

Laramie 0993-29-01 Well Pad

Water Plan ECMC Rule 304.c.(18)



**Laramie Energy, LLC
760 Horizon Drive, Suite 101
Grand Junction, CO 81506**

Laramie 0993-29-01 Well Pad Water Plan ECMC Rule 304.c.(18)



1. INTRODUCTION – ECMC RULE 304.c.(18) WATER PLAN

The following plan addresses the requirements for the Colorado Energy and Carbon Management Commission’s (referred to hereinafter as ECMC or the Commission) Rule 304.c.(18) Water Plan under 300 Series of the Commission’s rules. The Water Plan also incorporates applicable standards and rules listed in ECMC Rule 437 and Rule 905a.(3).

2. LARAMIE 0993-29-01 WELL PAD

Laramie Energy, LLC (Laramie) (Operator # 10433) is pursuing a Form 2A for an Oil and Gas Location Assessment permit in Mesa County, Colorado. The Laramie 0993-29-01 well pad (Laramie 29-01) is a proposed, new location. Laramie is proposing to drill sixteen (16) new directional wells at the Laramie 29-01 in Section 29 of Township 9 South, Range 93 West, 6th P.M. The Laramie 29-01 will develop fee and federal minerals.

OGDP Title: 2023 Laramie 0993-29-01 OGD

Location Name: Laramie 0993-29-01

Legal Description: NENE Section 29, Township 9 South, Range 93 West, 6th P.M.

Location Coordinates: Latitude: 39.254781°; Longitude: -107.784158°

Elevation (Graded): 7463 feet

County: Mesa

General Location: 8.5 mapped miles east of Collbran, Colorado.

Zone District: Agricultural, Forestry, Transitional District (AFT)

Surface Owner: Laramie Energy, LLC – Operator Owned (Working Pad Surface)

The well pad is located 20.8 access (travel/access) miles east of Collbran, Colorado. The Laramie 29-01 is located approximately 4,858 feet south (mapped distance) from the nearest public road, Highway 330.

Operations will be conducted in the following phases at the Laramie 29-01: construction of well pad, access road, and pipeline installation, drill rig mobilization, drilling, production installation, completions and flowback (including equipment mobilization, staging, and demobilization), production, interim reclamation, inspections, and final grading/reclamation of the site. Inspection activities will occur during the lifespan of the site. Laramie anticipates that the well pad will remain in production for approximately 30 years, based on the average lifespan of wells within the area.

3. WATER VOLUMES

Laramie is proposing to drill sixteen (16) new directional natural gas wells at the Laramie 29-01 well pad. Drilling and completions activities will utilize water sources. Only water-based bentonite drilling fluids will be utilized for the sixteen (16) new wells. Laramie has a sufficient volume of fresh water available by utilizing multiple sources, including sources owned by the Operator. Recycled produced water will be sourced from Laramie’s Harrison Creek Water Treatment Facility (HCWTF) (ECMC Location ID 413056).

**Laramie 0993-29-01 Well Pad
Water Plan
ECMC Rule 304.c.(18)**



3.1. DRILLING

Laramie anticipates that drilling will take approximately 72 days to complete. For drilling activities, fresh water will be used. Laramie has two sources of fresh water for operations within Laramie’s operations area: Groundhog Gulch Pond and Currier Reservoir (**Fresh Water Source Map – Appendix A**). Fresh water is derived from Laramie’s Groundhog Gulch Pond and will be transported via water gathering lines (**Appendix B**).

The following information is based on calculations from water usage records from wells within Laramie’s operations in the Plateau Valley area. During drilling activities, about 2,500 barrels of fresh water is used for drilling mud and about 650 barrels is used for cementing per well. During construction and drilling activities, an estimated 200 barrels of fresh water will be used for dust abatement per well. The total amount of fresh water estimated to be used during drilling for the 16 wells is 6.9 acre-feet.

