

February 7, 2023

Project No. 22-162-PMC
AER FIS 20212890

Via E-mail: Ryan.Hill@plainsmidstream.com
Original Will Remain on File

Plains Midstream Canada ULC
Suite 1400, 607 - 8th Avenue SW
Calgary, Alberta
T2P 0A7

DRAFT – FOR REVIEW

ATTN: **Ryan Hill**
Environment & Compliance Supervisor

RE: **Updated ESA and RAP**
Condensate Release
RPL Cremona 7-24 Incident
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta

Dear Ryan Hill:

Nichols Environmental (Canada) Ltd. (Nichols) was retained by Plains Midstream Canada ULC (Plains Midstream) to provide an updated environmental site assessment (ESA) and remedial action plan (RAP) at the above-referenced location in Mountain View County, Alberta (herein referred to as the 'Site'). Figure 1 (attached) depicts the location of the Site relative to the surrounding area.

As required, a record of site condition has been submitted to the Alberta Energy Regulator (AER) through the online OneStop portal (Submission ID **TBD**).

EXECUTIVE SUMMARY

Petroleum hydrocarbon (PHC) concentrations continue to be both horizontally and vertically delineated in the soil and groundwater at the Site. A multi phase extraction (MPE) system was operational at the Site between April 11 and November 4, 2022. The MPE system removed 5,621 kg of PHC mass via vapour extraction and 648 kg of PHC mass via liquid extraction (combination of groundwater and product) which represents 42% of the total PHC mass released at the Site.

As required, an updated RAP has been prepared for the Site and is discussed herein.

Plains Midstream continues to work in cooperation with the landowners, occupants, and other stakeholders affected by the incident.

BACKGROUND

On December 16, 2021, a pressure anomaly was reported for the Plains Midstream-operated condensate pipeline (AB00001386-3). Upon notification, operation of the



Nichols Environmental
(Canada) Ltd.

nichols.ca
Toll Free: 877 888 6325

Head Office:
17331 - 107th Avenue NW
Edmonton, Alberta
T5S 1E5
P: 780 484 3377

Branch Offices:
427 Manitou Road SE
Calgary, Alberta

Saskatchewan

PHASE I ESA
HISTORICAL REVIEW
DUE DILIGENCE

PHASE II ESA
SOIL & GROUNDWATER
ASSESSMENT
DELINEATION

REMEDIATION
ENGINEERING DESIGN
INSTALLATION
MANAGEMENT
CLOSURE MONITORING

HYGIENE
ABATEMENT MONITORING
INDOOR AIR QUALITY
ASBESTOS/MOULD/
RADON SAMPLING

SPILL RESPONSE
REGULATORY LIAISON
INVESTIGATION
REMEDIATION

GEOSCIENCES
CIVIL/MUNICIPAL
FOUNDATIONS
SITE DEVELOPMENT
TOP-OF-BANK
SLOPE STABILITY
EARTHWORKS DESIGN
TENDERING
CONSTRUCTION
SUPERVISION

Plains Midstream Canada ULC
Updated Environmental Site Assessment and Remedial Action Plan
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta
Project No. 22-162-PMC
February 7, 2023
Page 2 of 8

DRAFT – FOR REVIEW



pipeline was immediately suspended. Based on correspondence with Plains Midstream, it is understood that an estimated 20 m³ (14,884 kg) of condensate were released into the soil surrounding the pipeline. No condensate was released at surface or came to surface after the release.

An ESA and RAP summarizing the initial response, soil/groundwater analytical data, and proposed remedial actions was prepared by Nichols and submitted to the AER in February 2022. Monitoring, assessment and remediation activities completed at the Site in 2022 were in accordance with the approved RAP.

SITE DESCRIPTION

The Site is a naturally forested area within agricultural land use. The Site is relatively flat (1-2 m elevation change).

An unnamed watercourse intersects the Site and based on a Fish and Fish Habitat Assessment (FFHA) completed by EnviroMak Inc., the watercourse does not provide adequate fish habitat. A summary of the FFHA was provided in the 2022 ESA and RAP submitted to the AER.

There are three Plains Midstream-owned pipelines within the right-of-way (ROW) at the Site, one of which is abandoned (AB00003644-1). A crude oil pipeline (AB00001386-11) is located on the northeast perimeter of the ROW and a condensate pipeline (AB00001386-3) is located on the southwest perimeter of the ROW. Access to the Site is via a high-grade access road to a gas well operated by Whitecap Resources Inc.

Details of the Site are presented on Figures 2 and 3. An updated conceptual site model (CSM) is presented in Table 1 (attached).

CONTAMINANTS OF CONCERN

The primary contaminants of concern (COCs) associated with the condensate release at the Site are benzene, toluene, ethylbenzene, xylenes (BTEX) and PHC Fractions 1 and 2. The identified COCs are confirmed by soil and groundwater samples collected from the Site.

REGULATORY REGIME

In continuance with the 2022 ESA and RAP, all soil and groundwater analytical results are compared to the *Alberta Soil and Groundwater Remediation Guidelines*, as amended up to January 2023 (2023 Alberta Guidelines). Analytical data summarized in the 2022 ESA and RAP confirms the presence of fine-grained soil at the Site. As per Mountain View County Land Use Bylaw 21-21, the Site is zoned as Agricultural District. Agricultural land use would be considered the applicable criteria.

There are no buildings located at or adjacent to the Site. Furthermore, administrative controls prohibit the construction of buildings within the pipeline ROW. As such, the vapour inhalation pathways are not considered to be operative.

Plains Midstream Canada ULC
Updated Environmental Site Assessment and Remedial Action Plan
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta
Project No. 22-162-PMC
February 7, 2023
Page 3 of 8

DRAFT – FOR REVIEW



Hydraulic conductivity data from undisturbed Shelby tube soil samples (10^{-10} m/s) and in situ testing of the groundwater and confining layer (10^{-8} m/s) confirms that the domestic use aquifer (DUA) pathway is not operative. Results of the hydraulic conductivity data were previously summarized in the 2022 ESA and RAP.

All other exposure pathways are considered to be operative. A summary of the applicable guidelines and exposure pathways is provided in Table 1.

2022 SITE ACTIVITIES

MPE/SVE Operation

To confirm the applicability of soil vapour extraction (SVE) system at the Site, a pilot test and extended pilot test were completed in February and April 2022, respectively. Copies of the draft summary letters for each pilot test are attached. The results of the pilot tests confirmed that there was site-specific evidence to support expansion of the extraction well network to remove PHC mass from the soil at the Site.

In April 2022, Nichols supervised the advancement of boreholes M21-07, M21-17, M21-18, and M22-20 through M22-30. All boreholes were completed as extraction wells except M22-30 which was completed as a groundwater monitoring well. A copy of the draft summary letter for the extraction well installation is attached and location of extraction wells is provided on Figure 3.

The SVE system was operational at the Site between April 11 and June 30, 2022 at which time it was shut down due to groundwater flooding the extraction well screen interval. As a result of groundwater elevations, the SVE system was converted to an MPE system and was operational between August 11 and October 3, 2022. The MPE system was switched back to SVE on October 3, 2022 and operated until November 4, 2022 when all activities at the Site were suspended due to freezing temperatures. The SVE/MPE system was operational at the Site for a total of 2,898.8 hours (Table 2).

Multiple Site visits were completed between April 11 and November 4, 2022. During each Site visit, the exhaust of the SVE/MPE system was monitored for lower explosive limit (LEL) and operational time (Table 2). Between April 18 and May 30, 2022, eight air samples were collected during SVE operation using Tedlar bags, and submitted to AGAT Laboratories for analysis of BTEX and PHC Fractions C1 through C12. The analytical results are attached and summarized in Table 3. During sample collection, the LEL was also recorded.

A comparison of field-measured LEL versus total BTEX and C1-C12 in mg/m³ is presented in Chart 1 (attached). The linear regression between field-measured LEL percent and total BTEX, C1-C12 yielded a R-squared value of 0.99, which confirms that field-measured LELs are a near perfect measure for total BTEX, C1-C12 concentrations. Based on the operational hours and linear regression between field-measured LEL and total BTEX, C1-C12, an estimated 5,621 kg of PHC mass was removed from the subsurface during SVE operation (Table 2).

During SVE operation, liquids were recovered from the extraction wells and stored in a double-walled aboveground storage tank (AST) at the Site. An estimated 9,000 L of liquids were removed from the subsurface between April 11 and June 30, 2022. In August 2022, a 400 bbl AST was

Plains Midstream Canada ULC
Updated Environmental Site Assessment and Remedial Action Plan
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta
Project No. 22-162-PMC
February 7, 2023
Page 4 of 8

DRAFT – FOR REVIEW



mobilized to the Site in advance of switching the SVE system to an MPE system. The MPE system was operational at the Site between August 11 and October 3, 2022 and removed an additional 17,000 L of liquids from the subsurface. A summary of the volumes recovered is presented in Table 4.

Water samples were collected from the ASTs prior to off-site disposal and submitted for laboratory analyses of BTEX and PHC Fractions 1 through 4. Based on the PHC mass reported for each water sample and volume disposed, a total PHC mass was calculated. In total 9.69 kg of PHC mass was removed via dissolved phase liquid recovery. Non-aqueous phase liquid (NAPL) was also recovered from the subsurface during SVE/MPE operation. Based on the volumes of NAPL recovered, an additional 647.9 kg of PHC mass was recovered from the subsurface. A summary of the PHC mass recovered via liquids is provided in Table 4. All recovered liquids were disposed off-site by Plains Midstream at either the Secure Energy Rocky Mountain House disposal facility or the Medicine River Oil Recyclers Ltd. disposal facility. The supporting disposal manifests from both facilities are attached.

Natural Source Zone Depletion

To assess natural source zone depletion (NSZD) at the site, five boreholes (NSZD22-31 through NSZD22-35) were advanced at the Site in April 2022 and NSZD quantifiers were installed. A draft report summarizing the advancement and installation of the NSZD quantifiers is attached. Based on Site specific measurements, NSZD is occurring at the Site at an average of 14.9 kg/day. The summary report provided by Environmental Material Sciences Inc. (EMS) is attached. NSZD monitoring will continue through to April 2023.

Groundwater Monitoring and Sampling

As per the initial RAP, groundwater monitoring events were completed weekly and groundwater sampling events were completed monthly at the Site. All monitoring wells were monitored for well headspace vapour concentrations (organic vapour concentrations) and depth to groundwater. If NAPL was present within a groundwater monitoring well, the depth to and thickness of NAPL was documented and a photograph of the NAPL in a dedicated bailer was also collected. The NAPL was removed by a dedicated disposable bailer and placed into the on-site AST. Groundwater monitoring well completion data and field monitoring results are presented in Table 5. Groundwater flow is generally toward the northeast/east and is not seasonally influenced (Figures 4 through 7).

Based on the monitoring events, NAPL was present in monitoring wells M21-07, M21-09, M21-11, M21-18, M22-21, M22-22, M22-23, M22-24, M22-26, M22-27 and NSZD22-31. As a result of SVE/MPE activities, the presence of NAPL has been reduced (Figure 8). A recovery test was completed on January 16, 2023 for NAPL within monitoring well M22-23, the recovery results are presented on Charts 2 and 3. A qualitative review of NAPL recovery indicates a low transmissivity at this location, with only 0.125 m of NAPL recovered in 24 hours.

Groundwater samples were collected from the Site between January 2022 and January 2023 and submitted for laboratory analyses of BTEX and PHC Fractions 1 and 2. Analytical results are presented in Table 6 and on Figure 9.

Plains Midstream Canada ULC
Updated Environmental Site Assessment and Remedial Action Plan
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta
Project No. 22-162-PMC
February 7, 2023
Page 5 of 8

DRAFT – FOR REVIEW



Surface Water Monitoring and Sampling

During each mobilization to the site, the unnamed water body was visually assessed to confirm the absence of PHCs. No PHCs were observed within the unnamed water body for each mobilization. To further confirm the absence of PHCs, surface water samples were collected between March and August 2022 and submitted for laboratory analyses of BTEX and PHC Fractions 1 and 2. The analytical results are presented in Table 7.

Soil Sampling

Nichols supervised the advancement of boreholes M22-05B, M22-19 and M22-31 through M22-45 between October 24 and 27, 2022. All Service Drilling Inc. were retained to advance each borehole using solid stem augers to depths ranging from 6.0 to 13.5 metres below grade (mbg). Boreholes M22-05B, M22-19, M22-32A/B, M22-33, M22-34, M22-35, M22-36 and M22-44 were completed as groundwater monitoring wells.

Soil samples were collected from the auger at 0.5-m intervals and field-screened for organic vapour concentrations (OVCs), and results are presented in Table 8. Select soil samples were thereafter submitted for laboratory analyses of BTEX and PHC Fractions 1 through 4, results are presented on Table 9 and on Figure 10. Lithology was consistent with previous investigations for each borehole advanced. Detailed borehole logs, which also describe the installation details for each groundwater monitoring well, are attached. A Stonex Global Positioning System (GPS) was used to measure the horizontal and vertical positions of each monitoring well installed.

The locations of all soil samples, boreholes/monitoring wells, and surface water samples are provided on Figures 2 and 3. The field protocols and quality assurance/quality control (QA/QC) procedures utilized by Nichols were in accordance with standard industry protocols and all samples were transported under chain of custody protocols. AGAT Laboratories conducted all soil, surface water, air and groundwater laboratory analyses.

Copies of the final signed soil, groundwater, surface water, and air laboratory reports are attached.

DISCUSSION

PHC concentrations continue to be both horizontally and vertically delineated in the soil and groundwater at the Site. The operation of the SVE/MPE system at the Site between April 11 and November 4, 2022 resulted in the removal of 5,621 kg of PHC mass via vapour extraction and 648 kg of PHC mass via liquid extraction (combination of groundwater and product) which represents 42% of the total PHC mass released at the Site. PHC mass removal in the subsurface is further evidenced by the reduction of PHC concentrations in the soil at M21-09 (M22-41), M21-11 (M22-42), M21-16 (M22-40), and M21-17 (M22-39). SVE/MPE operations reduced the presence of NAPL at the Site. Since SVE/MPE operations were suspended in November 2022, NAPL has only been identified in monitoring well M22-23.

PHCs in the soil are generally between 1 and 4 mbg. PHCs are reported at depths greater than 4.0 mbg in boreholes located in proximity to, and west of, the pipeline release point, including

Plains Midstream Canada ULC
Updated Environmental Site Assessment and Remedial Action Plan
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta
Project No. 22-162-PMC
February 7, 2023
Page 6 of 8

DRAFT – FOR REVIEW



M21-07 (M22-44), M21-11 (M22-42), M22-23 (M22-45), and M22-24, but are considered localized in these areas.

Soil samples collected from boreholes M22-33, M22-34, and M22-35 which are located to the southwest of the Site were reported to have above guideline PHC concentrations. However, based on field observations and field-measured OVCs it is the opinion of Nichols that the analytical results are not valid as a result of possible cross contamination during sample preservation and laboratory error. Duplicate samples from M22-33, M22-34 and M22-35 were submitted to Element for analysis of BTEX and F1 to verify the data initially provided by AGAT. The results from the Element completed analysis reported parameter concentrations below the laboratory detection limits (it should be noted that the duplicate samples submitted were past the optimal hold time).

UPDATED REMEDIAL ACTION PLAN

The objective of the Updated RAP is to provide a framework within which to continue to manage and remediate PHC-impacted soils at the Site to concentrations below the identified 2023 Alberta Tier 2 criteria. Based on the ESA investigations summarized above, the area and depth of PHCs in the soil have been identified and delineated.

The operation of the SVE/MPE system at the Site resulted in the removal of 5,621 kg of PHC mass via vapour extraction and 648 kg of PHC mass via liquid extraction (combination of groundwater and product) which represents 42% of the total PHC mass released at the Site. The mass of PHCs removed was reduced over time as a result of the availability of PHCs in the subsurface (Chart 4). Further SVE/MPE operation in the spring/summer of 2023 will assist with removal of easily accessible PHCs, but it is expected there will be a decreased rate of removal over time.

It is recommended that a multi-faceted approach be adopted as follows:

<bullets>

Operation of the SVE/MPE for a period of 2 to 3 months or until such time that recovery of the available PHC mass is significantly reduced;

Consideration of ex-situ remediation or targeted excavation and off site disposal, specifically in proximity to the release point and/or areas where NAPL was historically present; and

Preparation of a risk management plan (RMP) to provide long term management of the residual PHCs at the Site.

