

Stormwater Management Plan

Red Rocks Oil and Gas Development Plan Amendment 2

This Stormwater Management Plan has been prepared by Desert Eagle Operating, LLC (DEO) for its Red Rocks Oil and Gas Development Plan – Amendment 2 in Las Animas County, Colorado. Amendment 2 consists of five proposed conventional vertical helium gas wells. The Plan addresses the Colorado Energy & Carbon Management Commission (ECMC) requirement at Rule 304.c.(15) to prepare a Stormwater Management Plan consistent with Rule 1002.f. The five proposed locations are listed in Table 1.

Table 1. Locations

Location	Qtr Qtr	Section/Township/Range	Lat/Lon
Red Rocks 1-09	SE¼NE¼	Section 1, T30S R55W	37.460372, -103.517227
Red Rocks 1-15	NW¼NE¼	Section 1, T30S R55W	37.465009, -103.522500
Red Rocks 35-01	SE¼SE¼	Section 35, T29S R55W	37.467959, -103.537764
Red Rocks 35-08A	NE¼SE¼	Section 35, T29S R55W	37.473477, -103.536136
Red Rocks 35-10	SW¼NE¼	Section 35, T29S R55W	37.475925, -103.541431

1.0 Oil and Gas Location and Construction Site Details

1.1 Proposed Oil and Gas Operations

DEO proposes to develop helium gas using one conventional vertical helium gas well at each location. The wells will be drilled with air using a water well-sized drill rig. Wells will be approximately 1,900 feet deep. There will be no drilling mud, hydraulic fracturing, stimulation, or flowback. The wells are not expected to produce hydrocarbons or water, based on results from DEO wells already drilled in the area. There will be no fluid storage on site during production.

The locations are on fee surface leased from a private landowner. The locations will produce fee minerals. Site elevations are listed in Table 2.

Table 2. Site Elevations

Location	Elevation (feet)
Red Rocks 1-09	5,472
Red Rocks 1-15	5,486
Red Rocks 35-01	5,555
Red Rocks 35-08A	5,560
Red Rocks 35-10	5,547

Estimated disturbance acreages for each Oil and Gas Location are listed in Table 3.

Table 3. Location Disturbance

Disturbance	Disturbance (ac)
Oil and Gas Location	1.10
Working Pad Surface	1.00
Production Pad	0.20
Interim Reclamation	0.90

Estimated durations for each phase of development are listed in Table 4.

Table 4. Phases of Development

Phase	Days
Construction	2
Drilling	5
Completion	5
Interim Reclamation	10
Production	10 years (est.)

1.2 Site Description

The environmental setting is arid rangeland, which is sparsely vegetated. The area is previously disturbed from ranching, dirt roads, and oil and gas well development.

An environmental on-site review was conducted November 16-19, 2023. The review did not identify any immediately downgradient waters of the state, wetlands, or riparian corridors. The nearest downgradient water features are listed in Table 5 and shown on the Form 2A, Hydrology Maps.

Table 5. Site Elevations

Location	Distance/Direction (ft)	Description
Red Rocks 1-09	800 SW	Field verified upland swale lacking an ordinary high water mark (OHWM)
Red Rocks 1-15	920 S	Field verified gully lacking an OHWM
Red Rocks 35-01	1,200 NE	Ephemeral downgradient of the mesa top
Red Rocks 35-08A	2,400 SE	Ephemeral downgradient of the mesa top
Red Rocks 35-10	610 NE	Ephemeral ledge lacking an OHWM

1.3 Nature of Construction Activity

Each location is relatively flat with approximately 15 feet, or less, of elevation change across the 1.10-acre Oil and Gas Location. There will be no anticipated cut or fill needed to support well drilling.

Estimated cubic yards of topsoil stockpiles, height, and slope are listed by location in Table 6.

Table 6. Topsoil Salvage by Location

Location	Salvage (cy)	Height (ft)	Slope
Red Rocks 1-09	<50	2.3	3:1
Red Rocks 1-15	75	2.9	3:1
Red Rocks 35-01	75	2.8	3:1
Red Rocks 35-08A	100	3.4	3:1
Red Rocks 35-10	125	3.8	3:1

The well will be drilled with air. There will be no hydraulic fracturing, stimulation, flowback, or any anticipated produced water. Storage tanks during well drilling and completion will consist of one 100-bbl freshwater tank on a water truck for cementing and dust suppression and one 300-gallon fuel tank for the drill rig.

