

Topsoil Site Assessment Report

Castor 7-59 12

Client: Summit Oil & Gas.

Project: Castor 7-59 12

Location: Section 12, T7N, R59W

Field Survey Date: 08/25/2022

Report delivered to
Summit Oil and
Gas LLC on
11/02/2022

RPG Resources (RPG), on behalf of Summit Energy conducted a topsoil site assessment of the permitted and built Castor 7-59 12 Pad to in relation to the Summit Energy Castor 7-59 12 Pad Corrective Action notice, issued by Colorado Oil and Gas Conservation Commission (COGCC). RPG's assessment included a desktop review, followed by drone mapping and a pedestrian field site survey on 08/25/2022. The results of this assessment are summarized below.

I. Drone Mapping

RPG performed a drone survey on the Castor 7-59 12 Pad to evaluate the topsoil pile volume. Ground control points were collected with a Trimble R1 (1-2 ft accuracy). The field data collected was processed with both Drone Deploy and Pix4D to see any differences that may occur using the different platforms. The processed imagery was then imported into CAD software to develop a surface and calculate an accurate topsoil volume. This task would include a simple exhibit and summary of the topsoil volume determination.

The results are as follows:

- a. Pix4D Model: 2,900 CY
- b. Drone Deploy Model: 3,329 CY

II. Topsoil Assessment

RPG performed a topsoil assessment using COGCC Topsoil Protection Plan guidance. Two soil types were identified by the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Web Soil Survey (WSS). Olney fine sandy loam, 0 to 6 percent slopes (44), and Olney fine sandy loam, 6 to 9 percent slopes (45). Topsoil depth was evaluated using physical and morphological soil characteristics. As described below, four (4) soil test pits, measuring approximately 36 inches in total depth, were evaluated within the land adjacent to the Castor 7-59-12 Pad. Soil colors were evaluated using a Munsell Soil Color Book. Top and subsoil samples were collected at each of the four (4) test pit locations. Soil samples were submitted to Weld Laboratories in Greeley, CO for analysis of baseline agronomic soil properties. The results will be used to determine the amount of available topsoil to be used for reclamation activities and if any soil amendments would be beneficial. See below for laboratory results.

In test pit 44-1, based on a higher presence of organic matter, the A horizon (topsoil) was measured from 0-12 inches below ground surface with a hue of 10YR, value of 5 and chroma of 3 with a sandy loam texture. The B horizon (subsoil) was measured from 6-28 inches below ground surface with a color of 10YR 5/3 and a sandy clay loam texture. The C horizon (substratum) was observed from 28-36 inches below ground surface with a color of 10YR 7/1 and a sandy clay loam texture.

In test pit 44-2 the A horizon (topsoil) was measured from 0 to 12 inches below ground surface with a color of 10YR 5/3 and a sandy loam texture. The B horizon (subsoil) was measured from 12 to 30 inches below ground surface with a color of 10YR 4/3 and a sandy loam texture. The C horizon (substratum) was measured from 30 to 36 inches below ground surface with a color of 10YR 7/1 and a sandy loam texture.

In test pit 45-1, based on a higher presence of organic matter, the A horizon (topsoil) was measured from 0-6 inches below ground surface with a hue of 10YR, value of 5 and chroma of 3 with a sandy loam texture. The B horizon (subsoil) was measured from 6-36 inches below ground surface with a color of 10YR 5/3 and a sandy loam texture. The C horizon (substratum) was not observed within test pit 45-1.

In test pit 45-2, the A horizon (topsoil) was measured from 0 to 6 inches below ground surface with a color of 10YR 5/3, and a loamy sand texture. The B horizon (subsoil) was measured from 6-21 inches below ground surface with a color of 10YR 4/3, and a sandy loam texture. The C horizon (substratum) was measured from 21 to 36 inches below ground surface with a color of 10YR 7/1, and a sandy loam texture.

SUMMARY TABLE

Test Pit	A Horizon (topsoil)	B Horizon (subsoil)	C Horizon (substratum)
44-1	Depth: 0-12 inches Color: 10YR 5/3 Texture: sandy loam	Depth: 12-28 inches Color: 10YR 5/3 Texture: sandy clay loam	Depth: 28-36 inches Color: 10YR 7/1 Texture: sandy clay loam
44-2	Depth: 0-12 inches Color: 10YR 5/3 Texture: sandy loam	Depth: 12-30 inches Color: 10YR 4/3 Texture: sandy loam	Depth: 30-36 inches Color: 10YR 7/1 Texture: sandy loam
45-1	Depth: 0-6 inches Color: 10YR 5/3 Texture: sandy loam	Depth: 6-36 inches Color: 10YR 5/3 Texture: sandy loam	Not observed
45-2	Depth: 0-6 inches Color: 10YR 5/3 Texture: loamy sand	Depth: 6-21 inches Color: 10YR 4/3 Texture: sandy loam	Depth: 21-36 inches Color: 10YR 7/1 Texture: sandy loam

