

# Topsoil Protection Plan

## Red Rocks Oil and Gas Development Plan Amendment 2

This Topsoil Protection Plan has been prepared by Desert Eagle Operating, LLC (DEO) for 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.(14) to prepare a Topsoil Protection Plan consistent with Rule 1002 and ECMC Topsoil Protection Plan Guidance (March 25, 2022). 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 Disturbance Acreage

Estimated disturbance acreages for each Oil and Gas Location are listed in Table 2.

**Table 2. Location Disturbance**

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

#### Oil and Gas Location

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.

Oil and Gas Locations, access, and new off-location flowlines will be located on rangeland. The area has existing disturbances from producing helium gas wells, dirt roads, and historical ranching operations.

Vegetation is primarily tree cholla, one-seed juniper, Great Plains yucca, sideoats grama, and blue grama.

#### Working Pad Surface

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. Topsoil will be stockpiled on the location and will be restored on the reclaimed area.

#### Access Road

DEO will use existing and new access roads. Areas of soil disturbance for new access are listed in Table 3. Access roads will be approximately 15 feet wide.

**Table 3. 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

**Off-Location Flowline**

Areas of soil disturbance for new off-location flowlines are listed in Table 4.

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 4. 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.

**Table 4. 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 Soil Types

The Natural Resources Conservation Service (NRCS) soil types are listed by location in Table 5. NRCS soil unit descriptions and Soil Unit Maps are provided with the Form 2A applications.

**Table 5. Soil Type by Location**

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

VT – Villedry-Travessilla complex, 1 to 8 percent slopes

WC – Plughat-Villegreen complex, 1 to 4 percent slopes

## 3.0 Soil Evaluation

A soil pit evaluation was conducted at each Oil and Gas Location in November 2023. Tables showing results and photographs for each soil pit are attached. Soil pit locations are shown on the Soil Unit Maps provided with the Form 2As.

## 4.0 Topsoil Stockpile Location

Topsoil stockpile locations are shown on the Construction Layout Drawings provided with the Form 2As.

## 5.0 Topsoil to be Salvaged

Acreages for the Oil and Gas Locations are listed in Table 2. 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

Topsoil will be segregated based on characteristics, such as color, texture, structure, and consistency. The topsoil will be protected by separating it on the Oil and Gas Location. It will be marked with a labeled surveyor stake to distinguish it from the surrounding area. DEO will further protect each topsoil stockpile in the following ways:

### Contamination

DEO will keep the area surrounding the stockpile clear of stored materials and vehicle parking.

### Compaction

The topsoil stockpile will be placed on the edge of the Working Pad Surface to avoid the risk that equipment will be operated over the stockpile.

### Method and Timeline for Seeding and Stabilization

Topsoil stockpiles will remain uncompacted in preparation for seeding. Seeding will occur following site development. It will be conducted during the first favorable growing season and concurrent with interim reclamation, which is within 6 months of completion of development on non-cropland. The stockpile size allows for seeding on the stockpile to be broadcast manually. The seed mix will be certified weed-free and identified in coordination with the surface owner and, as appropriate, local agricultural extension office, consistent with the Interim Reclamation Plan. Organic material will be blended in to improve the growth medium if germination demonstrates that soil amendment with additional seeding is needed. Likewise, crimped straw mulch will be used where needed to stabilize loose soil. Additional stabilization practices are described below under Wind and Water Erosion.

### Wind and Water Erosion

The stockpile will be consolidated and mounded to minimize loose soils. It will be located on a portion of the Working Pad Surface that promotes natural drainage and avoids ponding and stormwater runnels. Surface roughening and seeding will be used to contain loose soils and promote vegetation and soil microbial activity. An erosion control blanket or crimped straw mulch will be used where needed to control erosion and blowing topsoil.

