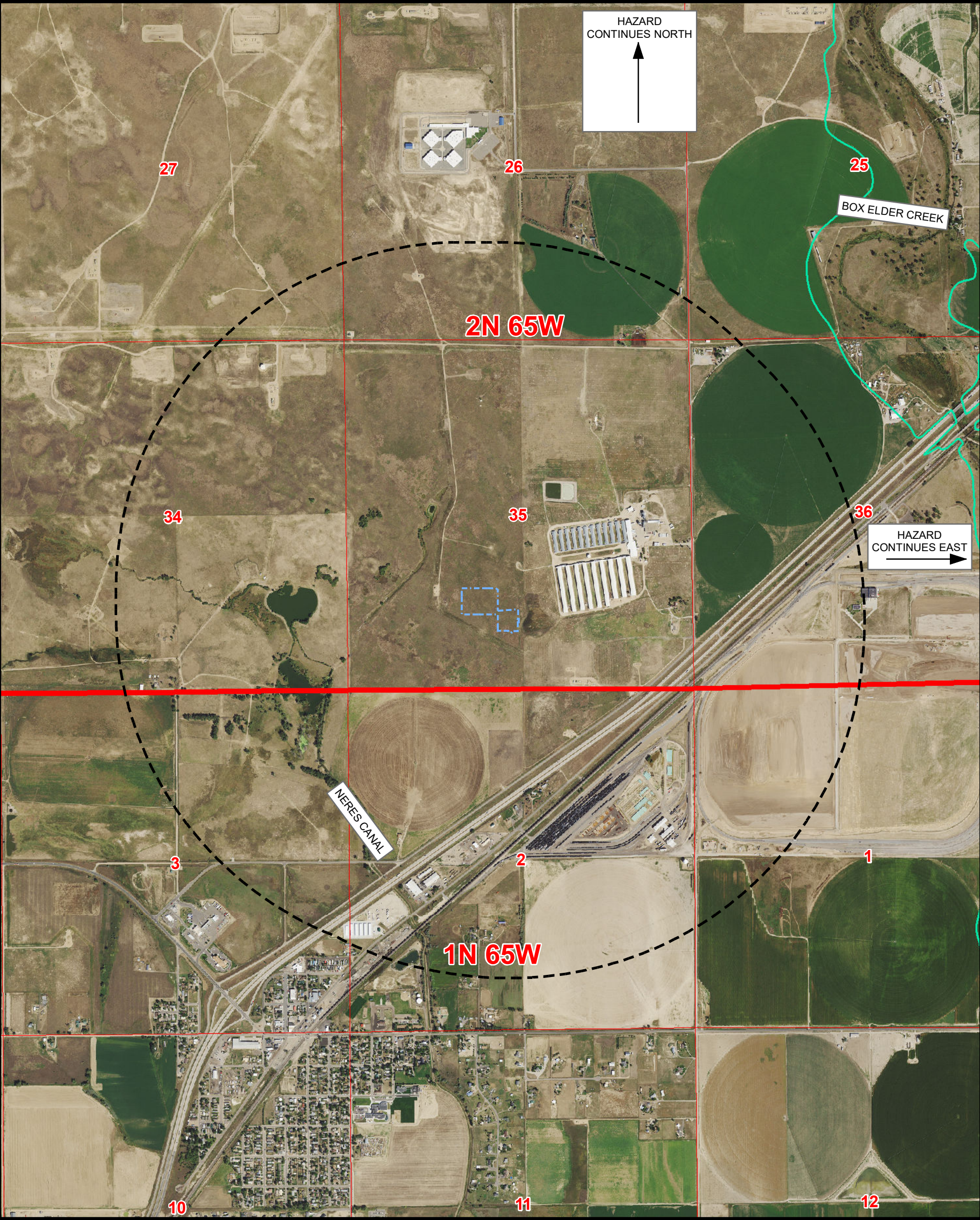


GEOLOGIC HAZARD MAP  
LABRISA 11-35HZ

SECTION 35, TOWNSHIP 2 NORTH, RANGE 65 WEST, 6TH P.M., WELD COUNTY, COLORADO



Legend

- PROPOSED WORKING PAD SURFACE
- 1 MILE BUFFER - WORKING PAD SURFACE
- 100-YEAR FLOODPLAIN (EFFECTIVE, 2016)
- 100-YEAR FLOODWAY (PRELIMINARY, 2020)
- 100-YEAR FLOODPLAIN (PRELIMINARY, 2020)

