0	50	72.0*	75-125	L492079-22	WG511903
Cadmium	mg/kg	54.6	0	50	109.	75-125	L492079-22	WG511903
Chromium	mg/kg	75.0	31.0	50	88.0	75-125	L492079-22	WG511903
Nickel	mg/kg	73.7	34.3	50	78.8	75-125	L492079-22	WG511903
Selenium	mg/kg	58.8	0.800	50	116.	75-125	L492079-22	WG511903
Silver	mg/kg	50.4	0	50	101.	75-125	L492079-22	WG511903
Zinc	mg/kg	155.	130.	50	50.0*	75-125	L492079-22	WG511903

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.226	0.217	87.9	32-137	4.21	39	L492056-02	WG511652
Ethylbenzene	mg/kg	0.182	0.195	71.5	10-150	7.11	44	L492056-02	WG511652
Toluene	mg/kg	0.202	0.202	80.7	20-142	0.350	42	L492056-02	WG511652
Total Xylene	mg/kg	0.507	0.541	64.3	16-141	6.50	46	L492056-02	WG511652
a,a,a-Trifluorotoluene(FID)				95.86	59-128				WG511652
a,a,a-Trifluorotoluene(PID)				101.7	54-144				WG511652
TPH (GC/FID) Low Fraction	mg/kg	13.7	15.4	49.7*	55-109	11.7	20	L492056-02	WG511652
a,a,a-Trifluorotoluene(FID)				96.69	59-128				WG511652
a,a,a-Trifluorotoluene(PID)				106.0	54-144				WG511652
Chromium,Hexavalent	mg/kg	2.87	2.38	14.4*	50-150	18.7	20	L492056-02	WG511936
Acenaphthene	mg/kg	0.159	0.164	95.3	38-121	3.09	23	L491986-03	WG511610
Acenaphthylene	mg/kg	0.154	0.153	92.1	39-120	0.312	22	L491986-03	WG511610
Anthracene	mg/kg	0.152	0.154	91.0	35-133	1.67	23	L491986-03	WG511610
Benzo(a)anthracene	mg/kg	0.166	0.164	99.2	35-136	1.07	23	L491986-03	WG511610
Benzo(a)pyrene	mg/kg	0.165	0.175	98.9	37-131	5.69	22	L491986-03	WG511610
Benzo(b)fluoranthene	mg/kg	0.201	0.203	120.	29-145	1.01	33	L491986-03	WG511610
Benzo(g,h,i)perylene	mg/kg	0.121	0.141	72.5	10-139	15.3	26	L491986-03	WG511610
Benzo(k)fluoranthene	mg/kg	0.160	0.164	95.8	31-140	2.57	34	L491986-03	WG511610
Chrysene	mg/kg	0.169	0.172	101.	34-137	1.38	23	L491986-03	WG511610
Dibenz(a,h)anthracene	mg/kg	0.135	0.152	80.6	21-132	12.3	25	L491986-03	WG511610
Fluoranthene	mg/kg	0.160	0.151	95.8	34-132	6.02	24	L491986-03	WG511610
Fluorene	mg/kg	0.163	0.170	97.8	38-126	3.91	23	L491986-03	WG511610
Indeno(1,2,3-cd)pyrene	mg/kg	0.134	0.156	80.2	17-134	15.2	25	L491986-03	WG511610
Naphthalene	mg/kg	0.140	0.138	83.6	24-122	1.02	29	L491986-03	WG511610
Phenanthrene	mg/kg	0.165	0.161	99.1	38-128	2.55	25	L491986-03	WG511610
Pyrene	mg/kg	0.166	0.156	99.2	35-141	5.96	25	L491986-03	WG511610
2-Fluorobiphenyl				88.02	37-123				WG511610
Nitrobenzene-d5				83.82	19-129				WG511610
p-Terphenyl-d14				82.20	34-149				WG511610
Mercury	mg/kg	0.250	0.244	95.6	70-130	2.43	20	L492079-16	WG512081
Arsenic	mg/kg	61.2	77.5	76.4	75-125	23.5*	20	L492079-22	WG511903
Barium	mg/kg	83.5	92.0	55.0*	75-125	9.69	20	L492079-22	WG511903
Cadmium	mg/kg	45.4	54.6	90.8	75-125	18.4	20	L492079-22	WG511903

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



YOUR LAB OF CHOICE

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

Quality Assurance Report
 Level II

L492094

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

December 15, 2010

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Chromium	mg/kg	66.7	75.0	71.4*	75-125	11.7	20	L492079-22	WG511903
Nickel	mg/kg	70.3	73.7	72.0*	75-125	4.72	20	L492079-22	WG511903
Selenium	mg/kg	49.1	58.8	96.6	75-125	18.0	20	L492079-22	WG511903
Silver	mg/kg	47.4	50.4	94.8	75-125	6.13	20	L492079-22	WG511903
Zinc	mg/kg	118.	155.	0*	75-125	27.1*	20	L492079-22	WG511903

Batch number /Run number / Sample number cross reference

WG511652: R1499220: L492094-01
 WG511786: R1499402: L492094-01
 WG511610: R1500372: L492094-01
 WG512076: R1500552: L492094-01
 WG512282: R1501101: L492094-01
 WG511936: R1501102: L492094-01
 WG512081: R1501459: L492094-01
 WG511734: R1502049: L492094-01
 WG512487: R1503110: L492094-01
 WG511903: R1505669: L492094-01

* * Calculations are performed prior to rounding of reported values.
 * Performance of this Analyte is outside of established criteria.
 For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

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

Grand Junction, CO 81506

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December 15, 2010

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

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

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

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

Company Name/Address:
**OXY USA Inc - Grand Junction,
 CO**
 760 Horizon Dr., Ste. 101
 Grand Junction, CO 81506

Billing Information:
 Accounts Payable
 760 Horizon Dr., Ste. 101
 Grand Junction, CO 81506

Analysis/Container/Preservative

B068 Chain of Custody age of



12065 Lebanon Road
 Mt. Juliet, TN 37122

Phone: (800) 767-5859
 Phone: (615) 758-5858
 Fax: (615) 758-5859

Report to: **BRETT KENNEDY**

Email to: **BRETT_KENNEDY@OXY.COM**

Project Description: **697-15-03B**

City/State Collected: **—**

Phone: **(970) 263-3601**
 FAX: **—**

Client Project #: **—**

ESC Key: **—**

Collected by: (print) **MARK SCHMEIDKE**

Site/Facility ID#: **—**

P.O.#: **—**

Collected by (signature): *Mark*
 Immediately Packed on Ice N

Rush? (Lab MUST Be Notified)
 Same Day..... 200%
 Next Day..... 100%
 Two Day..... 50%
 Three Day..... 25%

Date Results Needed:
 Email? No Yes
 FAX? No Yes

No. of Cntrs
SAR/EC/PAH
BTEX/6001/PRO
PAH
EC/SAR/pH
As, Ba, Ca, Co, Cu, Pb, Hg, Ni, Se, Tg, Zn
CR VI

CoCode **OXYGJCO** (lab use only)
 Template/Prelogin
 Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Analysis/Container/Preservative
01 CUTTINGS	Comp	SS	9130	3-DEC-10	0520	2	SAR/EC/PAH
02 CUTTINGS	Comp	SS	9130	3-DEC-10	0530	1	BTEX/6001/PRO
						Bh	

Remarks/Contaminant	Sample # (lab only)
	L492094.01

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

pH _____ Temp _____
 Flow _____ Other _____

Remarks:

Relinquished by: (Signature) <i>Brett Kennedy</i>	Date: 12/3/10	Time: 1530	Received by: (Signature) <i>[Signature]</i>	573417061315	Samples returned via: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier	Condition: ok (lab use only)
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received by: (Signature) <i>[Signature]</i>	Temp: 3.1°C	Bottles Received: 2 802	CoC Seals Intact <input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>Matthew Mohr</i>	Date: 12/4/10	Time: 0910	pH Checked: _____ NCF: _____



DE	ET	OE	ES

SUNDRY NOTICE

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

1. OGCC Operator Number: <u>66571</u>	4. Contact Name <u>Daniel I. Padilla</u>	Complete the Attachment Checklist OP OGCC
2. Name of Operator: <u>OXY USA WTP LP</u>	Phone: <u>970.263.3637</u>	
3. Address: <u>760 Horizon Drive, Suite 101</u> City: <u>Grand Junction</u> State: <u>CO</u> Zip: <u>81506</u>	Fax: <u>970.263.3694</u>	
5. API Number <u>05-</u>	OGCC Facility ID Number	Survey Plat
6. Well/Facility Name: <u>Cascade Creek 697-15-01</u>	7. Well/Facility Number <u>335921</u>	Directional Survey
8. Location (Qtr/Qtr, Sec, Twp, Rng, Meridian): <u>NWNW, Sec 15, T6S, R97W, 6th PM</u>		Surface Eqpmt Diagram
9. County: <u>Garfield</u>	10. Field Name: <u>Grand Valley</u>	Technical Info Page <input checked="" type="checkbox"/>
11. Federal, Indian or State Lease Number:		Other Drill Cuttings Plat <input checked="" type="checkbox"/>

General Notice

<input type="checkbox"/> CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)	
Change of Surface Footage from Exterior Section Lines:	<input type="checkbox"/> FNL/FSL <input type="checkbox"/> FEL/FWL
Change of Surface Footage to Exterior Section Lines:	<input type="checkbox"/> <input type="checkbox"/>
Change of Bottomhole Footage from Exterior Section Lines:	<input type="checkbox"/> <input type="checkbox"/>
Change of Bottomhole Footage to Exterior Section Lines:	<input type="checkbox"/> <input type="checkbox"/> attach directional survey
Bottomhole location Qtr/Qtr, Sec, Twp, Rng, Mer	
Latitude	Distance to nearest property line Distance to nearest bldg, public rd, utility or RR
Longitude	Distance to nearest lease line Is location in a High Density Area (rule 603b)? Yes/No <input type="checkbox"/>
Ground Elevation	Distance to nearest well same formation Surface owner consultation date:
GPS DATA: Date of Measurement PDOP Reading Instrument Operator's Name	
<input type="checkbox"/> CHANGE SPACING UNIT	<input type="checkbox"/> Remove from surface bond
Formation Formation Code Spacing order number Unit Acreage Unit configuration	Signed surface use agreement attached
<input type="checkbox"/> CHANGE OF OPERATOR (prior to drilling): Effective Date: Plugging Bond: <input type="checkbox"/> Blanket <input type="checkbox"/> Individual	<input type="checkbox"/> CHANGE WELL NAME NUMBER From: To: Effective Date:
<input type="checkbox"/> ABANDONED LOCATION: Was location ever built? <input type="checkbox"/> Yes <input type="checkbox"/> No Is site ready for inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No Date Ready for Inspection:	<input type="checkbox"/> NOTICE OF CONTINUED SHUT IN STATUS Date well shut in or temporarily abandoned: Has Production Equipment been removed from site? <input type="checkbox"/> Yes <input type="checkbox"/> No MIT required if shut in longer than two years. Date of last MIT
<input type="checkbox"/> SPUD DATE:	<input type="checkbox"/> REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)
<input type="checkbox"/> SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK *submit cbl and cement job summaries Method used Cementing tool setting/perf depth Cement volume Cement top Cement bottom Date	
<input type="checkbox"/> RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004. Final reclamation will commence on approximately Final reclamation is completed and site is ready for inspection.	

Technical Engineering/Environmental Notice

<input type="checkbox"/> Notice of Intent Approximate Start Date:	<input type="checkbox"/> Report of Work Done Date Work Completed:	
Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)		
<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Disposal
<input type="checkbox"/> Change Drilling Plans	<input type="checkbox"/> Repair Well	<input checked="" type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested	<input type="checkbox"/> Status Update/Change of Remediation Plans
<input type="checkbox"/> Casing/Cementing Program Change	<input type="checkbox"/> Other:	for Spills and Releases

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

Signed: [Signature] Date: 08/17/2011 Email: daniel_padilla@oxy.com

Print Name: Daniel I. Padilla Title: Regulatory Advisor

OGCC Approved: _____ Title: _____ Date: _____

CONDITIONS OF APPROVAL, IF ANY:

TECHNICAL INFORMATION PAGE



FOR OGCC USE ONLY

- | | |
|---|-------------------------------------|
| 1. OGCC Operator Number: <u>66571</u> | API Number: _____ |
| 2. Name of Operator: <u>OXY USA WTP LP</u> | OGCC Facility ID # _____ |
| 3. Well/Facility Name: <u>Cascade Creek 697-15-01</u> | Well/Facility Number: <u>335921</u> |
| 4. Location (QtrQtr, Sec, Twp, Rng, Meridian): <u>NWNW, Sec 15, T6S, R97W, 6th PM</u> | |

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5. **DESCRIBE PROPOSED OR COMPLETED OPERATIONS**

OXY USA WTP LP (Oxy) proposes to permanently dispose of drill cuttings at the Oxy 697-15-01 Annex Pad. The cuttings will be generated from drilling activities located at Oxy's 608-41, 608-43-31, 609-33, and 697-05C pads. Oxy has prepared the attached Drill Cuttings Materials Management Plan outlining its cuttings disposal and storage plan at the 697-15-01 Annex pad. All activities are located on Oxy property.

