

**Production Water Reuse  
And  
Waste Minimization Plan**

**For  
Water Transfers Between**

**PICEANCE ENERGY, LLC  
And  
OXY USA WTP LP**

**March 24, 2015**

## **Introduction**

Piceance Energy, LLC ("Piceance Energy") and OXY USA WTP LP ("Oxy") are each currently and separately engaged in natural gas exploration and production operations in the Piceance Basin, which encompasses areas of Mesa, Garfield, and Rio Blanco Counties, Colorado. Hydraulic fracturing operations associated with completing individual natural gas wells in the Piceance Basin typically require large volumes of water. A significant percentage of the water used to conduct hydraulic fracturing is provided by operators from recycling and reuse of formation water co-produced with natural gas from their previously drilled production wells. In addition, the flowback water obtained from the return of hydraulic fracturing fluids following well stimulation is recovered for subsequent reuse during additional well completion operations. Producers typically operate various permitted facilities, which include pits, tanks and ponds, needed to treat and store produced water from its operations ("Production Water" as defined more specifically in Appendix A's Memorandum), to support recycling and reuse of water during additional drilling, completion and workover activities.

Depending largely on the level and location of drilling activity, conditions may exist when and where Piceance Energy's Production Water volumes exceed its available treatment and storage capacity and Piceance Energy's Production Water is transferred for final disposal (with no further possibility for recycling or reuse) to its own permitted injection well facilities or a licensed commercial disposal facility. Under other conditions, Piceance Energy may need additional water to support its activities in new or peripheral areas that are removed from its infrastructure of water gathering lines, and water treatment and storage facilities or otherwise where its own supply of Production Water may be inadequate or inconvenient for that specific location or time.

Oxy's operations also occur in the Piceance Basin and in some areas are proximal to Piceance Energy's operations. Similarly, Oxy's operations experience conditions where its supply of Production Water exceeds its storage capacity or is insufficient to meet its demands for drilling, completion and workover activities for a given location or time. When either operator's demand for makeup water exceeds their current and foreseeable supply of Production Water, historically one recourse has been to extract fresh water from either company's rightful water rights and store and treat the fresh water for subsequent downhole use even though other nearby operators may have an abundant supply of Production Water that they have no immediate or foreseeable need to use.

## **Purpose**

In order to establish a mutually beneficial relationship that promotes the reuse of Production Water, and seeks to limit the withdrawal of fresh water supplies, Piceance Energy and Oxy have entered into a master agreement, a memorandum of which is attached as Appendix A, whereby volumes of each company's Production Water could be transferred to the other company, on an as-needed, as requested basis, for re-use in each other's respective drilling, completion, and workover operations.

Sharing via transfer of Production Water between operators represents a best management practice that promotes fresh water conservation, waste minimization, recycling, and re-use, consistent with the stated regulatory objectives of various Colorado state agencies (DWR, CDPHE and COGCC). This

Production Water Reuse and Waste Minimization Plan (Reuse Plan) is intended to satisfy the requirements of the COGCC Rule 907.a.(3) for the reuse and recycling of E&P Waste, which states:

*Reuse and recycling. To encourage and promote waste minimization, operators may propose plans for managing E&P waste through beneficial use, reuse, and recycling by submitting a written management plan to the Director for approval on a Sundry Notice, Form 4, if applicable. Such plans shall describe, at a minimum, the type(s) of waste, the proposed use of the waste, method of waste treatment, product quality assurance, and shall include a copy of any certification or authorization that may be required by other laws and regulations. The Director may require additional information.*

#### **Anticipated Benefits**

Under this Reuse Plan, each party intends to use reasonable and available means to safely transfer Production Water, in sufficient volumes and quality, to meet the other party's transfer requests, when mutually agreeable to do so. The benefits of this Plan are expected to include:

- Shorter haul distances and an overall reduction of truck traffic on lease and county roads, and state and federal highways, for an operator to supply and/or dispose of Production Water in the absence of sharing and transfer of Production Water between operators. This will result in:
  - Less road damage
  - Decreases in criteria air pollutions from water truck exhaust emissions and fugitive dust
  - Less noise
  - Fewer accidents and spills involving water trucks
- Fewer fresh water withdrawals from surface water sources
- Less reliance on injection wells for disposal of Production Water, and
- Increased operating efficiencies from reusing local supplies of Production Water to meet water demands for drilling, completion and workover activities.