1.4 Sequence of Construction Activities

Estimated durations by phase are listed in Table 4. Interim reclamation will occur during the first growing season and within 6 months after well development is complete at each location.

1.5 Access Road and Flowline Corridor Construction

Existing and new dirt access roads will be used to access the locations from County Road (CR) 177.9. Roads will be approximately 15 feet wide. Areas of soil disturbance for new access are listed in Table 7. Access roads are shown on the Form 2A, Access Road Maps. New access roads will be constructed using a bulldozer and motor grader. Access roads will remain in place during production.

Table 7. New Access Disturbance

Location	New Access (ft)	New Access (ac)
Red Rocks 1-09	910	0.31
Red Rocks 1-15	70	0.02
Red Rocks 35-01	140	0.05
Red Rocks 35-08A	130	0.04
Red Rocks 35-10	210	0.07

Areas of soil disturbance for new off-location flowlines are listed in Table 8. Flowlines are shown on the Form 2A, Related Location and Flowline Maps.

Each helium well will tie into the existing Red Rocks gathering system. Three of five locations require new off-location flowlines for the tie in, as listed in Table 8. In that case, off-location flowline corridor disturbance will be an estimated 20 feet wide for installation of a 2-foot-wide flowline trench and 8-inch polyethylene flowline. The trench will be approximately 48 inches deep with 3 feet of soil cover.

Vegetation, topsoil, and subsoil will be segregated during flowline installation. Topsoil will be segregated based on changes in physical characteristics. It will be windrowed along the flowline trench. After flowline installation and integrity testing, the trench will be backfilled. The soil layers will be replaced in the order in which they were removed. The operator will identify appropriate soil amendments to promote vegetative growth. Seeding and revegetation will provide cover and prevent soil erosion. The area will be monitored for vegetation growth.

Table 8. New Off-location Flowline Disturbance

Location	New Off-location Flowline (ft)	New Off-location Flowline (ac)
Red Rocks 1-09	2,050	0.94
Red Rocks 1-15	0	0
Red Rocks 35-01	0	0
Red Rocks 35-08A	1,260	0.58
Red Rocks 35-10	20	0.01

2.0 Supplemental Site Information

2.1 Site Area and Disturbance Area

Each location is relatively flat with approximately 15 feet, or less, of elevation change across the 1.10-acre Oil and Gas Location. There will be no anticipated cut or fill needed to support well drilling. Areas of disturbance are listed in Table 3 and shown on the Form 2A, Construction Layout Drawings.

2.2 Soil Description, Data, and Erosion Potential

Soil units are listed in Table 9. Soil unit boundaries are shown on the Form 2A, Soil Unit Maps.

Table 9. Soil by Location

Location	Oil and Gas Location	Access	Off-location Flowline
Red Rocks 1-09	DaE	DaE, VT, WC	DaE, VT

Location	Oil and Gas Location	Access	Off-location Flowline
Red Rocks 1-15	DaE	DaE, VT, WC	No new disturbance
Red Rocks 35-01	DaE, WC	WC	No new disturbance
Red Rocks 35-08A	VT	VT	VT
Red Rocks 35-10	DaE, VT	VT	VT

DaE – Dalerose-Rock outcrop complex, 3 to 25 percent slopes. The A-horizon is 0 to 5 inches of gravelly fine sandy loam overlaying 5 to 10 inches of gravelly loam. Well drained. Approximately 1 inch available water capacity. 6 to 20 inches to restrictive feature.

VT – Villedry-Travessilla complex, 1 to 8 percent slopes. The A-horizon is 0 to 5 inches of silt loam and sandy loam overlaying 4 to 11 inches of silt loam and sandy loam. Well drained. 1.6 to 6.6 inches available water capacity. 6 to 40 inches to restrictive feature.

WC – Plughat-Villegreen complex, 1 to 4 percent slopes. The A horizon is 0 to 6 inches of silt loam and loam overlaying 3 to 9 inches of silty clay loam. Well drained. 6.0 to 9.6 inches available water capacity. 30 to 51 inches to restrictive feature.

2.3 Vegetation Description

Predominant vegetation by location is listed in Table 10. The findings are based on the November 2023 environmental field review.

