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. Thank you for your attention in this matter.

Sincerely,

Daniel I. Padilla
Regulatory Advisor

Enclosures: as stated

cc: file
L. Prescott, Olsson Associates

Revised Process Description

OXY USA WTP LP

CENTRAL WATER HANDLING FACILITY

PROCESS DESCRIPTION

HISTORICAL UTILIZATION OF THE SITE

OXY USA WTP LP's (Oxy) Central Water Handling Facility (CWHF) site was initially cleared and utilized as a compressor site for Oxy's oil and gas exploratory program in the Cascade Creek operating area (Grand Valley Field). The compressor facilities were installed in 2004. The compressor site consisted of 2 compressors and support facilities; dehydration, refrigeration, electricity generation, oil/water separation and the associated water handling facilities. The facilities were constructed and operated for a period of time until it was determined that additional facilities would be need to accommodate the anticipated production for the Grand Valley Field.. As such, in 2005 construction was initiated on our Conn Creek treating facility (CC1 – facility ID: 412058), which is located approximately 1,400 feet south of the existing CWHF. Upon completion of CC1 facility in 2006, the original compression and treating facility located at the site of the CWHF facility was dismantled and decommissioned.

Oxy began utilizing the decommissioned compressor station footprint as a location for filtration of produced water for reuse in completions activities. Also, several gas and water pipelines were installed across the CWHF, with water pipelines feeding into the CWHF to filter the water for reuse. Several storage yards and a facility yard have been built up around the CWHF. These facilities were permitted in accordance with local county regulations. A Colorado Oil and Gas Conservation Commission (COGCC) permitted UIC injection well (629-1 – facility ID: 159281) is also part of the CWHF. As per discussion and verbal approval with Dave Dillion of the COGCC, use of this facility to filter produced water for reuse activities was acceptable since all water was being generated from a single lease and all water was being reused in the same lease. Mr. Dillion stated that as soon as the facility shifted from a reuse facility to a more disposal oriented facility, then Oxy would have to permit the facility to a Centralized E&P Waste Management Facility. Disposal activities were initiated in the fall of 2008 and Oxy submitted its first application (Form 28) for the CWHF in 2009. Subsequent changes to the plan and facility designs, such as the addition of the injection well (noted above) and requests for additional information by the COGCC required Oxy to re-file the Form 28 application in 2010. The COGCC application was approved in 2012. Oxy also obtained approval of a Limited Impact Review permit application from Garfield County's Planning department in 2010 for the facility and associated storage and facility yards.

DETAIL ASSOCIATED WITH FACILITY DESIGN AND ENGINEERING

Oxy's Centralized Water Handling Facility (CWHF) is intended to accommodate Oxy's requirement for disposal, storage, and reuse of produced water resulting from natural gas development activities in its Piceance Basin operations area. The proposed facility will facilitate the collection, storage, disposal and transfer of produced water from Oxy's natural gas wells. The primary use of the water will be for reuse in Oxy's natural gas drilling and completion operations. Any water that cannot be reused as part of Oxy's operations will be injected into salt

water disposal wells that have been properly permitted with the Colorado Oil & Gas Conservation Commission (COGCC), or taken to other appropriate disposal facilities.

The proposed CWHF will consist of a system of closed-tank gravity separation tanks. The typical closed-tank gravity separation system will be comprised of settling tanks, final water handling tanks and includes access to Oxy's salt water disposal wells. Additional ancillary infrastructure will consist of a pump building to house the proposed water pumps, electrical buildings for power phase controls, structures to contain other electrical components and other small structures required to house pump controls including a piping valve control set. Oxy will utilize the closed-tank gravity separation system to recycle water for reuse during their operations in the area. Condensate separated at the facility will be stored in tanks located at the facility. Condensate haul trucks will periodically come and remove the condensate for sales. The facility will also be served by salt water disposal injection wells which will be monitored remotely by Oxy's CC I control room. Further details and facility diagrams are provided in Attachment Q of this application.

The proposed operation of this facility is intended to reuse and/or dispose of water gathered from Oxy's natural gas well sites in the area. Produced water will be transported primarily via existing water pipelines. In the areas of Oxy's operations not currently serviced by pipelines for produced water, trucks will be utilized for transport of water to the water handling facility. Prior to transport of water to the water handling facility, residual oil or condensate will be allowed to separate by gravity from the produced water and then removed via a series of gravity separator tanks on the well pads. After the first stage of residual oil/condensate removal at the well pads, the water will be piped to the water handling facility.

