

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural
Resources Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	nAPP2209041864
District RP	
Facility ID	
Application ID	694798

Release Notification

Responsible Party

Responsible Party: Novo Oil & Gas Northern Delaware, LLC	OGRID: 372920
Contact Name: Kurt A. Shipley	Contact Telephone: 405-286-3916
Contact email: kshipley@novooog.com	Incident # (assigned by OCD): nAPP2209041864
Contact mailing address: 1001 West Wilshire Blvd., Suite 206 Oklahoma City, OK 73116	

Location of Release Source

Latitude 32.3405953Longitude -104.0455863
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Hades North Loop	Site Type: Produced Water Line (production)
Date Release Discovered: 03/28/2022	API# (if applicable)

Unit Letter	Section	Township	Range	County
D	11	T23S	R28E	Eddy

Surface Owner: ☐ State ☒ Federal ☐ Tribal ☐ Private (Name:)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls): 730	Volume Recovered (bbls): 300
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

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Cause of Release

The leak occurred because of a rupture in the body of the poly pipe (not at a fused connection). The cause of the rupture is unknown at this time. We could not find the root cause with our field inspections. We sent the section of pipe with the rupture to be inspected by the distributor and the manufacturer of the pipe.

Release Volume Calculation:

Water rate on the receiving end of the Hades North Loop was 18,000 bbls of produced water per day. This was recorded on the San Mateo SCADA water meter. During the time that the pipe was leaking, the receiving end SCADA meter was receiving a rate 11,000 bbls of produced water per day. The difference was 18,000 bbls minus 11,000 bbls, equal to 7,000 bbls of produced water per day.

This is our estimated rate for the amount of water lost from the pipeline during the failure while the pipeline was in operation. The SCADA data shows the meter receiving the reduced rate from 4:00am to 6:30am (2.5 hours).

This calculates to 7,000 bbls per day / 24 hours = 292 bbls x 2.5 hours = 730 bbls

Was this a major release as defined by 19.15.29.7(A) NMAC?

☒ Yes ☐ No

If YES, for what reason(s) does the responsible party consider this a major release?

Calculated volume of the release was 730 bbl of produced water, which is greater than the 25 bbl threshold defining a major release.

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?

Immediate notification was provided by Kurt Shipley on March 28, 2022 at 4:47pm by phone. Notification was made to the NMOCD – Artesia Office (575.703.3842). A recorded message was provided on the hotline voicemail (Laura Polk). Bryan Haney with Altamira-US (on behalf of Novo Oil & Gas Northern Delaware, LLC.) submitted notification of a release (NOR) on the online OCD system on March 31, 2022. Approved by OCD (Jocelyn Harimon) on April 5, 2022.

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

- ☒ The source of the release has been stopped.
- ☒ The impacted area has been secured to protect human health and the environment.
- ☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
- ☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

All initial response actions above have been completed.

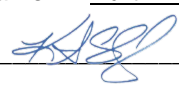
Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

State of New Mexico
Oil Conservation Division

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I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Kurt A. Shipley Title: Chief Operating Officer

Signature:  Date: March 31, 2022

email: kshipley@novoog.com Telephone: 405-286-3916

OCD Only

Received by: _____ Date: _____

Incident ID	nAPP2209041864
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Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	<u>>51</u> (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: *Each of the following items must be included in the report.*

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

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If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Kurt A. Shipley

Title: Chief Operating Officer

Signature:

Date: July 22, 2022

email: kshipley@novoog.com

Telephone: 405-286-3916

OCD Only

Received by: _____

Date: _____

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Remediation Plan


Remediation Plan Checklist: *Each of the following items must be included in the plan.*

- ☒ Detailed description of proposed remediation technique
- ☒ Scaled sitemap with GPS coordinates showing delineation points
- ☒ Estimated volume of material to be remediated
- ☒ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☒ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Kurt A. Shipley Title: Chief Operating OfficerSignature:  Date: Sept 02, 2022email: kshipley@novooog.com Telephone:405-286-3916**OCD Only**

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

Incident ID	nAPP2209041864
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Closure

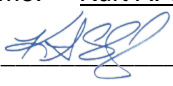
The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: *Each of the following items must be included in the closure report.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Kurt A. Shipley Title: Chief Operating Officer

Signature:  Date: _____

email: kshipley@novooog.com Telephone: 405-286-3916

OCD Only

Received by: _____ Date: _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

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Printed Name: Kurt A. Shipley Title: Chief Operating OfficerSignature:  Date: Sept 02, 2022email: kshipley@novooog.com Telephone:

405-286-3916

OCD OnlyReceived by: Robert Hamlet Date: 10/13/2022☐ Approved ☒ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral ApprovedSignature: Robert Hamlet Date: 10/13/2022

**Remediation & Reclamation Plan
Produced Water Line Release
Incident ID No. nAPP2209041864
Hades North Loop
Discovery Date: March 28, 2022
Eddy County, New Mexico**

***Prepared for:
Novo Oil & Gas Northern Delaware, LLC
1001 West Wilshire Blvd., Suite 206
Oklahoma City, Oklahoma 73116***

***Prepared By:
Altamira-US
Bryan Haney, P.G. TX 929
Corpus Christi, Texas 78418
(361)658-3126***

September 2, 2022



Hades North Loop – Produced Water Line Release – Remediation & Reclamation Plan
Novo Oil & Gas, Eddy County, New Mexico
Discovery Date: March 28, 2022

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ACRONYMS AND ABBREVIATIONS

Altamira	Altamira-US, LLC
Novo	Novo Oil & Gas Northern Delaware, LLC
bgs	below ground surface
bbl	barrels
mg/kg	milligram per kilogram
NMOCD	New Mexico Oil Conservation District
TPH	Total Petroleum Hydrocarbons
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes

1.0 INTRODUCTION

Novo Oil & Gas Northern Delaware, LLC (Novo Oil & Gas) (OGRID No. 372920) operates a facility known as the “Hades North Loop” located in Field Name Purple Sage – Wolfcamp, T23S, R28E, Section 1, in Eddy County, New Mexico. On March 28, 2022, field personnel for Novo Oil & Gas discovered a release of produced water from a subsurface permanent produced water line. The produced water line and point of release is located in an open area near the produced water pipeline intersection near the site location. The release area is located approximately 1.6 miles northwest of the intersection of Highway 605 and Highway 31, latitude 32.3405953, longitude W-104.0455863 (**Figure 1 and Figure 2**). This Remediation & Reclamation Plan has been prepared to outline proposed remediation efforts for the cleanup of chlorides in soil (only).

1.1 Release Details and Initial Response

On March 28, 2022, at approximately 6:30 am a release of produced water occurred as a result of a rupture on the permanent sub-grade produced water pipeline. Approximately 730 barrels of produced water was released into the area topographically down gradient of the point of rupture between two pipeline areas (bermed areas). The release occurred from an undetermined puncture or opening on the black polyethylene pipe that was located below grade. The release area is depicted on (**Figure 3**).

The release of produced water was identified by Novo Oil & Gas personnel and steps were taken to mitigate further release and contain and remove pooled areas of produced water. Novo Oil & Gas estimated approximately 730 barrels of produced water was released and approximately 300 barrels of produced water was recovered using vacuum trucks. The justification for the quantity release is based on the following:

- Water rate on the receiving end of Hades North Loop was 18,000 barrels of produced water per day.
- During the time of the rupture, the SCADA system was recording a rate of 11,0000 barrels per day.
- The difference of flow rate was approximately 7,000 barrels per day over a 2.5 hour time period (4:00 am – 6:30am).
- Total volume released is approximately 7,000 barrels per day/ 24 hours = 292 barrels x 2.5 hours = 730 barrels of produced water.

The area of the release occurred generally between the two raised pipeline segments located on each side of the area within the easement.

1.2 Notification

Based on the quantity of produced water released being greater than 25 barrels, the release was determined to be a Major release per 19.15.29.7.A NMAC. Immediate notification was provided by Kurt Shipley to the NMOCD and BLM hotlines on March 28, 2022. The initial online release notification C-141 was submitted to the New Mexico Oil Conservation District (NMOCD) on March 31, 2022. The OCD issued incident ID# nAPP2209041864 and approval dated April 5, 2022.

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Written notification of the release (BLM Major Undesirable Event Report) was also provided to the BLM.

1.3 Project Objectives

The project objectives are: 1) conduct soil remediation for Chlorides (only) and 2) complete restoration and reclamation of site area.