III. Summary

Based on the drone aerial, the pad was built to about 8.0 acres in size. This equates to about 3” of topsoil that was removed. The topsoil horizon was measured at a depth of up to twelve (12) inches across the site with the majority of organic material observed within the first six (6) inches. Observed topsoil color was consistently 10YR 5/3 throughout all four (4) soil test pits. Topsoil texture was recorded as sandy loam and loamy sand. Lab analysis was completed on samples collected from a depth of 0-6 inches (44-1A, 44-2A, 45-1A, 45-2A), 6-12 inches (44-1B, 44-2B, 45-1B, 45-2B) and 12-18 inches (44-2C).

Overall soil organic matter ranged from 0.6% to 1.2% in the sandy loams and 2.1% for the loamy sand. Based on the physical and morphological soil characteristics and the lab results, up to 12 inches is suitable topsoil to be salvaged in the Olney fine sandy loam, 0 to 6 percent slopes and up to 6 inches in the Olney fine sandy loam, 6 to 9 percent slopes mapped soil types.

IV. Photos and Lab Results

1. 44-1 Soil Test Pit Location.



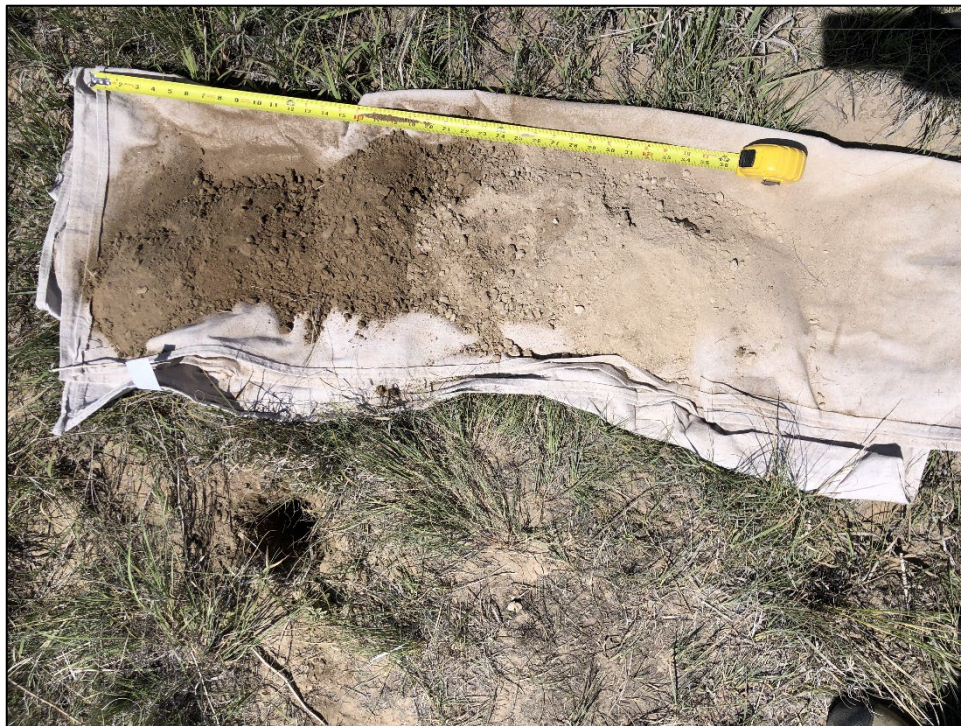
2. 44-2 Soil Test Pit Location.



3. 45-1 Soil Test Pit Location.



4. 45-2 Soil Test Pit Location.



5. Looking southeast at topsoil pile from west corner of pad.



6. Looking southeast at topsoil pile from west corner of pad.



WELD LABORATORIES, INC.