#### **Proposed Use, Transfer and Ownership of Production Water**

To promote waste minimization, Piceance Energy, as the Receiver, will accept Production Water generated from Oxy's operations as the Supplier/Shipper in the Piceance Basin of Colorado, if and when needed by Piceance Energy and as consented to by Oxy, to support Piceance Energy's drilling, completion or workover operations. Oxy's Production Water will be delivered by Oxy to a mutually agreed upon transfer location ("Transfer Location" as identified in a Record of Transfer included as Exhibit A in Appendix A). Transfer locations will be COGCC approved locations or facilities, such as storage tanks on well pads, multi-well pits or centralized E&P Waste Management Facilities. Transfer Locations will change over time as activities conclude in one area and move on to other locales. Best management practices for spill prevention and control will be applied at each Transfer Location. Oxy will be responsible for measuring and recording the volumes of Production Water transferred utilizing a Record of Transfer.

Similarly, Oxy has agreed to accept Production Water as the Receiver generated from Piceance Energy's operations as the Supplier/Shipper in the Piceance Basin of Colorado, if and when needed by Oxy and as consented to by Piceance Energy, to support Oxy's drilling, completion or workover operations. Piceance

Energy's Production Water will be delivered by Piceance Energy to a mutually agreed upon Transfer Location. Transfer Locations will be COGCC approved locations or facilities, such as well pads, multi-well pits or centralized E&P Waste Management Facilities. Transfer Locations will change over time as completion activities conclude in one area and move on to other locales. Spill prevention and control Best Management Practices will be applied at each Transfer Location. Piceance Energy will be responsible for measuring and recording the volumes of Production Water transferred utilizing a Record of Transfer.

Piceance Energy shall maintain all legal and regulatory responsibility, custody and control for its Production Water until it is delivered to Oxy. At the time of delivery Oxy will assume all legal and regulatory responsibility, custody and control for that Production Water. Similarly, Oxy shall maintain all legal and regulatory responsibility, custody and control for its Production Water until it is delivered to Piceance Energy when Piceance Energy will assume all legal and regulatory responsibility, custody and control for that Production Water. The Memorandum of Master Production Water Custody Transfer Agreement between Piceance Energy and Oxy in Appendix A provides the details of this arrangement.

In the event that one party desires to terminate the Water Transfer Agreement, written notice shall be provided to the other party at least 30 days prior to the effective date of the termination. In addition, the terminating party is also responsible for notifying the COGCC in writing of the termination of the Water Transfer Agreement with the respective operator.

#### **Production Water Originating from Wells within Federal Oil and Gas Leaseholds**

Prior to transfer of any Production Water originating from wells completed on federal oil and gas leases, the Shipper/Supplier shall submit a Sundry Notice as required by the BLM.

#### **Source, Treatment and Quality of Production Water**

The Supplier/Shipper (as defined in the master agreement) will be responsible for identifying the source of the Production Water on the Record of Transfer, which will only include water from facilities permitted by the COGCC including produced water storage tanks, multi-use or production storage pits, and centralized E&P waste management facilities. The majority of natural gas wells in the Piceance Basin are completed in the Williams Fork Formation, and a minority of the wells are completed in the Illes, Mancos, and Niobrara Formations. Varying amounts of formation water are co-produced with the natural gas from within these formations and over the life of the well.

This Reuse Plan recognizes the Colorado State Engineer Office's ("SEO") Rules for Produced Nontributary Ground Water (C.R.S. § 37-90-137(7), 2 CCR 402-17) that govern the administration of wells, including oil and gas wells, that dewater geologic formations by withdrawing nontributary ground water to facilitate or permit the mining of minerals. Only Production Water derived from an operator's nontributary oil and gas wells will be allowed as a supply source for a transfer between operators to accommodate reuse under this Reuse Plan. The operator acting as the Supplier/Shipper is responsible for ensuring that only Production Water from non-tributary and non-coalbed methane formations is utilized as a source for water transfer and re-use by another operator.

Specifically, SEO Rule 17.7.D delineates geographic areas under which the ground water in certain geologic formations is nontributary. Nontributary ground water in this area of the Piceance Basin includes ground water from the currently producing formations of the Undifferentiated, Middle, and Lower Wasatch Formation, the Iles Formation, the Williams Fork Formation, the Mancos Formation, the Niobrara Formation, and the Undifferentiated Mesa Verde Group. The delineated areas and subject formations defined as nontributary may be viewed through the Division of Water Resources' public data viewing tools as they are developed and the data files describing the areas are also available for downloading from the Division of Water Resources' website.