1.4 Regulatory Framework

The Site is subject to environmental regulatory oversight by the NMOCD and regulations set forth in Title 19, Chapter 15, Part 29. Remediation, Restoration, and Reclamation activities will be conducted in accordance with guidelines outlined in 19.15.29 NMAC.

2.0 STANDARD OF CARE, LIMITATIONS, & RELIANCE

2.1 Standard of Care

Altamira's services were performed in accordance with standards customarily provided by a firm rendering the same or similar services in the area during the same period of time. Altamira makes no warranties, expressed or implied, as to the services performed hereunder. Additionally, Altamira does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report.

2.2 Additional Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the services performed under this scope of work and it should be noted that this information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, or not present during these services, and Altamira cannot represent that the Site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this scope of services. Environmental conditions at other areas or portions of the Site may vary from those encountered at actual sample locations. Altamira's findings and recommendations are based solely upon data available to Altamira at the time of these services.

3.0 ASSESSMENT RESULTS AND SUMMARY

3.1 Initial Actions and Soil Assessment Summary

Following the release and notification to the OCD and BLM, Novo initiated remedial cleanup activities during April 2022. This included soil excavation and removal of affected soil areas based on visual wet areas and chloride residual identified on the soil surface. Approximately 1,040 cubic yards of soil was excavated, removed, and disposed of at the R360 facility near Hobbs New Mexico. Soil samples were collected along the release flow path (S-1 through S-8)

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Table 1 and Figure 3. Analytical data provided guidance for additional assessment and remediation efforts.

Atlamira on behalf of Novo Oil & Gas conducted soil assessment activities April 25-27, 2022 in the area of the produced water release to determine the degree of impact to soil. A total of 25 soil borings were installed to attempt to delineate the vertical and lateral extent of potential constituents of concern. Twenty-five soil borings (SB-1 – SB-25) were installed within the flow path of the produced water release and on the approximate lateral boundaries of the produced water release area.

Soil borings SB-1 and SB-25 were installed by Envirotech Drilling Company using a combination of direct push, flight auger, and air rotary drill methods. Soil samples were collected using a combination of direct push or air rotary (stainless-steel split spoon sampling device and cuttings) (dependent on lithology). Soil boring SB-11 was advanced to a total depth of 51-feet below ground surface for the purpose of lateral delineation and determination of depth of groundwater.

Soil samples were collected continuously from the surface to the total depth of each soil boring. Representative soil/rock from each one to two-foot interval was placed into a plastic bag, allowed to equilibrate and field screened with a photo-ionization detector (PID) for the presence of organic vapors. Soil samples were collected and submitted for laboratory analysis generally from the surface to the total depth of each soil boring in one to two-foot sample intervals. Soil samples were placed in laboratory provided containers, labeled, and maintained/preserved on ice in an insulated cooler with chain-of-custody documentation.

The soil sample analysis was initially conducted on the first two shallow depth sample intervals. If a constituent of concern exceeded the Assessment/Closure Criteria set forth 19.15.29 NMAC then the constituent in the next deeper sample interval was also analyzed until vertical delineation was achieved. Soil samples were submitted to Cardinal Laboratory in Hobbs, New Mexico for analysis. Soil samples were collected and submitted for analysis for the following:

- Chlorides – EPA 4500-Cl-B
- TPH (GRO, DRO, MRO) – EPA SW-846 Method 8015B
- BTEX – EPA SW-846 Method 8260B

The initial soil sample interval 0-1 foot was analyzed for chlorides, TPH, and BTEX. If a constituent exceeded the allowable assessment/cleanup level, that constituent was analyzed in the next deeper sample interval.

Following installation of soil borings, Envirotech Drilling Company plugged each borehole (except SB-11) using bentonite chips (hydrated) and capped with concrete to the surface.

3.2 Chloride Results Discussion

Analytical results for chlorides within the release area ranged from 16 mg/kg to 11,500 mg/kg (**Table 2**). Chloride concentrations exceeded 600 mg/kg in soil samples at soil borings SB-1 through SB-9 (in center of general flow path of produced water release), SB-20 through SB-23 (located within two areas located outside of the current easement), and in lateral delineation soil borings SB-13 and SB-18. The approximate lateral extent of the chloride impacted soil is depicted

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Discovery Date: March 28, 2022

on **Figure 4**. It appears that the produced water followed general topography within the release area. It should also be noted that general lithology consisted of a mix of silt-sand and rock, which may have also aided in the infiltration of produced water to deeper soil intervals. Chloride impacts appeared the deepest at soil borings along the flow path of the release and SB-13. Most chloride concentrations above 600 mg/kg occur within the upper four feet of soil. Vertical delineation has been achieved (to below 600 mg/kg) for chlorides at each soil boring location in the upper four feet and to 10,000 mg/kg below four feet.

Soil borings were installed radially outward from the known release area. Soil sample data for chlorides for these soil borings generally show lateral delineation and lack of impacts in the shallower soil profile. **Figure 4** depicts the delineation results for chlorides in soil. There is some lack of lateral delineation east of SB-13 and SB-18; southeast of SB-20, and west and northwest of SB-22 and SB-23. As a result, Novo will complete any lateral delineation as part of the post excavation confirmation soil sampling and treatment program provided below. This will continue until analytical data results show chloride concentration action levels have been achieved.

3.3 TPH Results Discussion

TPH was analyzed on the initial shallowest soil sample from each soil boring. TPH was fractionated into the GRO/DRO/MRO ranges. For the purpose of assessment and in accordance with regulatory guidance, TPH concentrations were compared to an assessment level of 100 mg/kg. Analytical data results show total TPH detectable concentrations present in only soil sample SB-8 (0-1') at a concentration of 47 mg/kg. Analytical results for TPH in all other soil samples demonstrated non-detected concentrations below the laboratory reporting limit. Since TPH concentrations were below the applicable assessment level in all soil samples, analysis of TPH on deeper soil samples was not necessary. No further assessment of TPH should be necessary. Based on the assessment data, TPH will not be considered or analyzed as part of the remediation process. Novo requests that TPH analysis not be necessary based on the known TPH data collected and provided indicating TPH is not a constituent of concern.

3.4 BTEX Results Discussion

BTEX was analyzed on the initial shallowest soil sample from each soil boring. For the purpose of assessment and in accordance with regulatory guidance, benzene and total BTEX concentrations were compared to an assessment level of 10 mg/kg and 50 mg/kg, respectively. Benzene was not detected above the laboratory reporting limit in any of the soil samples submitted for laboratory analysis. Analytical results show very low concentrations of total TEX were detected in seven soil samples/soil borings at the 0-1' depth interval. All TEX concentrations were significantly below the 10 mg/kg assessment level. Total BTEX was not detected in any of the other soil samples submitted for laboratory analysis.

Since benzene and total BTEX concentrations were either not detected or significantly below the applicable assessment level in all soil samples, analysis of benzene and total BTEX on deeper soil samples was not necessary and screened from further assessment. Based on the assessment data, BTEX constituents will not be considered or analyzed as part of the remediation process. Novo requests that BTEX analysis not be necessary based on the known BTEX data collected and provided indicating BTEX is not a constituent of concern.

Hades North Loop – Produced Water Line Release – Remediation & Reclamation Plan
Novo Oil & Gas, Eddy County, New Mexico
Discovery Date: March 28, 2022

4.0 REMEDIATION PLAN

Remediation of shallow soils along the general release flow path is necessary due to chloride concentrations that are greater than 600 mg/kg in the upper four feet of the soil profile. Affected soil in the flow path areas will be excavated and removed at various depths based on soil assessment results and field post excavation soil sample results. The areas of proposed remediation are depicted on **Figure 5**.

Analytical results indicate chloride concentrations exceed the 600 mg/kg assessment level in shallow soils within the release area (mainly in the upper four feet). Based on the analytical results for TPH, benzene and total BTEX during soil assessment, no further evaluation of TPH, benzene or total BTEX is necessary and should not be considered a constituent of concern moving forward. Refer to analytical data **Table 2** for soil sample results collected during the soil assessment.

Novo Oil & Gas will provide verbal and written notification to the OCD district office and BLM prior to start of field activities and two business days prior to confirmation soil sampling.

4.1 Estimated Affected Area Soil Volume

The estimated affected soil volume is based on analytical data results showing vertical delineation of chlorides in soil at each soil boring. The lateral extent is estimated based on lateral delineation data and will be verified during remediation by the use of confirmation soil sampling along excavated side-walls (refer to **Figure 5**). If chloride concentrations along excavation side-walls (in the 0-4' interval) exceed 600 mg/kg, the excavation along that side-wall will be further excavated until confirmation soil sample results are below the cleanup criteria. If the side-wall is greater than four feet, the data will be evaluated to 10,000 mg/kg chlorides. Estimated affected soil volume calculations are provided on **Table 3**.