## 6.0 Best Management Practices

**Table 7. Best Management Practices**

Short-Term
<ul style="list-style-type: none"> <li>Vegetation removal and soil disturbance on the Oil and Gas Location will be minimized to the area sufficient to site and level equipment.</li> </ul>
<ul style="list-style-type: none"> <li>The operator will segregate and salvage topsoil based on soil characteristics of color, texture, structure, and consistency.</li> </ul>
<ul style="list-style-type: none"> <li>Salvaged topsoil will be mounded on the Oil and Gas Location to minimize loose soils.</li> </ul>
<ul style="list-style-type: none"> <li>The topsoil stockpile will be seeded within 6 months of completion of well development for non-cropland.</li> </ul>

<b>Short-Term</b>	
<ul style="list-style-type: none"><li>• Topsoil will be protected from contamination by stockpiling it in a location free from drilling, fuel storage, and parking.</li><li>• Soil removed during flowline trenching will be segregated based on changes in physical characteristics. The soil layers will be windrowed adjacent to the trench.</li><li>• Soils from the flowline trench will be replaced promptly in the order in which they were removed.</li></ul>	
<b>Long-Term</b>	
<ul style="list-style-type: none"><li>• The topsoil stockpile will be protected from compaction by designating it with surveyor staking as topsoil for reclamation.</li><li>• The topsoil stockpile will be protected from wind degradation by mounding to prevent loose soils while promoting continued microbial activity.</li><li>• The topsoil stockpile will be protected from erosion by ensuring that stormwater controls and diversions are installed, where needed, to divert stormwater away from the stockpile.</li><li>• Surface roughening, seeding, and an erosion control blanket or crimped straw mulch, if needed, will be used to contain loose soils, while maintaining soil microbial activity.</li><li>• Vegetation will be allowed to establish on the topsoil stockpile to stabilize it, outcompete weeds, and promote soil microbial activity.</li><li>• The topsoil stockpile will be monitored and managed for weeds during weed management monitoring conducted at the Oil and Gas Location by the site operator.</li></ul>	

