

# Federal WMC 24-17 Pad Waste Management Plan



## INTRODUCTION

TEP Rocky Mountain LLC ("TEP") has developed the following waste management plan to address Exploration and Production ("E&P") and other wastes related to its proposed operations on the Federal WMC 24-17 Pad. This plan provides an overview of methods TEP will use for managing waste materials as required by Colorado Oil and Gas Commission ("COGCC") Rule 304.c.(11).

E&P wastes are not regulated (i.e., exempt) as hazardous wastes by the Environmental Protection Agency (EPA) (40 CFR 261) or by the COGCC. The COGCC regulates E&P wastes in the State of Colorado. Both agencies publish a list of E&P exempt wastes on their websites. To qualify as an E&P waste, the waste must be generated during the drilling, completions, or production operations. These wastes must be managed (treated, stored, transported, and disposed of) in accordance with COGCC, County and municipal regulations, and land use codes and ordinances.

Non-E&P Wastes are those that are not generated as part of Oil and Gas downhole operations and are generally classified as non-hazardous or hazardous. These wastes must be managed in accordance with Colorado Department of Public Health and Environment ("CDPHE") regulations, and County and Local landfill or waste disposal facility requirements.

The following documents the general practices and procedures TEP will use to manage the identified waste streams to be generated during development of the seventeen (17) proposed wells on the WMC 24-17 pad.

## DRILLING FLUIDS MANAGEMENT

A closed loop drilling system will be utilized to separate liquid and solids during drilling operations on the WMC 24-17 pad. Drilling fluids will be re-used throughout the drilling process. Once drilling operations are complete, drilling fluids will be stored in tanks and recycled for future drilling operations. Unless noted otherwise, all drilling fluids used during TEP operations are composed of a water-based, bentonitic drill mud.

## DRILL CUTTINGS MANAGEMENT

Drill cuttings generated during drilling operations on the WMC 24-17 pad will be managed within a cuttings trench constructed in the southeast corner of the pad. The cuttings trench will be approximately one-hundred-and-eighty feet (180') in length by ninety feet (90') in width, with a depth of approximately nineteen feet (19'). The estimated volume of drill cuttings generated per well at this location is approximately 325 cubic yards (cy). Hence, the total volume of drill cuttings estimated for the 17 wells to be drilled at this location is approximately 5,525 cy. The cuttings trench has been designed with a maximum capacity of seven-thousand two-hundred and sixty cubic yards (7,260cy). The cuttings trench will be constructed with a two and one-half foot (2.5') high earthen berm extending along the north, east, and western sides of the cuttings trench to ensure containment of drill cuttings. A wildlife ramp will be constructed near the northeast corner to prevent entrapment. Any excess drill cuttings that cannot be managed on location within the cuttings trench will be hauled to an approved third-party commercial disposal facility. Please see the attached construction layouts for additional details on the proposed drill cuttings management area.

### Protocol for Managing Cuttings

As drill cuttings are brought to the surface, they will be temporarily placed into a high-walled, heavy-duty, metal storage bin that is placed close to the rig shaker assembly. If needed, sawdust (or another acceptable, inert material) may be mixed with the cuttings during this phase to moderate the moisture content of the cuttings. Once the storage bin becomes full, a loader is used to move the cuttings from the storage bin to the cuttings trench. The moisture content of the drill cuttings is kept as low as practicable to prevent accumulation of liquids within the cuttings trench. Once all drill cuttings are placed into the cuttings trench, samples are collected to determine compliance with COGCC Table 915-1 standards. Additional treatment or amendment of the cuttings may be needed to ensure that COGCC Table 915-1 standards are met prior to reclamation. If needed, clean fill material may be mixed with the cuttings to ensure that cleanup standards are met. Representative samples of the blended material will be collected and submitted to an approved analytical laboratory and analyzed for the full COGCC list of organic, inorganic, and metal compounds (in soils) to confirm that the drill cuttings comply with the appropriate COGCC Table 915-1 cleanup standards. After the representative drill cuttings sample data has been received and confirm compliance with COGCC cleanup standards, the drill cuttings will be covered with a minimum of three feet (3') of clean fill material when the pad is reclaimed.

In cases where weather conditions, safety concerns, or operational constraints require, drill cuttings may be transported via truck to an approved third-party commercial disposal facility in accordance with COGCC rules for treatment and final disposal.

