

TOPSOIL PLAN

**JW POWELL 23-35
FREMONT COUNTY, COLORADO**

APRIL 2019



**113 North Santa Fe Ave
Florence, Colorado 81226**

TABLE OF CONTENTS

1.0	Introduction	2
1.1	Background	2
1.2	Existing Conditions	2
2.0	Topsoil Analyses	4
2.1	Quantitative Assessment	5
2.1.1	Topsoil Salvage	5
2.1.2	Laboratory Analyses	6
2.2	Qualitative Assessment	6
3.0	Topsoil Plan	6
3.1	Erosion and Sediment Controls	7
3.2	Noxious Weeds	7
3.3	Final Reclamation	7
3.4	Soil Amendments	7
4.0	References	7

FIGURES

FIGURE 1	TOPSOIL SALVAGE
FIGURE 2	SOIL SAMPLE LOCATIONS

ATTACHMENTS

ATTACHMENT 1	SOIL ANALYTICAL RESULTS
ATTACHMENT 2	LABORATORY REPORT
ATTACHMENT 3	AGRONOMIC INTERPRETATION

1.0 Introduction

AusCo Petroleum, Inc. (AusCo; Operator 10412), a subsidiary of Fremont Petroleum Corporation, operates the JW Powell 23-35 active well pad (Location ID 459836; API 05-043-06231) in the northeast section of the southwest section of Section 35, Township 19 South, Range 70 West. During a field inspection on February 26, 2019 (Doc 693900019), the Colorado Oil and Gas Conservation Commission (COGCC) issued the following Corrective Action:

Corrective Action - due April 6, 2019

Operator will provide COGCC one of two options. The first ("Option 1") is to provide a topsoil plan; the second ("Option 2") is to provide financial assurance (a bond) for the topsoil replacement during interim and final reclamation.

The following Topsoil Plan has been prepared to fulfill "Option 1" of the above Corrective Action. This Topsoil Plan provides a recent history of topsoil handling on location, a characterization of the existing topsoil on location, and a plan for future topsoil management. This Plan provides a baseline assessment for comparison with imported topsoil following COGCC approval of this Plan.

1.1 Background

During construction of the location, topsoil was salvaged to a depth of approximately 8 inches within approximately 0.62 acre in the well pad area (Figure 1). Some of this topsoil was stockpiled on the south end of the location, some was stockpiled on the west side of the location just south of the wellhead (this was not recognized as a topsoil stockpile during the February 26 inspection because equipment was placed on the pile at the time of the inspection), and some of the topsoil was used in the construction of berms for stormwater containment. Topsoil was not salvaged from equipment staging and parking areas.

Since the February 26 inspection, AusCo has performed the following actions:

- Topsoil that was originally utilized for stormwater berms was recovered and placed into a separate stockpile at the south end of the location (Topsoil Pile 2). The stormwater berms were rebuilt using road base material hauled to the location.
- The topsoil from the west area (south of the wellhead) was moved and incorporated into the stockpiles on the south end of the location (added to Topsoil Pile 3).
- Additional topsoil was recovered after temporary storage tanks were moved offsite and placed into a separate stockpile at the south end of the location (Topsoil Pile 4).
- Permission was obtained from COGCC via email on March 21, 2019, to decompact and seed equipment staging and parking areas, rather than importing topsoil for these areas.
- The staging and parking areas were roughened via harrow, hydroseeded, and are no longer in use (refer to the March 20, 2019 follow-up inspection photos; Doc 682600651);

1.2 Existing Conditions

The project area is located within the Natural Resources Conservation Service (NRCS) Major Land Resource Region (LRR) E – Rocky Mountain Range and Forest Region, Major Land Resource Area (MLRA) 49 – Southern Rocky Mountain Foothills (NRCS 2013). Approximately 27 percent (%) of the MLRA is in Wyoming, 58% is in Colorado, and 15% is in New Mexico.

The JW Powell is within Land Resource Unit (LRU) 49D – Loamy Foothill (Ecological Site Description ID: R049XD202CO), which describes the drier portion of MLRA 49 (NRCS 2013). LRU 49D begins at Fort Carson and extends through Canon City, west along the Upper Arkansas River Canyon to Salida. The southern extent ends at the Fremont/Custer County line near Wetmore. The majority of the LRU occurs in Fremont County. This site occurs on fans, fan remnants and swales on loamy to fine loamy soils derived from alluvium. It is a Western wheatgrass (*Pascopyrum smithii*) - Blue grama (*Bouteloua gracilis*) - winterfat (*Krascheninnikovia lanata*) community in the Pinyon-Juniper (*Juniperus monosperma* - *Pinus edulis*) Zone (NRCS 2013).

The potential vegetation in this LRU is about 70-85% grasses and grass-like plants, 10-15% forbs, 5-15% shrubs, and 0-2% trees. The dominant grasses include western wheatgrass and blue grama. Sub-dominant warm season grasses include little bluestem (*Schizachyrium scoparium*) and sideoats grama (*Bouteloua curtipendula*). Minor grasses include muttongrass (*Poa fendleriana*), needle and thread (*Heterostipa comata*), switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), prairie junegrass (*Koeleria macrantha*), and Sandberg bluegrass (*Poa secunda*). Major forbs and shrubs include scarlet globe mallow (*Sphaeralcea coccinea*), prairie coneflower (*Ratibida columnifera*), American vetch (*Vicia Americana*), purple prairie clover (*Dalea purpurea*), dotted gayfeather (*Liatris punctata*), winterfat, and fourwing saltbush (*Atriplex canescens*; NRCS 2013).