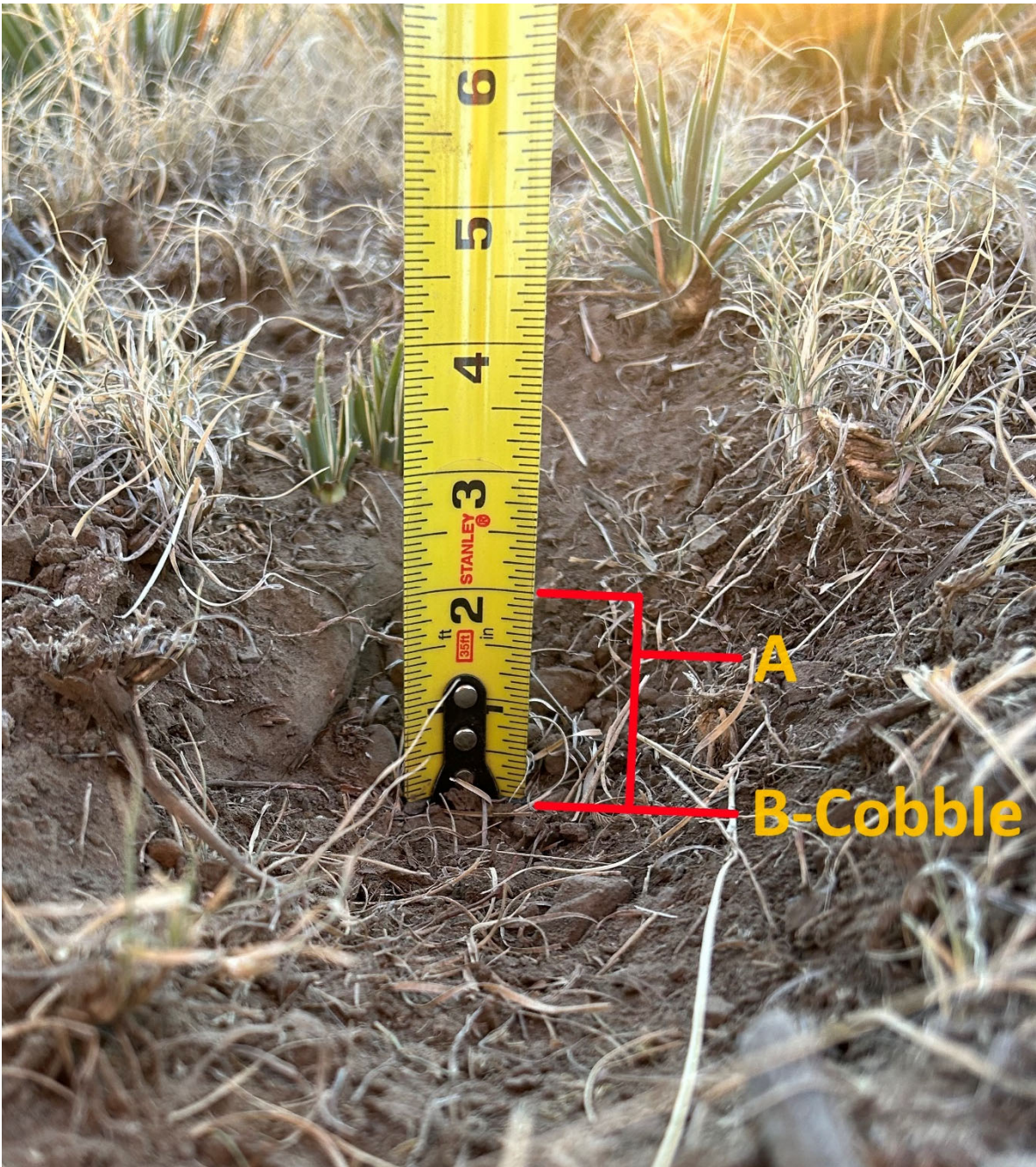
## Attachments

Soil Pit Evaluations and Photographs



**Desert Eagle 1-09 Well Pad**

Soil Pit 1		
Lat/Long	37.460463	-103.516988
Mapped Soil Unit	Dalerose 75%-Rock outcrop 15% complex, 3 to 25 percent slopes	
Topsoil Depth	<2 inch	
Soil Profile	<b>A Horizon (&lt;2 inch)</b>	10YR 4/3 Sandy Loam
