

Cumulative Impacts Plan

for the

**TEP Rocky Mountain LLC
Ryan Gulch Phase 3 Oil and Gas Development Plan**

Prepared by

**Edge Environmental, Inc.
203 South Devinney Street
Golden, CO 80401
303-988-8844**

December 2022

INTRODUCTION

Edge Environmental, Inc. (Edge) was asked by TEP Rocky Mountain LLC (TEP) to prepare a Cumulative Impacts Plan pursuant to Colorado Oil and Gas Commission's (COGCC's) Rule 304.c.(19). This plan documents how the Operator (TEP) would address cumulative impacts to resources identified pursuant to Rule 303.a.(5).

This Cumulative Impacts Plan for the Ryan Gulch Phase 3 Oil and Gas Development Plan (OGDP) was prepared based on the preliminary Oil and Gas Location Assessment (Form 2A) and Cumulative Impacts Data Identification (Form 2B) documentation provided by TEP for two well pads. The Ryan Gulch Phase 3 Project consists of the existing Federal RGU 23-6-297 well pad and the existing Federal RGU 44-1-298 well pad, which are both to be re-constructed and expanded.

The existing Federal RGU 23-6-297 well pad (COGCC Loc ID #335602) is located on Federal surface administered by the Bureau of Land Management (BLM) overlying Federal lease COC-62046. It is located on resource/rangeland within Lots 13, 17, and 18 of Section 6, Township 2 South, Range 97 West, 6th P.M., within Rio Blanco County, Colorado. It would be re-constructed and slightly expanded to accommodate the drilling, completion, and production of 16 proposed directional natural gas wells. Fourteen proposed wells would be directionally drilled into Federal lease COC-62046 and 2 proposed wells would be directionally drilled into Federal Lease COC-57285. The existing access road from Rio Blanco County Road 24 would be utilized to access the existing oil and gas location during construction, drilling, completion, and production operations.

The existing Federal RGU 44-1-298 well pad (COGCC Loc ID #335640) is located on Federal surface administered by the BLM overlying Federal leases COC-62053 and COC-60736. It is located on resource/rangeland within Lots 35 and 36 of Section 1, Township 2 South, Range 98 West, 6th P.M., within Rio Blanco County, Colorado. The well pad would be reconstructed and slightly expanded to accommodate the drilling, completion, and production of 18 proposed directional natural gas wells. All 18 of the proposed wells would be directionally drilled into four Federal Leases including COC-60736, COC-62046, COC-57285, and COC-0003453. Eleven of the proposed wells are located within the Ryan Gulch Unit (COC 068239X) and the remaining seven proposed wells are within the Ryan Gulch Unit but are not committed to the unit. The existing access road from Rio Blanco County Road 24 would be utilized to access the existing oil and gas location during construction, drilling, completion, and production operations. It would undergo road improvements including widening to accommodate traffic for the proposed activities.

The existing Federal RGU 23-7-297 pad (COGCC Loc ID# 316408) would be utilized as a remote frac support location for well stimulation operations for the proposed wells on the Federal RGU 23-6-297 well pad and the Federal RGU 44-1-298 well pad. The Federal RGU 23-7-297 pad is an existing oil and gas location that currently supports production operations of one existing natural gas well. The existing oil and gas location was re-constructed in 2020 to support remote well completion operations on the Federal RG 41-18-297 pad (COGCC Loc ID# 316591) and to support future drilling operations of 14 proposed natural gas wells. The Federal RGU 23-7-297 pad is located on Federal surface administered by the BLM in Lots 15 and 16 of Section 7, Township 2 South, Range 97 West, 6th P.M. It has been utilized for remote well completion operations in recent years and is proposed for use as a remote frac pad for multiple locations in the Ryan Gulch Phase 2 OGDP and Ryan Gulch Phase 3 OGDP.

To support production operations on the Federal RGU 23-6-297 pad, Williams Midstream (Williams) would install an 8-inch steel natural gas pipeline from the proposed separators on the Federal RGU 23-6-297 well pad to the existing 10-inch natural gas pipeline west of the well pad following the existing access road. The proposed off-location pipeline would be installed within a 50-foot pipeline right-of-way.

To support production operations on the Federal RGU 44-1-298 well pad, Williams would install an 8-inch steel natural gas pipeline (approximately 465 feet) from the proposed separators on the Federal RGU 44-1-298 well pad to the existing 16-inch natural gas pipeline west of the well pad adjacent to the pad entrance. TEP would install two 6-inch FlexSteel water pipelines to support production operations. A 6-inch produced water pipeline (approximately 3,522 feet) would be installed from the tank battery on the Federal RGU 44-1-298 pad to the existing tank battery on the Federal RGU 23-6-297 pad (COGCC Loc ID: 335602) and the other 6-inch produced water pipeline (approximately 285 feet) would be installed from the tank battery on the Federal RGU 44-1-298 pad to the existing 6-inch produced water pipeline located within the existing pipeline right-of-way adjacent to the oil and gas location. The proposed off-location pipelines would be installed within a 50-foot pipeline right-of-way.

Well completion operations associated with the proposed wells on the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads would be conducted via simultaneous operations (SIMOPS) from the existing Federal RGU 23-7-297 pad. Water would be transported to the Federal RGU 23-7-297 pad via existing water pipelines operated and maintained by TEP. TEP would install five 4.5-inch steel temporary surface frac lines from the Federal RGU 23-7-297 pad to the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads to support remote frac and flowback operations. Temporary surface frac lines would be installed following the existing/proposed access roads from the Federal RGU 23-7-297 pad to the Federal RGU 23-6-297 and Federal 44-1-298 well pads.

Recycled produced water from the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads would be pumped from TEP's existing water management facilities to the Federal RGU 23-7-297 pad during completions operations. Flowback would be processed through temporary four phase separation equipment and transported via pipeline either to the Federal RGU 23-7-297 pad for recycle for future well completion operations, or transported to TEP's water management facilities for processing, reuse, recycling, and/or disposal.

Construction activities for both the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads are scheduled to begin in September 2023. Construction of each of the well pads is expected to take approximately 60 days (\pm 8.5 weeks) to complete. Drilling operations for the 16 proposed directional wells on the Federal RGU 23-6-297 well pad would begin in February of 2024 and because SIMOPs is planned for development, well completion operations would begin in April of 2024. Drilling operations for the Federal RGU 23-6-297 well pad is expected to take approximately 168 days (\pm 24 weeks) and should be complete in August of 2024. Well completion operations for the Federal RGU 23-6-297 well pad is expected to take approximately 194 days (\pm 28 weeks) and should be completed in October 2024. Drilling operations for the 18 proposed directional wells on the Federal RGU 44-1-298 well pad would begin in November of 2024 and because SIMOPs is planned for development, well completion operations would begin in January 2025. Drilling operations for the Federal RGU 44-1-298 well pad is expected to take approximately 183 days (\pm 26 weeks) and should be completed in May of 2025. Well completion operations for the Federal RGU 44-1-298 well pad is expected to take approximately 180 days (\pm 26 weeks) and should be completed in July 2025. Reclamation of the Federal RGU 23-6-297 well pad would begin in May of 2025 and is expected to take approximately 30 days to complete. Reclamation of the Federal RGU 44-1-298 well pad would begin in August of 2025 and is also expected to take approximately 30 days to complete. Site reclamation may be delayed dependent on weather conditions and

project scheduling. Development activities may be accelerated or delayed based on market conditions and company constraints.

SUMMARY OF RESOURCE IMPACTS

Air Resources

Air emissions produced during the pre-production and production phases of development have been evaluated based on the scale and scope of the proposed development plan for the following pollutants: oxides of nitrogen (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), methane (CH₄), ethane (C₂H₆), carbon dioxide (CO₂), and nitrous oxide (N₂O).

A quantitative evaluation of the incremental increase in pollutants has been estimated for the entire proposed development plan for the Ryan Gulch Phase 3 OGD. The emissions estimate includes both stationary and mobile sources of emissions during all pre-production activities for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads (see Tables 1 and 2). Note that the emissions in these tables include pre-production activities that occur over a 17-month period (February 2024 through June 2025), that spans years 2024 and 2025. All pre-production emissions for the Federal RGU 23-6-297 well pad will occur in year 2024. For the Federal RGU 44-1-298 well pad, during year 2024 there are 2 months with drilling operations assumed, and in 2025 there are 4 months with drilling operations and 6 months with completion operations assumed. Based on these drilling and completion schedules it is estimated that the maximum emissions from pre-production would occur in year 2024 which includes all of the Federal RGU 23-6-297 pre-production emissions and 2 months of drilling operations from the RGU 44-1-298 well pad. The total pre-production emissions estimates are shown in Table 3.

Both stationary and mobile sources of emissions for the first year of production for the Ryan Gulch Phase 3 OGD based on the combination of emissions from all proposed wells and equipment from both the Federal RGU 23-6-297 and Federal RGU 44-1-298 are shown in Table 4. Emissions estimates for the first year of production for the individual well pads are listed in Tables A-1 and A-2 in Attachment A. Diesel vehicle miles for various project activities have also been estimated for each well pad (see Tables 5 and 6).

Table 1
Pre-Production Pollutant Emissions (tons) for the Federal RGU 23-6-297 Well Pad

Component	NO _x	CO	VOCs	CH ₄	C ₂ H ₆	CO ₂	N ₂ O
Process Heaters or Boilers	2.15	1.81	0.12	0.05	0.07	2,584.04	0.05
Storage Tanks	-	-	-	-	-	1.04	-
Venting or Blowdowns	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-
Non-road Internal Combustion Engines	155.30	124.33	7.52	30.97	2.53	19,184.42	0.00
Drill Mud	-	-	1.92	-	-	-	-
Flowback or Completions	0.06	0.29	0.12	0.78	0.11	109.67	0.00
Loadout	-	-	-	-	-	-	-
Total Emissions	157.51	126.43	9.68	31.80	2.71	21,879.17	0.05

Note: emissions are expected to occur in 2024 during months February through October.

Table 2
Pre-Production Pollutant Emissions (tons) for the Federal RGU 44-1-298 Well Pad

Component	NOx	CO	VOCs	CH ₄	C ₂ H ₆	CO ₂	N ₂ O
Process Heaters or Boilers	2.96	2.49	0.16	0.07	0.09	3,553.05	0.07
Storage Tanks	-	-	-	-	-	1.04	-
Venting or Blowdowns	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-
Non-road Internal Combustion Engines	169.17	132.56	8.69	30.97	2.53	21,721.83	-
Drill Mud	-	-	1.92	-	-	-	-
Flowback or Completions	0.07	0.33	0.13	0.87	0.12	123.38	-
Loadout	-	-	-	-	-	-	-
Total Emissions	172.20	135.38	10.90	31.91	2.74	25,399.30	0.07

Note: emissions are expected to occur from November 2024 until July of 2025, which includes 6 months of drilling operations between November 2024 and May 2024 and 6 months of completion operations from January 2024 through June 2025, ending on July 1, 2025.

