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MAY 06 2021

DIVISION OF RECLAMATION
MINING AND SAFETY

Mahogany Energy Resources, L.L.C.

285 8th Street

Meeker, CO, 81641

970-878-9995

May 04, 2021

Colorado Division of Reclamation Mining & Safety,

I am formally re-submitting two Notice of Intent forms in this single mailing. These are being sent in response to Incompleteness Notice P-2021-002 and P-2021-003.

The NOI's are separated into two different envelopes. Each envelope should contain:

- 2 signed copies of Form 1
- 2 signed copies of Form 2
- 1 signed copies of Affidavit of Authority to Execute Financial Warranty Documents
- 1 signed copies of the One Site Prospecting Financial Warranty Check for Deposit in State Treasury

There is also one portable USB drive with pdf copies of the NOI on it. There should be three files total:

- NOI.Core2020-01.r1.pdf
- NOI.Core2020-03.r1.pdf
- 20148940-TM-0-Botany_Survey_02OCT20

Sincerely,



Justin Bilyeu

Vice President; Mahogany Energy Resources, LLC

May 04, 2021



COLORADO
Division of Reclamation,
Mining and Safety
Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

Form 2 (Public File)
NOTICE OF INTENT TO CONDUCT PROSPECTING OPERATIONS
FOR HARD ROCK/METAL MINES

CHECK ONE:

☐

There is an NOI Number Already Assigned to this Operation (Please reference the file number assigned to this operation)

NOI # P-

 - ☒

New NOI

☐

Modification to an Existing NOI (Provide for Modifications to an existing NOI)

NOI# P-

 -

GENERAL OPERATION INFORMATION

Type or print clearly, in the space provided, ALL information described below.

I. GENERAL INFORMATION

1. DATE NOI RECEIVED BY THE DIVISION:

(office use only)

2. PROJECT NAME: Shale Core 2020-01

3. PROSPECTOR:

Mahogany Energy Resources, LLC

Name

Title

Mahogany Energy Resources, LLC

Company Name

PERSON MLRB SHOULD CONTACT:

Justin Bilyeu

Name

Vice President

Title

Mahogany Energy Resources, LLC

Company Name



285 8th STREET

Street

P.O. Box

MEEKER, CO, 81641

City, State, Zip

(970) 878-9995

Telephone

()

Fax

1354 COUNTY RD. 246

Street

P.O. Box

Rifle, CO, 81650

City, State, Zip

(970) 440-2057

Telephone

(970) 210-4977

Fax

4. **APPLICATION FEE: \$86.** (NOIs require an **\$86** fee which must accompany this notice or it cannot be processed by the Division).

5.

LOCATION INFORMATION:

County: RIO BLANCO

Principal Meridian (check one):



6th (Colorado)



10th

(New Mexico)



Ute

Section (write number)

9

TOWNSHIP

2

N



S



RANGE

100

E



W



QUARTER SECTION (check one):

NE



NW



SE



SW



QUARTER/QUARTER SECTION (check one):

NE



NW



SE



SW



GENERAL DESCRIPTION: (the number of miles and direction to the nearest town and the approximate elevation):

Rangely, CO is 17 miles to the NW, or 37.5 road miles. 8560 ft. elev.

NOTE: Supply longitude and latitude or UTM coordinates if lands have not been surveyed or as supplemental information to this NOI. GPS measurements will be acceptable for this purpose:

Lat: 39.896328 X: _____
Long: -108.6112828 Y: _____

6. LAND OWNERSHIP:

☒ Private ☐ Public Domain (BLM) ☐ National Forest (USFS)
☐ State ☐ State Sovereign Lands ☐ Other (please describe)

If prospecting is located on BLM or USFS land the remaining section must be completed, otherwise go to section II Maps & Drawings

7. PROSPECTING ON BUREAU OF LAND MANAGEMENT (BLM) LAND AND U.S. FOREST SERVICE (USFS) LAND

The Division and the BLM/USFS have entered into cooperative agreements that eliminate the need for a prospector to post a financial warranty with each agency and allow them to coordinate the review of the NOI in order to minimize administrative processing time and effort.

A. CLAIMANT:

Name MAHOGANY ENERGY RESOURCES, LLC
Address 285 8TH STREET
City, State, Zip MEEKER, CO, 81641
Telephone (970) 878-9995
Fax ()

B. SITE/CLAIM INFORMATION:

List names, serial numbers and provide legal description to nearest quarter-quarter section of all sites or claims (attach additional page, if necessary).

NAME	SERIAL NUMBER	LEGAL DESCRIPTION
PARCEL #	165501100002	NE 1/4NE 1/4 SECTION 9
		2TS R100W, 6TH P.M.
		A.K.A. 62 FEL 472 FSL
		SECTION 9 T2S R100W
		6TH P.M.

C. LOCATION MAP: Attach a USGS 7.5 minute quad, or similar map of adequate scale, which locates the prospecting site(s).

D. Are prospect sites (e.g., drill holes, trench locations, etc.) staked on the ground? Yes ☒ No ☐

E. Specify the Land Management Agency, Address and Telephone Number:

Agency

Address

City, State, Zip

Telephone

()

F. The prospector is required to document that the NOI has been sent to the BLM or the USFS. Processing of the NOI will not begin until the prospector has submitted evidence acceptable to the Division that the NOI was sent to the BLM or USFS. Check one:

☐

Evidence of notification is attached to this NOI for BLM Land

☐

Evidence of notification is attached to this NOI for USFS Land.

☐

Other proof of notice is attached to this NOI

II. MAPS & DRAWINGS

An accurate topographic base map showing the location of the proposed project must be submitted with this notice. The prospector may submit a U.S.G.S. 7.5 minute quadrangle, or similar map of adequate scale that:

1. Identifies the proposed prospecting site(s) or activity areas involving surface disturbance. Activity areas include all drill holes, mud pits, excavations, trenches, adits, shafts, tunnels, rock dumps, stockpiles, impoundments and prospecting roads, and
2. Includes sufficient detail to identify and locate known prospecting features and facilities that may be affected and those that are not anticipated to be affected. This includes the location of all drill holes, mud pits, excavations, trenches, adits, shafts, tunnels, rock dumps, stockpiles, impoundments and prospecting roads. Color photographs, adequately labeled (including date, orientation and location), of the prospecting site may be used to fulfill this requirement if included with the NOI submittal.

III. PROJECT DESCRIPTION

1. Mineral(s) and/or Resource(s) being Investigated:

Kerogen Oil Shale

2. Estimated dates of commencement and completion:

Commencement:	05	/15	/ 2021
Completion	12	/31	/ 2021
3. Amount of material (specify units) to be extracted, moved or proposed to be moved:

17.5	Units	TONS
------	-------	------

Identify the type or method of prospecting proposed and quantity (place an "X")

- | | | |
|--|--|--|
| ☐ Cuts | ☐ Pits | ☐ Trenches |
| ☐ Shafts | ☐ Tunnels | ☐ Adits |
| ☐ Declines | ☒ Air Drilling | ☒ Fluid Drilling |
| ☐ Drilling and Blasting | | |

5. Describe proposed surface excavation or other land disturbance, including roads, pits, trenches, waste piles, drill pads and collar areas of underground workings, ponds, etc.

Site is 200 feet east of CR103 next to a private road. The private road will be improved to the pad site. A pad measuring no more than 150 ft x 100 ft will be cleared, leveled, and used for all drilling purposes. This will be located on the south side of the improved road. The prepared pad site will contain the drilling rig, fresh water storage tank, generator, air compressor, parking, fuel storage, restroom facilities, and temporary control trailer. Top soil will be mounded at the southern area of the 150ft pad. The pad will then be leveled. Water produced during the drilling operation will be contained in an excavated pond near the south eastern end of the pad area. This water will be contained so that it infiltrates into the soil at that location. No surface water discharge permit(s) will be required.