Prior to transfer for reuse by another operator, the Supplier/Shipper shall be responsible for treatment of the Production Water which may involve one or more of the following: primary separation at the wellhead, addition of bactericide, removal of any surface accumulations of oil/condensate, and basic separation of solids. Treatment shall be sufficient to allow for the intended reuse of the Production Water for makeup fluid to support either drilling, completion, or workover operations for natural gas wells. Each operator will be obligated to provide and maintain documentation of the quality of its Production Water and the volumes transferred in accordance with applicable laws and regulations.

Specifically, Piceance Energy and Oxy will each be obligated to maintain laboratory analytical results for a representative sample(s) of its Production Water. On an annual basis, one or more samples will be collected for the type of source(s) representative of the Production Water and analyzed for the following chemical parameters using the appropriate EPA standard analytical method:

- |                                       |                        |
|---------------------------------------|------------------------|
| • Volatile organic compounds          | EPA Method 624 (GC/MS) |
| • Semi-volatile organic compounds     | EPA Method 625 (GC/MS) |
| • Dissolved Metals                    | EPA Method 200.7 (ICP) |
| • Dissolved Inorganics (non-metals)   | EPA Method 300.0 (IC)  |
| ○ Br, Cl, F, Nitrate/Nitrite, Sulfate |                        |
| • General water quality parameters    |                        |
| ○ Specific Conductance                | EPA Method 300.0 (IC)  |
| ○ Hardness                            | EPA Method 130.1       |
| ○ Total Dissolved Solids              | EPA Method 160.1       |
| ○ pH                                  | EPA Method 150.2       |
| ○ Alkalinity                          | EPA Method 310.1       |

#### **Measurements, Recordkeeping and Reporting**

In addition, for any materials that meet the definition of E&P waste, the party acting as the Supplier/Shipper for each Water Transfer will be responsible for measuring transfer volumes and maintaining records for the volumes transferred in accordance with applicable laws and regulations including COGCC Rule 907.b.(2) which states:

**Waste generator requirements.** Generators of E&P waste that is transported off-site shall maintain, for not less than five (5) years, copies of each invoice, bill, or ticket and such other records as necessary to document the following requirements A through F:

- A. The date of the transport;
- B. The identity of the waste generator;
- C. The identity of the waste transporter;
- D. The location of the waste pickup site;
- E. The type and volume of waste; and
- F. The name and location of the treatment or disposal site.

Such records shall be signed by the transporter, made available for inspection by the Director during normal business hours, and copies thereof shall be furnished to the Director upon request.

Records relating to BLM leasehold (including copies of each invoice, bill, or ticket and such other records as necessary to document the requirements A through F above) will be maintained for not less than six (6) years or as otherwise required by the BLM.


Piceance Energy and Oxy will each separately submit an annual report to the COGCC summarizing the transfers of Production Water (both as the Supplier/Shipper and the Receiver) during the previous calendar year and including laboratory analytical results for representative sample(s) of the Production Water provided as the Supplier/Shipper. The annual report will include a spreadsheet that summarizes the information contained in the Record(s) of Transfer, and include copies of individual Records of Transfer. The annual report for the previous calendar year will be submitted to the COGCC February 15 of the following year. In addition, for Production Water originating from wells completed on federal oil and gas leases, the Supplier/Shipper will prepare and submit an annual report as required by the BLM for the previous year's transfers.

**Authorization and Points of Contact**

This Production Water Reuse and Waste Minimization Plan for Water Transfers Between Piceance Energy, LLC and OXY USA WTP LP is hereby authorized for implementation by:

  
\_\_\_\_\_  
Bob Hea, EVP & Chief Operating Officer  
Piceance Energy, LLC

4-9-2015  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Chris Clark – Operations Manager  
OXY USA WTP LP

4-9-2015  
\_\_\_\_\_  
Date

The primary and secondary points of contact representing Piceance Energy Corporation are:

**Primary**

John Grubich  
Piceance Basin-Completions Manager  
Piceance Energy, LLC  
601 28 ½ Rd Suite D  
Grand Junction, CO 81506  
Office: 970-812-5312

**Secondary**

Wayne P. Bankert  
Senior Reg. & Env. Coordinator  
Piceance Energy, LLC  
601 28 ½ Rd Suite D  
Grand Junction, CO 81506  
Office: 970-812-5310

The primary and secondary points of contact representing Oxy are:

**Primary**

Ken McKinney  
Sr. Workover & Completions Specialist  
OXY USA WTP LP  
760 Horizon Drive, Suite 101  
Grand Junction, CO 81506  
Office: 970-263-2715

**Secondary**

Michael Brygger  
Regulatory Advisor  
OXY USA WTP LP  
760 Horizon Drive, Suite 101  
Grand Junction, CO 81506  
Office: 970-263-3601

**Appendix A**  
**Memorandum of**  
**Master Production Water Custody Transfer Agreement**



**MEMORANDUM OF  
MASTER PRODUCTION WATER CUSTODY TRANSFER AGREEMENT**

This MEMORANDUM OF MASTER PRODUCTION WATER CUSTODY TRANSFER AGREEMENT ("Memorandum") is made effective April 9, 2015 ("Effective Date"), by and between OXY USA WTP LP ("Oxy") and Piceance Energy, LLC (Piceance Energy) sometimes referred to collectively as "Parties" or singularly as "Party" or "Supplier/Shipper" or "Receiver."