Water transported to the CWHF via Oxy's water gathering pipeline system enters the facility through four filter pods prior to being sent to the main 1500 bbl tanks. Each filter pod is comprised of four filter socks and has an internal capacity of 75 gallons. On average, each filter pod processes 31.25 bbls of produced water every hour, for a cumulative total of approximately 750 bbls per day per filter pod (~3,000 bbls per day for all four filter pods). Depending on the quality of the water, filter socks are changed an average of at least once per shift (12 hr), or twice a day. If the water quality is poor, filter socks are changed twice per shift, or four times a day. On rare occurrences, filter pods may be changed three times in a single shift. When a filter socks are replaced, the tie-in valve leading into the filter pods is closed and any excess pressure in the filter pods (approximately 25 PSI per filter pod) is purged into a relief tank, located immediately adjacent to the filter pods. After the filer pods have safely been purged, each filter pod is opened individually and all four socks are removed and replaced with new filter socks. Filter socks that have been removed are placed on a drying grate over a steel trough (located within the secondary containment structure of the filter pod station). After new filter socks have been added, the filter pods are closed, and the system is brought back on line. Once the filter socks have drip dried, they are moved to the steel trough used for purging the filter pods for additional drying time. After they have sufficiently dried, the filter socks are carried over to an approved E&P waste closed-top bin which is located at the CWHF. When the bin is near capacity, off-site disposal is arranged with an approved E&P waste hauler. The waste hauler retrieves the bin and transports it to an approved E&P disposal facility. The waste hauler also drops off a new waste bin on site. The hauler transports the filter socks using previously approved E&P waste manifests obtained by Oxy from the disposal facility. The disposal facilitymay ask for periodic review of the approved manifest(s).

After the water has passed through the filter pod assembly, it will be stored in the main 1500 bbl tanks which will be configured to allow for additional gravity separation and removal of residual

oil/condensate. The produced water will be stored in four existing water storage tanks while condensate will be stored in three condensate storage tanks. The water will also have impurities removed as it is passed through a series of filters and an additional 2-phase separator. The proposed tank batteries provide settling time to allow the remaining oil/condensate to break out and rise to the top of the tanks where the material is then directed into designated oil/condensate storage tanks. The oil/condensate stored in these tanks will then be sold just as it is from typical production sites. The high emission tank system will be a closed vapor control system utilizing one or more enclosed-flame combustors, similar to those used on producing wells, to collect and destroy hydrocarbon emissions. The vapor recovery systems and or closed vapor control systems will be installed both for the water tank area and the condensate separation area. The water tank area system will include a vapor recovery unit and or a closed vapor control system for the water and overflow tanks, and the 2-phase separator; and a tank blanket gas system for the tanks (using fuel gas). The condensate separator area vapor system will include a vapor recovery unit and or closed vapor control system for the condensate, water surge, separator feed tanks and, the 3-phase separator and heater treater. Recovered vapor from the water tank area will be returned to Oxy's gas plant. Vapor recovered from the condensate separation area will be sent to vapor combustion units equipped with fuel gas assist. The combustor destruction efficiency will meet or exceed the appropriate Colorado Department of Public Health and Environment (CDPHE) requirement for air-emission health standards. Oxy will secure all appropriate air quality permits for the operation of these units. From the facility's settling tank batteries, the water will then be pumped to existing storage ponds for future reuse, off-site disposal or to the injection well for onsite disposal.

All tanks will be set within secondary containment. Secondary containment for the atmospheric storage tanks (water storage, condensate storage, etc.) shall be achieved by means of corrugated steel curbing, compacted soil (Hesco) barriers and/or impervious concrete containment structures. Depending upon the location, some tanks will also have an impervious interior liner installed beneath them according to details specified by Oxy's preferred vendor. The entire CWHF facility is constructed to accommodate Oxy's Spill Prevention, Control and Countermeasures Plan (SPCC).