- 0-2 foot interval – approximately 3,522 cubic yards
- 0-4 foot interval – approximately 10,995 cubic yards

Total Estimated Soil Volume – 14,517 cubic yards

4.2 Remediation Methodology

Novo Oil & Gas will utilize Altamira as their environmental consultant and will subcontract various construction and trucking companies to complete soil excavation and hauling of soil for disposal.

Altamira and contracted personnel will mobilize equipment and personnel to the site to excavate each affected soil area depicted on **Figure 5**. Soil will be either temporarily stockpiled and or direct loaded to 20-yard trucks for transport to Lea Land, LLC disposal facility located west of Hobbs, NM.

Prior to site work and subsurface digging, Novo, Altamira and subcontractors will conduct a New Mexico utility locate within 72 hours prior to site work. Altamira will track and document utility and pipeline companies and arrange for a meeting onsite to document utility/pipeline locations and understand potential safety requirements for excavation.

Hades North Loop – Produced Water Line Release – Remediation & Reclamation Plan
Novo Oil & Gas, Eddy County, New Mexico
Discovery Date: March 28, 2022

Soil in each area will be excavated using a backhoe or long-arm excavator. Soil is planned to be direct loaded to 20-yard trucks and may be temporarily stockpiled as necessary ahead of loading. Altamira intends to begin on the north end of the release area and work towards the south, mainly for truck loading flow. As shown on **Figure 5** and **Table 3**, there are three areas that will be excavated to approximately two feet below ground surface and six areas that will be excavated to approximately four feet below ground surface. These areas and associated depth intervals will serve as a starting point for excavation and confirmation soil sampling.

Each truck load of soil loaded and transported for disposal will be accompanied with a manifest or bill of lading document so that the soil is tracked and documented for final disposal at the facility. Soil will be disposed of at the Lea Land, LLC facility located at Mile Marker 64, US Highway 62/180 East, Carlsbad, NM 88220.

4.3 Post Excavation Confirmation Native Soil Sampling Methodology

Following excavation of each area, confirmation soil sampling of the “native soil” will be conducted per 19.15.29.12 (D)(1). A five-point composite soil sample will be collected every 200 square feet for each sidewall and floor of the excavation. Representative soil from each of the five points (per composite) will be mixed and placed into laboratory provided containers, labeled, and maintained on ice in an insulated cooler. Confirmation soil samples will be submitted to Cardinal Laboratories for analysis of chloride using EPA Method 300.0. Since TPH, benzene and total BTEX concentrations were well below the Assessment and Closure Criteria for soils, these constituents will not be considered for analysis for confirmation of remediation effectiveness. Post excavation confirmation soil sample quantities were calculated for excavation areas. A summary of each area and the calculated number of confirmation soil samples is provided on **Table 4**.

The established closure criteria for chlorides in soil (upper 4-feet) is 600 mg/kg since the area is not on a well pad area. Closure criteria for chlorides in soil below four feet, based on depth to water greater than 51 feet at the site, is 10,000 mg/kg. Confirmation soil sample results with a concentration less than 600 mg/kg will indicate remediation of chlorides in soil is complete in the upper four feet interval. If the concentration of chlorides in a particular soil sample is greater than 600 mg/kg, the area will be further excavated and then re-sampled. This methodology will be implemented until affected soil is removed to concentrations less than 600 mg/kg.

4.4 Backfill Activities

Prior to use of backfill soil material, representative soil samples will be collected from the borrow area to confirm the chloride concentration of the borrow material is less than 600 mg/kg. Following completion of soil excavation activities and post excavation confirmation soil sampling, the area will be backfilled using native soils from the general area.

5.0 RESTORATION, RECLAMATION & RE-VEGETATION

Following completion of affected soil remediation and confirmation soil sampling, Novo Oil & Gas will restore the excavated areas to the condition that existed prior to the release. This will include the replacement of removed soil, reclamation to original grade, and re-vegetation with native species.

Hades North Loop – Produced Water Line Release – Remediation & Reclamation Plan
Novo Oil & Gas, Eddy County, New Mexico
Discovery Date: March 28, 2022

5.1 Proposed Restoration Schedule/Timeline

Following treatment of chloride affected soils and obtaining confirmation soil sample results for chlorides in treated soil below 600 mg/kg (0-4'), backfill soil will be placed back into the respective excavation areas and compacted on 6-inch to 9-inch lifts. Final soil cover will be placed to match the sites existing grade to prevent ponding of water and erosion. Site personnel will inspect the area on a weekly basis to monitoring the final cover/grade.

5.2 Proposed Reclamation & Re-vegetation Schedule/Timeline

Currently, pre-disturbed areas within the immediate area consists of spars vegetation including weeds and low brush forming plants. Approximately 70-75% of the ground surface consists of native soil and broken rock.

Following placement of the top layer, native seed mixtures will be spread and watered to support growth. Per NMOCD 19.15.29.13 (D)(3) reclamation of disturbed areas will be considered complete when the uniform vegetation cover has been established that reflects a life-form ration of plus or minus fifty percent of pre-disturbed levels and a total percent plant cover of at least seventy percent of pre-disturbed levels. This results in an approximate established re-growth of 25-30% of the ground surface (based on best estimate of site observations).

Novo Oil & Gas will notify the NMOCD and BLM when reclamation and re-vegetation is complete and submit the final closure report and request final site closure.

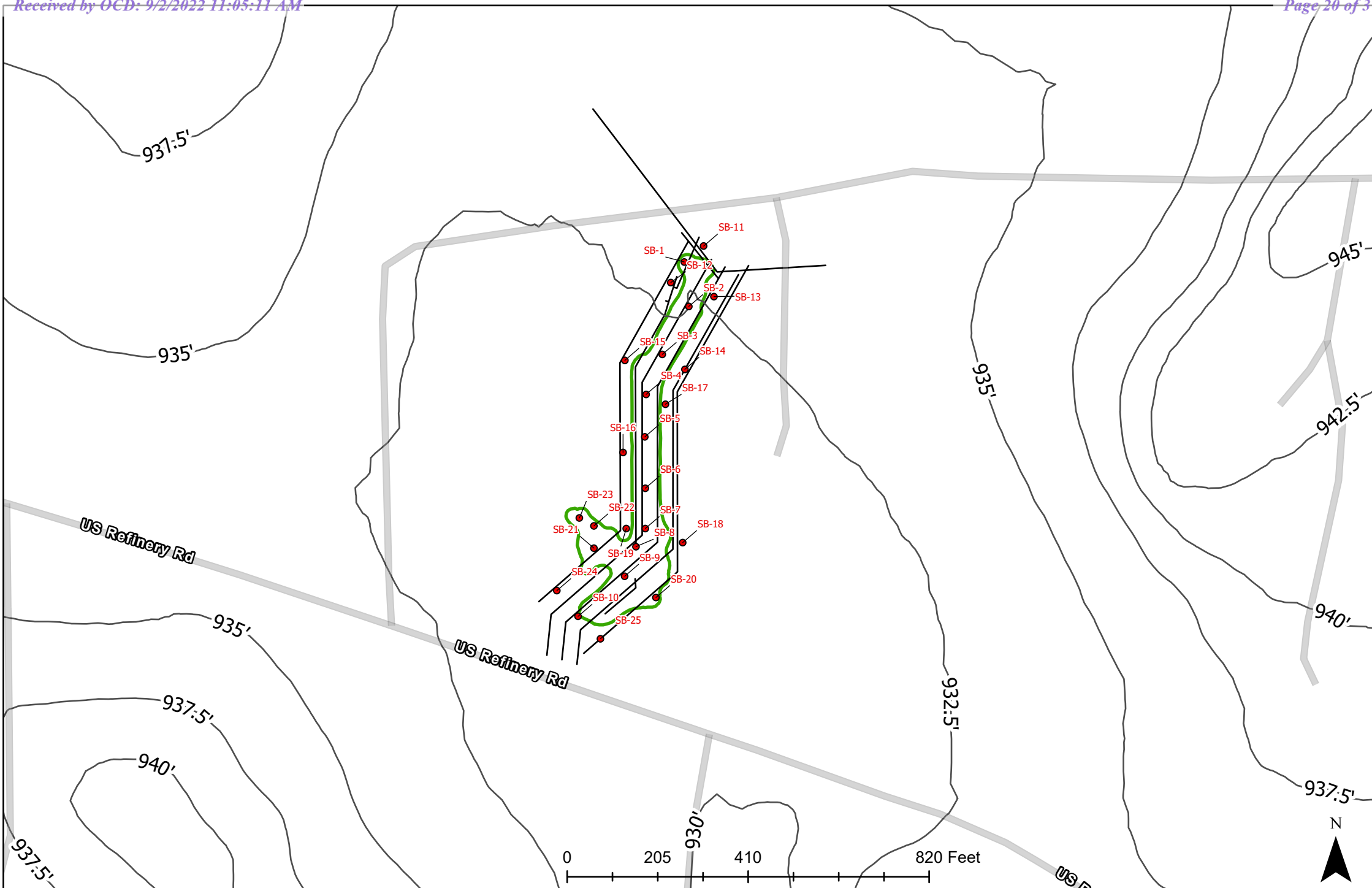
6.0 PROPOSED REMEDIATION SCHEDULE AND TIMELINE