Table 3
Pre-Production Pollutant Emissions (tons/year) for the Ryan Gulch Phase 3 OGD

Year	NOx	CO	VOCs	CH ₄	C ₂ H ₆	CO ₂	N ₂ O
2024	186.21	148.99	11.50	37.12	3.17	26,112.39	0.06
2025	143.50	112.83	9.08	26.59	2.28	21,166.08	0.06

Note: total emissions assume that the Federal RGU 23-6-297 well pad is completed in 2024 and that there are 2 months with drilling operations at the Federal RGU 44-1-298 well pad during 2024, with the remaining 4 months of drilling and 6 months of completion activities occurring during year 2025.

Table 4
One Year Production Pollutant Emissions (tons) for the Ryan Gulch Phase 3 OGD

Component	NOx	CO	VOCs	CH ₄	C ₂ H ₆	CO ₂	N ₂ O
Stationary Engines or Turbines	-	-	-	-	-	-	-
Process Heaters or Boilers	3.11	2.62	0.17	0.07	0.10	3,735.88	-
Storage Tanks	4.81	21.90	30.26	17.83	16.13	7,206.05	0.16
Dehydration Units	-	-	-	-	-	-	-
Pneumatic Pumps	-	-	-	-	-	-	-
Pneumatic Controllers	-	-	4.05	26.93	3.67	0.08	-
Separators	-	-	-	-	-	-	-
Fugitives	-	-	0.33	2.21	0.30	-	-
Venting or Blowdown	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-
Non-Road Internal Combustion Engines	-	-	-	-	-	-	-
Loadout	0.14	0.66	0.71	0.41	0.38	211.11	-
Well Bradenhead	-	-	-	-	-	-	-
Well Maintenance	-	-	1.00	6.62	0.91	0.02	-
Total	8.06	25.18	36.52	54.07	21.49	11,153.14	0.16

Note: emissions are the combined production emissions from the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads.

**Table 5
Diesel Vehicle Miles for the Federal RGU 23-6-297 Well Pad**

Activity	Miles
Construction	23
Drilling	122
Completion	59
Interim reclamation	2
Production (1 st year only)	16
Total	222

**Table 6
Diesel Vehicle Miles for the Federal RGU 44-1-298 Well Pad**

Activity	Miles
Construction	23
Drilling	136
Completion	66
Interim reclamation	2
Production (1 st year only)	16
Total	244

The maximum total criteria pollutant emissions (NOx, CO, and VOCs) for the Ryan Gulch Phase 3 OGDG pre-production and production activities are estimated as: 194.3, 174.2, and 48.0 tons per year (tpy), respectively. These maximum emissions totals include the maximum pre-production emissions (year 2024) and the combined production emissions for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads. Project emissions of the greenhouse gases CO₂, CH₄, and N₂O from pre-production and production activities are quantified in terms of CO₂ equivalents (CO₂e). GHGs have various capacities to trap heat in the atmosphere, which are known as global warming potentials (GWPs). GWPs are related to different time intervals to fully account for the gases' ability to absorb infrared radiation (heat) over their atmospheric lifetimes. Carbon dioxide has a GWP of 1, so for the purposes of the analysis, a GHG GWP is generally standardized to a CO₂e, or the equivalent amount of CO₂ mass the GHG would represent. Methane has a current estimated GWP between 28 (gas alone) and 36 (with climate feedbacks). N₂O has a GWP of 298. The total pre-production and production GHG emissions (sum of CH₄, CO₂, and N₂O emissions reported as CO₂e in units of million metric tons [MMT]) are estimated as 0.04 MMT per year.

The Colorado Air Resource Management Modeling Study – version 2.0 (CARMMS) (BLM, 2017a) can be used to estimate reasonably foreseeable future near-field air quality conditions for the area surrounding the proposed project. The CARMMS analysis included cumulative air emissions for year 2015 and future year emissions of NOx and VOCs from increased total (Federal and non-Federal) oil and gas development/operations through year 2025 (post-2015) in the area surrounding the proposed project, which includes the Ryan Gulch Phase 3 OGDG NOx and VOC emissions. Emissions of ethane (C₂H₆) are estimated by the CAMx model from project VOC emissions and gas speciation profile data and were used in estimating ozone concentrations for the project.

The CARMMS analysis predicted that, in year 2025, the contributions to cumulative air quality from Federal project-specific maximum potential annual emissions (full development plus one full year of production occurring in the same year) would be above applicable project-level Significant Impact Levels (SILs) for ozone, PM₁₀, PM_{2.5} and NO₂ would be exceeded. However predicted ozone, PM₁₀, PM_{2.5} and NO₂ concentrations are expected to be below the National Ambient Air Quality Standards (NAAQS) and Colorado Ambient Air Quality Standards (CAAQS).

In addition, as part of air quality assessment performed for a BLM Environmental Assessment (EA) of a nearby TEP project (BLM 2017b), CO and NO_x emissions from pre-production and production operations were quantified. The total CO and NO_x emissions from the EA, 92.3 and 131.2 tpy respectively, are similar to the level of project emissions presented above (CO – 174.2 tpy and NO_x – 194.3 tpy).

Air quality modeling was performed to estimate near-field impacts of CO and NO₂ concentrations from project activities. Predicted CO and NO₂ concentrations were estimated to be below the applicable NAAQS and CAAQS. Therefore, it is estimated that the CO and NO_x emissions resulting from the expansion of the Federal RGU 23-6-297 well pad, the expansion of the Federal RGU 44-1-298 well pad, and the drilling of 16 oil and gas wells on the Federal RGU 23-6-297 pad and 18 oil and gas wells on the Federal RGU 44-1-298 well pad would not cause or contribute to any exceedance of the CO and NO₂ ambient air quality standards.

Cumulative Impacts

The BLM Colorado State Office air resource specialists prepared an Annual Report (Version 2.0) as a comprehensive assessment tool to assist in the preparation of project level NEPA for oil and gas development projects (BLM 2022). The Annual Report 2.0 provides up-to-date information on oil and gas development (current regulations, rates for drilling and production, emission inventories, etc.) and the state of the atmosphere (air pollutant concentration trends, air quality related values, etc.) for each applicable Colorado field office or planning area. The report also places this information in the context of the CARMMS, which provides cumulative analyses for multiple projected oil and gas development scenarios in Colorado through year 2025 for CARMMS 2.0 (BLM 2017a).

Section 4.8 of the BLM Annual Report presents data for cumulative emissions from new Federal oil and gas development within the BLM White River Field Office (WRFO) as compared to the emissions scenarios analyzed by CARMMS and qualitatively scales the CARMMS projected impacts to the cumulative report year emissions (year 2020) to provide a context for the current cumulative impacts. This section is referenced to set the context for the project's current cumulative impacts at field office scales. As described in the BLM Annual Report, WRFO specific contributions to cumulative air quality concentrations and air quality related values (visibility, deposition, etc.) for sensitive areas around the region (except for Dinosaur National Monument) are predicted to be minimal and insignificant with respect to accepted impact thresholds for new foreseeable Federal oil and gas development post-2015 through year 2025. However, in year 2025 data indicates that the nitrogen deposition impacts are exceeding the project level deposition analysis threshold (DAT) (0.005 kilogram per hectare per year [kg/ha-yr]) at Dinosaur National Monument (0.006 kg/ha-yr).

No adverse project impacts to air resources are anticipated as a result of construction (short-term) and production (long-term) operations for the Ryan Gulch Phase 3 OGDP. Adverse cumulative impacts are not expected as a result of project implementation.

Specific Measures Taken to Avoid or Minimize Cumulative Adverse Impacts

Implementation of Best Management Practices (BMPs) and the respective Dust Mitigation Plans - Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, as well as the implementation of an Air Monitoring Program as required by the Colorado Department of Public Health and Environment (CDPHE) avoids and minimizes project impacts to air resources and therefore, no adverse cumulative impacts are expected.

Measures to Mitigate or Offset Cumulative Adverse Impacts

As mentioned above, no project or cumulative adverse impacts to air resources are anticipated from the development of the Ryan Gulch Phase 3 OGD and therefore, no mitigation or offsets are proposed.

Public Health

A quantitative evaluation of the incremental increase in total hazardous air pollutant (HAPs) emissions (benzene, toluene, ethylbenzene, xylene, 2,2,4-trimethylpentane, hydrogen sulfide, formaldehyde, and methanol) and for specific HAPs emissions with known health impacts were estimated for the entire proposed development plan for the Ryan Gulch Phase 3 OGD. The emissions estimate includes both stationary and mobile sources of emissions during all pre-production activities (see Tables 7 and 8 for the estimated emissions from Federal RGU 23-6-297 and Federal RGU 44-1-298, respectively). Note that the HAP emissions in these tables include pre-production activities that occur over a 17-month period (February 2024 through June 2025), that spans years 2024 and 2025. All pre-production HAP emissions for the Federal RGU 23-6-297 well pad will occur in year 2024. For the Federal RGU 44-1-298 well pad, during year 2024 there are 2 months with drilling operations assumed, and in 2025 there are 4 months with drilling operations and 6 months with completion operations assumed. Based on these drilling and completion schedules it is estimated that the maximum HAP emissions from pre-production would occur in year 2024 which includes all of the Federal RGU 23-6-297 pre-production emissions and 2 months of drilling operations from the RGU 44-1-298 well pad. The total pre-production HAP emissions estimates are shown in Table 9.

Both stationary and mobile sources of HAP emissions for the first year of production for the Ryan Gulch Phase 3 OGD based on all proposed wells and equipment are shown in Table 10. HAP emissions estimates for the first year of production for the individual well pads are listed in Tables A-3 and A-4 in Attachment A. The estimated number of vehicle trips for each well pad are listed in Tables 11 and 12, respectively.