### **COMPLETIONS / FLOWBACK**

Returned stimulation fluids generated during flowback operations are processed through two (2) four (4) phase separators to remove gas, water, condensate, and sand. Water will be reused during future well completion operations on the WMC 24-17 pad or transported via pipelines as described in the Produced Water section below. Frac sand will be managed within a forty-foot (40') by forty-foot (40') earthen containment cell with two and one-half foot (2.5') high earthen berms surrounding all sides of the containment cell. This frac sand management area will be located on pad within the pad perimeter berm. Once flowback operations are complete, returned frac sand is mixed with drill cuttings and/or clean fill material and buried onsite within the cuttings trench or cut slope of the pad. Once mixed with the drill cuttings, sampling will be conducted as described above for drill cuttings to ensure that COGCC standards are met prior to pad reclamation. Any frac sand remaining onsite after reclamation activities are complete will be hauled off-site to an approved third-party commercial disposal facility.

Spent filter socks generated during the completions / flowback process are collected and stored separately from garbage / trash. The filters have been sampled and profiled for disposal at an approved third-party commercial disposal facility that is permitted and authorized to accept waste filter socks for disposal. Please see the Waste Handling Table (Table 1) below for additional details.

### **PRODUCED WATER**

Produced water (water produced from the wells after the wells are turned over to production) will be transported through the proposed four-inch (4") produced water pipeline to the tie-in point with an existing four-inch (4") water pipeline at the RU 23-17 pad (Location ID 452566). Water will then be transported via existing water pipelines to one of the following TEP operator Centralized E&P Waste Management Facilities:

**Table 1, Existing E&P Waste Management Facilities**

<b>Facility Name</b>	<b>Location</b>	<b>COGCC Location ID</b>	<b>COGCC Facility ID</b>
Spruce Creek 14-4-794	SWSW Section 4 T7S R94W	427810	441099
Smith Gulch 31-32-796	NWNW Section 32 T7S R96W	430110	446561
KP 32-17 Completions Pit	SWNE Section 17 T6S R91W	323844	418807
Parachute E&P Waste Management Facility	SWSW Section 36 T6S R96W	--	149015
Rulison E&P Waste Management Facility	NWSW Section 20 T6S R94W	--	149006
Mautz Ranch E&P Waste Fac.	SENE Section 19 T2S R98W	422672	444993

Produced water will be treated with biocide at the water management facility. Produced water will also be treated with biocide prior to disposal if necessary. Produced water is then disposed of through (1) natural evaporation at the evaporation ponds, (2) delivered and injected into one of the approved TEP operated underground injection control (“UIC”) facilities, (3) re-used in hydraulic fracturing operations, or (4) hauled to an approved third party, commercial disposal facility as described below.

#### Natural Evaporation Ponds

Produced water that has been collected and treated at any of the various Centralized E&P waste management facilities is stored in large, lined, engineered evaporation storage ponds that have been permitted and constructed to comply with COGCC Rule 907, Centralized E&P Waste Management Facilities, Rule 909 Pits – Construction and Operation, and Rule 910 Pit Lining Requirements and Specifications. These water storage ponds are purposefully designed with a large surface area to maximize evaporation of the produced water. Exposure to the sun, warm temperatures, and wind effectively evaporate water from the ponds and return that water to the atmosphere and ultimately to the hydrologic cycle. The arid climate of western Colorado is an ideal location for use of natural evaporation ponds as the annual evaporation rate typically is 3 – 4 times the annual precipitation rate for the area.

#### Underground Injection Control Facilities

Disposal of produced water at permitted underground injection control facilities is another viable option for disposal of excess produced water. Currently, TEP owns and operates 16 UIC injection wells (see Table 2) that are used for produced water disposal as needed. These UIC disposal wells / facilities are a critical component of TEP’s water management process as they help to maintain the balance between the total volume of production water generated, and the volume of water that is re-used / recycled or otherwise evaporated. All UIC facilities have been permitted per the Rule 800 series.

**Table 2, Approved UIC Facilities**

<b>Well Name</b>	<b>Location</b>	<b>UIC Facility Number</b>	<b>Ownership</b>	<b>API</b>
Circle B Land 33A-35-692	NWSE-S35-T6S-R92W	159277	Fee	05-045-18493
GGU Roderick	NENW-S31-T6S-R91W	159176	Fee	05-045-13803
Scott 41D-36-692	NENE-S36-T6S-R92W	159159	Fee	05-045-11169
Specialty 13A-28	NWSW-S28-T6S-R92W	159212	Fed	05-045-14054
KP SWD 9-12D	NESE-S8-T6S-R91W	159301	Fee	05-045-18532
PWD Federal 21-6	SWSE-S21-T6S-R91W	159479	Fed	05-045-21277