The soils of this LRU are very deep to moderately deep. Typically, they are well drained with moderate to slow permeability. They formed in alluvium from mixed sources on fans, terraces and in drainageways. Available water capacity is high in deep and very deep soils. The surface layer ranges from 0 to 25 inches and is typically loam or fine sandy loam but may include clay loam and silty clay loam. The soil surface is stable and intact. Sub-surface soil layers are nonrestrictive to water movement and root penetration (NRCS 2013). The well pad is within NRCS mapped Louviers-Travessilla complex, 20 to 50 percent slopes and the parking and staging areas are within NRCS mapped Shanta loam, 0 to 3 percent slopes (NRCS 2017).

Louviers-Travessilla complex, 20 to 50 percent slopes (NRCS 1988)

These soils are on hills, ridges, hogbacks, and canyonsides. The native vegetation is mainly pinyon and juniper. Elevation is 5,300 to 6,800 feet. The average annual precipitation is 13 to 15 inches, the average annual air temperature is 48 to 52 degrees Fahrenheit, and the average frost-free period is 120 to 150 days. The Louviers soil is on side slopes and on the scarp side of hogbacks. The Travessilla soil is on canyon rims, ridges, and the upper part of side slopes and in areas of weather-resistant bedrock on hogbacks.

The Louviers soil is shallow and well drained. It formed in residuum derived dominantly from shale and siltstone. The surface layer is typically light brownish gray very channery clay loam about 3 inches thick. The substratum is mainly clay about 13 inches thick. Shale bedrock is at a depth of about 16 inches. The soil is neutral to a depth of 3 inches. It is mildly alkaline to a depth of 6 inches and is neutral below that depth. In some areas the soil is calcareous and moderately alkaline. In other areas the surface layer is very cobbly or very stony.

Permeability is slow in the Louviers soil. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very rapid, and the hazard of water erosion is very high.

The Travessilla soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. The surface layer is typically light brown channery loam about 4 inches thick. The substratum is channery

loam about 10 inches thick. Sandstone bedrock is at a depth of about 14 inches. The soil is moderately alkaline.

Permeability is moderate in the Travessilla soil. Available water capacity is very low. Effective rooting depth is 4 to 20 inches. Runoff is rapid, and the hazard of water erosion is very high.

The potential plant community is mainly pinyon and juniper and an understory of Scribner needlegrass (*Achnatherum scribneri*), western wheatgrass, blue grama, sideoats grama (*Bouteloua curtipendula*), Gambel oak (*Quercus gambelii*), and mountain mahogany (*Cercocarpus ledifolius*). If the condition of the understory deteriorates, red threeawn (*Aristida purpurea*), blue grama, pricklypear (*Opuntia* sp.), and other forbs and shrubs increase. Thinning the overstory generally enhances reproduction and promotes the growth of grass and younger trees. After pinyon and juniper are thinned or harvested, seeding grasses reduces the hazard of erosion.

***Shanta loam, 0 to 3 percent slopes* (NRCS 1988)**

This deep, well-drained soil is on stream terraces. It formed in alluvium. The native vegetation is mainly grasses. Elevation is 5,800 to 6,300 feet. The average annual precipitation is 13 to 15 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 120 to 140 days.

The surface layer and the subsoil are typically brown loam about 49 inches thick. The substratum to a depth of 60 inches or more is stratified sandy loam and loamy sand. The soil is mildly alkaline to a depth of 2 inches and is moderately alkaline below that depth.

Permeability is moderate in the Shanta soil. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The soil is subject to rare, very brief periods of flooding from April through September. Most areas of this soil are used for irrigated pasture and hay. A few areas are used as rangeland or for non-irrigated pasture.

The potential plant community is mainly western wheatgrass, blue grama, prairie junegrass, and needle and thread. If the condition of the range deteriorates, blue grama, red threeawn, and rabbitbrush (*Ericameria nauseosa*) increase. Range seeding is suitable if the range is in poor condition.

This soil is well suited to irrigated crops. The seedbed should be prepared on the contour or across the slope where practical. Irrigation water can be applied by contour ditches and corrugation. It should be applied at a rate that ensures optimum production without increasing deep percolation, the runoff rate, or the hazard of erosion. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and protect the soil from erosion. Fertilizer is needed to ensure the optimum growth of grasses and legumes. If properly managed, this soil can produce 5 tons of irrigated alfalfa hay per acre.

2.0 Topsoil Analyses

Existing topsoil was assessed using quantitative and qualitative methods in order to characterize the soil for later comparison with imported topsoil. Soil samples were collected on March 9, 2019, from 2 reference areas (SS-06 and SS-03), salvaged topsoil (SS-01 and SS-02), and compacted topsoil (staging area; SS-04; Figure 2).

Five samples were collected as follows from 0-6 inches:

- SS-01 - Topsoil Stockpile: 6-point composite of the properly stored topsoil pile
- SS-02 - Topsoil Berm: 6-point composite of topsoil that was used for berm material
- SS-03 - Topsoil Background 1: 6-point composite from topsoil adjacent to the existing road
- SS-04 - Topsoil Staging Area: 6-point composite from topsoil in the area that was compacted via staged equipment such as frac tanks, vehicles, etc. in the open field
- SS-06 - Topsoil Background 2: 6-point composite sample from an undisturbed area

Prior to sampling, the field technician was instructed to collect a sample from topsoil on the pad that had not been salvaged. Temporary storage tanks were located in that area, thus SS-05 was not collected.

2.1 Quantitative Assessment

Quantitative assessments of the topsoil quantity and physical properties are detailed below.

2.1.1 Topsoil Salvage

Topsoil was salvaged to a depth of approximately 8 inches from 2 areas on the well pad (Figure 1), totaling approximately 0.62 acre (Table 1).

Table 1. Approximate topsoil salvage area and volume.