Table 7
Pre-Production Hazardous Air Pollutants Emissions (lbs) for the Federal RGU 23-6-297 Well Pad

Component	Benzene	Toluene	Ethyl benzene	Xylenes	n-Hexane	2,2,4-Trimethylpentane	Hydrogen sulfide	Formaldehyde	Methanol	Total HAPs
Process Heaters or Boilers	-	-	-	-	-	-	-	3.23	-	3.23
Storage Tanks	0.08	-	-	-	0.09	-	-	-	-	0.17
Venting or Blowdowns	-	-	-	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-	-	-	-
Non-road Internal Combustion Engines	283.00	130.00	5.00	70.00	55.00	-	-	2,972.00	-	3,515.00
Drill Mud	-	139.00	188.00	7.00	139.00	-	-	-	139.00	612.00
Flowback or Completions	1.00	2.00	-	1.00	8.00	1.00	-	-	-	13.00
Loadout	-	-	-	-	-	-	-	-	-	-
Total	284.08	271.00	193.00	78.00	202.09	1.00	-	2,975.23	139.00	4,143.40

Note: emissions are expected to occur in 2024 during months February through October.

Table 8
Pre-Production Hazardous Air Pollutants Emissions (lbs) for the Federal RGU 44-1-298 Well Pad

Component	Benzene	Toluene	Ethyl benzene	Xylenes	n-Hexane	2,2,4-Trimethylpentane	Hydrogen sulfide	Formaldehyde	Methanol	Total HAPs
Process Heaters or Boilers	-	-	-	-	-	-	-	4.44	-	4.44
Storage Tanks	0.08	-	-	-	0.09	-	-	-	-	0.17
Venting or Blowdowns	-	-	-	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-	-	-	-
Non-road Internal Combustion Engines	312.00	142.00	5.00	79.00	55.00	-	-	3,009.00	-	3,602.00
Drill Mud	-	139.00	188.00	7.00	139.00	-	-	-	139.00	612.00
Flowback or Completions	1.00	2.00	-	1.00	9.00	1.00	-	-	-	14.00
Loadout	-	-	-	-	-	-	-	-	-	-
Total	313.08	283.00	193.00	87.00	203.09	1.00	-	3,013.44	139.00	4,232.61

Note: emissions are expected to occur from November 2024 until July of 2025, which includes 6 months of drilling operations between November 2024 and May 2024 and 6 months of completion operations from January 2024 through June 2025, ending on July 1, 2025.

Table 9
Pre-Production Hazardous Air Pollutants Emissions (lbs/year) for the Ryan Gulch Phase 3 OGD

Year	Benzene	Toluene	Ethyl benzene	Xylenes	n-Hexane	2,2,4-Trimethylpentane	Hydrogen sulfide	Formaldehyde	Methanol	Total HAPs
2023	336.26	318.17	225.17	92.50	235.94	1.17	-	3,477.47	162.17	5,989.17
2024	260.90	235.83	160.83	72.50	169.24	0.83	-	2,511.20	115.83	4,360.83

Note: total emissions assume that the Federal RGU 23-6-297 well pad is completed in 2024 and that there are 2 months with drilling operations at the Federal RGU 44-1-298 well pad during 2024, with the remaining 4 months of drilling and 6 months of completion activities occurring during year 2025.

Table 10
One Year Production Hazardous Air Pollutants Emissions (lbs) for the Ryan Gulch Phase 3 OGD

Component	Benzene	Toluene	Ethyl benzene	Xylenes	n-Hexane	2,2,4-Trimethylpentane	Hydrogen sulfide	Formaldehyde	Methanol	Total HAPs
Stationary Engines or Turbines	-	-	-	-	-	-	-	-	-	-
Process Heaters or Boilers	-	-	-	-	-	-	-	5.00	-	5.00
Condensate Tanks	255.00	-	-	-	1,173.00	-	-	-	-	1,428.00
Produced Water Tanks	7.00	-	-	-	6.00	-	-	-	-	13.00
Dehydration Units	-	-	-	-	-	-	-	-	-	-
Pneumatic Pumps	-	-	-	-	-	-	-	-	-	-
Pneumatic Controllers	41.00	63.00	2.00	28.00	267.00	31.00	-	-	-	432.00
Separators	-	-	-	-	-	-	-	-	-	-
Fugitives	3.00	-	-	-	9.00	-	-	-	-	12.00
Venting or Blowdowns	-	-	-	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-	-	-	-
Non-Road Internal Combustion Engines	-	-	-	-	-	-	-	-	-	-
Loadout	3.00	-	-	-	22.00	-	-	-	-	25.00
Well Bradenhead	-	-	-	-	-	-	-	-	-	-
Well Maintenance	10.00	16.00	-	7.00	66.00	7.00	-	-	-	106.00
Total	319.00	79.00	2.00	35.00	1,543.00	38.00	-	5.00	-	2,021.00

Note: emissions are the combined production emissions from the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads.

Table 11
Estimated Number of Vehicle Trips for the Federal RGU 23-6-297 Well Pad

Activity	Vehicle Trips (monthly)	Vehicle Trips (annually)
Construction	201	401
Drilling	756	4,234
Completion	418	2,701
Interim reclamation	77	77
Production (1 st year)	39	466
Total	1,491	7,879

Table 12
Estimated Number of Vehicle Trips for the Federal RGU 44-1-298 Well Pad

Activity	Vehicle Trips (monthly)	Vehicle Trips (annually)
Construction	202	404
Drilling	759	4,632
Completion	523	3,138
Interim reclamation	77	77
Production	39	466
Total	1,600	8,717

Qualitative Evaluation of Potential Acute or Chronic, Short- or Long-Term Incremental Impacts

Pre-Production. As part of an air quality assessment performed for a BLM EA of a similar nearby TEP project (BLM 2017b), HAP emissions from pre-production operations were quantified. Impacts from pre-production HAP emissions were not estimated or analyzed as part of the 2017 BLM EA given that the emissions from pre-production activities are from short-term activities and do not occur over the lifetime of the project. In addition, as part of the 2017 BLM EA, HAP emissions from production operations were quantified and impacts were estimated. The total HAPs emissions, 1.01 tpy include benzene, toluene, ethylbenzene, xylenes, n-hexane, and formaldehyde emissions of 0.16, 0.23, 0.01, 0.09, 0.48, and 0.04 tpy, respectively. These total HAP emissions are of similar magnitude to the maximum level of project pre-production total HAP emissions presented above for year 2024 (5,989.17 lbs/year or 2.99 tpy). Impacts from production HAP (benzene, toluene, ethylbenzene, xylenes, n-hexane, and formaldehyde) emissions in the vicinity of the well pads were analyzed and the potential maximum acute (short-term; 1-hour) and long-term (annual) HAP concentrations were estimated to be well below applicable health thresholds for these HAPs. Therefore, it is estimated the HAP emissions resulting from the emissions from the expansion of the Federal RGU 23-6-297 well pad, the expansion of the Federal RGU 44-1-298 well pad, and the drilling of 16 oil and gas wells on the Federal RGU 23-6-297 pad and 18 oil and gas wells on the Federal RGU 44-1-298 pad would not cause or contribute to any potential acute or chronic, short-or long-term incremental impacts to public health.

2,2,4-trimethylpentane, hydrogen sulfide, and methanol HAP emissions from pre-production activities were estimated and are shown in Tables 7, 8, and 9. The maximum emissions are estimated as 0.001, 0.0, and 0.08 tpy, respectively. Although these HAPs were not specifically modeled in the BLM 2017 study, the emissions levels are less than the project benzene emissions (which were modeled). Given that the applicable short-term (1-hour) and long-term (annual) health thresholds for these HAPs are above the levels applicable to benzene it is estimated the

short-term and long-term concentrations for these HAPs would be well below applicable health thresholds.

Production. As part of an air quality assessment performed for a BLM EA of a similar nearby TEP project (BLM 2017b), HAP emissions from production operations were quantified. The total HAPs emissions, 1.01 tpy include benzene, toluene, ethylbenzene, xylenes, n-hexane, and formaldehyde emissions of 0.16, 0.23, 0.01, 0.09, 0.48, and 0.04 tpy, respectively. These total HAP emissions are of similar magnitude to the level of project production total HAP emissions presented above (2,021 lbs/year or 1.01 tpy).

As part of the 2017 BLM EA, impacts from production HAP emissions (benzene, toluene, ethylbenzene, xylenes, n-hexane, and formaldehyde) in the vicinity of the well pads were analyzed and the potential maximum acute (short-term; 1-hour) and long-term (annual) HAP concentrations were estimated to be well below applicable health thresholds for these HAPs. In addition, long-term exposures to emissions of suspected carcinogens (benzene, ethylbenzene and formaldehyde) were evaluated based on estimates of the increased latent cancer risk over a 70-year lifetime. The estimated cancer risk from these HAPs is shown to be below acceptable cancer risk levels. Therefore, it is estimated the HAP emission resulting from the production activities from 16 natural gas wells on the Federal RGU 23-6-297 pad and 18 natural gas wells on the Federal RGU 44-1-298 pad would not cause or contribute to any potential acute or chronic, short-or long-term incremental impacts to public health.

2,2,4-trimethylpentane, hydrogen sulfide, and methanol HAP emissions from production activities were estimated and are shown in Table 10. These emissions are estimated as 0.02, 0.0, and 0.0 tpy, respectively. Although these HAPs were not specifically modeled in the BLM 2017 study, the emissions levels are less than the project benzene emissions (which were modeled). Given that the applicable short-term (1-hour) and long-term (annual) health thresholds for these HAPs are above the levels applicable to benzene, it is estimated that the short-term and long-term concentrations for these HAPs would be well below applicable health thresholds.

Cumulative Impacts

No applicable cumulative (regional) HAP modeling analyses are available for the area to estimate cumulative HAP impacts. However, as described above, the HAP emissions for the Balzac Gulch EA (BLM 2017b) are comparable to the Ryan Gulch Phase 3 OGDH HAP emissions. Impacts from the Balzac Gulch HAP emissions (benzene, toluene, ethylbenzene, xylenes, n-hexane, and formaldehyde) in the vicinity of the well pads were analyzed and the potential maximum acute (short-term; 1-hour) and long-term (annual) HAP concentrations were estimated to be well below applicable health thresholds for these HAPs. In addition, long-term exposures to emissions of suspected carcinogens (benzene, ethylbenzene and formaldehyde) were evaluated based on estimates of the increased latent cancer risk over a 70-year lifetime. The estimated cancer risk from these HAPs was shown to be below acceptable cancer risk levels. Therefore, no adverse project impacts to public health are anticipated as a result of construction (short-term) and production (long-term) operations for the Ryan Gulch Phase 3 OGDH. Adverse cumulative impacts are not expected as a result of project implementation.

Edge Environmental, Inc.

Specific Measures Taken to Avoid or Minimize Cumulative Adverse Impacts

Implementation of BMPs included in the respective Form 2A and the Dust Mitigation Plan attached to the Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, as well as the implementation of an Air Monitoring Program as required by CDPHE avoids and minimizes project impacts to public health and therefore, no adverse cumulative impacts are expected.