<end bullets>

Proposed Actions and Timelines

At this time, the Updated RAP milestones and time lines will be as follows:

Milestone	Time Line
Submission of Updated ESA and RAP	February 2023

Plains Midstream Canada ULC
Updated Environmental Site Assessment and Remedial Action Plan
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta
Project No. 22-162-PMC
February 7, 2023
Page 7 of 8

DRAFT – FOR REVIEW



MPE/SVE Operation	April - June 2023
Groundwater monitoring/sampling	Monthly/weekly (during SVE/MPE operation)
Remediation re-evaluation	July 2023
Potential ex-situ remediation	August to November 2023
Risk Management Plan Development	2024

The objectives of the groundwater monitoring/sampling would be to monitor for the presence of PHCs and any changes to PHC concentrations in the subsurface over time.

During the groundwater monitoring/sampling events, if PHCs are identified in the groundwater at sentinel well locations and at concentrations above the 2023 Alberta Tier 2 guidelines, an updated RAP would be prepared to address the migration of PHCs.

Ongoing Monitoring, Contingency Measures, and Commitment

At this time, ongoing monitoring will include monthly monitoring and sampling events. Monitoring will be required until such a time that the remedial targets are met, and the program will be subject to change if and when additional information is gathered for the Site.

Monitoring wells will be monitored for well headspace vapour concentrations (organic vapour concentrations) and depth to groundwater. If NAPL is present within a groundwater monitoring well, the depth to and thickness of NAPL will be collected and a photograph of the NAPL in a dedicated bailer will also be collected.

LIMITATIONS

In conducting the Updated ESA and RAP at the Site and in rendering our conclusions on the potential presence or level of contamination, Nichols Environmental (Canada) Ltd. gives the benefit of its best judgment based on its experience and in accordance with generally accepted professional standards for this type of investigation. Our conclusions are limited by the following:

- Nichols spent only a limited amount of time on the Site. Thus, any activities conducted on the Site following the site inspection that Nichols is not aware of may have an impact on the conclusions and recommendations presented;
- The sampling areas and analyses were limited to the sample locations outlined on Figure 2 and laboratory analyses were limited to those parameters outlined in the enclosed tables; and
- It was not possible to test for all forms of contamination at each and every location in the study areas. Although site-specific locations were used during testing, it is our opinion that the information obtained is representative of the conditions at the time the assessment was

Plains Midstream Canada ULC
Updated Environmental Site Assessment and Remedial Action Plan
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta
Project No. 22-162-PMC
February 7, 2023
Page 8 of 8

DRAFT – FOR REVIEW



conducted based on Nichols' understanding of the potential contaminants of concern at the time of assessment.

This report is intended to provide information to reduce, but not necessarily eliminate, uncertainty regarding the potential for contamination of a property. This report has been prepared for the exclusive use of Plains Midstream Canada ULC for the purpose of assessing the current environmental conditions that may be present at the Site. Any uses that a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. Nichols Environmental (Canada) Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

CLOSURE

We trust this meets your current requirements. If you have any questions, please contact our office at 403-452-1820 at your convenience.

Yours truly,
NICHOLS ENVIRONMENTAL (CANADA) LTD.

DRAFT – FOR REVIEW

Lauren Pickering, B.A.Sc., E.I.T.
Environmental Engineer
pickering@nichols.ca

Reviewed by:

DRAFT – FOR REVIEW

David Nuell, P.Ag.
EVP - Environmental
nuell@nichols.ca

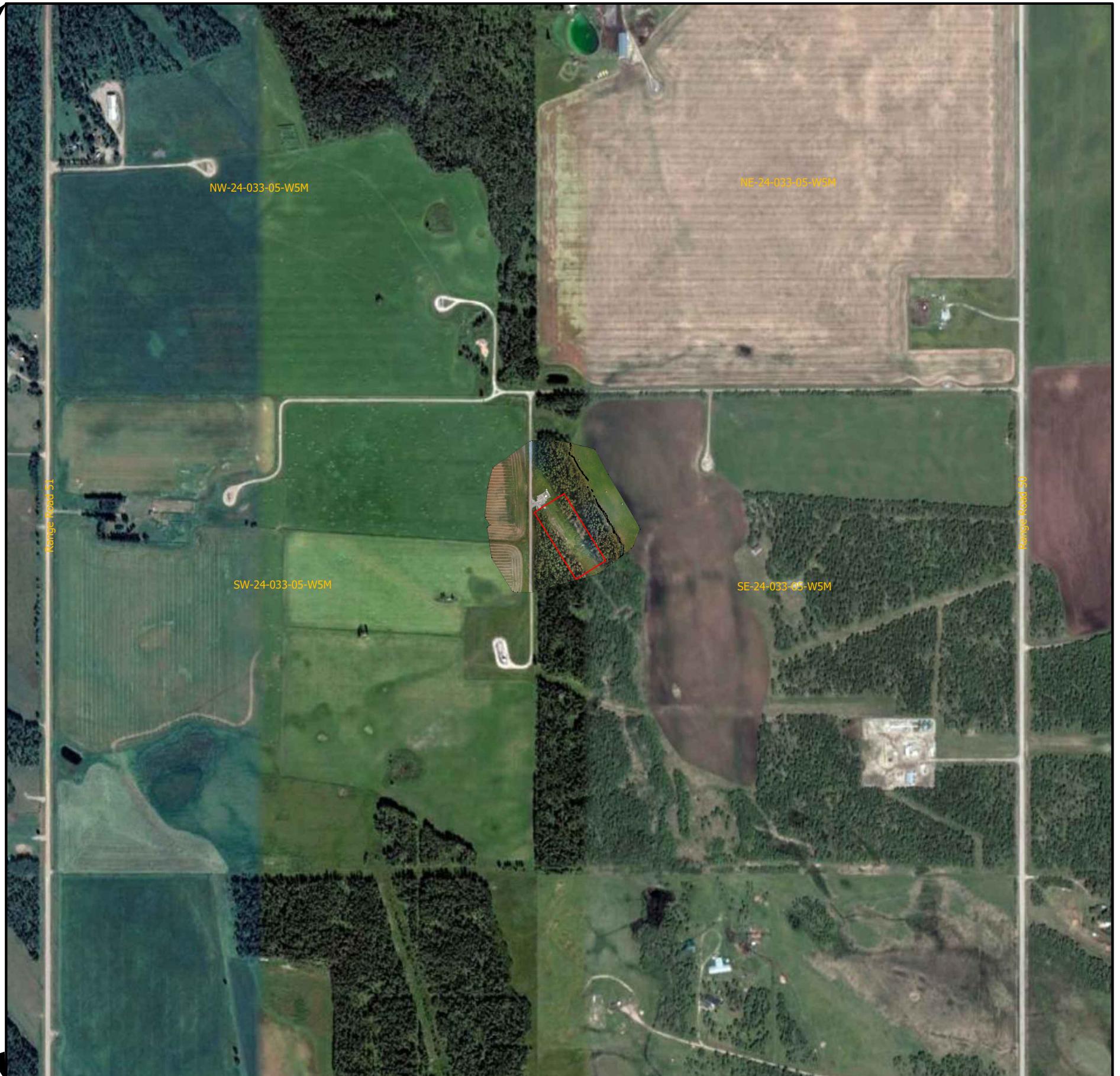
LP/DN/BR

Attachments

DRAFT – FOR REVIEW

Barry Rakewich, P.Ag., EP
President
rakewich@nichols.ca

Reference image scale 1:200,000



2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth



-50 0 50 100 150 200m

CLIENT	Plains Midstream Canada ULC
PROJECT	Updated ESA and RAP LSD (SE)07-24-033-05-W5M Mountain View County, Alberta
DRAWING TITLE	Site Location
BASE/SITE PLAN PROVIDED BY	Nichols Environmental (Canada) Ltd.
REVISION DATE	February 2023
SCALE	1:7,500 APPROVED
PROJECT NO.	22-162-PMC
DRAWING NO.	Figure 1

Legend:

- Water Sample
- ◆ Potable Water Well
- Approximate Spill Area
- Fence
- Watercourse
- ▨ Wetland Area



Original drawing in colour. Black and white copies may not interpret properly.

N:\jobs\2022\22-162-PMC\Drawings\22-162-PMC_DPS-RAP.dwg

2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth



-30	0	30	60	90m			
CLIENT							
Plains Midstream Canada ULC							
PROJECT							
Updated ESA and RAP LSD (SE)07-24-033-05-W5M Mountain View County, Alberta							
DRAWING TITLE							
Receptor and Surface Water Sample Location							
BASE/SITE PLAN PROVIDED BY							
Nichols Environmental (Canada) Ltd.							
REVISION DATE							
February 2023							
SCALE		APPROVED					
1:3,000		LP/JB					
PROJECT NO.							
22-162-PMC							
DRAWING NO.							
Figure 2							

Legend:

- Borehole/Test Pit
- Monitoring Well
- Extraction Well
- Recovery/Extraction Well
- NAPL Detected
- Fence
- Watercourse**
- U/G PIPE** Condensate Underground Pipeline
- U/G PIPE** Abandoned Underground Pipeline
- U/G PIPE** Crude Oil Underground Pipeline



Original drawing in colour. Black and white copies may not interpret property.

N:\jobs\2022-22-162-PMC\Drawings\22-162-PMC_DPS-RAP.dwg

2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth



-5	0	5	10	15m
CLIENT				
Plains Midstream Canada ULC				
PROJECT				
Updated ESA and RAP LSD (SE)07-24-033-05-W5M Mountain View County, Alberta				
DRAWING TITLE				
Site Detail, Borehole, Extraction and Groundwater Well Locations				
BASE/SITE PLAN PROVIDED BY				
Nichols Environmental (Canada) Ltd.				
REVISION DATE				
February 2023				
SCALE	APPROVED			
1:500	LP/JB			
PROJECT NO.				
22-162-PMC				
DRAWING NO.				
Figure 3				

Legend:

- Borehole/Test Pit
- Monitoring Well
- Extraction Well
- Recovery/Extraction Well
- Fence
- Watercourse
- Groundwater Flow Direction
- Groundwater Contour (m)
- 1,086,50



Original drawing in colour. Black and white copies may not interpret property.

N:\Jobs\2022-22-162-PMC\Drawings\22-162-PMC_RAP.dwg

2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth



-5	0	5	10	15m
CLIENT				
Plains Midstream Canada ULC				
PROJECT				
Updated ESA and RAP LSD (SE)07-24-033-05-W5M Mountain View County, Alberta				
DRAWING TITLE				
May 16, 2022 Groundwater Contours and Flow Direction				
BASE/SITE PLAN PROVIDED BY				
Nichols Environmental (Canada) Ltd.				
REVISION DATE				
February 2023				
SCALE	APPROVED			
1:500	LP/JB			
PROJECT NO.				
22-162-PMC				
DRAWING NO.				
Figure 4				

Legend:

- Borehole/Test Pit
- Monitoring Well
- Extraction Well
- Recovery/Extraction Well
- Fence
- Watercourse
- Groundwater Flow Direction
- Groundwater Contour (m)
- 1,088.50



2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth



-5	0	5	10	15m
CLIENT				
Plains Midstream Canada ULC				
PROJECT				
Updated ESA and RAP LSD (SE)07-24-033-05-W5M Mountain View County, Alberta				
DRAWING TITLE				
July 19, 2022 Groundwater Contours and Flow Direction				
BASE/SITE PLAN PROVIDED BY				
Nichols Environmental (Canada) Ltd.				
REVISION DATE				
February 2023				
SCALE	APPROVED			
1:500	LP/JB			
PROJECT NO.				
22-162-PMC				
DRAWING NO.				
Figure 5				



Original drawing in colour. Black and white copies may not interpret properly.

N:\Jobs\2022\22-162-FMC\Drawings\22-162-PMC_DPS-RAP.dwg

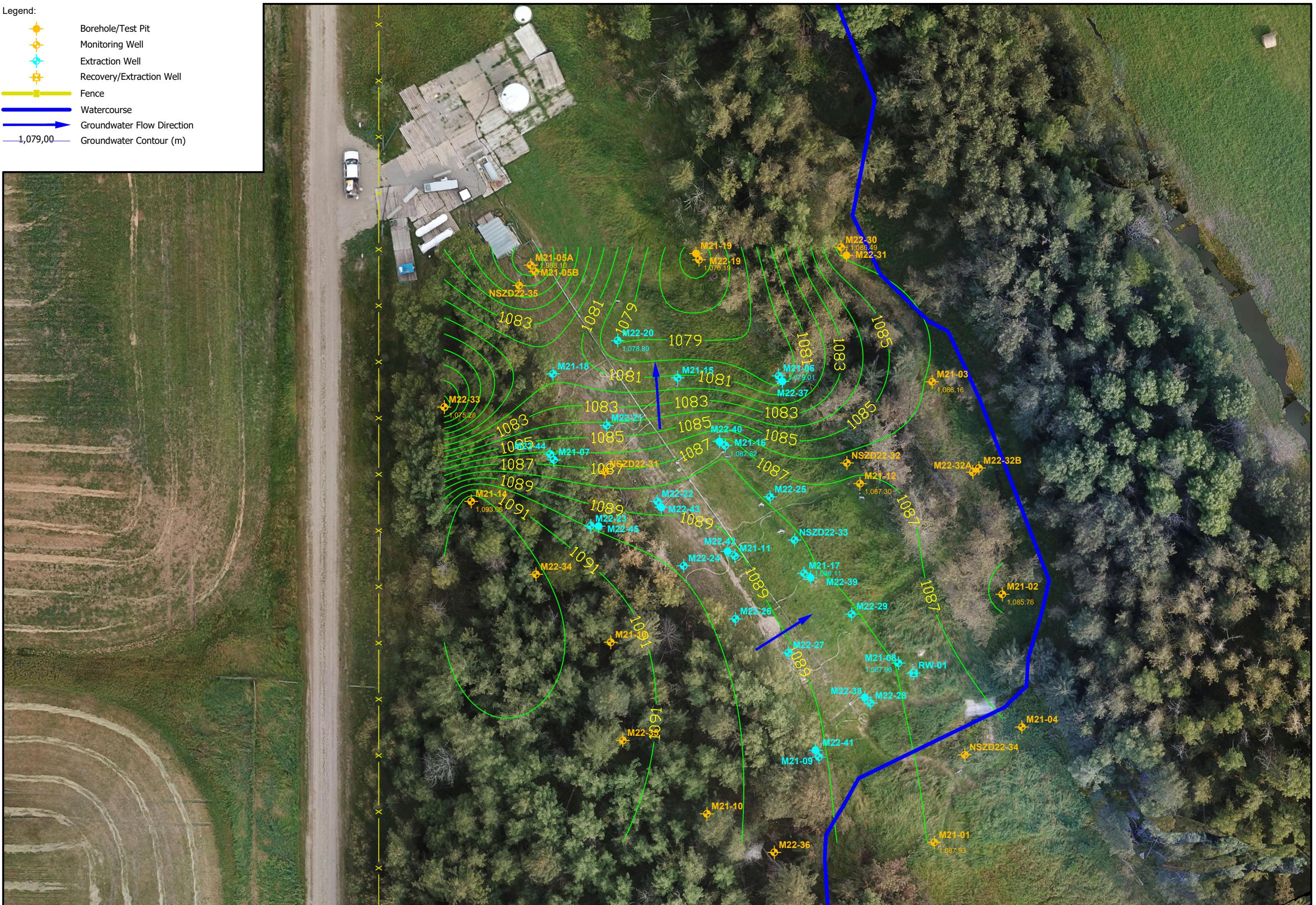


2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth

Figure 6

Legend:

- Borehole/Test Pit
- Monitoring Well
- Extraction Well
- Recovery/Extraction Well
- Fence
- Watercourse
- Groundwater Flow Direction
- 1,079,00 Groundwater Contour (m)

