

STATE OF COLORADO

John W. Hickenlooper, Governor
Larry Wolk, MD, MSPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
Located in Glendale, Colorado (303) 692-3090

www.colorado.gov/cdphe



Colorado Department
of Public Health
and Environment

October 8, 2013

Michael J. Gardner
WXP Energy Rocky Mountain LLC
1058 County Road 215
Parachute, CO 81635

RE: Certification, Colorado Discharge Permit System – Produced Water Treatment Facilities
Permit Number COG840000 Certification Number: COG840015

Dear Mr. Gardner:

Enclosed please find a copy of the permit certification for the Parachute Treatment facility, discharging to an intermittent stream tributary to the Colorado River, which was issued under the Colorado Water Quality Control Act. **Please read the enclosed permit and certification, as well as this letter, which outline the requirements under this permit, and the explanation of how certain limitations were developed.** The Division holds the permittee legally liable for all permit requirements.

The following information describes how the limitations and permit requirements were developed.

Facility Information:

- **Industry Description**

The Parachute Treatment facility (WWTF) will treat produced water and flow back water from a non-conventional natural gas and Natural Gas Liquids (NGL) production operation. This will be a new facility designed to treat 10,000 barrels water per day (bwpd) or 0.42 million gallons per day (MGD).

This facility may be subject to Colorado Department of Public Health and Environment Solid Waste Unit regulations pertaining to solid waste sites and facilities and may need a Certificate of Designation. The facility may also be subject to permitting by the Air Pollution Control Division. The discharge of treated water to adjacent surface waters requires a discharge permit from the Water Quality Control Division (WQCD).

- **Treatment Facility Description**

The proposed process consists of two primary treatment systems: pretreatment and desalination by reverse osmosis technology. The pretreatment will consist of electrocoagulation, tube settling clarification, spiral wound ultrafiltration and weak acid cation exchange softening. The desalination system consists of a primary reverse osmosis system, a brine recovery reverse osmosis system, and chemical feed for pH adjustment and remineralization prior to discharge. The maximum anticipated flow rate to be discharged is estimated at 0.42 MGD.

- **Chemical Usage**

The permit application states that the following chemicals are used in the treatment process. The ion exchange process uses sodium hydroxide, hydrochloric acid and membrane cleaner. The reverse osmosis system uses antiscalant and pH neutralizer. The calcium chloride is added to the treated discharge. The MSDS documents for these chemicals are provided in the permit application. The MSDS sheets have been reviewed and the following chemicals have been approved for use.

Chemical Name	Purpose	Constituents of Concern
30% Sodium Hydroxide	Ion Exchange Resin Regeneration, Membrane Cleaning, pH Adjustment	Sodium hydroxide
General Purpose Antiscalant Dispersant	Antiscalant, Silica Dispersant	Acidic (pH)
30% Hydrochloric Acid	Ion Exchange Resin Regeneration, Membrane Cleaning	Hydrochloric acid
30-35% Calcium Chloride Liquid	Sodium Absorption Ratio (SAR) Adjustment	Calcium chloride

Chemicals deemed acceptable for use in waters that will or may be discharged to waters of the State are acceptable only when used in accordance with all state and federal regulations, and in strict accordance with the manufacturer's site-specific instructions.

Basis of Certification Limitations:

- **Stream Segment Information**

The discharge is to Hayes Gulch (or Allenwater Creek depending on the map), direct tributary to the Colorado River, within Segment COLCLC11g of the Lower Colorado River Sub-basin, Lower Colorado River Basin, found in the Classifications and Numeric Standards for the Lower Colorado River Basin (Regulation No. 37; last update effective September 30, 2013). Segment 11g is undesignated and is classified for the following beneficial uses: Recreation Class N, Aquatic Life Class 2 Cold, and Agriculture without a full suite of aquatic life-based standards but rather standards to protect agricultural uses.