Table 10. Vegetation

Location	Vegetation
Red Rocks 1-09	Great Plains yucca, sideoats grama, blue grama, gambel oak
Red Rocks 1-15	Tree cholla, one-seed juniper, sideoats grama, blue grama
Red Rocks 35-01	Tree cholla, one-seed juniper, Great Plains yucca, blue grama
Red Rocks 35-08A	Tree cholla, one-seed juniper, Great Plains yucca, blue grama
Red Rocks 35-10	Tree cholla, one-seed juniper, Great Plains yucca, blue grama

2.4 Pre-disturbance Coverage Estimate

Pre-disturbance coverage by location is listed in Table 11. The findings are based on the November 2023 environmental field review.

Table 11. Percent Vegetation Cover

Location	Vegetation Cover (%)
Red Rocks 1-09	70
Red Rocks 1-15	75
Red Rocks 35-01	75
Red Rocks 35-08A	70
Red Rocks 35-10	75

2.5 Known Weed Infestations

There were no noxious weeds identified at any of the Oil and Gas Locations during the November 2023 environmental field review. Two specimens of wavyleaf thistle (*Cirsium undulatum*) identified at the Red Rocks 35-01 location are not Colorado Department of Agriculture listed A, B, or C species.

2.6 Non-stormwater Discharges

The location will have no non-stormwater discharges.

2.7 Receiving Waters

The location has no immediately downgradient receiving water, as listed in Table 5.

3.0 Stormwater Management Control Measures

3.1 Potential Pollution Sources

Potential pollution sources during construction are soils and sediment from disturbed areas and potential fluid drips, leaks, or spills during well development and production. The sources are described below.

3.2 Locations Listed in Rule 1002.f.(3).A

Locations listed in Rule 1002.f.(3).A are described below.

Chemicals and Materials

The well will be drilled with air. There will be no mud, hydraulic fracturing, stimulation, or flowback. During well development, chemicals and material brought to the site will consist predominantly of lubricants. Lubricants will be properly stored and capped in their original containers. During production, product used to support the well or wellhead will not be left on site. Material is further described below for Waste Disposal Practices.

Fueling

The drill rig will have a separate 300-gallon fuel tank. The fuel tank will be double walled for secondary containment. Vehicles will not be fueled on site.

Produced Water and Drilling Fluids

There will be no anticipated produced water, based on previous DEO wells drilled in the area. There will be no drilling fluids. The wells will be drilled with air.

Outdoor Processing Activities

There will be no on-site processing. The wells will produce helium gas with take away at the wellhead using the DEO 8-inch buried polyethylene gathering system with additional tie in by location, as listed in Table 8.

Significant Dust or Particulate Generating Processes

Exposed soils and drilling have potential to generate dust. Dust during well drilling will be controlled using the Cambelt Sandmaster equipment with integrated filter socks shown on the Form 2A, Preliminary Drill Rig Layouts, and freshwater delivered by water truck tank as needed on access roads for dust suppression.

Erosion and Vehicle Tracking

There is not a sufficient elevation change between the Working Pad Surfaces and surrounding topography to result in significant erosion. Location access will tie into dirt road. Aggregate will be placed as needed at the apron where the access road ties into the public road. The aggregate will serve as a wheel shaker and erosion control at the tie in.

Waste Disposal Practices

Wastes will not be left on site during production. Wastestreams and disposal are described in the Form 2A, Waste Management Plan. Drill cuttings will be containerized in a steel tank for off-site disposal. Unused bagged cement will be removed for use at another well site. There will be no anticipated cement returns because the pumper stops the cement in the casing when it nears the surface to avoid generating excess cement or waste. A temporary trailer-mounted portable toilet will be removed and trailered back to the rental company for cleanout. Trash will consist of domestic trash and packaging. It will be containerized to prevent it from blowing and access from bears.

Leaks and Spills

A synthetic liner will be placed under the drill rig to capture incidental leaks or drips. Spill control material will be available during well development. The well driller will be equipped with a spill kit consisting of absorbents (e.g., socks and bagged absorbent).

Ground Disturbing Maintenance Activities

After construction and interim reclamation, there will be no anticipated ground disturbing maintenance activities.