6. Proposed Disturbance (approximate) Describe the proposed drilling to be conducted, including anticipated number of holes, diameter, depth, location, etc. Submit additional pages if necessary:

A. Drill Pads:

Quantity	<u>1</u>	Average Width (ft)	<u>100 (east-west)</u>	Average Length (ft)	<u>150 (n-s)</u>
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B. Drill Holes:

Quantity	<u>2</u>	Depth (ft)	<u>1700</u>	Diameter (in)	<u>3.3" cores</u>
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C. Mud Pits

Quantity	<u>1</u>	Average Width (ft)	<u>20</u>	Average Length (ft)	<u>28.5</u>	Average Depth (ft)	<u>7.5</u>
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- D. Described proposed underground work, including reopening of old workings, advancement of adits or shafts, trenches, pits, cuts, rock dumps, or other types of disturbance, describe type, quantity and general dimensions:

No underground work will be conducted. Only two core holes bored within 3 feet of each other at this single pad location.

E. Other Disturbances (please describe)

Please see the description of the additional tests to be conducted on bore hole 2020.01.

F. Indicate Chemicals and Fuels used or stored on site. List type, quantity and method to store.

Drilling will use air and/or water. Generators and equipment will use diesel fuel and grease. Diesel fuel will be stored in a fuel truck on the drilling pad. Greases and oils will be stored in or on the fuel truck. Self contained toilet facilities will be used on site for human waste. These will be cleaned periodically by a service company.

G. New Roads:

Length (ft): 300 Width (ft): 16

Significantly

Upgraded Roads

Length (ft): _____ Width (ft): _____

Are culverts or other crossings proposed? If so, please describe:

NONE.

H. Total project area to be disturbed (acres) 0.195

I. Describe the equipment to be used for the prospecting operations:

Core drilling rig. Diesel powered generator. Diesel powered air compressor. Fuel truck. 500 barrel water storage tank. Pipe storage truck. Control building. Personal transportation trucks (up to 6).

E. Continued Answer

In addition to core retrieval several other geological tests will be conducted in the borehole. A wireline company will be brought in to perform geophysical logging. This is to include:

- Natural Gamma, Caliper Log, Fluid Temperature, and Conductivity with a Combo Tool
- E-logs
- Full Waveform Sonic
- Neutron
- Dual Density
- Acoustic and Optical Televiwer
- Spinner and/or Heat-Pulse Flowmeter
- Borehole Nuclear Magnetic Resonance (NMR)
- Hydrogeological Packer

The hydrogeological packer testing consist of pressure testing the borehole using either single or double packer assemblies. The testing is accomplished by sealing off and isolating 10 to 100 foot intervals and injecting water into that interval of rock. By measuring the flow rate of injection water, and the associated pressure over time, estimates of hydraulic conductivity and transmissivity can be made. None of the packer equipment will be left in the borehole. The results will help estimate future mine water inflow.

Once all of these tests are complete on borehole 2020.01 a vibrating wire piezometer (VWP) will be installed for long term monitoring purposes. This will be used to measure water pressure in zones where groundwater was indicated during drilling. It will allow for long term monitoring of groundwater levels and effects of future mine development on the groundwater regime. The VWP will be attached to the outside of a 1" Schedule 80, threaded PVC pipe and lowered into the drill hole with the rig. The entire hole will be filled with the piezometer manufacturer's recommended blend of cement-bentonite grout from bottom to top, inside and out of the PVC pipe. This seals the different aquifer zones from each other. The surface will be completed by leaving a 6.625 inch - 8.625 inch steel pipe extending 20 inches - 30 inches above grade. The grout, PVC pipe, and wires for the VWP will be brought flush to the top of pipe and concealed under a removable, lockable cap.

Periodic measurements of the VWP will be made by carrying hand-held instruments to the pipe, removing the cap and connecting to the exposed wires. No instruments will be permanently attached to the VWP. It will remain covered and locked nearly all of the time. The area around the VWP can be fully reclaimed after drilling and installation of the VWP. In the event that the VWP needs to be removed from the surface, it can be cut away using hand tools. No access roads or cleared areas are required. The down-hole portion of the VWP would be left in the ground permanently as it has been plugged during the grouting operation.

The core hole locations have been selected to be at the highest point on the western rim of the Piceance basin at approximately 8560 feet above mean sea level. The hydrostatic pressure of any water aquifers encountered under ground will not be enough to cause artesian flow while drilling. Additionally, because the core hole has been fully grouted the Division of Water Resources does not require a permit for the core hole as water cannot be removed in the future.

Please see a sketch of the proposed bore hole attached to this permit. An as-built report will be provided to the Colorado Division of Reclamation Mining and Safety within 3 months of the completion of drilling and plugging activities of these core holes. This report will detail the bore hole depths and the completion depths of the vibrating wire piezometer.

- J. Describe and locate any structures to be constructed (i.e. stockpiles, ponds, impoundments):

The drill cuttings and water will be collected in a settling pond on the south east end of the drilling pad. Top soil will be located to the south of the settling pond.

- K. Describe anticipated relationship to surface water and groundwater (proximity to streams, penetration of ground water aquifers):

The site is located on top of a hill that drains to a small tributary to Water Gulch. This joins at Dry Fork to Corral Gulch. This area is nearly at the top of the Cathedral Bluffs ridge. Water generally seeps into ground water aquifers in this region to become part of the Yellow Creek drainage basin. Silt fencing or straw wattles will be placed at the toe of fill slopes along their entire length to control soil migration in the event of surface water movement. The drill pad location was selected at the top of a ridge to eliminate surrounding surface water movement through the pad location.

IV. OPERATION AND RECLAMATION MEASURES:

1. The Board suggests that a photographic record of the pre-prospecting and post-prospecting conditions be kept by the prospector. These photos should be taken from the same location and by the same method to clearly show the pre-prospecting condition of the land and the reclamation efforts. Upon completion of reclamation and request for bond or surety release, the Board may consider the photos as evidence of adequate reclamation, and thus, be able to act more quickly on the request for release.
2. Provide a description of the native vegetation of the area to be disturbed, including tree, shrub, and grass communities of the area. Color photographs, sufficient to adequately represent the ecology of the site and adequately labeled (including date, orientation and location), may be used in lieu of a written description. Based on the quality of the photographs, the Division may require additional detail.

Please see the Technical Memorandum: BOTANY SURVEY OF PROPOSED DRILL PADS, RIO BLANCO COUNTY, COLORADO; by Mike Bellitto, Golder Associates, Inc.; October 2, 2020. This document is located in Appendix B of this NOI request documentation.

3. Describe the estimated topsoil depth and how topsoil will be salvaged, stockpiled and redistributed for the re-establishment of vegetation. Specify approximate topsoil redistribution depth:

All woody material will be chipped, or roller chopped in place and salvaged and stored with topsoil. Twelve inches of topsoil would be stripped from the site and stored on the southern edge of the pad in piles 2 to 3 feet deep with stable slopes and be positioned to minimize exposure to wind and water erosion. The shallow mounded topsoil stockpiles will help maintain soil microbes and seed banks of viable seed for the native plants present on the site. Note: due to the position of the site along the windswept Cathedral Bluffs, an anchored mulch cover may be required on the topsoil stockpile (such as: jute netting or straw erosion blanket).

Upon completion of drilling, approximately 12 inches of topsoil would be evenly redistributed across the site just prior to re-seeding. Topsoil replacement would occur in late August and September followed by re-seeding in late September prior to freezing soil surface. Salvaged topsoil will be reseeded within 180 days if it has not been reapplied to the disturbed area.

4. Describe how drill holes will be plugged (refer to Rule 5.4 of the Rules for required abandonment procedures):

After the shale coring, geophysical testing, and down-hole packer testing has been completed on the 3" core hole a vibrating wire piezometer will be installed. This unit will be used to measure water pressure in zones that indicated groundwater during drilling. The piezometers will be attached to 1" Sch. 80 PVC and lowered into the drill hole. Once in place the assembly will be grouted with a cement-bentonite mixture meeting the piezometer manufacturer's specifications. This will be terminated 20-30" above ground and protected by a welded steel pipe and removable, locked cap. This will be painted juniper green. The second bore hole, once cored will be filled with grout and terminated 24" below finished grade. The entire drill pad, and access road will be reclaimed at this time. Access to the VWP will be done by foot traffic only.

5. Describe how portals, adits, shafts, ponds, excavations, or other disturbances will be reclaimed (refer to Rule 3 and Rule 5 for specific reclamation performance standards). You may wish to contact the Division for closure specifications.