Oxy requests review and if appropriate, approval of the proposed cuttings disposal plan.



OXY USA WTP LP
A subsidiary of Occidental Petroleum Corporation

760 Horizon Drive, Suite 101
Grand Junction, CO 81506

OXY USA WTP LP

DRILL CUTTINGS MATERIALS MANAGEMENT PLAN

**697-15-01 ANNEX
STORAGE/STAGING AND DISPOSAL AREA
FOR DRILL CUTTINGS GENERATED AT
OXY'S 608-41, 608-43-31, 609-33, 697-05C,
AND 697-15-01 ANNEX PADS**

August 2011

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Facility Closure	6
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Appendices

Appendix A – Sample chain-of-custody procedures

Attachments:

Figure 1 – Location Map

Figure 2 – 697-15-01 Annex Pad (Aerial and Topographic Maps)

Analytical Data

Hydrogeologic Report (Prepared by WALSH)

Operator contact information

OXY USA WTP LP (Operator #66571)
760 Horizon Drive, Suite 101
Grand Junction, CO 81506
(970) 263-3600 – Office
(970) 263-3694 – Fax

Designated contact person

Daniel Padilla
Regulatory Advisor
(970) 263-3637 – Office

Materials Management Plan (MMP) Overview

OXY USA WTP LP (Oxy) developed this Materials Management Plan to address storage, management, and disposal of drill cuttings at Oxy's Cascade Creek 697-15-01 Annex pad location where Oxy owns both the surface and minerals (see Figure 1, Location Map). Oxy is requesting review and approval of this plan and supporting documents from the Colorado Oil and Gas Conservation Commission (COGCC) to utilize this location for permanent cuttings disposal. Oxy has included a Hydrogeologic Report prepared by Walsh Environmental Scientists and Engineers, LLC for the 697-15-01 cuttings disposal area (see attached report). Oxy's 2011 oil and gas development activities in the Piceance Basin consist of drilling at the 608-41, 608-43-31, 609-33, 697-05C, and 697-15-01 Annex pads located on Oxy surface and minerals. Oxy's 2011 drilling plans were initially designed for drilling activities to occur first followed by completions activities. Revisions to the development plan requires drilling and completions operations to occur simultaneously at these locations, commonly referred to as SimOps. Pad space normally used to store cuttings for disposal would now be used for SimOps. In order to accommodate SimOps without increasing the pad size, Oxy is proposing to permanently dispose drill cuttings generated from the above-mentioned pads at the 697-15-01 Annex pad to ensure that all activities are completed safely.

The 697-15-01 Annex pad is located within Oxy's Cascade Creek operation area, specifically:

- 697-15-01 Annex pad (Location ID # 335921): NWNW, Section 15, Township 6 South, Range 97 West, Garfield County, Colorado

Drill Cuttings Generation

Oxy has drilled 17 directional wells from the 608-43-31 pad and 9 wells from the 697-15-01 Annex pad, is currently drilling 22 directional wells from the 608-41 pad and 20 directional wells from the 609-33 pad, and proposes to drill 22 directional wells from the 697-05C pad. Drilling began at the 697-15-01 Annex in October 2010, with SimOps commencing in 2011. At the 608-43-31 pad, drilling began in November 2010 followed by SimOps in 2011. In April 2011, Oxy began drilling at the 609-33 pad which will be followed by SimOps in 2011. Oxy began drilling at the 608-41 pad in March 2011 and SimOps will commence in 2011. Finally, Oxy will begin drilling on the 697-05C pad in September 2011, with SimOps commencing in January 2012. After processing, the cuttings will be blended with sawdust to absorb *de minimus* amounts of liquid. On average, the drill cuttings will expand to approximately 330 cubic yards per well, using a conservative 50 percent swelling factor. Oxy will update the COGCC regarding the approximate volume amount that the closed loop system is generating.

Oxy employs a skidable rig capable of drilling up to 24 wells from a single pad. Oxy's drilling rig now utilizes a closed loop system for mud cycling and reuse. The rig air drills the surface hole and then air injected with mud for the production hole. As drill cuttings are returned to the surface they are deposited into a de-gasser. The de-gassing process allows the cuttings and mud to better separate in the next phase. The cuttings and mud are then sent to four rig shakers, which drains out fluids and mud from the cuttings. The cuttings separated in this phase consist of a larger aggregate size and constitute the bulk of the cuttings to be stored off site. In addition to the rig shakers, the cuttings are also sent to four additional drying shakers, which removes another 20 percent of fluids from the cuttings. The separated fluids and mud collected are reused in the drilling process. Finer aggregate cuttings are then separated by sending the cuttings/mud

mixture to a settling tank (mud trap), from which the cuttings are then sent to two centrifuges to remove low gravity solids (cuttings). These low gravity solids will also be hauled off site for storage and disposal. Any low gravity solids containing cement will be diverted to the above-mentioned pad reserve pit.

To account for additional disposal needs, Oxy is currently preparing permits for additional disposal locations which will follow this format.

Drill Cuttings Sampling Procedures

In accordance with COGCC regulations for storage and permanent disposal, samples shall be collected throughout the drilling process to document that the cuttings meet the standards which have been established by COGCC. To accomplish this, Oxy will:

- **Background Samples:** Initially, three (3) background samples were collected from undisturbed locations around the 697-15-01 Annex pad. All background samples were analyzed for COGCC Table 910-1 constituents excluding Hot Water Soluble Boron and Barium will be analyzed via method SW-846.
- **Cuttings Samples:** In an effort to define the concentrations of Table 910-1 constituents which may be encountered on each pad, samples will be collected to determine the geologic source. On each of the first 3 well pads, beginning with the first well drilled, Oxy will collect multiple composite samples from both the surface and production strings, collecting samples of each major formation. Thus, for example, if there are The cuttings samples generated from the first well will be analyzed for the above mentioned analysis. Following the initial well, Oxy will collect cuttings samples from every 4th well (the 4th, 8th, 12th, 16th, and 20th) wells (based on a 22 well pad), targeting composites of surface and production string formations. Oxy will continue to use this numbered well sampling strategy for well pads which have fewer than 22 wells. In general, the samples will be collected in the following manner:
 - Initial well (well 1): Collect three to four composite samples from the surface string; targeting the Uinta, Green River, and Wasatch formations. Then collect six to seven samples from the production string; targeting the Fort Union, Williams Fork (four to five zones), and the Illes formations.
 - Additional wells (wells 4, 8, 12, 16, and 20 for a multi-well pad): Collect one composite sample from the surface string and three composite samples from the production string.
 - These composite samples will be collected from the cuttings storage bin which will consist of cuttings that have been processed and mixed with sawdust, used to absorb *de minimus* amounts of water present in the cuttings, and are ready for storage and disposal.
 - Oxy employs a drilling technique commonly referred to as “batch drilling”, where the surface string is drilled for the first 6, 8 or 10 wells, prior to returning to the initial well to drill the production string, where the production string of the 6, 8 or 10 wells will be drilled out. Batch drilling increases Oxy’s efficiency by not having to switch out surface and production section tools between each well. Oxy typically batch drills every six wells. Batch drilling will stagger when surface and production string cuttings samples are collected for each well. Oxy will take this staggering into consideration when reviewing and tabulating the analytical data.
- **Analysis of Samples:** The samples collected from the initial well of each pad will be tabulated to characterize cuttings generated from the specific formations and/or combined formations within Oxy’s Cascade Creek operating area. Oxy will be looking for any variations or leading indicators in the cuttings to allow Oxy to make recommendations on the sampling frequency of future wells or pads. The samples collected from the additional wells, will also be tabulated characterize cuttings generated from combined formations within in Oxy’s Cascade Creek operating area to determine if

statistical trends can be identified from the cuttings samples. All samples analyzed will be used to determine if more or less sampling should be required for future wells or pads.

Cuttings samples shall be collected directly from the blended cuttings storage bin. At a minimum, three composite samples will be collected from cuttings generated by the drilling of each well. This composite sample will represent concentrations found in the processed cuttings for each well.

The composite sample will consist of cuttings samples taken from at least five random locations on the blended cuttings bin pile and placed in the stainless steel bowl for blending. The blended composite cuttings sample found in the stainless steel bowl will then be packaged in laboratory provided glass jars for sample shipment and analysis. After filling of the appropriate number of jars, sample labels will be prepared and placed over the lid to provide a permanent seal to take the sample through chain-of-custody to the specified laboratory.

The individual collecting the sample should wear a new pair of disposable nitrile gloves for each sample collected to prevent cross-contamination of the samples. The samples should be collected using a stainless steel spoon, trowel or other appropriate equipment. The sampling equipment used will need to be thoroughly cleaned and rinsed with distilled water between each discrete sample. Appropriate sampling containers should be used for each sample. Each discrete sample should be placed into the specified container, and a log generated to identify the date, time, and identification of the person collecting the samples. The containers must be stored in a temperature controlled area which will maintain at or near 40 degrees F. (i.e. a refrigerator).

Each composite sample will be sent to a laboratory for analysis, samples should be given a distinct identification number (for example: 01 cuttings), labeled with the date and time of the sample collection, and the initials of the sampler, placed in a cooler with ice or back into the refrigerator under chain of custody protocol. The samples must be kept on ice and cool, during transportation from the field to the laboratory.

Background samples shall be collected immediately adjacent to the existing pad, in an undisturbed area.

After the lab has analyzed the samples, the lab will provide Oxy with the results in a written report per the specified turn-around time. Oxy will tabulate the results for statistical analysis and trending.

Cuttings Storage and Disposal Plan

Transportation of dry cuttings from the above-mentioned pads to the 697-15-01 Annex pad for permanent disposal:

1. Each cuttings delivery will be offloaded into the 50' by 50' receiving/mixing area located immediately adjacent to the permanent disposal area; the permanent disposal area will be between 250' by 60' to 300' by 100' and surrounded by an earthen berm, see figure 2.
2. After cuttings have been mixed they will be carried over to the permanent disposal area and stacked until approximately 8,700 cubic yards of cuttings are laid there. The cuttings will be set back so that they do not over-run the earthen berm serving as containment for the permanent disposal area.
3. A final 3' cap consisting of native material will be placed on top of the cuttings and seeded.

Transportation of Cuttings to Disposal Areas

Dry cuttings will be placed onto transport trucks (16 cubic yard dump trucks) and hauled to the 697-15-01 Annex pad. The transport trucks will travel on Oxy owned and maintained roads, a short distance from each pad. All approximate distances reported below are based on driving distances. The 608-41 pad is approximately 19,000 feet from the 697-15-01 Annex pad. The 608-43-31 pad is approximately 20,000 feet from the 697-15-01 Annex pad. The 697-05C pad is approximately 30,000 feet from the 697-15-01 Annex pad. The 697-15-01 Annex pad is immediately adjacent to the receiving/mixing area and the permanent disposal location. The transport trucks will offload the dry cuttings initially at the designated permanent disposal area located on the 697-15-01 annex pad and once this permanent disposal area is full, the cuttings will be transported to another approved disposal facility. Oxy will track the volume of dry cuttings hauled for disposal and storage at the 697-15-01 Annex pad.

The above-mentioned transportation routes accessing the 697-15-01 Annex location use existing access roads and crosses Cascade Canyon and an unnamed drainage. In the event that a transport truck over turns along the transport route, Oxy will implement spill response and cleanup procedures (see below).