Oxy's proposed use of this water treatment technology will alleviate the heavy demand on local sources of water by recycling water back into operations versus obtaining fresh water from local sources for drilling and completion operations. The local disposal and reuse of water in proximity to where it is generated will also reduce the heavy truck traffic currently traveling down CR 213, Conn Creek Road, CR 204 (Roan Creek Road), and I-70 to disposal facilities.

The CWHF will be accessible to Oxy personnel and contractors 24 hours-a-day, 365-days-a-year. The facility will generally be unmanned; however, daily inspections will be conducted by local operation personnel.

The facility was designed by professional engineers who reviewed all engineering, drafting, procurement support, and field services assistance required for the complete design of all civil, structural, mechanical, piping, electrical, instrumentation and controls for the facility.

The facility has been designed in accordance with applicable Industry Codes and Standards listed and referenced below. In addition, all work shall comply with the latest applicable editions of all applicable codes and standards produced by the following bodies. This list is not necessarily exhaustive and other codes and standards may be used with prior approval. Subdivisions are for convenience only; requirements of all listed codes and standards are to be followed where applicable:

To minimize re-handling and transport of produced water and condensate in the Cascade Creek field an integrated handling system is in operation at the CWHF area. This includes controlling production liquids entering the facility for reduction in pressure, residence time for oil/water separation, and filtration. The facility has the capability to receive and process production fluids from the field, limited storage, and pumps and piping for distribution with connection to various gathering and distribution pipelines within the Cascade Creek operating area.

The CWHF area consists of four (4) 1500bbl settling and storage tanks, a pressure control and off-gas flashing system, inlet liquid filtration, distribution pumps, water injection system for associated disposal well, additional condensate and water storage tanks, instrument and fuel gas pressure regulation, and onsite MCC and power generation. Further details of each unit operation are given below.

Slug Catcher
A linear 36" slug catcher removes liquids from the gas gathering pipeline for slugs of up to 200bbls. The liquid leg operates off of level to send liquid to the Conn Creek I Gas Treating Facility (CC I GTF).

Inlet Liquid Handling
Production liquids from the field gathering system enter through a control valve to regulate and reduce inlet pressure prior to entering the tank system. Pressure is reduced from as high as 1400psi down to 25psi. The liquid goes through a 4 series (option for parallel) 4-bag filter pod system to remove suspended solids down to as low as 5 micron. Liquid then goes over to the 2-Phase separator.

Two Phase Separator
The two-phase separator removes entrained gas from water collected in the field water gathering system to flash any residual entrained gas in the liquid prior to entry into the liquid settling tank (TK401 or TK400). The vapor is connected to Vapor Control System #1 for emission control. The separator operates with instrument gas from a local level float switch.

Separator Feed Tank (TK401, TK400)
Liquid flows through a flow meter totalizing fluid flow through the system. Typical flow at 50MMCFD gas production is 2000 bpd with a maximum throughput of 6000 bpd. With associated residence time water and oil separate in the primary tank. Water continues movement through a water leg into three additional tanks connected in series. Oil remains in the settling tank and is weir'd at the top of the tank (20') for distribution to the CC I GTF condensate handling system. A control valve on the water leg side of the tank facilitates holding liquid level in the settling tank to weir condensate. The tank sizes are nominal 1500bbl (TK401) and 500bbl (TK400). TK400 is connected to Vapor Control System #1 for combustion of residual vapors.

Water Storage Tanks (TK401-404)
Consist of 4 ea 1500bbl tanks. Tanks provide storage of water for either disposal or distribution (pipe, truck) to other areas of the field or offsite. The water storage tanks (TK401-404) have modified tie-ins to other water facility main components and liquid pipelines for load in and out of storage. The tanks vent to atmosphere and handle processed produced water and fresh water.

Overflow Tanks (TK503/504)
Two 400 bbl tanks provide water overflow (TK504) and condensate overflow (TK503). This also facilitates use of the facility without connection to the CC I GTF. These tanks are connected to Vapor Control System #2 to combust residual vapors. The tanks will be emptied by vacuum trucks when required.

Condensate Storage Tanks (TK503/504)
Two 300bbl tanks provide storage of separated and ready for sale condensate for pickup by DOT approved vacuum trucks. These tanks are connected to Vapor Control System #2 to combust residual vapors. These tanks are in process of conversion to a produced water load in point. At set tank levels a small pump will transfer liquid over to TK400/401 for settling via the inlet liquid handling. All tanks will be set up with a blanket gas system to further control emissions.