Upon NMOCD and BLM approval of this remediation and reclamation work plan, Novo Oil & Gas anticipates the following schedule:

- 15-30 days following approval – finalize work plan and mobilize to site area
- 48 hours prior to start of field activities, notify NMOCD and BLM – conduct soil excavation and disposal activities – estimating 25-35 days to complete
- 48 hours prior to confirmation soil sampling, notify NMOCD and BLM – confirmation soil samples will be collected by area as the soil excavation of that area is deemed initially complete
- 1-3 days following confirmation soil sample results demonstrate cleanup levels area met, backfilling activities will commence. This may be conducted area to area once the excavation area is cleared
- 5 days following completion of backfill activities, seed the work area with native seed and hydrate
- remediation and reclamation complete, observe vegetation growth to meet state criteria
- Submit final closure once established vegetation growth meets regulated criteria.



FIGURES

**Legend**

- Soil Sample Location
- BPL
- CONTROL

Notes:**Site Area Topographic Map**

Hades North Loop - Produced
Water Release NAPP2209041864
Eddy County, New Mexico
Novo Oil and Gas Northern Delaware, LLC

Date:
7/15/2022

Figure 1



ALTAMIRA

**Legend**

- Soil Sample Location
- BPL
- CONTROL

Notes:**Site Location Map**

Hades North Loop - Produced
Water Release NAPP2209041864
Eddy County, New Mexico
Novo Oil and Gas Northern Delaware, LLC

Date:
7/15/2022

Figure 2



ALTAMIRA

DISCOVERY DATE
MARCH 28, 2022

R.O.W.

ORYX CRUDE
OIL PIPELINEEASEMENT
BOUNDARY

POINT OF RELEASE

NOVO PRODUCED
WATER LINENOVO PRODUCED
WATER LINE

PIPELINE

EASEMENT
BOUNDARY

US Refinery Rd

SPILL AREA BREAKDOWN
TOTAL AREA = 1.795 ACRES
OUTSIDE EASEMENTS
TOTAL AREA = 0.184 ACRES

N

0 95 190 380 Feet

Legend

- Post Initial Cleanup - Soil Sample Location (4/7/2022)
- Soil Boring Location (4/25-27/2022)
- EASEMENT
- - PIPELINE
- - WATER
- SPILL AREA
- other
- ▨ Area Outside Easements

Notes:

Site Plan

Hades North Loop -
Produced Water Release
NAPP2209041864
Eddy County, New Mexico
Novo Oil and Gas Northern
Delaware, LLC

Date:
7/19/2022

Figure 3



ALTAMIRA

DISCOVERY DATE
MARCH 28, 2022

R.O.W.

ORYX CRUDE
OIL PIPELINEEASEMENT
BOUNDARY

POINT OF RELEASE

NOVO PRODUCED
WATER LINENOVO PRODUCED
WATER LINE

PIPELINE

EASEMENT
BOUNDARY

ID	Date	Chloride
S-1 (1.5')	4/7/2022	96
S-2 (2')	4/7/2022	1,960
S-3 (2')	4/7/2022	4,880
S-4 (1.5')	4/7/2022	5,280
S-5 (1.5')	4/7/2022	8,000
S-6 (3.5')	4/7/2022	5,200
S-7 (1')	4/7/2022	4,880
S-8 (1.5')	4/7/2022	64

ID	Date	Chloride
SB-1 (0-1')	4/26/2022	4,960
SB-1 (2-3')	4/26/2022	2,160
SB-1 (3-4')	4/26/2022	208
SB-2 (0-1')	4/25/2022	1,650
SB-2 (2-3')	4/25/2022	16
SB-2 (5-6')	4/25/2022	800
SB-2 (7-8')	4/25/2022	48
SB-3 (0-1')	4/25/2022	6,240
SB-3 (2-3')	4/25/2022	2,560
SB-3 (3-4')	4/25/2022	1,410
SB-3 (5-6')	4/25/2022	176
SB-4 (0-1')	4/25/2022	6,800
SB-4 (2-3')	4/25/2022	5,760
SB-4 (3-4')	4/25/2022	5,520
SB-4 (5-6')	4/25/2022	208
SB-5 (0-1')	4/25/2022	8,880
SB-5 (2-3')	4/25/2022	1,420
SB-5 (5-6')	4/25/2022	64
SB-6 (0-1')	4/25/2022	4,400
SB-6 (2-3')	4/25/2022	448
SB-6 (5-6')	4/25/2022	384
SB-7 (0-1')	4/25/2022	1,580
SB-7 (2-3')	4/25/2022	2,080
SB-7 (3-4')	4/25/2022	1,360
SB-7 (5-6')	4/25/2022	720
SB-7 (7-8')	4/25/2022	320
SB-8 (0-1')	4/25/2022	11,500
SB-8 (2-3')	4/25/2022	192
SB-8 (5-6')	4/25/2022	320
SB-8 (7-8')	4/25/2022	256

ID	Date	Chloride
SB-9 (0-1')	4/25/2022	1,330
SB-9 (2-3')	4/25/2022	272
SB-10 (0-1')	4/25/2022	112
SB-20 (0-1')	4/27/2022	4,000
SB-20 (2-3')	4/27/2022	480
SB-20 (3-4')	4/27/2022	1,680
SB-20 (5-6')	4/27/2022	4,880
SB-20 (7-8')	4/27/2022	576
SB-20 (9-10')	4/27/2022	112
SB-21 (0-1')	4/27/2022	2,760
SB-21 (2-3')	4/27/2022	400
SB-21 (3-4')	4/27/2022	384
SB-22 (0-1')	4/27/2022	4,640
SB-22 (2-3')	4/27/2022	192
SB-22 (3-4')	4/27/2022	272
SB-23 (0-1')	4/27/2022	9,060
SB-23 (2-3')	4/27/2022	5,680
SB-23 (3-4')	4/27/2022	1,020
SB-23 (5-6')	4/27/2022	256
Lateral Delineation Soil Borings		
SB-11 (0-1')	4/26/2022	96
SB-11 (3-4')	4/26/2022	48
SB-11 (7-8')	4/26/2022	64
SB-12 (0-1')	4/26/2022	480
SB-12 (2-3')	4/26/2022	16
SB-12 (5-6')	4/26/2022	528
SB-12 (27-8')	4/26/2022	48

ID	Date	Chloride
SB-13 (0-1')	4/26/2022	7,600
SB-13 (2-3')	4/26/2022	9,800
SB-13 (3-4')	4/26/2022	5,920
SB-13 (5-6')	4/26/2022	4,560
SB-13 (7-8')	4/26/2022	3,840
SB-13 (9-10')	4/26/2022	16
SB-13 (11-12')	4/26/2022	16
SB-14 (0-1')	4/27/2022	48
SB-14 (2-3')	4/27/2022	64
SB-14 (3-4')	4/27/2022	48
SB-15 (0-1')	4/26/2022	128
SB-15 (2-3')	4/26/2022	32
SB-15 (3-4')	4/26/2022	64
SB-16 (0-1')	4/27/2022	128
SB-16 (2-3')	4/27/2022	80
SB-16 (5-6')	4/27/2022	32
SB-17 (0-1')	4/27/2022	48
SB-17 (2-3')	4/27/2022	48
SB-17 (5-6')	4/27/2022	64
SB-18 (0-1')	4/27/2022	9,360
SB-18 (2-3')	4/27/2022	48
SB-18 (3-4')	4/27/2022	64
SB-18 (5-6')	4/27/2022	528
SB-19 (0-1')	4/25/2022	352
SB-19 (2-3')	4/25/2022	144
SB-19 (3-4')	4/25/2022	192
SB-19 (5-6')	4/25/2022	336
SB-24 (0-1')	4/25/2022	80
SB-24 (2-3')	4/25/2022	16
SB-24 (3-4')	4/25/2022	64
SB-25 (0-1')	4/27/2022	112
SB-25 (2-3')	4/27/2022	80
SB-25 (5-6')	4/27/2022	224

> 600 mg/Kg

US Refinery Rd

N

0 95 190 380 Feet

Legend

- Post Initial Cleanup - Soil Sample Location (4/7/2022)
- Soil Boring Location (4/25-27/2022)
- EASEMENT
- PIPELINE
- WATER
- SPILL AREA
- other
- Area Outside Easements

Notes:

Assessment Action
Level = 600 mg/Kg

Site Plan

Hades North Loop -
Produced Water Release
NAPP2209041864
Eddy County, New Mexico
Novo Oil and Gas Northern
Delaware, LLC

Date:
7/26/2022

Figure 4



ALTAMIRA

DISCOVERY DATE
MARCH 28, 2022

R.O.W.