Cuttings Disposal Areas

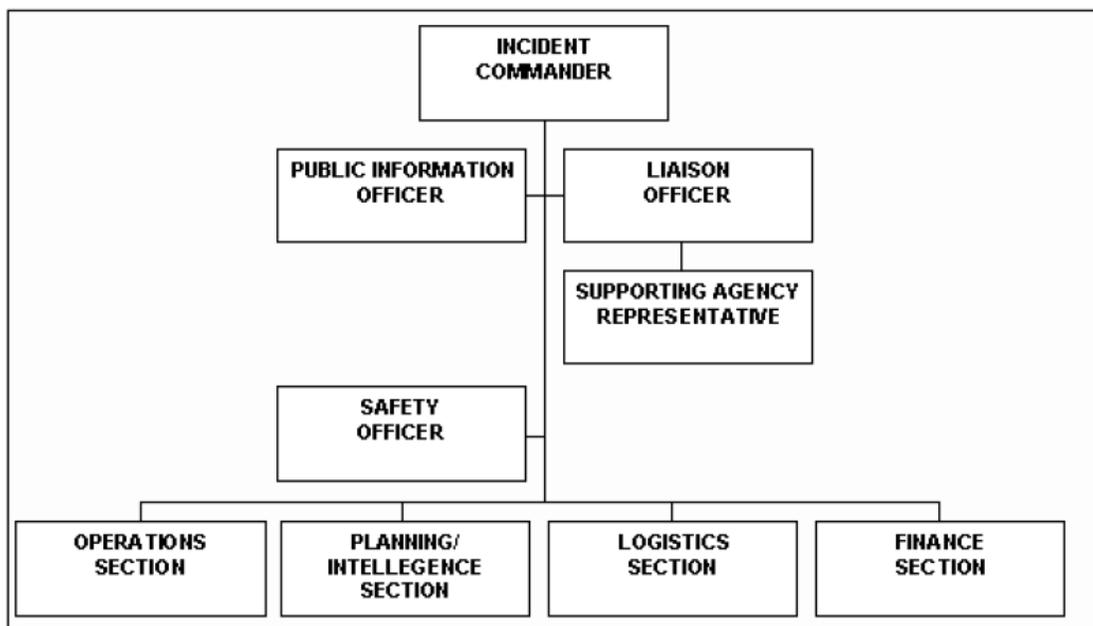
The cuttings disposal areas will be located at the 697-15-01 Annex pad and will be managed in accordance with COGCC regulations and comply with COGCC Table 910-1 standards. The initial cuttings batch samples show elevated concentrations of sodium adsorption ratio (SAR), pH, and arsenic (see attached analytical results). To address the elevated concentrations of SAR and pH, the cuttings will be buried and capped below at least three feet of native soil. Oxy believes the elevated arsenic concentrations found in the cuttings samples are due to documented naturally occurring arsenic known to be in the native sub-surface formations. Although natural variability is known to occur within the region, Oxy will default to naturally occurring background sample concentrations known to exist within the area. Prior to being capped, a final sample will be collected to ensure compliance with COGCC Table 910-1 standards. The final disposal locations shall be documented to include the final volume of cuttings disposed.

The dry cuttings will be hauled to the site via transport trucks. The trucks will deliver the cuttings at a designated off-loading area where mixing and final disposal will occur.

After the disposal areas have been capped with 3 feet of native fill material; the areas will be prepared for seeding. However, reseeding will generally occur in the early spring or fall which ever comes first to ensure seed germination. The disposal area will be monitored at the next growing season for revegetation efforts.

Spill Response and Cleanup Procedures

In the event that a transport truck overturns and discharges cuttings materials, the site will be secured and Oxy will employ the Incident Command System (ICS):



The ICS is the organization and assignment of key personnel to facilitate the control and removal of an incident which has the potential to harm the public health, safety, and the environment. Oxy emergency response personnel following the ICS will ensure that the area is safe and that no fuel or hydraulic fluid has been released. If fuel, hydraulic fluid or other refined chemical has been released, then the release will be contained, cleaned up, and if applicable reported to the necessary agencies. Please refer to the Oxy's Emergency Response Plan to identify individual roles and responsibilities associated with the ICS.

Any processed cuttings that have discharged from the truck will be contained, collected, and taken to the disposal area. The cuttings shall be transported in a dry state and therefore will not run-off or generate an impact beyond the release area.

Following control and removal of the incident, Oxy will ensure that any and all required governmental and non-governmental agencies will be contacted. Please refer to Table 1 of the Emergency Response Plan for Agency emergency contact information.

Proposed Facility Modifications

Oxy will notify the COGCC in writing if proposed modifications to the facility design, operating plan, permit data, or permit conditions change following applicable COGCC rules.

Facility Closure

Oxy will comply with established COGCC rules by submitting a detailed Site Investigation and Remediation Workplan, Form 27, prior to facility closure to the Director for approval. Outlined below are operations and activities which Oxy assumes could be associated with the preliminary closure of the 697-15-01 Annex cuttings management plan location:

- Stacking of the processed cuttings;
- Capping the cuttings with at least 3 feet of native fill material;
- Composite sample collection of disposal area to ensure adequate capping of the cuttings;
- Final contour and seed bed preparation, followed by seeding during the appropriate season;
- Monitor seeding efforts and stormwater best management practices on the cuttings disposal area;

Surface Water Monitoring

Water quality sampling will be conducted from the unnamed perennial creek located approximately 1,000 feet south of the proposed cuttings disposal location (see Figure 1). Oxy will collect one sample from the unnamed creek down-gradient of the 697-15-01 pad prior to commencing disposal operations at the proposed location to serve as a background assessment of water quality parameters in the area. Quarterly water samples will be collected during disposal operations and will continue for an additional four quarters following capping and completion of the disposal operations. Whenever achievable, quarterly samples during operation and post-operations will be conducted during peak flow and/or considerable seasonal flow. Whenever this is not achievable, Oxy will continue to conduct quarterly sampling during normal season weather events to ensure adequate water quality data is analyzed. Background, quarterly during operation, and quarterly post-operation samples will be collected as grab samples from the same location of the unnamed creek to ensure reproducible data is collected and analyzed. All water samples will be collected and analyzed for COGCC Table 910-1 water standards to include; benzene, toluene, ethylbenzene, and total xylenes (BTEX), dissolved metals, total dissolved solids, chlorides, and sulfates.

The individual collecting the sample will wear a new pair of disposable nitrile gloves for each sample collected to prevent cross-contamination of the samples. The individual collecting the surface water sample will fill, cap, and seal all laboratory provided containers using laboratory provided labels. The individual collecting the samples will follow all storage, shipment, and chain-of-custody procedures implemented by Oxy in this MMP and outlined in Appendix A.

Appendix A – Chain-of-custody Procedures

Written procedures for sample handling should be available and followed whenever samples are collected, transferred, stored, analyzed or destroyed. For the purposes of litigation (and quality control), it is necessary to have an accurate written record to trace the possession and handling of samples from collection through reporting. The procedures defined here represent a means to satisfy this requirement.

A. Sample is in someone's "custody" if:

1. It is in one's actual physical possession;
2. It is in one's view, after being in one's physical possession;
3. It is one's physical possession and then locked up so that no one can tamper with it;
4. It is kept in a secured area, restricted to authorized personnel only.

B. Sample Collection, Handling and Identification

1. It is important that a minimum number of persons be involved in sample collection and handling. Field records should be completed at the time the sample is collected and should be signed or initialed, including the date and time, by the sample collector(s). Field records should contain the following information:
 - a. Unique sample or log number;
 - b. Date and time;
 - c. Source of sample (including name, location and sample type);
 - d. Name of collector(s);
 - e. Comments.
2. Each sample is identified by affixing a pressure sensitive gummed label or standardized tag on the container(s). This label should contain the sample number, source of sample, preservative used, and the collector(s)' initials. The analysis required should be identified. Where a label is not available, the sample information should be written on the sample container with an indelible marking pen.
3. The closed sample container should then be placed in a transportation case or appropriate container along with the chain-of-custody record form, pertinent field records, and analysis request forms (these forms will be supplied with the appropriate sample containers). A transportation case if used should then be sealed and labeled. All records should be filled out legibly in waterproof pen. The use of locked or sealed chests will eliminate the need for close control of individual sample containers. However, there will undoubtedly be occasions when the use of a chest will be inconvenient. On these occasions, the sampler should place a seal around the cap of the individual sample container which would indicate tampering if removed.

C. Transfer of Custody and Shipment

1. When transferring the possession of the samples, the transferee must sign and record the date and time on the chain-of-custody record. Custody transfers, if made to a sample custodian in the field, should account for each individual sample, although samples may be transferred as a group. Every person who takes custody must fill in the appropriate section of the chain-of-custody record.
2. The field custodian (or field sampler if a custodian has not been assigned) is responsible for properly packaging and dispatching samples to the appropriate laboratory for analysis. This responsibility includes filling out, dating, and signing the appropriate portion of the chain-of-custody record.
3. All packages sent to the laboratory should be accompanied by the chain-of-custody record and other pertinent forms. A copy of these forms should be retained by the field custodian (either carbon or photocopy).

4. Mailed packages can be registered with return receipt requested. If packages are sent by common carrier, receipts should be retained as part of the permanent chain-of-custody documentation.
5. Samples to be transported must be packed to prevent breakage. If samples are shipped by mail or by other common carrier, the shipper must comply with any applicable Department of Transportation regulations. (Most water samples are exempt unless quantities of preservatives used are greater than certain levels.) The package must be sealed or locked to prevent tampering. Any evidence of tampering should be readily detected if adequate sealing devices are used.

If the field sampler delivers samples to the laboratory, custody may be relinquished to laboratory personnel. If appropriate personnel are not present to receive the samples, they should be locked in a designated area of the laboratory to prevent tampering. The person delivering the samples should make a log entry stating where and how the samples were delivered and secured. Laboratory personnel may then receive custody by noting in a logbook, the absence of evidence of tampering, unlocking the secured area, and signing the custody sheet.

697-05C
Location ID 421340
SWNE, Sec 5, T6S, R97W, 6th PM

608-41
Location ID 324100
NENE, Sec 8, T6S, R97W, 6th PM

608-43-31
Location ID 383337
NESE, Sec 8, T6S, R97W, 6th PM

Mesa Cuttings Disposal Area
NWSE, Sec 9, T6S, R97W, 6th PM

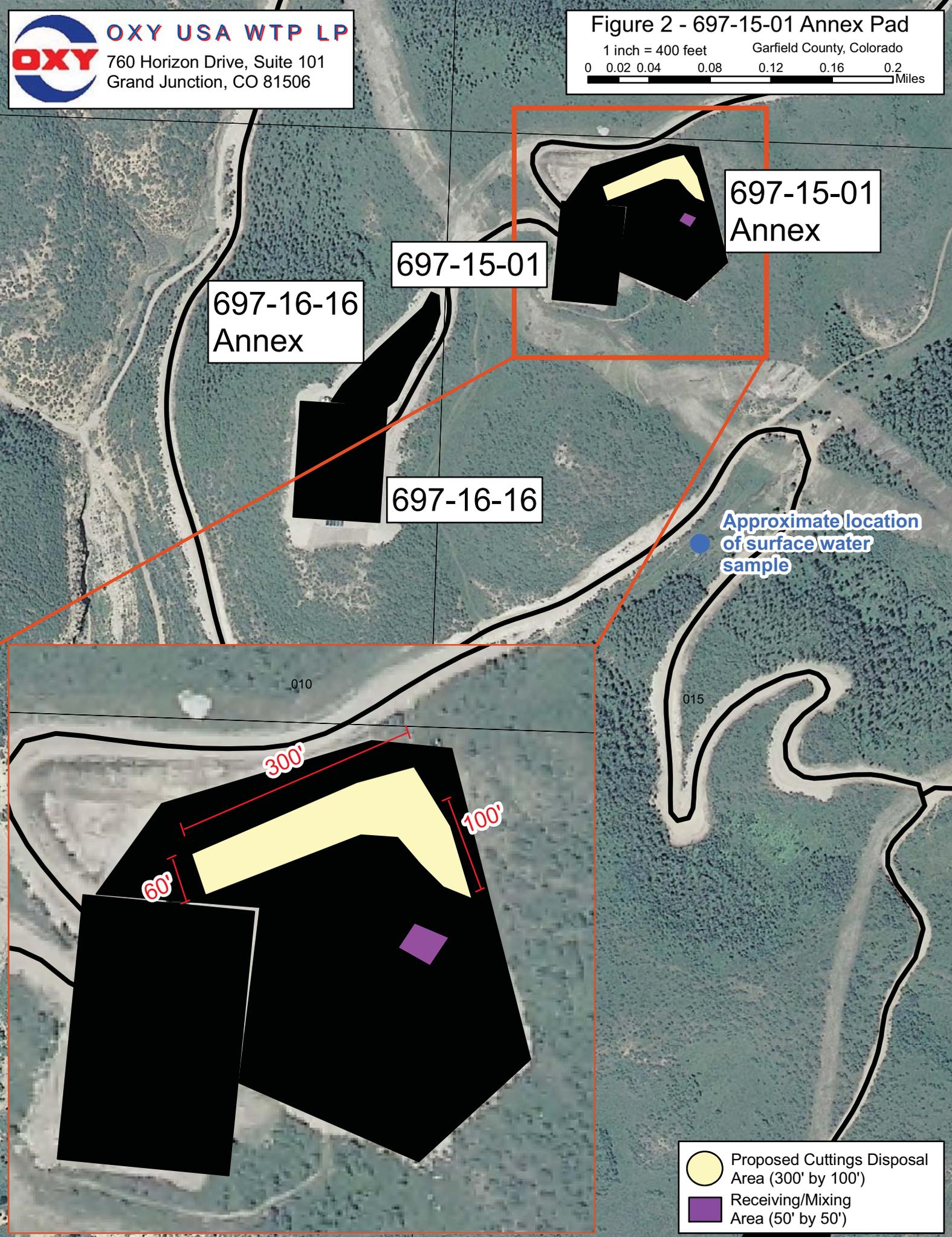
609-33
Location ID 335801
NWSE, Sec 9, T6S, R97W, 6th PM

697-15-01 Annex
Location ID 335921
NWNW, Sec 15, T6S, R97W, 6th PM

- Drill Cuttings Generated Location
- Drill Cuttings Disposal Location
- Additional Disposal Location