	<b>B Horizon</b>	Cobble





**Desert Eagle 1-09 Well Pad**

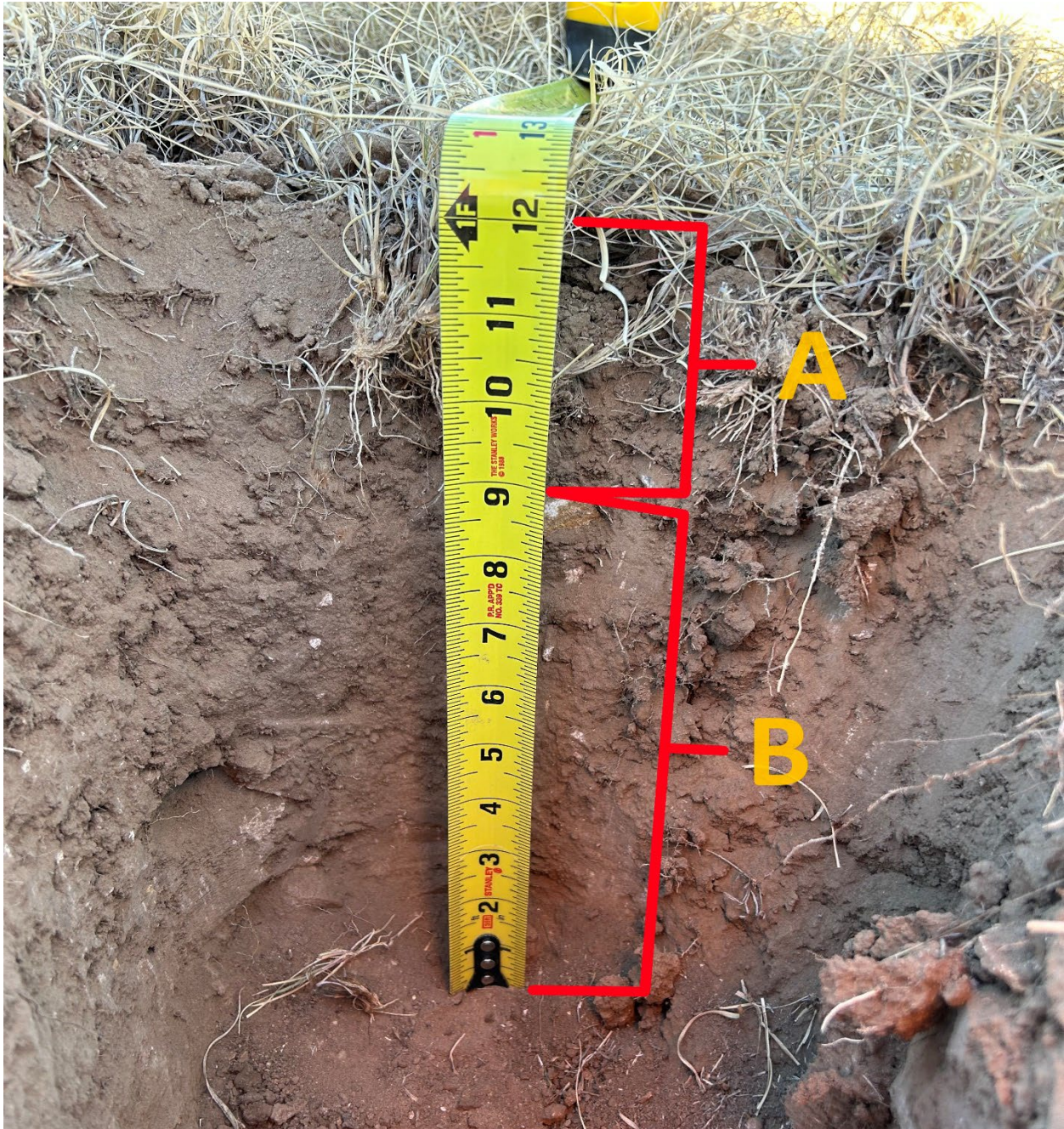
Soil Pit 2		
Lat/Long	37.460073	-103.517518
Mapped Soil Unit	Dalerose 75%-Rock outcrop 15% complex, 3 to 25 percent slopes	
Topsoil Depth	1.5 inch	
Soil Profile	A Horizon (1.5 inch)	10YR 4/3 Sandy Loam
	B Horizon	Cobble