NOTE:  
THIS MAP IS A COMPILATION OF PUBLICLY AVAILABLE DATA. THE ACCURACY AND COMPLETENESS OF SAID DATA  
HAS NOT BEEN VERIFIED BY 609 CONSULTING, LLC. EXISTING CONDITIONS MAY DIFFER FROM WHAT IS SHOWN.

**Kerr-McGee Oil &  
Gas Onshore LP**  
1099 18th Street  
Denver, Colorado 80202



Consulting, LLC

LOVELAND OFFICE  
6706 North Franklin Avenue  
Loveland, Colorado 80538  
Phone 970-776-4331  
SHERIDAN OFFICE  
1095 Saberton Avenue  
Sheridan, Wyoming 82801  
Phone 307-674-0609



NAD83 CO-Nft

1" = 1,500ft

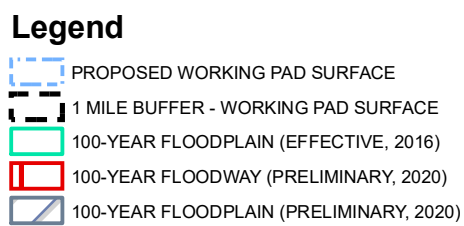
Drawn by: BB  
Revised:

Date: 12 Aug 2022  
Date:

0 750 1,500



SECTION 35, TOWNSHIP 2 NORTH, RANGE 65 WEST, 6TH P.M., WELD COUNTY, COLORADO



NOTE:  
THIS MAP IS A COMPILATION OF PUBLICLY AVAILABLE DATA. THE ACCURACY AND COMPLETENESS OF SAID DATA HAS NOT BEEN VERIFIED BY 609 CONSULTING, LLC. EXISTING CONDITIONS MAY DIFFER FROM WHAT IS SHOWN.

**Kerr-McGee Oil &  
Gas Onshore LP**  
1099 18th Street  
Denver, Colorado 80202



**LOVELAND OFFICE**  
6706 North Franklin Avenue  
Loveland, Colorado 80538  
Phone 970-776-4331

**SHERIDAN OFFICE**  
1095 Saberton Avenue  
Sheridan, Wyoming 82801  
Phone 307-674-0609



**NAD83 CO-Nft**

$$1'' = 3,000\text{ft}$$

Drawn by: BB  
Revised:

Date: 12 Aug 2022  
Date:



## Certification

I certify that I am a Professional Geologist, having met the educational requirements and professional work experience required by C.R.S. 23-41-208(b). I have reviewed information pertaining to the Oil and Gas location and the surrounding area and have identified no Geologic Hazards within a one-mile radius.

## Soils

The soil types impacting our operation include Osgood Sand (0-3% slope) and Valent Sand (3-9% slope). Osgood Sand constitutes ~8% of the location and Valent Sand constitutes ~92%. With respect to risk of caving during shallow excavation, Crab (1980) classifies Osgood Sand and Valent sand as severe in the soil survey of Weld County, CO. KMOG will not be creating any steep embankments or cutbank style changes in the disturbance area. KMOG follows proper sloping and benching techniques suggested by OSHA. In addition, KMOG best practices conservatively assume Type C soils (1½:1 or 34° slope) for all construction activities that require excavation. Assuming Type C also accounts for soil that has been worked and reworked during grading and pad construction process, effectively homogenizing pre-existing soil types. Most shallow excavation is done after the soil has been reworked. Collapsible soils do not pose a risk to the proposed Oil and Gas Operations or Location.