3.3 Pollution Prevention

Erosion Control

There is approximately 15 feet, or less, of elevation change across the 1.10-acre Oil and Gas Locations. Stormwater flow direction is shown on the Form 2A, Construction Layout Drawings. The Construction Layout Drawings show that topsoil salvage will be mounded on a topsoil stockpile with an approximately 3:1 slope to avoid loose soils. Topsoil will be used on the 0.90-acre portion of the Working Pad Surfaces identified for interim reclamation during the first growing season and within 6 months after well development is complete at each location.

Secondary Containment

Tanks during well drilling will consist of a water truck with a 100-bbl freshwater tank and a 300-gallon fuel tank with a double wall for secondary containment. The drill rig will have a synthetic liner underneath to capture drips or leaks. There will be no tanks on the location during production. There will be no fuel storage on the location during production. The Larkin-type natural gas wellhead will flow to a buried 8-inch polyethylene off-location flowline.

Spill Prevention

There will be no fluids, loading or unloading, or tank storage during production. Best Management Practices (BMPs) during well drilling are described below.

Reclamation

Each location will be reduced to approximately 0.20 acres after well development is complete. The remaining area will be revegetated and stabilized during interim reclamation.

3.4 Structural and Non-structural Practices

Structural Practices

The locations will have staked stormwater wattles to control run on and run off. The placement of wattles is shown on the Form 2A, Layout Drawings. Placement corresponds to the direction of surface flow. The erosion controls will minimize run on to the location and run off of soils and sediment in the event of a significant storm event and prior to interim reclamation. After interim reclamation, if vegetation does not provide sufficient armoring, erosion controls will be maintained and inspected to prevent soils and sediment from leaving the locations. If there is evidence of ponding or erosion at a location, stormwater diversions will be created to avoid stormwater channelization. During production, there will be only a wellhead and buried off-location flowline on each location.

Non-structural Practices

Disturbances will be limited to the portions of the Oil and Gas Location needed to support well development and production so that vegetation and/or stable soils remain in place. Disturbed portions of the Working Pad Surface not needed for production will be stabilized and revegetated as part of interim reclamation. Trash will be contained. Vehicles and equipment will be monitored for leaks during well development. A spill kit with absorbents will be made available to address inadvertent spills. Ingress, egress, and parking will occur in designated areas. Inspections will be performed daily during well drilling and completion. Inspections will be performed routinely during well production, as described below. The locations and stormwater controls will be maintained to prevent deterioration resulting in erosion or transport of soils and sediments off site.

3.5 Erosion Controls

Erosion controls using wattles are shown on the Form 2A, Layout Drawings. They will prevent movement of sediment and soils from stormwater runoff. Designated vehicle ingress and egress will help to avoid vegetation and soil disturbance resulting in erosion. Interim reclamation and revegetation will occur when well development is complete. Seeding will occur during the first growing season. Revegetation will be monitored for growth and a vegetative cover that reflects 80 percent of the reference area condition.

3.6 Vehicle Tracking Control

Location access ties into existing dirt road. There will be no access onto paved roads. Aggregate will be placed as needed at the apron where the access road ties into the public road. The aggregate will serve as a wheel shaker and erosion control at the tie in.

3.7 Materials Handling and Spill Prevention

Routine inspection of valves, transfer lines, tanks, and secondary containment during well development will identify potential damage, deterioration, or signs of staining and leaks. Shut off valves will be function tested to ensure adequate containment of fluids. Trash will be containerized to prevent it from blowing and bear access. Trash will be transported off site for disposal. Vehicles and equipment used on site during drilling and production will be properly maintained and will be monitored for leakage. Site personnel will be trained in spill prevention, response, and response equipment. Training will include how spills or releases will be investigated, controlled, and contained in accordance with Rule 912.a.

3.8 Management of Waste Material

An estimated 48 cubic yards of drill cuttings will be generated at each location. Drill cuttings will be containerized in a steel tank for off-site disposal. Unused bagged cement will be removed for use at another well site. There will be no anticipated cement returns. A temporary trailer-mounted portable toilet will be removed and trailered back to the rental company for cleanout. Trash will consist of domestic trash and packaging. It will be containerized to prevent it from blowing and access from bears. There will be no produced water or fluid storage tanks during production.

4.0 Site-specific Construction and Stormwater/Erosion Control Measure Drawings

In accordance with ECMC guidance, this section refers to the Form 2A, Construction Layout Drawings and Facility Layout Drawings.