ORYX CRUDE
OIL PIPELINE

3'-AREA

POINT OF RELEASE

NOVO PRODUCED
WATER LINEEASEMENT
BOUNDARY

2'-AREA

NOVO PRODUCED
WATER LINE

PIPELINE

EASEMENT
BOUNDARY

ID	Date	Chloride
S-1 (1.5')	4/7/2022	96
S-2 (2')	4/7/2022	1,960
S-3 (2')	4/7/2022	4,880
S-4 (1.5')	4/7/2022	5,280
S-5 (1.5')	4/7/2022	8,000
S-6 (3.5')	4/7/2022	5,200
S-7 (1')	4/7/2022	4,880
S-8 (1.5')	4/7/2022	64

ID	Date	Chloride
SB-1 (0-1')	4/26/2022	4,960
SB-1 (2-3')	4/26/2022	2,160
SB-1 (3-4')	4/26/2022	208
SB-2 (0-1')	4/25/2022	1,650
SB-2 (2-3')	4/25/2022	16
SB-2 (5-6')	4/25/2022	800
SB-2 (7-8')	4/25/2022	48
SB-3 (0-1')	4/25/2022	6,240
SB-3 (2-3')	4/25/2022	2,560
SB-3 (3-4')	4/25/2022	1,410
SB-3 (5-6')	4/25/2022	176
SB-4 (0-1')	4/25/2022	6,800
SB-4 (2-3')	4/25/2022	5,760
SB-4 (3-4')	4/25/2022	5,520
SB-4 (5-6')	4/25/2022	208
SB-5 (0-1')	4/25/2022	8,880
SB-5 (2-3')	4/25/2022	1,420
SB-5 (5-6')	4/25/2022	64
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SB-6 (2-3')	4/25/2022	448
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SB-7 (3-4')	4/25/2022	1,360
SB-7 (5-6')	4/25/2022	720
SB-7 (7-8')	4/25/2022	320
SB-8 (0-1')	4/25/2022	11,500
SB-8 (2-3')	4/25/2022	192
SB-8 (5-6')	4/25/2022	320
SB-8 (7-8')	4/25/2022	256

ID	Date	Chloride
SB-9 (0-1')	4/25/2022	1,330
SB-9 (2-3')	4/25/2022	272
SB10 (0-1')	4/25/2022	112
SB-20 (0-1')	4/27/2022	4,000
SB-20 (2-3')	4/27/2022	480
SB-20 (3-4')	4/27/2022	1,680
SB-20 (5-6')	4/27/2022	4,880
SB-20 (7-8')	4/27/2022	576
SB-20 (9-10')	4/27/2022	112
SB-21 (0-1')	4/27/2022	2,760
SB-21 (2-3')	4/27/2022	400
SB-21 (3-4')	4/27/2022	384
SB-22 (0-1')	4/27/2022	4,640
SB-22 (2-3')	4/27/2022	192
SB-22 (3-4')	4/27/2022	272
SB-23 (0-1')	4/27/2022	9,060
SB-23 (2-3')	4/27/2022	5,680
SB-23 (3-4')	4/27/2022	1,020
SB-23 (5-6')	4/27/2022	256
Lateral Delineation Soil Borings		
SB-11 (0-1')	4/26/2022	96
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SB-11 (7-8')	4/26/2022	64
SB-12 (0-1')	4/26/2022	480
SB-12 (2-3')	4/26/2022	16
SB-12 (5-6')	4/26/2022	528
SB-12 (27-8')	4/26/2022	48

ID	Date	Chloride
SB-13 (0-1')	4/26/2022	7,600
SB-13 (2-3')	4/26/2022	9,800
SB-13 (3-4')	4/26/2022	5,920
SB-13 (5-6')	4/26/2022	4,560
SB-13 (7-8')	4/26/2022	3,840
SB-13 (9-10')	4/26/2022	16
SB-13 (11-12')	4/26/2022	16
SB-14 (0-1')	4/27/2022	48
SB-14 (2-3')	4/27/2022	64
SB-14 (3-4')	4/27/2022	48
SB-15 (0-1')	4/26/2022	128
SB-15 (2-3')	4/26/2022	32
SB-15 (3-4')	4/26/2022	64
SB-16 (0-1')	4/27/2022	128
SB-16 (2-3')	4/27/2022	80
SB-16 (5-6')	4/27/2022	32
SB-17 (0-1')	4/27/2022	48
SB-17 (2-3')	4/27/2022	48
SB-17 (5-6')	4/27/2022	64
SB-18 (0-1')	4/27/2022	9,360
SB-18 (2-3')	4/27/2022	48
SB-18 (3-4')	4/27/2022	64
SB-18 (5-6')	4/27/2022	528
SB-19 (0-1')	4/25/2022	352
SB-19 (2-3')	4/25/2022	144
SB-19 (3-4')	4/25/2022	192
SB-19 (5-6')	4/25/2022	336
SB-24 (0-1')	4/25/2022	80
SB-24 (2-3')	4/25/2022	16
SB-24 (3-4')	4/25/2022	64
SB-25 (0-1')	4/27/2022	112
SB-25 (2-3')	4/27/2022	80
SB-25 (5-6')	4/27/2022	224

2'-AREA
4'-AREA

4'-AREA

2'-AREA

> 600 mg/Kg

US Refinery Rd

N

0 95 190 380 Feet

Legend

- Post Initial Cleanup - Soil Sample Location (4/7/2022)
- Soil Boring Location (4/25-27/2022)
- Easement
- - Pipeline
- - Water
- Spill Area
- other
- ▨ Area Outside Easements
- ▨ Iso Contour - Chlorides > 600 mg/Kg

Notes:

- Assessment Action Level = 600 mg/Kg
- Cleanup Level 0-4' = 600mg/kg
- Cleanup Level > 4' = 10,000 mg/kg (depth to groundwater is greater than 51' below ground surface)

Areas of Proposed
Remediation - Chlorides

Hades North Loop -
Produced Water Release
NAPP2209041864
Eddy County, New Mexico
Novo Oil and Gas Northern
Delaware, LLC