Table 1: Drilling Phase – Fresh Water Use (barrels)

Activity	Fresh Water (Barrels)	
	Per Well	Well Pad Total – 16 Wells
Cementing	650	10,400
Mud	2,500	40,000
Dust Abatement	200	3,200
TOTAL	3,350	53,600

3.2. COMPLETIONS

During the completions and flowback phase (approximately 40 days) recycled produced water and fresh water will be used. Due to the limited capacity of Laramie's existing infrastructure, both recycled produced water and fresh water to support continuous completions operations. This will reduce Laramie’s completions and flowback operations from 56 days to 40 days. Recycled produced water used during completions will be sourced and treated at Laramie’s HCWTF (Location ID 413056) in accordance with ECMC Rule 905.c.

Table 2: Completions Phase – Water Use (barrels)

Activity: Acid Wash/ Hydraulic Fracturing			
Water Type	Per Well	Well Pad Total – 16 Wells	Acre-Foot
Fresh Water (bbl.)	17,487	279,792	36
Recycled Produced Water* (bbl.)	45,026	720,416	93
Recycled Flowback Water* (bbl.)	17,487	279,792	36
Total (bbl.)	80,000	1,280,000	165

*Recycled produced water and flowback water will not result in fresh water depletion. Recycled produced water and flowback water will be derived from Laramie operations.

**Laramie 0993-29-01 Well Pad
Water Plan
ECMC Rule 304.c.(18)**



The total amount of water estimated to be used during competitions for the 16 wells is 165 acre-feet.

3.3. TOTAL WATER USAGE

Approximately 75% of water utilized during well development activities will be recycled water, resulting in only about 25% fresh water use prior to the production phase.

Table 3: Total Water Usage – Water Use

Phase	Well Pad Total – 16 Wells			
	Fresh	Recycled Produced Water and Flowback*	Total Water Usage	Acre-Feet
Drilling (bbl.)	53,600		53,600	6.9
Completions(bbl.)	279,792	1,000,208	1,280,000	165
TOTAL (bbl.)	333,392	1,000,208	1,333,600	171.9
Acre-Feet	43	128.9	171.9	

*Recycled produced water and flowback water will not result in fresh water depletion. Recycled produced water and flowback water will be derived from Laramie operations.

The total amount of water estimated to be used during pre-production operations for the 16 wells is 171.9 acre-feet.

4. TRANSPORTATION OF WATER SOURCES

Table 4. Water Sources Transportation Table

Type of Water	Operational Phase	Transportation Method
Fresh	Drilling	Existing Water Gathering Line and Temporary Water Gathering Line
Fresh Water, Recycled Produced Water, & Flowback Water	Completions & Flowback	Existing Water Gathering Line and Temporary Water Gathering Line
Produced Water	Generated during Production	Transported to HCWTF via water gathering lines

5. FRESH WATER SOURCES

The Groundhog Gulch Pond is located on property owned by Laramie. Laramie owns the water rights of Groundhog Gulch Pond. Water from the pond is an available source when there are no calls on the river. Historically, Buzzard Creek goes on call during late spring and remains on call until September. During years of reduced precipitation, the water may go on call at Cameo (Colorado River). When Buzzard Creek is not on-call, Laramie is able to fill Groundhog Gulch Pond. Groundhog Gulch Pond is also able to receive irrigation water run-off from Erie Canal during the irrigation season. Groundhog Gulch Pond will be the

**Laramie 0993-29-01 Well Pad
Water Plan
ECMC Rule 304.c.(18)**



primary fresh water source for operations at the Laramie 29-01. Fresh water will be transferred to the Laramie 29-01 well pad via buried and surface water gathering lines.

Table 5: Fresh Water Source

Name	Owner	Parcel #	Coordinates: Latitude/ Longitude	Water Source
Groundhog Gulch Pond	Laramie Energy, LLC 1001 17 th Street Suite 1900 Denver, CO 80202	2661-282-00-319	39.251261°/ -107.781546°	Pond (Surface Water)
Currier Reservoir	Vander Laan Merial C PO Box 27059 Denver, CO 80227-0059	2657-071-00-003	39.290369°/ -107.718387°	Reservoir (Surface Water)
	Takeout - Buzzard Creek Laramie Owned Surface Laramie Energy, LLC 1001 17 th Street Suite 1900 Denver, CO 80202	2661-143-00-288	39.274981° / - 107.743452°	
	Takeout - Buzzard Creek Private Owned Surface (Jery Gunderson) and transported via Laramie owned dedicated fresh water gathering lines	2661-201-00-040	39.267529° / -107.788453°	

Fresh water may also be purchased from Currier Reservoir. The Currier Reservoir established water rights is sourced from the reservoir which is supplied by Sheep Creek. Currier Reservoir sends the fresh water from the Currier Reservoir via Buzzard Creek. Laramie obtains the fresh water from the Currier Reservoir at the takeout location owned by Laramie described in **Table 5**. This reduces mileage associated with the hauling of fresh water.