**RECITALS**

- A. The Parties entered into that certain Master Production Water Custody Transfer Agreement made effective April 9, 2015, pursuant to which the Parties set forth the terms and conditions for possible transfers of water from either company's operations in the Piceance Basin of Colorado. Actual transfers of water shall be also subject to the specific terms and conditions of Records of Transfer. The Master Production Water Custody Transfer Agreement together with executed Records of Transfer, if any, shall be referred to as the "Water Custody Transfer Agreement" or "Agreement."
- B. The water subject to transfer under the Water Custody Transfer Agreement consists primarily of produced water from non-tributary, non-coalbed methane wells and flowback water from the Parties' respective completion operations (collectively "Production Water").
- C. Transfer of Production Water between the Parties is expected to significantly reduce water disposal volumes, wastes, haul distances and truck traffic and monetary costs, in addition to being consistent with State of Colorado regulatory agencies' objectives of resource conservation, waste minimization and recycling and re-use of water.
- D. The Parties desire to include this Memorandum as an Appendix to their respective Production Water Reuse and Waste Minimization Plans to give notice of the existence of the Water Custody Transfer Agreement and the legal responsibility for Production Water transferred between the Parties.

**AGREEMENT**

**NOW, THEREFORE**, in consideration of the covenants and conditions contained herein and in the Water Custody Transfer Agreement, Oxy and Piceance Energy agree as follows:

**Defined Terms.** The defined terms used in this Memorandum shall have the meaning given them in the Water Custody Transfer Agreement.

**Notice.** Notice is hereby given of the existence of the Water Custody Transfer Agreement and certain provisions contained therein are described below. Authorized representatives of COGCC or other third parties with a legal right to know may contact either Party to schedule a review of an executed copy of the Water Custody Transfer Agreement in its entirety, or any records that are required to be maintained under applicable law or promulgated regulations concerning the Water Custody Transfer Agreement or related to transfers of Production Water between the Parties.

**No Amendment.** This Memorandum is executed and recorded solely for the purpose of giving notice and shall not amend nor modify the Water Custody Transfer Agreement in any way. In the event of any conflict or discrepancy between the terms and conditions set forth in this Memorandum and the Water Transfer Agreement, the terms and conditions of the Water Custody Transfer Agreement shall control.

**Term.** The Water Custody Transfer Agreement shall be in effect for all time periods and volumes of Production Water transferred between the Parties until terminated by either Party by providing written notice to the other Party at least thirty (30) days prior to the effective date of the termination. The terminating Party is also responsible for notifying the COGCC in writing of the termination of the Water Custody Transfer Agreement between the Parties.

**Custody Transfer.** It is agreed that the transferring company ("Supplier/Shipper") shall maintain all legal and regulatory responsibility, custody and control for any Production Water that is transferred under the Water Custody Transfer Agreement until such time as it is Delivered to the receiving company ("Receiver") or its designee at which point the Receiver will assume all legal and regulatory responsibility, custody and control for the Production Water. For purposes of the Water Custody Transfer Agreement, "Delivered" or "Delivery" shall mean the instant the water leaves the water truck(s) or water pipeline(s) at the mutually agreed upon Transfer Location of the Transferee. The Party having legal custody of the Production Water, as described in this Paragraph, shall be the Party with primary responsibility for any spills or releases of Production Water, including notifications and clean-up, if and as applicable.

**Quality.** Supplier/Shipper shall verify that the quality of its Production Water is suitable for re-use for fracture stimulation operations or other intended use by the Receiver in oil and gas extraction operations and shall maintain laboratory analytical results for water samples that are representative of their Production Water quality.

