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March 21, 2023

Mr. Jason Kosola, P.G.
Southeast Environmental Protection Specialist
Colorado Oil & Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

RE: Nicolarsen #1
API # 05-017-07358
Analysis Results and Potential Excavation
Location ID# 25830

Mr. Kosola:

Mull Drilling Co., Inc (Mull) is providing this report to the Colorado Oil and Gas Commission (COGCC) for sampling, analysis and Excavation Plan of the Nicolarsen.#1. The location in question was drilled in 1993 and subsequently abandoned. After contacting the landowner to determine the status of the site for reclamation purposes there was some question as to the nature of the area: there were indications by the landowner that the area was subject to old alkaline deposits of some sort.



Site Location

Additionally, there was an indication that these deposits existed before any oil and gas exploration took place on the location and it was only recently that the area was converted to cropland.

Nevertheless, upon contacting the COGCC with this information it was determined that the area will still need a basic soils investigation and examination of historical records performed. There was one image that will be submitted with this document that existed prior to exploration activities which indicates that there was some sort of landform chemistry differences relative to outside areas. This image – Figure I -- was taken from Google Earth and is from 1985. Currently it is our best example of what may have existed prior to Mull drilling the Nicolarsen #1.

Sampling and Results

In any event, Mull mobilized to the location in December 2022 to verify the presence of any soil impacts by taking samples within the assumed area of the original drilling pit for Table 915-1 analysis. A total of 6 soil samples were taken from the area and included a background sample. One of these samples was at 4 ft depth. All collected soil samples were submitted to Pace Laboratories of Kansas for analysis following approved chain of custody protocols.

The results of these samples indicate that the area is impacted by lagging chloride contamination. Essentially, the center core area appears indicative of a drilling pit at that time with wash over that has migrated around the perimeter in the intervening years. Please see **Figure 2** for an aerial location of the sampling locations and SAR Ratios. This figure has a modern updated image. Impacts are conductivity (EC) and sodium adsorption ratio (SAR) parameters that are important for reclamation purposes.

There was little to no indication of hydrocarbon impacts. It does not appear that the SAR impacts are native to the location or indicative of alkali deposits. Arsenic appears in all samples including the background sample. As a result, Mull is ignoring Arsenic as a cleanup parameter.

Excavation & Sampling

Weather and planting permitting (initial estimates are Fall 2023 after crops are harvested), Mull plans to excavate a significant portion of the center core area (down to 4' bgs) and up to a of 1' bgs of SAR impacted materials around the parameter. These soils shall be transported to Phantom Landfill or an approved Waste Connections Landfill following an approved waste profile. New soils shall then be transported to the area and regraded as appropriate for the topography.

Additionally, Mull will take parameter and depth samples to determine remaining presence of impacted areas. All sampling shall conform to sampling methodologies for EC and SAR as other parameters do not appear to be definitive of surface impacts in the area. Samples shall be submitted to Pace Analytical of Kansas following an approved chain-of-custody protocols. A report displaying the soil sampling results will be submitted upon completion of activities and an analysis given data.

Upon completion of work, reclamation shall occur through standard crop planting practices.

Should there be any questions or concerns feel free to contact us,

A handwritten signature in black ink that reads "James Beilman". The signature is written in a cursive, flowing style.

James Beilman, PG, CPG
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Attachments:

