

IGW 154 Site Specific Data Sheet Elm Ridge Exploration Company, LLC July 2014

INTRODUCTION

This Site Specific Data Sheet (SSDS) includes the best management practices (BMPs) and reclamation plans for Elm Ridge Exploration Company (Elm Ridge) IGW 154 well in accordance with the Colorado Department of Public Health and Environment (CDPHE) requirements. This SSDS is a supplemental attachment to the Elm Ridge Master Stormwater Management Plan (MSWMP) for oil and gas construction activities in the Ignacio-Blanco oil and gas field. BMP diagrams and additional general stormwater information are also included in the MSWMP.

The SSDS and MSWMP can be obtained from Elm Ridge. Terry Lindeman is the Elm Ridge contact person and his contact information is listed below:

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PROJECT DESCRIPTION

The proposed work area would be located on and off the existing Elm Ridge A H Terrell #1 well pad. This area of existing well pad disturbance is 1.04 acres. The total area of the proposed well pad construction is 0.98 acre, of which, 0.36 acre would be new disturbance off the existing pad. Slopes within the proposed project average 0 to 3 percent. Disturbance would include the removal of soil to create a level pad of 170 feet by 250 feet for drilling. The wellhead and additional aboveground surface equipment and infrastructure will be the only items remaining on the pad once the well goes to completion.

ESTIMATED TOTAL AREA OF THE SITE TO UNDERGO CLEARING, EXCAVATION, OR GRADING

The maximum disturbance associated with the proposed permanent well pad would be 0.98 acre, of which, 0.36 acre would be new disturbance.

EXISTING SOIL

Parent materials found at the project site and surrounding areas include residuum weathered from shale. The surveyed soil-map unit for the project area consist of Zyme-Rock outcrop complex, 12 to 65 percent slopes. This soil type is well drained. Zyme-Rock outcrop soils have a low potential for water erosion and a moderate potential for wind erosion (NRCS 2014¹).

¹ Natural Resources Conservation Service (NRCS). 2014. Web Soil Survey. Available online at <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed July 2014.

DESCRIPTION OF EXISTING VEGETATION AND ESTIMATE OF PERCENT OF GROUND COVER

The proposed well pad would be within an existing well pad disturbance area. The majority of the project area is bare ground with no ground cover. Previously disturbed, reclaimed vegetation accounts for a small portion of the project area. Ground cover was visually estimated at approximately 20 percent in reclaimed areas during the July 2014 site visit.

NAME OF RECEIVING WATER AND TYPE OF OUTFALLS

The nearest perennial water (indicated on the U.S. Geological Survey topographic map) is the Florida River, located approximately 1.6 miles west of the project area. Drainage from the proposed project area generally flows north then northwest, through unnamed intermittent drainages to the Florida River. There are no perennial water sources, wetlands, seeps, springs, or riparian areas within the proposed well pad or surrounding area.

PROJECT-SPECIFIC BMPs

The following BMPs are site-specific BMPs identified by Ecosphere Environmental Services during a field visit conducted in July 2014. BMP diagrams are included in the MSWMP. BMPs would be maintained or amended by Elm Ridge as site conditions change throughout the construction and reclamation process. Stormwater inspections would occur as stipulated in the MSWMP and required by the CDPHE. A map showing the BMP locations is attached. Site-specific BMPs will be installed pre-construction and during the construction process; BMPs will continue to be maintained until the site is finally stabilized per CDPHE requirements. Table 1 describes the structural BMPs used at IGW 154.

Table 1. Structural BMPs

BMP	How It Works	Location
Culvert with Culvert Protection	Culverts allow stormwater to flow through the project area without causing erosion. Inlet and outlet protection prevents soil and debris from entering storm drain inlets and prevents scouring at outlets by reducing flow.	Culvert with culvert protection at access road/well pad entrance.
Erosion Control Logs	Erosion control logs are made of fibrous material and work by trapping sediment. Erosion control logs must be trenched into the ground to be effective.	Around perimeter of the well pad.
Diversion Ditch with Wattles	The diversion ditch diverts surface run on, around the well pad.	A diversion ditch would be located on top of the slope on the southwest, west, and northwest sides of the well pad to divert water around the well pad. Another diversion ditch will be located around the perimeter of the well pad area to divert water from the well pad.
Fuel and Chemical Containment	Fuel and chemicals stored on-site will be within secondary containments to reduce the potential for spills or off-site releases.	Where needed.