The pond excavated for water containment and infiltration will be backfilled with the soil removed from the pond area. After compaction the area will be re-covered with the top soil set aside from the area. Then the entire area will be re-vegetated. This will be completed after the coring activities while vibrating wire piezometer monitoring is occurring. Piezometer monitoring will involve hand-held instruments carried to location, on foot, approximately 4 times per year, with no vehicle traffic off of established roads.

6. Describe how roads will be reclaimed or returned to their pre-prospecting (or better) condition:

The road from CR-103 used for access to this drill pad will be fully reclaimed along with the drill pad. The topography will be contoured to match the surrounding landscape.

Noxious weeds will be controlled by pressure washing drilling equipment prior to arriving on-site to prevent weed transference. After seeding the disturbed areas, vegetation will be monitored annually for the presence of noxious weeds until the natural cover is reestablished. Any identified noxious weeds will be removed by hand pulling.

7. List the seed mixture to be used in the re-establishment of vegetation. See the attached seed mixture calculation to obtain PLS/acre. For assistance with formulating seed mixtures and rates, contact the local NRCS if on private land, BLM/USFS if on public land or State Land Board if on state land.

A. Plant name and seeding rate:

Plant Name	Seeding Rate (PLS/Acre)
Slender Wheatgrass, <i>Elymus trachycaulis</i>	2.9
Saskatoon serviceberry, <i>Amelanchier alnifolia</i>	1.69
cicer milkvetch, <i>Astragalus cicer</i>	1.5
Prairie junegrass, <i>Koeleria macrantha</i>	0.59
silky lupine, <i>Lupinus sericeus</i>	1.74
western wheatgrass <i>Pascopyrum smithii</i>	3.71
Rocky Mountain penstemon, <i>Penstemon strictus</i>	0.46
mountain snowberry, <i>Symphoricarpos oreophilus</i>	1.59
Pure Live Seed Application Rate	14.19 (lbs/PLS/ac)
Application rate is designed for drill seeding.	
Broadcast seeding rate would be twice the application rate shown in this table.	

B. Describe the method for seed bed preparation, and application method for grass/forb seeding:

Following completion of drilling, sub-surface cut and fill material would be replaced to reconstruct the original contours of the site prior to topsoiling. Any compacted subsurface areas would be ripped prior to topsoiling. As noted above, topsoil would be evenly redistributed across the site just prior to re-seeding. Topsoil replacement would occur in late August and September followed by re-seeding in late September prior to freezing soil surface. The prescribed seed mix would be broadcast across the site following topsoiling; anticipating a loose seedbed, the site would be lightly compacted by use of tracked equipment.

After seeding, a certified weed free straw mulch (2 tons/acre) would be applied to the site and shallow harrowed to crimp the straw mulch in place. The site will be protected with BLM specification wire fencing for seedling growth until State requirements have been met. After that, the fence will be removed.

V. TERMS AND CONDITIONS FOR PROSPECTING OPERATIONS:

1. Reclamation measures shall be fulfilled in a timely manner and completed within five (5) years of completion of prospecting activities.
2. The prospecting operations described in this Notice will be conducted in such a manner as to minimize surface disturbances. In addition to the measures required in Rule 5, precautions to be taken include:
 - A. Confinement of operations to areas near existing roads or trails, where practicable. Existing roads which are to remain as permanent roads after prospecting activities are completed shall be left in a condition equal to or better than the pre-prospecting condition;
 - B. Drilling shall be conducted in such a way as to prevent cuttings and fluids from directly entering any dry or flowing stream channel. Drill cuttings must be spread to a depth no greater than one-half (1/2) inch or buried in an approved disposal pit;
 - C. Proper and timely abandonment of drill holes upon completion of drilling;
 - D. Reclamation of affected lands upon completion of operations or phases of an operation;;
 - E. Backfilling and revegetating any pits to blend in with the surrounding land surface;

- F. Safeguarding mine entries, trenches and excavations from unauthorized entry at all times;
 - G. Disposal of any trash, scrap metal, wood, machinery, and buildings;
 - H. Control of noxious weeds within the area affected by the prospector
- 3. The prospecting operations shall be conducted in such a manner as to comply with all applicable local, state and federal laws and regulations including applicable state and federal air and water quality laws and regulations.
 - 4. The prospecting operations shall be conducted so as to minimize adverse effects upon wildlife to include covering of open drill holes until properly plugged.
 - 5. During the prospecting operations, the operator will perform the necessary stabilization and reclamation work to ensure those areas affected by prospecting activities are erosionally and geotechnically stable.
 - 6. All prospecting operations shall be in compliance with the Colorado Mined Land Reclamation Act, as amended (34-32-101 et seq. C.R.S.), and all rules and regulations currently in effect or promulgated pursuant thereto. See 2 CCR 407-1, Mined Land Reclamation Board Hardrock /Metal Mining Rules.

VI. ADDITIONAL TERMS AND CONDITIONS FOR PROSPECTING ON BLM/USFS LANDS

- 1. The prospector will supply a copy of this NOI to the appropriate BLM and/or USFS office.
- 2. The prospector authorizes the MLRB to discuss the information in this Notice of Intent with the BLM and/or USFS.
- 3. If on BLM land, the prospector will complete reclamation to the standards described in 43 CFR 3809.1-3 (d) and implement reasonable measures to prevent unnecessary or undue degradation of lands during operations.

VII. FINANCIAL WARRANTY

A financial warranty must be provided for the cost of reclamation of the disturbance described in this Notice. The prospector can either file a "One Site Prospecting Financial Warranty" or a "Statewide Financial Warranty." **The financial warranty must be submitted and approved by the Division prior to entry upon lands for the purpose of prospecting.**

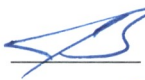
A One-Site Prospecting Financial Warranty is usually filed by individuals or companies where prospecting activities are limited to a single area. It must be filed in the amount of \$2,000 per acre for land to be disturbed, or such other amount as determined by the Division, based on the projected costs of reclamation. A Statewide Financial Warranty is usually filed by companies with multiple prospecting sites. It must be filed in an amount equal to the estimated cost of reclamation per acre of affected land for all anticipated sites statewide. (You may increase the statewide bond at any time in order to cover additional or expanded prospecting activities.)

VIII. SIGNATURE REQUIREMENT

Please place your initials on the line provided:

 I hereby verify that the foregoing information is true and accurate and commit to the reclamation of the aforementioned prospecting site as required by the Colorado Mined Reclamation Act and the rules as specified in the Hard Rock/Metal Mining Rules and Regulations and this NOI form.

 I have enclosed the required permit fee.

 I authorize the Division to contact and copy the BLM and/or USFS on any correspondence related to the prospecting operation, if the prospecting operation is located on federal public land.

 I have also enclosed the appropriate reclamation surety amount or will post an amount as determined by the office, based on the projected costs of reclamation.

 I understand that I am not authorized to create any surface disturbance until the surety amount is posted and approved in writing from the Division of Reclamation, Mining and Safety.

 I accept and agree to comply with the foregoing terms and conditions and with all of the provisions of Rules 3 and 5, and C.R.S. 34-32-101.

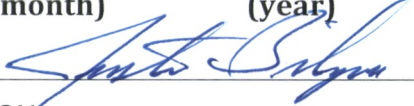
 I hereby certify that concurrent with submittal of this NOI to the Division, I have sent notice to the Boards of County Commissioners in the counties where the proposed activities will occur. This notice also indicated that non-confidential information regarding the proposed activities will be available for review at the Division's website.

This form has been approved by the Mined Land Reclamation Board pursuant to section 34-32-113, C.R.S., of the Mined Land Reclamation Act. Any alteration or modification of this form shall result in voiding any NOI issued on the altered or modified form and subject the operator to cease and desist orders and civil penalties for operating without a NOI pursuant to section 34-32-123, C.R.S.

I, the undersigned, being the NOI holder or the person authorized to sign on behalf of the NOI holder, declare that the information given in this NOI form is true and correct.