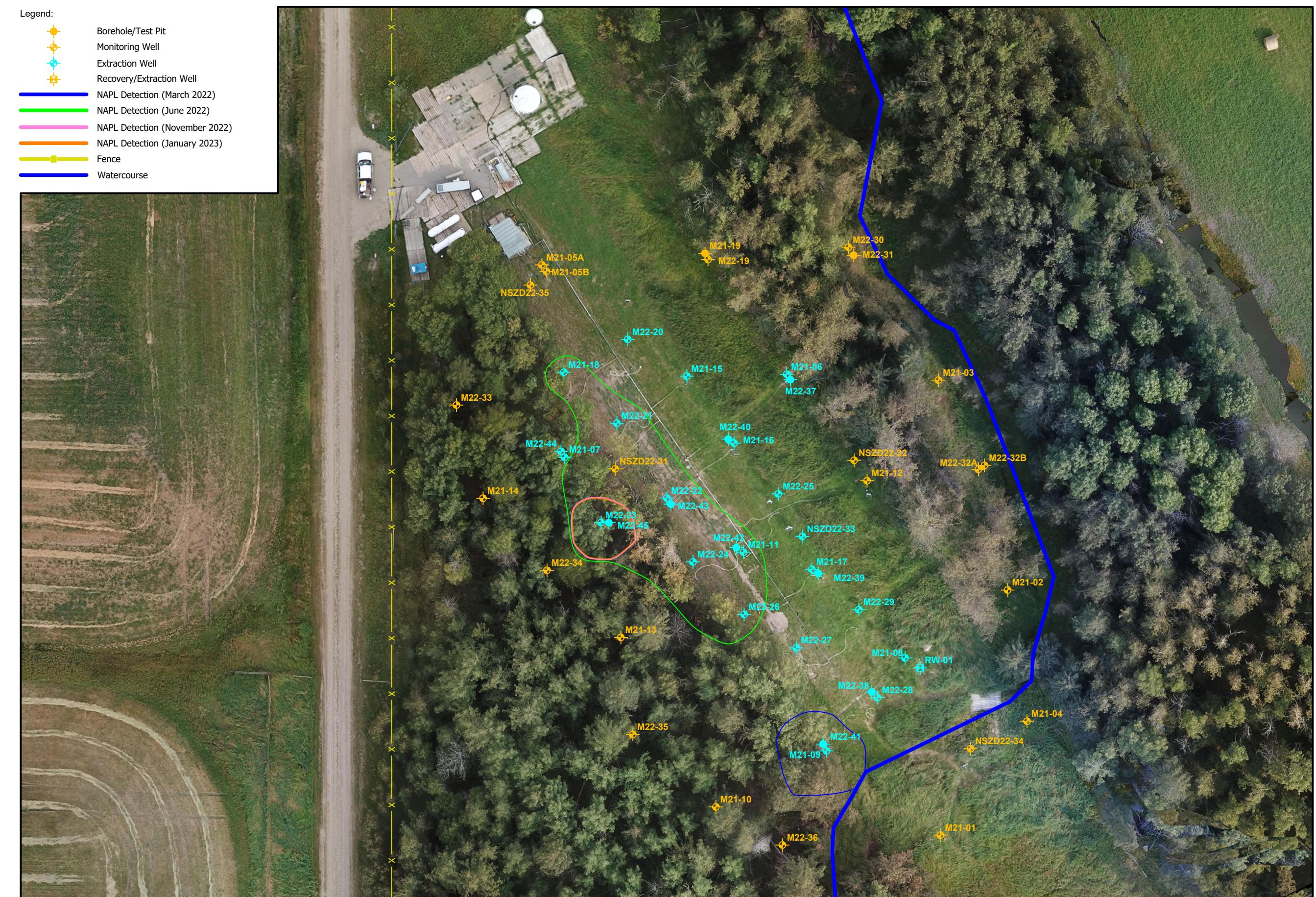


2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth



-5	0	5	10	15m		
CLIENT						
Plains Midstream Canada ULC						
PROJECT						
Updated ESA and RAP LSD (SE)07-24-033-05-W5M Mountain View County, Alberta						
DRAWING TITLE						
January 16, 2023 Groundwater Contours and Flow Direction						
BASE/SITE PLAN PROVIDED BY						
Nichols Environmental (Canada) Ltd.						
REVISION DATE						
February 2023						
SCALE	1:500	APPROVED	LP/JB			
PROJECT NO.						
22-162-PMC						
DRAWING NO.						
Figure 7						

Original drawing in colour. Black and white copies may not interpret property.

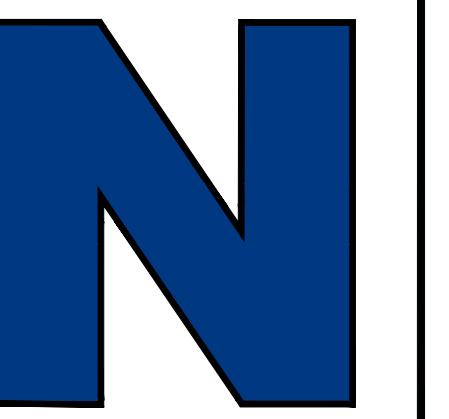


N:\jobs\2022-22-162-PMC\Drawings\22-162-PMC_RAP.dwg

2022-09-12 Nichols UAV, 2011 Air Photo Source: Google Earth



CLIENT	Plains Midstream Canada ULC
PROJECT	Updated ESA and RAP LSD (SE)07-24-033-05-W5M Mountain View County, Alberta
DRAWING TITLE	NAPL Plume Changes
BASE/SITE PLAN PROVIDED BY	Nichols Environmental (Canada) Ltd.
REVISION DATE	February 2023
SCALE	1:500
APPROVED	LP/JB
PROJECT NO.	22-162-PMC
DRAWING NO.	Figure 8



NICHOLS
NICHOLS ENVIRONMENTAL
(CANADA) LTD.

Legend:
◆ Borehole/Test Pt
◆ Monitoring Well
◆ Extraction Well
◆ Recovery/Extraction Well
● Exceeds Guidelines
● Below Guidelines
— Fence
— Watercourse
— Estimated Area of Soil Contamination

2023 Alberta Tier 2 Guidelines						
	Benzene	Toluene	Ethylbenzene	Xylenes	Fraction 1	Fraction 2
Benzene	0.088					
Toluene	4.9					
Ethylbenzene	3.2					
Xylenes	13					
Fraction 1	6.5					
Fraction 2	1.8					

-8 0 8 16 24m

CLIENT

Plains Midstream Canada ULC

PROJECT

Updated ESA and RAP
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta

DRAWING TITLE

Groundwater Petroleum
Hydrocarbon Data

BASE/SITE PLAN PROVIDED BY
Nichols Environmental (Canada) Ltd.

REVISION DATE
February 2023

SCALE APPROVED
1:400 LP/JB

PROJECT NO.
22-162-PMC

DRAWING NO.

Figure 9



NICHOLS
NICHOLS ENVIRONMENTAL
(CANADA) LTD.

Legend:
+/- Borehole/Test Pt
+/- Monitoring Well
+/- Extraction Well
+/- Recovery/Extraction Well
● Exceeds Guidelines
● Below Guidelines
— Fence
— Watercourse
— Estimated Area of Soil Contamination

2019 Alberta Tier 2 Guidelines						
Agricultural Fine Surface Soil ppm						
Benzene	0.2					
Toluene	26					
Ethylbenzene	36					
Xylenes	65					
Fraction 1	210					
Fraction 2	150					
Fraction 3	1,300					
Fraction 4	5,600					

2019 Alberta Tier 2 Guidelines						
Agricultural Fine Subsoil ppm						
Benzene	0.2					
Toluene	26					
Ethylbenzene	36					
Xylenes	130					
Fraction 1	800					
Fraction 2	1000					
Fraction 3	3,500					
Fraction 4	10,000					

-8 0 8 16 24m

CLIENT

Plains Midstream Canada ULC

PROJECT
Updated ESA and RAP
LSD (SE)07-24-033-05-W5M
Mountain View County, Alberta

DRAWING TITLE

Soil Petroleum
Hydrocarbon Data

BASE/SITE PLAN PROVIDED BY
Nichols Environmental (Canada) Ltd.

REVISION DATE

February 2023

SCALE APPROVED
1:400 LP/JB

PROJECT NO.
22-162-PMC

DRAWING NO.
Figure 10

M21-05A	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
28-Dec-2021	1.5	<0.005	<0.05	<0.01	<0.05	<10	<10	<10	<10
28-Dec-2021	3.5	<0.005	<0.05	<0.01	<0.05	<10	<10	<10	<10
28-Dec-2021	5.5	<0.005	<0.05	<0.01	<0.05	<10	<10	<10	<10
M22-05B	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
25-Oct-2022	1.5	<0.005	<0.05	<0.01	<0.05	<10	<10	<10	<10
25-Oct-2022	11	<0.005	<0.05	<0.01	<0.05	<10	<10	<10	<10
M21-18	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
31-Dec-2021	1.5	0.032	<0.05	<0.01	<0.05	<10	<10	<10	<10
31-Dec-2021	2.5	56.4	149	12.6	155	3,060	342	300	50
31-Dec-2021	5.5	0.195	0.14	0.01	<0.05	<10	<10	25	<10
31-Dec-2021	7.5	0.081	0.11	<0.01	0.05	<10	<10	29	13
M21-07	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
28-Dec-2021	1	0.006	<0.05	<0.01	<0.05	<10	<10	11	<10
28-Dec-2021	1.5	0.407	0.18	<0.01	<0.05	20	<10	<10	<10
28-Dec-2021	2	0.111	0.06	<0.01	<0.05	<10	<10	12	<10
28-Dec-2021	2.5	1.22	2.38	0.15	1.71	40	<10	29	11
28-Dec-2021	3	24.3	81.3	7.35	82.6	2570	451	378	75
28-Dec-2021	5	1.82	3.84	0.29	2.98	80	<10	22	<10
28-Dec-2021	5.5	0.4	0.88	0.07	0.78	20	<10	28	<10
28-Dec-2021	6	0.171	0.38	0.01	0.2	<10	<10	28	<10
M22-44	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
27-Oct-2022	2.5	2.35	19.4	4.97	40.2	850	417	363	53
27-Oct-2022	3	4.89	34.9	10.5	82.9	1,040	480	411	84
27-Oct-2022	5	111	55.4	14.8	78.3	3,740	756	645	132
27-Oct-2022	5.5	77	41.9	11.6	61.3	3,090	744	636	130
27-Oct-2022	6	53.6	44.2	11.8	65.6	2,390	431	414	87
27-Oct-2022	8	8.4	20	3.02	22.4	440	36	51	14
27-Oct-2022	9.5	0.248	0.2	<0.01	<0.05	<10	34	68	19
27-Oct-2022	10.5	0.079	<0.05	<0.01	<0.05	<10	37	13	
27-Oct-2022	12	0.054	0.11	<0.01	<0.05	<10	11	34	12
27-Oct-2022	13.5	0.145	0.21	<0.01	<0.05	<10	26	<10	
M22-22	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
28-Apr-2022	0.1	1.42	1.67	<0.01	<0.05	<10	17	128	43
28-Apr-2022	0.5	12	48.8	7.55	64.5	227	281	348	61
28-Apr-2022	3	21.3	61.8	7.62	78.9	460	239	179	21
28-Apr-2022	4	7.93	19.1	1.94	19.7	251	21	35	<10
M22-43	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
27-Oct-2022	0.5	0.022	<0.05	<0.01	<0.05	<10	<10	17	<10
27-Oct-2022	1.5	<0.005	<0.05	0.16	2.3	140	193	247	39
27-Oct-2022	3	0.871	18.9	5.87	55.2	880	296	199	27
27-Oct-2022	3.5	18.9	31.2	4.6	33.2	790	161	152	24
27-Oct-2022	4	11.5	20.1	2.86	20.9	500	85	86	12
27-Oct-2022	5	0.16	0.07	<0.01	<0.05	<10	<10	24	<10
27-Oct-2022	5.5	0.128	0.2	0.01	<0.05	<10	<10	28	<10
M22-33*	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
25-Oct-2022	0.5	<0.005	<0.02	<0.005	<0.03	<10	NM	NM	NM
25-Oct-2022	3.5	<0.005	<0.02	<0.005	<0.03	<10	NM	NM	NM
25-Oct-2022	6	<0.005	<0.02	<0.005	<0.03	<10	NM	NM	NM
M21-14	Depth (mbg)	B	T	E	X	PHC F1	PHC F2	PHC F3	PHC F4
30-Dec-2021	2	<0.005	<0.05	<0.01	<0.05	<10	<10	23	<10
30-Dec-2021	4								



Nichols Environmental (Canada) Ltd.

TABLE: 1
TITLE: CONCEPTUAL SITE MODEL SUMMARY

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

		Parameter	Site
Site Information	Address	SE-24-033-05-W5M	
	Legal	Mountain View County, Alberta	
	Size (m ²)	Estimated at 100 m x 50 m (5,000 m ²)	
	Buildings	No buildings are located at the Site	
	Utilities	There are three buried pipelines located at the Site as follows (north to south): 1) AB00001386-11, 8" pipeline containing crude oil operated by Plains Midstream 2) AB00003644-1, 6" abandoned pipeline historically containing HVP operated by Plains Midstream 3) AB00001386-3, 6" pipeline containing condensate operated by Plains Midstream	
	Topography & Vegetation	The Site is flat with overall relief towards the south/southeast	
	Surface Water	An ephemeral wet area is located at the Site and when there is water, flow is toward the north/northwest. A wet area is also located to the south of the Site (50 m)	
Land Use	Current Land Use	The Site is undeveloped and forested. The surrounding areas that are not forested are used for agricultural purposes	
	Current Zoning	As per Mountain View County Land Use Bylaw 21-21, the Site is zoned as Agricultural District (A)	
	Proposed Land Use	No change in land use is proposed	
	Historical Land Uses of Concern	No historical land uses of concern identified	
Surrounding Land Use	North	Agricultural District (A)	
	East	Agricultural District (A)	
	South	Agricultural District (A)	
	West	Agricultural District (A)	
Lithology & Hydrogeology	Soil Lithology	As based on borehole drilling, the lithology of the Site is confirmed to be a fine-grained clay/clay loam from near surface to 13.5 mbg, which is the maximum depth of investigation.	
	Grain Size	The soil is fine-grained as confirmed by laboratory analysis	
	Water Table Depth (mbg)	Average groundwater depth for the shallow wells is 2.87 mbg (range -0.01 to 7.42 mbg) and for the deep wells is 7.41 mbg (range 4.46 to 10.79 mbg) from January 2022 to January 2023.	
	Gradient (m/m) & Direction	For the shallow wells, groundwater flow is generally toward the northeast/east and is not seasonally influenced, under an average gradient of 0.127 m/m (as based on select monitoring events). No contours created for deep wells.	
	Hydraulic Conductivity (m/s)	Analytical results confirm that the hydraulic conductivity for the disturbed soil sample from M21-17 @ 3.0 mbg is 6.2×10^{-10} m/s. The geometric mean of hydraulic conductivity for the disturbed soil samples M22-05B at 11.9 mbg and M22-32B at 10.5 mbg, is 6.6×10^{-10} m/s.	
		In-situ hydraulic conductivity testing was completed in shallow groundwater monitoring wells M21-01, M21-05, M21-06, M22-21, M22-25, and M22-28 and in confining layer groundwater monitoring wells M21-04 and M22-05B. The geometric mean for the shallow and deep groundwater monitoring wells is calculated to be 1.63×10^{-8} m/s and 4.83×10^{-8} m/s, respectively.	
	Velocity (m/yr)	Estimated to be 0.065 m/year for the shallow groundwater table.	
Contaminant Characterization	Contaminants of Concern	Condensate was released from the Site. The contaminants of concern include benzene, toluene, ethylbenzene, xylenes (BTEX) and petroleum hydrocarbon (PHC) Fractions 1 through 4 in the soil	
	Source(s)	PHCs released from buried pipeline at the Site	
	Depth of Impacts (mbg)	PHCs in the soil are generally between 1.0 and 4.0 mbg, with deeper impacts localized near release point	
	Estimated Soil Impacts (m ²)	Estimated soil area is estimated to be 1,580 m ² (Tier 2)	
	Est. Groundwater Plume (m ²)	Impacted water observed in areas where elevated soil concentrations observed	
Exposure Analysis (Alberta)	Human		
	Direct Soil Contact	Active - Direct Soil Contact can not be excluded at the Site	
	Vapour Inhalation	Not Active - no buildings are located at or near the Site. Administrative controls prohibit the construction of buildings within the pipeline ROW	
	Domestic Use Aquifer	Not Active - based on Site specific hydraulic conductivity data for both soil and groundwater	
	Off-site Migration	Active - Off-Site Migration can not be excluded	
	Management Limits	Active - Management Limits can not be excluded	
	Ecological		
	Direct Soil Contact	Active - Direct Soil Contact can not be excluded at the Site	
	Nutrient and Energy Cycle Check	Active - can not be excluded at the Site	
	Livestock Soil & Food Ingestion	Active - although the site is undeveloped and not used for agricultural purposes, the site is zoned for agricultural land use	

PAHs = Polycyclic Aromatic Hydrocarbons
PHCs = Petroleum hydrocarbons
VOCs = Volatile Organic Compounds


TABLE: 2
TITLE: SVE/MPE OPERATIONS

PROJECT #: 22-162-PMC
 CLIENT: Plains Midstream Canada ULC
 PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
 SITE: LSD (SE07-24-033-05-W5M)
 LOCATION: Mountain View County, Alberta

