



**OXY USA WTP LP**  
A subsidiary of Occidental Petroleum Corporation

760 Horizon Drive, Suite 101  
Grand Junction, CO 81506

February 23, 2012

Alex Fischer, P.G.  
Environmental Supervisor -  
Colorado Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801  
Denver, CO 80203

**Re: Responses Specific to COGCC Requirements and COA's for Oxy's  
Central Water Handling Facility (Approved Form 28; ID No. 417559)  
Oxy Operator No. 66571**

Mr. Fischer,

OXY USA WTP LP (Oxy) is pleased to provide you with Oxy's responses to Colorado Oil and Gas Conservation Commission (COGCC) conditions of approval (COA's) identified as "REQUIREMENTS" and included in your email dated February 12, 2012. The enclosed package of materials is intended to address the COA's as noted below:

- Provide a revised groundwater and surface water monitoring plan. *Attached; the revised plan has been updated to reflect Oxy's specific sampling, monitoring, and reporting procedures.*
- Provide a Site Plan detailing the existing facility. *Attached; the updated site plan has been updated. The site plan will be updated annually, this point forward.*
- Provide a revised "Process Description" including a discussion of the site use prior to modifying the site into the current Central Water Handling Facility. *Attached; Oxy has updated the "Process Description" (1) with a narrative describing the historical utilization of the site, prior to becoming the central water handling facility, (2) a narrative describing the waste stream associated with the filter pods/socks, and (3) Oxy's interpretation for determining minor and major changes associated with annual reporting.*

In addition to the attached "REQUIREMENTS" Oxy has also provided the COGCC with the initial financial assurance in the amount of \$389,406.00, submitted under a separate cover. Oxy is arranging for the groundwater monitoring wells to be drilled prior to the 30Jun12 COA requirement date and will begin surface water and NORM sampling events next month.

Attached, please find two hard copies of the items noted and the electronic files associated with Oxy's responses. If you have any questions or require additional information, please contact me at 970.263.3637 or via email at [daniel\\_padilla@oxy.com](mailto:daniel_padilla@oxy.com). Thank you for your attention in this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Daniel I. Padilla".

Daniel I. Padilla  
Regulatory Advisor

Enclosures: as stated

cc: file

L. Prescott, Olsson Associates

# **Groundwater and Surface Water Sampling and Analysis Plan**



# **GROUNDWATER AND SURFACE WATER SAMPLING AND ANALYSIS PLAN**

for

**OXY'S CENTRALIZED E&P WATER MANAGEMENT  
FACILITY  
(COGCC Facility ID: 417559)**

located in

**GARFIELD COUNTY, COLORADO**

**OXY USA WTP LP  
760 Horizon Drive, Suite  
Grand Junction, CO 81506**

**REVISION DATE:  
February 15, 2012**

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## **Appendices**

- Attachment A - Proposed Sampling Location Diagram
- Attachment B - Analyte and Sample Container List
- Attachment C - Sample Data Sheet

## **1.0 INTRODUCTION**

This Sampling and Analysis Plan (SAP) is intended for use at OXY USA WTP LP's (Oxy) approved Centralized E&P Waste Management Facility (facility ID: 417559) for its Central Water Handling Facility (CWHF). This SAP has been created to identify sampling frequency, define procedures used to monitor the quality of ground water and surface water adjacent to the facility and to assure quality and consistency in data collection. The SAP also identifies sample reporting requirements. All samples will be collected and analyzed for Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 standards and major/minor cations/anions.

## **2.0 FIELD DATA COLLECTION ACTIVITIES**

The field data collection methods and procedures that will be used to assess potential impacts from the operation of the CWHF are described in this section.

### **2.1 Sampling Location and Frequency**

Oxy has established a total of five water quality monitoring points within and adjacent to the CWHF; two surface water locations along Conn Creek (one up-gradient and one down-gradient of the site) and three groundwater monitoring wells (two down-gradient and one up-gradient of the site). The locations of these sampling locations are illustrated in Appendix A. Water from these locations will be sampled and analyzed for the full analytical suite, as presented in Appendix B.