SIGNATURES MUST BE IN BLUE INK

Signed and dated this 4th day of MAY, 2021
(date) (month) (year)

Signature of NOI holder or person authorized to sign: 

Name (typed or printed):

Justin Bilyeu

Title/Position:

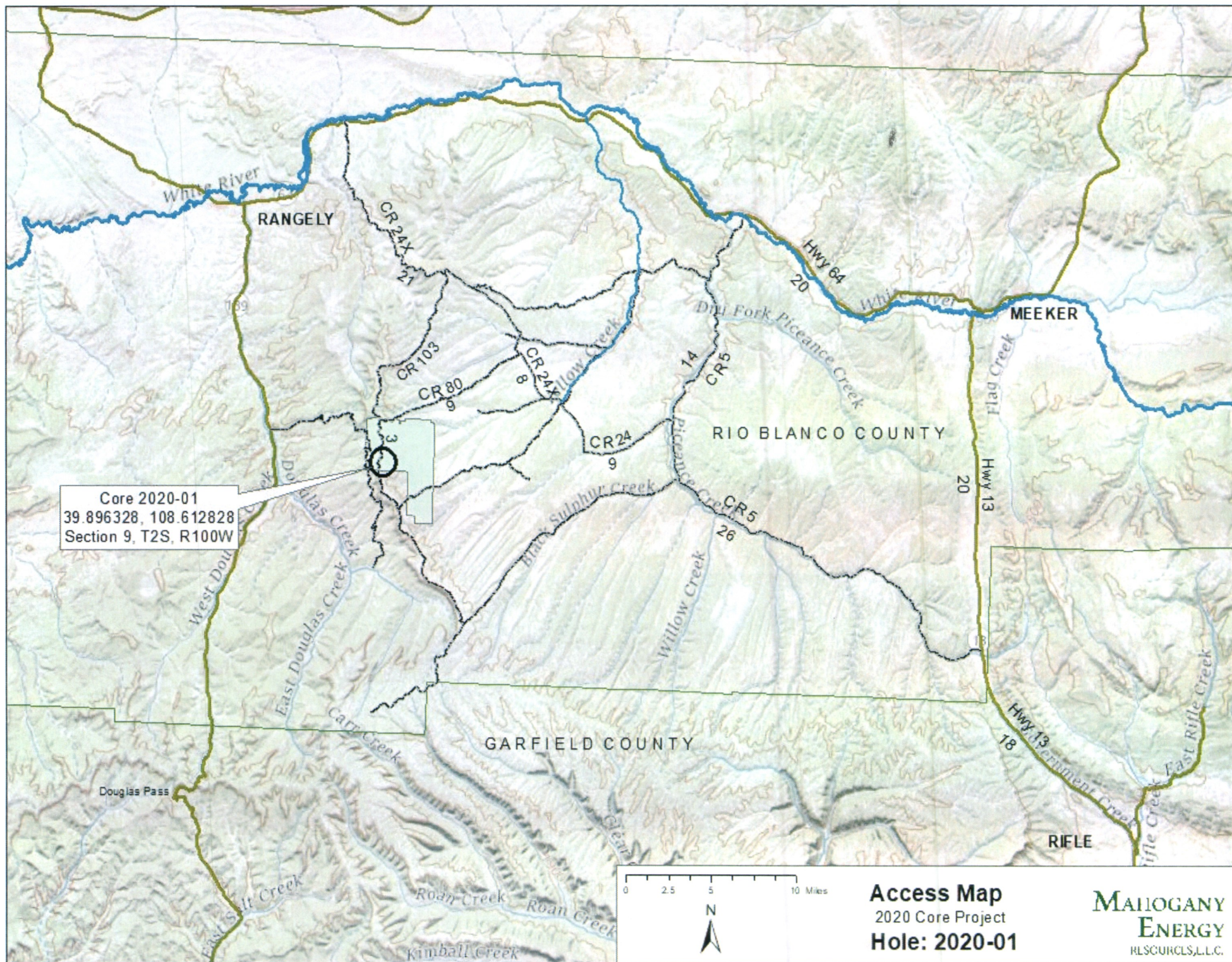
Vice President, Mahogany Energy Resources, LLC

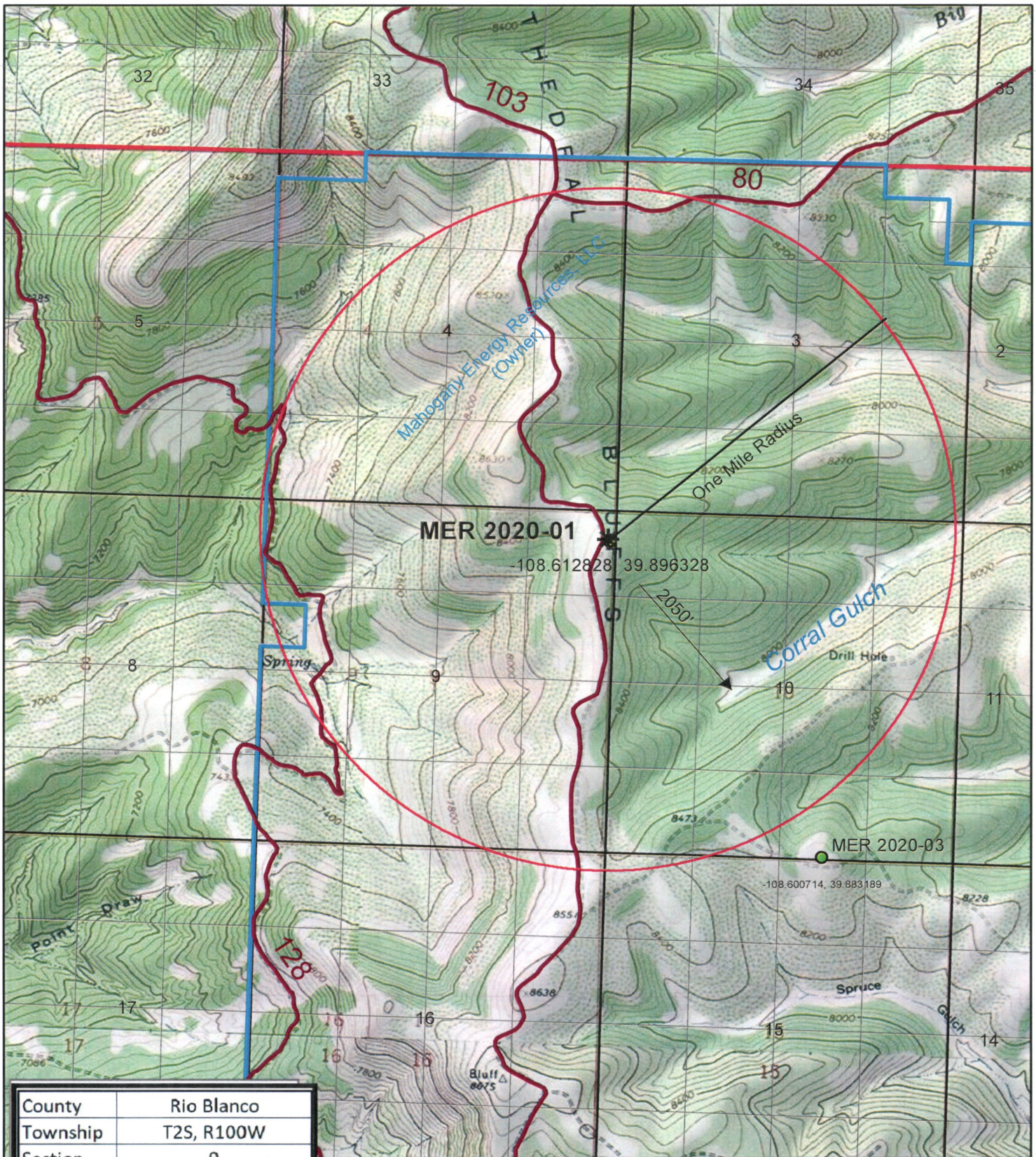
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30 Aug 2017

APPENDIX A

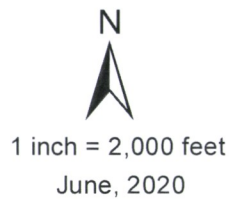
MAPS AND DRAWINGS

- 1) Access Map by Mahogany Energy Resources
- 2) Vicinity Map by Mahogany Energy Resources
- 3) Section Map by Powers Enterprises, Inc.
- 4) Topographic Map by Powers Enterprises, Inc.
- 5) Grading Map of Drill Pad by SGM Engineering, Inc.
- 6) Proposed Drillhole Abandonment Schematic by Golder.