Well Name	Location	UIC Facility Number	Ownership	API
GM 14-36	Lot 4-S36-T6S-R96W	159262	Fee	05-045-07501
GM 239-36	NESW-S36-T6S-R96W	159369	Fee	05-045-14693
GM 523-36	NESW-S36-T6S-R96W	159266	Fee	05-045-13979
GM 923-1D	SWNE-S1-T7S-R96W	159295	Fee	05-045-18424
GM 931-1D	SWNE-S1-T7S-R96W	159297	Fee	05-045-18425
GM 943-1D	SWNE-S1-T7S-R96W	159296	Fee	05-045-18426
Fed 299-23-1	SESW-S23-T2S-R99W	159478	Fed	05-103-10488
Fed 299-23-2	NESE-S23-T2S-R99W	159452	Fed	05-103-10490
Fed 299-26-1	SWNW-S26-T2S-R99W	160001	Fed	05-103-10364
Fed 299-26-2	NWNW-S26-T2S-R99W	159413	Fed	05-103-10538
Fed 299-27-5	SWNE-S27-T2S-R99W	159317	Fed	05-103-10624
Fed 299-27-6	NENW-S27-T2S-R99W	159396	Fed	05-103-10644
RG 41-16-397	NWNE-S16-T3S-R97W	159410	Fed	05-103-11517
RMV 215-21	NESW-S21-T6S-R94W	159388	Fee	05-045-07465
RWF 434-21	SWSE-S21-T6S-R94W	159386	Fee	05-045-10469
RWF 623-21	NESW-S21-T6S-R94W	159387	Fee	05-045-10389
RWF 911-28D	SESW-S21-T6S-R94W	159447	Fee	05-045-22176
RWF 933-19D	SWNW-S20-T6S-R94W	159462	Fed	05-045-22333
SG 334-32	NWSE-S32-T7S-R96W	159971	Fee	05-045-18442
SG 914-32D	NESE-S32-T7S-R96W	159981	Fee	05-045-18533
SG 922-32D	SESW-S32-T7S-R96W	159960	Fee	05-045-22654
SG 924-29D	NWNE-S32-T7S-R96W	159974	Fed	05-045-23023
B19-N	NWNE-S32-T7S-R96W	159220	Fee	05-103-11000
BAT 23CWI-24-07-96	NESW-S24-T7S-R96W	159457	Fee	05-045-22313
CSF #1-10W (Speakman)	NESW-S10-T7S-R91W	159150	Fed	05-045-06273
Tompkins 41 AWI-08-07-95	SESE-S5-T7S-R95W	160006	Fee	05-045-22551
Valley Farms D3	NENW-S15-T6S-R92W	159299	Fee	05-045-12082
Valley Farms F4	NWSW-S14-T6S-R92W	159298	Fee	05-045-14287
Watson Ranch B 24AWI-17-07-95	SESW-S17-T7S-R95W	159983	Fee	05-045-22801
DOE 1-W-26	Lot 6-S26-T6S-R95W	159432	Fed	05-045-06583
DOE 1-W-27	Lot 5-S27-T6S-R95W	159432	Fed	05-045-06584
DOE 2-W-27	Lot 8-S27-T6S-R95W	159432	Fed	05-045-06585
DOE 2-W-29	Lot 8-S29-T6S-R95W	159418	Fed	05-045-06588

#### Re-use/Recycle in Hydraulic Fracturing Operations

Re-use and recycling of produced water is an effective and efficient use of produced water as it precludes the use and consumption of freshwater resources. As produced water is generated from existing wells, the water is collected / transported to one of the Centralized E&P waste management facilities for further treatment and potential re-use during hydraulic fracturing operations. The “finished” water from the

treatment facility has been treated to remove any residual hydrocarbon content that was not separated at the well-head. After treatment, the treated water may then be “re-used / recycled” during hydraulic fracturing operations where the water is pumped from a Centralized E&P waste management facility to a series of remote storage ponds where the water is staged and ultimately used for hydraulic fracturing operations. Hydraulic fracturing operations is a highly water intensive activity and re-using / recycling produced water serves to protect and reserve freshwater resources.

### Third Party Disposal Facilities

Third party disposal facilities is an option available to TEP for management and disposal of produced water. However, because this option requires trucking to a distant commercial disposal facility, this is typically considered to be a labor-intensive option, is not cost effective for TEP, and therefore, is not a preferred option. There are five Third-Party, commercial disposal facilities that are locally / regionally available to TEP operations (see Table 3). Typically, TEP would only use a third-party commercial disposal facility for produced water disposal if our existing water treatment facilities were full (at maximum capacity) and/or TEP’s permitted injection wells were incapacitated (not available) for some reason.