CC 629-1 SWD
Two 60HP PD Pumps provide process power to inject produced water into the CC 629-1 Disposal Well. TK401-404 provide the source water for disposal. Water goes through a 2 series 4-bag filter pot line prior to injection. Water is filtered down to 10 micron prior to injection. Power to the package is provided through the MCC and associated gen sets.

Vapor Control System #1
Vapor control system #1 connects vapors from the 2-Phase separator and TK400 for combustion through a 60" combustor. Vapor collection will be via a 4" collection line.

Vapor Control System #2
Vapor control system #2 connects vapors from TK501/502/503/504 through a liquid knock-out drum to a 48" combustor. The gas blanket will tie into a local fuel gas line and use self contained regulators at each tank to provide an appropriate pressure gas to the tank blanket. Vapor collection will be via a 4" collection line.

GENERAL OPERATION
Above systems will be operated within design parameters and maintained to optimize operation as water production rates change. Additional general and operational safeguards to the system include:

- Piping and tank systems protection includes automated heat trace and insulation on lines.
- Lines, pumps not in use for extended periods or planned for long periods of static conditions will be purged to prevent freezing
- General checks for serviceability and leak development
- Maintenance Program – MAXIMO
    - Instrument testing, repair
    - Pressure retaining equipment – Mechanical Integrity program
    - Rotating Equipment – services, and preventative maintenance
- Filtration systems – filters replaced on high differential otherwise at prescribed intervals for filtration level
- Fire protection and prevention equipment checked on a monthly basis.

SYSTEM INTEGRATED PROTECTION (AUTOMATED/MECHANICAL)
Tanks
All – Secondary Containment

TK501/502/503/504 – 18’ Crossover connection (Spill mitigation)
TK401/402/403/404 – High Level Alarm (Callout), High High Level Shutdown
TK501/502/503/504 – High Level Alarm (Callout), High High Level Shutdown

Inlet Flow
Pressure Control (PCV400, SDV400) – High Pressure Shutdown

Pumps
PTs (P401/402) – Discharge High Pressure Shutdown, Suction Low Pressure Shutdown
Injection Package (629-1 SWD) - Discharge High Pressure Shutdown, Suction Low Pressure Shutdown

Vapor Control
VCUs – Operation time, Fail to Ignite Alarm (Callout)

OPERATIONAL CHECKS – SYSTEM PROTECTION (OPERATORS)
Tank Level (TK401/402/403/404, TK501/502/503/504) – Daily
Pump Pressure (PT401A/B, PT402A/B) – Daily (When in use)
Inlet Pressure: PIC400 Setpoint, PT403 Pressure – Daily
Inlet Filtration: Filter differential pressure – Daily

Civil and Architectural

Local City, County and State Jurisdictions and Building Commissions as applicable.

American Concrete Institute

- ACI 318-02 Building Code Requirements for Reinforced Concrete Design

American Institute of Steel Construction

AISC Manual of Steel Construction, Ninth edition, ASD

American National Standards Institute

- ANSI A-12.1 Safety Requirements for Floor and Wall Openings, Railings and Toe boards
- ANSI A-14.3 Safety Requirements for Fixed Ladders
- ANSI A-64.1 Requirements for Fixed industrial Stairs

American Society of Civil Engineers

- ASCE 7-02 Minimum Design Loads For Buildings and Other Structures

American Society for Testing and Materials

American Welding Society

- AWS D1.1 Structural Welding Code-Steel

American Society of Heating, Refrigerating and Air Conditioning Engineers

International Code Council (ICC/International Building Code)

- IBC International Building Code, 2003

Metal Building Manufacturers Association

National Fire Protection Association
- NFPA-90 A/B Air Conditioning and Ventilation Systems
- NFPA-30 Flammable and Combustible Liquids Code