Figure 2 - 697-15-01 Annex Pad

1 inch = 400 feet
Garfield County, Colorado
0 0.02 0.04 0.08 0.12 0.16 0.2 Miles



697-15-01
Annex

697-16-16
Annex

697-15-01

697-16-16

Approximate location
of surface water
sample

Proposed Cuttings Disposal
Area (300' by 100')
Receiving/Mixing
Area (50' by 50')



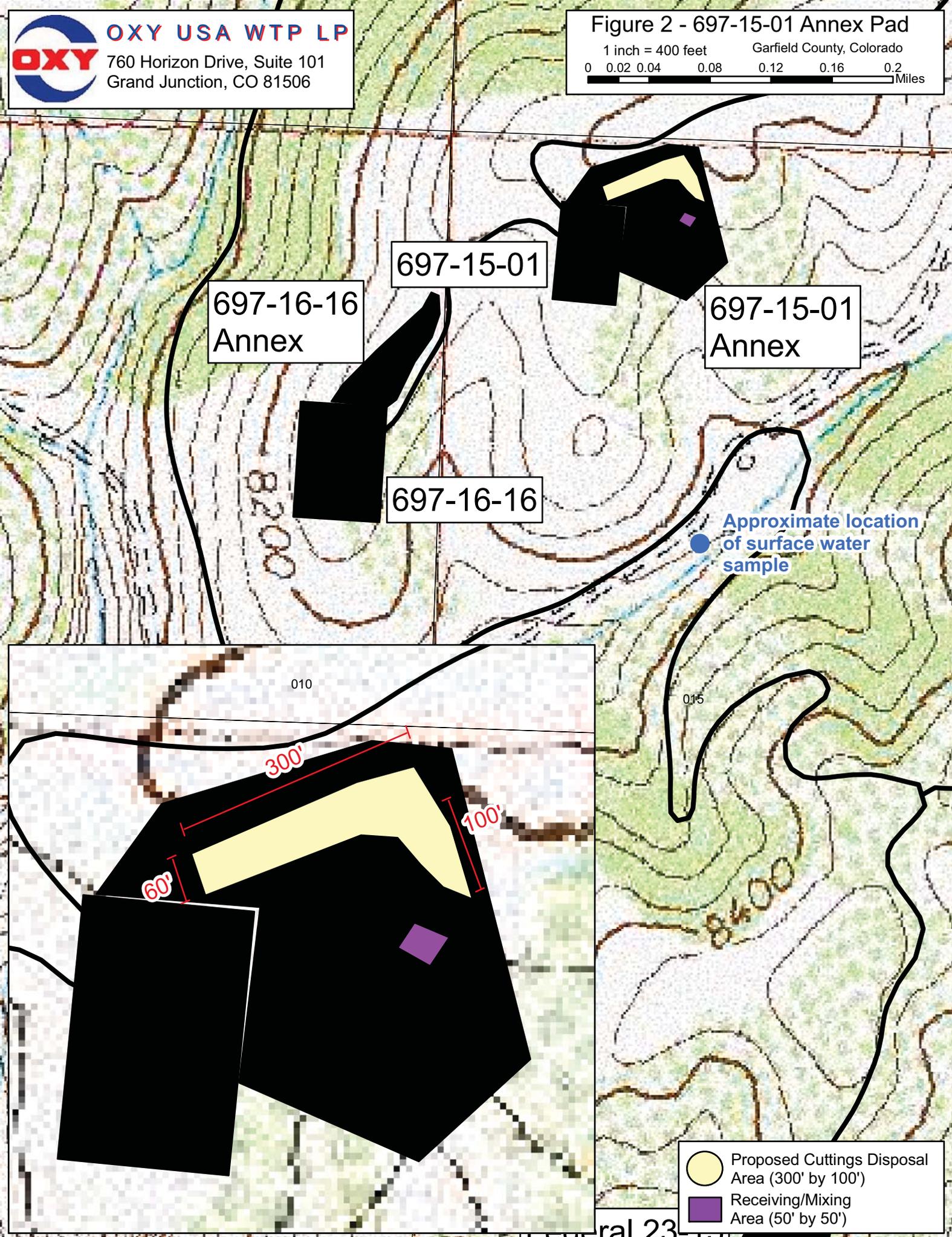
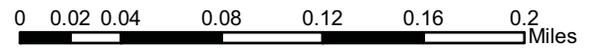
OXY USA WTP LP

760 Horizon Drive, Suite 101
Grand Junction, CO 81506

Figure 2 - 697-15-01 Annex Pad

1 inch = 400 feet

Garfield County, Colorado



697-15-01

697-16-16
Annex

697-15-01
Annex

697-16-16

Approximate location
of surface water
sample

010

015

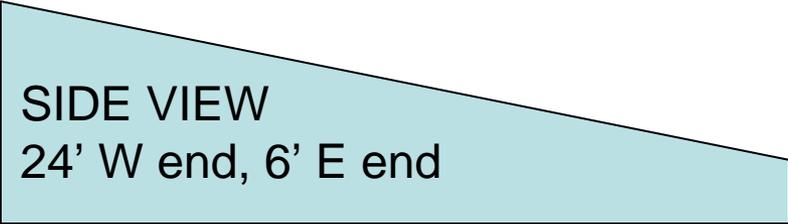
300'

100'

60'

-  Proposed Cuttings Disposal Area (300' by 100')
-  Receiving/Mixing Area (50' by 50')

CUTTING RECLAIM AREA (Pad)



Concept: Cuttings will be reclaimed on area utilizing layered mixing and reclamation in order to stack multiple layers. Once height reaches over 6' it will require use of excavator to lift cuttings onto site. Final layer will be capped with 3' cover and seeded.

$$V(\text{Pad}) = 6 * (250 * 60 + 150 * 60) + (24 * (150 * 60 + 150 * 60) / 2) = 360000 \text{cf} = 13,000 \text{cy}$$
 2:1 of cuttings mixed (12" lift), 100% virgin stabilizer (6" lift)
 $V = 8700 \text{cy}$ cuttings capacity

Drill Cutting Management Plan Laboratory Data

	MCL (mg/kg)	Sample Identification (mg/Kg)						
		609-33 (1) 1/15/11	609-33 (2) 1/15/11	609-33 (3) 1/15/11	608-43-31 (1) 1/15/11	608-43-31 (2) 1/15/11	608-43-31 (3) 1/15/11	
Organics in Soil								
TPH (GRO and DRO)	500	18.0	16.3	26.8	33	294.6	293.8	232.0
Benzene	0.17	0.0054	0.0060	0.0087	0.052	0.025	0.029	0.022
Toluene	85	0.03	0.0320	0.04	0.055	0.09	0.10	0.074
Ethylbenzene	100	0.01	0.0140	0.02	0.0079	0.03	0.03	0.0180
Xylenes	175	0.09	0.0960	0.13	0.027	0.16	0.17	0.12
Organics in Soil (PAHs)								
Acenaphthene	1000	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Anthracene	1000	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(A)anthracene	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(B)fluoranthene	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(K)fluoranthene	2.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo(A)pyrene	0.022	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chrysene	22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibenz(A,H)anthracene	0.022	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Fluoranthene	1000	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Flourene	1000	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Indeno(1,2,3-C,D)pyrene	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	23	0.092	0.086	0.067	0.088	0.047	0.059	0.06
Pyrene	1000	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Inorganics in Soil								
EC	<4 mmhos/cm or 2X background	1.0	1.1	1.0	2.9	1.9	1.9	1.9
SAR	<12	31.0	57.0	31.0	42	52.0	27.0	55.0
pH	6-8	9.3	9.4	9.4	8.8	9.1	9.2	9.2
Metals in Soils								
Arsenic	0.39	3.5	3.4	3.8	6.7	9.9	10.0	8.6
Barium	15000	220.0	200.0	220	160	260	260	250
Cadmium	70	BDL	BDL	BDL	0.047	BDL	BDL	BDL
Chromium	12000	11.0	9.2	10.0	16	16.1	18.4	17.5
Chromium VI	23	1.1	1.2	1.4	BDL	1.1	1.4	1.5
Copper	3100	7.9	7.5	9.2	21	16.0	16.0	16.0
Lead	400	8.2	8.9	10.0	16	14.0	14.0	14.0
Mercury	23	0.01	0.01	0.013	0.0087	0.010	0.010	0.010
Nickel	1600	5.9	6.6	7.9	11	11.0	11.0	13.0
Selenium	390	BDL	BDL	BDL	2.3	BDL	BDL	BDL
Silver	390	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	23000	21.0	21.0	25.0	67	33.0	38.0	32.0



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

Report Summary

Thursday January 20, 2011

Report Number: L497659

Samples Received: 01/18/11

Client Project:

Description: 609-33/608-43-31/697-16A2

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 - E97487
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

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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

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

January 20, 2011

Date Received : January 18, 2011
 Description : 609-32/608-43-31/697-16A2
 Sample ID : 609-33 1
 Collected By : Jerry David
 Collection Date : 01/15/11 19:00

ESC Sample # : 1497659-01

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	1.1	0.31	2.0	mg/kg	J	3060A/7	01/18/11	1
Chromium, Trivalent	9.5	0.17	0.50	mg/kg		Calc.	01/19/11	1
ORP	5.0			mV		2560	01/18/11	1
pH	9.3			su		9045D	01/19/11	1
Sodium Adsorption Ratio	31.					Calc.	01/19/11	1
Specific Conductance	1000			umhos/cm		9050AMo	01/19/11	1
Mercury	0.013	0.0015	0.020	mg/kg	J	7471	01/19/11	1
Arsenic	3.5	0.32	1.0	mg/kg		6010B	01/19/11	1
Barium	220	0.050	0.25	mg/kg		6010B	01/19/11	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/19/11	1
Chromium	11.	0.085	0.50	mg/kg		6010B	01/19/11	1
Copper	7.9	0.21	1.0	mg/kg		6010B	01/19/11	1
Lead	8.2	0.090	0.25	mg/kg		6010B	01/19/11	1
Nickel	5.9	0.26	1.0	mg/kg		6010B	01/19/11	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/19/11	1
Silver	U	0.16	0.50	mg/kg		6010B	01/19/11	1
Zinc	21.	0.34	1.5	mg/kg		6010B	01/19/11	1
Benzene	0.0054	0.00090	0.0025	mg/kg		8021/80	01/18/11	5
Toluene	0.029	0.0015	0.025	mg/kg		8021/80	01/18/11	5
Ethylbenzene	0.013	0.0013	0.0025	mg/kg	B	8021/80	01/18/11	5
Total Xylene	0.088	0.0028	0.0075	mg/kg		8021/80	01/18/11	5
TPH (GC/FID) Low Fraction	1.0	0.14	0.50	mg/kg		GRD	01/18/11	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene (FID)	102.			% Rec.		8021/80	01/18/11	5
a,a,a-Trifluorotoluene (PID)	99.5			% Rec.		8021/80	01/18/11	5
TPH (GC/FID) High Fraction	17.	0.77	4.0	mg/kg		3546/DR	01/19/11	1
Surrogate recovery(%)								
o-Terphenyl	89.9			% Rec.		3546/DR	01/19/11	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthylene	U	0.0078	0.033	mg/kg		8270C	01/19/11	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	01/19/11	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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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Alonzo Hernandez
 OKY USA Inc - Grand Junction, CO
 760 Horizon Dr., Ste. 101
 Grand Junction, CO 81506

January 20, 2011

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 609-33 1
 Collected By : Jerry David
 Collection Date : 01/15/11 19:00

ESC Sample # : L497659-01

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Benzo(a)pyrene	U	0.0073	0.033	mg/kg		8270C	01/19/11	1
Benzo(b)fluoranthene	U	0.0086	0.033	mg/kg		8270C	01/19/11	1
Benzo(g,h,i)perylene	U	0.0050	0.033	mg/kg		8270C	01/19/11	1
Benzo(k)fluoranthene	U	0.0074	0.033	mg/kg		8270C	01/19/11	1
Chrysene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Dibenz(a,h)anthracene	U	0.0058	0.033	mg/kg		8270C	01/19/11	1
Fluoranthene	U	0.0069	0.033	mg/kg		8270C	01/19/11	1
Fluorene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Indeno(1,2,3-cd)pyrene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Naphthalene	0.092	0.0074	0.033	mg/kg		8270C	01/19/11	1
Phenanthrene	0.018	0.0067	0.033	mg/kg	J	8270C	01/19/11	1
Pyrene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1
Surrogate Recovery								
Nitrobenzene-d5	80.5			% Rec.		8270C	01/19/11	1
2-Fluorobiphenyl	75.5			% Rec.		8270C	01/19/11	1
p-Terphenyl-d14	50.3			% Rec.		8270C	01/19/11	1

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

Note:

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REPORT OF ANALYSIS

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

January 20, 2011

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 609-33 2
 Collected By : Jerry David
 Collection Date : 01/15/11 19:00