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October 28, 2022

RPG Resources

Attn: Russell Beam

1720 Bellaire St.

Denver, CO 80222

Laboratory No. Sample ID	E22250-3A Castor 44-1A	Extraction Method
Sodium (ppm)	5.20	Saturated Paste
Calcium (ppm)	106.50	
Magnesium (ppm)	18.35	
pH	6.96	
EC (mS/cm)	0.947	
Saturated Paste %	35.86	
SAR	0.12	
Nitrate-N (ppm)	6.67	AB-DPTA
Phosphorus (ppm)	11.82	
Potassium (ppm)	436.5	
Copper (ppm)	1.09	
Iron (ppm)	11.1	
Manganese (ppm)	7.5	
Zinc (ppm)	0.5	
Ammonia-N (ppm)	3.1	KCl Water
Chloride (ppm)	43.6	
Boron (ppm)	0.3	
Sand (%)	52.4	
Fine Sand (%)	10.7	
Silt (%)	21.2	
Clay (%)	15.8	
Classification	SANDY LOAM	
Organic Matter (%)	1.0	Walkley-Black
% CaCO ₃ -C equivalent	0.09	
CEC (meq/100g)	16.90	
ESP (%)	0.13	


Project Manager


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Laboratory No. Sample ID	E22250-3B Castor 44-1B	Extraction Method
Sodium (ppm)	2.90	Saturated Paste
Calcium (ppm)	62.00	
Magnesium (ppm)	11.70	
pH	7.13	
EC (mS/cm)	0.565	
Saturated Paste % SAR	38.64 0.09	
Nitrate-N (ppm)	1.45	AB-DPTA
Phosphorus (ppm)	12.03	
Potassium (ppm)	334.0	
Copper (ppm)	1.06	
Iron (ppm)	10.0	
Manganese (ppm)	3.0	
Zinc (ppm)	0.3	KCl Water
Ammonia-N (ppm)	1.1	
Chloride (ppm)	36.1	
Boron (ppm)	0.2	
Sand (%)	39.9	
Fine Sand (%)	13.0	
Silt (%)	25.4	Walkley-Black
Clay (%)	21.7	
Classification	SANDY CLAY LOAM	
Organic Matter (%)	1.1	
% CaCO ₃ -C equivalent	0.05	
CEC (meq/100g)	15.07	
ESP (%)	0.08	


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Laboratory No. Sample ID	E22250-3C Castor 44-2A	Extraction Method
Sodium (ppm)	3.15	Saturated Paste
Calcium (ppm)	80.80	
Magnesium (ppm)	12.15	
pH	7.21	
EC (mS/cm)	0.722	
Saturated Paste % SAR	27.52 0.09	
Nitrate-N (ppm)	3.32	AB-DPTA
Phosphorus (ppm)	9.92	
Potassium (ppm)	351.0	
Copper (ppm)	0.78	
Iron (ppm)	3.8	
Manganese (ppm)	3.1	
Zinc (ppm)	0.4	KCI Water
Ammonia-N (ppm)	24.3	
Chloride (ppm)	34.3	
Boron (ppm)	0.2	
Sand (%)	71.2	
Fine Sand (%)	7.3	
Silt (%)	11.6	Walkley-Black
Clay (%)	9.9	
Classification	SANDY LOAM	
Organic Matter (%)	1.0	
% CaCO ₃ -C equivalent	0.05	
CEC (meq/100g)	8.51	
ESP (%)	0.16	


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Laboratory No. Sample ID	E22250-3D Castor 44-2B	Extraction Method
Sodium (ppm)	3.60	Saturated Paste
Calcium (ppm)	87.65	
Magnesium (ppm)	11.75	
pH	7.47	
EC (mS/cm)	0.56	
Saturated Paste % SAR	27.19 0.10	
Nitrate-N (ppm)	2.10	AB-DPTA
Phosphorus (ppm)	7.63	
Potassium (ppm)	282.9	
Copper (ppm)	0.87	
Iron (ppm)	5.0	
Manganese (ppm)	1.7	
Zinc (ppm)	0.3	KCl Water
Ammonia-N (ppm)	0.3	
Chloride (ppm)	21.4	
Boron (ppm)	0.3	
Sand (%)	59.7	
Fine Sand (%)	11.4	
Silt (%)	17.3	Walkley-Black
Clay (%)	11.6	
Classification	SANDY LOAM	
Organic Matter (%)	0.6	
% CaCO ₃ -C equivalent	0.24	
CEC (meq/100g)	8.60	
ESP (%)	0.18	


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Laboratory No. Sample ID	E22250-3E Castor 44-2C	Extraction Method
Sodium (ppm)	3.68	Saturated Paste
Calcium (ppm)	68.00	
Magnesium (ppm)	13.30	
pH	7.42	
EC (mS/cm)	0.466	
Saturated Paste % SAR	33.09 0.11	
Nitrate-N (ppm)	1.94	AB-DPTA
Phosphorus (ppm)	3.81	
Potassium (ppm)	284.5	
Copper (ppm)	0.77	
Iron (ppm)	4.2	
Manganese (ppm)	1.3	
Zinc (ppm)	0.1	
Ammonia-N (ppm)	0.5	KCl Water
Chloride (ppm)	29.5	
Boron (ppm)	0.3	
Sand (%)	50.8	
Fine Sand (%)	10.8	
Silt (%)	28.2	
Clay (%)	10.2	
Classification	SANDY LOAM	
Organic Matter (%)	0.7	Walkley-Black
% CaCO ₃ -C equivalent	0.01	
CEC (meq/100g)	16.26	
ESP (%)	0.10	