Measures to Mitigate or Offset Cumulative Adverse Impacts

As mentioned above, no project or cumulative adverse impacts to public health are anticipated from the development of the Ryan Gulch Phase 3 OGD and therefore, no mitigation or offsets are proposed.

Water Resources

The total planned on-location storage volumes of oil, condensate, produced water, and other hydrocarbons, chemicals, and waste fluids for the Ryan Gulch Phase 3 OGD are listed in Table 13 (see Tables A-5 and A-6 in Attachment A for planned on-location storage volumes associated with individual well pads Federal RGU 23-6-297 and Federal RGU 44-1-298). TEP would follow measures described in the respective Waste Management Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) such as identification and cleanup of localized spills and excavation of any impacted soils to avoid and minimize impacts resulting from spills.

**Table 13
Planned On-Location Storage Volumes for the Ryan Gulch Phase 3 OGD**

Material Stored	Number of Tanks	Individual Capacity (barrels)	Total Capacity (barrels)
Oil	0	0	0
Condensate (500s)	4	500	3,600
Condensate (400s)	4	400	
Produced water (500s)	6	500	6,600
Produced water (400s)	9	400	
Gun barrel	5	500	2,500
Blowdown/vent tank	1	80	1,080
Blowdown/vent tank	2	500	
Knockout tank	1	17	17
Methanol tank	1	24	24
Chemicals	8	12	96
Chemicals (other)	1	3	3
Total	42	--	13,920

The respective Hydrology Maps – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads show the presence and distance to surface water and groundwater features for each well pad (see Tables 14 and 15).

**Table 14
Distance to Nearest Downgradient Surface Waters
and Public Water Systems from the Federal RGU 23-6-297 Working Pad Surface**

Description	Distance (feet)	Direction	Baseline Condition
Riparian Corridor	>2,640	E	Perennial stream: Piceance Creek
Wetlands	>2,640	E	Perennial stream; Potential wetland – Piceance Creek (NWI)
Surface Waters of the State	52	NW	Intermittent stream; Ryan Gulch
Public Water System Intake	>2,640	N	No PWS intakes within 1-mile of the working pad surface (WPS)
Additional Information			
Sensitive Area	Yes		
Estimated Depth to Groundwater	>50 feet		

**Table 15
Distance to Nearest Downgradient Surface Waters
and Public Water Systems from the Federal RGU 44-1-298 Working Pad Surface**

Description	Distance (feet)	Direction	Baseline Condition
Riparian Corridor	>2,640	E	Perennial stream: Piceance Creek
Wetlands	>2,640	E	Perennial stream; Potential wetland – Piceance Creek (NWI)
Surface Waters of the State	10	SW	Intermittent stream; unnamed
Public Water System Intake	>2,640	N	No PWS intakes within 1-mile of the working pad surface (WPS)
Additional Information			
Sensitive Area	Yes		
Estimated Depth to Groundwater	>50 feet		

There are two identified intermittent streams and one livestock well located within 0.25 mile of the Federal RGU 23-6-297 well pad. The existing pad is constructed immediately south of the flow path of an intermittent stream but does not negatively impact drainage integrity or hydraulic capacity. The Ryan Gulch intermittent stream is 52 feet northwest of the existing well pad and unnamed intermittent stream discharging to the Ryan Gulch drainage is 279 feet northeast of the well pad. A second intermittent stream discharging to Ryan Gulch is located 1,731 feet to the northeast. The intermittent streams located 1,569 feet and 2,579 feet southwest of the well pad are oriented in a parallel direction (across) to topographic contours thus lacking potential head to received flow from a potential release. All five of the identified intermittent drainages discussed above support Water of the United States (WOUS) defined as riverine aquatic resources with an intermittent flow regime tied to a seasonally flooded stream beds.

There are four identified intermittent streams located within 0.5-mile of the Federal RGU 44-1-298 well pad. The existing pad is constructed immediately north of the flow path of an intermittent stream. Integrity of this drainage and existing hydraulic capacity is not negatively impacted by the existing or proposed expanded well pad. The southeast edge of the pad is 368 feet from the intermittent stream in the bottom of Ryan Gulch and 443 feet from an intermittent stream

discharging to the Ryan Gulch drainage. The intermittent stream located 550 feet to the northeast is located in a parallel direction (across) to topographic contours thus lacking potential head to receive flow from a potential release from the site. The intermittent stream located 1,615 feet southwest of the site is also oriented across topographic contours with low environmental risk. All four of the identified intermittent drainages discussed above supports WOUS defined as riverine aquatic resources with an intermittent flow regime tied to a seasonally flooded stream bed. The receiving intermittent drainage in Ryan Gulch eventually discharges to perennial Piceance Creek. Site grading would provide control measures minimizing potential fluid migration off site. BMPs slated during site construction would eliminate preferential pathways for offsite depression flow using earthen berms and diversion ditches. All newly constructed BMPs would be closely monitored and maintained to ensure complete on-site containment of a potential release.

A sensitive areas determination was completed for the Ryan Gulch Phase 3 OGD. Based on the proximity of the well pads to intermittent drainages, it was determined that the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads are located within a hydrologically sensitive area and the potential for impacts to surface water are deemed to be moderate (WestWater Engineering [WestWater] 2022). The moderate environmental risk would be mitigated using BMPs and stormwater control measures.

Site grading would provide control measures minimizing potential fluid migration off-site. BMPs implemented during site construction would eliminate preferential pathways for off-site depression flow using earthen berms and diversion ditches (see respective Stormwater Management Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). All newly constructed BMPs would be closely monitored and maintained to ensure complete on-site containment of fluids.

TEP has implemented and maintains a Spill Prevention, Control and Countermeasure Plan (SPCC), which is a basin wide emergency spill response plan as required by Title 40, Code of Federal Regulations, Part 112 (40 CFR 112) as administered by the EPA. This plan describes measures implemented by TEP to prevent discharges from occurring and response measures to mitigate the impacts of a potential discharge. TEP has also implemented and maintains a Drilling and Workover Facilities Integrated Spill Prevention, Control, and Countermeasures Plan, as required by 40 CFR Part 112.10, which describes measures to prevent spills and releases during drilling, completions, and workover operations.

The working pad surface (WPS) of the Federal RGU 23-6-297 and the Federal RGU 44-1-298 well pads are not within 2,640 feet of a Groundwater Under the Direct Influence of Surface Water (GUDI) well, a Type III Well as defined by Rule 411.b.(1).B and 411.b.(1).D, or a surface water feature segment that is 15 miles or less upstream from a Public Water System intake. TEP overlaid the available GUDI well and Type III Well data from the COGCC to determine if the proposed operations would be within 2,640 feet of these wells. Additionally, TEP identified the Public Water System intake locations downstream of the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads and determined that all proposed operations would not fall within 15 stream miles of an active Public Water System intake.

State Engineers Office and USGS records were reviewed for existing/constructed water wells in the vicinity of the Ryan Gulch Phase 3 OGD. A permitted water well (permit no. 313779) is located 4,595 feet northwest of the Federal RGU 23-6-297 well pad and 1,921 feet northwest of the Federal RGU 44-1-298 well pad. Depth to shallow groundwater residing in the local flow system is greater than 80 inches (6.67 feet) based on NRCS soil properties and qualities for the Glendive fine sandy loam and Barcus channery loamy sand mapped soil units occurring at the

Edge Environmental, Inc.

site. The saturated hydraulic conductivity for these soils are less than 1.0×10^{-7} cm/sec. Dominant upland vegetation indicates pervasive dry antecedent soil conditions not in hydraulic connection with the local groundwater flow system. Evidence of springs or seeps in the project vicinity were not detected during site reconnaissance and vegetation assessment conducted for the Biological Survey Report.

Potential impact to groundwater resources at the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads is deemed to be low based on site hydrogeology. Based on the information collected during the desktop review, the potential for impacts to surface water and groundwater for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads is deemed to be moderate based on the proximity to intermittent drainages. Although both expanded well pads are designated as being in a sensitive area, the moderate environmental risk would be mitigated using BMPs and stormwater control measures.

The use of fresh water would be limited to that used for drilling and for dust control. Water use would be reduced by recycling produced water. It is estimated that approximately 4,676.5 barrels of fresh water would be required to drill a single well and that approximately 230,000 barrels of recycled produced water would be required for completion of a single well. Fresh water would be transported by truck from the Mautz Ranch Fresh Water Pond. The Mautz Ranch Fresh Water Pond is located along Ryan Gulch on TEP property north of County Road 86. Water trucks would utilize existing county and lease roads and would follow existing truck routes where applicable. Estimated water usage for the Ryan Gulch Phase 3 OGD is listed in Table 16. Estimated water usage for individual well pads Federal RGU 23-6-297 and Federal RGU 44-1-298 is listed in Tables A-7 and A-8 in Attachment A. A total of 98 percent of the total water used for drilling and completion would be recycled.

Table 16
Drilling and Completion
Estimated Water Usage for the Ryan Gulch Phase 3 OGD

Type	Volume (barrels)
Surface water	159,000
Groundwater	0
Recycled water (produced water)	7,820,000
Recycled water (non-produced water)	0
Unspecified source	0
Total	7,979,000
Percentage recycled	98

Based on the project design and implementation of the measures described above, potential impacts to surface water and groundwater are deemed to be low.

Cumulative Impacts

No adverse impacts to water resources are anticipated as a result of construction (short-term) and production (long-term) operations for the Ryan Gulch Phase 3 OGD. Adverse cumulative impacts are not expected as a result of project implementation.

Specific Measures Taken to Avoid or Minimize Cumulative Adverse Impacts

Implementation of the measures described above and those included in the respective Stormwater Management Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) to avoid and minimize project impacts to water resources would also avoid and minimize cumulative impacts and therefore, no adverse cumulative impacts are expected.

Measures to Mitigate or Offset Cumulative Adverse Impacts

As mentioned above, no project or cumulative adverse impacts to water resources are anticipated from the development of the Ryan Gulch Phase 3 OGD and therefore, no mitigation or offsets are proposed.

Terrestrial and Aquatic Wildlife Resources and Ecosystems

The Federal RGU 23-6-297 WPS is located within High Priority Habitat (HPH) including Mule Deer Severe Winter Range, Mule Deer Winter Concentration Area, and Aquatic Sportfish Management Waters WPS (see Table 17 below and Wildlife Habitat Drawing – Form 2A for the Federal RGU 23-6-297 well pad).