The proposed discharge location is approximately 1.37 miles above the confluence with the Colorado River, segment COLCLC02a which is undesignated and classified: Recreation E, Aquatic Life Warm 1, Water Supply and Agriculture. Segment COLCLC02a is also critical habitat for the federally endangered Razorback Sucker.

- **Technology Based Standards**

The limitations for BOD₅ and total suspended solids (TSS) are from Regulation No. 62, which apply to all discharges that would be covered under this General Permit. BOD₅ is more typically of concern for domestic facilities; however, data provided by the permittee indicates the presence of BOD at or above effluent limits. Values for BOD have led to the inclusion of numeric limits.

Limitations for oil and grease are in accordance with the federal effluent limit guideline developed by the EPA for the Oil and Gas Extraction Industry for the protection of Agricultural and Wildlife Water Use in 40 CFR 435 Subpart E. Note, in accordance with Regulation No. 62 at 62.4(2), this federal limit overrides the Colorado limit.

- **Water Quality Standards**

Due to the location of the discharge just one mile upstream of the Colorado River, effluent limitations will be based on the water quality standards specific to stream segment COLCLC02a.

Note that although there are no known drinking water intakes on Hayes Gulch, there are known drinking water intakes on the Colorado River approximately 2 miles downstream of this discharge. Therefore, water supply based limitations for dissolved iron, sulfate and manganese will be applied.

For organic parameters, the aquatic life and water + fish limits in Regulation No. 31 will be applied.

Metals standards for segment COLCLC02a are based on the aquatic life Table Value Standards (TVS) which are mostly hardness-based equations. Hardness data was assessed from the Riverwatch monitoring site on the Colorado River at Parachute Bridge. The mean hardness was determined to be 231 mg/l. The resulting TVS at a hardness of 231 mg/l are presented in the table below.

Temperature limitations will not be applied as the receiving stream is assumed to be a zero low flow stream in all months. The temperature of the discharge into Hayes Gulch is unlikely to affect the Colorado River one mile downstream.

Effluent limits for certification under this general permit are set at the water quality standard without allowances for dilution.

Parameter	In-Stream Water Quality Standard		TVS Formula: Hardness (mg/l) as CaCO ₃ =	231
Aluminum, Total Recoverable	Acute	10071 µg/l	$e^{(1.3695(\ln(\text{hardness}))+1.8308)}$	
	Chronic	1438 µg/l	$e^{(1.3695(\ln(\text{hardness}))-0.1158)}$	
Cadmium, Dissolved	Acute	5.7 µg/l	$[1.136672-0.041838\ln(\text{hardness})]e^{(0.9151(\ln(\text{hardness}))-3.1485)}$	
	Chronic	0.8 µg/l	$[1.101672-0.041838\ln(\text{hardness})]e^{(0.7998(\ln(\text{hardness}))-4.4451)}$	
Hexavalent Chromium, Dissolved	Acute	16 µg/l	Numeric standards provided, formula not applicable	
	Chronic	11 µg/l	Numeric standards provided, formula not applicable	
Copper, Dissolved	Acute	30 µg/l	$e^{(0.9422(\ln(\text{hardness}))-1.7408)}$	
	Chronic	18 µg/l	$e^{(0.8545(\ln(\text{hardness}))-1.7428)}$	
Lead, Dissolved	Acute	159 µg/l	$[1.46203-0.145712\ln(\text{hardness})][e^{(1.273(\ln(\text{hardness}))-1.46)}]$	
	Chronic	6.2 µg/l	$[1.46203-0.145712\ln(\text{hardness})][e^{(1.273(\ln(\text{hardness}))-4.705)}]$	
Manganese, Dissolved	Acute	3946 µg/l	$e^{(0.3331(\ln(\text{hardness}))+6.4676)}$	
Nickel, Dissolved	Acute	951 µg/l	$e^{(0.846(\ln(\text{hardness}))+2.253)}$	
	Chronic	106 µg/l	$e^{(0.846(\ln(\text{hardness}))+0.0554)}$	
Selenium, Dissolved	Acute	18.4 µg/l	Numeric standards provided, formula not applicable	
	Chronic	4.6 µg/l	Numeric standards provided, formula not applicable	
Silver, Dissolved	Acute	8.6 µg/l	$\frac{1}{2} e^{(1.72(\ln(\text{hardness}))-6.52)}$	
	Chronic	1.4 µg/l	$e^{(1.72(\ln(\text{hardness}))-9.06)}$	
Zinc, Dissolved	Acute	293 µg/l	$0.978e^{(0.8525(\ln(\text{hardness}))+1.0617)}$	
	Chronic	254 µg/l	$0.986 e^{(0.8525(\ln(\text{hardness}))+0.9109)}$	