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Laboratory No. Sample ID	E22250-3F Castor 45-1A	Extraction Method
Sodium (ppm)	2.90	Saturated Paste
Calcium (ppm)	41.70	
Magnesium (ppm)	9.80	
pH	6.37	
EC (mS/cm)	0.402	
Saturated Paste % SAR	30.36 0.10	
Nitrate-N (ppm)	9.28	AB-DPTA
Phosphorus (ppm)	8.20	
Potassium (ppm)	317.5	
Copper (ppm)	0.77	
Iron (ppm)	13.8	
Manganese (ppm)	9.0	
Zinc (ppm)	0.6	KCl Water
Ammonia-N (ppm)	6.3	
Chloride (ppm)	32.2	
Boron (ppm)	0.3	
Sand (%)	67.8	
Fine Sand (%)	10.9	
Silt (%)	11.6	Walkley-Black
Clay (%)	9.7	
Classification	SANDY LOAM	
Organic Matter (%)	1.2	
% CaCO ₃ -C equivalent	0.15	
CEC (meq/100g)	8.12	
ESP (%)	0.16	


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Laboratory No. Sample ID	E22250-3H Castor 45-1B	Extraction Method
Sodium (ppm)	4.00	Saturated Paste
Calcium (ppm)	52.70	
Magnesium (ppm)	10.25	
pH	6.65	
EC (mS/cm)	0.421	
Saturated Paste % SAR	27.60 0.13	
Nitrate-N (ppm)	3.76	AB-DPTA
Phosphorus (ppm)	7.44	
Potassium (ppm)	335.6	
Copper (ppm)	1.03	
Iron (ppm)	7.3	
Manganese (ppm)	3.7	
Zinc (ppm)	0.3	KCI Water
Ammonia-N (ppm)	3.2	
Chloride (ppm)	34.3	
Boron (ppm)	0.4	
Sand (%)	60.0	
Fine Sand (%)	8.2	
Silt (%)	14.8	Walkley-Black
Clay (%)	16.9	
Classification	SANDY LOAM	
Organic Matter (%)	0.9	
% CaCO ₃ -C equivalent	0.00	
CEC (meq/100g)	13.10	
ESP (%)	0.13	


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Laboratory No. Sample ID	E22250-3G Castor 45-2A	Extraction Method
Sodium (ppm)	5.10	Saturated Paste
Calcium (ppm)	113.35	
Magnesium (ppm)	20.05	
pH	7.31	
EC (mS/cm)	0.774	
Saturated Paste % SAR	30.03 0.12	
Nitrate-N (ppm)	1.57	AB-DPTA
Phosphorus (ppm)	5.72	
Potassium (ppm)	264.4	
Copper (ppm)	0.78	
Iron (ppm)	3.4	
Manganese (ppm)	5.1	
Zinc (ppm)	0.2	KCl Water
Ammonia-N (ppm)	5.1	
Chloride (ppm)	26.2	
Boron (ppm)	0.3	
Sand (%)	66.5	
Fine Sand (%)	11.4	
Silt (%)	15.1	Walkley-Black
Clay (%)	7.0	
Classification	LOAMY SAND	
Organic Matter (%)	2.1	
% CaCO ₃ -C equivalent	0.11	
CEC (meq/100g)	12.12	
ESP (%)	0.18	


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Laboratory No. Sample ID	E22250-3i Castor 45-2B	Extraction Method
Sodium (ppm)	3.71	Saturated Paste
Calcium (ppm)	101.40	
Magnesium (ppm)	14.90	
pH	7.25	
EC (mS/cm)	0.627	
Saturated Paste % SAR	35.40 0.09	
Nitrate-N (ppm)	0.91	AB-DPTA
Phosphorus (ppm)	0.37	
Potassium (ppm)	365.0	
Copper (ppm)	1.01	
Iron (ppm)	4.8	
Manganese (ppm)	1.9	
Zinc (ppm)	0.3	
Ammonia-N (ppm)	3.1	KCI Water
Chloride (ppm)	43.9	
Boron (ppm)	0.2	
Sand (%)	62.3	
Fine Sand (%)	7.2	
Silt (%)	21.6	
Clay (%)	8.9	
Classification	SANDY LOAM	
Organic Matter (%)	0.8	Walkley-Black
% CaCO ₃ -C equivalent	0.19	
CEC (meq/100g)	17.13	
ESP (%)	0.09	


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V. Maps