ESC Sample # : L497659-02
 Site ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	1.2	0.31	2.0	mg/kg	J	3060A/7	01/18/11	1
Chromium, Trivalent	8.0	0.17	0.50	mg/kg		Calc.	01/19/11	1
ORP	0.0			mV		2580	01/18/11	1
pH	9.4			su		9045D	01/19/11	1
Sodium Adsorption Ratio	57.					Calc.	01/19/11	1
Specific Conductance	1100			umhos/cm		9050AM0	01/19/11	1
Mercury	0.011	0.0015	0.020	mg/kg	J	7471	01/19/11	1
Arsenic	3.4	0.32	1.0	mg/kg		6010B	01/19/11	1
Barium	200	0.050	0.25	mg/kg		6010B	01/19/11	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/19/11	1
Chromium	9.2	0.065	0.50	mg/kg		6010B	01/19/11	1
Copper	7.5	0.21	1.0	mg/kg		6010B	01/19/11	1
Lead	8.9	0.090	0.25	mg/kg		6010B	01/19/11	1
Nickel	6.6	0.26	1.0	mg/kg		6010B	01/19/11	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/19/11	1
Silver	U	0.16	0.50	mg/kg		6010B	01/19/11	1
Zinc	21.	0.34	1.5	mg/kg		6010B	01/19/11	1
Benzene	0.0060	0.00090	0.0025	mg/kg		8021/80	01/18/11	5
Toluene	0.032	0.0015	0.025	mg/kg		8021/80	01/18/11	5
Ethylbenzene	0.014	0.0013	0.0025	mg/kg	B	8021/80	01/18/11	5
Total Xylene	0.096	0.0028	0.0075	mg/kg		8021/80	01/18/11	5
TPH (GC/FID) Low Fraction	1.3	0.14	0.50	mg/kg		GRO	01/18/11	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	103.			% Rec.		8021/80	01/18/11	5
a,a,a-Trifluorotoluene(FID)	98.6			% Rec.		8021/80	01/18/11	5
TPH (GC/FID) High Fraction	15.	0.77	4.0	mg/kg		3546/DR	01/19/11	1
Surrogate recovery(%)								
o-Terphenyl	90.4			% Rec.		3546/DR	01/19/11	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthylene	U	0.0078	0.033	mg/kg		8270C	01/19/11	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
 RDL = Reported Detection Limit = LOQ = PQL = EQL
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 L497659-02 (PH) - 9 4@20.7c



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REPORT OF ANALYSIS

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

January 20, 2011

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 609-33 2
 Collected By : Jerry David
 Collection Date : 01/15/11 19:00

ESC Sample # : L497659-02
 Site ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Benzo(a)pyrene	U	0.0073	0.033	mg/kg		8270C	01/19/11	1
Benzo(b)fluoranthene	U	0.0086	0.033	mg/kg		8270C	01/19/11	1
Benzo(g,h,i)perylene	U	0.0050	0.033	mg/kg		8270C	01/19/11	1
Benzo(k)fluoranthene	U	0.0074	0.033	mg/kg		8270C	01/19/11	1
Chrysene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Dibenz(a,h)anthracene	U	0.0058	0.033	mg/kg		8270C	01/19/11	1
Fluoranthene	U	0.0069	0.033	mg/kg		8270C	01/19/11	1
Fluorene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Indeno(1,2,3-cd)pyrene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Naphthalene	0.086	0.0074	0.033	mg/kg		8270C	01/19/11	1
Phenanthrene	0.014	0.0067	0.033	mg/kg	J	8270C	01/19/11	1
Pyrene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1
Surrogate Recovery								
Nitrobenzene-d5	76.5			% Rec.		8270C	01/19/11	1
2-Fluorobiphenyl	73.7			% Rec.		8270C	01/19/11	1
p-Terphenyl-d14	56.3			% Rec.		8270C	01/19/11	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
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 L497659-02 (PH) - 9.4@20.7c



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REPORT OF ANALYSIS

January 20, 2011

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

Date Received : January 16, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 609-33 3
 Collected By : Jerry David
 Collection Date : 01/15/11 19:00

ESC Sample # : L497659-03

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	1.4	0.31	2.0	mg/kg	J	3060A/7	01/18/11	1
Chromium, Trivalent	9.1	0.17	0.50	mg/kg		Calc.	01/19/11	1
ORP	-2.0			mV		2580	01/18/11	1
pH	9.4			su		9045D	01/19/11	1
Sodium Adsorption Ratio	31.					Calc.	01/19/11	1
Specific Conductance	1000			umhos/cm		9050AM0	01/19/11	1
Mercury	0.013	0.0015	0.020	mg/kg	J	7471	01/19/11	1
Arsenic	3.8	0.32	1.0	mg/kg		6010B	01/19/11	1
Barium	220	0.050	0.25	mg/kg		6010B	01/19/11	1
Cadmium	U	0.040	0.25	mg/kg		6010B	01/19/11	1
Chromium	10.	0.085	0.50	mg/kg		6010B	01/19/11	1
Copper	9.2	0.21	1.0	mg/kg		6010B	01/19/11	1
Lead	10.	0.090	0.25	mg/kg		6010B	01/19/11	1
Nickel	7.9	0.26	1.0	mg/kg		6010B	01/19/11	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/19/11	1
Silver	U	0.16	0.50	mg/kg		6010B	01/19/11	1
Zinc	25.	0.34	1.5	mg/kg		6010B	01/19/11	1
Benzene	0.0087	0.00090	0.0025	mg/kg		8021/80	01/18/11	5
Toluene	0.039	0.0015	0.025	mg/kg		8021/80	01/18/11	5
Ethylbenzene	0.018	0.0013	0.0025	mg/kg	B	8021/80	01/18/11	5
Total Xylene	0.13	0.0028	0.0075	mg/kg		8021/80	01/18/11	5
TPH (GC/FID) Low Fraction	2.8	0.14	0.50	mg/kg		GRO	01/18/11	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene (FID)	102.			% Rec.		8021/80	01/18/11	5
a,a,a-Trifluorotoluene (PID)	96.5			% Rec.		8021/80	01/18/11	5
TPH (GC/FID) High Fraction	24.	0.77	4.0	mg/kg		3546/DR	01/19/11	1
Surrogate recovery(%)								
o-Terphenyl	85.8			% Rec.		3546/DR	01/19/11	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthylene	U	0.0078	0.033	mg/kg		8270C	01/19/11	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
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 L497659-03 (PH) - 9.4820.3c



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REPORT OF ANALYSIS

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

January 20, 2011

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 609-33 3
 Collected By : Jerry David
 Collection Date : 01/15/11 19:00

ESC Sample # : L497659-03

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Benzo(a)pyrene	U	0.0073	0.033	mg/kg		8270C	01/19/11	1
Benzo(b)fluoranthene	U	0.0086	0.033	mg/kg		8270C	01/19/11	1
Benzo(g,h,i)perylene	U	0.0050	0.033	mg/kg		8270C	01/19/11	1
Benzo(k)fluoranthene	U	0.0074	0.033	mg/kg		8270C	01/19/11	1
Chrysene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Dibenz(a,h)anthracene	U	0.0058	0.033	mg/kg		8270C	01/19/11	1
Fluoranthene	U	0.0069	0.033	mg/kg		8270C	01/19/11	1
Fluorene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Indeno(1,2,3-cd)pyrene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Naphthalene	0.067	0.0074	0.033	mg/kg		8270C	01/19/11	1
Phenanthrene	0.010	0.0067	0.033	mg/kg	J	8270C	01/19/11	1
Pyrene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1
Surrogate Recovery								
Nitrobenzene-d5	71.6			% Rec.		8270C	01/19/11	1
2-Fluorobiphenyl	74.1			% Rec.		8270C	01/19/11	1
p-Terphenyl-d14	56.4			% Rec.		8270C	01/19/11	1

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 MDL = Minimum Detection Limit = LOD
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 L497659-03 (PH) - 9.4@20.3c



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REPORT OF ANALYSIS

January 20, 2011

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

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 608-43-31 1
 Collected By : Jerry David
 Collection Date : 01/15/11 20:00

ESC Sample # : L497659-04

Site ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	1.1	0.31	2.0	mg/kg	J	3060A/7	01/18/11	1
Chromium, Trivalent	15.	0.17	0.50	mg/kg		Calc.	01/19/11	1
ORP	-3.0			mV		2580	01/18/11	1
pH	9.1			su		9045D	01/19/11	1
Sodium Adsorption Ratio	52.					Calc.	01/19/11	1
Specific Conductance	1900			umhos/cm		9050AMo	01/19/11	1
Mercury	0.0095	0.0015	0.020	mg/kg	J	7471	01/19/11	1
Arsenic	9.9	1.6	5.0	mg/kg		6010B	01/20/11	5
Barium	260	0.25	1.3	mg/kg		6010B	01/20/11	5
Cadmium	U	0.20	1.3	mg/kg	Q	6010B	01/20/11	5
Chromium	16.	0.085	0.50	mg/kg		6010B	01/19/11	1
Copper	16.	0.21	1.0	mg/kg		6010B	01/19/11	1
Lead	14.	0.45	1.3	mg/kg		6010B	01/20/11	5
Nickel	11.	0.26	1.0	mg/kg		6010B	01/19/11	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/19/11	1
Silver	U	0.16	0.50	mg/kg		6010B	01/19/11	1
Zinc	33.	0.34	1.5	mg/kg		6010B	01/19/11	1
Benzene	0.025	0.00090	0.0025	mg/kg		8021/80	01/18/11	5
Toluene	0.086	0.0015	0.025	mg/kg		8021/80	01/18/11	5
Ethylbenzene	0.025	0.0013	0.0025	mg/kg	B	8021/80	01/18/11	5
Total Xylene	0.16	0.0028	0.0075	mg/kg		8021/80	01/18/11	5
TPH (GC/FID) Low Fraction	4.6	0.14	0.50	mg/kg		GRO	01/18/11	5
Surrogate Recovery-%								
a, a, a-Trifluorotoluene (FID)	102.			% Rec.		8021/80	01/18/11	5
a, a, a-Trifluorotoluene (PID)	97.0			% Rec.		8021/80	01/18/11	5
TPH (GC/FID) High Fraction	290	0.77	4.0	mg/kg		3546/DR	01/19/11	1
Surrogate recovery(%)								
o-Terphenyl	2270			% Rec.	J1	3546/DR	01/19/11	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthylene	U	0.0078	0.033	mg/kg		8270C	01/19/11	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
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 L497659-04 (PH) - 9.1@20.3c
 L497659-04 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

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

January 20, 2011

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 608-43-31 1
 Collected By : Jerry David
 Collection Date : 01/15/11 20:00

ESC Sample # : L497659-04
 Site ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Benzo(a)pyrene	U	0.0073	0.033	mg/kg		8270C	01/19/11	1
Benzo(b)fluoranthene	U	0.0086	0.033	mg/kg		8270C	01/19/11	1
Benzo(g,h,i)perylene	U	0.0050	0.033	mg/kg		8270C	01/19/11	1
Benzo(k)fluoranthene	U	0.0074	0.033	mg/kg		8270C	01/19/11	1
Chrysene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Dibenz(a,h)anthracene	U	0.0058	0.033	mg/kg		8270C	01/19/11	1
Fluoranthene	U	0.0069	0.033	mg/kg		8270C	01/19/11	1
Fluorene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Indeno(1,2,3-cd)pyrene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Naphthalene	0.047	0.0074	0.033	mg/kg		8270C	01/19/11	1
Phenanthrene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Pyrene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1
Surrogate Recovery								
Nitrobenzene-d5	73.5			% Rec.		8270C	01/19/11	1
2-Fluorobiphenyl	69.6			% Rec.		8270C	01/19/11	1
p-Terphenyl-d14	113.			% Rec.		8270C	01/19/11	1

U ND (Not Detected)

MDL - Minimum Detection Limit = LOD

ADL - Reported Detection Limit = LOQ = PQL = EQL

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L497659-04 (PH) - 9.1820.3c

L497659-04 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

January 20, 2011

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

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 606-43-31 2
 Collected By : Jerry David
 Collection Date : 01/15/11 20:00

ESC Sample # : L497659-05
 Site ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	1.4	0.31	2.0	mg/kg	JJ3	3060A/7	01/18/11	1
Chromium, Trivalent	17.	0.17	0.50	mg/kg		Calc.	01/19/11	1
ORP	-6.0			mV		2580	01/18/11	1
pH	9.2			su		9045D	01/19/11	1
Sodium Adsorption Ratio	27.					Calc.	01/19/11	1
Specific Conductance	1900			umhos/cm		9050A/0	01/19/11	1
Mercury	0.010	0.0015	0.020	mg/kg	J	7471	01/19/11	1
Arsenic	10.	1.6	5.0	mg/kg		6010B	01/20/11	5
Barium	260	0.25	1.3	mg/kg		6010B	01/20/11	5
Cadmium	U	0.20	1.3	mg/kg	O	6010B	01/20/11	5
Chromium	18.	0.085	0.50	mg/kg		6010B	01/19/11	1
Copper	16.	0.21	1.0	mg/kg		6010B	01/19/11	1
Lead	14.	0.45	1.3	mg/kg		6010B	01/20/11	5
Nickel	11.	0.26	1.0	mg/kg		6010B	01/19/11	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/19/11	1
Silver	U	0.16	0.50	mg/kg		6010B	01/19/11	1
Zinc	38.	0.34	1.5	mg/kg		6010B	01/19/11	1
Benzene	0.029	0.00090	0.0025	mg/kg		8021/80	01/18/11	5
Toluene	0.10	0.0015	0.025	mg/kg		8021/80	01/18/11	5
Ethylbenzene	0.026	0.0013	0.0025	mg/kg	B	8021/80	01/18/11	5
Total Xylene	0.17	0.0028	0.0075	mg/kg		8021/80	01/18/11	5
TPH (GC/FID) Low Fraction	3.8	0.14	0.50	mg/kg		GRO	01/18/11	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	100.			% Rec.		8021/80	01/18/11	5
a,a,a-Trifluorotoluene(PID)	95.6			% Rec.		8021/80	01/18/11	5
TPH (GC/FID) High Fraction	290	0.77	4.0	mg/kg		3546/DR	01/19/11	1
Surrogate recovery(%)								
o-Terphenyl	2410			% Rec.	J1	3546/DR	01/19/11	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthylene	U	0.0078	0.033	mg/kg		8270C	01/19/11	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD

RDL = Reported Detection Limit = LOQ = PQL = EQL

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L497659-05 (DRO) - Previous run also had high SURR recovery. Matrix effect.