Ongoing sampling/monitoring will occur as directed, and on a frequency, as required by the Conditions of Approval established by the COGCC, specific to the issuance of the facilities permit (COGCC Document number: 01949102). Oxy will utilize its electronic tracking system (MAXIMO) to schedule and track sampling events. Sampling shall occur in the following manner:

- Groundwater Monitoring Well Samples: sample quarterly for the first year (2012) and then reevaluate the sampling frequency based upon seasonal fluctuations encountered during the first year.
- Surface Water Samples: sampling shall occur on a period basis depending on seasonal flows of Conn Creek. Sampling events will begin in March of 2012 and attempted quarterly thereafter. Sampling events and frequency shall be evaluated at the end of the first full year of sampling. No sampling shall occur immediately after a storm event.

### **2.2 Documentation**

In addition to scheduling sampling events, MAXIMO will also be used to document laboratory analysis results from each sampling event. A copy of the laboratory data collected will also be retained by Oxy's Regulatory department. The data will be tabulated throughout the year and reported to the COGCC annually, unless the data indicates the potential for a release. If data indicates the potential for a release, Oxy will evaluate the data and make agency notifications, as necessary.

One of the most important data collection tasks is the recording of information that can be easily transferred and interpreted by those not familiar with the field activities that are being recorded. All sampling records should be written legibly with an indelible-ink pen. Sampling personnel will maintain a bound field logbook that has numbered and dated pages and sample data sheets to

record specific information for each sample. An example of a sample data sheet is attached as Appendix C. Notes should be taken in a manner such that the information can readily be transferred to a database or similar data tabulation and storage system.

Entries in logbook should identify the individuals present during sampling and describes the task(s) accomplished and any other pertinent information that is not addressed on the sample data sheet. All entries into the logbook will include the date and initials of the person making the entry and/or page numbers on the top of the page. In addition to the specific information identified for each of the field activities described above, other general information should be recorded in the log book, such as, equipment used for the activity; weather conditions); locations and times of sampling; and any individuals present during the sampling activities, including any visitors or members of the general public.

Field equipment calibration records will be in kept in the Oxy field office or other centralized location.

### **2.3 Sample Collection**

The individual collecting the samples should wear disposable “exam-type” gloves to prevent any cross contamination of the samples. The gloves should be changed following the collection of each sample from each sample location.

Prior to collecting a groundwater sample from a monitoring well, a minimum of three well volumes of water should be purged from the well or by dewatering the well at least once using disposable or dedicated bailer. If the well is dewatered, the water level in the monitoring wells should be allowed to recover to a minimum of 90 percent of the original water level, if possible, before sample collection.

While collecting surface water samples, care should be taken to not disturb the surface water upstream of the sampling location. The sampler will estimate the depth and width of the channel. Surface water samples should be collected using a peristaltic pump with new tubing, or by dipping an unpreserved collection bottle into the water. Take photographs to aid in documenting the location qualitative description.

Water samples collected for volatile analyses, such as benzene, toluene, ethylbenzene, & xylene (BTEX), should be placed in clean, preserved sample containers with zero headspace, labeled, and placed into an iced cooler immediately. Samples collected for dissolved metal analyses should be field filtered using a portable peristaltic sampling pump and a 0.45 micron in-line filter prior to collection in a clean, nitric acid (HNO<sub>3</sub>) preserved sampling container. Samples collected for other analyses should be placed into the appropriate sample containers that contain the appropriate sample preservative as designated by the laboratory method. All samples should be shipped in iced coolers and delivered to the laboratory under chain-of-custody procedures.

At a minimum, field parameters including pH, temperature, and conductivity, when possible, should be measured and recorded prior to the collection of the sample. All instruments should be calibrated according to respective manufacturer specifications and the calibration and response of all instruments should be checked daily before sampling activities begin. Each sample will be given a distinct ID (i.e. sample location or well number) and labeled with the requested analyses, date, time and initials of the sampler.