BMP	How It Works	Location
Tracking Control	An effective vehicle tracking control helps remove sediment (mud or dirt) from vehicle tires, reducing the potential for tracking onto off-site paved roadways.	If and where needed.
Earth Berm	A compacted and stabilized earth berm greatly helps prevent any off-site releases.	On north, east, and southeast of the well pad.
Riprap	Riprap is protection consisting of a layer of angular rocks. The rocks slow stormwater flow, thereby reducing erosion and settling out sediment.	Installed at inlets and/or outlets of diversion ditches, drainpipes, and culverts.
Silt Trap	Silt traps located at the end of diversion ditches collect sediment.	Installed at the end of diversion ditches.
Tackifier	Used to stabilize bare soil from wind and water erosion. The tackifier is combined with seed to encourage germination as well.	On cut slopes and fill slopes of the disturbance area on the well pad.

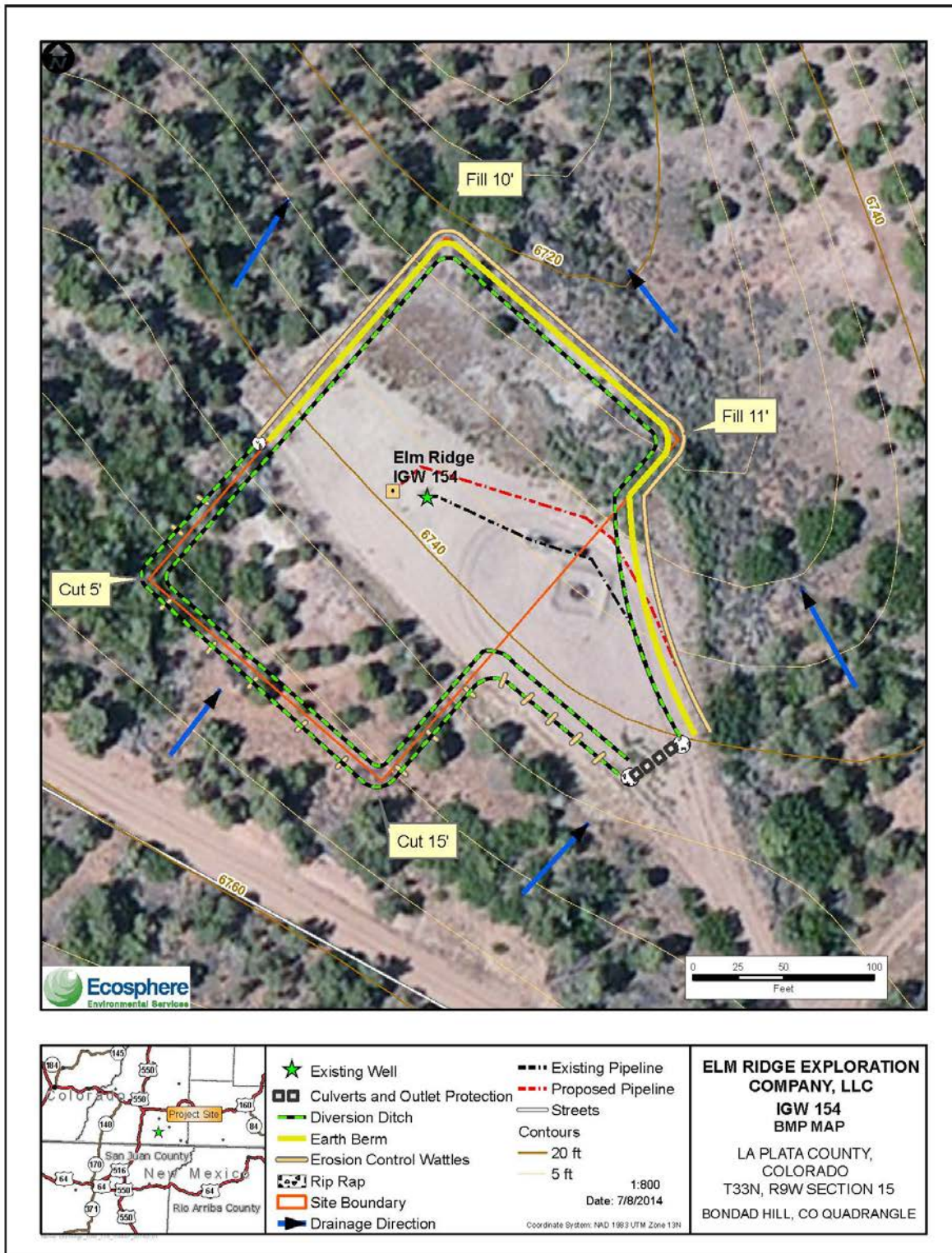
NON-STRUCTURAL BMPs

Table 2 includes non-structural BMPs that will be applied to the entire project area where needed, beginning with construction and continuing until final stabilization is reached.

Table 2. Non-Structural BMPs

BMP	How It Works	Location
Soil Roughening	Surface roughening creates small ridges and gullies with the teeth of the bucket on the front-end loader or with the grooves of tracked equipment. These ridges and gullies go across the slope (or along the contour of the slope), trapping stormwater and helping with revegetation. To create these ridges/gullies with tracked equipment, the equipment should be run up/down the slope.	All disturbed areas where needed.
Equipment Storage	All equipment will be contained within the ROW disturbance.	Within disturbance area where needed.
Rapid Reclamation	Rapid reclamation (surface contouring, surface roughening, seeding, and weed control) help to stabilize soil with vegetation and reduce runoff.	Within disturbance area where needed.
Dust Mitigation	Whenever needed, a water truck will be used to add moisture to the soil that will prevent the soil from becoming airborne and leaving the site.	Within disturbance area where needed.

PROJECT BMP MAP