Date:
8/8/2022

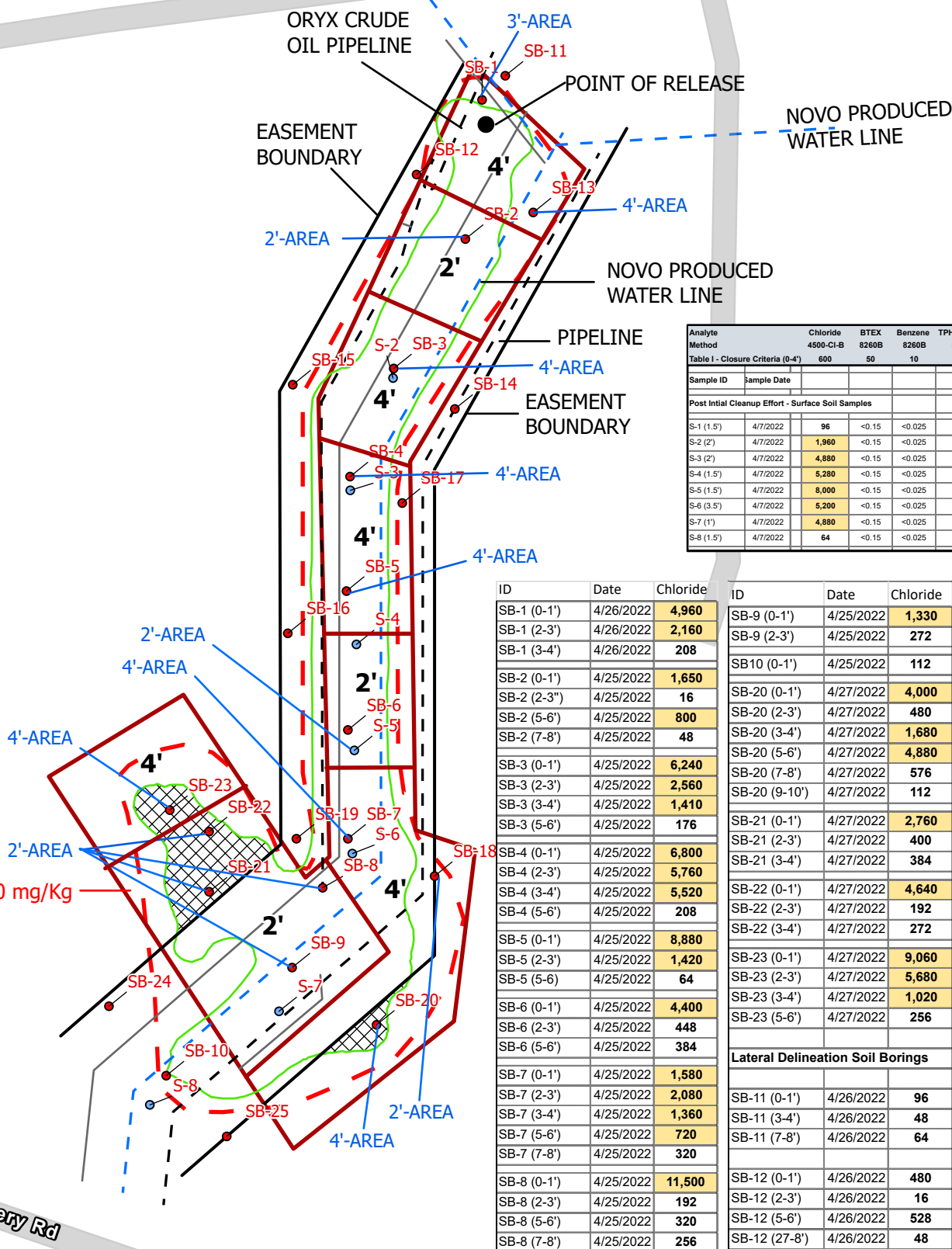
Figure 5



ALTAMIRA

DISCOVERY DATE
MARCH 28, 2022

R.O.W.



Analyte	Method	Chloride 4500-Cl-B	BTEX 8260B	Benzene 8260B	TPH (C6-C10) 8015B	TPH (C10-28) 8015B	TPH (C28-36) 8015B	Total TPH 8015B
Table 1 - Closure Criteria (0-4')		600	50	10	-	-	-	100
Sample ID	Sample Date							
Post Initial Cleanup Effort - Surface Soil Samples								
S-1 (1.5')	4/7/2022	96	<0.15	<0.025	<10	<10	<10	<10
S-2 (2')	4/7/2022	1,960	<0.15	<0.025	<10	<10	<10	<10
S-3 (2')	4/7/2022	4,880	<0.15	<0.025	<10	<10	<10	<10
S-4 (1.5')	4/7/2022	5,280	<0.15	<0.025	<10	<10	<10	<10
S-5 (1.5')	4/7/2022	8,000	<0.15	<0.025	<10	<10	<10	<10
S-6 (3.5')	4/7/2022	5,200	<0.15	<0.025	<10	<10	<10	<10
S-7 (1')	4/7/2022	4,880	<0.15	<0.025	<10	<10	<10	<10
S-8 (1.5')	4/7/2022	64	<0.15	<0.025	<10	<10	<10	<10

ID	Date	Chloride
SB-1 (0-1')	4/26/2022	4,960
SB-1 (2-3')	4/26/2022	2,160
SB-1 (3-4')	4/26/2022	208
SB-2 (0-1')	4/25/2022	1,650
SB-2 (2-3')	4/25/2022	16
SB-2 (5-6')	4/25/2022	800
SB-2 (7-8')	4/25/2022	48
SB-3 (0-1')	4/25/2022	6,240
SB-3 (2-3')	4/25/2022	2,560
SB-3 (3-4')	4/25/2022	1,410
SB-3 (5-6')	4/25/2022	176
SB-4 (0-1')	4/25/2022	6,800
SB-4 (2-3')	4/25/2022	5,760
SB-4 (3-4')	4/25/2022	5,520
SB-4 (5-6')	4/25/2022	208
SB-5 (0-1')	4/25/2022	8,880
SB-5 (2-3')	4/25/2022	1,420
SB-5 (5-6')	4/25/2022	64
SB-6 (0-1')	4/25/2022	4,400
SB-6 (2-3')	4/25/2022	448
SB-6 (5-6')	4/25/2022	384
SB-7 (0-1')	4/25/2022	1,580
SB-7 (2-3')	4/25/2022	2,080
SB-7 (3-4')	4/25/2022	1,360
SB-7 (5-6')	4/25/2022	720
SB-7 (7-8')	4/25/2022	320
SB-8 (0-1')	4/25/2022	11,500
SB-8 (2-3')	4/25/2022	192
SB-8 (5-6')	4/25/2022	320
SB-8 (7-8')	4/25/2022	256

ID	Date	Chloride
SB-9 (0-1')	4/25/2022	1,330
SB-9 (2-3')	4/25/2022	272
SB10 (0-1')	4/25/2022	112
SB-20 (0-1')	4/27/2022	4,000
SB-20 (2-3')	4/27/2022	480
SB-20 (3-4')	4/27/2022	1,680
SB-20 (5-6')	4/27/2022	4,880
SB-20 (7-8')	4/27/2022	576
SB-20 (9-10')	4/27/2022	112
SB-21 (0-1')	4/27/2022	2,760
SB-21 (2-3')	4/27/2022	400
SB-21 (3-4')	4/27/2022	384
SB-22 (0-1')	4/27/2022	4,640
SB-22 (2-3')	4/27/2022	192
SB-22 (3-4')	4/27/2022	272
SB-23 (0-1')	4/27/2022	9,060
SB-23 (2-3')	4/27/2022	5,680
SB-23 (3-4')	4/27/2022	1,020
SB-23 (5-6')	4/27/2022	256
Lateral Delineation Soil Borings		
SB-11 (0-1')	4/26/2022	96
SB-11 (3-4')	4/26/2022	48
SB-11 (7-8')	4/26/2022	64
SB-12 (0-1')	4/26/2022	480
SB-12 (2-3')	4/26/2022	16
SB-12 (5-6')	4/26/2022	528
SB-12 (27-8')	4/26/2022	48

ID	Date	Chloride
SB-13 (0-1')	4/26/2022	7,600
SB-13 (2-3')	4/26/2022	9,800
SB-13 (3-4')	4/26/2022	5,920
SB-13 (5-6')	4/26/2022	4,560
SB-13 (7-8')	4/26/2022	3,840
SB-13 (9-10')	4/26/2022	16
SB-13 (11-12')	4/26/2022	16
SB-14 (0-1')	4/27/2022	48
SB-14 (2-3')	4/27/2022	64
SB-14 (3-4')	4/27/2022	48
SB-15 (0-1')	4/26/2022	128
SB-15 (2-3')	4/26/2022	32
SB-15 (3-4')	4/26/2022	64
SB-16 (0-1')	4/27/2022	128
SB-16 (2-3')	4/27/2022	80
SB-16 (5-6')	4/27/2022	32
SB-17 (0-1')	4/27/2022	48
SB-17 (2-3')	4/27/2022	48
SB-17 (5-6')	4/27/2022	64
SB-18 (0-1')	4/27/2022	9,360
SB-18 (2-3')	4/27/2022	48
SB-18 (3-4')	4/27/2022	64
SB-18 (5-6')	4/27/2022	528
SB-19 (0-1')	4/25/2022	352
SB-19 (2-3')	4/25/2022	144
SB-19 (3-4')	4/25/2022	192
SB-19 (5-6')	4/25/2022	336
SB-24 (0-1')	4/25/2022	80
SB-24 (2-3')	4/25/2022	16
SB-24 (3-4')	4/25/2022	64
SB-25 (0-1')	4/27/2022	112
SB-25 (2-3')	4/27/2022	80
SB-25 (5-6')	4/27/2022	224