**Table 17
High Priority Habitats within 1 Mile of Federal RGU 23-6-297 Working Pad Surface**

Type	Distance (feet) from WPS	HPH Disturbed (acres)
Mule Deer Severe Winter Range	0	7.70
Mule Deer Winter Concentration Area	0	7.70
Aquatic Sportfish Management Waters	0	7.19

The Federal RGU 44-1-298 WPS is also located within HPH including Mule Deer Severe Winter Range, Winter Concentration Area, and Aquatic Sportfish Management Waters (see Table 18 below and Wildlife Habitat Drawing – Form 2A for the Federal RGU 44-1-298 well pad).

**Table 18
High Priority Habitats within 1 Mile of Federal RGU 44-1-298 Working Pad Surface**

Type	Distance (feet) from WPS	HPH Disturbed (acres)
Mule Deer Severe Winter Range	0	5.63
Mule Deer Winter Concentration Area	0	5.63
Aquatic Sportfish Management Waters	0	1.02

The Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads are located within Mule Deer Severe Winter Range and Mule Deer Winter Concentration Area. These HPH boundaries cover large swaths of northwestern Colorado; therefore, relocation of development activities outside of the HPH boundaries would not be possible. Utilization of existing oil and gas locations and facilities would ultimately minimize direct and indirect impacts to mule deer. Additionally, the pads are located in close proximity to Rio Blanco County Road 24, which is a public road utilized by the public and for access to existing oil and gas facilities in the area. TEP intends to conduct winter drilling operations on the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads. A Big Game Winter Range/Winter Concentration Timing Limitation from December 1st through April 30th annually would be applied to the BLM Applications for Permit to Drill. The current

Edge Environmental, Inc.

development schedule results in proposed well development activities occurring during the identified timing limitation. TEP has agreed to complete compensatory mitigation to mitigate direct and indirect impacts to mule deer through the payment of the habitat mitigation fee. Alternatively, TEP and CPW have agreed to evaluate potential mitigation projects within the northwest region of Colorado that could be used to off-set direct and indirect impacts to mule deer. If a compensatory mitigation project is agreed to, a sundry will be submitted documenting the mitigation project based on the requirements described under rule 1203.b.(1).

The Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads are also located within the perimeter of the Aquatic Sportfish Management Waters HPH boundary associated with Ryan Gulch. The majority of the oil and gas locations, including the existing wells and production facilities, are located within the 500-foot Aquatic Sportfish Management Water buffer. Stormwater control measures would be implemented to minimize potential impacts to aquatic sportfish downstream of the oil and gas location. Proposed stormwater control measures include diversion ditches, sediment traps, outflow protections, onsite berming, and soil stabilization methods to minimize the potential for soil erosion. Furthermore, TEP is proposing to minimize operations at the locations by conducting remote frac operations from the Federal RGU 23-7-297 pad located outside the aquatic HPH buffers. Because the Federal RGU 23-6-297 pad is existing and would require minimal expansion to support the proposed activities, relocation of the oil and gas location would likely result in an increase in direct and indirect impacts on wildlife resources. Information on stormwater control measures is included in TEP's respective Stormwater Management Plans – Form 2A for the Federal RGU 23-6-297 and Federal 44-1-298 well pads.

The Federal RGU 23-6-297 well pad is located within Non-Crop Land - Rangeland. When applying a 1-mile buffer to the proposed oil and gas location there are approximately 2,310 acres of existing rangeland. The Federal RG 44-1-298 well pad is also proposed within Non-Crop Land - Rangeland. When applying a 1-mile buffer to the proposed oil and gas location there are approximately 2,288 acres of existing rangeland. A quantitative vegetative assessment (WestWater 2022) was conducted for the project area. A portion of the project area overlaps with previous projects that were surveyed during 2019 and 2020. These areas were not re-surveyed during the 2021 survey effort; however, results from 2019 and 2020 are included in the Biological Survey Report (WestWater 2022). Biological surveys were conducted during May of 2021 with follow-up vegetation assessments completed during June of 2021. Vegetation assessments followed the methodology described in "The Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume 1: Core Methods" (Herrick et al 2015) to assist with interim and final reclamation.

After well development is complete, TEP would reclaim the area surrounding the wellhead and production facilities not required for long-term production operations. The area would be reclaimed using species and methods described in TEP's respective Reclamation Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads. Reclamation would comply with Federal, State, and local reclamation standards and would occur within 6 months following completion of well construction. Composition of species used for reclamation would also consider the Summer 2022 vegetative assessment. Construction and Interim Reclamation disturbance acreages for the Federal RGU 23-6-297 well pad and the Federal RGU 44-1-298 well pad are shown in Tables 19 and 20, respectively.

**Table 19
Disturbance by Component for the Federal RGU 23-6-297 Well Pad and Utilities**

Component	Total Short-Term (acres)	Total Long-Term (acres)
Federal RGU 23-6-297 well pad	7.70 ¹	2.17
8-inch gas pipeline	0.47 ²	0.00
Total	8.17	2.17
¹ Includes 1.88 acres of existing disturbance, 3.56 acres of re-disturbance, and 2.26 acres of new disturbance. ² Includes 0.39 acre of re-disturbance and 0.08 acre of new disturbance.		

**Table 20
Disturbance by Component for the Federal RGU 44-1-298 Well Pad and Utilities**

Component	Total Short-Term (acres)	Total Long-Term (acres)
Federal RGU 44-1-298 well pad	5.63 ¹	1.65
Access road	0.28 ²	0.17
8-inch gas and 6-inch water pipeline	0.18 ³	0.00
6-inch water pipeline to RGU 23-6-297 pad	3.38 ⁴	0.05
Total	9.47	1.87
¹ Includes 1.23 acres of existing disturbance, 2.54 acres of re-disturbance, and 1.86 acres of new disturbance. ² Includes 0.13 acre of existing disturbance, 0.10 acre of re-disturbance, and 0.05 acre of new disturbance. ³ Includes 0.01 acre of existing disturbance, 0.16 acre of re-disturbance, and 0.01 acre of new disturbance. ⁴ Includes 0.06 acre of existing disturbance, 3.14 acre of re-disturbance, and 0.18 acre of new disturbance.		

The loss of basin big sagebrush and Wyoming sagebrush shrubland would be long-term, but these species are common throughout the region, and the loss would be negligible at both a project and regional level. Gradual reestablishment of a portion of the affected shrubland is likely following reclamation.

TEP has designed the project to incorporate existing infrastructure to minimize impacts to the ecosystem and wildlife that rely on available habitats in the vicinity surrounding the Ryan Gulch Phase 3 OGD. As a result of incorporating existing infrastructure into the development plan, impacts to existing wildlife habitat would be minimal and impacts on wildlife would be reduced compared to less developed or undeveloped areas because some habituation of the animals to oil and gas operation and other human activities would be expected (see the respective Wildlife Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads for detailed BMPs proposed to minimize impacts to wildlife).

Hydraulic fracturing operations would use recycled produced water pumped through an existing buried water collection system avoiding use of truck traffic to deliver water for well completions and avoiding potential wildlife impacts. TEP would also install five temporary surface steel frac lines to support remote frac and flowback operations. The temporary surface frac lines would be installed following the existing access roads and existing pipeline rights-of-ways minimizing short-term disturbance to wildlife during hydraulic fracturing.

To minimize traffic during operations, TEP would install buried natural gas and produced water pipelines. As mentioned above, disturbance associated with pipeline construction would be

Edge Environmental, Inc.

promptly revegetated with native species consistent with CPW's recommended seed mix when the pipeline is completed (see the respective Reclamation Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). TEP would utilize remote telemetry equipment to minimize well site visitation reducing the vehicles traveling on dirt/gravel roads. When feasible, TEP would limit post-development operations to daylight hours when wildlife activity is minimal. To minimize the potential for wildlife related traffic accidents, TEP would implement speed restrictions for all roads and would require that all TEP employees and contractors adhere to posted speed limits.

TEP has scheduled construction of the Federal 23-6-297 and Federal 44-1-298 well pads for September 2023, which is outside of the nesting season for migratory birds (April 1 to August 31); however, if the construction schedule changes and vegetation removal is required during the nesting season, TEP would utilize methods to avoid a take of migratory birds during construction. TEP would either implement hazing prior to April 1, or a pre-construction migratory bird survey would be conducted during the nesting season to determine if nesting migratory birds are present within the project area. If any active nests are located, TEP would provide work zone buffers around those active nests as allowed under Rule 1202.a.(8) (see the respective Wildlife Protection Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). Additionally, TEP would conduct raptor surveys within 0.25 mile or 0.5 mile (depending on the species) of proposed well development activities prior to construction and implement appropriate buffers around active nests during the species' nesting seasons to avoid impacts.

To minimize the potential spread and infestation of invasive, non-native plants within areas used for the Ryan Gulch Phase 3 OGDG that could degrade wildlife habitat and out-compete native vegetation, TEP would implement a weed management program. This includes control or reduction of invasive weeds and non-native populations that have been established prior to development, as well as invasive plant species that may be introduced during project development and reclamation activities. Interim and final reclamation of disturbed areas would use seed mixes that are certified to be weed-free. Reclamation would be monitored annually until reclamation is successful, and if noxious weeds are documented, TEP would use methods to treat the weeds as outlined within the Pesticide Use Permit on record with the BLM (see the respective Reclamation Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). These measures would minimize impacts on existing vegetation communities within the Project area as well as maintain native vegetation for the continued use of wildlife in the Project area.

Cumulative Impacts

No adverse impacts to terrestrial and aquatic wildlife resources and ecosystems are anticipated as a result of construction (short-term) and production (long-term) operations for the Ryan Gulch Phase 3 OGDG. Adverse cumulative impacts are not expected as a result of project implementation.

Specific Measures Taken to Avoid or Minimize Cumulative Adverse Impacts

Implementation of the measures described above and those included in the respective Wildlife Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) and the respective Reclamation Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) to avoid and minimize project impacts to terrestrial and aquatic wildlife resources and ecosystems would also avoid and minimize cumulative impacts and therefore, no adverse cumulative impacts are expected.

Measures to Mitigate or Offset Cumulative Adverse Impacts

As mentioned above, no project or cumulative adverse impacts to terrestrial and aquatic wildlife resources and ecosystems are anticipated from the development of the Ryan Gulch Phase 3 OGDG and therefore, no mitigation or offsets are proposed.