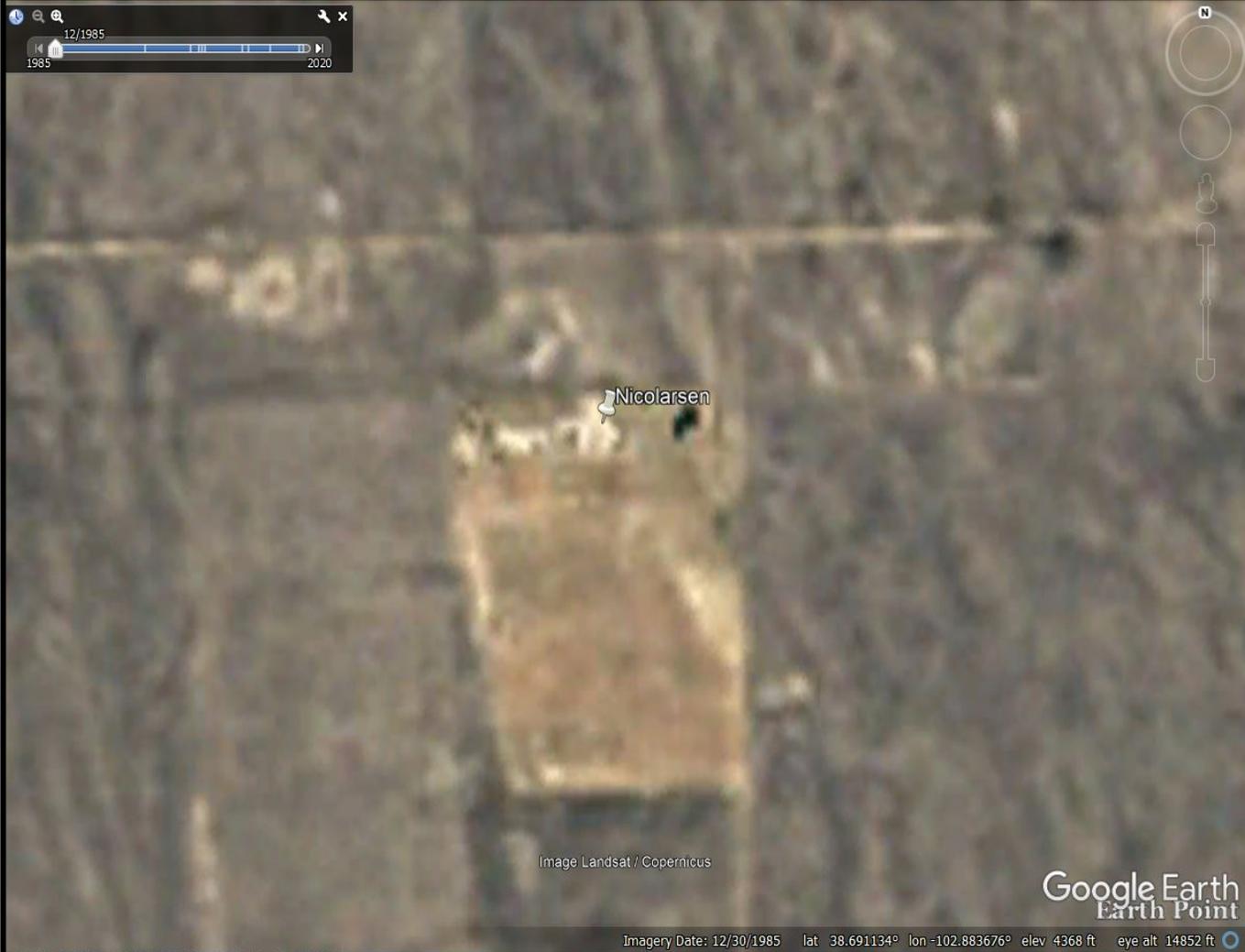
Figure 1 – 1985 Map Aerial of Nicolarsen #1 Area

Figure 2 – Sampling locations and Proposed Excavation Area

Table 915-1 – Nicolarsen Analytical Results

Figure 1: 1985 Satalite Image

Nicolarsen #1



Legend

Regulatory Limits as COGCC promulgated table 915-1

Location:	Latitude: 38.686378	Longitude: -102.882503	COGCC Project #	25830
State:	Colorado			
County:	Cheyenne			