## **2.4 Analytical Program and Quality Assurance**

Quality assurance samples will include one duplicate sample per ten samples collected. Equipment blank samples should be collected if using an external pump and associated tubing is used after the collection of five samples using distilled water. One trip blank for BTEX analysis should be submitted along with all samples collected for each sampling event. If there is a potential for cross contamination of the samples from hydrocarbon emission sources in the vicinity of the sample collection activities such as a well head, compressors or generators, then a field blank containing distilled water should be collected by removing the cap on the sample container during the entire time of volatile sampling.

Surface and groundwater samples will be analyzed as listed in Attachment B. Associated holding times for each analysis are also listed. All samples should be shipped to the laboratory in iced coolers under chain-of-custody procedures by overnight courier.

## **2.5 Decontamination**

This procedure applies to all down-hole equipment placed in wells for groundwater level measurements, and to all sample collection equipment. The sampling equipment used will be thoroughly cleaned prior to initiation of sampling activities and between each use at the site. Dedicated equipment will be used as often as possible.

Decontamination of field instruments, small items (slip caps) or delicate materials (i.e. soft plastics) will include an alconox wash and scrubbing with bristle brush or paper towel as appropriate to remove potential contaminants, followed by a deionized water rinse.

## **2.6 Personal Protective Equipment**

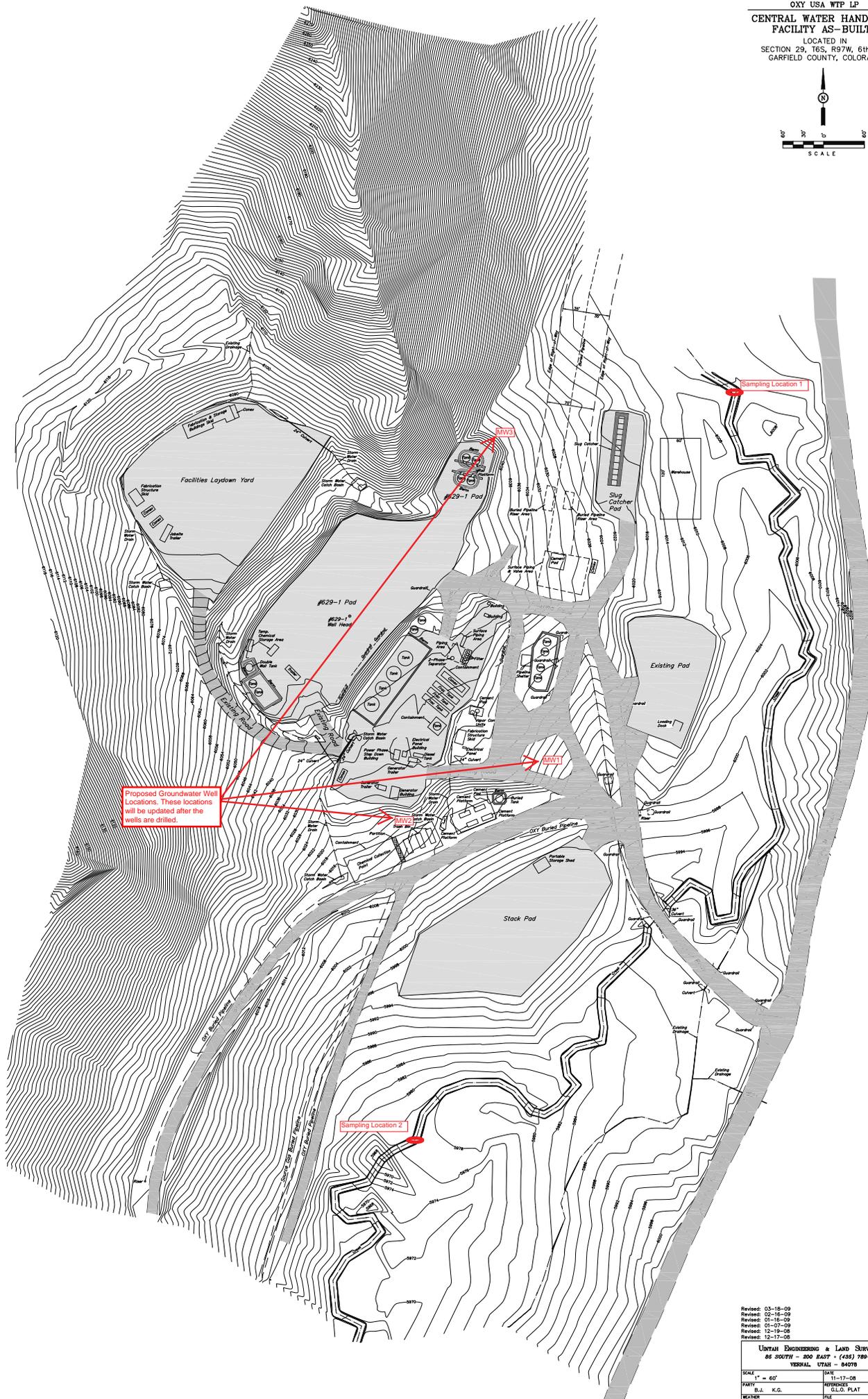
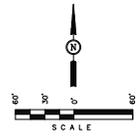
Reasonable caution, including use of proper handling techniques and use of personal protective equipment (PPE), should be practiced whenever hazardous or unknown substances are encountered during sampling activities. PPE to be used includes, but may not be limited to, safety glasses, hard hat, rubber gloves, fire retardant clothing, and steel-toed boots. A job safety analysis shall be prepared for every field sampling day. The Oxy Health, Environmental, and Safety Specialist, the Oxy Contractor Safety Manual, and appropriate Material Safety Data Sheets should be consulted for further guidance.