**Desert Eagle 1-15 Well Pad**

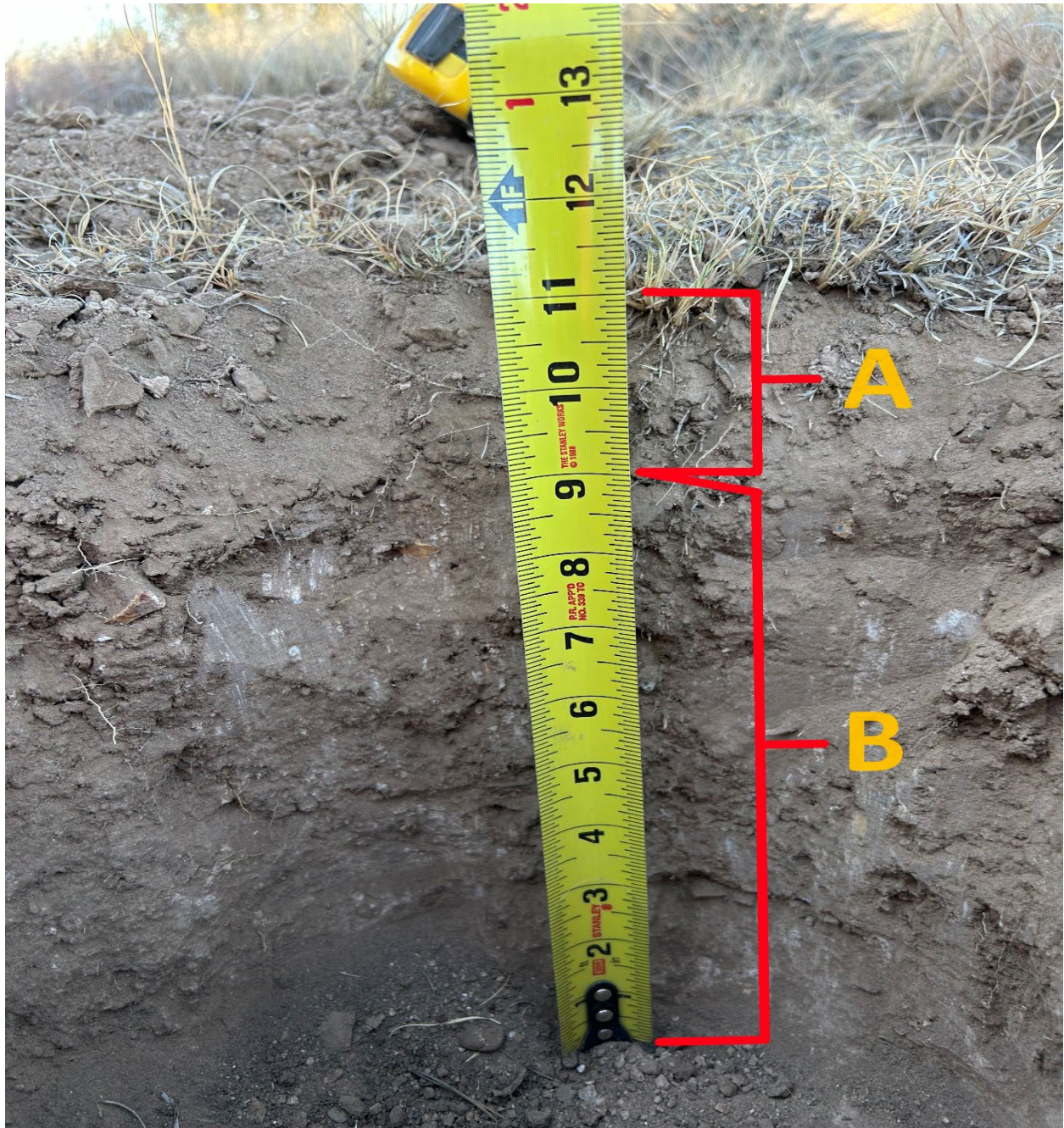
Soil Pit 1		
Lat/Long	37.464707	-103.522158
Mapped Soil Unit	Dalerose-Rock outcrop complex, 3 to 25 percent slopes	
Topsoil Depth	3-inch	
Soil Profile	<b>A Horizon</b> (0-3 inches)	10YR 4/3 Sandy Loam
	<b>B Horizon</b> (3-12 inches)	10YR 5/3 Loam