L497659-05 (PH) - 9.2@20.3c



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REPORT OF ANALYSIS

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

January 20, 2011

Date Received : January 15, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 609-43-31 2
 Collected By : Jerry David
 Collection Date : 01/15/11 20:00

ESC Sample # : L497659-05
 Site ID :
 Project # :

Parameter	Result	MDL	RDL	Unics	Qualifier	Method	Date	Dil.
Benzo(a)pyrene	U	0.0073	0.033	mg/kg		8270C	01/19/11	1
Benzo(b)fluoranthene	U	0.0086	0.033	mg/kg		8270C	01/19/11	1
Benzo(g,h,i)perylene	U	0.0050	0.033	mg/kg		8270C	01/19/11	1
Benzo(k)fluoranthene	U	0.0074	0.033	mg/kg		8270C	01/19/11	1
Chrysene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Dibenz(a,h)anthracene	U	0.0058	0.033	mg/kg		8270C	01/19/11	1
Fluoranthene	U	0.0069	0.033	mg/kg		8270C	01/19/11	1
Fluorene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Indeno(1,2,3-cd)pyrene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Naphthalene	0.059	0.0074	0.033	mg/kg		8270C	01/19/11	1
Phenanthrene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Pyrene	U	0.0077	0.033	mg/kg		8270C	01/19/11	1
Surrogate Recovery								
Nitrobenzene-d5	71.6			% Rec.		8270C	01/19/11	1
2-Fluorobiphenyl	66.0			% Rec.		8270C	01/19/11	1
p-Terphenyl-d14	139.			% Rec.		8270C	01/19/11	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
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Reported: 01/20/11 15:30 Printed: 01/20/11 15:30
 L497659-05 (DRO) - Previous run also had high SURR recovery. Matrix effect.
 L497659-05 (PH) - 9.2@20.3c



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REPORT OF ANALYSIS

January 20, 2011

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

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 608-43-31 3
 Collected By : Jerry David
 Collection Date : 01/15/11 20:00

ESC Sample # : L497659-06
 Sita ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium,Hexavalent	1.5	0.31	2.0	mg/kg	J	3060A/7	01/18/11	1
Chromium,Trivalent	16	0.17	0.50	mg/kg		Calc.	01/19/11	1
ORP	-11.			mV		2580	01/18/11	1
pH	9.2			su		9045D	01/19/11	1
Sodium Adsorption Ratio	55.					Calc.	01/19/11	1
Specific Conductance	1900			umhos/cm		9050AMo	01/19/11	1
Mercury	0.010	0.0015	0.020	mg/kg	J	7471	01/19/11	1
Arsenic	8.6	1.6	5.0	mg/kg		6010B	01/20/11	5
Barium	250	0.25	1.3	mg/kg		6010B	01/20/11	5
Cadmium	U	0.20	1.3	mg/kg	O	6010B	01/20/11	5
Chromium	18.	0.085	0.50	mg/kg		6010B	01/19/11	1
Copper	16.	0.21	1.0	mg/kg		6010B	01/19/11	1
Lead	14.	0.45	1.3	mg/kg		6010B	01/20/11	5
Nickel	13.	0.26	1.0	mg/kg		6010B	01/19/11	1
Selenium	U	0.32	1.0	mg/kg		6010B	01/19/11	1
Silver	U	0.16	0.50	mg/kg		6010B	01/19/11	1
Zinc	32.	0.34	1.5	mg/kg		6010B	01/19/11	1
Benzene	0.022	0.00090	0.0025	mg/kg		8021/80	01/18/11	5
Toluene	0.074	0.0015	0.025	mg/kg		8021/80	01/19/11	5
Ethylbenzene	0.018	0.0013	0.0025	mg/kg		8021/80	01/18/11	5
Total Xylene	0.12	0.0028	0.0075	mg/kg	B	8021/80	01/18/11	5
TPH (GC/FID) Low Fraction	2.0	0.14	0.50	mg/kg		GRO	01/18/11	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	100.			% Rec.		8021/80	01/18/11	5
a,a,a-Trifluorotoluene(PID)	96.3			% Rec.		8021/80	01/18/11	5
TPH (GC/FID) High Fraction	230	0.77	4.0	mg/kg	J5	3546/DR	01/19/11	1
Surrogate recovery(%)								
o-Terphenyl	1880			% Rec.	J1	3546/DR	01/19/11	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthene	U	0.0082	0.033	mg/kg		8270C	01/19/11	1
Acenaphthylene	U	0.0078	0.033	mg/kg		8270C	01/19/11	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	01/20/11	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
 RDL = Reported Detection Limit = LOQ = PQL = EQL
 Note:

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Reported: 01/20/11 15:30 Printed: 01/20/11 15:30
 L497659-06 (PH) - 9.2020.2c
 L497659-06 (DRO) - Previous run also had high SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

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

January 20, 2011

Date Received : January 18, 2011
 Description : 609-33/608-43-31/697-16A2
 Sample ID : 608-43-31 3
 Collected By : Jerry David
 Collection Date : 01/15/11 20:00

ESC Sample # : L497659-06
 Site ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Benzo(a)pyrene	U	0.0073	0.033	mg/kg		8270C	01/20/11	1
Benzo(b)fluoranthene	U	0.0066	0.033	mg/kg		8270C	01/20/11	1
Benzo(g,h,i)perylene	U	0.0050	0.033	mg/kg		8270C	01/20/11	1
Benzo(k)fluoranthene	U	0.0074	0.033	mg/kg		8270C	01/20/11	1
Chrysene	U	0.0067	0.033	mg/kg		8270C	01/20/11	1
Dibenz(a,h)anthracene	U	0.0058	0.033	mg/kg		8270C	01/20/11	1
Fluoranthene	U	0.0069	0.033	mg/kg		8270C	01/19/11	1
Fluorene	U	0.0059	0.033	mg/kg		8270C	01/19/11	1
Indeno(1,2,3-cd)pyrene	U	0.0059	0.033	mg/kg		8270C	01/20/11	1
Naphthalene	0.060	0.0074	0.033	mg/kg		8270C	01/19/11	1
Phenanthrene	U	0.0067	0.033	mg/kg		8270C	01/19/11	1
Pyrene	U	0.0077	0.033	mg/kg		8270C	01/20/11	1
Surrogate Recovery								
Nitrobenzene-d5	77.5			% Rec.		8270C	01/19/11	1
2-Fluorobiphenyl	72.4			% Rec.		8270C	01/19/11	1
p-Terphenyl-d14	144.			% Rec.		8270C	01/20/11	1

U = ND (Not Detected)
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 RDL = Reported Detection Limit = LOQ = PQL = EQL

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Reported: 01/20/11 15:30 Printed: 01/20/11 15:30
 L497659-06 (PH) - 9.2@20.2c
 L497659-06 (DRO) - Previous run also had high SURR recovery. Matrix effect.

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L497659-01	WG517610	SAMP	Ethylbenzene	R1542829	B
	WG517315	SAMP	Chromium, Hexavalent	R1542389	J
	WG517636	SAMP	Mercury	R1543530	J
L497659-02	WG517694	SAMP	Phenanthrene	R1544570	J
	WG517610	SAMP	Ethylbenzene	R1542829	B
	WG517315	SAMP	Chromium, Hexavalent	R1542389	J
L497659-03	WG517636	SAMP	Mercury	R1543530	J
	WG517694	SAMP	Phenanthrene	R1544570	J
	WG517610	SAMP	Ethylbenzene	R1542829	B
L497659-04	WG517315	SAMP	Chromium, Hexavalent	R1542389	J
	WG517636	SAMP	Mercury	R1543530	J
	WG517694	SAMP	Phenanthrene	R1544570	J
L497659-05	WG517610	SAMP	Ethylbenzene	R1542829	B
	WG517658	SAMP	Cadmium	R1544529	O
	WG517795	SAMP	o-Terphenyl	R1544352	J1
L497659-06	WG517315	SAMP	Chromium, Hexavalent	R1542389	JJ3
	WG517636	SAMP	Mercury	R1543530	J
	WG517610	SAMP	Total Xylene	R1542829	B
L497659-07	WG517658	SAMP	Cadmium	R1544529	O
	WG517795	SAMP	TPH (GC/FID) High Fraction	R1544352	J5
	WG517795	SAMP	o-Terphenyl	R1544352	J1
L497659-08	WG517315	SAMP	Chromium, Hexavalent	R1542389	J
	WG517636	SAMP	Mercury	R1543530	J
	WG517610	SAMP	Toluene	R1542829	J
L497659-09	WG517658	SAMP	Selenium	R1544529	O
	WG517658	SAMP	Silver	R1544529	J
	WG517795	SAMP	o-Terphenyl	R1544352	J1
L497659-10	WG517315	SAMP	Chromium, Hexavalent	R1542389	J
	WG517694	SAMP	Fluorene	R1544570	J
	WG517694	SAMP	Phenanthrene	R1544570	J
L497659-11	WG517694	SAMP	p-Terphenyl-d14	R1544570	J1
	WG517610	SAMP	Toluene	R1542829	J
	WG517610	SAMP	Ethylbenzene	R1542829	B
L497659-12	WG517658	SAMP	Selenium	R1544529	O
	WG517658	SAMP	Silver	R1544529	J
	WG517795	SAMP	o-Terphenyl	R1544352	J1
L497659-13	WG517315	SAMP	Chromium, Hexavalent	R1542389	J
	WG517694	SAMP	Fluorene	R1544570	J
	WG517694	SAMP	Phenanthrene	R1544570	J
L497659-14	WG517694	SAMP	p-Terphenyl-d14	R1544570	J1
	WG517610	SAMP	Ethylbenzene	R1542829	B
	WG517658	SAMP	Selenium	R1544529	O
L497659-15	WG517658	SAMP	Silver	R1544529	J
	WG517795	SAMP	o-Terphenyl	R1544352	J1
	WG517315	SAMP	Chromium, Hexavalent	R1542389	J
L497659-16	WG517694	SAMP	Fluorene	R1544570	J
	WG517694	SAMP	Phenanthrene	R1544570	J
	WG517694	SAMP	Phenanthrene	R1544570	J
L497659-17	WG517694	SAMP	Phenanthrene	R1544570	J
	WG517694	SAMP	Phenanthrene	R1544570	J
	WG517694	SAMP	p-Terphenyl-d14	R1544570	J1

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
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high
J3	The associated batch QC was outside the established quality control range for precision.
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
01/20/11 at 15:30:52

TSR Signing Reports: 134
R3 - Rush: Two Day

Sample: L497659-01 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-02 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-03 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-04 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-05 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-06 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-07 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-08 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30
Sample: L497659-09 Account: OXYGJCO Received: 01/18/11 08:30 Due Date: 01/20/11 00:00 RPT Date: 01/20/11 15:30



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Est. 1970

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

Report Summary

Wednesday December 15, 2010

Report Number: L492094

Samples Received: 12/04/10

Client Project:

Description: 697-15-03B

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

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

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

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

December 15, 2010

Date Received : December 04, 2010
 Description : 697-15-03B
 Sample ID : 01 CUTTINGS 9130 FT
 Collected By : Mark Schneider
 Collection Date : 12/03/10 05:30