0 95 190 380 Feet

Legend

- Post Initial Cleanup - Soil Sample Location (4/7/2022)
- Soil Boring Location (4/25-27/2022)
- Easement
- Pipeline
- Water
- Spill Area
- other
- Area Outside Easements
- Iso Contour - Chlorides > 600 mg/Kg

Notes:

- Assessment Action Level = 600 mg/Kg
 - Cleanup Level 0-4' = 600mg/kg
 - Cleanup Level > 4' = 10,000 mg/kg
- (Depth to groundwater is greater than 51' below ground surface)

Areas of Proposed Remediation - Chlorides

Hades North Loop -
Produced Water Release
NAPP2209041864
Eddy County, New Mexico
Novo Oil and Gas Northern
Delaware, LLC

Date:
8/16/2022

Figure 5



ALTAMIRA



TABLE 1
Analytical Data Results Summary – Post Initial Cleanup - Soil Samples (mg/kg)

Analytical Data Results Summary - Post Initial Cleanup Effort - Soil Samples (mg/kg)
Novo Oil Gas - Hades North Loop Produced Water Release
(Discovered March 28, 2022)
Near Loving, New Mexico

Analyte Method	Chloride	BTEX	Benzene	TPH (C6-C10)	TPH (C10-28)	TPH (C28-36)	Total TPH
	4500-Cl-B	8260B	8260B	8015B	8015B	8015B	8015B
Table I - Closure Criteria (0-4')	600	50	10	-	-	-	100
Sample ID	Sample Date						
Post Initial Cleanup Effort - Surface Soil Samples							
S-1 (1.5')	4/7/2022	96	<0.15	<0.025	<10	<10	<10
S-2 (2')	4/7/2022	1,960	<0.15	<0.025	<10	<10	<10
S-3 (2')	4/7/2022	4,880	<0.15	<0.025	<10	<10	<10
S-4 (1.5')	4/7/2022	5,280	<0.15	<0.025	<10	<10	<10
S-5 (1.5')	4/7/2022	8,000	<0.15	<0.025	<10	<10	<10
S-6 (3.5')	4/7/2022	5,200	<0.15	<0.025	<10	<10	<10
S-7 (1')	4/7/2022	4,880	<0.15	<0.025	<10	<10	<10
S-8 (1.5')	4/7/2022	64	<0.15	<0.025	<10	<10	<10

Notes:

All results are in mg/kg

Closure Criteria Soils - Table I of 19.15.29.12 NMAC

TPH - Total Petroleum Hydrocarbons - includes GRO, DRO, MRO

BTEX - Benzene, Toluene, Ethylbenzene, Xylenes

- - indicates constituent was not analyzed

< number is the SDL (not detected above the sample detection limit)

Bold indicates that a COC was detected

Shading indicates that a detected result exceeded the NMOCD Table 1 Closure Criteria Levels



TABLE 2
Analytical Data Results Summary – Soil Assessment Samples (mg/kg)

Table 2
Analytical Data Results Summary - Soil Assessment Samples (mg/kg)
Novo Oil Gas - Hades North Loop Produced Water Release
(Discovered March 28, 2022)
Near Loving, New Mexico

Analyte Method		Chloride 4500-Cl-B	BTEX 8260B	Benzene 8260B	TPH (C6-C10) 8015B	TPH (C10-28) 8015B	TPH (C28-36) 8015B	Total TPH 8015B
Table I - Closure Criteria (0-4')		600	50	10	-	-	-	100
Table I - Closure Criteria (>4')		10,000	50	10	-	-	-	1,000
Sample ID	Sample Date							
Source Area Soil Borings								
SB-1 (0-1')	4/26/2022	4,960	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-1 (2-3')	4/26/2022	2,160	-	-	-	-	-	-
SB-1 (3-4')	4/26/2022	208	-	-	-	-	-	-
SB-2 (0-1')	4/25/2022	1,650	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-2 (2-3')	4/25/2022	16	-	-	-	-	-	-
SB-2 (5-6')	4/25/2022	800	-	-	-	-	-	-
SB-2 (7-8')	4/25/2022	48	-	-	-	-	-	-
SB-3 (0-1')	4/25/2022	6,240	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-3 (2-3')	4/25/2022	2,560	-	-	-	-	-	-
SB-3 (3-4')	4/25/2022	1,410	-	-	-	-	-	-
SB-3 (5-6')	4/25/2022	176	-	-	-	-	-	-
SB-4 (0-1')	4/25/2022	6,800	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-4 (2-3')	4/25/2022	5,760	-	-	-	-	-	-
SB-4 (3-4')	4/25/2022	5,520	-	-	-	-	-	-
SB-4 (5-6')	4/25/2022	208	-	-	-	-	-	-
SB-5 (0-1')	4/25/2022	8,880	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-5 (2-3')	4/25/2022	1,420	-	-	-	-	-	-
SB-5 (5-6')	4/25/2022	64	-	-	-	-	-	-
SB-6 (0-1')	4/25/2022	4,400	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-6 (2-3')	4/25/2022	448	-	-	-	-	-	-
SB-6 (5-6')	4/25/2022	384	-	-	-	-	-	-
SB-7 (0-1')	4/25/2022	1,580	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-7 (2-3')	4/25/2022	2,080	-	-	-	-	-	-
SB-7 (3-4')	4/25/2022	1,360	-	-	-	-	-	-
SB-7 (5-6')	4/25/2022	720	-	-	-	-	-	-
SB-7 (7-8')	4/25/2022	320	-	-	-	-	-	-
SB-8 (0-1')	4/25/2022	11,500	0.078	<0.025	10.5	36.5	<10.0	47
SB-8 (2-3')	4/25/2022	192	-	-	-	-	-	-
SB-8 (5-6')	4/25/2022	320	-	-	-	-	-	-
SB-8 (7-8')	4/25/2022	256	-	-	-	-	-	-
SB-9 (0-1')	4/25/2022	1,330	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-9 (2-3')	4/25/2022	272	-	-	-	-	-	-

Table 2
Analytical Data Results Summary - Soil Assessment Samples (mg/kg)
Novo Oil Gas - Hades North Loop Produced Water Release
(Discovered March 28, 2022)
Near Loving, New Mexico

Analyte Method			Chloride 4500-Cl-B	BTEX 8260B	Benzene 8260B	TPH (C6-C10) 8015B	TPH (C10-28) 8015B	TPH (C28-36) 8015B	Total TPH 8015B
Table I - Closure Criteria (0-4')			600	50	10	-	-	-	100
Table I - Closure Criteria (>4')			10,000	50	10	-	-	-	1,000
SB10 (0-1')	4/25/2022		112	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-20 (0-1')	4/27/2022		4,000	0.147	<0.025	<10.0	<10.0	<10.0	<10.0
SB-20 (2-3')	4/27/2022		480	-	-	-	-	-	-
SB-20 (3-4')	4/27/2022		1,680	-	-	-	-	-	-
SB-20 (5-6')	4/27/2022		4,880	-	-	-	-	-	-
SB-20 (7-8')	4/27/2022		576	-	-	-	-	-	-
SB-20 (9-10')	4/27/2022		112	-	-	-	-	-	-
SB-21 (0-1')	4/27/2022		2,760	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-21 (2-3')	4/27/2022		400	-	-	-	-	-	-
SB-21 (3-4')	4/27/2022		384	-	-	-	-	-	-
SB-22 (0-1')	4/27/2022		4,640	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-22 (2-3')	4/27/2022		192	-	-	-	-	-	-
SB-22 (3-4')	4/27/2022		272	-	-	-	-	-	-
SB-23 (0-1')	4/27/2022		9,060	0.212	<0.025	<10.0	<10.0	<10.0	<10.0
SB-23 (2-3')	4/27/2022		5,680	-	-	-	-	-	-
SB-23 (3-4')	4/27/2022		1,020	-	-	-	-	-	-
SB-23 (5-6')	4/27/2022		256	-	-	-	-	-	-
Lateral Delineation Soil Borings									
SB-11 (0-1')	4/26/2022		96	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-11 (3-4')	4/26/2022		48	-	-	-	-	-	-
SB-11 (7-8')	4/26/2022		64	-	-	-	-	-	-
SB-12 (0-1')	4/26/2022		480	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-12 (2-3')	4/26/2022		16	-	-	-	-	-	-
SB-12 (5-6')	4/26/2022		528	-	-	-	-	-	-
SB-12 (27-8')	4/26/2022		48	-	-	-	-	-	-
SB-13 (0-1')	4/26/2022		7,600	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-13 (2-3')	4/26/2022		9,800	-	-	-	-	-	-
SB-13 (3-4')	4/26/2022		5,920	-	-	-	-	-	-
SB-13 (5-6')	4/26/2022		4,560	-	-	-	-	-	-
SB-13 (7-8')	4/26/2022		3,840	-	-	-	-	-	-
SB-13 (9-10')	4/26/2022		16	-	-	-	-	-	-
SB-13 (11-12')	4/26/2022		16	-	-	-	-	-	-
SB-14 (0-1')	4/27/2022		48	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0