- Antidegradation**

Because the receiving water is undesignated or “reviewable”, an antidegradation evaluation is applicable to this discharge. In accordance with the Master General Permit COG840000, Regulation No. 31 and the Division’s Antidegradation Significance Determination Guidance Document, water quality based permit limits will be set at the water quality standard and in addition, antidegradation-based limits will be set at the Significant Concentration Threshold (SCT) or in this case at 15% of the water quality standard. The antidegradation-based limits will be implemented at a 2 year rolling average interval. Note that any future renewals of this certification which include additional parameters will also have limits set equal to the SCT.

In addition to establishing effluent limits at the SCT, Mercury must be evaluated for effluent limits set at the Threshold Load (TL) since it is a bioaccumulative toxic pollutant. The Threshold Load is established based on Baseline Water Quality which in the case of mercury in the Colorado River is non-detect. The Threshold Load is set at 10% of the Baseline Water Quality Load. As detection limits have changed over the years, it is difficult to determine the actual concentration of mercury in the Colorado River at baseline conditions. The Division routinely characterizes water quality parameter concentrations below the Practical Quantitation Level as zero. The Division will not establish an effluent limit set at 10% of zero; therefore, the Division would require an effluent limit set to non-detect for mercury analyses using a PQL of 0.003 µg/l. The mercury analysis PQL is included in Part I Section E (3) of the General Permit COG840000.

Since the antidegradation-based mercury effluent limit was already evaluated at the SCT to be 0.0015 µg/l, the limit evaluated at the TL would be higher at 0.003 µg/l; therefore, the chosen limit in the permit will be the 0.0015 µg/l. Note, the Division also evaluated using half the detection limit to establish a baseline water quality concentration. The limit set at 10% of that baseline load was also still higher than the 0.0015 µg/l SCT limit.

- TMDL**

Stream segments COLCLC11g and COLCLC02a are not on the State’s 303(d) list, and therefore TMDLs do not apply. Segment COLCLC02a is on the Monitoring and Evaluation List for sediment.

- Salinity – Colorado River Basin Regulations**

As the discharge is to the Colorado River basin, reduced salt loading is required through Regulation No.39 and its’ implementing requirements in Regulation No. 61. For industrial sources, the no-salt discharge requirement may be waived where the salt load reaching the mainstem of the Colorado River is less than 1 ton per day, or 350 tons per year. In addition, the maximum TDS concentration considered to be fresh water is 500 mg/l for discharges to the Colorado River. See Regulation No. 61.8(2)(I)(i)(A) for more information.

Based on data submitted by the permittee, the 500 mg/l, 1 ton per day or 366 tons per year criteria can be met and therefore report only requirements will be required during this permit term.

- **Narrative Standards**

Section 31.11(1)(a)(iv) of The Basic Standards and Methodologies for Surface Waters (Regulation No. 31) includes the narrative standard that State surface waters shall be free of substances that are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life.

- **Agricultural Protection**

For protection of Agricultural uses, the interpretation of these conditions (i.e., “no harm to plants” and “no harm to the beneficial uses”) and how they were to be applied in permits were contemplated by the Division as part of an Agricultural Work Group, and culminated in the most recent policy entitled Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops (hereafter the Narrative Standards policy). This drainage does not typically have water present and there are no known active irrigation intakes in the area; therefore, this policy is not applied. Downstream Colorado River diversions are unaffected due to extreme dilution in the Colorado River.

