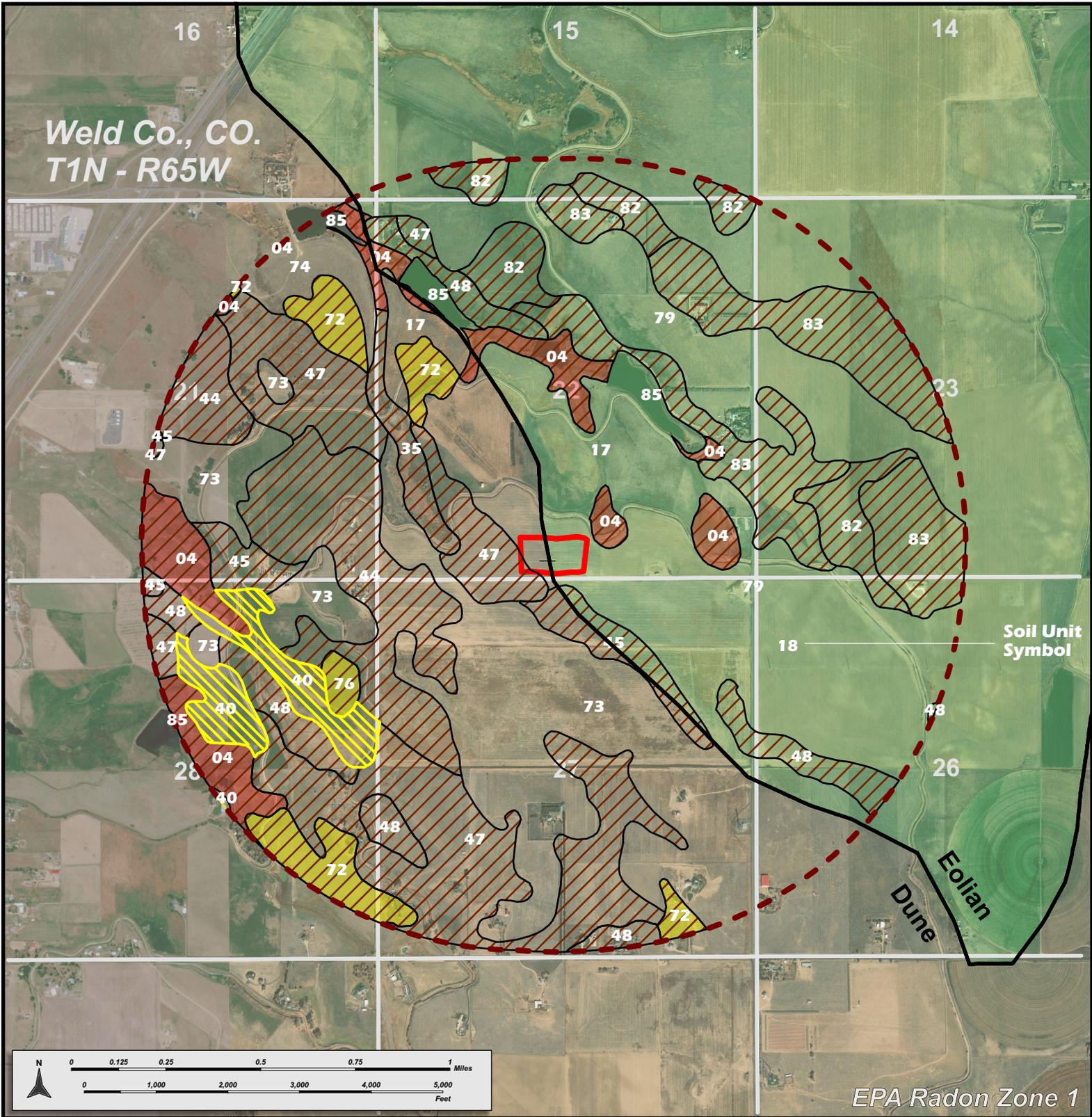


FAWN 2734-2833 PAD GEOLOGIC HAZARD MAP




Verdad Resources
1125 17th Street,
Suite 550
Denver, CO 80202
720-845-6900
verdadresources.com

Drawn by:
VG

Checked by:
WKR

Drawing Date:
01-26-22

Data Source:
Esri, Maxar, GeoEye, AeroGRID,
Earthstar Geographics,
CIGS Services Mines
CNES/Airbus DS, USDA, USGS,
IGN, GIS User Community