5.0 Inspection and Maintenance Procedures

5.1 Trained and Qualified Site Inspectors

Stormwater inspections will be conducted by personnel trained on the content of this Stormwater Management Plan. Personnel will be qualified regarding stormwater preventative measures, practices, controls, and maintenance in the field.

5.2 Scope of the Inspection

During stormwater inspections, personnel will review the Oil and Gas Location perimeter; erosion control measures; disturbed areas and reclaimed areas; equipment; and vehicle access. Inspections will look for damaged or missing wattles, missing staking, evidence of erosion or uncontrolled stormwater, pooled or ponding stormwater, improper drainage, and evidence of soils or sediment leaving the location. Inspections will review the locations for signs of erosion. Stormwater control maintenance needs will be identified and addressed with appropriate follow up.

5.3 State and Local Inspection Requirements

The operator will comply with construction stormwater management requirements administered by the Colorado Department of Public Health and Environment (CDPHE). Las Animas County does not separately regulate stormwater.

5.4 Inspection Procedures and Frequency

The Oil and Gas Locations and stormwater controls will be monitored daily during site preparation and well development. Evidence of soil or sediment runoff, maintenance needs, and any spills or leaks will be addressed. Following well development, stormwater inspection will occur at a minimum of once every 7 days, consistent with stormwater requirements administered by CDPHE. Inspection frequency may be reduced to once every 30 days after ground disturbance is complete and the site is stabilized with interim reclamation. During inspection, the site operator will look for evidence of erosion, runoff, and stabilization and vegetative success from interim reclamation. Inspections will ensure that erosion and sediment controls identified in this plan are maintained, functioning properly, and that there is no evidence of movement of soils, ponding, or erosion.

5.5 Reporting and Recordkeeping Requirements

Recordkeeping will include conformance with recordkeeping requirements administered by CDPHE. During well drilling, stormwater records will be included with drilling operations records. During production, the site operator will record stormwater inspections and maintenance needs as part of the maintenance records for the location. Documentation will be kept in the operator's Dallas, Texas office.

6.0 Site-specific Construction and Stormwater/Erosion Control BMPs

Table 12. Best Management Practices

Structural
<ul style="list-style-type: none"> • Wattles will be placed where shown on the Form 2A, Layout Drawings. They will be staked in place.
<ul style="list-style-type: none"> • Stormwater diversions will be created when there is evidence of ponding or erosion runnels.
<ul style="list-style-type: none"> • The fuel tank used during well development will be double walled for secondary containment. There will be no separate fueling on the location.
<ul style="list-style-type: none"> • The drill rig will have a liner under the motor to capture drips or leaks.
Non-Structural
<ul style="list-style-type: none"> • Personnel will receive training for how spills or releases will be investigated, controlled, and contained.
<ul style="list-style-type: none"> • During pre-production, inspection of equipment will occur daily during well development to detect staining, drips, or leaks that could result in spills.
<ul style="list-style-type: none"> • Vehicles will be monitored for leaks during well development.
<ul style="list-style-type: none"> • During well drilling and completion, absorbent pads and absorbents will be available to support cleanup of leaks or spills. A larger incident would be bermed, and the operator would use third-party support, as needed.
<ul style="list-style-type: none"> • Waste materials will be bagged or containerized to avoid contact with precipitation.
<ul style="list-style-type: none"> • Ingress, egress, and parking will occur in designated areas.
<ul style="list-style-type: none"> • The well pad will be inspected for excessive erosion. Diversions will be installed if there is evidence of runnels or ponding.
<ul style="list-style-type: none"> • Stabilization and revegetation will be performed as part of interim reclamation during the first growing season and within 6 months after well development is complete.
<ul style="list-style-type: none"> • During production, an operator will be on site approximately twice weekly to oversee areas that require corrective action.
<ul style="list-style-type: none"> • The Oil and Gas Location and stormwater controls will be monitored daily during site preparation and well development. After well development, stormwater inspections will occur at a minimum of once every 7 days, consistent with stormwater requirements administered by CDPHE. The inspection frequency may be reduced to once every 30 days after ground disturbance is complete and the site is stabilized with interim reclamation.
<ul style="list-style-type: none"> • The location and access road will not be accessible to the public to prevent unauthorized access and excessive wear on access roads.