SVE Data																
Monitoring Date	SVE Extraction Wells	Starting Operational Time (Hours)	Monitoring Operational Time (Hours)	Operational Period	Vacuum on well head	Vacuum on System	Flowrate	Field Measured Hydrocarbon Vapours (hexane)	Hydrocarbon (Isobutylene)	Exhaust Temperature	Air Recovery Rate	Air Recovery	Calculated Concentration Recovery	PHC Mass Recovery	Cumulative PHC Mass Recovery	Comments
11/Apr/2022	-08, -09, -11, -15, RW-01	25.95	25.95	0.00	0-6	8.0	660	3.0	150.1	54	1,121	0	1,301	0.0	0	Remove M21-06 from system extraction as water has mounded and contaminated. Given lower temps run at SVE pressures (5-9 in Hg) to reduce water recovery and have issues with freeze up.
14/Apr/2022		25.95	98.63	72.68	NM	5.0	690	0.9	22.1	55	1,172	83,352	390	70.5	70	Shut off system on April 14, and run generator over weekend to reduce freezing. Oil drop due to low load on system, correspond with BigStar
18/Apr/2022		98.63	98.63	0.00	NM	7.0	680	1.0	56.7	32	1,155	0	434	0.0	70	Monitor M21-06 before adding back to the system extraction
18/Apr/2022		98.63	102.00	3.37	NM	7.8	680	1.6	50.0	35	1,155	3,893	694	2.2	73	System shut down unexpectedly after running for a few hours, after inspection was the generator that shut down, contact BigStar to complete repairs, fixed same day and restarted system around 14:50
22/Apr/2022		102.00	192.38	90.38	NM	6.5	680	1.2	27.0	47	1,155	104,418	520	63.4	136	System shut off on April 18 to monitor recovery over the weekend of water levels
25/Apr/2022		192.38	192.38	0.00	0-7	9.5	660	2.0	NM	NM	1,121	0	867	0.0	136	System started up on April 25, completed individual well tests, run without thermal oxidizer (TO) for one day, start-up TO at end of day to run overnight
25/Apr/2022	-06, -08, -09, -11, -15, RW-01	192.38	195.58	3.20	0-7	9.5	660	2.0	126.0	49	1,121	3,588	867	3.1	139	Starting April 26 shut system off during the day to move all hosing out of the way, start-up each evening to run overnight with the TO running
25/Apr/2022		195.58	198.76	3.18	0-7	9.0	660	2.0	80.2	65	1,121	3,566	867	3.1	142	Drilling and site construction work completed during the week
26/Apr/2022		198.76	213.21	14.45	NM	6.8	680	1.0	68.2	49	1,155	16,449	434	10.7	153	Drilling completed on April 28
27/Apr/2022		213.21	229.02	15.81	NM	7.2	680	3.0	147.7	53	1,155	18,266	1,301	15.8	169	System shut off on April 29, attempt individual tests, however grout needed to solidify first, return on Tuesday May 3 to start up system again and test each newly installed well.
28/Apr/2022		229.02	242.37	13.35	NM	12.0	630	0.5	86.3	88	1,070	14,857	217	11.3	180	System shut off on Tuesday May 3 to start up system again and test each newly installed well.
29/Apr/2022		242.37	256.49	14.12	NM	5.9	680	1.0	51.8	48	1,155	15,713	434	5.1	185	
29/Apr/2022		256.49	262.74	6.25	0-7	9.0	660	1.2	35.8	54-70	1,121	7,115	520	3.4	189	
3/May/2022		262.74	262.74	0.00	9	9.0	660	20.4	NM	NM	1,121	0	8,846	0.0	189	System was started on Tuesday May 3 and each individual new well was tested for max vapour extraction, and then all wells containing little to no water were connected to system for continuous extraction
3/May/2022	-06, -07, -11, -15, -16, -18, -20, 21, -22, -23, -24, -25, -26	262.74	264.48	1.74	9	9.0	660	20.4	434.4	70-72	1,121	1,951	8,846	17.3	206	Wells containing product were bailed and approximately 17L of product were removed and stored in the onsite AST
6/May/2022		264.48	327.83	63.35	8.5	9.0	660	22.0	1038.0	72	1,121	71,037	9,540	653.0	859	
6/May/2022		327.83	333.42	5.59	NM	9.0	660	14.0	964.0	70	1,121	6,268	6,071	48.9	908	Added wells containing water and elevated vapours (M21-09, 17, 27, 28, and 29), little recovery observed after 2-3 hours of running
9/May/2022		333.42	398.20	64.78	NM	10.5	630	0.1	45.0	85	1,070	70,990	43	217.0	1,125	Ice plug observed in the morning of May 9, assume it blocked vapour extraction mid weekend as weather went to freezing temps overnight on Saturday and rained/snow on Sunday afternoon, broke up ice plug and run extraction again.
9/May/2022	-06, -07, -09, -11, -15, -16, -17, -18, -20, -21, -22, -23, -24, -25, -26, -27, -28, -29	398.20	399.02	0.82	NM	8.8	660	22.0	856.0	70	1,121	899	9,540	4.3	1,129	Completed vacuum tests to determine what LEls too high to use thermal oxidizer, threw high heat error at 15 °Hg after a few minutes of running.
9/May/2022		399.02	401.38	2.36	NM	9.0	660	30.0	1376.0	70	1,121	2,646	13,009	29.8	1,159	Removed wells previously containing water from extraction at 13:02 as forecast expected to drop to below 0 over the week and want to reduce potential additional ice plug.
9/May/2022		401.38	401.45	0.07	NM	12.0	630	58.0	>2,000	84	1,070	77	25,151	1.5	1,160	Ran system at higher pressure for an hour to try to drain water into tanks before leaving
9/May/2022		401.45	401.55	0.10	NM	12.0	630	35.0	1411.0	90	1,070	107	15,177	2.2	1,163	System generator was shutdown from May 13 to May 16 due to loose connections/grounds. After servicing, generator and system start up at May 16, 12:15 and system is operating at 9 °Hg. AST was emptied along with water in bottom of generator. Wells with high water levels are removed from extraction as colder temperatures are expected later in the week. Process tanks are ~30% full.
9/May/2022		401.55	401.62	0.07	NM	15.0	570	100.0	1722.0	100	968	71	43,363	2.1	1,165	
9/May/2022		401.62	402.07	0.45	NM	11.2	630	62.0	1286.0	84	1,070	459	26,885	16.1	1,181	
9/May/2022		402.07	402.28	1.21	6-7	9.5	660	22.0	1239.0	74	1,121	1,326	9,540	24.1	1,205	
12/May/2022		402.28	403.28	55.55	NM	9.5	660	18.0	775.0	80	1,121	62,291	7,805	540.2	1,745	System generator shut down unexpectedly on May 11, 2022. Operations checked on system and turned off control panel to reserve battery.
12/May/2022		403.28	405.83	0.99	NM	9.5	660	17.0	715.0	85	1,121	1,110	7,372	8.4	1,754	Generator started again on May 12, no issues on restart.
13/May/2022		405.83	409.82	21.56	0-9.5	9.2	660	14.0	730.0	75	1,121	24,176	6,071	162.5	1,916	Completed additional site monitoring on May 13, 2022.
13/May/2022		409.82	410.38	21.56	NM	9.2	660	16.0	852.0	76	1,121	4,014	6,938	26.1	1,942	Evidence of hydrocarbon vapour leak detected around the perimeter of the excavation site.
15/May/2022	-06, -07, -11, -15, -16, -18, -20, -21, -22, -23, -24, -25, -26	410.38	484.96	0.00	0-10	9.0	660	25.0	NM	NM	1,121	0	10,841	0.0	1,942	System generator was shutdown from May 13 to May 16 due to loose connections/grounds. After servicing, generator and system start up at May 16, 12:15 and system is operating at 9 °Hg. AST was emptied along with water in bottom of generator. Wells with high water levels are removed from extraction as colder temperatures are expected later in the week. Process tanks are ~30% full.
16/May/2022		484.96	491.16	6.20	0-10	9.0	660	25.0	963.0	74	1,121	6,952	10,841	75.4	2,018	
16/May/2022		491.16	491.99	0.83	NM	9.0	660	22.0	NM	74	1,121	931	9,540	9.5	2,027	Minimal water recovery, system appeared to be running well.
24/May/2022		491.99	678.93	186.94	0-7	7.2	680	5.0	303.0	63	1,121	212,801	2,168	1,245.7	3,273	
24/May/2022		678.93	685.45	6.52	NM	9.2	660	15.0	610.0	77	1,121	7,422	6,504	32.2	3,305	
27/May/2022		685.45	739.59	54.14	NM	9.0	660	11.0	512.0	80	1,121	60,710	4,770	342.2	3,647	System shut downs occurred on May 26 and May 28, generator still running but thermal oxidizer shut down, was identified as high heat/burner alarm shut down on May 28. Sequoia confirmed can increased the exit temperature to maximum 1900°F, system shut down will occur at this time regardless, set exit temp to 1850°F and process temp at 1600°F to assist with burner off earlier on in system.
30/May/2022		739.59	762.34	22.75	0-6.5	7.2	680	14.0	666.0	55	1,121	25,897	6,071	140.4	3,788	Some water recovery observed May 24 to May 26 (~25 cm in AST).
30/May/2022	-06, -07, -09, -11, -15, -16, -17, -18, -20, -21, -22, -23, -24, -25, -26, -27, -28, -29	762.34	764.87	2.53	NM	11.0	630	13.0	634.0	68	1,070	2,816	5,637	16.5	3,804	Generator shut down on May 30 after initial start-up, restarted okay
30/May/2022		764.87	766.62	1.75	NM	11.0	630	10.0	453.0	65	1,070	1,873	4,336	9.3	3,813	
30/May/2022		766.62	766.98	0.36	NM	9.0	660	10.0	460.0	68	1,121	395	4,336	1.7	3,815	
6/Jun/2022		766.98	844.01	77.03	NM	9.0	660	9.0	385.0	77	1,121	86,377	3,903	355.8	4,171	System shutdown on June 3rd (reason unknown). Nichols on Site to start-up system and monitor on June 6. BlueWave brought new vapourizer unit and installed in the afternoon. System was up and operating using the new vapourizer by 14:45.
6/Jun/2022		844.01	848.73	4.72	NM	9.0	660	9.0	394.0	65	1,121	5,293	3,903	20.7	4,192	
10/Jun/2022		848.73	927.15	78.42	NM	9.0	660	10.0	483.0	79	1,121	87,936	4,336	362.3	4,554	Thermal oxidizer high heat shut off on evening of June 9. LEI levels measured after system stabilized upon start-up on June 10. Initially had very high LEI but dropped down over a few hours.
13/Jun/2022	-07, -11, -18, -21, -22, -23, -24, -26	927.15	927.73	0.58	NM	12.0	630	70.0	1650.0	53	1,070	636	30,354	11.0	4,565	Completed odour test on June 13, connected only wells with product to see recovery.
13/Jun/2022		927.73	927.95	0.22	NM	12.0	630	19.0	803.0	62	1,070	235	8,239	4.5	4,569	Bailed product from wells that remained to have product on June 14
13/Jun/2022		927.95	936.29	8.34	NM	9.5	660	10.0	476.0	68	1,121	9,139	4,336	57.5	4,627	Based on information from Tay River who emptied tank on Juner 14, approximately 220 L of product was observed when dumped.
17/Jun/2022	-06, -09, -15, -16, -17, -20, -27, -28, -29	936.29	942.16	5.87	NM	9.0	660	1.0	73.0	76	1,121	6,582	453	15.8	4,643	System shut off on evening of June 13, could not restart, do not have vapours at end
17/Jun/2022		942.16	943.43	1.27	NM	9.0	660	1.0	64.0	77	1,121	1,424	434	0.6	4,643	Sequoia completed repairs to thermal oxidizer and started up system without wells previously containing product (M21-07,11,18,M22-21,22,23,24,25,26)
20/Jun/2022		943.43	996.20	52.77	NM	9.0	660	1.0	65.0	NM	1,121	59,173	434	25.7	4,669	System shut off morning of June 20, out of propane, wait for fill up before starting



TABLE: 2
TITLE: SVE/MPE OPERATIONS

PROJECT #: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

Monitoring Date	SVE Extraction Wells	SVE Data														Comments
		Starting Operational Time (Hours)	Monitoring Operational Time (Hours)	Operational Period	Vacuum on well head	Vacuum on System	Flowrate	Field Measured Hydrocarbon Vapours (hexane)	Hydrocarbon (Isobutylene)	Exhaust Temperature	Air Recovery Rate	Air Recovery	Calculated Concentration Recovery	PHC Mass Recovery	Cumulative PHC Mass Recovery	
		hr	in Hg	in Hg	cfm	% LEL	ppmv	°C	m3/hr	m3	mg/m3	kg	kg	kg	kg	
19/Aug/2022	07, 09, 11, 15, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29	1270.67	1315.51	44.84	NM	12.5	610	1.7	133.0	80	1,036	47,234	729	37.7	4,896	Quick system checkup, shutoff wells M21-18 and M22-23 for product recovery and potential sampling on August 22, 2022
	07, 09, 11, 15, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29	1315.51	1315.70	0.19	NM	12.0	630	0.7	64.0	78	1,070	200	296	0.1	4,896	
22/Aug/2022	07, 09, 11, 15, 21, 22, 24, 25, 26, 27, 28, 29	1315.70	1385.16	69.46	NM	12.0	630	0.5	47.0	73	1,070	74,348	217	19.1	4,915	MPE system monitoring during groundwater monitoring onsite. Thermal oxidizer still disconnected
	07, 09, 11, 15, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29	1385.16	1388.41	3.25	NM	10.0	655	0.6	102.8	71	1,113	3,548	256	0.8	4,916	
30/Aug/2022	1388.41	1577.38	188.97	NM	12.2	630	0.9	47.5	80	1,070	206,282	374	65.1	4,981	MPE system monitoring during groundwater monitoring onsite. Thermal oxidizer still disconnected. Wells M21-06, M21-08, M21-16, M21-17, M22-20 connected to MPE on	
	06, 07, 08, 09, 11, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29	1577.38	1580.43	3.05	NM	12.2	580	1.1	46.8	84	985	3,135	473	1.3	4,982	August 30th. Both measurements taken with these wells connected.
	1580.43	1583.13	2.70	NM	11.8	630	0.9	143.1	79	1,070	2,775	394	1.2	4,984		
6/Sep/2022	1583.13	1583.84	0.71	NM	13.0	580	0.9	143.1	79	985	730	394	0.3	4,984		
	1583.84	1603.76	19.92	NM	13.5	580	0.9	63.4	80	985	19,630	394	7.7	4,992	MPE system monitoring during groundwater monitoring onsite. Thermal oxidizer still disconnected.	
	1603.76	1648.56	44.80	NM	13.5	580	0.9	63.4	84	985	44,147	394	17.4	5,009		
6/Sep/2022	1648.56	1668.33	19.77	NM	13.5	580	0.9	63.4	89	985	19,482	394	7.7	5,017		
	1668.33	1668.95	0.62	NM	12.0	630	0.9	63.4	78	1,070	637	394	0.3	5,017		
	1668.95	1811.11	142.16	NM	11.0	640	1.4	38.6	70	1,087	153,372	591	75.6	5,093	MPE Monitoring during groundwater monitoring onsite. Thermal oxidizer still disconnected. No groundwater samples collected.	
12/Sep/2022	1811.11	1813.66	2.55	NM	10.0	650	1.0	67.0	62	1,104	2,794	453	1.5	5,094		
	1813.66	1976.89	163.23	NM	11.0	640	0.6	51.4	61	1,087	178,878	260	63.8	5,158	MPE system maintenance completed. MPE system monitored after and prior to maintenance. Groundwater monitored during shutdown. Thermal oxidizer still disconnected. No groundwater samples collected.	
19/Sep/2022	1976.89	1977.09	0.20	NM	10.8	640	0.7	75.0	50	1,087	217	304	0.1	5,158		
	1977.09	2145.00	167.91	NM	11.8	630	0.9	63.0	75	1,070	181,153	390	62.8	5,221	MPE Monitoring during groundwater monitoring onsite. Thermal oxidizer (TO) still disconnected. No groundwater samples collected. -09 and -11 valves were closed.	
26/Sep/2022	2145.00	2148.98	3.98	NM	11.8	630	1.2	86.1	75	1,070	4,260	520	1.9	5,223		
	2148.98	2303.38	154.40	NM	12.0	630	2.4	131.4	40	1,070	165,266	1,041	129.0	5,352	MPE system was deactivated upon arrival. System was diagnosed and restarted. Propane tanks were refilled by Bluewave Energy. Groundwater and system monitoring were completed. TO is still disconnected. Groundwater samples collected from -01, -02, -03, -04, -05, -12, -14, and -30. Wells -09 and -11 valves remain closed.	
3/Oct/2022	2303.38	2307.38	4.00	NM	10.8	640	1.4	68.7	68	1,087	4,315	607	3.6	5,355		
	2307.38	2495.10	187.72	NM	11.0	640	0.8	46.9	60	1,087	204,121	335	96.2	5,451	MPE Monitoring during groundwater monitoring onsite. Thermal oxidizer still disconnected. Groundwater samples collected from M21-06, 09, 21, and 28. Wells M21-17 and M22-27 removed after sampling, and M21-09 and 11 added back.	
11/Oct/2022	2495.10	2501.68	6.58	NM	9.8	650	1.1	55.7	58	1,104	7,211	493	3.0	5,454		
	2501.68	2566.72	65.04	NM	9.5	660	0.4	56.0	58	1,121	72,380	181	24.4	5,479	MPE 400 BBL tank pump out, system shut off after pumping out ~ 15 cubic metres.	
14/Oct/2022	2566.72	2570.48	3.76	NM	9.4	660	0.4	60.0	60	1,121	4,216	185	0.8	5,479		
	2570.48	2570.54	0.06	NM	9.0	660	3.0	98.0	55	1,121	67	1,301	0.0	5,480	Switch system over to SVE again and change system set up to include wells with limited or low water levels.	
17/Oct/2022	2570.54	2661.69	91.15	NM	8.0	670	0.6	64.0	50	1,138	102,985	256	80.2	5,560		
	2661.69	2662.91	1.22	NM	7.5	670	0.7	57.0	48	1,138	1,389	315	0.4	5,560	Complete locates with TCB, remove M22-27 and 29 from system, drain lines best as possible to avoid freezing.	
21/Oct/2022	2662.91	2733.07	70.16	NM	8.2	670	0.2	47.0	48	1,138	79,866	79	15.7	5,576	Shut system off before completing drilling program, leave off entire time.	
	2733.07	2733.07	0.00	NM	7.0	680	1.3	70.0	42	1,155	0	572	0.0	5,576	Turn system back on after completing repairs from broken extraction lines and drilling program.	
1/Nov/2022	2733.07	2826.32	93.25	NM	8.0	670	0.2	38.0	50	1,138	106,942	99	35.8	5,612		
	2826.32	2831.28	4.96	NM	7.9	670	0.2	29.0	52	1,138	5,646	99	0.6	5,612	Complete monitoring and sampling, collect Tedlar bag at 11 am. Leave all existing extraction wells connected.	
4/Nov/2022	2831.28	2898.80	67.52	NM	5.8	690	0.3	39.0	38	1,172	78,008	138	9.2	5,621		
	2898.80														Shut off system for winter, last reading. Leave generator running to keep building heated.	