5.1. PURCHASED WATER

In accordance with ECMC Rule 304.c.(18).B., the seller’s and address of fresh water to be purchased is provided below.

Fresh Water Purchased – Currier Reservoir

Vander Laan Merial C
PO Box 27059
Denver, CO 80227-0059

6. RECYCLED PRODUCED WATER SOURCE

Laramie will utilize reused or recycled water whenever possible to alleviate the heavy demand on local sources of water by recycling water back into operations. Laramie

**Laramie 0993-29-01 Well Pad
Water Plan
ECMC Rule 304.c.(18)**



estimates approximately 75% of water used during pre-production operations will be recycled water, resulting in only 25% of fresh water use.

Recycled produced water and flowback water will be used at the Laramie 29-01, as stated in this Water Plan. Background concentrations of produced water from the HCWTF are provided in **Table 8**.

The 16 new directional wells that will be drilled at the Laramie 29-01 will be drilled to the same formation and produced water will be derived from the same producing horizon. Laramie will comply with Rule 909.j.(6) *“Alternative to the sampling required by Rules 909.j.(1)–(5) the Operator transporting produced water produced from the same formation(s) in the same Field or unit to the same Pit may submit a Form 4 to request the Director’s approval for an alternative sampling program to consolidate the number of samples required from the same formation(s).”* Laramie is currently developing a sampling program for produced water that is obtained from the same producing formation within the Mesaverde Group. Laramie will submit a Form 4 detailing an alternative sampling program for produced water prior to drilling.

Requirements of ECMC Rule 905.a.(3) are detailed throughout the Water Plan and the Laramie 29-01 Waste Management Plan. Brief summaries for ECMC Rule 905.a.(3) are stated below:

Rule 905.a.(3).A. Pre-production operations will be comprised of 75% recycled water due to Laramie utilizing recycled produced water and flowback water during completions.

Rule 905.a.(3).B. Volumes of produced water are identified in the Laramie 29-01 Water Plan. Tables 1, 2, and 3 identified types of water and anticipated volumes.

Rule 905.a.(3).C. Recycled produced water used during completions will be sourced from Harrison Creek Water Treatment Facility (HCWTF) (Location ID 413056).

Rule 905.a.(3).D. Laramie will not add additives listed in Table 437-1 to produced water. Laramie will test for chemicals listed in Table 437-1 to determine background concentrations of produced water.

Rule 905.a.(3).E. Produced water will be disposed of at Laramie’s permitted injection wells as shown below. Produced water disposal is detailed in the Laramie 0993-29-01 Waste Management Plan.

TABLE 6. LARAMIE OPERATED INJECTION WELLS		
WELL NAME	UIC FACILITY ID	Legal Description
Currier /1-13 (BK1) SWD	160026	NESW Section 1 T9S R93W
Buzzard Creek Unit 12-4	159355	NWNW Section 12 T9S R93W
Vega Unit 34-13D	159294	SENE Section 33 T9S R93W
ZIEGAL 7-1 SWD	159172	SENE Section 7 T10S R94W

**Laramie 0993-29-01 Well Pad
Water Plan
ECMC Rule 304.c.(18)**



Rule 905.a.(3).G. Water usage for completions activities will be comprised of recycled produced water, flowback water, and fresh water. Utilization of recycled produced water and flowback water during completion will result in 75% of recycled water being used for pre-production activities.