## **3.0 DATA MANAGEMENT**

All analytical data received from the laboratories will be compiled in a spreadsheet detailing location information, site identification, sample collection date, sample source, and field parameters. The results of the sampling at each location will be compared with the baseline results from that location to determine if there is any indication that the operation of the facility may have impacted groundwater or surface water.

All analytical results will be provided annually to the COGCC in an electronic data deliverable format. Hard copies can also be prepared for COGCC staff, if requested. All submittals to the COGCC will be labeled with Facility ID Number as assigned by the COGCC. Any results that indicate potential impact from the facilities operation will be promptly reported to the COGCC.

**Attachment A - Proposed Sampling Location Diagram**



Proposed Groundwater Well Locations. These locations will be updated after the wells are drilled.

Revised: 03-18-09  
 Revised: 02-16-09  
 Revised: 01-16-09  
 Revised: 01-07-09  
 Revised: 12-19-08  
 Revised: 12-17-08

UTAH ENGINEERING & LAND SURVEYING 86 SOUTH - 200 EAST • (435) 788-1017 VERMILION, UTAH - 84078	
SCALE	TITLE
1" = 60'	11-17-08
DRAWN BY	REVISED BY
B.J. K.G.	G.L.O. PLAT
WEATHER	FILE
COOL	2 3 1 1 4