Occupational Safety and Health Association

Mechanical

American Petroleum Institute
- API-5L Specification for Line Pipe
- API-6D Specification for Pipeline Valves (Gate, Plug, Ball, and Check Valves)
- API-12F Shop Welded Tanks for Storage of Production Liquids
- API-650 Design and Construction of Large, Welded, Low-Pressure Storage Tanks
- API-570 Piping Inspection Code: Inspection, Repair, Alteration and Rerating of In-Service Piping Systems
- API-598 Specification for Valves Inspection and Test
- API-610 Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries
- API-661 Air Cool Heat Exchangers for General Refinery Service
- API-RP 520 Sizing, Selection and Installation of pressure Relieving Devices in Refineries
- API-RP 521 Guide for pressure relieving and Depressurization Systems
- API-2510 Design and Construction of LPG Installations
- API MPMS Manual of Petroleum Measurement Standards

American Society of Mechanical Engineers
- ASME B31.3 Chemical Plant and Petroleum Refinery Piping
- ASME B31.8 Gas Transmission Distribution and Piping Systems
- ASME B31G Manual for Determining the Remaining Strength of Corroded Pipelines: A supplement to B31.3
- ASME V NDT for Pressure Vessels
- ASME VIII Boiler and Pressure Vessel Code
- ASME IX Welding
- ASME/ANSI B16.5 Pipe Flanges and Flanged Fittings
- ASME/ANSI B16.9 Factory-Made Wrought Steel Buttwelding Fittings
- ASME/ANSI B16.11 Forged Steel Fittings, Socket-Welding and Threaded
- ASME/ANSI B16.21 Nonmetallic Flat Gaskets for Pipe Flanges
- ASME/ANSI B16.34 Steel Valves, Flanged and Butt-Welding End
- ASME/ANSI B73.1 Horizontal End Suction Centrifugal Pumps for Chemical Process

American Society for Testing and Materials
- ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
- ASTM A105 Specification for Forgings, Carbon Steel for Piping Components
- ASTM A106 Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service

- ASTM A182 Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temp Service
- ASTM A193 Alloy-Steel and Stainless-Steel Bolting Materials for High-Temperature Service
- ASTM A194 Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High Temperature Service
- ASTM A234 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
- ASTM A312 Seamless and welded austenitic stainless steel pipe
- ASTM A333 Specification for Seamless and Welded Steel Pipe for Low Temperature Service
- ASTM A350 Standard Specification for Carbon and Low Alloy Steel Forgings, Requiring Notch Toughness Testing for Piping Components
- ASTM A403 Specification for wrought austenitic stainless steel piping fittings

Tubular Exchanger Manufacturers Association (TEMA)

Manufacturer's Standardization Society
- MSS-SP-44 Steel Pipeline Flanges
- MSS-SP-75 High Test Wrought Butt Weld Fittings
- MSS-SP-97 Integrally Reinforced Branch Outlet Fittings

Electrical

In addition to QGM Engineering Design and Construction Standards, the latest edition of following codes and standards shall be adhered to for the electrical design:
- ANSI American National Standards Institute
- API American Petroleum Institute RP-500
- FM Factory Mutual
- IEEE Institute of Electrical and Electronic Engineers
- NACE National Association of Corrosion Engineers Standard RP-0169-92
- NEMA National Electrical Manufacturers Association
- NESC National Electrical Safety Code - ANSI C2
- NFPA National Fire Protection Association
- NFPA 70 National Electrical Code
- UL Underwriters Laboratories

Instrumentation and Control

American Gas Association
American Petroleum Institute
- API 551 Process Measurement Instrumentation
- API 554 Process Instrumentation and Control

Instrument Society of America
- ISA-S12.1 Electrical Instruments in Hazardous Locations
- ISA-RP12.1 Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations

- ISA-S12.12 Electrical Equipment for Use in Class 1, Division 2 Hazardous Classified Locations

National Electrical Manufacturers Association
National Fire Protection Association

Annual Reporting Criteria

Minor and Major Change Definitions

Annual reporting requirements as per Colorado Oil and Gas Conservation Commission (COGCC) rule 908.f will be accommodated in accordance with (but not limited to) the following definitions:

Minor Changes: Any replacement or modifications of existing equipment that does not result in increase to the existing disturbed area(s) and is confined to the area(s) identified in the approved site plan will be considered *minor changes*. This includes road maintenance activities and minor earthwork. The implementation of storm water best management practices that require minor earth work to maintain control of erosion and emergent erosion issues will also be considered *minor changes*.

Major Changes: Any facilities construction project which provides for the addition of equipment or provides for the major renovation (modernization) of facilities that is not part of the original configuration detailed in the approved site plan will be considered a *major change*.