County	Rio Blanco
Township	T2S, R100W
Section	9
Aliquot	NENE
Date	Jun-20
Long	-108.612828
Lat	39.896328
Grd. Elev.	8560
Sheet 2 of 6	



Hole MER 2020.01
2020 Core Program
Rio Blanco County, Colorado

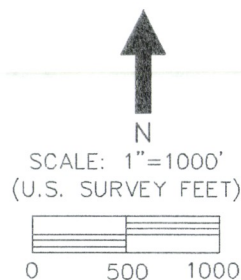
MAHOGANY
ENERGY
RESOURCES, L.L.C.

LOCATED IN THE NE1/4NE1/4 OF
SECTION 9, T2S, R100W OF THE
6TH P.M., RIO BLANCO COUNTY,
COLORADO

WELL
MER 2020.01
SHALE TECH INTERNATIONAL
SERVICES LLC

LEGEND

- MONUMENT AS SHOWN
- NO MONUMENT FOUND
- ⊙ WELL LOCATION



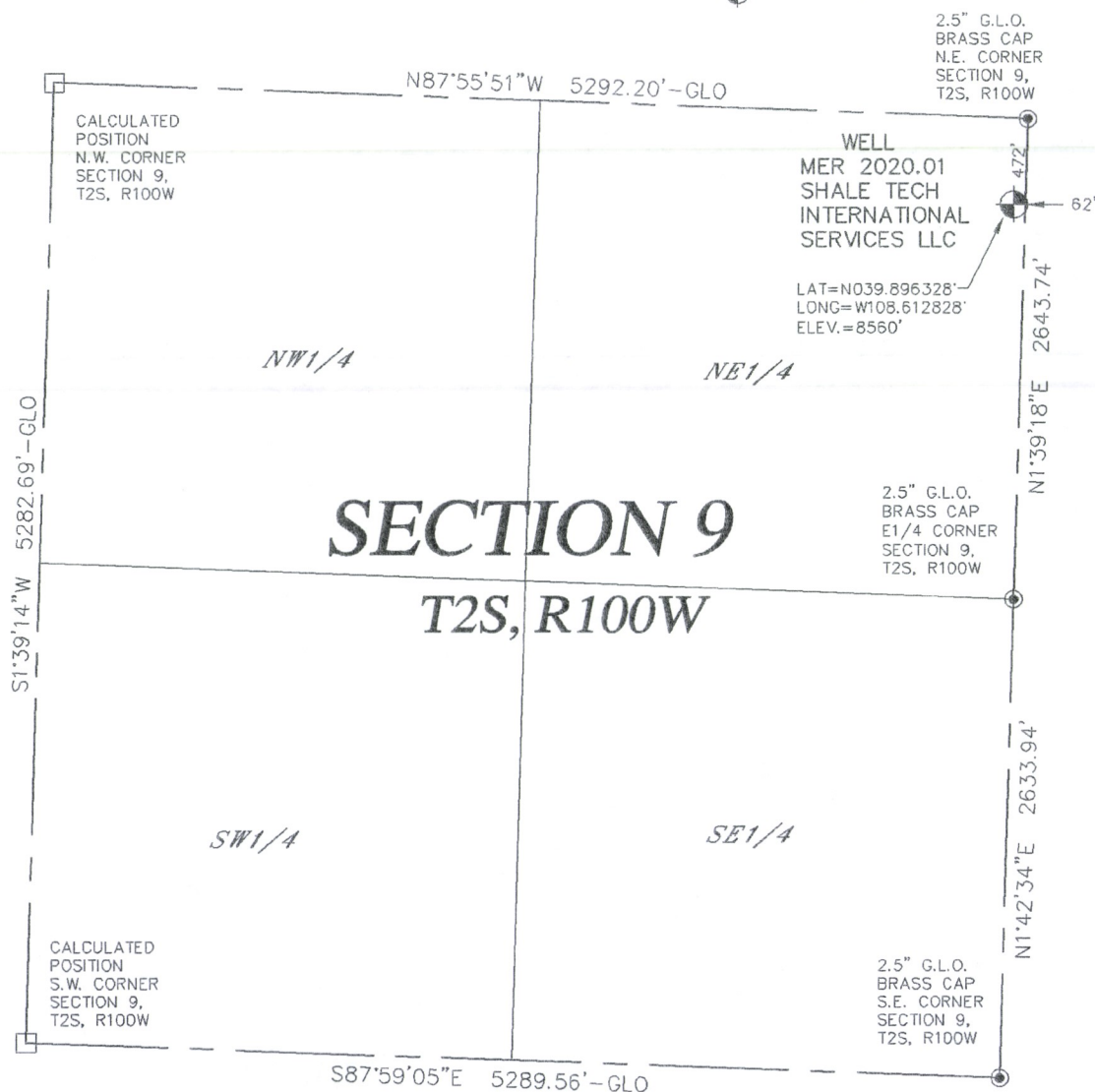
BASIS OF BEARINGS,
DISTANCES AND ELEVATIONS
SHOWN ARE TAKEN FROM
G.P.S. OBSERVATIONS
(NAD 83)(PDOP - 1.5)
(JULY 16, 2020)
(OPERATOR- L. POWERS)

SURFACE USE

AGRICULTURAL
LIVESTOCK GRAZING

IMPROVEMENTS

NO STRUCTURES
WITHIN 200' OF
PROPOSED WELL



LAND SURVEYOR'S CERTIFICATE

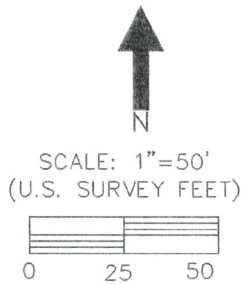
I, Lloyd W. Powers being a duly registered Professional Land Surveyor do hereby certify that this survey was made by me or under my direct supervision and is based upon my professional knowledge, information and belief and conforms with the applicable standards of practice in the State of Colorado. This certificate does not constitute a guaranty or warranty, either expressed or implied.