Table 2
Analytical Data Results Summary - Soil Assessment Samples (mg/kg)
Novo Oil Gas - Hades North Loop Produced Water Release
(Discovered March 28, 2022)
Near Loving, New Mexico

Analyte		Chloride	BTEX	Benzene	TPH (C6-C10)	TPH (C10-28)	TPH (C28-36)	Total TPH
Method		4500-Cl-B	8260B	8260B	8015B	8015B	8015B	8015B
Table I - Closure Criteria (0-4')		600	50	10	-	-	-	100
Table I - Closure Criteria (>4')		10,000	50	10	-	-	-	1,000
SB-14 (2-3')	4/27/2022	64	-	-	-	-	-	-
SB-14 (3-4')	4/27/2022	48	-	-	-	-	-	-
SB-15 (0-1')	4/26/2022	128	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-15 (2-3')	4/26/2022	32	-	-	-	-	-	-
SB-15 (3-4')	4/26/2022	64	-	-	-	-	-	-
SB-16 (0-1')	4/27/2022	128	0.078	<0.025	<10.0	<10.0	<10.0	<10.0
SB-16 (2-3')	4/27/2022	80	-	-	-	-	-	-
SB-16 (5-6')	4/27/2022	32	-	-	-	-	-	-
SB-17 (0-1')	4/27/2022	48	0.219	<0.025	<10.0	<10.0	<10.0	<10.0
SB-17 (2-3')	4/27/2022	48	-	-	-	-	-	-
SB-17 (5-6')	4/27/2022	64	-	-	-	-	-	-
SB-18 (0-1')	4/27/2022	9,360	0.088	<0.025	<10.0	<10.0	<10.0	<10.0
SB-18 (2-3')	4/27/2022	48	-	-	-	-	-	-
SB-18 (3-4')	4/27/2022	64	-	-	-	-	-	-
SB-18 (5-6')	4/27/2022	528	-	-	-	-	-	-
SB-19 (0-1')	4/25/2022	352	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-19 (2-3')	4/25/2022	144	-	-	-	-	-	-
SB-19 (3-4')	4/25/2022	192	-	-	-	-	-	-
SB-19 (5-6')	4/25/2022	336	-	-	-	-	-	-
SB-24 (0-1')	4/25/2022	80	<0.150	<0.025	<10.0	<10.0	<10.0	<10.0
SB-24 (2-3')	4/25/2022	16	-	-	-	-	-	-
SB-24 (3-4')	4/25/2022	64	-	-	-	-	-	-
SB-25 (0-1')	4/27/2022	112	0.05	<0.025	<10.0	<10.0	<10.0	<10.0
SB-25 (2-3')	4/27/2022	80	-	-	-	-	-	-
SB-25 (5-6')	4/27/2022	224	-	-	-	-	-	-

Notes:

All results are in mg/kg

Closure Criteria Soils - Table I of 19.15.29.12 NMAC

TPH - Total Petroleum Hydrocarbons - includes GRO, DRO, MRO

BTEX - Benzene, Toluene, Ethylbenzene, Xylenes

- - indicates constituent was not analyzed

< number is the SDL (not detected above the sample detection limit)

Bold indicates that a COC was detected

Shading indicates that a detected result exceeded the NMOCD Table 1 Closure Criteria Levels



TABLE 3
Estimated Excavated Affected Soil Volume Calculations

Table 3
Estimated Excavated Affected Soil Volume Calculations
Novo Oil Gas - Hades North Loop Produced Water Release
(Discovered March 28, 2022)
Near Loving, New Mexico

Areas of Soil Remediation - Estimated Soil Volume

2' Depth Excavation Areas				
Length (ft)	Width (ft)	Depth (ft)	ft³	yd³
95	105	2	19,950	739
119	72	2	17,136	635
200	145	2	58,000	2,148
Total:				3,522

4' Depth Excavation Areas				
Length (ft)	Width (ft)	Depth (ft)	ft³	yd³
125	95	4	47,500	1,759
130	95	4	49,400	1,830
166	72	4	47,808	1,771
130	72	4	37,440	1,387
190	72	4	54,720	2,027
125	120	4	60,000	2,222
Total:				10,995

Estimated Total Soil Volume: 14,517

Notes:

Refer to Figure 5 for Areas of Proposed Remediation and Depth Intervals

Volume is estimated based on Soil Assessment Results - actual volume may vary based on field conditions and post excavation sample results



TABLE 4
Calculated Post Excavation Soil Sample Quantities

Table 4
Calculated Post Excavation Soil Sample Quantities
Novo Oil Gas - Hades North Loop Produced Water Release
(Discovered March 28, 2022)
Near Loving, New Mexico

Post Excavation Confirmation Soil Sample Per Area (1 per 200 ft²)

<u>Excavation Surface</u>					<u>Excavation Side Walls</u>						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
1	95	105	9,975	50	95	2	190	1	2	2	54
					105	2	210	1	2	2	

<u>Excavation Surface</u>					<u>Excavation Side Walls</u>						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
2	119	72	8,568	43	119	2	238	2	2	4	49
					72	2	144	1	2	2	

<u>Excavation Surface</u>					<u>Excavation Side Walls</u>						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
3	200	145	29,000	145	200	2	400	2	2	4	153
					145	2	290	2	2	4	

<u>Excavation Surface</u>					<u>Excavation Side Walls</u>						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
4	125	95	11,875	60	124	4	496	3	2	6	70
					95	4	380	2	2	4	

<u>Excavation Surface</u>					<u>Excavation Side Walls</u>						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
5	130	95	12,350	62	130	4	520	3	2	6	72
					95	4	380	2	2	4	

Table 4
Calculated Post Excavation Soil Sample Quantities
Novo Oil Gas - Hades North Loop Produced Water Release
(Discovered March 28, 2022)
Near Loving, New Mexico

Excavation Surface					Excavation Side Walls						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
6	166	72	11,952	60	166	4	664	4	2	8	72
					72	4	288	2	2	4	
Excavation Surface					Excavation Side Walls						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
7	130	72	9,360	47	130	4	520	3	2	6	57
					72	4	288	2	2	4	
Excavation Surface					Excavation Side Walls						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
8a	190	72	13,680	69	190	4	760	4	2	8	81
					72	4	288	2	2	4	
Excavation Surface					Excavation Side Walls						Total Soil Samples for Area
Area	Length (ft)	Width (ft)	Area (ft ²)	1 sample per 200 feet ²	Length (ft)	Depth (ft)	Area (ft ²)	1 sample per 200 feet ²	# of side walls	Side Wall Samples	
8b	125	120	15,000	75	125	4	500	3	2	6	87
					120	4	480	3	2	6	

Estimated Total Post Excavation Soil Samples Required: 694

Notes:

Refer to Figure 5 for Areas of Proposed Remediation and Depth Intervals

Dimensions are estimated based on Soil Assessment Results - actual dimensions may vary based on field conditions and actual excavation areas

District I

1625 N. French Dr., Hobbs, NM 88240
 Phone:(575) 393-6161 Fax:(575) 393-0720

District II

811 S. First St., Artesia, NM 88210
 Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 140472

CONDITIONS

Operator: NOVO OIL & GAS NORTHERN DELAWARE, LLC 1001 West Wilshire Blvd Oklahoma City, OK 73116	OGRID: 372920
	Action Number: 140472
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
rhamlet	The Remediation Plan is Conditionally Approved. All off pad areas must contain a minimum of 4 feet non-waste containing uncontaminated, earthen material with chloride concentrations less than 600 mg/kg and less than 100 mg/kg for TPH. Floor confirmation samples should be delineated/excavated to meet closure criteria standards for site assessment/characterization/proven depth to water determination. Sidewall samples should be delineated/excavated to 600 mg/kg for chlorides and 100 mg/kg for TPH to define the edge of the release. Confirmation samples should be collected every 200 ft2. The spill rule states, "The samples must be analyzed for the constituents listed in Table I of 19.15.29.12 NMAC". To deviate from the rule, we need a detailed written demonstration that the variance will provide equal or better protection of fresh water, public health and the environment. A closure report will need to be completed and uploaded within 90 days.	10/13/2022