Salvage Areas	Acre	Feet ²	Depth (ft)	Feet ³	Yard ³
1	0.50	21,780	0.67	14,593	540
2	0.12	5,227	0.67	3,502	130
TOTAL				18,628	670*

As of April 2019, all salvaged topsoil has been recovered and placed in 4 stockpiles at the south end of the location (Figure 1; Table 2).

Table 2. Approximate topsoil stockpile area and volume.

Topsoil Pile	Length (ft)	Width (ft)	Height (ft)	Feet ³	Yard ³
1	35	14	5.5	2,695	100
3	33	24	5.7	4,514	167
4	19	14	5.5	1,463	54
Topsoil Pile	Circumference	Area ²	Height	Feet ³	Yard ³
2	162	2089	5.5	11,492	426
TOTAL				20,165	747*

***NOTE:** Since the stockpiles are not perfect cubic rectangles or cylinders, but in actuality are piles with wide bases and narrow tops, the above calculations are likely overestimates of the actual topsoil volume. Thus,

the difference between estimated salvage volume and estimated stockpile volume (+23 cubic yards) is likely accounted for by empty space surrounding the narrow tops of the stockpiles.

2.1.2 Laboratory Analyses

Per the corrective action, soil analyses included the following:

- pH
- Saturated paste,
- Electrical conductivity,
- Organic matter,
- Nitrate nitrogen,
- Phosphorus,
- Potassium,
- Zinc,
- Iron,
- Manganese,
- Copper,
- Lime
- Texture estimates,
- Percent calcium carbonate equivalency,
- SAR

Attachment 1 presents the soil analytical results and the complete laboratory report is included as Attachment 2. Analytical results from the sampling event indicate pH, SAR, and EC do not exceed COGCC Table 910-1 standards.

2.2 Qualitative Assessment

Topsoil was segregated from subsurface soil at approximately 8 inches depth based on changes in texture, color, and/or consistency. Topsoil is sandy clay loam on the well pad and light brown-gray in color. Lab analyses of soil texture indicate the area ranges from clay loam and loam around the staging area and is sandy clay loam within the area of the wellpad.

3.0 Topsoil Plan

Temporary disturbance during construction was estimated to be 2.40 acres (Doc 401970081). Following interim reclamation, the long-term disturbance will encompass approximately 0.90 acre. Since the 1.5-acre interim reclamation area has been hydroseeded, the stockpiled topsoil is only needed for the final reclamation area (approximately 0.90 acre; 973 cubic yards). The existing stockpiles contain approximately 747 cubic yards of topsoil. Thus, an additional 226 cubic yards of topsoil will need to be imported prior to final reclamation (Table 3).

Table 3. Approximate topsoil stockpile area and volume.

Area	Size in Acres	Cubic Yards Topsoil (8 Inches Depth)
Long-Term Disturbance (Final Reclamation Area)	0.90	973
Topsoil Salvage Area	0.62	747
Additional Topsoil Needed	0.28	226

No later than two months after the approval of this Topsoil Plan, AusCo will obtain 226 cubic yards of topsoil from the below source. Soil analyses will be provided to Langston Concrete, Inc. in order to ensure that the imported soil will be of the same quality as the reference topsoil as described above in Section 2.0. If needed, amendments or fertilizer will be applied to the imported soil prior to final reclamation to

better match the soil properties of the existing topsoil. Imported topsoil will be weed-free. Topsoil stockpiles will remain in the current location at the south end of the well pad for the life of the well.

Langston Concrete, Inc.
902 South Union Street
Florence, Colorado 81226

3.1 Erosion and Sediment Controls

Topsoil stockpiles will be compacted and tracked in using a track dozer where tracks are perpendicular to water flow, to protect soils from wind and runoff erosion. Sediment controls will be placed at the base of soil stockpiles. Sediment controls may include, but are not limited to, berms, straw wattles, or ditches. Combinations of these methods may be employed as necessary for sediment control of runoff.

Seeding will be employed as a stabilization method to guard against erosion. A certified weed-free seed mix with a fast-growing cover crop may be used to establish a temporary vegetative cover of the topsoil during the life of the well.

3.2 Noxious Weeds

If noxious weeds become established in the stockpile area, AusCo will employ herbicides, mechanical treatment, grazing, or biological control methods, as appropriate, to treat noxious weed infestations.

Areas where noxious weed infestations are identified and treated will be inspected over time to ensure that control methods are working to reduce and suppress the identified infestation. The sites will be monitored until the infestations are eliminated or reduced to acceptable levels.

3.3 Final Reclamation

During final reclamation, all topsoil will be evenly distributed across the location and seeded with a Natural Resources Conservation Service (NRCS) recommended seed mix to a depth of approximately 8 inches. Topsoil will not be used as fill or padding material for the well pad or road. Final Reclamation will be conducted per COGCC Rule 1004.