Soil Resources

In addition to 1.88 acre of existing disturbance for the Federal RGU 23-6-297 well pad, it is estimated that 1.99 acres of Barcus channery loamy sand, 2 to 8 percent slopes and 5.31 acres of Glendive fine sandy loam would be disturbed during reconstruction of the oil and gas location. Of this, 3.56 acres would be new disturbance, and 2.26 acres would be re-disturbance. After drilling and completion, 6.00 acres would be reclaimed leaving 2.17 acres disturbed during long-term production. It is estimated that 0.47 acre of Glendive fine sandy loam would be disturbed for utilities associated with the Federal RGU 23-6-297 well pad during construction (see Table 21). Of the disturbance associated with utilities, 0.39 acre would be re-disturbance and 0.08 acre would be new disturbance; however, all would be reclaimed. The Federal RGU 23-6-297 well pad has been designed to disturb the minimum area possible while maintaining safety standards.

**Table 21
Soil Types Disturbed by Construction of the Federal RGU 23-6-297 Well Pad, Access, and Utilities**

Map Unit Number	Soil Type	Federal RGU 23-6-298 Well Pad (acres)	Access/Utilities (acres)
6	Barcus channery loamy sand, 2 to 8 percent slopes	1.99	0.00
36	Glendive fine sandy loam	5.31	0.47
91	Torriorthents-Rock outcrop complex, 15 to 90 percent slopes	0.40	0.00
Total		7.70	0.47

Construction of the Federal RGU 44-1-298 well pad requires 5.63 acres of disturbance in Barcus channery loamy sand, 2 to 8 percent slopes. Of this, 1.23 acres is existing disturbance, 2.54 acres is re-disturbance, and 1.86 acres is new disturbance. After drilling and completion, 3.98 acres would be reclaimed leaving 1.65 acres disturbed during long-term production for the well pad. It is estimated that 2.21 acres of Barcus channery loamy sand, 2 to 8 percent slopes, 1.57 acres of Glendive fine sandy loam, and 0.06 acre of Torriorthents-Rock outcrop complex, 15 to 90 percent slopes would be disturbed for roads/utilities associated with the Federal RGU 44-1-298 well pad during construction (see Table 22). Of this, 0.2 acre is existing disturbance, 3.4 acres is re-disturbance, and 0.24 acre is new disturbance. The Federal RGU 44-1-298 well pad has been designed to disturb the minimum area possible while maintaining safety standards.

TEP has prepared and would follow their respective Topsoil Protection Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) to address compliance with Federal, State, and local requirements regarding topsoil management and preservation. TEP has also prepared and would follow their respective Reclamation Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). Proper management of topsoil during initial site construction would ensure topsoil is preserved for site reclamation following construction and to ensure adequate organic material is available for re-establishment of desirable vegetation at reclamation.

Table 22

Soil Types Disturbed by Construction of the Federal RGU 44-1-298 Well Pad, Access, and Utilities

Map Unit Number	Soil Type	Federal 298 44-1-298 Well Pad (acres)	Access/Utilities (acres)
6	Barcus channery loamy sand, 2 to 8 percent slopes	5.63	2.21
36	Glendive fine sandy loam	0.00	1.57
91	Torriorthents-Rock outcrop complex, 15 to 90 percent slopes	0.00	0.06
Total		5.63	3.84

During reconstruction of the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, and construction of the proposed pipeline infrastructure and access road, topsoil stripped during initial construction of these project components would be managed according to use and duration of development. Prior to separation and storage of the topsoil horizon, or top 6 inches, from the well pad facility and pipeline corridor, woody vegetation would be mulched, and stormwater control measures properly installed to control erosion and sedimentation during precipitation events (see respective Stormwater Management Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). When separating soil horizons, TEP would segregate each horizon based upon noted changes in physical characteristics, such as organic content, color, texture, density, or consistency. To the extent feasible, stockpiled soils would be protected from degradation due to contamination, compaction, and from wind and water erosion during drilling and production operations. Surface roughening, temporary seeding and mulching, erosion control blankets, or soil binders would be used as needed, and BMPs implemented, to prevent weed establishment and to maintain soil microbial activity.

During re-construction of the Federal RGU 23-6-297 well pad, the topsoil horizon would be stripped between the top of cut and toe of fill and the soil stockpile area would be expanded to the northeast. The topsoil volume disturbed for the re-constructed well pad is estimated at 4,270 cubic yards. During re-construction of the Federal RGU 44-1-298 well pad, the topsoil horizon would be stripped between the top of cut and toe of fill and stockpiled northwest of the existing wells. The topsoil volume disturbed for the construction of the well pad is estimated at 3,470 cubic yards. For both well pads, topsoil would be segregated from all other subsurface materials. Wattles would be placed around the base of the topsoil stockpile to control sedimentation and a metal sign would be placed on the pad side of the stockpile.

During construction of the proposed access road associated with the Federal RGU 44-1-298 well pad, the topsoil horizon between the top of road cut and toe of road fill would be stripped to a depth no less than 6 inches and windrowed above the top of cut and below the toe of fill of the proposed access road profile. Topsoil would be segregated from all other subsurface materials disturbed during access road construction and no topsoil would be used for building the location nor will be left in place and covered by subsoil in a cut and fill situation. The topsoil volume disturbed for construction of the access road is estimated at 121 cubic yards.

During construction of the pipeline infrastructure associated with the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, the topsoil horizon would be stripped within the 50-foot construction right-of-way width and placed along the downhill side. Topsoil would be segregated from subsurface materials and stockpiled upslope of the trench. When construction is complete and the pipeline right-of-way has been re-contoured to pre-construction slopes, stripped topsoil would be uniformly replaced across the disturbance. It is estimated that 380 cubic yards and 2,815

Edge Environmental, Inc.

cubic yards would be disturbed for pipeline installation associated with the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, respectively.

Cumulative Impacts

No adverse impacts to soil resources are anticipated as a result of construction (short-term) and production (long-term) operations for the Ryan Gulch Phase 3 OGD. Adverse cumulative impacts to soil resources are not expected as a result of project implementation.

Specific Measures Taken to Avoid or Minimize Cumulative Adverse Impacts

Implementation of the measures described above, and the measures included in the respective Topsoil Protection Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) and respective Reclamation Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) to avoid and minimize project impacts to soil resources would also avoid and minimize cumulative impacts and therefore, no adverse cumulative impacts are expected.

Measures to Mitigate or Offset Cumulative Adverse Impacts

As mentioned above, no project or cumulative adverse impacts to soil resources are anticipated from the development of the Ryan Gulch Phase 3 OGD and therefore, no mitigation or offsets are proposed.

Public Welfare

This section considers a qualitative evaluation of incremental adverse impacts to public welfare (noise, light, odor, dust, and recreation and scenic values) as a result of pre-production operations (short-term) and production operations (long-term) of the Ryan Gulch Phase 3 OGD. Pre-production activities include construction, drilling, and completion operations and installation of pipeline infrastructure. Production activities include standard well and facility maintenance operations and inspection activities.

During initial site planning of the oil and gas locations (for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads), TEP evaluated receptors for noise, light, and odor where members of the public or wildlife resources may be located and impacted from the proposed activities. These receptors include public roads, railroads, building units, residential building units, high occupancy building units, school property or facilities, designated outdoor activity areas, childcare centers, disproportionately impacted communities, trails, and wildlife habitat. As provided in the respective Cultural Distance sections of the Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, there are no building units, high occupancy building units, school facilities, or child care centers within 1 mile of the WPS of either of the well pads. Because no residential building units are present within 1 mile, it is unlikely that pre-production or production operations would adversely impact members of the public.

The Federal RGU 23-6-297 Federal RGU 44-1-298 well pads are located within Mule Deer Severe Winter Range and Mule Deer Winter Concentration Area HPH. It is unlikely either pre-production or production operations would adversely affect wildlife resources.

Noise. Pre-production (short-term) activities are typically shorter in nature and emit a higher noise level than long-term production operations. Noise from these activities could have impacts on surrounding receptors if located within close proximity of the proposed WPS of the well pads.

Edge Environmental, Inc.

No residential or other building units are located within 1 mile of the Ryan Gulch Phase 3 OGD. Because no residential or other building units are present within 1 mile, it is unlikely for noise generated during pre-production or production operations to adversely impact members of the public (see respective Cultural Distance Maps – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads).

TEP reviewed HPH within 1 mile of Federal RGU 23-6-297 pad and the Federal RGU 44-1-298 well pad. The well pads are located within Mule Deer Severe Winter Range and Mule Deer Winter Concentration Area HPH. TEP is proposing to begin construction operations for both well pads in September of 2023 outside of the winter timing limitation for mule deer; however, planned drilling and completions operations are scheduled within the winter timing limitation. The pads are located in close proximity to existing oil and gas operations and adjacent to Blanco County Road 24. Because the pads are in close proximity to existing facilities and existing public roads, impacts to mule deer would be minimal. TEP will be paying a habitat mitigation fee to CPW to offset impacts to mule deer due to direct and indirect impacts associated with development activities, including winter operations. Based on this evaluation it is unlikely for noise during pre-production or production operations to adversely affect wildlife resources. All HPH boundaries within 1 mile of the WPS are shown on the respective Wildlife Habitat Drawings included in the Form 2As for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads. TEP met with CPW to discuss potential impacts from noise during operations on the Federal RGU 23-6-297 pad and Federal RGU 44-1-298 well pads. CPW informed TEP that noise impacts are not anticipated for these oil and gas locations.

Cumulative

Adverse cumulative noise impacts to members of the public and wildlife are not expected given that noise impacts from the project are expected to be nonexistent or minimal.

Light. Pre-production activities are typically shorter in nature and require sufficient lighting to ensure the safety of employees and contractors. All lighting used during the pre-production phase of development would be directed downward and inward towards operation to minimize light pollution in the vicinity of the location. Lighting from these activities could have minimal impacts on surrounding receptors if located within close proximity of the proposed WPS of each well pad.

No residential or other building units are located within 1 mile of the Ryan Gulch Phase 3 OGD. Because no residential or other building units are present within 1 mile of the well pads, it is unlikely for light generated during pre-production operations to adversely impact members of the public (see respective Cultural Distance Map – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). TEP does not plan to install any on-site lighting during production operations (see respective Cultural Distance Maps – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads).

TEP reviewed HPH within 1 mile of Federal RGU 23-6-297 pad and the Federal RGU 44-1-298 well pad. The well pads are located within Mule Deer Severe Winter Range and Mule Deer Winter Concentration Area HPH. TEP is proposing to begin construction operations for both well pads in September of 2023 outside of the winter timing limitation for mule deer; however, planned drilling and completions operations are scheduled within the winter timing limitation. The pads are located in close proximity to existing oil and gas operations and adjacent to Rio Blanco County Road 24. Because the pads are in close proximity to existing facilities and existing public roads, impacts to mule deer would be minimal. TEP will be paying a habitat mitigation fee to CPW to offset impacts

Edge Environmental, Inc.

to mule deer due to direct and indirect impacts associated with development activities, including winter operations. Based on this evaluation it is unlikely for lighting during pre-production or production operations to adversely affect wildlife resources. All HPH boundaries within 1 mile of the WPS are shown on the respective Wildlife Habitat Drawings included in the Form 2As for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads. TEP met with CPW to discuss potential impacts from light during pre-production operations on the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads. Based on this evaluation, it is unlikely that light from pre-production operations would adversely affect wildlife.