Lloyd W. Powers, PLS
Colorado Reg. No. 13901



LOCATED IN THE NE1/4NE1/4 OF
SECTION 9, T2S, R100W OF THE
6TH P.M., RIO BLANCO COUNTY,
COLORADO

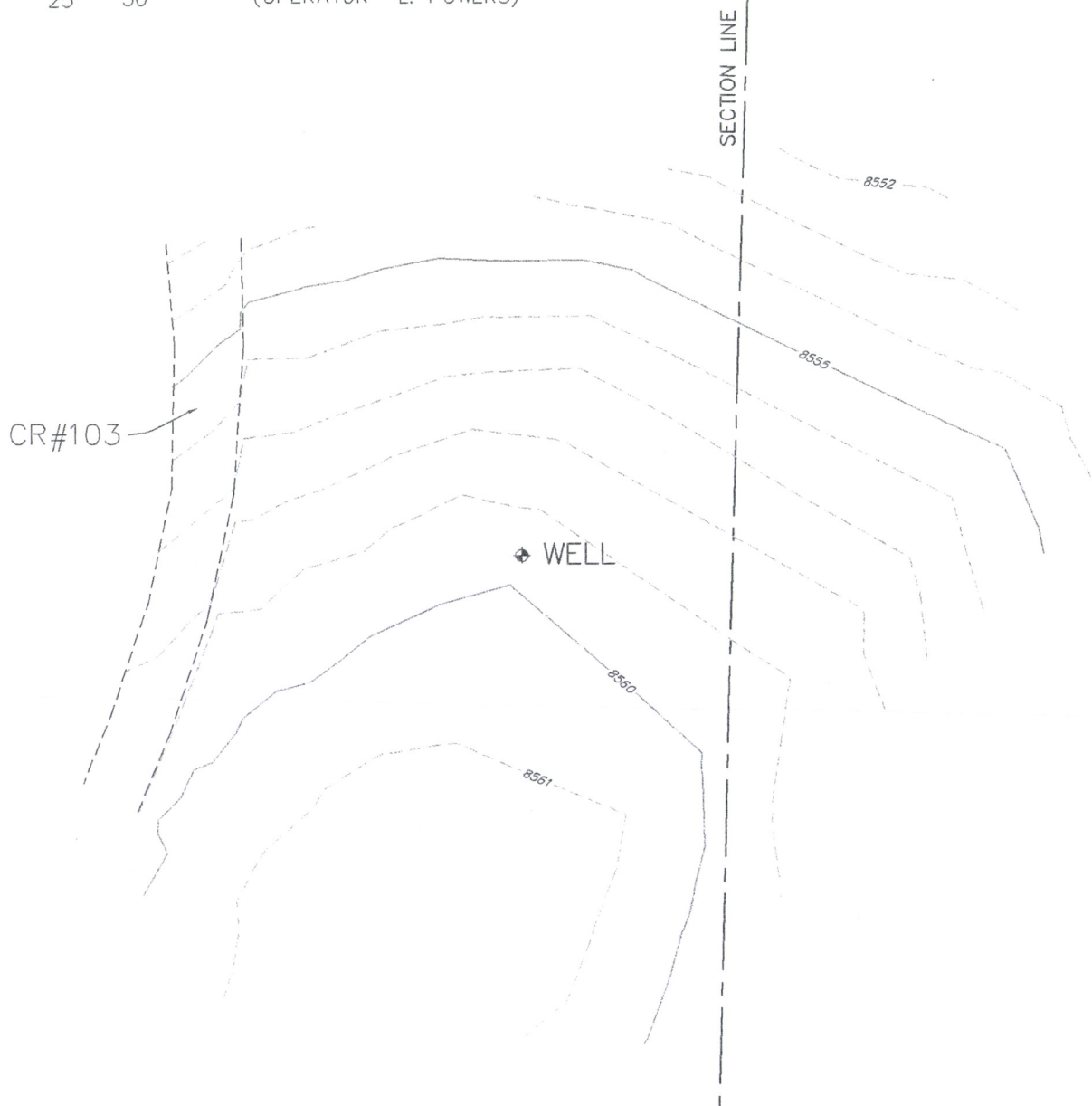
WELL
MER 2020.01
SHALE TECH INTERNATIONAL
SERVICES LLC

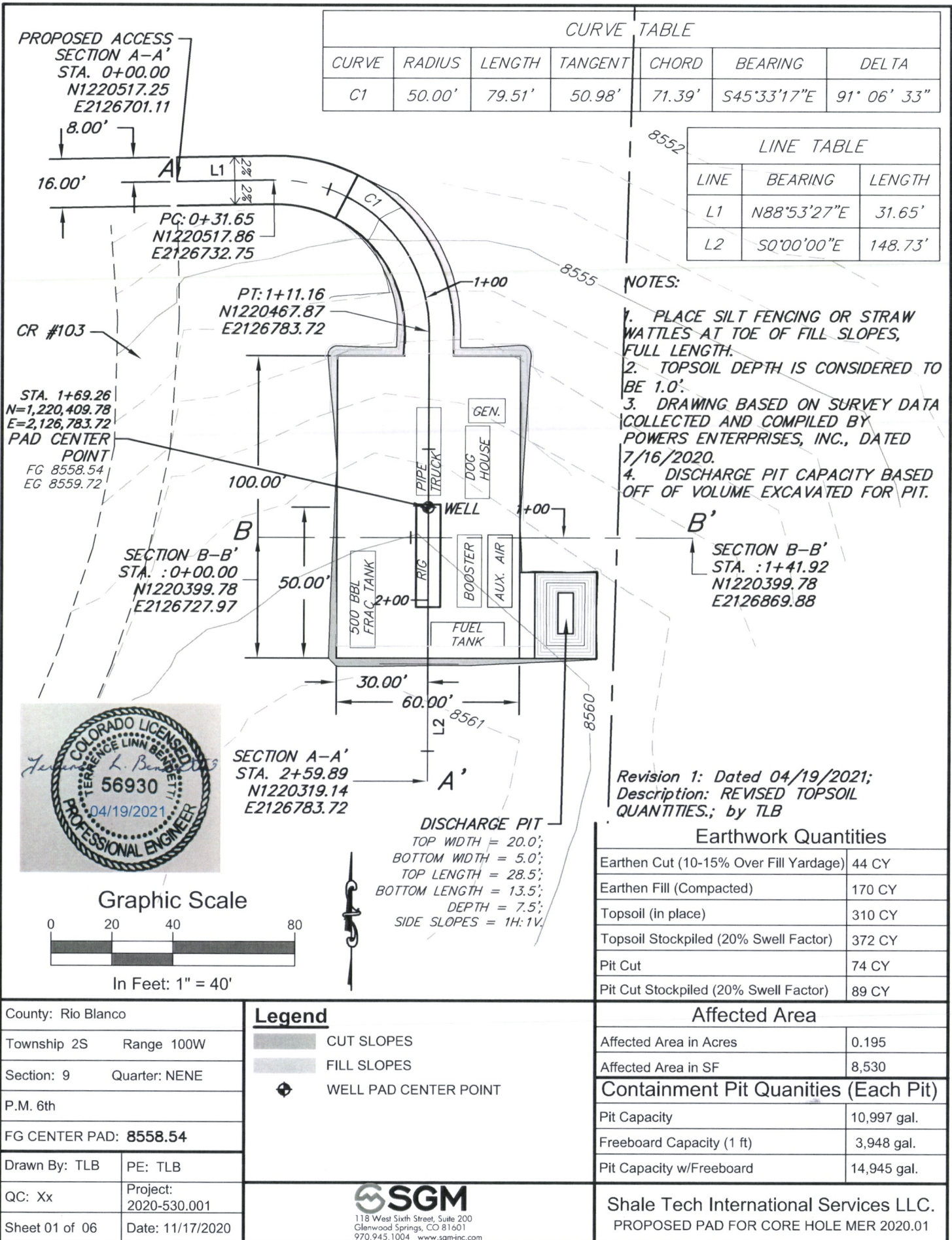


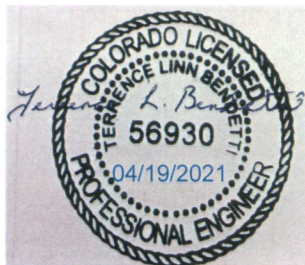
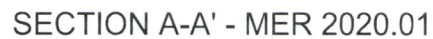
NOTE:
1) CONTOUR INTERVAL 1'
2) BASIS OF BEARINGS,
DISTANCES AND ELEVATIONS
SHOWN ARE TAKEN FROM
OBSERVATIONS
(NAD 83)(PDOP - 1.5)
(JULY 16, 2020)
(OPERATOR- L. POWERS)

LEGEND

- ⊙ MONUMENT AS SHOWN
- NO MONUMENT FOUND
- ⊕ WELL LOCATION



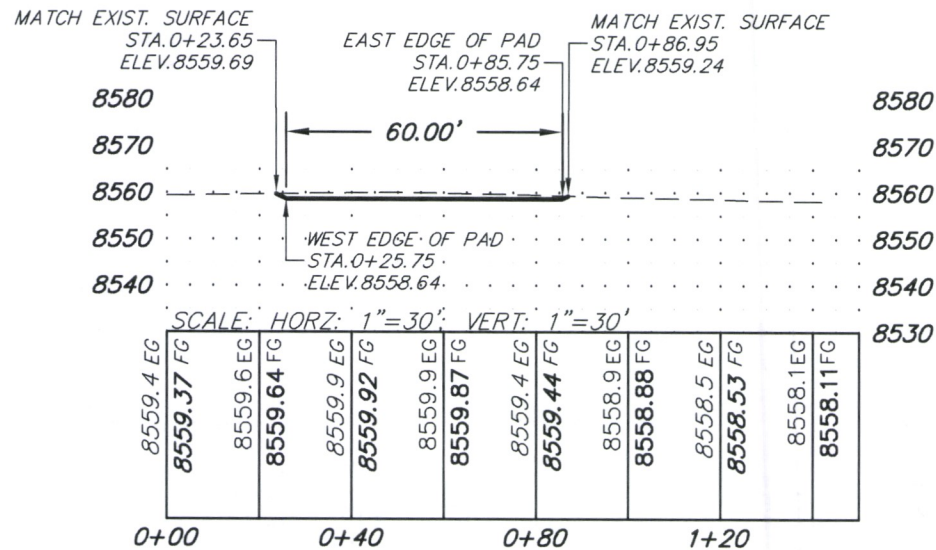




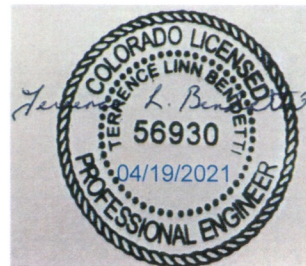
Revision 1: Dated 04/19/2021; Description: REVISED TOPSOIL QUANTITIES.; by TLB