3.4 Soil Amendments

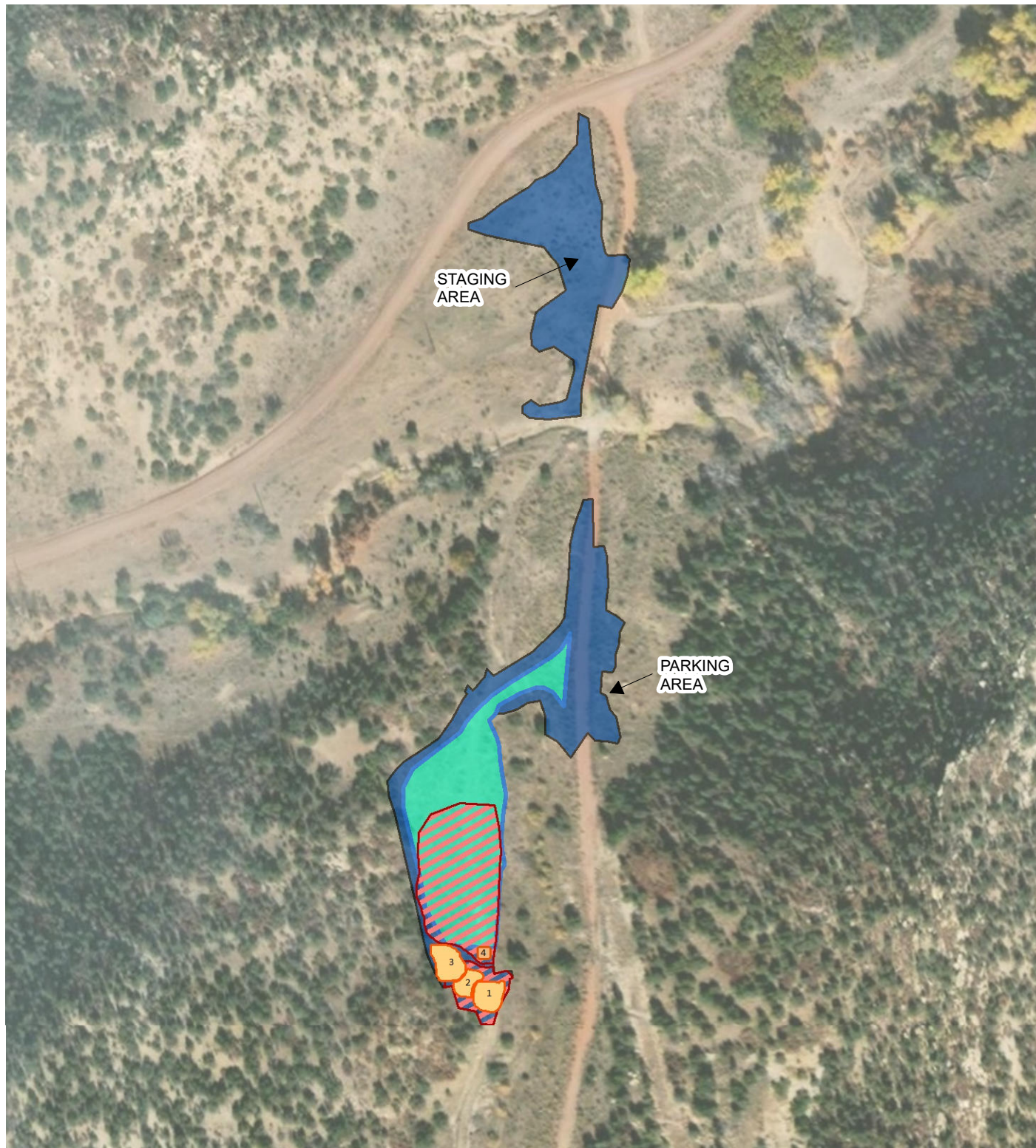
If, after 2 growing seasons, vegetation has not established within the seeded area, AusCo will apply fertilizer or amendments to the soil per the recommendations listed in Attachment 3. If fertilizing is necessary, the rates of application will be based on site-specific requirements of the soil.

4.0 References





Natural Resources Conservation Service, United States Department of Agriculture. 2017. Web Soil Survey. Available online at the following link: <https://websoilsurvey.sc.egov.usda.gov/>. Accessed March 29, 2019.

Natural Resources Conservation Service, United States Department of Agriculture. 2013. Ecological Site Description Report. Loamy Foothill 11-14 Inches P.Z. Site ID: R049XD202CO.

Natural Resources Conservation Service, United States Department of Agriculture. 1988. Soil Survey of Fremont County Area, Colorado



LEGEND

-  SALVAGE AREAS (0.62 ACRE)
-  TOPSOIL PILE (747 CUBIC YARDS)
-  INTERIM RECLAMATION AREA (1.5 ACRES)
-  LONG-TERM DISTURBANCE (0.9 ACRE)