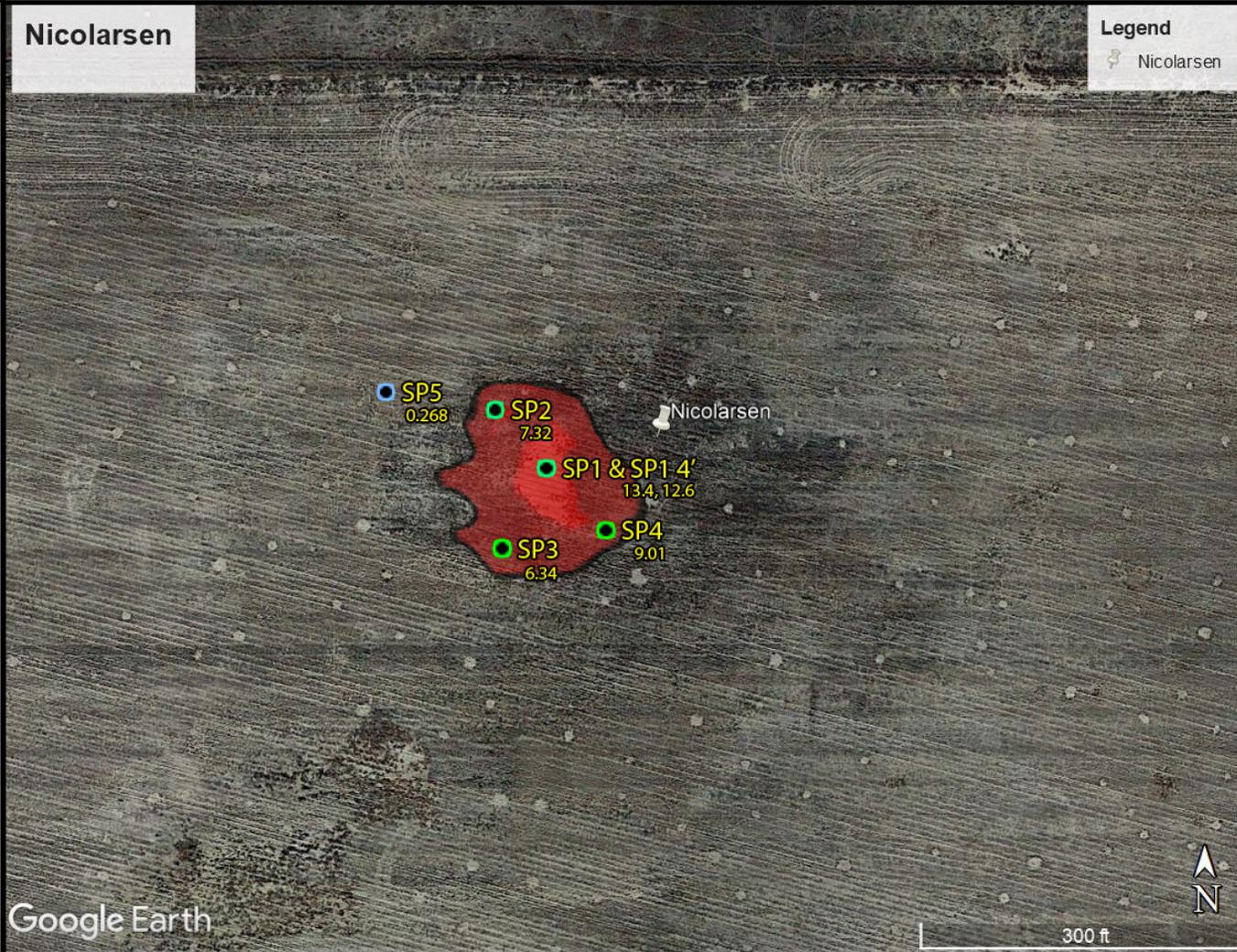
Figure 2: Sampling Points and Excavation Area

Nicolarsen #1

Nicolarsen

Legend

Nicolarsen



Legend

Highlighted Points are boring locations with SAR parameter values.

Red highlighted area is potential excavation area

Excavation will be to a depth of 4 bgs on the interior of the excavation area grading to 12" on the perimeter.

Regulatory Limits as COGCC promulgated table 915-1

Google Earth

300 ft

Location:	Latitude: 38.686378	Longitude: -102.882503	COGCC Project #	25830
State:	Colorado			
County:	Cheyenne			



Table 915-1		12/5/2022					
CLEANUP CONCENTRATIONS		SP1	SP1 4'	SP 2	SP 3	SP 4	SP 5
Contaminant of Concern	Concentrations	38.686307; - 102.882866	38.686307; - 102.882866	38.686497; - 102.883025	38.686138; - 102.883001	38.686144; - 102.882695	38.686556; - 102.883320
Soil TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons)	500mg/kg	ND	ND	ND	ND	4.7J	ND
Soils and Groundwater - liquid hydrocarbons including condensate and oil	below visual detection limits	NA	NA	NA	NA	NA	NA
Soil Suitability for Reclamation							
Electrical conductivity (EC) (by saturated paste method)	<4mmhos/cm	10.4	3.97	2.24	2.55	1.58	0.33
Sodium adsorption ratio (SAR) (by saturated paste method)	<6	13.4	12.6	7.32	6.34	9.01	0.268
pH (by saturated paste method)	6-8.3	7.37	8.29	8.14	8.01	7.91	7.97
boron (hot water soluble soil extract)	2mg/l	2.58	2.29	0.865	0.888	0.557	0.202
Organic Compounds in Groundwater							
benzene	5µg/l	NA	NA	NA	NA	NA	NA
toluene	560 to 1,000µg/l	NA	NA	NA	NA	NA	NA
ethylbenzene	700µg/l	NA	NA	NA	NA	NA	NA
xylenes (sum of o-, m- and p- isomers = total xylenes)	1,400 to 10,000µg/l	NA	NA	NA	NA	NA	NA
naphthalene	140µg/l	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	67µg/l	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	67µg/l	NA	NA	NA	NA	NA	NA
Groundwater Inorganic Parameters							
total dissolved solids (TDS)	<1.25 X local background	NA	NA	NA	NA	NA	NA
chloride ion	250mg/l or <1.25 X local background	NA	NA	NA	NA	NA	NA
sulfate ion	250mg/l or <1.25 X local background	NA	NA	NA	NA	NA	NA