Shale Tech International Services LLC.
PROPOSED PAD FOR CORE HOLE MER 2020.01



SECTION B-B' - MER 2020.01

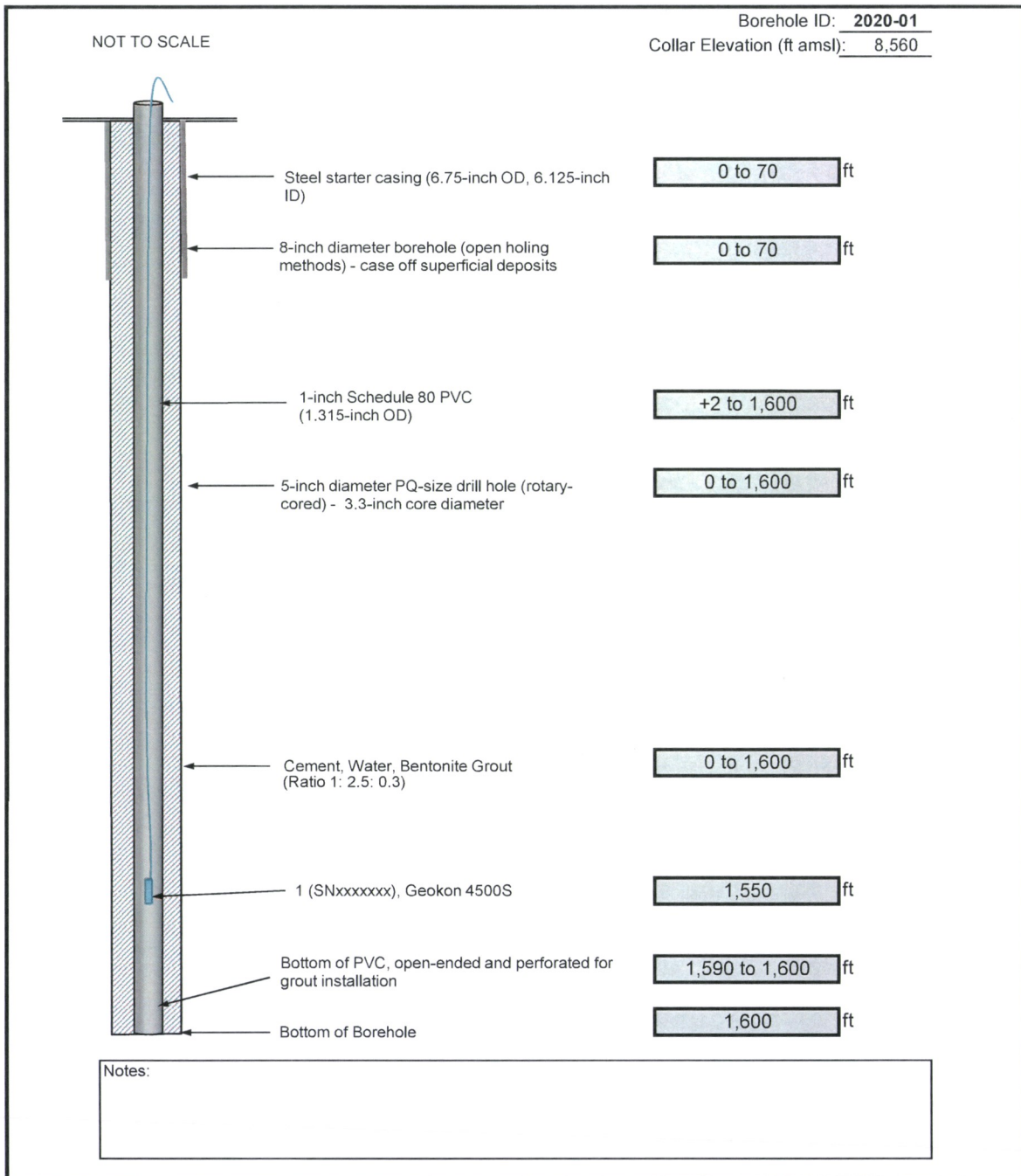


County: Rio Blanco	
Township 2S	Range 100W
Section: 9	Quarter: NENE
P.M. 6th	
Ground Elevation: 8558.54	
Drawn By: TLB	PE: TLB
QC: Xx	Project: 2020-530.001
Sheet 03 of 06	Date: 11/17/2020

Revision 1: Dated 04/19/2021; Description: REVISED TOPSOIL QUANTITIES.; by TLB



Shale Tech International Services LLC.
PROPOSED PAD FOR CORE HOLE MER 2020.01



 GOLDER	TITLE		
	Proposed Drill Hole Abandonment Schematic		
	DRAWN	DATE	JOB NO.
	AGC		20148940
CLIENT/PROJECT Mahogany Energy Resources, Rio Blanco County, CO - Core Holes and Piezometer Installation	CHECKED	SCALE	DWG. NO.
		Not to Scale	
	REVIEWED	FILE NO.	FIGURE NO.
			Figure 1

APPENDIX B

BOTANY SURVEY

1) By Golder, file name:

a) 20148940-TM-0-Botany_Survey_02OCT20

TECHNICAL MEMORANDUM

DATE October 2, 2020

Project No. 20148940

TO Justin Bilyeu
Shale Tech International Services, LLC

CC

FROM Mike Bellitto, Golder Associates Inc.

EMAIL mbellitto@golder.com

BOTANY SURVEY OF PROPOSED DRILL PADS, RIO BLANCO COUNTY, COLORADO

1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this technical memorandum (TM) to document the results of a botany survey of two proposed drill pad locations in Rio Blanco County, Colorado. Figure 1 presents the proposed drill pad locations. Golder performed the survey to collect information required for a Notice of Intent to Conduct Prospecting Operations (NOI) to be submitted to Colorado Division of Reclamation, Mining and Safety (DRMS). The purpose of the survey was to:

- 1) Provide a description of the native vegetation of the area to be disturbed, including tree, shrub, and grass communities of the area
- 2) Describe the estimated topsoil depth

2.0 SURVEY RESULTS

Golder performed the survey on September 24, 2020. Mike Bellitto, a senior restoration ecologist, visited both sites accompanied by Justin Bilyeu (Shale Tech).

Both proposed drill pads are located on relatively level terrain on ridgelines at approximately 8,380 feet above mean sea level (ft AMSL) (Core 2020-03/04) and 8,560 ft AMSL (Core 2020-01/02). The local vegetation community is described under the United States Geological Survey (USGS) GAP system (NatureServe 2020) as Rocky Mountain Lower Montane-foothill Shrubland.

2.1 Core 2020-01/02

Vegetation on this site is dominated by a sparse to moderately dense tall shrub layer (10% to 60% cover). The dominant shrub is the cold-deciduous shrub *Amelanchier alnifolia* (Saskatoon serviceberry). *Symphoricarpos oreophilus* (roundleaf snowberry) often dominates in the short-shrub layer. Other shrub associates include low cover of *Artemisia tridentata* var. *vaseyana* (mountain big sagebrush), *Chrysothamnus viscidiflorus* (green rabbitbrush), and *Rosa woodsii* (Wood's rose). The sparse to moderate herbaceous layer is dominated by *Carex geyeri* (elk sedge) with smaller components of *Stipa viridula* (green needlegrass), *Pascopyron smithii* (western wheatgrass) and *Achnatherum hymenoides* (Indian ricegrass). Due to the fall survey date, most forbs had senesced and could not be identified to species. Several were identified to genus, including milkvetch

(*Astragalus* sp.), penstemon (*Penstemon* sp.), buckwheat (*Eriogonum* spp.) and paintbrush (*Castilleja* sp.). Photograph 1 is representative of the vegetation.