### Desert Eagle 1-15 Well Pad

Soil Pit 2		
Lat/Long	37.465261	-103.522798
Mapped Soil Unit	Dalerose-Rock outcrop complex, 3 to 25 percent slopes	
Topsoil Depth	2-inch	
Soil Profile	<b>A Horizon</b> (0-2 inches)	10YR 5/3 Sandy Loam
	<b>B Horizon</b> (2-11 inches)	10YR 6/3 Loam





**Desert Eagle 35-01 Well Pad**

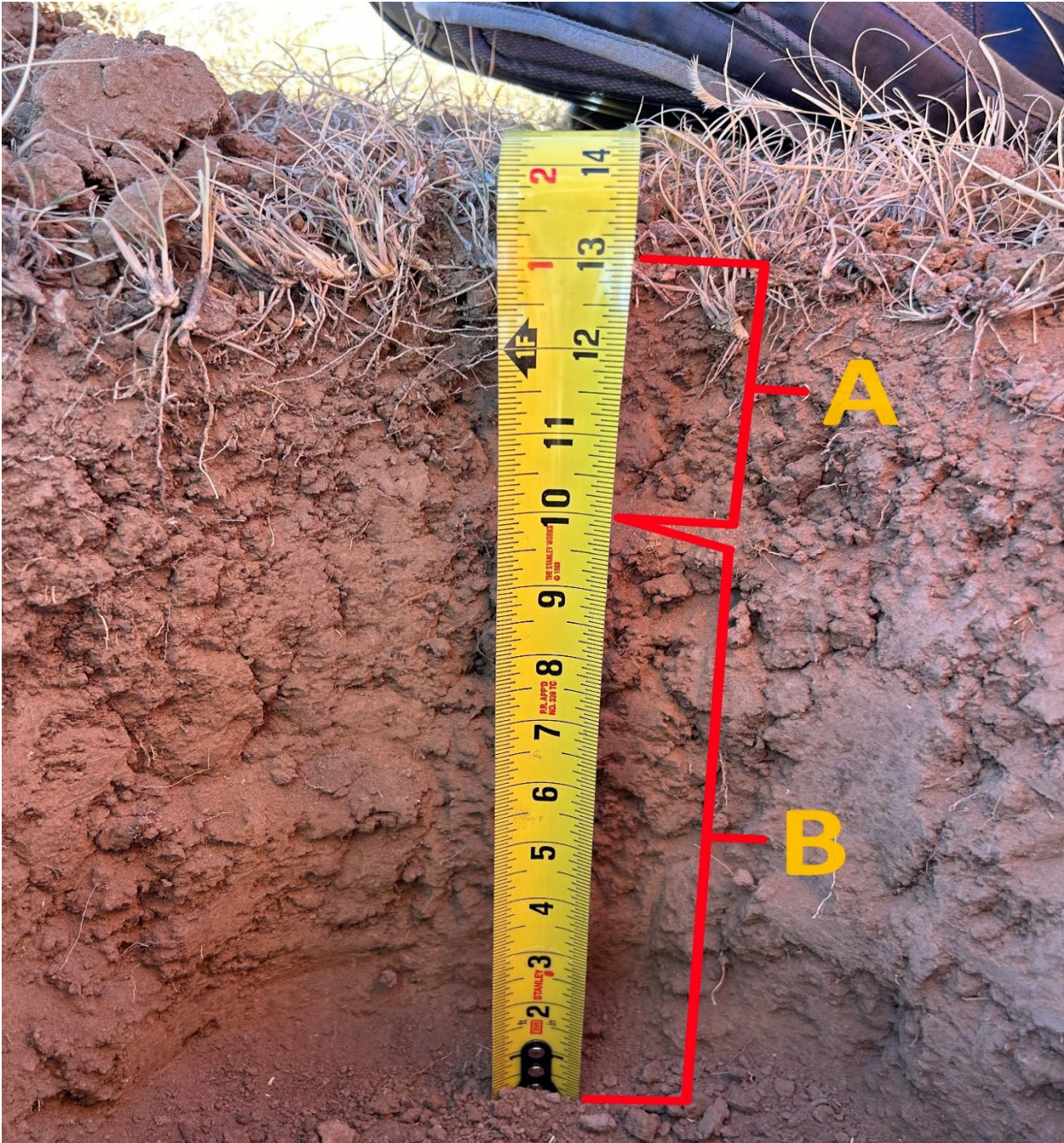
Soil Pit 1		
Lat/Long	37.467797	-103.537550
Mapped Soil Unit	Dalerose-Rock outcrop complex, 3 to 25 percent slopes	
Topsoil Depth	3-inch	
Soil Profile	<b>A Horizon</b> (0-3 inches)	10YR 4/3 Sandy Loam
	<b>B Horizon</b> (3-10 inches)	10YR 5/3 Loam