In Hg = Inches of Mercury
In H2O = Inches of Water
ppmv = Parts per Million by Vapour

**TABLE:** 3**VAPOUR ANALYSES - BTEX AND C1-C12**

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-WSM
LOCATION: Mountain View County, Alberta

Vapour Sample ID	Pilot/Operation	Date	Collection Time	Field-Measured LEL (percent)	Benzene	Toluene	Ethylbenzene	Xylenes	C1	C1-C2	C2-C3	C3-C4	C4-C5	C5-C6	C6-C7	C7-C8	C8-C9	C9-C10	C10-C11	C11-C12	Total BTEX, C1-C12
					mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³
SP-01	Operation Data	18/Apr/2022	14:50	1.6%	3.3	4.6	0.3	5.5	1	<1	<2	61	310	124	53	25	9	<6	<6	<7	596.70
SP-02	Operation Data	22/Apr/2022	8:30	1.2%	3	2	<0.2	2	1	<1	<2	55	285	110	27	8	<5	<6	<6	<7	493.00
SP-01	Operation Data	3/May/2022	19:00	17.0%	42	39	1	25	3	3	38	1180	4380	1400	549	197	32	<6	<6	<7	7889.00
SP-01	Operation Data	6/May/2022	16:00	14.0%	39	52	3	65	2	<1	12	537	2890	1230	692	415	143	48	17	<7	6145.00
SP-01	Operation Data	16/May/2022	13:45	22.0%	101	167	21	390	2	<1	10	538	2990	1890	1050	647	360	200	105	12	8483.00
SP-01	Operation Data	24/May/2022	8:50	5.0%	30	44	2	55	1	<1	2	123	1010	594	367	202	64	19	9	<7	2522.00
SP-01	Operation Data	27/May/2022	11:15	11.0%	57	86	9	162	1	<1	4	222	1820	1160	804	478	181	75	32	<7	5091.00
SP-01	Operation Data	30/May/2022	15:50	10.0%	86	159	12	237	2	<1	6	252	1770	1090	798	521	171	48	15	<7	5167.00



TABLE: 4
TITLE: LIQUID VOLUMES RECOVERED

PROJECT #: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

Date	Estimated Total Liquids Removed	Benzene	Toluene	Ethylbenzene	Xylenes	Fraction 1	Fraction 2	Fraction 3	Fraction 4	Cumulative Water PHC Mass Recovery	Visual and/or Confirmed Volume of NAPL (L)	Benzene	Toluene	Ethylbenzene	Xylenes	Fraction 1	Fraction 2	Fraction 3	Fraction 4	Cumulative Product PHC Mass Recovery	Comments
		L	kg	kg	kg	kg	kg	kg	kg	kg	L	kg	kg	kg	kg	kg	kg	kg	kg	kg	
Total	26,000									9.69	892									647.9	
16-May-2022	1,000	0.000165	0.000203	0.000005	0.000120	0.000200	0.000200	NM	NM	0.00	NM	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	Capital pressure vacuumed out liquids collected in Blue AST Level was at 45 cm
14-Jun-2022	1,100	0.000576	0.001419	0.000100	0.001287	0.003080	0.135300	NM	NM	0.14	22	0.0995	0.5559	0.0721	0.7964	7.4433	3.7723	2.7251	0.5155	16.0	Tay River vacuumed out liquids collected in both Blue AST and knock-out tanks
21-Jun-2022	1,900	0.001317	0.002128	0.000117	0.001938	0.001140	0.049590	0.129580	0.022420	0.21	190	0.8594	4.8007	0.6226	6.8780	64.2833	32.5787	23.5347	4.4523	138.0	Tay River vacuumed out liquids collected in both Blue AST and knock-out tanks
24-Jun-2022	2,000	0.00006	0.000023	0.000004	0.000072	0.000600	0.370000	0.136400	0.023600	0.53	200	0.9047	5.0533	0.6553	7.2400	67.6667	34.2933	24.7733	4.6867	145.3	Tay River vacuumed out liquids collected in both Blue AST and knock-out tanks
28-Jun-2022	2,000	0.000154	0.000208	0.000004	0.000204	0.000400	0.038400	0.181600	0.031000	0.25	300	1.3570	7.5800	0.9830	10.8600	101.5000	51.4400	37.1600	7.0300	217.9	Tay River vacuumed out liquids collected in both Blue AST and knock-out tanks
12-Jul-2022	1,000	0.000077	0.000104	0.000002	0.000102	0.000200	0.019200	0.090800	0.015500	0.13	10	0.0452	0.2527	0.0328	0.3620	3.3833	1.7147	1.2387	0.2343	7.3	Tay River vacuumed out liquids collected in both Blue AST and knock-out tanks
16-Aug-2022	4,000	0.000051	0.000112	0.000010	0.000157	0.001200	0.355200	1.360000	0.266800	1.98	40	0.1809	1.0107	0.1311	1.4480	13.5333	6.8587	4.9547	0.9373	29.1	Continued collection of water in 400 bbl tank. Discharge not done to date
12-Sep-2022	9,000	0.000114	0.000252	0.000022	0.000354	0.002700	0.799200	3.060000	0.600300	4.46	90	0.4071	2.2740	0.2949	3.2580	30.4500	15.4320	11.1480	2.1090	65.4	Continued collection of water in 400 bbl tank. Discharge not done to date
19-Sep-2022	1,000	0.000013	0.000028	0.000002	0.000039	0.000300	0.088800	0.340000	0.066700	0.50	10	0.0452	0.2527	0.0328	0.3620	3.3833	1.7147	1.2387	0.2343	7.3	Continued collection of water in 400 bbl tank. Discharge not done to date
26-Sep-2022	2,000	0.000025	0.000056	0.000005	0.000079	0.000600	0.177600	0.680000	0.133400	0.99	20	0.0905	0.5053	0.0655	0.7240	6.7667	3.4293	2.4773	0.4687	14.5	Continued collection of water in 400 bbl tank. Discharge not done to date
3-Oct-2022	1,000	0.000013	0.000028	0.000002	0.000039	0.000300	0.088800	0.340000	0.066700	0.50	10	0.0452	0.2527	0.0328	0.3620	3.3833	1.7147	1.2387	0.2343	7.3	Continued collection of water in 400 bbl tank. Discharge not done to date

NM = Not Measured

TBD = To be determined

1,100 L AST	= Blue Aboveground Storage Tank
400 BBL	= 400 Barrel Tank



TABLE: 5
TITLE: GROUNDWATER MONITORING DATA

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SEJ07-24-033-05-W5M)
LOCATION: Mountain View County, Alberta

Monitoring Well	Install Date	Grade Elevation (m)	Stick-up or Down (m)	Installation Data				Monitoring Data							
				Well Screen				Groundwater				OVC	Product Thickness (cm)		
				Depth (mbg)		Elevation (m)		mBTOS		mbg		Elevation (m)			
Monitor Date	Depth	Total*	Depth	Total*	OVC	Product Thickness (cm)									
21-Jan-2022	6.05	6.70	5.09	5.73	1084.94	ND	ND								
27-Jan-2022	6.12	6.69	5.15	5.72	1084.88	1.4	ND								
4-Feb-2022	6.04	6.68	5.07	5.71	1084.96	ND	ND								
11-Feb-2022	6.09	6.69	5.12	5.72	1084.91	ND	ND								
16-Feb-2022	6.17	6.68	5.20	5.71	1084.83	0.5	ND								
18-Feb-2022	6.04	6.68	5.07	5.71	1084.96	11.1	ND								
25-Feb-2022	6.12	6.69	5.15	5.72	1084.88	ND	ND								
4-Mar-2022	5.98	6.69	5.01	5.72	1085.02	ND	ND								
11-Mar-2022	6.12	6.68	5.15	5.71	1084.88	1.8	ND								
18-Mar-2022	5.75	6.68	4.78	5.71	1085.25	1.2	ND								
22-Mar-2022	1.03	NM	0.06	NM	1089.97	ND	ND								
OBSTRUCTION IN WELL															
24-Mar-2022	1.25	NM	0.28	NM	1089.75	ND	ND								
8-Apr-2022	1.30	6.67	0.33	5.70	1089.70	ND	ND								
11-Apr-2022	1.36	6.68	0.39	5.71	1089.64	ND	ND								
14-Apr-2022	1.60	6.68	0.63	5.71	1089.40	ND	ND								
18-Apr-2022	1.70	6.67	0.73	5.70	1089.30	ND	ND								
22-Apr-2022	1.79	6.68	0.86	5.75	1089.17	ND	ND								
25-Apr-2022	1.31	6.68	0.36	5.73	1089.67	ND	ND								
29-Apr-2022	1.27	6.69	0.33	5.75	1089.70	ND	ND								
3-May-2022	1.33	6.68	0.39	5.74	1089.64	ND	ND								
6-May-2022	1.36	6.68	0.42	5.74	1089.61	ND	ND								
9-May-2022	1.43	6.68	0.49	5.74	1089.54	ND	ND								
12-May-2022	1.47	6.68	0.46	5.67	1089.57	ND	ND								
16-May-2022	1.52	6.66	0.51	5.65	1089.52	ND	ND								
24-May-2022	1.48	6.68	0.47	NM	1089.56	ND	ND								
30-May-2022	1.60	6.66	0.62	5.68	1089.41	ND	ND								
6-Jun-2022	1.34	6.69	0.33	5.68	1089.70	ND	ND								
21-Jun-2022	1.11	6.68	-0.01	5.56	1090.04	ND	ND								
24-Jun-2022	1.03	6.69	0.06	5.72	1089.97	ND	ND								
4-Jul-2022	1.13	6.67	0.09	5.63	1089.94	ND	ND								
9-Jul-2022	1.11	6.67	0.05	5.61	1089.98	ND	ND								
12-Jul-2022	1.23	6.68	0.27	5.72	1089.76	ND	ND								
15-Jul-2022	1.34	6.68	0.34	5.68	1089.69	ND	ND								
19-Jul-2022	1.40	6.67	0.35	5.62	1089.68	ND	ND								
22-Jul-2022	1.54	6.69	0.50	5.65	1089.53	ND	ND								
2-Aug-2022	1.16	6.67	0.18	5.69	1089.85	ND	ND								
8-Aug-2022	1.36	6.67	0.34	5.65	1089.69	ND	ND								
15-Aug-2022	1.60	6.69	0.54	5.63	1089.49	0.4	ND								
22-Aug-2022	1.89	6.69	0.90	5.70	1089.12	1.6	ND								
30-Aug-2022	2.00	6.68	1.00	5.68	1089.03	1.6	ND								
7-Sep-2022	2.19	6.72	2.19	6.72	1087.84	ND	ND								
12-Sep-2022	2.24	6.68	1.26	5.70	1088.77	ND	ND								
19-Sep-2022	2.31	6.68	1.32	5.69	1088.71	ND	ND								
26-Sep-2022	2.44	6.66	1.44	5.66	1088.59	ND	ND								
3-Oct-2022	2.53	6.68	1.53	5.68	1088.50	ND	ND								
11-Oct-2022	2.60	6.68	1.55	5.63	1088.48	ND	ND								
17-Oct-2022	2.64	6.69	1.58	5.63	1088.45	ND	ND								
1-Nov-2022	2.74	6.685	1.68	5.63	1088.35	ND	ND								
9-Nov-2022	2.77	6.68	1.77	5.68	1088.26	ND	ND								
17-Nov-2022	2.81	6.66	1.82	5.67	1088.21	ND	ND								
13-Dec-2022	2.89	6.70	2.91	5.72	1087.12	ND	ND								
26-Jan-2023	3.09	6.69	2.10	5.70	1087.93	0.1	ND								
21-Jan-2022	6.76	7.17	5.72	6.13	1084.07	ND	ND								
27-Jan-2022	6.74	7.15	5.70	6.11	1084.09	1.4	ND								
4-Feb-2022	6.67	7.14	5.63	6.10	1084.16	ND	ND								
11-Feb-2022	6.78	7.14	5.74	6.10	1084.05	ND	ND								
16-Feb-2022	6.74	7.15	5.70	6.11	1084.09	0.1	ND								
18-Feb-2022	6.66	7.15	5.62	6.11	1084.17	ND	ND								
25-Feb-2022	6.69	7.14	5.65	6.10	1084.14	ND	ND								
4-Mar-2022	6.50	7.15	5.46	6.11	1084.33	ND	ND								
11-Mar-2022	6.55	7.14	5.51	6.10	1084.28	ND	ND								
18-Mar-2022	6.30	7.14	5.26	6.10	1084.53	ND	ND								
22-Mar-2022	6.51	7.14	5.47	6.10	1084.32	ND	ND								
24-Mar-2022	6.55	7.14	5.51	6.10	1084.28	ND	ND								
29-Mar-2022	6.46	7.15	5.42	6.11	1084.37	ND	ND								
8-Apr-2022	5.72	7.14	4.68	6.10	1085.11	ND	ND								
11-Apr-2022	5.53	7.17	4.49	6.13	1085.30	ND	ND								
14-Apr-2022	6.53	7.15	5.49	6.11	1084.30	ND	ND								
18-Apr-2022	6.20	7.14	5.16	6.10	1084.63	ND	ND								
22-Apr-2022	5.94	7.17	4.92	6.15	1084.87	ND	ND								
25-Apr-2022	5.70	7.10	4.72	6.12	1085.07	ND	ND								
29-Apr-2022	5.39	7.01	4.39	6.01	1085.40	ND	ND								
3-May-2022	5.04	7.14	4.04	6.14	1085.75	ND	ND								
6-May-2022	6.37	7.15	5.37	6.15	1084.42	ND	ND								
9-May-2022	6.09	7.14	5.09	6.14	1084.70	ND	ND								
12-May-2022	6.09	7.14	5.07	6.12	1084.72	ND	ND								
16-May-2022	6.09	7.14	5.07	6.12	1084.72	ND	ND								
24-May-2022	6.09	7.08	5.07	6.06	1084.72	ND	ND								
30-May-2022	6.09	7.13	5.07	6.11	1084.72	ND	ND								
6-Jun-2022	6.09	7.10	5.07	6.08	1084.72	ND	ND								
21-Jun-2022	6.09	7.15	4.95	6.01	1084.84	ND	ND								
24-Jun-2022	6.09	7.17	4.95	6.03	1084.84	ND	ND								
4-Jul-2022	6.09	7.09	5.06	6.06	1084.73	ND	ND								
8-Jul-2022	6.09	7.14	4.93	5.98	1084.86	ND	ND								
12-Jul-2022	6.09	7.15	5.00	6.06	1084.79	ND	ND								
15-Jul-2022	6.09	7.10	5.06	6.07	1084.73	ND	ND								
19-Jul-2022	6.09	7.10	5.07	6.08	1084.72	ND	ND								
22-Jul-2022	6.09	7.15	4.97	6.03	1084.82	ND	ND								
2-Aug-2022	6.09	7.15	5.06	6.12	1084.73	ND	ND								
8-Aug-2022	6.09	7.14	5.09	6.14	1084.70	ND	ND								
15-Aug-2022	6.09	7.15	5.05	6.10	1084.74	0.2	ND								
22-Aug-2022	6.09	7.15	5.05	6.11	1084.74	1.8	ND								
30-Aug-2022	6.09	7.15	5.07	6.13	1084.72	1	ND								
7-Sep-2022	3.03	7.10	1.99	6.05	1087.80	ND	ND								
12-Sep-2022	4.28	7.15	3.23	6.10	1086.56	ND	ND								
19-Sep-2022	4.01	7.15	2.96	6.10	1086.83	ND	ND								
26-Sep-2022	3.76	7.14	2.73	6.11	1087.06	ND	ND								
3-Oct-2022	3.60	7.10	2.56	6.06	1087.23	ND	ND								
11-Oct-2022	5.37	7.15	4.33	6.12	1085.46	ND	ND								
17-Oct-2022	5.07	7.09	4.03	6.05	1085.76	ND	ND								
1-Nov-2022	4.465	7.08	3.41	6.02	1086.38	ND	ND								
17-Nov-2022	4.00	7.20	2.95	6.15	1086.84	ND	ND								
13-Dec-2022	4.34	7.09	3.28	6.03	1086.51	ND	ND								
16-Jan-2023	5.08	7.08	4.03	6.03	1085.76	ND	ND								