- **Reasonable Potential**

All parameters were evaluated as part of a Reasonable Potential Analysis based on data provided by the permittee. Parameters without reasonable potential to be present in the discharge were excluded from effluent limitations. Parameters requiring more data to make a definitive evaluation will have a Report only requirement. Data on beryllium were not available; therefore, limits are included in this permit term.

- **Whole Effluent Toxicity**

Due to the discharge being located approximately 1 mile upstream of the Colorado River mainstem which is designated critical habitat for the federally endangered Razorback Sucker, WET testing will be required. This discharge may contain metals and/or salts at concentrations that may be toxic to aquatic life, as well as organics found in the treated water or applied in the chemical usage.

General Information:

- **Permit Action Fees** - The Annual Fee for this certification is \$ 9880 (Category 4 Subcategory 5, Mine water and process water discharge) and is invoiced every July. Do not pay this now as an invoice will be prorated and sent shortly.
- **Changes to the Certification** – Any changes that need to be made to the certification page – changes in outfalls, monitoring requirements, etc., must be submitted using the “Permit and Certification Modification form” available on our website: coloradowaterpermits.com, and signed by the legal contact.
- **Discharge Monitoring Report (DMR)** - forms will be mailed out within the next month. Reports must be submitted **monthly** as long as the certification is in effect. The permittee shall provide the Division with any additional monitoring data on the permitted discharge collected for entities other than the Division. This will be supplied to the Division within 48 hours of the receipt of the data by the permittee. If forms have not been received, please contact the Division at 303-692-3517.
- **Sampling Requirements** - Sampling shall occur at a point after treatment, or after the implementation of any Best Management Practices (BMPs). If BMPs or treatment are not implemented, sampling shall occur where the discharge leaves control of the permittee, and prior to entering the receiving stream or prior to discharge to land. Samples must be representative of what is entering the receiving stream.
- **Termination requirements** - This certification to discharge is effective long term. For termination of permit coverage, the permittee must initiate this by sending the “CDPS Permits Authorization Termination Form”. This form is available on the Division’s web site and must be signed by the legal contact.
- **Certification Records Information** - The following information is what the Division records show for this certification. For any changes to Contacts – Legal, Local, Billing, or DMR – a “Notice of Change of Contacts form” must be submitted to the Division. This form is available on the Division’s web site and must be signed by the legal contact.

Facility: Parachute WXP Energy Rocky Mountain LLC
Industrial Activities: Impounding and Storing salt water, oil and gas field

Garfield County
SIC Code : 13899909

Legal Contact *Receives all legal documentation, pertaining to the permit certification. [including invoice; is contacted for any questions relating to the facility; and receives DMRs.]*

Michael J. Gardner, Environmental Manager
WXP Energy Rocky Mountain LLC
1058 County Road 215
Parachute, Colorado 81635

Phone number: 970-263-2760
Email: Michael.Gardner@wpenergy.com

Facility Contact *Contacted for general inquiries regarding the facility*

Peggy Carter, Operations Engineer
WXP Energy Rocky Mountain LLC
1058 County Road 215
Parachute, Colorado 81635

Phone number: 970-263-2750
Email: Peggy.Carter@wpenergy.com

Billing Contact

Leland Harris, Supervisor Wastewater Operations
WXP Energy Rocky Mountain LLC
1058 County Road 215
Parachute, Colorado 81635

Phone number: 970-263-5304
Email: Leland.Harris@wpenergy.com

DMR Contact

Same as Legal

If you have any other questions please contact me at 303-692-6318.

Sincerely



Susan Applegate
Assessment Based Permits Unit
WATER QUALITY CONTROL DIVISION

Enclosures: Certification page; General Permit

xc:

Garfield County, Local County Health Department
Permit File: COG840015