**Record Keeping and Reporting.** The Supplier/Shipper shall be the primary Party to maintain records of its Production Water and all transfers of Production Water between the Parties in accordance with applicable laws and promulgated regulations. The Supplier/Shipper shall provide copies of its Record of Transfer within 30 days of completing the transfer. Each Party shall be responsible for preparing and submitting an Annual Report to the COGCC which summarizes its respective Production Water transfers for the previous calendar year. The Annual Report will include a spreadsheet that summarizes the information contained in the Record(s) of Transfer. The annual report for the previous calendar year will be submitted to the COGCC by February 15 of the following year. For Production Water originating from Wells located on federal oil and gas leasehold, prior to transfer the Supplier/Shipper shall provide the BLM with a Sundry Notice, as required by the BLM. In addition, the Supplier/Shipper will prepare and submit an annual report as required by the BLM for the previous year's transfers.

**Usage.** Each Party represents that it has the right to use and consume all of the Production Water to be delivered to the Receiver and that such Production Water will come from non-coalbed methane wells determined to be "non-tributary" in accordance with applicable laws and regulations. In addition, each Party represents that it has complied with all water permitting and related other legal requirements concerning its Production Water, including but not limited to any requirements from the Colorado State Engineer's office.

**Compliance.** Each Party shall comply with all applicable laws and regulations of governmental entities having jurisdiction over the Production Water, the Transfer Location, or the transfer process including

without limitation: a) maintaining an approved plan for the management of its Production Water and its reuse of Production Water; b) timely notifying and reporting reportable spills or releases of Production Water; c) maintaining laboratory analytical results of representative samples of its Production Water and waste generator/transfer records; d) conducting and maintaining records of environmental, health and safety training of personnel and procedures, and e) submitting electronically an annual report to COGCC summarizing produced water transfers for the previous calendar year by February 15 of the following year. Each Party shall also comply with all written environmental, health and safety policies and procedures provided to it by the other Party pertaining to the Transfer Location or the transfer process.

**Relationship of the Parties.** Neither Party is the partner, agent or legal representative of the other, and there is no fiduciary relationship between them.

**No Third Party Beneficiary Rights.** This Memorandum and the Water Custody Transfer Agreement shall be construed to benefit the Parties and their respective successors and assigns only, and shall not be construed to create third party beneficiary rights.

**Entire Agreement; Successors and Assigns.** This Memorandum and the Water Custody Transfer Agreement contain the entire understanding of the Parties and supersede all prior agreements and understandings between the Parties relating to the subject matter hereof. This Memorandum and the Water Custody Transfer Agreement shall be binding upon and inure to the benefit of the respective successors and permitted assigns of the Parties.

**Additional Terms.** The Water Custody Transfer Agreement contains additional provisions, terms and conditions, all of which are by this reference incorporated herein including without limitation those provided in one or more Records of Transfer in the form attached hereto as Exhibit A for fee and state leasehold, and the form attached hereto as Exhibit B for BLM leasehold.

IN WITNESS WHEREOF, the Parties have executed this Memorandum of Water Transfer Agreement effective as of the date first above written.

By

  
Chris Clark – Field Operations Manager  
OXY USA WTE LP

4-9-2015  
Date

By

  
Bob Hea, EVP & Chief Operating Officer  
Piceance Energy LLC

4-9-2015  
Date

**Exhibit A**  
**to**  
**Memorandum of**  
**Master Production Water Custody Transfer Agreement**  
**Between OXY USA WTP LP ("OXY")**  
**and PICEANCE ENERGY, LLC ("PICEANCE ENERGY")**

**RECORD OF PRODUCTION WATER TRANSFER**  
**Fee and State Leasehold**

**Proposed Transfer/Transport Date(s):**  
**Actual Transfer/Transport Date(s):**

**Pickup Time:**  
**Delivery Time:**

SUPPLIER/SHIPPER
Company:
Representative: Printed Name: Signature:
Phone:
Source Location Name/ID:

RECEIVER
Company:
Representative: Printed Name: Signature:
Phone:
Transfer Location Name/ID:

**Point of Custody Transfer:** At the Transfer Location unless otherwise specified below or by attachment(s).

**Volume Transferred:**      Proposed Volume \_\_\_\_\_ bbls

Actual Volume \_\_\_\_\_ bbls

**Name & Contact Information of Trucking/Transfer Company:**

**Water Transfer and Volume Records:** Attach haul tickets or other volume documentation. The Shipper is responsible for maintaining laboratory analytical results for a representative sample of the Production Water being transferred.

**Record Retention:** Upon completion of transfer, ensure that both Shipper and Receiver receive a completed copy of this finalized form together with such volume and other records as necessary to meet COGCC recordkeeping requirements.

**Record Retention Period:** 5 years from Actual Transfer/Transport Date unless otherwise specified below or by attachment(s).

**Special Instructions:** None unless otherwise specified below or by attachment(s).