TABLE: 5
TITLE: GROUNDWATER MONITORING DATA

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

Monitoring Well	Install Date	Grade Elevation (m)	Stick-up or Down (m)	Total Depth (mbg)	Installation Data				Monitoring Data									
					Well Screen				Groundwater				Monitor Date	OVC	Product Thickness (cm)			
					Depth (mbg)		Elevation (m)		mBTOTC		mbg		Elevation (m)					
					Top	Bottom	Top	Bottom	Depth	Total*	Depth	Total*	(m)					
M21-03	23-Dec-2021	1089.10	1.04	5.6	1.1	-	5.6	1088.00	-	1083.50	21-Jan-2022	6.65	6.75	5.61	5.71	1082.49	0.2	ND
			0.94								27-Jan-2022	6.41	6.72	5.37	5.68	1083.73	1	ND
			1.04								4-Feb-2022	6.50	6.72	5.46	5.68	1083.64	ND	ND
			1.04								11-Feb-2022	6.52	6.72	5.48	5.68	1083.62	0.1	ND
			1.04								16-Feb-2022	6.54	6.72	5.50	5.68	1083.60	ND	ND
			1.04								18-Feb-2022	6.50	6.72	5.46	5.68	1083.64	1.1	ND
			1.04								25-Feb-2022	6.40	6.71	5.36	5.67	1083.74	ND	ND
			1.04								4-Mar-2022	6.52	6.72	5.48	5.68	1083.62	ND	ND
			1.04								11-Mar-2022	6.53	6.73	5.49	5.69	1083.61	ND	ND
			1.04								18-Mar-2022	6.43	6.72	5.39	5.68	1083.71	ND	ND
			1.04								24-Mar-2022	6.30	6.73	5.26	5.69	1083.84	ND	ND
			1.04								29-Mar-2022	6.39	6.73	5.35	5.69	1083.75	ND	ND
			1.04								8-Apr-2022	5.12	6.79	4.08	5.75	1085.02	ND	ND
			1.04								11-Apr-2022	4.64	6.73	3.60	5.69	1085.50	ND	ND
			1.04								14-Apr-2022	5.74	6.72	4.70	5.68	1084.40	ND	ND
			1.04								18-Apr-2022	5.16	6.73	4.12	5.69	1084.98	ND	ND
			1.04								22-Apr-2022	4.73	6.75	3.79	5.81	1085.31	ND	ND
			1.04								25-Apr-2022	4.39	6.74	3.35	5.70	1085.75	ND	ND
			1.04								29-Apr-2022	3.36	6.74	2.32	5.70	1086.78	ND	ND
			1.04								3-May-2022	2.53	6.72	1.49	5.68	1087.61	ND	ND
			1.04								6-May-2022	5.17	6.68	4.13	5.64	1084.97	ND	ND
			1.04								9-May-2022	4.37	6.73	3.33	5.69	1085.77	ND	ND
			1.04								13-May-2022	3.32	6.72	2.28	5.68	1086.82	ND	ND
			1.04								16-May-2022	2.72	6.72	1.68	5.68	1087.43	ND	ND
			1.04								24-May-2022	1.75	6.72	0.71	5.68	1088.39	ND	ND
			1.04								30-May-2022	4.19	6.71	3.15	5.67	1085.95	ND	ND
			1.04								6-Jun-2022	2.77	6.72	1.73	5.68	1087.37	ND	ND
			1.04								21-Jun-2022	1.20	6.73	0.10	5.63	1089.00	ND	ND
			1.04								24-Jun-2022	1.14	6.73	0.01	5.60	1089.09	ND	ND
			1.04								4-Jul-2022	1.25	6.73	0.24	5.72	1088.86	ND	ND
			1.04								8-Jul-2022	2.61	6.73	1.57	5.69	1087.53	ND	ND
			1.04								12-Jul-2022	1.34	6.73	0.22	5.61	1088.88	ND	ND
			1.04								12-Jul-2022	1.34	6.73	0.22	5.61	1088.88	ND	ND
			1.04								15-Jul-2022	3.71	6.73	2.71	5.73	1086.39	ND	ND
			1.04								19-Jul-2022	1.72	6.73	0.57	5.58	1088.53	ND	ND
			1.04								22-Jul-2022	1.68	6.73	0.62	5.67	1088.48	ND	ND
			1.04								2-Aug-2022	1.40	6.73	0.38	5.71	1088.72	ND	ND
			1.04								8-Aug-2022	1.49	6.73	0.47	5.71	1088.63	0.1	ND
			1.04								15-Aug-2022	1.88	6.72	0.84	5.68	1088.26	ND	ND
			1.04								22-Aug-2022	2.20	6.72	1.08	5.60	1088.02	4	ND
			1.04								30-Aug-2022	2.23	6.73	1.22	5.72	1087.88	1.5	ND
			1.04								7-Sep-2022	2.40	6.73	1.36	5.69	1087.74	ND	ND
			1.04								12-Sep-2022	3.07	6.73	2.04	5.70	1087.06	ND	ND
			1.04								19-Sep-2022	2.90	6.73	1.87	5.70	1087.23	ND	ND
			1.04								26-Sep-2022	2.89	6.72	1.90	5.73	1087.20	ND	ND
			1.04								3-Oct-2022	2.92	6.74	1.88	5.69	1087.22	ND	ND
			1.04								11-Oct-2022	4.88	6.76	3.81	5.69	1085.29	ND	ND
			1.04								17-Oct-2022	4.67	6.73	3.64	5.70	1085.46	ND	ND
			1.04								1-Nov-2022	4.29	6.73	3.23	5.67	1085.87	ND	ND
			1.04								17-Nov-2022	4.04	6.73	2.99	5.68	1086.11	ND	ND
			1.04								13-Dec-2022	4.42	6.74	3.36	5.68	1085.74	ND	ND
			1.04								16-Jan-2023	3.99	6.73	2.94	5.68	1086.16	ND	ND



TABLE: 5
TITLE: GROUNDWATER MONITORING DATA

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

Monitoring Well	Install Date	Grade Elevation (m)	Stick-up or Down (m)	Total Depth (mbg)	Installation Data				Monitoring Data									
					Well Screen				Groundwater				Monitor Date	OVC	Product Thickness (cm)			
					Depth (mbg)		Elevation (m)		mBTOTC		mbg		Elevation (m)					
Monitoring Well	Install Date	Grade Elevation (m)	Stick-up or Down (m)	Total Depth (mbg)	Top	Bottom	Top	Bottom	Depth	Total*	Depth	Total*	(m)					
M21-04	28-Dec-2021	1089.96	9	9	7.5	-	9	1082.46	-	1080.96	0.66	9.66	10.04	8.96	9.33	1081.00	ND	ND
			0.71						21-Jan-2022	9.60	10.00	8.90	9.30	1081.06	1.4	ND		
									27-Jan-2022	9.61	10.01	8.91	9.31	1081.05	ND	ND		
									13-Feb-2022	9.59	10.06	8.89	9.36	1081.07	ND	ND		
									16-Feb-2022	9.61	10.01	8.91	9.31	1081.05	ND	ND		
									18-Feb-2022	9.57	10.01	8.87	9.31	1081.09	ND	ND		
									25-Feb-2022	9.34	9.99	8.63	9.29	1081.33	ND	ND		
									4-Mar-2022	9.49	9.99	8.78	9.29	1081.18	ND	ND		
									11-Mar-2022	9.50	10.00	8.80	9.30	1081.16	ND	ND		
									18-Mar-2022	9.30	10.00	8.60	9.29	1081.36	ND	ND		
									24-Mar-2022	9.09	10.00	8.39	9.30	1081.57	ND	ND		
									29-Mar-2022	9.38	9.99	8.68	9.29	1081.28	ND	ND		
									8-Apr-2022	7.05	10.13	6.35	9.43	1083.61	ND	ND		
									11-Apr-2022	8.89	10.07	8.18	9.37	1081.78	ND	ND		
									14-Apr-2022	8.78	10.00	8.08	9.30	1081.88	ND	ND		
									18-Apr-2022	6.35	10.08	5.65	9.38	1084.31	ND	ND		
									22-Apr-2022	8.47	10.03	7.84	9.40	1082.12	ND	ND		
									25-Apr-2022	8.15	10.01	7.52	9.38	1082.44	ND	ND		
									29-Apr-2022	7.66	10.05	7.03	9.42	1082.93	ND	ND		
									3-May-2022	7.23	10.00	6.60	9.37	1083.36	ND	ND		
									6-May-2022	8.30	10.00	7.67	9.37	1082.29	ND	ND		
									9-May-2022	9.13	10.00	8.50	9.37	1081.46	ND	ND		
									13-May-2022	8.87	10.00	8.21	9.34	1081.75	ND	ND		
									16-May-2022	8.73	9.95	8.07	9.29	1081.89	ND	ND		
									24-May-2022	8.00	10.00	7.34	9.34	1082.62	ND	ND		
									30-May-2022	7.27	9.98	6.61	9.32	1083.35	ND	ND		
									6-Jun-2022	6.59	10.10	5.93	9.44	1084.03	ND	ND		
									21-Jun-2022	7.23	9.99	6.56	9.32	1083.40	ND	ND		
									24-Jun-2022	6.87	10.02	6.23	9.38	1083.73	ND	ND		
									4-Jul-2022	5.86	10.08	5.25	9.47	1084.71	ND	ND		
									8-Jul-2022	9.11	9.98	8.47	9.34	1081.49	ND	ND		
									12-Jul-2022	8.82	9.99	8.16	9.33	1081.80	ND	ND		
									15-Jul-2022	9.48	10.00	8.81	9.33	1081.15	ND	ND		
									19-Jul-2022	9.15	10.02	8.47	9.34	1081.49	ND	ND		
									22-Jul-2022	8.92	10.02	8.23	9.33	1081.73	ND	ND		
									25-Jul-2022	8.69	10.01	8.00	9.32	1081.96	ND	ND		
									2-Aug-2022	8.93	10.01	8.25	9.33	1081.71	ND	ND		
									8-Aug-2022	8.50	10.01	7.82	9.33	1082.14	ND	ND		
									15-Aug-2022	7.44	10.00	6.77	9.33	1083.19	0.5	ND		
									22-Aug-2022	6.84	10.00	6.20	9.36	1083.76	2.7	ND		
									30-Aug-2022	6.27	10.17	5.57	9.47	1084.39	0.7	ND		
									7-Sep-2022	5.76	10.03	5.09	9.36	1084.87	ND	ND		
									12-Sep-2022	6.56	10.00	5.89	9.32	1084.07	ND	ND		
									19-Sep-2022	6.02	10.02	5.24	9.34	1084.62	ND	ND		
									26-Sep-2022	5.61	10.17	4.98	9.54	1084.98	ND	ND		
									3-Oct-2022	5.32	10.00	4.65	9.33	1085.31	ND	ND		
									11-Oct-2022	6.66	10.01	5.93	9.27	1084.04	ND	ND		
									17-Oct-2022	6.20	10.00	5.52	9.32	1084.44	ND	ND		
									1-Nov-2022	5.43	10.00	4.75	9.32	1085.21	ND	ND		
									9-Nov-2022	5.19	10.10	4.50	9.41	1085.46	ND	ND		
									17-Nov-2022	5.52	10.00	4.86	9.34	1085.10	ND	ND		
									13-Dec-2022	6.20	10.00	5.52	9.32	1084.44	0.3	ND		
									16-Jan-2023	5.14	10.00	4.46	9.32	1085.50	0.2	ND		



TABLE: 5
TITLE: GROUNDWATER MONITORING DATA

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

Monitoring Well	Install Date	Grade Elevation (m)	Stick-up or Down (m)	Total Depth (mbg)	Installation Data				Monitoring Data						
					Well Screen				Monitor Date	Groundwater				OVC	Product Thickness (cm)
					Depth (mbg)		Elevation (m)			Depth	Total*	mbg	Elevation (m)		
					Top	Bottom	Top	Bottom		Depth	Total*	mbg	Elevation (m)		
M21-05A	28-Dec-2021	1091.08	0.70	6.2	1.7	-	6.2	1089.38	-	1084.88					
M22-05B	25-Oct-2022	1081.77	0.82	12.5	11	-	12.5	1069.27							
M21-06	28-Dec-2021	1081.37	0.79	6	1.5	-	6	1079.87	-	1075.37					



TABLE: 5
TITLE: GROUNDWATER MONITORING DATA

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

Monitoring Well	Install Date	Grade Elevation (m)	Stick-up or Down (m)	Total Depth (mbg)	Installation Data		Monitoring Data						OVC	Product Thickness (cm)					
					Well Screen		Groundwater				Monitor Date	Groundwater							
					Depth	Elevation (m)	Depth	mbg	Total*	Elevation (m)		Depth	mbg	Elevation (m)					
Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top*	Bottom	Top	Bottom	Top*	Bottom	Top	Bottom				
M21-09	29-Dec-2021	1090.54	0.71	3.3	1.5	-	3	1089.04	-	1087.54	2-Jun-2022	1.73	3.845	1.05	3.17	1089.49	323	ND	
												6-Jun-2022	1.39	3.83	0.73	3.17	1089.81	456.8	ND
												13-Jun-2022	1.43	3.84	0.77	3.18	1089.77	329.1	ND
M21-10	29-Dec-2021	1091.37	0.71	6	1.5	-	6	1089.87	-	1085.37	21-Jan-2022	DRY	6.86	6.15	DRY	0.5	ND		
												11-Mar-2022	DRY	6.86	6.15	DRY	0.5	ND	
												18-Mar-2022	DRY	6.86	6.15	DRY	0.5	ND	