Soils	Residential Soil Screening Level Concentrations (mg/kg)	Protection of Groundwater Soil Screening Level Concentrations (mg/kg)						
Organic Compounds in Soils								
benzene	1.2	0.0026 (M)	0.0011J	ND	ND	ND	ND	ND
toluene	490	0.69 (M)	ND	ND	ND	ND	ND	ND
ethylbenzene	5.8	0.78 (M)	ND	ND	ND	ND	ND	ND
xylenes (sum of o-, m- and p- isomers = total xylenes)	58	9.9 (M)	ND	ND	ND	ND	ND	ND
1,2,4-trimethylbenzene	30	0.0081 (R)	ND	ND	ND	ND	ND	ND
1,3,5-trimethylbenzene	27	0.0087 (R)	ND	ND	ND	ND	ND	ND
acenaphthene	360	0.55 (R)	ND	ND	ND	ND	ND	ND
anthracene	1800	5.8 (R)	ND	ND	ND	ND	ND	ND
benz(a)anthracene	1.1	0.011 (R)	ND	ND	ND	ND	ND	ND
benzo(b)fluoranthene	1.1	0.3 (R)	ND	ND	ND	ND	ND	ND
benzo(k)fluoranthene	11	2.9 (R)	ND	ND	ND	ND	ND	ND
benzo(a)pyrene	0.11	0.24 (M)	ND	ND	ND	ND	ND	ND
chrysene	110	9 (R)	ND	ND	ND	ND	ND	ND
dibenzo(a,h)anthracene	0.11	0.096 (R)	ND	ND	ND	ND	ND	ND
fluoranthene	240	8.9 (R)	ND	ND	ND	ND	ND	ND
fluorene	240	0.54 (R)	ND	ND	ND	ND	ND	ND
indeno(1,2,3-cd)pyrene	1.1	0.98 (R)	ND	ND	ND	ND	ND	ND
1-methylnaphthalene	18	0.006 (R)	ND	ND	ND	ND	ND	ND
2-methylnaphthalene	24	0.019 (R)	ND	ND	ND	ND	ND	ND
naphthalene	2	0.0038 (R)	ND	ND	ND	ND	ND	ND
pyrene	180	1.3 (R)	ND	ND	ND	ND	ND	ND
Metals in Soils								
arsenic	0.68	0.29 (M)	4.1	18.8	3.4	3.5	3.3	3.8
barium	15000	82 (M)	57.5	142	66.2	42.9	60.9	78.3
cadmium	71	0.38 (M)	0.46J	1.1	0.8	0.31J	0.39J	0.37J
chromium (VI)	0.3	0.00067 (R)	0.307J	ND	ND	ND	ND	0.526J
copper	3100	46 (M)	7.4	21.3	5.7	4.6	6.4	6.4
lead	400	14 (M)	6.2	10.8	5.5	4.9	5.8	5.8
nickel	1500	26 (R)	7.3	29	6	4.5	7.2	7.2
selenium	390	0.26 (M)	0.68J	1.7	0.40J	0.44J	0.32J	0.32J
silver	390	0.8 (R)	ND	ND	ND	ND	ND	ND
zinc	23000	370 (R)	32.3	37.8	51.4	18.1	27.5	27.5

The letter "(R)" following a protection of Groundwater soil screening level indicates the concentration is derived from a risk-based approach. The letter "(M)" following a protection of Groundwater soil screening level indicates the concentration is derived from the drinking water MCL.