**Desert Eagle 35-01 Well Pad**

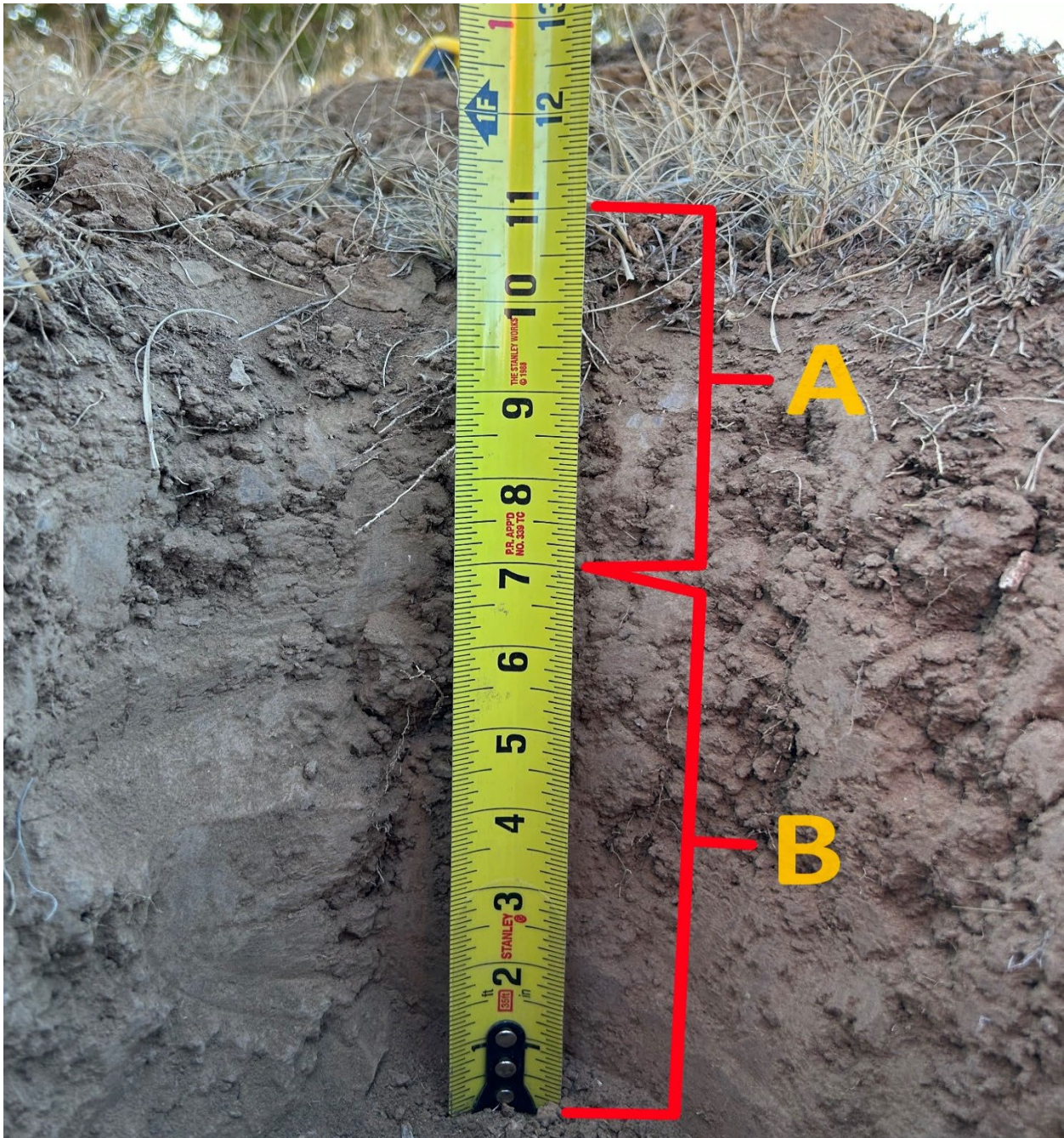
Soil Pit 2		
Lat/Long	37.467853	-103.538280
Mapped Soil Unit	Plughat-Villegreen complex, 1 to 4 percent slopes	
Topsoil Depth	3-inch	
Soil Profile	<b>A Horizon</b> (0-3 inches)	10YR 5/3 Silt Loam
	<b>B Horizon</b> (3-13 inches)	10YR 6/3 Silty Clay Loam