TABLE: 5
TITLE: GROUNDWATER MONITORING DATA

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

Monitoring Well	Install Date	Grade Elevation (m)	Stick-up or Down (m)	Total Depth (mbg)	Installation Data		Monitor Date	Monitoring Data					OVC	Product Thickness (cm)		
					Well Screen			Groundwater								
					Depth (mbg)	Elevation (m)		Depth	Total*	Depth	Total*	Depth	Elevation (m)			
NSZD22-34	26-Apr-2022	1089.94	0.89 0.89 0.89 0.89 0.89 0.89 0.89 0.89 0.92 0.89 0.90 0.89 0.89 0.89 0.85 0.84 0.88 0.89 0.99 0.90	3.3	2.005	- 3.155	1087.94	- 1086.79								
NSZD22-35	27-Apr-2022	1091.24	0.78 0.79	3.3	1.965	- 3.115	1089.28	- 1088.13								
NSZD SENSOR INSTALLED AUGUST 17																
3-May-2022	1.25	4.22	0.36	3.33	1088.71	ND	ND									
6-May-2022	1.32	4.23	0.43	3.34	1088.64	ND	ND									
9-May-2022	1.37	4.22	0.48	3.33	1088.59	ND	ND									
13-May-2022	1.39	4.22	0.50	3.33	1088.57	ND	ND									
16-May-2022	1.43	4.22	0.54	3.33	1088.53	ND	ND									
24-May-2022	1.43	4.20	0.54	3.31	1088.53	ND	ND									
30-May-2022	1.52	4.22	0.60	3.30	1088.47	ND	ND									
6-Jun-2022	1.32	4.23	0.43	3.34	1088.64	ND	ND									
4-Jul-2022	1.16	4.18	0.26	3.28	1088.81	ND	ND									
8-Jul-2022	1.06	4.24	0.17	3.35	1088.90	ND	ND									
12-Jul-2022	1.20	4.23	0.38	3.41	1088.69	ND	ND									
15-Jul-2022	1.28	4.23	0.43	3.38	1088.64	ND	ND									
19-Jul-2022	1.34	4.18	0.50	3.34	1088.57	ND	ND									
22-Jul-2022	1.43	4.16	0.55	3.28	1088.52	ND	ND									
2-Aug-2022	1.17	4.23	0.28	3.34	1088.79	ND	ND									
8-Aug-2022	1.33	4.23	0.34	3.24	1088.73	ND	ND									
15-Aug-2022	1.42	4.23	0.52	3.33	1088.55	0.4	ND									
NSZD SENSOR INSTALLED MAY 3																
3-May-2022	3.68	4.07	2.90	3.29	1086.17	11	ND									
NSZD SENSOR INSTALLED AUGUST 17																
17-Aug-2022	1.95	4.07	1.16	3.28	1087.91	2.3	ND									

= Detectable water

= Elevated OVCs

(all concentrations in parts per million by volume = ppmv, unless noted)

mbg = metres below grade

mBTOTC = metres below top of casing

ND = Non-detect (<0.1 ppmv OVC or < 1mm free product thickness)

NM = Not Measured

OVC = Organic Vapour Concentration (ppmv)

* = Total Measured Depth on Date of Monitoring



Nichols Environmental (Canada) Ltd.

TABLE:

6

TITLE: GROUNDWATER ANALYSES - PETROLEUM HYDROCARBONS

PROJECT#: 22-162-PMC
 CLIENT: Plains Midstream Canada ULC
 PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
 SITE: LSD (SE)07-24-033-05-W5M
 LOCATION: Mountain View County, Alberta

	Fine Grained	Benzene	Toluene	Ethylbenzene	Xylenes	Fraction 1	Fraction 2
		Potable GW	0.005	0.024	0.0016	0.02	2.2
	Inhalation	0.57	NGR	NGR	44	19	NGR
	Eco Soil Contact	100	82	42	21	6.5	1.8
	Aquatic Life	3.6	12000	NGR	NGR	NGR	NGR
	Irrigation	---	---	---	---	---	---
	Livestock	0.088	4.9	3.2	13	53	NGR
	Wildlife Watering	6.8	NGR	NGR	NGR	NGR	NGR

Land Use	Agricultural	Benzene	Toluene	Ethylbenzene	Xylenes	Fraction 1	Fraction 2
Sample ID	Date	0.088	4.9	3.2	13	6.5	1.8
M21-01	21-Jan-2022	<0.0005	<0.0003	<0.0005	0.0007	<0.1	<0.1
	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	25-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Apr-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	12-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	0.1
	2-Aug-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Sep-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	9-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M21-02	21-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	NM	NM
	18-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	0.1
	11-Apr-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	12-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Sep-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	17-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M21-03	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	25-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	0.1
	3-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	0.1
	4-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	0.1
	12-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	17-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1



Nichols Environmental (Canada) Ltd.

TABLE:

6

TITLE: GROUNDWATER ANALYSES - PETROLEUM HYDROCARBONS

PROJECT#: 22-162-PMC

CLIENT: Plains Midstream Canada ULC

PROJECT: Updated Environmental Site Assessment and Remedial Action Plan

SITE: LSD (SE)07-24-033-05-W5M

LOCATION: Mountain View County, Alberta

M21-04	21-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	25-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	12-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	0.2
	6-Sep-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	17-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M21-05A	21-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	25-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	2-Aug-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Sep-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	17-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M22-05B	1-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M21-06	21-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	25-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Apr-2022	2.06	2.9	0.0997	1.84	0.1	0.4
	18-Apr-2022	0.673	1.58	0.0682	0.734	0.5	<0.1
	4-Jul-2022	4.28	6.08	0.34	4.94	1.1	0.6
	12-Jul-2022	3.8	4.99	0.225	3.79	1.7	3.4
	19-Jul-2022	3.05	3.98	0.24	3.58	0.9	3.8
	30-Aug-2022	4.35	3.48	0.075	1.84	3.8	0.3
	11-Oct-2022	0.0041	0.0021	<0.0005	0.0011	<0.1	0.1
	21-Nov-2022	0.118	0.0175	<0.0005	0.0018	<0.1	<0.1
	13-Dec-2022	0.0696	0.0331	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	0.0681	0.027	<0.0005	0.0098	<0.1	<0.1
M21-08	23-Mar-2022	15.5	17.2	0.78	8.85	21.8	3.1
	24-Mar-2022	20.7	22.3	0.543	9.85	1	12.5
	6-May-2022	3.64	7.71	0.198	2.48	4.5	0.4
	6-Jun-2022	5.66	9.86	0.135	1.87	1.1	0.6
	4-Jul-2022	5.84	9.75	0.388	4.83	3.2	0.4
M21-09	23-Mar-2022	19.5	16.9	0.523	7.24	18.9	2.3
	24-Mar-2022	26.7	22.3	0.412	7.6	0.3	2.6
	6-Jun-2022	26.3	21.5	0.184	2.68	12.3	0.6
	4-Jul-2022	1.27	2.76	0.141	2.03	3.7	0.4
	30-Aug-2022	5.22	9.19	0.563	6.41	78.1	139
	11-Oct-2022	2.48	3.71	0.198	3.18	8.2	5.6
	21-Nov-2022	1.47	2.5	0.0977	2.37	8.1	15
	13-Dec-2022	2.44	3.46	0.0994	2.73	4.6	9
	16-Jan-2023	2.89	3.14	0.0679	3.23	5.6	21



Nichols Environmental (Canada) Ltd.

TABLE:

6

TITLE: GROUNDWATER ANALYSES - PETROLEUM HYDROCARBONS

PROJECT#: 22-162-PMC
CLIENT: Plains Midstream Canada ULC
PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
SITE: LSD (SE)07-24-033-05-W5M
LOCATION: Mountain View County, Alberta

M21-12	21-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	25-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	18-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Sep-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	17-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
NSZD-32 (AKA M21-12)	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	19-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	2-Aug-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M21-14	21-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	27-Jan-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	11-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	25-Feb-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	2-Aug-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Sep-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	9-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M21-16	13-Dec-2022	6.05	1.7	0.0488	0.735	2	0.2
M21-17	6-Jun-2022	5.81	2.62	0.0071	0.691	3.6	0.1
	4-Jul-2022	2.49	1.21	0.021	1.22	2	0.2
	30-Aug-2022	1.97	0.804	0.0027	0.549	0.7	3.3
	21-Nov-2022	0.845	0.285	0.002	0.099	0.4	0.1
	13-Dec-2022	0.266	0.0468	<0.0005	0.0131	0.1	<0.1
	16-Jan-2023	0.318	0.0356	<0.0005	0.0422	0.4	0.1
M21-44	13-Dec-2022	20.2	18.8	0.252	5.69	10.3	12.6
M22-19	17-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M22-21	30-Aug-2022	6.13	13.4	0.669	6.59	25.5	65.1
	11-Oct-2022	10.8	9.11	0.271	3.42	3.1	8.7
	21-Nov-2022	7.84	9.47	0.594	5.2	19	60.6
	13-Dec-2022	10.6	12.7	0.478	5.4	20.9	58.1
	16-Jan-2023	11.8	10.3	0.422	5.58	14.3	11.2
M22-27	6-Jun-2022	63.5	30.4	0.251	2.36	4.7	1
	4-Jul-2022	35.1	33.5	0.861	9.82	3.9	0.8
	30-Aug-2022	4.96	9.02	0.913	9.88	119	705
M22-28	3-May-2022	5.77	7.45	0.15	2.56	1.8	0.3
	6-Jun-2022	12.7	8.02	0.008	1.24	20.2	0.2
	30-Aug-2022	1.61	1.07	0.0312	0.84	6.2	4.9
	11-Oct-2022	1.5	2.85	0.0822	1.87	0.3	3.5
	21-Nov-2022	1.79	0.858	0.0322	1.38	1.2	4.8
	13-Dec-2022	2.86	0.862	0.047	1.53	2.1	0.6
	16-Jan-2023	3.13	0.435	0.0375	1.26	1.1	7.8
M22-29	6-Jun-2022	0.862	0.622	0.0068	0.12	0.1	<0.1



Nichols Environmental (Canada) Ltd.

TABLE:

6

TITLE: GROUNDWATER ANALYSES - PETROLEUM HYDROCARBONS

PROJECT#: 22-162-PMC

CLIENT: Plains Midstream Canada ULC

PROJECT: Updated Environmental Site Assessment and Remedial Action Plan

SITE: LSD (SE)07-24-033-05-W5M

LOCATION: Mountain View County, Alberta

	3-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Jul-2022	0.0023	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	12-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M22-30	19-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	2-Aug-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Sep-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	3-Oct-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M22-32A	17-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M22-33	9-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
M22-36	9-Nov-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	13-Dec-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	16-Jan-2023	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
NSZD-34	3-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	4-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	19-Jul-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1

BOLD = Applicable Guideline Criteria

BOLD = Parameter Exceeds Recommended Guideline Criteria

*Alberta Tier 2 Soil and Groundwater Remediation Guidelines (Tables B-1 to B-4). January 2023.

(all concentrations in mg/L = ppm, unless noted)

Fraction 1 = C₆ to C₁₀ (-BTEX)

Fraction 2 = > C₁₀ to C₁₆

Fraction 3 = > C₁₆ to C₃₄

Fraction 3+ = C₃₅+

ND = Non-detect (<0.1 ppmv OVC)

NGR = No Guideline Required

NM = Not Measured

OVC = Organic Vapour Concentration (ppmv)

--- = No Value Provided in Guidelines



Nichols Environmental (Canada) Ltd.

TABLE:

7

TITLE: SURFACE WATER ANALYSES - PETROLEUM HYDROCARBONS

PROJECT#: 22-162-PMC
 CLIENT: Plains Midstream Canada ULC
 PROJECT: Updated Environmental Site Assessment and Remedial Action Plan
 SITE: LSD (SE)07-24-033-05-W5M
 LOCATION: Mountain View County, Alberta

EQGSW*						
Land Use	Benzene	Toluene	Ethylbenzene	Xylenes	Fraction 1	Fraction 2
Protection of Aquatic Life (PAL)	0.040	0.0005	0.090	0.030	0.150	0.110
Agricultural: Irrigation	---	---	---	---	---	---
Agricultural: Livestock	----	0.024	0.0024	----	----	----
Drinking Water**	0.005	0.024	0.0016	0.02	2.2	1.1

Protection of Aquatic Life (PAL)		Benzene	Toluene	Ethylbenzene	Xylenes	Fraction 1	Fraction 2
Sample ID	Date						
SW-01	18-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	22-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	23-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
SW-02A	18-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	22-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	23-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	21-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
SW-02	24-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
SW-02B	22-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	23-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	1-Apr-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	21-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
SW-03	2-Aug-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	22-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	23-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	24-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	1-Apr-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	21-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
SW-04	24-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	22-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	23-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	21-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
SW-05	24-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	22-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	23-Mar-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
	6-May-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1
SW-05	24-Jun-2022	<0.0005	<0.0003	<0.0005	<0.0005	<0.1	<0.1

BOLD = Applicable Guideline Criteria
BOLD = Parameter Exceeds Recommended Guideline Criteria

*Environmental Quality Guidelines for Alberta Surface Waters (EQGSW, March 2018)

**Alberta Soil and Groundwater Remediation Guidelines (Tables B-1 to B-4). February 2016.

(all concentrations in mg/L = ppm, unless noted)

Fraction 1 = C₆ to C₁₀ (-BTEX)

Fraction 2 = > C₁₀ to C₁₆

--- = No Value Provided in Guidelines



Chart: 1
Title: Field-Measured LEL vs Total BTEX, C1-C12
Project #: 22-162-PMC
Client: Plains Midstream Canada ULC
Project: Updated Environmental Site Assessment and Remedial Action Plan
Site: LSD (SE)07-24-033-05-W5M
Location: Mountain View County, Alberta

● SVE Operation
..... Linear (SVE Operation)

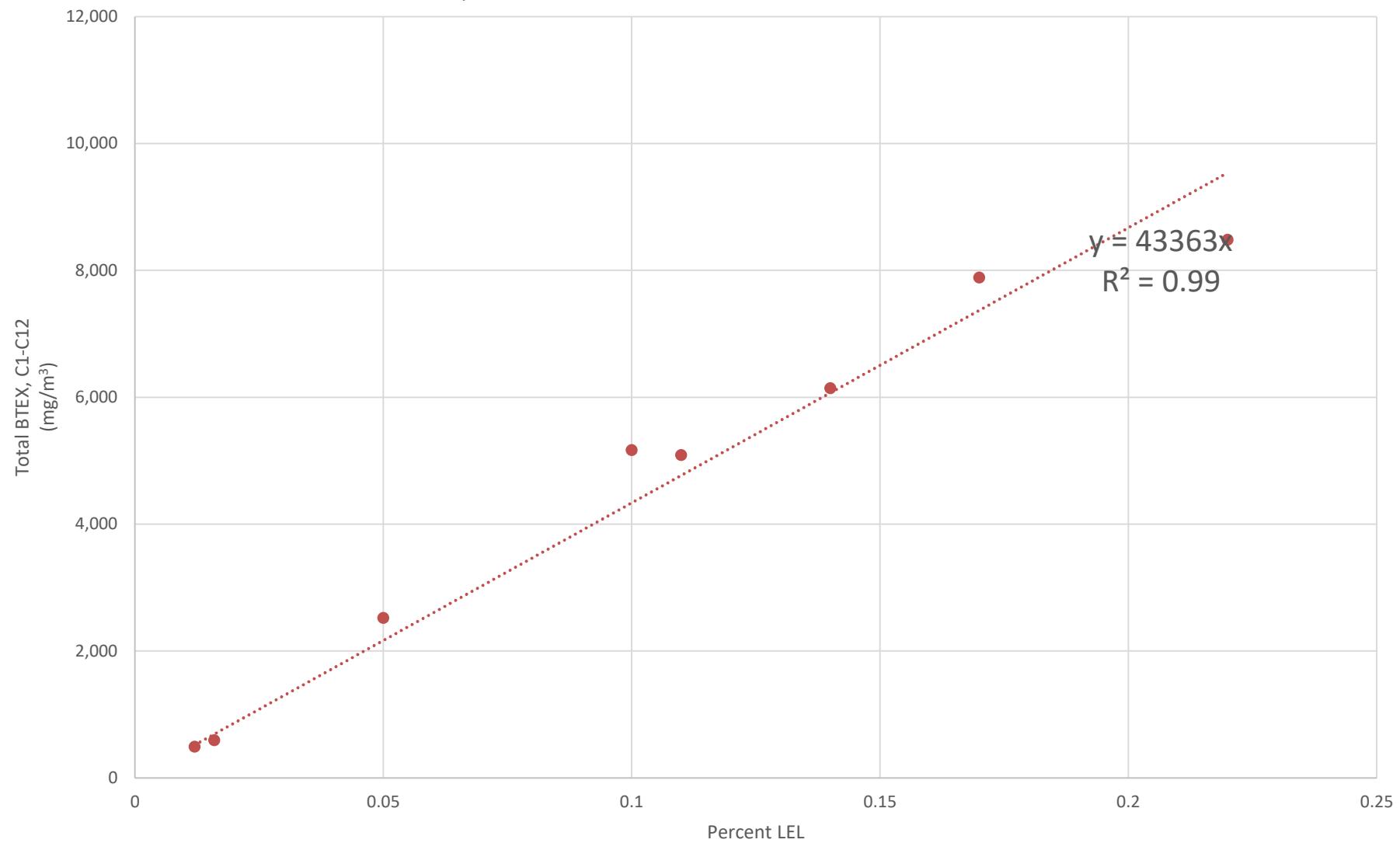




Chart: 2
Title: Product Recovery, Monitoring Well M22-23 (January 16, 2023)
Project #: 22-162-PMC
Client: Plains Midstream Canada ULC
Project: Updated Environmental Site Assessment and Remedial Action Plan
Site: LSD (SE)07-24-033-05-W5M
Location: Mountain View County, Alberta