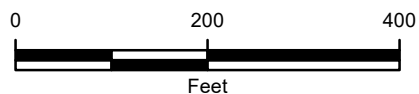


IMAGE COURTESY OF ESRI

FIGURE 1
TOPSOIL SALVAGE
JW POWELL 23-35
SEC 35 T19S R70W FREMONT
COUNTY, COLORADO
FREMONT PETROLEUM CORPORATION



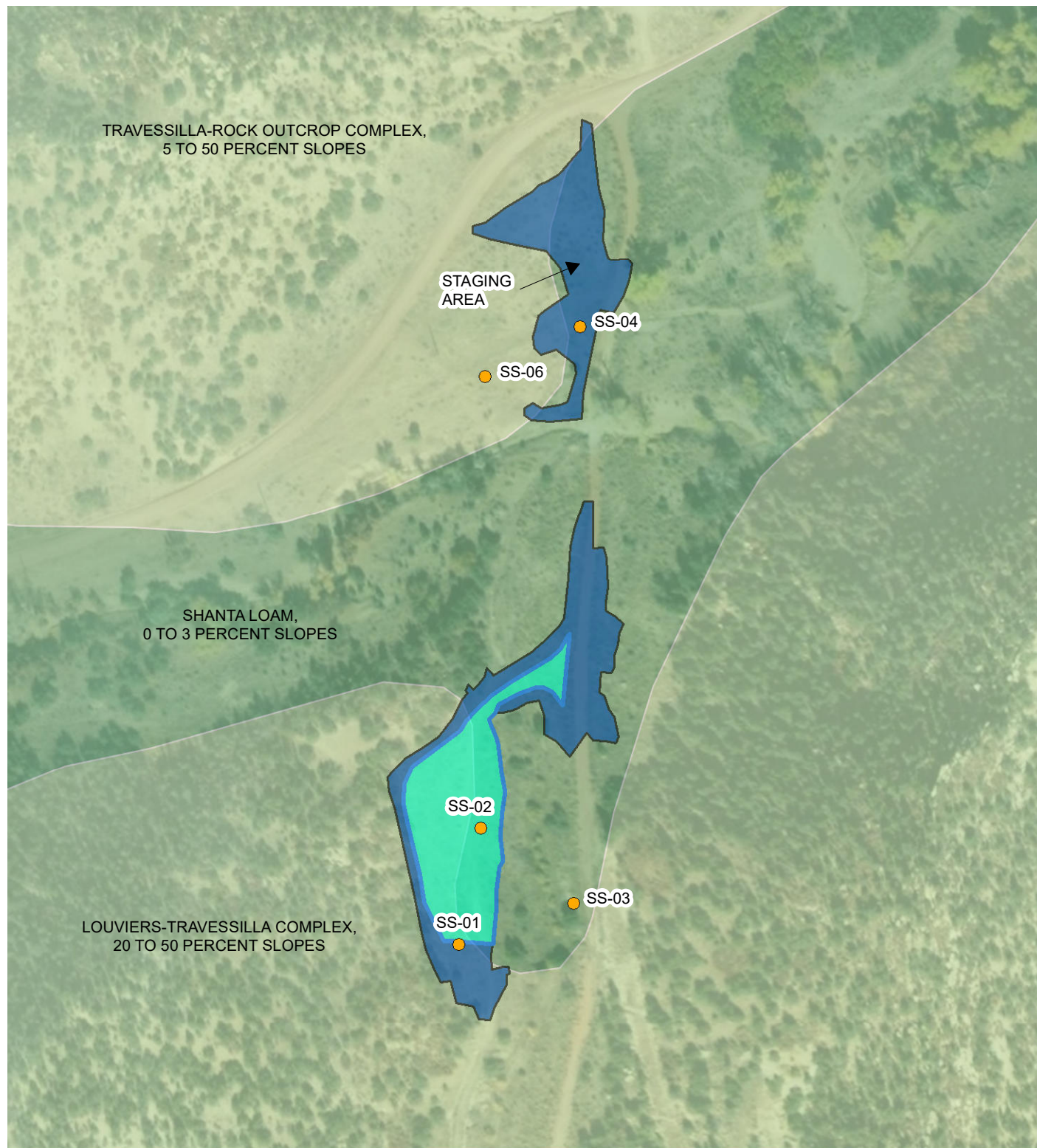


IMAGE COURTESY OF ESRI

LEGEND

- SOIL SAMPLE
- INTERIM RECLAMATION AREA (1.5 ACRES)
- LONG-TERM DISTURBANCE (0.9 ACRE)

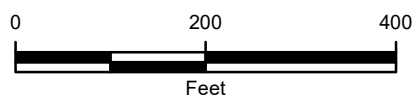


FIGURE 2
SAMPLE LOCATIONS
JW POWELL 23-35
SEC 35 T19S R70W
FREMONT COUNTY, COLORADO
FREMONT PETROLEUM CORPORATION



TABLE 1
SOIL ANALYTICAL RESULTS

JW POWELL 23-35
FREMONT, COLORADO
AUSCO PETROLEUM

Analyte	COGCC STANDARDS	UNITS	SS-01	SS-02	SS-03	SS-04	SS-06
Sample Date			3/9/2019	3/9/2019	3/9/2019	3/9/2019	3/9/2019
Location			Stock Pile	Berm	Background 1	Staging	Background 2
Nitrate	NE	PPM	1.8	5.5	10.3	11.8	2.1
Phosphorus	NE	PPM	22	12	18	21	11
Potassium	NE	PPM	207	403	283	575	213
Calcium	NE	PPM	3,151	2,435	4,837	4,451	3,896
Sulfate	NE	PPM	5	60	21	18	3
Zinc	NE	PPM	1.3	8.2	6.1	4.4	1.3
Iron	NE	PPM	43.4	65.5	34.4	29.1	44.2
Manganese	NE	PPM	5.0	19.1	11.0	9.1	3.3
Copper	NE	PPM	1.0	1.1	1.1	1.3	1.0
Sodium	NE	PPM	50.2	233.2	46.9	49.8	25.1
CaCO ₃	NE	%	0.22	0.31	0.38	0.47	0.52
Soil Texture	NE	NE	SCL	SCL	L	L	CL
Inorganics							
Electrical Conductivity (saturated paste)	NE	ms/cm	1.03	3.60	1.42	1.71	1.01
pH	6 - 9	SU	7.29	6.8	6.96	7.11	7.49
Sodium Adsorption Ratio	12	unitless	0.85	5.04	0.38	0.46	0.09
TDS	NE	mg/kg	657	2,304	909	1,094	646
Ammonium (NH ₄ ⁺)	NE	mg/kg	34	46	34	39	27
Salts (electrical conductivity)	4	mmhos/cm	0.44	1.08	0.58	0.62	0.40
Organics							
Organic Matter	NE	%	1.58	2.69	3.42	3.29	2.07

NOTES:**BOLD** - indicates result exceeds the COGCC Table 910-1 applicable standardCaCO₃ - calcium carbonate