**Desert Eagle 35-08A Well Pad**

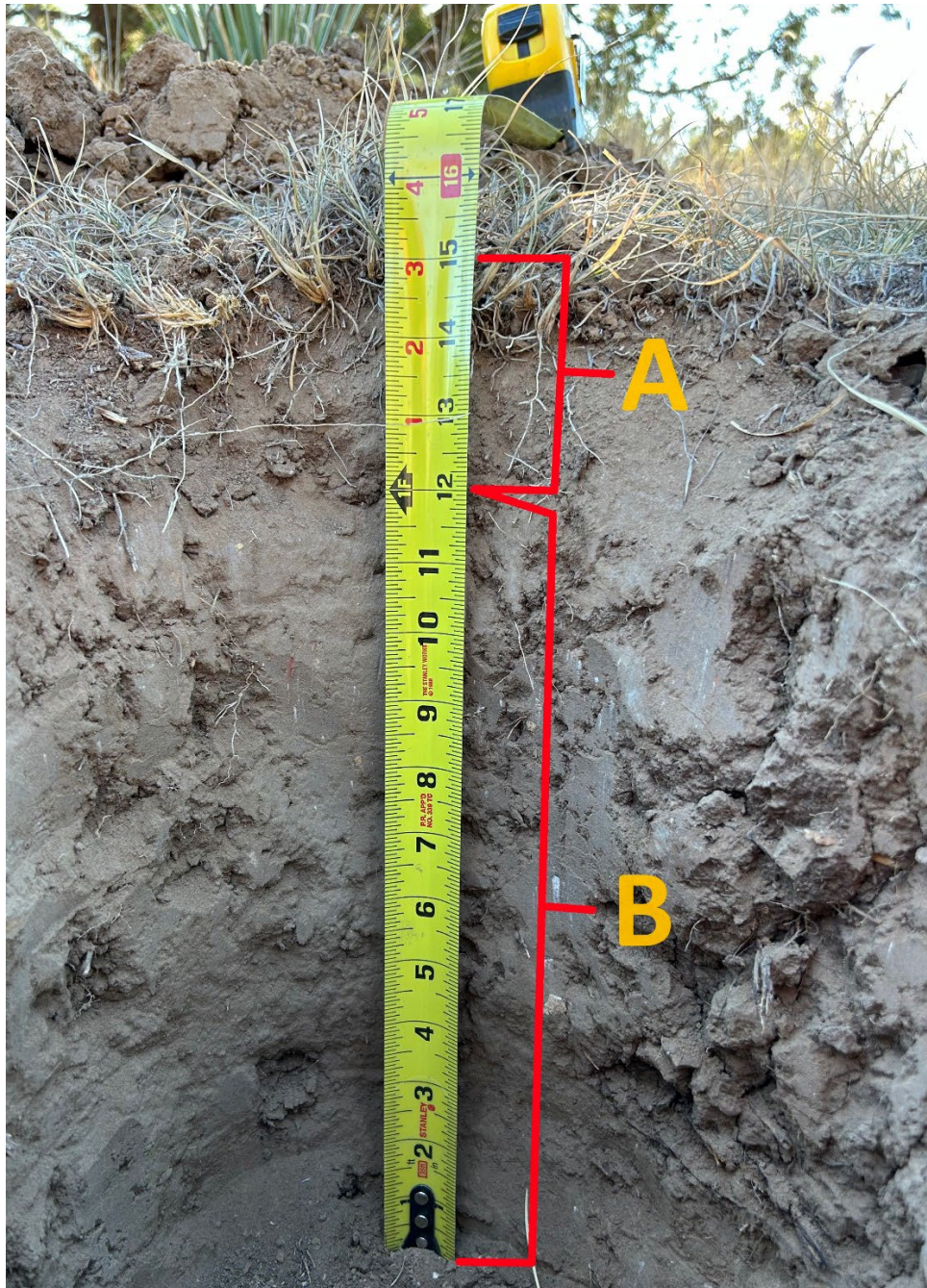
Soil Pit 1		
Lat/Long	37.473163	-103.536475
Mapped Soil Unit	Villedry-Travessilla complex, 1 to 8 percent slopes	
Topsoil Depth	4-inch	
Soil Profile	<b>A Horizon</b> (0-4 inches)	10YR 5/3 Silty Loam
	<b>B Horizon</b> (4-11 inches)	10YR 6/3 Silty Clay Loam





### Desert Eagle 35-08A Well Pad

Soil Pit 2		
Lat/Long	37.473558	-103.535911
Mapped Soil Unit	Villedry-Travessilla complex, 1 to 8 percent slopes	
Topsoil Depth	3-inch	
Soil Profile	<b>A Horizon</b> (0-3 inches)	10YR 5/3 Silty Loam
	<b>B Horizon</b> (3-15 inches)	10YR 4/3 Silty Clay Loam





### Desert Eagle 35-10 Well Pad

Soil Pit 1		
Lat/Long	37.476279	-103.541503
Mapped Soil Unit	Dalerose-Rock outcrop complex, 3 to 25 percent slopes	
Topsoil Depth	4-inch	
Soil Profile	<b>A Horizon</b> (0-4 inches)	10YR 5/3 Silty Loam
	<b>B Horizon</b> (4-13 inches)	10YR 6/4 Silty Clay Loam





### Desert Eagle 35-10 Well Pad

Soil Pit 2		
Lat/Long	37.475603	-103.541920
Mapped Soil Unit	Villedry-Travessilla complex, 1 to 8 percent slopes	
Topsoil Depth	5-inch	
Soil Profile	<b>A Horizon</b> (0-5 inches)	10YR 4/3 Sandy Loam
	<b>B Horizon</b> (5-10 inches)	10YR 5/3 Loam