Rule 905.a.(3).I. To transfer freshwater during drilling and completions, Laramie will utilize a temporary 12-inch HDPE dedicated freshwater surface water lines to transfer freshwater from Laramie’s Groundhog Gulch Pond to the Laramie 29-01 well pad. This temporary surface water line will be laid on Laramie owned surface which is previously disturbed. A temporary produced water surface line will be laid on Laramie owned surface, which will connect the Laramie 29-01 well pad to the Groundhog Pump Station. The 12-inch (steel or composite) temporary surface produced water line will be approximately 1,400 feet in length and will be used to move recycled produced water to the well pad for completions activities and used as take away for flowback water. No surface disturbance will result from the placement of the temporary surface water lines. These lines will be removed following completions and flowback operations. For production, approximately 877 feet of 6-inch HDPE water gathering line will be buried and will connect to Laramie’s existing 8-inch HDPE waterline adjacent to the proposed pad. The water will be pumped to Laramie’s HCWTF in the NE¼NE¼ Sec. 22, Township 09 South, Range 93 West. By utilizing existing nearby infrastructure, Laramie reduces the need for transport produced and flowback water by truck hauling.

Recycled produced water and flowback will be transported via Laramie’s water gathering system (**Appendix B**). Calculations are based on produced water usage records from wells within Laramie’s operations area. During drilling activities, cementing uses about 650 barrels per well, and completions use about 80,000 barrels per well. Produced water will be sourced from Laramie’s water treatment facility, detailed in **Table 7**.

Table 7: Recycled Produced Water Source

Name	Owner	Parcel #	ECMC Location ID	Coordinates: Latitude/ Longitude
Harrison Creek Water Treatment Facility	Laramie Energy, LLC 1001 17 th Street Suite 1900 Denver, CO 80202	2661-221-00-143 & 2661-221-00-145	413056	39.265921° / -107.748165°

7. HYDRAULIC FRACTURING CHEMICAL ADDITIVES - RULE 437

Laramie does not use additives listed in Table 437-1 in produced water, adhering to Rule 437.a. Laramie collected samples of untreated produced water from the HCWTF as representative of background concentrations from the formation to be drilled at the Laramie 29-01, displayed in **Table 8**. Laramie will utilize produced water that has naturally occurring trace amounts of chemicals listed in Table 437-1. Background concentrations of

**Laramie 0993-29-01 Well Pad
Water Plan
ECMC Rule 304.c.(18)**



the chemicals listed in Table 437-1 for the source water will be provided via sundry following further testing and analysis.

Chemical constituents listed in Table 437-1 and have a standard in Table 915-1 are:

- Benzene
- Ethylbenzene
- Xylene
- 1,3,5-trimethylbenzene

Analytical results of produced water from the HCWTF for Rule 437.c. are shown in **Table 8**.

**Table 8: HCWTF Pad Produced Water Background Analytical Results for
ECMC Rule 437.c.***

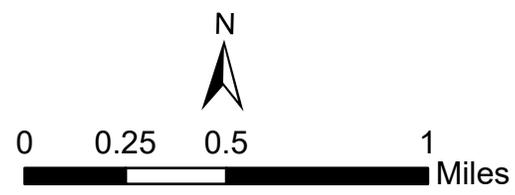
Analyte	Benzene	Ethylbenzene	Xylene	1,3,5- Trimethylbenzene
Background Concentrations (mg/L)	11.8	1.04	15.9	0.527

*Samples collected November 9th, 2022, from the HCWTF Pad (ECMC Location ID 413056).

LIST OF APPENDICES	
Appendix A	Fresh Water Source Map
Appendix B	Laramie Operated Water Gathering System