Osgood Sand is classified as low risk for shrinking and swelling up to 60 inches depth. Valent Sand is classified as low risk for shrinking and swelling up to 60 inches depth. Compacting and swelling soils are not a concern for our operations given the well pad is a temporary location with no long-term structures and soil on location will be actively worked and reworked throughout the construction phase.

Osgood Sand and Valent Sand are classified as low risk for corrosion. Any buried pipe on location uses fiberglass reinforced plastic (FRP) coating and is buried with sacrificial anodes to mitigate any impact of corrosive soils. Corrosive soils do not pose a risk to our operations at the Oil and Gas location.

## Surface Mines

The McGill 99 mine, approximately 2,500 feet to the southeast of the proposed Oil and Gas Location was identified using the COGCC's DRMS surface mine layer. This mine, owned by Winslow Construction Company, overlaps the feeder road south of I-76. No signs of activity were observed in satellite imagery or during an in-person visit. The surface mine information indicates it was used for construction borrow material and operations were terminated on 05/27/2019. KMOG was unable to make contact with representatives from the Winslow Construction Company. The Weld County Property portal does not show any special use designation for this area related to surface mining, therefore KMOG does not expect the area to be active prior to the cessation of oil and gas operations at the location. The surface mine does not pose a risk to the proposed Oil and Gas Operations or Location.

## Data Sources

The data source for floodplain information shown on the figure is the Federal Emergency Management Agency GIS Datasets (both effective and preliminary). USDA Natural Resources Conservation Service soil data, the Weld County Soil Survey and the Colorado Geological Survey's Collapsible Soils webmap was used for the soil hazards evaluation. Additional datasets, maps, and published papers used to evaluate other possible geologic hazards included in CO Rev Stat § 24-65.1-103 are listed below.

Respectfully,  
Kerr-McGee Oil & Gas Onshore LP



Alex Cheney  
Staff Geologist

## Data Sources

### Floodplain

- COGCC Floodplains (FEMA) [https://cogccmap.state.co.us/cogcc\\_gis\\_online/](https://cogccmap.state.co.us/cogcc_gis_online/)
- National Flood Hazard Layer (NFHL) <https://hazards-fema.maps.arcgis.com/apps/webappviewer/>
- Weld County: <https://www.weldgov.com/Government/Departments/Planning-and-Zoning/Floodplain-Management>

### Surface Mines

- COGCC DRMS Mine: [https://cogccmap.state.co.us/cogcc\\_gis\\_online/](https://cogccmap.state.co.us/cogcc_gis_online/)
- Weld County: <https://www.weldgov.com/Government/Departments/Planning-and-Zoning>

### Earthquakes:

- USGS: <https://www.usgs.gov/natural-hazards/earthquake-hazards/science/>
- USGS: <https://earthquake.usgs.gov/earthquakes/map/>

### Landslides

- CGS: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/>

### Sub-Surface Mines

- COGCC Coal Mine: [https://cogccmap.state.co.us/cogcc\\_gis\\_online/](https://cogccmap.state.co.us/cogcc_gis_online/)
- Roberts, S.B., Hynes, J.L., and Woodward, C.L. Maps Showing the Extent of Mining, Locations of Mine Shafts, Adits, Air Shafts, and Bedrock Faults, and Thickness of Overburden above Abandoned Coal Mines in the Boulder-Weld Coal Field, Boulder, Weld and Adams Counties, Colorado. 1:48:000. Denver, CO: US Geological Survey: 2001
- Ivery, J.B., and Hynes, J.L., Subsidence Hazard Map Boulder-Weld Coal Field Boulder and Weld Counties, Colorado. Map No. 7361-6 1:24,000. Colorado Geological Survey: 1974

## Soils

- USDA NRCS Soil Survey:  
<https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>
  - Collapsible Soils: CGS: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/>
  - Crab, J.A., Soil Survey of Weld County, Colorado, Southern Part., USDA Soil Conservation Service, 1980.
-