Site Name:
FAWN 2734-2833

Surface Location:
**SEC 22, T 1-N, R 65-W
Weld County, Colorado**

Map area is within:
EPA Radon Zone 1

Legend:
5280' Radius from WPS
Working Pad Surface

Collapsible Soils:
EG-14 Dune and sheet sand deposits
EG-14 Eolian (wind-blown) deposit
EG-14 Cretaceous and Tertiary Formations
Covers Entire Map Area

Landslide:
Not Present

Coal Mines:
Not Present

Floodplain:
Not Present

Corrosion of Concrete		Corrosion of Steel	
Soil Unit Symbol #	Soil Rating	Soil Unit Symbol #	Soil Rating
	High		High
04	Moderate	04, 35, 44, 45 47, 48, 72 76, 82, 83	High
	Moderate		Moderate
72, 76	Moderate	40	Moderate

All other soil unit numbers low or not rated

Geologic Hazards Summary for Fawn 2734 & Fawn 2833

Location: S ½ S ½ Section 22, T1N-R65W 6th P.M.

Summary:

My name is Kurt Rucker, and I am currently employed as Senior Geologist for Verdad Resources LLC (“Verdad”). I certify that I am a Professional Geologist, satisfying the requirements of C.R.S. 23-41-208 (b). The matters described herein were devised under my direction and control. To the best of my knowledge and belief, all the matters set forth herein, my testimony and the supporting exhibits, are true, correct, and accurate.

Based on this review of available geologic data comprised of experience, measurements, and published reports, I determine that the following hazards are present at the proposed location: soil corrosion of concrete[1], soil corrosion of steel[1], collapsible soils[9], and Radon (NORM)[4]. Other hazards examined, but absent at the proposed location are landslides[1,2], expansive soils[1], flooding[3], NORM & TENORM[5], induced seismicity[6], natural rate seismicity[7], and coal mine subsidence[8]. A map summary of these findings is attached.

Corrosion to concrete is identified as a potential in the vicinity of the proposed location. The concrete on location will serve as a combustor base. Considering the soil composition, and Verdad’s facility design and management, I determine the soil corrosion to concrete hazard is insignificant.

Corrosion to steel is identified as a potential hazard in vicinity of the proposed location. No steel at the proposed location will be exposed to the soil because 1) all steel equipment on location will have impervious liners, 2) steel flowlines will have protective lining, and 3) imported gravel or road base will separate the natural soil from steel. Considering the primary soil on the location, and facility design and management, I determine the steel corrosion hazard from soil at the proposed location is insignificant.

Collapsible soils are identified as a potential hazard. Prior to construction at the proposed location, topsoil is removed. During the cut and fill process, the ground is wetted and compacted. A cap of about 4-6” of road base per gravel provides additional protection from differential compaction. The grade and ditches promote flow off of the proposed location to further mitigate the risk of water saturating soils. Considering the soil composition, and Verdad’s facility design and management, I determine the collapsible soil hazard is insignificant.

Radon hazard is identified as a potential geo hazard on the map. However, there are no inhabited structures, or structures occupied throughout the working day, planned at the location. Considering the EPA radon zone, and the lack of inhabited structures, the radon hazard at the proposed location, I determine the radon hazard at the proposed location is insignificant.

Based on this review of available geologic data comprised of experience, measurements, and published reports, I determine that there are no known geologic hazards of significance at the proposed location.



Kurt Rucker

References:

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- [2] Colorado Landslide Inventory. Colorado Geologic Survey, 25 January 2022. <https://www.arcgis.com/apps/webappviewer/index.html?id=9dd73db7fbc34139abe51599396e2648>
- [3] FEMA's National Flood Hazard Layer (NFHL) Viewer. Federal Emergency Management Agency Hazard and Risk Information Platform, January 25, 2022, <https://www.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd>
- [4] Environmental Protection Agency. (1993) EPA's Map of radon zones Colorado (Report No. EPA/402 R 93 026). U.S. Environmental Protection Agency. <https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=000005WN.txt>.
- [5] Colorado Oil and Gas Conservation Commission. (2014). Analysis of Naturally Occurring Radioactive Materials in Drill Cuttings, Greater Wattenberg Field, Weld County, Colorado (COGCC Special Project 2136).
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- [9] White, Jonathan L., and Celia Greenman. "EG-14 Collapsible Soils in Colorado." Soil Engineering. Environmental Geology. Denver, CO: Colorado Geological Survey, Department of Natural Resources, 2008. <https://coloradogeologicalsurvey.org/publications/collapsible-soils-colorado/>.