Soil is described as a channery loam of the Parachute series (NRCS 2020). Topsoil depth was estimated based on four hand-dug holes. The depth ranged from 10 inches to 14 inches and averaged 12 inches. Photograph 2 shows a typical profile.

2.2 Core 2020-04/03

Drill pad Core 2020-04/03 is located on a previously reclaimed drill pad. The adjacent undisturbed vegetation is a mountain shrub community similar in composition to Core 2020-01/02. The vegetation on the reclaimed pad can be described as a disturbed reclamation community. Dominant species are grasses and forbs, including green needlegrass, Indian ricegrass, western wheatgrass, and *Koeleria macrantha* (prairie junegrass). A few scattered shrubs include mountain big sagebrush, green rabbitbrush, *Tetradymia canescens* (spineless horsebrush), and *Artemisia frigida* (fringed sage), which is a subshrub. Forbs include *Lupinus sericea* (silky lupine) and *Kochia scoparia* (kochia). Photograph 3 is representative of the vegetation.

Soil is described as a gravelly loam of the Starman series (NRCS 2020). The soil profile is undeveloped and appears to have been placed during reclamation of the old drill pad. Topsoil depth was estimated based on four hand-dug holes. The depth is 6 inches at all four holes. Photograph 4 shows a typical profile.

The proposed access is the former access road for the old drill pad. The access road will be bladed to provide access. The road supports a highly disturbed mountain shrub community consisting of species from the adjacent native community, including Saskatoon serviceberry, roundleaf snowberry, mountain big sagebrush, and green rabbitbrush. The herbaceous layer includes slender wheatgrass, Indian ricegrass, and prairie junegrass; and forbs silky lupine and kochia. Photograph 4 is representative of the access road vegetation.

3.0 REFERENCES

NatureServe. 2020. Terrestrial Ecological System, Rocky Mountain Lower Montane-Foothill Shrubland. Available online:
https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.722851/Rocky_Mountain_Lower_Montane-Foothill_Shrubland (accessed October 2, 2020)

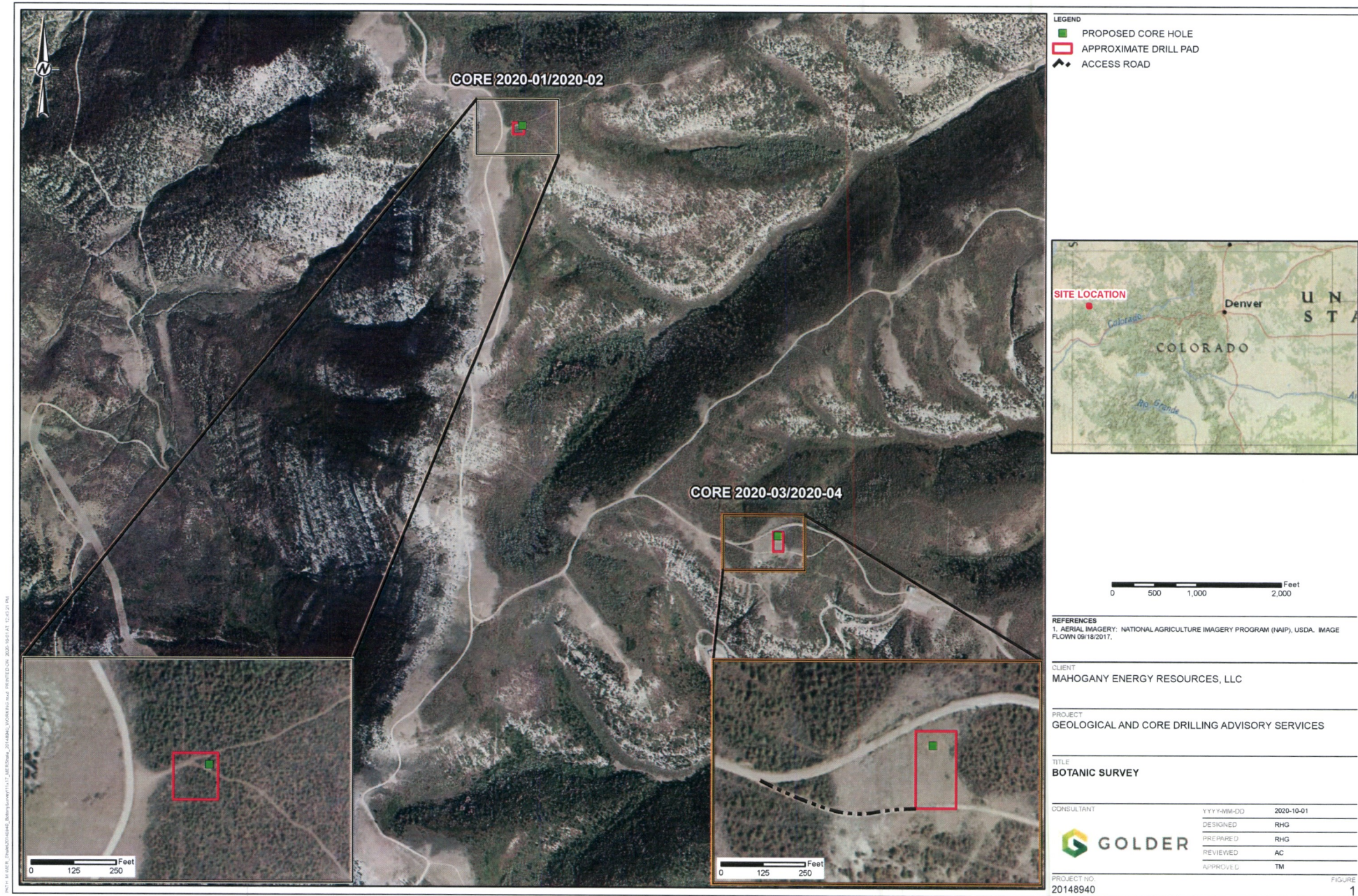
US Department of Agriculture Natural Resource Conservation Service (USDA NRCS). 2020a. Official Soil Series Description. Parachute Series.

USDA NRCS. 2020b. Official Soil Series Description. Starman Series.

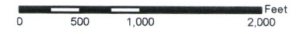
Attachments: Figure 1: Botanic Survey
Attachment 1: Photograph Log

[https://golderassociates.sharepoint.com/sites/131794/project files/6 deliverables/01_botany_tm/20148940-tm-0-botany_survey_02oct20.docx](https://golderassociates.sharepoint.com/sites/131794/project%20files/6%20deliverables/01_botany_tm/20148940-tm-0-botany_survey_02oct20.docx)

Figures



- LEGEND
- PROPOSED CORE HOLE
 - APPROXIMATE DRILL PAD
 - ACCESS ROAD



REFERENCES
1. AERIAL IMAGERY: NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP), USDA, IMAGE FLOWN 06/18/2017.

CLIENT
MAHOGANY ENERGY RESOURCES, LLC

PROJECT
GEOLOGICAL AND CORE DRILLING ADVISORY SERVICES

TITLE
BOTANIC SURVEY

CONSULTANT	YYY YMM-00	2020-10-01
DESIGNED	RHG	
PREPARED	RHG	
REVIEWED	AC	
APPROVED	TM	

PROJECT NO.
20148940

FIGURE
1

ATTACHMENT 1

Photograph Log

Botany Survey of Proposed Drill Pads, Rio Blanco County, Colorado

PHOTO 1

Rocky Mountain Lower
Montane-foothill Shrubland
community on Core 2020-1/2
view looking east



Botany Survey of Proposed Drill Pads, Rio Blanco County, Colorado

PHOTO 2

Typical topsoil Depth – Core
2020-1/2



Botany Survey of Proposed Drill Pads, Rio Blanco County, Colorado

PHOTO 3

Reclaimed Vegetation
Community on Core 2020-3/4
view looking west



Botany Survey of Proposed Drill Pads, Rio Blanco County, Colorado

PHOTO 4

Typical topsoil depth – Core
2020-3/4



Botany Survey of Proposed Drill Pads, Rio Blanco County, Colorado

PHOTO 5

Core 2020-03/04 access road –
Disturbed Rocky Mountain
Lower Montane-foothill
shrubland community



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