ESC Sample # : L492094-01
 Site ID :
 Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Chromium, Hexavalent	U	0.31	2.0	mg/kg		3060A/7	12/09/10	1
ORP	21.			mV		2580	12/06/10	1
pH	8.8			su		9045D	12/08/10	1
Sodium Adsorption Ratio	42.					Calc.	12/10/10	1
Specific Conductance	2900			umhos/cm		9050AMo	12/08/10	1
Mercury	0.0087	0.0015	0.020	mg/kg	J	7471	12/09/10	1
Arsenic	6.7	0.32	1.0	mg/kg		6010B	12/15/10	1
Barium	160	0.050	0.25	mg/kg		6010B	12/15/10	1
Cadmium	0.047	0.040	0.25	mg/kg	J	6010B	12/15/10	1
Chromium	16.	0.085	0.50	mg/kg		6010B	12/15/10	1
Copper	21.	0.21	1.0	mg/kg		6010B	12/15/10	1
Lead	16.	0.090	0.25	mg/kg		6010B	12/15/10	1
Nickel	11.	0.26	1.0	mg/kg		6010B	12/15/10	1
Selenium	2.3	0.32	1.0	mg/kg		6010B	12/15/10	1
Silver	U	0.16	0.50	mg/kg		6010B	12/15/10	1
Zinc	67.	0.34	1.5	mg/kg		6010B	12/15/10	1
Benzene	0.052	0.00090	0.0025	mg/kg		8021/80	12/06/10	5
Toluene	0.055	0.0015	0.025	mg/kg		8021/80	12/06/10	5
Ethylbenzene	0.0079	0.0013	0.0025	mg/kg		8021/80	12/06/10	5
Total Xylene	0.027	0.0028	0.0075	mg/kg		8021/80	12/06/10	5
TPH (GC/FID) Low Fraction	U	0.14	0.50	mg/kg		GRO	12/06/10	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	97.6			% Rec.		8021/80	12/06/10	5
a,a,a-Trifluorotoluene(PID)	101.			% Rec.		8021/80	12/06/10	5
TPH (GC/FID) High Fraction	33.	0.77	4.0	mg/kg		3546/DR	12/13/10	1
Surrogate recovery(%)								
o-Terphenyl	189.			% Rec.	J1	3546/DR	12/13/10	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0093	0.033	mg/kg		8270C	12/08/10	1
Acenaphthene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Acenaphthylene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Benzo(a)anthracene	U	0.0077	0.033	mg/kg		8270C	12/08/10	1
Benzo(a)pyrene	U	0.0074	0.033	mg/kg		8270C	12/08/10	1
Benzo(b)fluoranthene	U	0.0078	0.033	mg/kg		8270C	12/08/10	1

U = ND (Not Detected)
 MDL = Minimum Detection Limit = LOD
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Reported: 12/15/10 15:50 Printed: 12/15/10 15:51
 L492094-01 (PH) - 8.8@18.3c
 L492094-01 (DRO) - Previous run also had high IS/SURR recovery. Matrix effect.



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REPORT OF ANALYSIS

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

December 15, 2010

Date Received : December 04, 2010
 Description : 697-15-03B
 Sample ID : 01 CUTTINGS 9130 FT
 Collected By : Mark Schneider
 Collection Date : 12/03/10 05:30

ESC Sample # : L492094-01

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Benzo(g,h,i)perylene	U	0.0095	0.033	mg/kg		8270C	12/08/10	1
Benzo(k)fluoranthene	U	0.012	0.033	mg/kg		8270C	12/08/10	1
Chrysene	U	0.0091	0.033	mg/kg		8270C	12/08/10	1
Dibenz(a,h)anthracene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Fluoranthene	U	0.0079	0.033	mg/kg		8270C	12/08/10	1
Fluorene	U	0.0095	0.033	mg/kg		8270C	12/08/10	1
Indeno(1,2,3-cd)pyrene	U	0.011	0.033	mg/kg		8270C	12/08/10	1
Naphthalene	0.088	0.016	0.033	mg/kg		8270C	12/08/10	1
Phenanthrene	0.016	0.0073	0.033	mg/kg	J	8270C	12/08/10	1
Pyrene	U	0.0089	0.033	mg/kg		8270C	12/08/10	1
Surrogate Recovery								
Nitrobenzene-d5	65.0			% Rec.		8270C	12/08/10	1
2-Fluorobiphenyl	97.3			% Rec.		8270C	12/08/10	1
p-Terphenyl-d14	79.8			% Rec.		8270C	12/08/10	1

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 MDL = Minimum Detection Limit = LOD
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 L492094-01 (PH) - 8.8@18.3c
 L492094-01 (DRO) - Previous run also had high IS/SURR recovery. Matrix effect.

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L492094-01	WG511903	SAMP	Cadmium	R1505669	J
	WG512487	SAMP	o-Terphenyl	R1503110	J1
	WG512081	SAMP	Mercury	R1501459	J
	WG511610	SAMP	Phenanthrene	R1500372	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

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)."

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- 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
12/15/10 at 15:51:27

TSR Signing Reports: 134
R5 - Desired TAT

Sample: L492094-01 Account: OXYGJCO Received: 12/04/10 09:00 Due Date: 12/10/10 00:00 RPT Date: 12/15/10 15:50



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

Quality Assurance Report
Level II

Grand Junction, CO 81506

December 15, 2010

L492094

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG511652	12/05/10 20:18
Ethylbenzene	< .0005	mg/kg			WG511652	12/05/10 20:18
Toluene	< .005	mg/kg			WG511652	12/05/10 20:18
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG511652	12/05/10 20:18
Total Xylene	< .0015	mg/kg			WG511652	12/05/10 20:18
a,a,a-Trifluorotoluene (FID)		% Rec.	96.59	59-128	WG511652	12/05/10 20:18
a,a,a-Trifluorotoluene (PID)		% Rec.	104.7	54-144	WG511652	12/05/10 20:18
Acenaphthene	< .033	mg/kg			WG511610	12/08/10 10:07
Acenaphthylene	< .033	mg/kg			WG511610	12/08/10 10:07
Anthracene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(a)anthracene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(a)pyrene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(b)fluoranthene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(g,h,i)perylene	< .033	mg/kg			WG511610	12/08/10 10:07
Benzo(k)fluoranthene	< .033	mg/kg			WG511610	12/08/10 10:07
Chrysene	< .033	mg/kg			WG511610	12/08/10 10:07
Dibenz(a,h)anthracene	< .033	mg/kg			WG511610	12/08/10 10:07
Fluoranthene	< .033	mg/kg			WG511610	12/08/10 10:07
Fluorene	< .033	mg/kg			WG511610	12/08/10 10:07
Indeno(1,2,3-cd)pyrene	< .033	mg/kg			WG511610	12/08/10 10:07
Naphthalene	< .033	mg/kg			WG511610	12/08/10 10:07
Phenanthrene	< .033	mg/kg			WG511610	12/08/10 10:07
Pyrene	< .033	mg/kg			WG511610	12/08/10 10:07
2-Fluorobiphenyl		% Rec.	107.4	37-123	WG511610	12/08/10 10:07
Nitrobenzene-d5		% Rec.	103.7	19-129	WG511610	12/08/10 10:07
p-Terphenyl-d14		% Rec.	136.7	34-149	WG511610	12/08/10 10:07
pH	4.30	su			WG512076	12/08/10 11:53
Specific Conductance	0.870	umhos/cm			WG512282	12/08/10 17:57
Chromium, Hexavalent	< 2	mg/kg			WG511936	12/09/10 08:54
Mercury	< .02	mg/kg			WG512081	12/09/10 10:13
TPH (GC/FID) High Fraction	< 4	ppm			WG512487	12/11/10 10:29
o-Terphenyl		% Rec.	91.43	50-150	WG512487	12/11/10 10:29
Arsenic	< 1	mg/kg			WG511903	12/15/10 10:23
Barium	< .25	mg/kg			WG511903	12/15/10 10:23
Cadmium	< .25	mg/kg			WG511903	12/15/10 10:23
Chromium	< .5	mg/kg			WG511903	12/15/10 10:23
Copper	< 1	mg/kg			WG511903	12/15/10 10:23
Lead	< .25	mg/kg			WG511903	12/15/10 10:23
Nickel	< 1	mg/kg			WG511903	12/15/10 10:23
Selenium	< 1	mg/kg			WG511903	12/15/10 10:23
Silver	< .5	mg/kg			WG511903	12/15/10 10:23
Zinc	< 1.5	mg/kg			WG511903	12/15/10 10:23

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



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 Brett Kennedy
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 Grand Junction, CO 81506

Quality Assurance Report
 Level II

L492094

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

Tax I.D. 62-0814289

Est. 1970

December 15, 2010

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
ORP	mV	14.0	21.0	40.0*	20	L492056-04	WGS11786
ORP	mV	5.00	8.00	46.2*	20	L492124-03	WGS11786
pH	su	8.50	8.40	1.18*	1	L492052-02	WGS12076
pH	su	9.70	9.60	1.04*	1	L492329-03	WGS12076
Specific Conductance	umhos/cm	11000	11000	2.30	20	L491699-01	WGS12282
Specific Conductance	umhos/cm	1100	1300	14.9	20	L492329-03	WGS12282
Chromium, Hexavalent	mg/kg	0	0	0	20	L492056-06	WGS11936
Chromium, Hexavalent	mg/kg	0	0	0	20	L492198-02	WGS11936
Mercury	mg/kg	0	0.0110	NA	20	L492079-16	WGS12081
Arsenic	mg/kg	16.0	23.0	33.5*	20	L492079-22	WGS11903
Barium	mg/kg	51.0	56.0	9.35	20	L492079-22	WGS11903
Cadmium	mg/kg	0	0	0	20	L492079-22	WGS11903
Chromium	mg/kg	27.0	31.0	15.3	20	L492079-22	WGS11903
Nickel	mg/kg	29.0	34.3	17.1	20	L492079-22	WGS11903
Selenium	mg/kg	1.80	0.800	76.0*	20	L492079-22	WGS11903
Silver	mg/kg	0	0	0	20	L492079-22	WGS11903
Zinc	mg/kg	110.	130.	18.5	20	L492079-22	WGS11903
Copper	mg/kg	10.0	13.1	23.9*	20	L492079-22	WGS11903
Lead	mg/kg	19.0	27.0	35.3*	20	L492079-22	WGS11903

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0523	105.	76-113	WGS11652
Ethylbenzene	mg/kg	.05	0.0568	114.	78-115	WGS11652
Toluene	mg/kg	.05	0.0515	103.	76-114	WGS11652
Total Xylene	mg/kg	.15	0.160	107.	81-118	WGS11652
a, a, a-Trifluorotoluene (FID)				97.20	59-128	WGS11652
a, a, a-Trifluorotoluene (PID)				104.2	54-144	WGS11652
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.76	123.	67-135	WGS11652
a, a, a-Trifluorotoluene (FID)				105.3	59-128	WGS11652
a, a, a-Trifluorotoluene (PID)				114.7	54-144	WGS11652
ORP	mV	229	220.	96.1	95.6-104.37	WGS11766
Acenaphthene	mg/kg	.167	0.177	106.	44-117	WGS11610
Acenaphthylene	mg/kg	.167	0.181	108.	43-118	WGS11610
Anthracene	mg/kg	.167	0.187	112.	42-127	WGS11610
Benzo(a)anthracene	mg/kg	.167	0.174	104.	45-127	WGS11610
Benzo(a)pyrene	mg/kg	.167	0.177	106.	46-123	WGS11610
Benzo(b)fluoranthene	mg/kg	.167	0.160	95.5	43-126	WGS11610
Benzo(g,h,i)perylene	mg/kg	.167	0.191	114.	43-128	WGS11610
Benzo(k)fluoranthene	mg/kg	.167	0.169	101.	40-126	WGS11610
Chrysene	mg/kg	.167	0.187	112.	44-129	WGS11610
Dibenz(a,h)anthracene	mg/kg	.167	0.194	116.	43-127	WGS11610
Fluoranthene	mg/kg	.167	0.191	114.	44-125	WGS11610
Fluorene	mg/kg	.167	0.180	108.	45-121	WGS11610
Indeno(1,2,3-cd)pyrene	mg/kg	.167	0.191	114.	43-127	WGS11610

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Analyte	Units	Laboratory Control Known Val	Sample Result	% Rec	Limit	Batch
Naphthalene	mg/kg	.167	0.154	92.2	32-113	WG511610
Phenanthrene	mg/kg	.167	0.174	104.	43-124	WG511610
Pyrene	mg/kg	.167	0.186	111.	47-128	WG511610
2-Fluorobiphenyl				110.9	37-123	WG511610
Nitrobenzene-d5				103.8	19-129	WG511610
p-Terphenyl-d14				124.6	34-149	WG511610
pH	su	5.92	7.00	101.	97.98-102.02	WG512076
Specific Conductance	umhos/cm	406	390.	96.1	85-115	WG512282
Chromium, Hexavalent	mg/kg	100	93.9	93.9	50-143	WG511936
Mercury	mg/kg	8.77	6.36	72.5	71.6-127.7	WG512081
TPH (GC/FID) High Fraction o-Terphenyl	ppm	60	58.7	97.9 89.47	50-150 50-150	WG512487 WG512487
Arsenic	mg/kg	192	170.	88.5	78.6-120.8	WG511903
Barium	mg/kg	420	384.	91.4	78.8-121.4	WG511903
Cadmium	mg/kg	70.1	61.4	87.6	78.5-121.5	WG511903
Chromium	mg/kg	168	158.	94.0	80.4-120.2	WG511903
Copper	mg/kg	122	122.	100.	81.6-119.7	WG511903
Lead	mg/kg	113	96.6	85.5	77.3-122.1	WG511903
Nickel	mg/kg	74.1	67.0	90.4	78.8-121.2	WG511903
Selenium	mg/kg	176	163.	92.6	75.6-125.0	WG511903
Silver	mg/kg	115	103.	89.6	66-133.9	WG511903
Zinc	mg/kg	437	405.	92.7	78.5-121.7	WG511903