COGCC - Colorado Oil and Gas Conservation Commission

mg/kg - milligrams per kilogram

mS/cm - millisiemens per centimeter

mmhos/cm - milliMhos per centimeter

NE - not established

PPM - parts per million

SU - standard unit on saturated paste

% - percentage

< - less than the stated method reporting limit

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March 20, 2019

AusCo Petroleum Inc.
 113 N. Santa Fe Ave.
 Florence, CO 81126

Laboratory No.: E19071-4A
 Sample: SS-01

Project: AusCo Petroleum
 Location: Stockpile

Analyses performed according to methods in notes below

	Results	Units	Surr Recovery (%)
TRPH	NA	mg/kg – ppm	NA
TEH (DRO)	NA	mg/kg - ppm	NA
TVH (GRO)	NA	µg/kg - ppb	NA
Benzene	NA	µg/kg - ppb	NA
Toluene	NA	µg/kg - ppb	NA
Ethyl-benzene	NA	µg/kg - ppb	NA
m,p-Xylene	NA	µg/kg - ppb	NA
o-Xylene	NA	µg/kg - ppb	NA
Sat. Paste pH	6.9	SI	NA
Sat. Paste EC	1.03	mS/cm	NA
Sat. Paste Saturation%	34.6	%	NA
Sat. Paste TDS	657	mg/kg	NA
Sat. Paste SAR	0.85	--	NA
Ammonium (NH ₄ ⁺)	34	mg/kg	NA

Notes:

TRPH = Total Recoverable Petroleum Hydrocarbons (EPA Method 1664, Soxhlet extracted SGT-HEM)

DRO = Diesel Range Organics, GRO = Gas Range Organics

TVH = Total Volatile Hydrocarbons (C6-C10 EPA 8015, EPA 5030/5035 purge and trap)

TEH = Total Extractable Hydrocarbons (Diesel #2 C11-C28, EPA Method 8015 solvent extraction)


BTEX = Benzene, Toluene, Ethylbenzene, Xylenes (EPA 8015, EPA 5030/5035 purge and trap)

VOC = Volatile Organic Compounds (EPA 8260B, EPA 5030/5035 purge and trap)

Soils always run as received but reported on a dry weight basis (mg/kg-dry-wt)

U = Compound analyzed but not detected, NA = Not Applicable or Not Analyzed

TKN includes both organic and ammoniacal forms of nitrogen



Project Manager

3-20-19

Date

WELD LABORATORIES, INC.

1527 First Avenue • Greeley, Colorado 80631
 Phone: (970) 353-8118 • Fax: (970) 353-1671
 www.weldlabs.com

March 20, 2019

AusCo Petroleum Inc.
 113 N. Santa Fe Ave.
 Florence, CO 81126

Laboratory No.: E19071-4B
 Sample: SS-02

Project: AusCo Petroleum
 Location: Berm

Analyses performed according to methods in notes below

	Results	Units	Surr Recovery (%)
TRPH	NA	mg/kg – ppm	NA
TEH (DRO)	NA	mg/kg - ppm	NA
TVH (GRO)	NA	µg/kg - ppb	NA
Benzene	NA	µg/kg - ppb	NA
Toluene	NA	µg/kg - ppb	NA
Ethyl-benzene	NA	µg/kg - ppb	NA
m,p-Xylene	NA	µg/kg - ppb	NA
o-Xylene	NA	µg/kg - ppb	NA
Sat. Paste pH	7.0	SI	NA
Sat. Paste EC	3.60	mS/cm	NA
Sat. Paste Saturation%	37.0	%	NA
Sat. Paste TDS	2304	mg/kg	NA
Sat. Paste SAR	5.04	--	NA
Ammonium (NH ₄ ⁺)	46	mg/kg	NA

Notes:

TRPH = Total Recoverable Petroleum Hydrocarbons (EPA Method 1664, Soxhlet extracted SGT-HEM)

DRO = Diesel Range Organics, GRO = Gas Range Organics

TVH = Total Volatile Hydrocarbons (C6-C10 EPA 8015, EPA 5030/5035 purge and trap)

TEH = Total Extractable Hydrocarbons (Diesel #2 C11-C28, EPA Method 8015 solvent extraction)

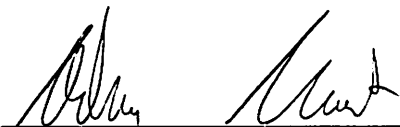
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Project Manager

3-20-19

Date

WELD LABORATORIES, INC.

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www.weldlabs.com

March 20, 2019

AusCo Petroleum Inc.
113 N. Santa Fe Ave.
Florence, CO 81126

Laboratory No.: E19071-4C
Sample: SS-03

Project: AusCo Petroleum
Location: Parking

Analyses performed according to methods in notes below

	Results	Units	Surr Recovery (%)
TRPH	NA	mg/kg – ppm	NA
TEH (DRO)	NA	mg/kg - ppm	NA
TVH (GRO)	NA	µg/kg - ppb	NA
Benzene	NA	µg/kg - ppb	NA
Toluene	NA	µg/kg - ppb	NA
Ethyl-benzene	NA	µg/kg - ppb	NA
m,p-Xylene	NA	µg/kg - ppb	NA
o-Xylene	NA	µg/kg - ppb	NA
Sat. Paste pH	7.1	SI	NA
Sat. Paste EC	1.42	mS/cm	NA
Sat. Paste Saturation%	43.0	%	NA
Sat. Paste TDS	909	mg/kg	NA
Sat. Paste SAR	0.38	--	NA
Ammonium (NH ₄ ⁺)	34	mg/kg	NA

Notes:

TRPH = Total Recoverable Petroleum Hydrocarbons (EPA Method 1664, Soxhlet extracted SGT-HEM)

DRO = Diesel Range Organics, GRO = Gas Range Organics

TVH = Total Volatile Hydrocarbons (C6-C10 EPA 8015, EPA 5030/5035 purge and trap)

TEH = Total Extractable Hydrocarbons (Diesel #2 C11-C28, EPA Method 8015 solvent extraction)

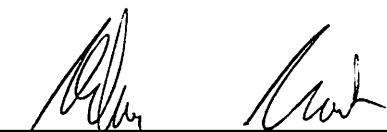
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TKN includes both organic and ammoniacal forms of nitrogen



Project Manager

3-20-19

Date

WELD LABORATORIES, INC.