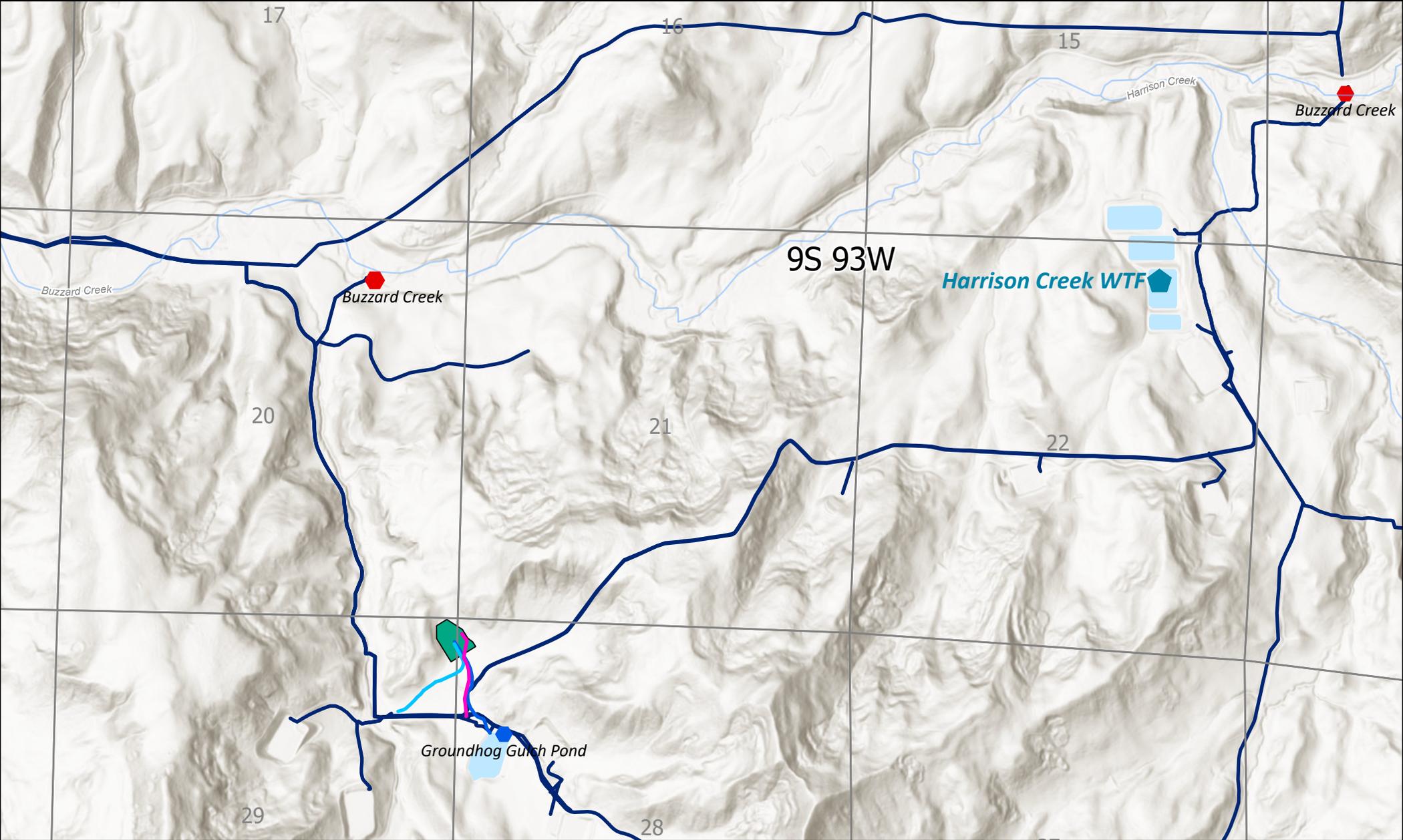


-  Fresh Water Take Out
-  Fresh Water Sources
-  Site Location



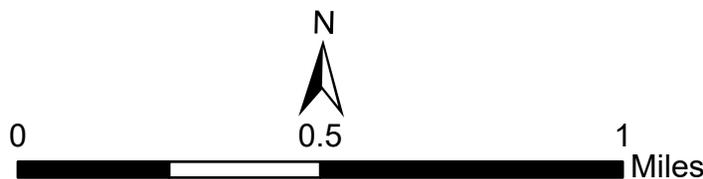
APPENDIX A
Fresh Water Source Map
ECMC Rule 304.c.18.H
Laramie 0993-29-01
NENE, Sec. 29
T9S R93W 6th PM
Mesa County, CO





-  Fresh Water Take Out
-  Fresh Water Sources
-  Water Treatment Facility
-  Ponds
-  Site Location
-  Water Gathering System

- Proposed Water Lines**
-  Temporary Dedicated Fresh Water Surface Line
 -  Temporary Produced Water Surface Line
 -  Buried Water Gathering Line (877ft)



APPENDIX B
Water System Map
 ECMC Rule 304.c.18.H
Laramie 0993-29-01
 NENE, Sec. 29
 T9S R93W 6th PM
 Mesa County, CO