TEP does not plan to install any on-site lighting during production operations (long-term) and does not anticipate conducting any nighttime well maintenance operations requiring temporary lights. Therefore, light impacts to members of the public and wildlife resources are expected to be nonexistent during production operations (long-term).

Cumulative

Adverse cumulative light impacts are not expected given that light impacts from the project are expected to be nonexistent or minimal.

Odor. Pre-production and production activities have the potential to generate odors. During planning of the Ryan Gulch Phase 3 OGD, TEP determined through on-site surveys and review of available aerial imagery that there are no residential building units within 1 mile of the proposed WPS of the well pads. The nearest residential building unit is located over 1 mile from the WPS of the well pads., and therefore, it is unlikely for odor generated during pre-production operations (short-term) or production operations (long-term) to adversely affect members of the public (see respective Cultural Distance Maps – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads).

Cumulative

Adverse cumulative odor impacts are expected to be nonexistent or minimal given that odor impacts from the project are expected to be minimal.

Dust. TEP has prepared Dust Mitigation Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads as required by COGCC Rule 304.c.(5) based on the requirements outlined in COGCC Rule 427. Fugitive dust is created during construction and from vehicular travel on dirt or gravel roads. Tables 11 and 12 provide the estimated vehicle trips during construction and operation for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, respectively. Fugitive dust can also be propagated from disturbed areas during high wind events. TEP would implement the BMPs outlined in the respective Dust Mitigation Plans for each well pad including application of fresh water during construction, application of fresh water on road surfaces, and speed restriction.

With implementation of the measures outlined in the respective Dust Mitigation Plans – Form 2A for Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads and described above, no adverse impacts related to dust are anticipated as a result of construction (short-term) and operation (long-term) of the Ryan Gulch Phase 3 OGD.

Edge Environmental, Inc.

Cumulative

The existing unpaved access roads used to access other existing oil and gas locations within the area would be used for the Ryan Gulch Phase 3 OGD. The BMPs in the respective Dust Mitigation Plans – Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads would be applied to the oil and gas locations, proposed pipeline corridors, and existing and new access roads. Adverse cumulative dust related impacts are expected to be minimal and not adverse with proper implementation of the BMPs included in the respective Dust Mitigation Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads).

Recreation and Scenic Values. No State Parks, State Trust Lands, State Wildlife Areas, or Designated Outdoor Activity Areas exist within 1 mile of the project area for the Ryan Gulch Phase 3 OGD. TEP reviewed BLM Transportation layer and Colorado Trails Explorer to evaluate existing trails in the vicinity of the oil and gas locations. There are two mapped trails within 1 mile of the project area including Tower Road and Hog Lot Ridge Road (BLM Road 1019). The project area is periodically used for recreation including hunting.

No adverse impacts to Recreation and Scenic Values are anticipated as a result of construction (short-term) and operation (long-term) of the Ryan Gulch Phase 3 OGD.

Cumulative Impacts

No adverse project or cumulative impacts to recreation and scenic values are expected as a result of project implementation.

Specific Measures Taken to Avoid or Minimize Cumulative Adverse Impacts

Implementation of the measures in the respective Dust Mitigation Plans (Form 2A for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads) to avoid and minimize project impacts to public welfare would also avoid and minimize cumulative impacts and therefore, no adverse cumulative impacts are expected.

Measures to Mitigate or Offset Cumulative Adverse Impacts

As mentioned above, no project or cumulative adverse impacts to public welfare are anticipated from the development of the Ryan Gulch Phase 3 OGD and therefore, no mitigation or offsets are proposed.

SURROUNDING OIL AND GAS IMPACTS

This section provides a baseline evaluation of the existing landscape level impacts within the area surrounding the existing Federal RGU 23-6-297 well pad proposed for expansion and the existing Federal RGU 44-1-298 well pad also proposed for expansion. This information is required per COGCC Rule 303.a.(5).C and is necessary when evaluating cumulative impacts. The information provided below gives context to existing and proposed activities within the vicinity of the proposed oil and gas locations. The Ryan Gulch Phase 3 OGD is in an area of the Piceance Basin with existing oil and gas operations.

There are three active oil and gas locations within 1 mile of the existing Federal RGU 23-6-297 WPS as listed in Table 23. The total disturbance acreage for the active and proposed Oil and Gas Locations is 14.52 acres (including proposed expansion of the RGU 44-1-298 well pad). A

breakdown of the acreage by facility is provided in Table 23. For existing TEP operated Oil and Gas Locations, TEP proposed the actual post-construction disturbance acreage based on field measurement utilizing a GPS receiver.

**Table 23
Existing Oil and Gas Locations within 1 Mile of the Federal RGU 23-6-297 Working Pad Surface**

O&G Location Name	Operator	COGCC Location ID	Status	Source	Disturbance Acreage
RGU 41-1-298	TEP	335919	Active/Built	Field Observation	5.57
RGU 44-1-298	TEP	335640	Active/Built /Proposed	Field Observation	5.63
Piceance Creek-62S97W	Caerus	316226	Active/Built	Aerial	3.32
Total					14.52

There are five active oil and gas locations within 1 mile of the proposed Federal RGU 44-1-298 WPS as listed in Table 24. The total disturbance acreage for the active and proposed Oil and Gas Locations is 29.29 acres (including proposed expansion of Federal RGU 23-6-297 well pad). A breakdown of the acreage by facility is provided in Table 24. TEP proposed the actual post-construction disturbance acreage based on field measurement utilizing a GPS receiver.

**Table 24
Existing Oil and Gas Locations within 1 Mile of the Federal RGU 44-1-298 Working Pad Surface**

O&G Location Name	Operator	COGCC Location ID	Status	Source	Disturbance Acreage
RGU 23-7-297	TEP	316408	Active/Built	Field Observation	5.71
RGU 41-1-298	TEP	335919	Active/Built	Field Observation	5.57
RGU 23-6-297	TEP	335602	Active/Built/ Proposed	Permit	7.51
RGU 12-1-298	TEP	335873	Active/Built	Field Observation	4.54
RGU 33-36-198	TEP	428956	Active/Built	Field Observation	5.96
Total					29.29

TEP reviewed the COGCC database to compile a list of the existing and/or permitted wells within 1 mile of the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads. A total of 23 active producing oil and natural gas wells and 18 proposed wells are within 1 mile of the Federal RGU 23-6-297 WPS as shown in Table 25. A total of 21 active producing oil and natural gas wells, 30 proposed wells, and 2 plugged and abandoned wells are within 1 mile of the Federal RGU 44-1-298 WPS as shown in Table 26.

**Table 25
Existing/Proposed Wells within 1 Mile
of the Federal RGU 23-6-297 Working Pad Surface**

Well Status	Count
Active oil and gas wells	23
Permitted but not drilled	0
Proposed	18
Plugged and abandoned	0
Total	41

**Table 26
Existing/Proposed Wells within 1 Mile
of the Federal RGU 44-1-298 Working Pad Surface**

Well Status	Count
Active oil and gas wells	21
Permitted but not drilled	0
Proposed	30
Plugged and abandoned	2
Total	53

TEP reviewed COGCC location files and permitting documents to determine the permitted storage capacity within 1-mile of each oil and gas location within the Ryan Gulch Phase 3 OGD (Table 27). TEP also review available aerial imagery and facility diagrams prepared following recent site visits to determine the existing storage capacity for each oil and gas location with the Ryan Gulch Phase 3 OGD (Table 27).

**Table 27
Permitted/Existing Storage Capacity within 1 Mile of the Working Pad Surface**

Storage	Federal RGU 23-6-297		Federal RGU 44-1-298	
	Count	Source of Count	Count	Source of Count
Permitted onsite storage capacity (oil)	0	COGCC	0	COGCC
Permitted onsite storage capacity (condensate)	6	COGCC	17	COGCC
Permitted onsite storage capacity (water)	6	COGCC	16	COGCC
Permitted onsite storage capacity (pits)	3	COGCC	6	COGCC
Existing onsite storage capacity (oil)	0	FO/Inspection	0	FO
Existing onsite storage capacity (condensate)	6	FO/Inspection	15	FO
Existing onsite storage capacity (water)	7	FO/Inspection	27	FO
Existing onsite storage capacity (pits)	0	FO/Inspection	0	FO
COGCC=Colorado Oil & Gas Commission - Records/Permits FO=Field Observation				

As described above, there are existing landscape level impacts associated with oil and gas development (i.e., existing oil and gas locations, wells, and fluid storage facilities) present on the landscape within the vicinity of the proposed Ryan Gulch Phase 3 OGD. Furthermore, there are existing access roads and pipeline infrastructure supporting oil and gas operations for these location and facility in the vicinity of the Ryan Gulch Phase 3 OGD. No adverse impacts to resources are expected from development of the Ryan Gulch Phase 3 OGD.

OTHER INDUSTRIAL IMPACTS

Per COGCC Rule 303.a.(5).D, the operator is required to identify existing industrial facilities within 1 mile of the proposed oil and gas location. During review of the two locations included in the Ryan Gulch Phase 3 OGD, no industrial facilities were identified within 1 mile of either well pad location. The Ryan Gulch Phase 3 OGD is in a remote area of Rio Blanco, Colorado with oil and gas development and grazing activities.

BENEFICIAL IMPACTS

The Ryan Gulch Phase 3 OGDG does not include any proposed direct incremental beneficial impacts associated with the development of the proposed wells on the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads, as summarized in Table 28, Beneficial Impacts List (respective Form 2B for the Federal RGU 23-6-297 and Federal RGU 44-1-298 well pads). However, there are indirect beneficial impacts associated with the Ryan Gulch Phase 3 OGDG which include broader benefits to the community and the environment. A qualitative evaluation of beneficial impacts to the local community and to the environment is provided below.