1527 First Avenue • Greeley, Colorado 80631
 Phone: (970) 353-8118 • Fax: (970) 353-1671
 www.weldlabs.com

March 20, 2019

AusCo Petroleum Inc.
 113 N. Santa Fe Ave.
 Florence, CO 81126

Laboratory No.: E19071-4D
 Sample: SS-04

Project: AusCo Petroleum
 Location: Staging

Analyses performed according to methods in notes below

	Results	Units	Surr Recovery (%)
TRPH	NA	mg/kg – ppm	NA
TEH (DRO)	NA	mg/kg - ppm	NA
TVH (GRO)	NA	µg/kg - ppb	NA
Benzene	NA	µg/kg - ppb	NA
Toluene	NA	µg/kg - ppb	NA
Ethyl-benzene	NA	µg/kg - ppb	NA
m,p-Xylene	NA	µg/kg - ppb	NA
o-Xylene	NA	µg/kg - ppb	NA
Sat. Paste pH	7.0	SI	NA
Sat. Paste EC	1.71	mS/cm	NA
Sat. Paste Saturation%	44.6	%	NA
Sat. Paste TDS	1094	mg/kg	NA
Sat. Paste SAR	0.46	--	NA
Ammonium (NH ₄ ⁺)	39	mg/kg	NA

Notes:

TRPH = Total Recoverable Petroleum Hydrocarbons (EPA Method 1664, Soxhlet extracted SGT-HEM)

DRO = Diesel Range Organics, GRO = Gas Range Organics

TVH = Total Volatile Hydrocarbons (C6-C10 EPA 8015, EPA 5030/5035 purge and trap)

TEH = Total Extractable Hydrocarbons (Diesel #2 C11-C28, EPA Method 8015 solvent extraction)

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes (EPA 8015, EPA 5030/5035 purge and trap)

VOC = Volatile Organic Compounds (EPA 8260B, EPA 5030/5035 purge and trap)

Soils always run as received but reported on a dry weight basis (mg/kg-dry-wt)

U = Compound analyzed but not detected, NA = Not Applicable or Not Analyzed

TKN includes both organic and ammoniacal forms of nitrogen



Project Manager

3-20-19

Date

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March 20, 2019

AusCo Petroleum Inc.
 113 N. Santa Fe Ave.
 Florence, CO 81126

Laboratory No.: E19071-4E
 Sample: SS-06

Project: AusCo Petroleum
 Location: Background

Analyses performed according to methods in notes below

	Results	Units	Surr Recovery (%)
TRPH	NA	mg/kg – ppm	NA
TEH (DRO)	NA	mg/kg - ppm	NA
TVH (GRO)	NA	µg/kg - ppb	NA
Benzene	NA	µg/kg - ppb	NA
Toluene	NA	µg/kg - ppb	NA
Ethyl-benzene	NA	µg/kg - ppb	NA
m,p-Xylene	NA	µg/kg - ppb	NA
o-Xylene	NA	µg/kg - ppb	NA
Sat. Paste pH	7.4	SI	NA
Sat. Paste EC	1.01	mS/cm	NA
Sat. Paste Saturation%	36.0	%	NA
Sat. Paste TDS	646	mg/kg	NA
Sat. Paste SAR	0.09	--	NA
Ammonium (NH ₄ ⁺)	27	mg/kg	NA

Notes:

TRPH = Total Recoverable Petroleum Hydrocarbons (EPA Method 1664, Soxhlet extracted SGT-HEM)

DRO = Diesel Range Organics, GRO = Gas Range Organics

TVH = Total Volatile Hydrocarbons (C6-C10 EPA 8015, EPA 5030/5035 purge and trap)

TEH = Total Extractable Hydrocarbons (Diesel #2 C11-C28, EPA Method 8015 solvent extraction)

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes (EPA 8015, EPA 5030/5035 purge and trap)

VOC = Volatile Organic Compounds (EPA 8260B, EPA 5030/5035 purge and trap)

Soils always run as received but reported on a dry weight basis (mg/kg-dry-wt)

U = Compound analyzed but not detected, NA = Not Applicable or Not Analyzed

TKN includes both organic and ammoniacal forms of nitrogen


 Project Manager

3-20-19
 Date

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Weld Laboratories, Inc.
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Ausco Petroleum Inc
113 N Santa Fe Ave
Florence, CO 81126

Date: 3/19/2019

Farmer/Grower: Aaron Goss

Field No.: SS-01 stockpile

Requested Fertilizer Recommendation:

Crop: Native Grass

Yield goal: NA

Units: NA

Laboratory No. S19071-36

		Vs. Our Average Ag. Soil
Soil Texture	SCL	
pH	7.29	Avg
Salts, mmhos/cm	0.44	Avg
Organic Matter, %	1.58	Avg

	ppm	lbs/acre	Vs. Our Average Ag. Soil
Nitrate-N	1.8	4	V. Low
Phosphorus	22	43	Avg
Potassium	207	414	Avg
Calcium	3151	6301	Avg
Sulfate-S	5	10	Low
Boron			
Zinc	1.3	2.7	Avg
Iron	43.4	87	Avg
Manganese	5.0	9.9	Avg
Copper	1.0	2.1	Avg
Magnesium			
Sodium	50.2	100	Avg
		CaCO₃-C%	0.22
SMP Buffer pH	7.49	Lime req.(tons/ac)	None

Recommendations (add lbs. per acre)