**Attachment B - Analyte and Sample Container List**

Analyte and Sample Container List

Analyte		COGCC MCL	Method	Reporting/Detection Limit	Sample Type	Sample Container	Preservative	Holding time
Organics	Benzene	5 µg/l <sup>3</sup>	SW846/8021B	1.0 µg/L	Unfiltered	2 x 40 mL Glass	4°C	7 days
	Toluene	560 to 1000 µg/l <sup>3</sup>	SW846/8021B	2.0 µg/L			4°C	7 days
	Ethylbenzene	700 µg/l <sup>3</sup>	SW846/8021B	2.0 µg/L			4°C	7 days
	Total Xylenes	1400 to 10,000 µg/l <sup>3</sup>	SW846/8021B	2.0 µg/L			4°C	7 days
Dissolved Metals	Calcium		SW6020/6010B	0.40 mg/L	Field Filter	250 mL Polyethylene	4°C, HNO3	6 months
	Iron		SW6020/6010B	0.10 mg/L			4°C, HNO3	6 months
	Magnesium		SW6020/6010B	0.03 mg/L			4°C, HNO3	6 months
	Manganese		SW6020/6010B	0.01 mg/L			4°C, HNO3	6 months
	Potassium		SW6020/6010B	0.13 mg/L			4°C, HNO3	6 months
	Selenium		SW6020/6010B	0.005 mg/L			4°C, HNO3	6 months
	Sodium		SW6020/6010B	0.50 mg/L			4°C, HNO3	6 months
Anions	Fluoride		SM 4500-F C/9056	0.10 mg/L	Unfiltered	250 mL Polyethylene	4°C	48 hours
	Bromide		E300/9056	0.05 mg/L			4°C	48 hours
	Chloride		E300/9056	0.05 mg/L			4°C	48 hours
	Nitrate		E300/9056	0.10 mg/L			4°C	48 hours
	Nitrite		E300/9056	0.10 mg/L			4°C	48 hours
	Sulfate		E300/9056	0.50 mg/L			4°C	48 hours
	Total Alkalinity/Bicarbonate/Carbonate		SM2320B/310.2	5.0 mg/L			Unfiltered	250 mL Polyethylene
WQ	TDS	<1.25 x background	160.1/SM 2540C	1.0 mg/L	Unfiltered	500 mL Polyethylene	4°C	7 Days
	Chlorides	<1.25 x background						
	Sulfates	<1.25 x background						
	Specific Conductivity		9050A	1.0 µmho/cm			4°C	7 Days
	pH		Field	-			-	-

## **Attachment C - Sample Data Sheet**

**Olsson Associates, Inc.**  
Water Sampling Field Form



<b>Client:</b>	<b>Project #</b>	<b>Date</b>	
<b>Gas well pad:</b>		<b>Sampler</b>	
<b>Landowner:</b>			

<b>Address</b>	<b>Mailing address</b>
<b>Phone(s)</b>	<b>Alternate contact</b>

<b>Sample source</b>	<b>GPS Location</b> N
<b>Sample ID</b>	(NAD 27) W

**Description/location** (document the sample collection point's physical location on the site and within the water system (i.e. before filtration, before/after pressure tank or storage, etc.)

<b>Well information</b>	
Pump: Y ( ) N ( ) Voltage:	Construction (casing material):
Sampling Eq. Used:	Maintenance
Casing diameter (in)	Permit #
1 Casing volume (gal)	Age
Water level TOC (ft)	Use
Total depth TOC (ft)	Frequency of use
	Well gas methane (ppm)

<b>Purge Information</b>		
Start time	Average rate (gpm)/Total Volume (gal)	End
<b>Sample</b>		
Flow rate (gpm)	Time	

<b>Water quality</b>		
Observations	Color	
	Odor	
	Sediment	
	Effervescence	
	Other	

<b>Laboratory Analytes</b>			
Diss. Meth.	Alk./Carb./Bicarb.	BART	
BTEX	Calcium	Oil & Grease	
MTBE	Iron		
H2S/Sulfide	Potassium		
Ammonia	Magnesium		
Chloride	Manganese		
Nitrate/Nitrite	Selenium		
Sulfate	Sodium		
TDS	pH		
Fluoride	SpC		
Bromide	Other (specify on reverse)		

Field parameters	Meter			Expected value ranges
	Calibration date			
	Readings	Initial	Final	
	Time			---
	Temp (°C)			0-35
	SpC (mS/cm)			0-12
	DO (mg/L)			0-120
	pH			6.5-9.5
	Salinity (%)			
	TDS (mg/L)			0-6
DO sat (%)			0-400	
Turb (NTU)			0-2,000	

**Landowner Comments**

**Olsson Associates, Inc.**  
Water Sampling Field Form

**Sampler comments:**


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