**Table 3, Approved Third Party Disposal Facilities**

<b>Facility Name</b>	<b>Location</b>	<b>Permit No.</b>
OWL SWD Operating LLC Services	SE Sec 8, T20S, R24E Grand County, UT	Grand County Council Resolution 2798
Harley Dome #1 SWD 43-019-31622	Sec. 10-9S-25E	UIC-358-1
Greenleaf Environmental Services	15655 45 ½ Road Debeque, CO 81630	Mesa County CUP Resolution MCM 2012-044 APCD Permit – 02ME0577 CDPHE-HMWMD – SW / MES BLA / 2.2
White River Dome (Owned by RNI/DHI) Colorado disposal site	White River City Rio Blanco County, CO Intersection of CR 5 and Hwy 64	CDPHE Solid Waste Permit: SW-RBL.PIC 2.3 APCD Permit- 07RB0987
PBR Disposal	SWSW Section 2, T3S, R98W Rio Blanco County	Air Construction Permit. 09RB0921 Rio Blanco County SUP Resolution 2007-42 (07/13/09)

### **SPILL / CONTAMINATED SOILS**

Occasionally, spills of productions fluids may occur during oil and gas operations that result in localized impacts to soils on or near the well pad. All spills are immediately investigated by TEP Environmental and Operations personnel. Contaminated soils are assessed to determine if they exceed regulatory cleanup standards and require removal, treatment, or disposal. Characterizing potentially contaminated soils is accomplished either by field-screening the impacted soils to determine relative hydrocarbon concentrations, and/or by collecting samples of the impacted soils and sending the samples to an approved commercial lab for analysis.

All contaminated soils exceeding regulatory cleanup standards are excavated and managed / disposed of appropriately. If a spill incident is subject to agency reporting requirements, the appropriate agencies are notified within the regulatory timelines. Impacted soils that exceed applicable cleanup standards are

typically excavated and taken to an off-site commercial disposal facility that is authorized to accept that type of waste.

## **SEWAGE**

Chemical toilets (i.e., porta potties) will be provided on site for personnel use during construction, drilling, and completions operations. Porta potties will be emptied weekly by an approved sanitary waste contractor and hauled to an approved sanitary waste disposal facility. Please see the Waste Handling Table (Table 1) for additional details.

## **GARBAGE**

All garbage and trash (i.e., solid, non-hazardous wastes) will be stored in enclosed bear-proof trash containers. Disposal of garbage and trash will occur approximately once per week during drilling and completions operations. All garbage and trash will be transported to a permitted solid waste landfill within one (1) week following termination of drilling or completion operations. Garbage or trash will not be disposed of on-location. The well site and access road will be kept free of trash and debris during long-term production operations. No hazardous substances or hazardous wastes are anticipated to be generated during construction, drilling, and completions operations. Such materials are strictly prohibited for disposal at a solid waste landfill. Please see the Waste Handling Table (Table 1) for additional details.

## **SUMMARY**

As described above, development of the proposed wells on the WMC 24-17 pad will produce waste fluids and materials which will be managed in accordance with all Federal, State, and local guidelines. Table 1, Waste Handling Summary, shows a detailed summary of the waste streams involved in development of the proposed wells.

**Table 1, Waste Handling Summary**

<b>Waste Type</b>	<b>Waste Content Description</b>	<b>Waste per Well</b>	<b>Units</b>	<b>Disposal Frequency</b>	<b>Containment Description</b>	<b>Disposal Type</b>	<b>Disposal Location</b>
<b>Drilling</b>	Drill Cuttings	325	Cubic Yards	One Time Only	Cuttings trench	On-site Disposal	Private
<b>Sewage</b>	Sewage	200	Barrels	Weekly	Chemical toilets or enclosed sewer system	Haul to Commercial Facility	Commercial
<b>Garbage</b>	Garbage/Trash	4000	Pounds	Weekly	Enclosed trash containers	Haul to Commercial Facility	Commercial
<b>Flowback</b>	Frac Sand	35000	Pounds	One Time Only	Earthen berm containment on pad	Burial on Site	Private
<b>Produced Water</b>	Produced water after well is turned over to production. The volume reported is not accurate nor known at this time.	100+	Barrels	Weekly	Water is piped into existing infrastructure	Recycled/Off-Lease Injection/Commercial Facility	Private
<b>Spill-Impacted / Contaminated Soils</b>	Soils impacted from spills of production fluids during oil and gas operations			As needed	Excavation and direct placement into dump trucks or temporary storage bins	Haul to approved commercial disposal facility	Commercial