Table 28
Beneficial Impacts List for the Ryan Gulch Phase 3 OGDG (Form 2B)

Total number of existing wells that are planned to be plugged and abandoned as part of this OGDG.	0	Estimated number of truck trips that are planned to be avoided from the above-mentioned facility closures and equipment upgrades (on an annual basis).	0
Total number of existing locations that are planned to be closed and undergo final reclamation as part of this OGDG.	0	Total number of Oil Tanks planned to be removed from existing locations through the approval of this OGDG.	0
Total number of acres that are planned to be reclaimed through the closing of existing locations.	0	Total number of Condensate Tanks planned to be removed from existing locations through the approval of this OGDG.	0
Total number of existing pits that are planned to be closed and undergo final reclamation as part of this OGDG.	0	Total number of Produced Water Tanks planned to be removed from existing locations through the approval of this OGDG:	0

Beneficial Impacts to Surrounding Community

Rio Blanco County and the town of Meeker would benefit most notably from the employment and tax revenues generated by the proposed development plan. Some of these benefits would be likely to extend to the City of Rifle, in Garfield County, which acts as a service center for regional oil and gas activity and is located approximately 38 miles southeast of the Project Area. In addition to the direct jobs created by the project, the development plan would support jobs in regional businesses that support the project and its employees, including retail trade, lodging and eating establishments, construction, real estate, and other services.

Taxes paid by TEP on production and equipment would support infrastructure and community services in Rio Blanco County. In the tax district where the Ryan Gulch Phase 3 OGDG is located (Tax District 8), ad valorem (property) taxes on production fund Rio Blanco County government, Meeker RE1 and Rangely RE4 school districts, hospitals and medical centers in Meeker and Rangely, and special districts, including county-wide fire protection, cemetery, library, parks and recreation, Colorado River Water Conservation District, Piceance Creek Pest Control, and White River Soil Conservation District.

In addition to ad valorem taxes, Rio Blanco County would receive a portion of state severance taxes and federal mineral royalties paid on production. The severance tax rate on oil and gas production in Colorado ranges from 2% to 5% on a graduated scale based on sales volume. Half of severance taxes paid to the state is returned to local governments impacted by oil, gas and

mineral production. The federal mineral royalty rate on existing oil and gas leases is 12.5% of production value. Nearly half (49%) of federal mineral royalties are returned to Colorado, a portion of which is allocated to local governments and school districts impacted by mineral development.

While production-based taxes would produce the greatest benefits to local governments, Rio Blanco County would also receive tax revenues from property taxes paid on physical assets in the Project Area and sales and use taxes paid on equipment purchases associated with the Ryan Gulch Phase 3 OGD.

Beneficial Impacts to Surrounding Wildlife and Ecosystems

A detailed discussion of the benefits to surrounding wildlife and ecosystem is included above under the section titled “Terrestrial and Aquatic Wildlife Resources and Ecosystems.” As discussed above, TEP would minimize impacts to wildlife and surrounding ecosystems by using existing infrastructure, recycling produced water thereby reducing truck trips, installation of buried pipelines, coordination with CPW, ground clearing outside of migratory bird habitat restrictions, and implementation of a weed management program.

REFERENCES

- Bureau of Land Management. 2017a. Colorado Air Resource Management Modeling Study (CARMMS), 2025 CAMx Modeling Results for the High, Low, and Medium Oil and Gas Development Scenarios. CARMMS 2.0 Final Report. Prepared by Ramboll Environmental. Accessed online at: <https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado>.
- _____. 2017b. Environmental Assessment for the Proposed Balzac Gulch – Phase I Oil and Gas Master Development Plan Project, DOI-BLM-CO-N040-2017-0093-EAB2015. BLM Colorado River Valley Field Office. September 2017.
- _____. 2022. Annual Report 2.0 - 2020. BLM Colorado State Office. Accessed online at: <https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado>. Accessed February 15, 2022.
- Herrick, J.E., J.W. Van Zee, S.E. McCord, E.M. Courtright, J.W. Karl, and L.M. Burkett. 2015. Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Second Edition, Volume 1: Core Methods. USDA-ARS Jornada Experimental Range, Las Cruces, New Mexico.
- WestWater Engineering (WestWater). 2022. Biological Survey Report, TEP Rocky Mountain, LLC Ryan Gulch Phase 3 Development Plan. October.

Attachment A Tables

**Table A-1
One Year Production Pollutant Emissions (tons) for the Federal RGU 23-6-297 Well Pad**

Component	NOx	CO	VOCs	CH ₄	C ₂ H ₆	CO ₂	N ₂ O
Stationary Engines or Turbines	-	-	-	-	-	-	-
Process Heaters or Boilers	1.77	1.49	0.01	0.04	0.06	2,125.59	-
Storage Tanks	3.63	16.54	18.08	16.82	8.15	4,466.41	0.12
Dehydration Units	-	-	-	-	-	-	-
Pneumatic Pumps	-	-	-	-	-	-	-
Pneumatic Controllers	-	-	2.2	14.62	1.99	0.04	-
Separators	-	-	-	-	-	-	-
Fugitives	-	-	0.19	1.25	0.17	-	-
Venting or Blowdown	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-
Non-Road Internal Combustion Engines	-	-	-	-	-	-	-
Loadout	0.11	0.52	0.42	0.39	0.19	140.27	-
Well Bradenhead	-	-	-	-	-	-	-
Well Maintenance	-	-	0.43	2.84	0.39	0.01	-

**Table A-2
One Year Production Pollutant Emissions (tons) for the Federal RGU 44-1-298 Well Pad**

Component	NOx	CO	VOCs	CH ₄	C ₂ H ₆	CO ₂	N ₂ O
Stationary Engines or Turbines	-	-	-	-	-	-	-
Process Heaters or Boilers	1.34	1.13	0.07	0.03	0.04	1,610.29	-
Storage Tanks	1.18	5.36	12.18	1.01	7.98	2,739.64	0.04
Dehydration Units	-	-	-	-	-	-	-
Pneumatic Pumps	-	-	-	-	-	-	-
Pneumatic Controllers	-	-	1.85	12.31	1.68	0.04	-
Separators	-	-	-	-	-	-	-
Fugitives	-	-	0.14	0.96	0.13	-	-
Venting or Blowdown	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-
Non-Road Internal Combustion Engines	-	-	-	-	-	-	-
Loadout	0.03	0.14	0.29	0.02	0.19	70.84	-
Well Bradenhead	-	-	-	-	-	-	-
Well Maintenance	-	-	0.57	3.78	0.52	0.01	-

**Table A-3
One Year Production Hazardous Air Pollutants Emissions (lbs) for the Federal RGU 23-6-297 Well Pad**

Component	Benzene	Toluene	Ethyl benzene	Xylenes	n-Hexane	2,2,4-Trimethylpentane	Hydrogen sulfide	Formaldehyde	Methanol	Total HAPs
Stationary Engines or Turbines	-	-	-	-	-	-	-	-	-	-
Process Heaters or Boilers	-	-	-	-	-	-	-	3	-	3
Condensate Tanks	175	-	-	-	742	-	-	-	-	917
Produced Water Tanks	3	-	-	-	4	-	-	-	-3	7
Dehydration Units	-	-	-	-	-	-	-	-	-	-
Pneumatic Pumps	-	-	-	-	-	-	-	-	-	-
Pneumatic Controllers	22	34	1	15	145	17	-	-	-	234
Separators	-	-	-	-	-	-	-	-	-	-
Fugitives	2	-	-	-	5	-	-	-	-	7
Venting or Blowdowns	-	-	-	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-	-	-	-
Non-Road Internal Combustion Engines	-	-	-	-	-	-	-	-	-	-
Loadout	2	-	-	-	13	-	-	-	-	15
Well Bradenhead	-	-	-	-	-	-	-	-	-	-
Well Maintenance	4	7	-	3	28	3	-	-	-	45

**Table A-4
One Year Production Hazardous Air Pollutants Emissions (lbs) for the Federal RGU 44-1-298 Well Pad**

Component	Benzene	Toluene	Ethyl benzene	Xylenes	n-Hexane	2,2,4-Trimethylpentane	Hydrogen sulfide	Formaldehyde	Methanol	Total HAPs
Stationary Engines or Turbines	-	-	-	-	-	-	-	-	-	-
Process Heaters or Boilers	-	-	-	-	-	-	-	2	-	2
Condensate Tanks	80	-	-	-	431	-	-	-	-	511
Produced Water Tanks	4	-	-	-	2	-	-	-	-	6
Dehydration Units	-	-	-	-	-	-	-	-	-	-
Pneumatic Pumps	-	-	-	-	-	-	-	-	-	-
Pneumatic Controllers	19	29	1	13	122	14	-	-	-	198
Separators	-	-	-	-	-	-	-	-	-	-
Fugitives	1	-	-	-	4	-	-	-	-	5
Venting or Blowdowns	-	-	-	-	-	-	-	-	-	-
Combustion Control Devices	-	-	-	-	-	-	-	-	-	-
Non-Road Internal Combustion Engines	-	-	-	-	-	-	-	-	-	-
Loadout	1	-	-	-	9	-	-	-	-	10
Well Bradenhead	-	-	-	-	-	-	-	-	-	-
Well Maintenance	6	9	-	4	38	4	-	-	-	61

**Table A-5
Planned On-Location Storage Volumes for the Federal RGU 23-6-297 Well Pad**

Material Stored	Number of Tanks	Individual Capacity (barrels)	Total Capacity (barrels)
Oil	0	0	0
Condensate (500s)	2	500	2,600
Condensate (400s)	4	400	
Produced water	9	400	3,600
Gun barrel	3	500	1,500
Blowdown/vent tank	1	80	80
Knockout tank	1	17	17
Methanol tank	1	24	24
Chemicals	4	12	48
Total	25	--	7,869 barrels

**Table A-6
Planned On-Location Storage Volumes for the Federal RGU 44-1-298 Well Pad**

Material Stored	Number of Tanks	Individual Capacity (barrels)	Total Capacity (barrels)
Oil	0	0	0
Condensate	2	500	1,000
Produced water	6	500	3,000
Gun barrel	2	500	1,000
Blowdown/vent tank	2	500	1,000
Chemicals	4	12	48
Chemicals (other)	1	3	3
Total	17	--	6,051 barrels

**Table A-7
Drilling and Completion
Estimated Water Usage for the Federal RGU 23-6-297 Well Pad**

Type	Volume (barrels)
Surface water	75,000
Groundwater	0
Recycled water (produced water)	3,680,000
Recycled water (non-produced water)	0
Unspecified source	0
Total	3,775,000
Percentage recycled	98

**Table A-8
Drilling and Completion
Estimated Water Usage for the Federal RGU 44-1-298 Well Pad**

Type	Volume (barrels)
Surface water	84,000
Groundwater	0
Recycled water (produced water)	4,140,000
Recycled water (non-produced water)	0
Unspecified source	0
Total	4,224,000
Percentage recycled	98