65	#N
18	#P₂O₅
0	#K₂O
0.5	#S
	#B
0.0	#Zn
	#Fe
	#Mn
0.2	#Cu
	#Mg

**Notes: Based on a mixture of
buffalograss and blue grama**

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113 N Santa Fe Ave
Florence, CO 81126

Date: 3/19/2019

Farmer/Grower: Aaron Goss

Field No.: SS-02 Berm

Requested Fertilizer Recommendation:

Crop: Native Grass

Yield goal: NA

Units: NA

Laboratory No. S19071-37

		Vs. Our Average Ag. Soil
Soil Texture	SCL	
pH	6.8	Low
Salts, mmhos/cm	1.08	Avg
Organic Matter, %	2.69	High

	ppm	lbs/acre	Vs. Our Average Ag. Soil
Nitrate-N	5.5	11	Low
Phosphorus	12	23	Low
Potassium	403	806	High
Calcium	2435	4869	Avg
Sulfate-S	60	120	High
Boron			
Zinc	8.2	16.4	High
Iron	65.5	131	High
Manganese	19.1	38.2	V. High
Copper	1.1	2.3	Avg
Magnesium			
Sodium	233.2	466	V. High
		CaCO3-C%	0.31
SMP Buffer pH	7.53	Lime req.(tons/ac)	None

Recommendations (add lbs. per acre)

58	#N
38	#P₂O₅
0	#K₂O
0.0	#S
	#B
0.0	#Zn
	#Fe
	#Mn
0.2	#Cu
	#Mg

**Notes: Based on a mixture of
 buffalograss and blue grama**

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Ausco Petroleum Inc
113 N Santa Fe Ave
Florence, CO 81126

Date: 3/19/2019

Farmer/Grower: Aaron Goss

Field No.: SS-03 Parking

Requested Fertilizer Recommendation:

Crop: Native Grass

Yield goal: NA

Units: NA

Laboratory No. S19071-38

		Vs. Our Average Ag. Soil
Soil Texture	L	
pH	6.96	Low
Salts, mmhos/cm	0.58	Avg
Organic Matter, %	3.42	V. High

	ppm	lbs/acre	Vs. Our Average Ag. Soil
Nitrate-N	10.3	21	Avg
Phosphorus	18	36	Avg
Potassium	283	565	Avg
Calcium	4837	9674	V. High
Sulfate-S	21	42	Avg
Boron			
Zinc	6.1	12.1	High
Iron	34.4	69	Avg
Manganese	11.0	22.0	High
Copper	1.1	2.2	Avg
Magnesium			
Sodium	46.9	94	Avg
		CaCO3-C%	0.38
SMP Buffer pH	7.73	Lime req.(tons/ac)	None

Recommendations (add lbs. per acre)

48	#N
25	#P₂O₅
0	#K₂O
0.0	#S
	#B
0.0	#Zn
	#Fe
	#Mn
0.2	#Cu
	#Mg

**Notes: Based on a mixture of
buffalograss and blue grama**

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Ausco Petroleum Inc
113 N Santa Fe Ave
Florence, CO 81126

Date: 3/19/2019

Farmer/Grower: Aaron Goss

Field No.: SS-04 Staging

Requested Fertilizer Recommendation:

Laboratory No. S19071-39

Crop: Native Grass

		Vs. Our Average Ag. Soil
Soil Texture	L	
pH	7.11	Avg
Salts, mmhos/cm	0.62	Avg
Organic Matter, %	3.29	V. High

Yield goal: NA

Units: NA

	ppm	lbs/acre	Vs. Our Average Ag. Soil
Nitrate-N	11.8	24	Avg
Phosphorus	21	42	Avg
Potassium	575	1149	V. High
Calcium	4451	8902	High
Sulfate-S	18	35	Avg
Boron			
Zinc	4.4	8.7	Avg
Iron	29.1	58	Avg
Manganese	9.1	18.2	High
Copper	1.3	2.5	Avg
Magnesium			
Sodium	49.8	100	Avg
		CaCO ₃ -C%	0.47
SMP Buffer pH	7.58	Lime req.(tons/ac)	None

Recommendations (add lbs. per acre)

45	#N
19	#P ₂ O ₅
0	#K ₂ O
0.0	#S
	#B
0.0	#Zn
	#Fe
	#Mn
0.2	#Cu
	#Mg

Notes: Based on a mixture of
buffalograss and blue grama

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113 N Santa Fe Ave
Florence, CO 81126

Date: 3/19/2019

Farmer/Grower: Aaron Goss

Field No.: SS-06 Background

Requested Fertilizer Recommendation:

Crop: Native Grass

Yield goal: NA

Units: NA

Laboratory No. S19071-40

		Vs. Our Average Ag. Soil
Soil Texture	CL	
pH	7.49	Avg
Salts, mmhos/cm	0.40	Avg
Organic Matter, %	2.07	Avg

	ppm	lbs/acre	Vs. Our Average Ag. Soil
Nitrate-N	2.1	4	V. Low
Phosphorus	11	22	Low
Potassium	213	426	Avg
Calcium	3896	7792	High
Sulfate-S	3	6	Low
Boron			
Zinc	1.3	2.7	Avg
Iron	44.2	88	Avg
Manganese	3.3	6.5	Avg
Copper	1.0	2.0	Avg
Magnesium			
Sodium	25.1	50	Avg
		CaCO3-C%	0.52
SMP Buffer pH	7.64	Lime req.(tons/ac)	None

Recommendations (add lbs. per acre)

65	#N
39	#P₂O₅
0	#K₂O
0.5	#S
	#B
0.0	#Zn
	#Fe
	#Mn
0.2	#Cu
	#Mg

**Notes: Based on a mixture of
 buffalograss and blue grama**