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
TPH (GC/FID) Low Fraction	mg/kg	6.69	6.76	122.	67-135	0.940	20	WG511652
a, a, a-Trifluorotoluene (FID)				105.0	59-128			WG511652
a, a, a-Trifluorotoluene (PID)				115.3	54-144			WG511652
Benzene	mg/kg	0.0509	0.0523	102.	76-113	2.57	20	WG511652
Ethylbenzene	mg/kg	0.0549	0.0568	110.	78-115	3.43	20	WG511652
Toluene	mg/kg	0.0508	0.0515	102.	76-114	1.31	20	WG511652
Total Xylene	mg/kg	0.155	0.160	103.	81-118	3.23	20	WG511652
a, a, a-Trifluorotoluene (FID)				97.27	59-128			WG511652
a, a, a-Trifluorotoluene (PID)				104.1	54-144			WG511652
DRP	mV	220.	220.	96.0	95.6-104.37	0	20	WG511786
Acenaphthene	mg/kg	0.179	0.177	107.	44-117	0.844	21	WG511610
Acenaphthylene	mg/kg	0.178	0.181	106.	43-118	1.94	20	WG511610
Anthracene	mg/kg	0.182	0.187	109.	42-127	2.68	21	WG511610
Benzo(a)anthracene	mg/kg	0.174	0.174	104.	45-127	0.162	21	WG511610
Benzo(a)pyrene	mg/kg	0.175	0.177	105.	46-123	1.07	20	WG511610
Benzo(b)fluoranthene	mg/kg	0.152	0.160	91.0	43-126	4.59	27	WG511610
Benzo(g,h,i)perylene	mg/kg	0.182	0.191	109.	43-128	4.64	20	WG511610

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzo(k)fluoranthene	mg/kg	0.198	0.169	119.	40-126	15.9	32	WG511610
Chrysene	mg/kg	0.183	0.187	110.	44-129	2.41	22	WG511610
Dibenz(a,h)anthracene	mg/kg	0.164	0.194	98.0	43-127	16.6	20	WG511610
Fluoranthene	mg/kg	0.170	0.191	102.	44-125	11.3	22	WG511610
Fluorene	mg/kg	0.175	0.180	105.	45-121	2.69	20	WG511610
Indeno(1,2,3-cd)pyrene	mg/kg	0.167	0.191	100.	43-127	13.3	21	WG511610
Naphthalene	mg/kg	0.154	0.154	92.0	32-113	0.196	26	WG511610
Phenanthrene	mg/kg	0.167	0.174	100.	43-124	4.06	21	WG511610
Pyrene	mg/kg	0.181	0.186	108.	47-128	2.56	20	WG511610
2-Fluorobiphenyl				114.2	37-123			WG511610
Nitrobenzene-d5				105.7	19-129			WG511610
p-Terphenyl-d14				115.4	34-149			WG511610
pH	su	7.00	7.00	101.	97.98-102.02	0	20	WG512076
Specific Conductance	umhos/	390.	390.	96.0	85-115	0	20	WG512292
Chromium, Hexavalent	mg/kg	88.7	93.9	89.0	50-143	5.70	20	WG511936
TPH (GC/FID) High Fraction o-Terphenyl	ppm	56.9	58.7	95.0	50-150	3.14	25	WG512487
				87.27	50-150			WG512487

Analyte	Units	MS Res	Matrix Spike			Limit	Ref Samp	Batch
			Ref Res	TV	% Rec			
Benzene	mg/kg	0.217	0.00660	.05	84.2	32-137	L492056-02	WG511652
Ethylbenzene	mg/kg	0.195	0.00320	.05	76.8	10-150	L492056-02	WG511652
Toluene	mg/kg	0.202	0	.05	81.0	20-142	L492056-02	WG511652
Total Xylene	mg/kg	0.541	0.0240	.15	68.9	16-141	L492056-02	WG511652
a,a,a-Trifluorotoluene (FID)					94.44	59-128		WG511652
a,a,a-Trifluorotoluene (PID)					99.99	54-144		WG511652
TPH (GC/FID) Low Fraction	mg/kg	15.4	0	5.5	55.9	55-109	L492056-02	WG511652
a,a,a-Trifluorotoluene (FID)					96.70	59-128		WG511652
a,a,a-Trifluorotoluene (PID)					105.1	54-144		WG511652
Chromium, Hexavalent	mg/kg	2.38	0	20	11.9*	50-150	L492056-02	WG511936
Acenaphthene	mg/kg	0.164	0	.167	98.3	38-121	L491986-03	WG511610
Acenaphthylene	mg/kg	0.153	0	.167	91.8	39-120	L491986-03	WG511610
Anthracene	mg/kg	0.154	0	.167	92.5	35-133	L491986-03	WG511610
Benzo(a)anthracene	mg/kg	0.164	0	.167	98.2	35-136	L491986-03	WG511610
Benzo(a)pyrene	mg/kg	0.175	0	.167	105.	37-131	L491986-03	WG511610
Benzo(b)fluoranthene	mg/kg	0.203	0	.167	122.	29-145	L491986-03	WG511610
Benzo(g,h,i)perylene	mg/kg	0.141	0	.167	84.5	10-139	L491986-03	WG511610
Benzo(k)fluoranthene	mg/kg	0.164	0	.167	98.3	31-140	L491986-03	WG511610
Chrysene	mg/kg	0.172	0	.167	103.	34-137	L491986-03	WG511610
Dibenz(a,h)anthracene	mg/kg	0.152	0	.167	91.2	21-132	L491986-03	WG511610
Fluoranthene	mg/kg	0.151	0	.167	90.2	34-132	L491986-03	WG511610
Fluorene	mg/kg	0.170	0	.167	102.	38-126	L491986-03	WG511610
Indeno(1,2,3-cd)pyrene	mg/kg	0.156	0	.167	93.4	17-134	L491986-03	WG511610
Naphthalene	mg/kg	0.138	0	.167	82.8	24-122	L491986-03	WG511610
Phenanthrene	mg/kg	0.161	0	.167	96.6	38-128	L491986-03	WG511610
Pyrene	mg/kg	0.156	0	.167	93.5	35-141	L491986-03	WG511610

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Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
2-Fluorobiphenyl					86.83	37-123		
Nitrobenzene-d5					74.07	19-129		
p-Terphenyl-d14					83.05	34-149		
Mercury	mg/kg	0.244	0.0110	.25	93.2	70-130	L492079-16	WG512081
Arsenic	mg/kg	77.5	23.0	50	109.	75-125	L492079-22	WG511903
Barium	mg/kg	92.0	56.0	50	72.0*	75-125	L492079-22	WG511903
Cadmium	mg/kg	54.6	0	50	109.	75-125	L492079-22	WG511903
Chromium	mg/kg	75.0	31.0	50	88.0	75-125	L492079-22	WG511903
Nickel	mg/kg	73.7	34.3	50	78.8	75-125	L492079-22	WG511903
Selenium	mg/kg	58.8	0.800	50	116.	75-125	L492079-22	WG511903
Silver	mg/kg	50.4	0	50	101.	75-125	L492079-22	WG511903
Zinc	mg/kg	155.	130.	50	50.0*	75-125	L492079-22	WG511903

Analyte	Units	Matrix Spike Duplicate			Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref	%Rec					
Benzene	mg/kg	0.226	0.217	87.9	32-137	4.21	39	L492056-02	WG511652
Ethylbenzene	mg/kg	0.182	0.195	71.5	10-150	7.11	44	L492056-02	WG511652
Toluene	mg/kg	0.202	0.202	80.7	20-142	0.350	42	L492056-02	WG511652
Total Xylene	mg/kg	0.507	0.541	64.3	16-141	6.50	46	L492056-02	WG511652
a, a, a-Trifluorotoluene (FID)				95.86	59-128				WG511652
a, a, a-Trifluorotoluene (PID)				101.7	54-144				WG511652
TPH (GC/FID) Low Fraction	mg/kg	13.7	15.4	49.7*	55-109	11.7	20	L492056-02	WG511652
a, a, a-Trifluorotoluene (FID)				96.69	59-128				WG511652
a, a, a-Trifluorotoluene (PID)				106.0	54-144				WG511652
Chromium, Hexavalent	mg/kg	2.87	2.38	14.4*	50-150	18.7	20	L492056-02	WG511936
Acenaphthene	mg/kg	0.159	0.164	95.3	38-121	3.09	23	L491986-03	WG511610
Acenaphthylene	mg/kg	0.154	0.153	92.1	39-120	0.312	22	L491986-03	WG511610
Anthracene	mg/kg	0.152	0.154	91.0	35-133	1.67	23	L491986-03	WG511610
Benzo(a)anthracene	mg/kg	0.166	0.164	99.2	35-136	1.07	23	L491986-03	WG511610
Benzo(a)pyrene	mg/kg	0.165	0.175	98.9	37-131	5.69	22	L491986-03	WG511610
Benzo(b)fluoranthene	mg/kg	0.201	0.203	120.	29-145	1.01	33	L491986-03	WG511610
Benzo(g,h,i)perylene	mg/kg	0.121	0.141	72.5	10-139	15.3	26	L491986-03	WG511610
Benzo(k)fluoranthene	mg/kg	0.160	0.164	95.8	31-140	2.57	34	L491986-03	WG511610
Chrysene	mg/kg	0.169	0.172	101.	34-137	1.38	23	L491986-03	WG511610
Dibenz(a,h)anthracene	mg/kg	0.135	0.152	80.6	21-132	12.3	25	L491986-03	WG511610
Fluoranthene	mg/kg	0.160	0.151	95.8	34-132	6.02	24	L491986-03	WG511610
Fluorene	mg/kg	0.163	0.170	97.8	38-126	3.91	23	L491986-03	WG511610
Indeno(1,2,3-cd)pyrene	mg/kg	0.134	0.156	80.2	17-134	15.2	25	L491986-03	WG511610
Naphthalene	mg/kg	0.140	0.138	83.6	24-122	1.02	29	L491986-03	WG511610
Phenanthrene	mg/kg	0.165	0.161	99.1	38-128	2.55	25	L491986-03	WG511610
Pyrene	mg/kg	0.166	0.156	99.2	35-141	5.96	25	L491986-03	WG511610
2-Fluorobiphenyl				88.02	37-123				WG511610
Nitrobenzene-d5				83.82	19-129				WG511610
p-Terphenyl-d14				82.20	34-149				WG511610
Mercury	mg/kg	0.250	0.244	95.6	70-130	2.43	20	L492079-16	WG512081
Arsenic	mg/kg	61.2	77.5	76.4	75-125	23.5*	20	L492079-22	WG511903
Barium	mg/kg	83.5	92.0	55.0*	75-125	9.69	20	L492079-22	WG511903
Cadmium	mg/kg	45.4	54.6	90.8	75-125	18.4	20	L492079-22	WG511903

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



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Tex I.D. 62-0814289

Est. 1970

YOUR LAB OF CHOICE

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

Quality Assurance Report
 Level II

Grand Junction, CO 81506

December 15, 2010

L492094

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Chromium	mg/kg	66.7	75.0	71.4*	75-125	11.7	20	L492079-22	WG511903
Nickel	mg/kg	70.3	73.7	72.0*	75-125	4.72	20	L492079-22	WG511903
Selenium	mg/kg	49.1	58.8	96.6	75-125	18.0	20	L492079-22	WG511903
Silver	mg/kg	47.4	50.4	94.8	75-125	6.13	20	L492079-22	WG511903
Zinc	mg/kg	118.	155.	0*	75-125	27.1*	20	L492079-22	WG511903

Batch number /Run number / Sample number cross reference

WG511652: R1499220: L492094-01
 WG511786: R1499402: L492094-01
 WG511610: R1500372: L492094-01
 WG512076: R1500552: L492094-01
 WG512282: R1501101: L492094-01
 WG511936: R1501102: L492094-01
 WG512081: R1501459: L492094-01
 WG511734: R1502049: L492094-01
 WG512487: R1503110: L492094-01
 WG511903: R1505669: L492094-01

* * Calculations are performed prior to rounding of reported values.
 * Performance of this Analyte is outside of established criteria.
 For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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

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

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

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