Addendum Addressing Deficiencies and Revising

BMP Narrative-

Elm Ridge IGW 154

Deficiencies:

Item 1)- Remedy:

Owner was present at the onsite on June 19, 2014.

Item 2.)-Remedy:

The surface location has been relocated 10' to the North, which, according to the best resources available for measurement at this time, locates it outside the 500' Exception Location/Buffer Zone and also places the surface location of the well further from the existing residence.

A new Survey and a new Site BMP map have been prepared and are attached.

Items 3)-Remedy

The existing well location is oriented Southeast to Northwest. To the North there is a substantial drop in elevation which slopes to a drainage feature with numerous trees in the area. To the South, there is a corresponding rise in elevation, also with numerous trees in the area.

Cutting the location into the hillside along the entire South edge of the pad would require a substantial expansion of the disturbed area and remove many more trees than the existing plan. It would also put most of the operational area closer to the existing residence on the property.

Expanding the pad to along the entire North side would require removing many more trees than the existing plan requires, plus this entire area would require a substantial amount of fill material which would have to be compacted and structurally stabilized which would impact the existing topography and stormwater drainage to a greater degree than the current plan.

The existing plan minimizes disturbance and the amount of fill material that will need to be brought to the location since the material from the cut on the South end can be used as fill on the North end of the location.

Item 4)- Remedy: Noise Mitigation:

During drilling operations, Elm Ridge will take whatever steps are necessary that may be practical and possible to do on the location in order to comply with COGCC Rule 602.c.(1)

This may include erecting sound walls and stacking straw bales oriented in a manner that will mitigate operational noise to light industrial standards. The approximate location of the sound walls/straw bales is noted on the accompanying IGW 154 BMP Map.