● Product Depth
● Water Level
— Log. (Product Depth)
— Linear (Water Level)

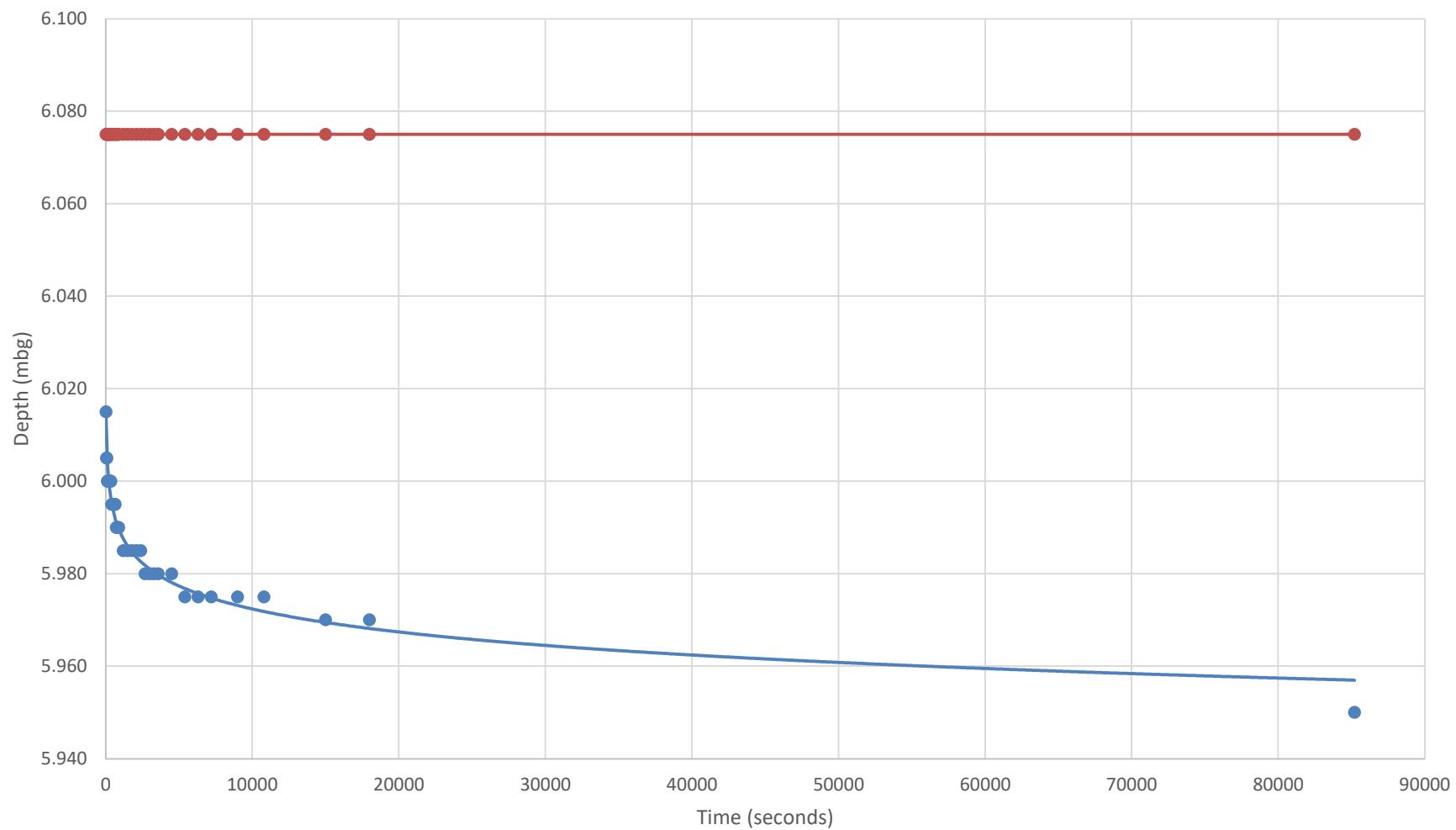




Chart: 3
Title: NAPL Thickness vs. Time, Monitoring Well M22-23 (January 16, 2023)
Project #: 22-162-PMC
Client: Plains Midstream Canada ULC
Project: Updated Environmental Site Assessment and Remedial Action Plan
Site: LSD (SE) 07-24-033-05-W5M
Location: Mountain View County, Alberta

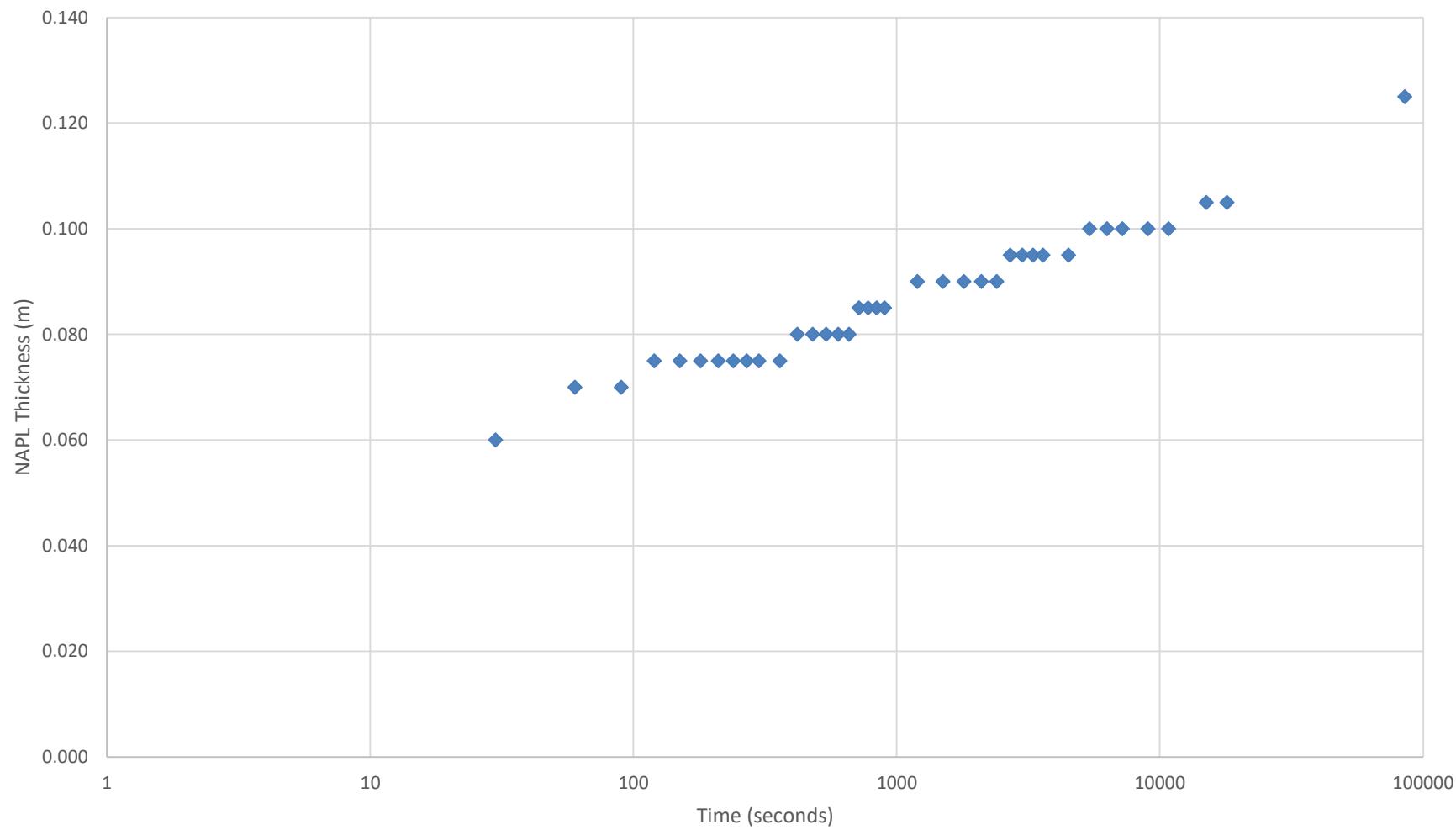
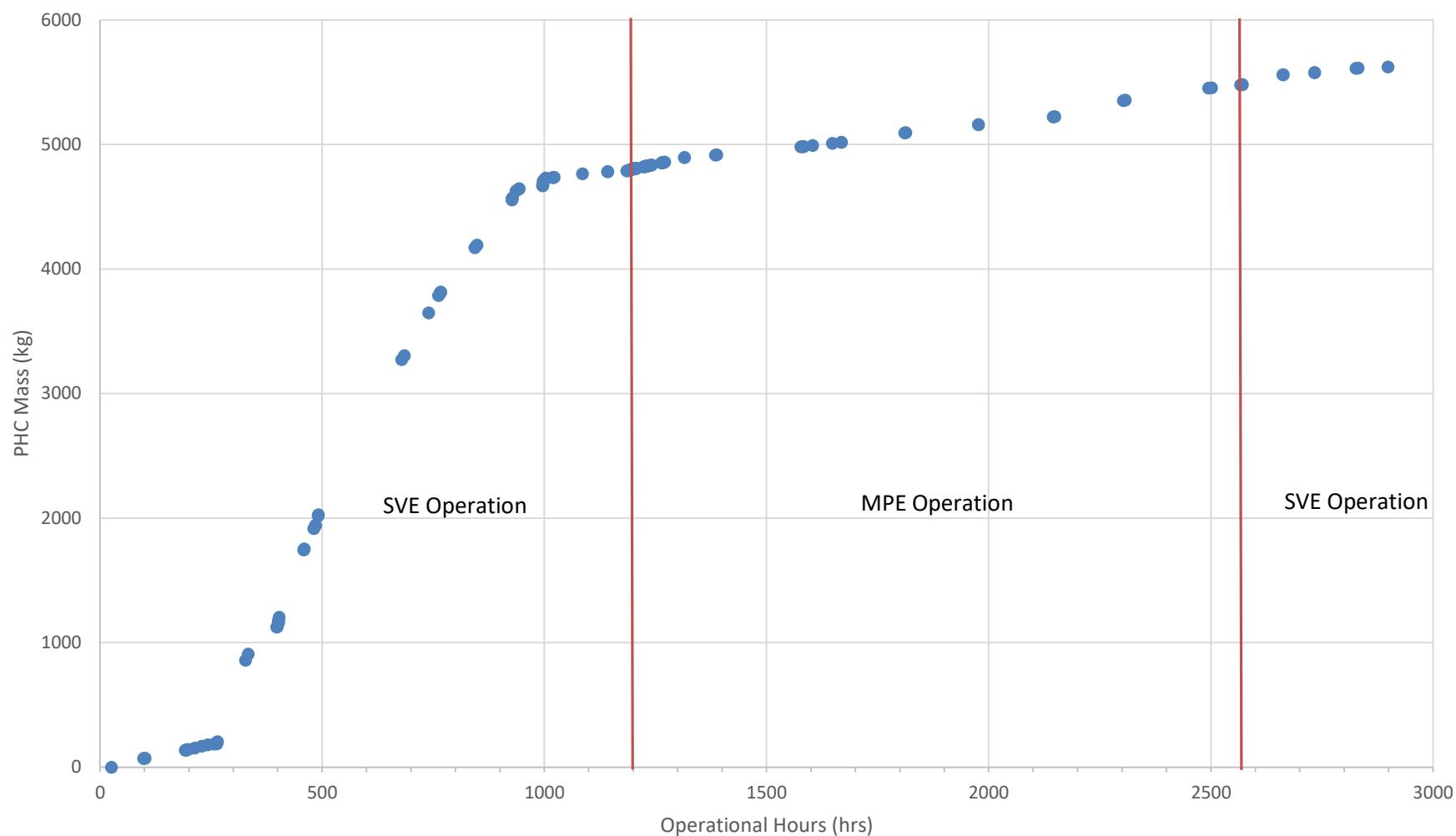


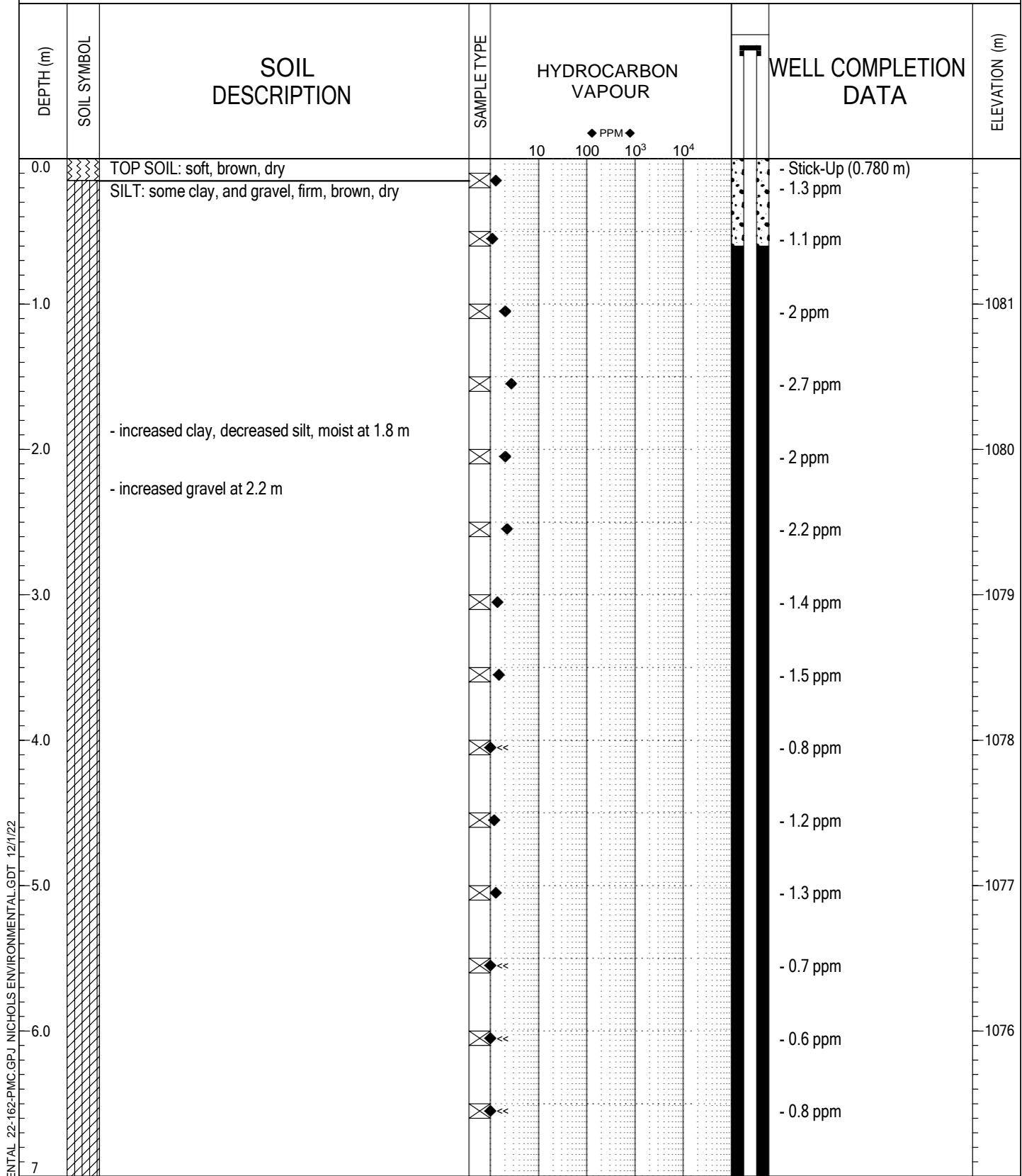


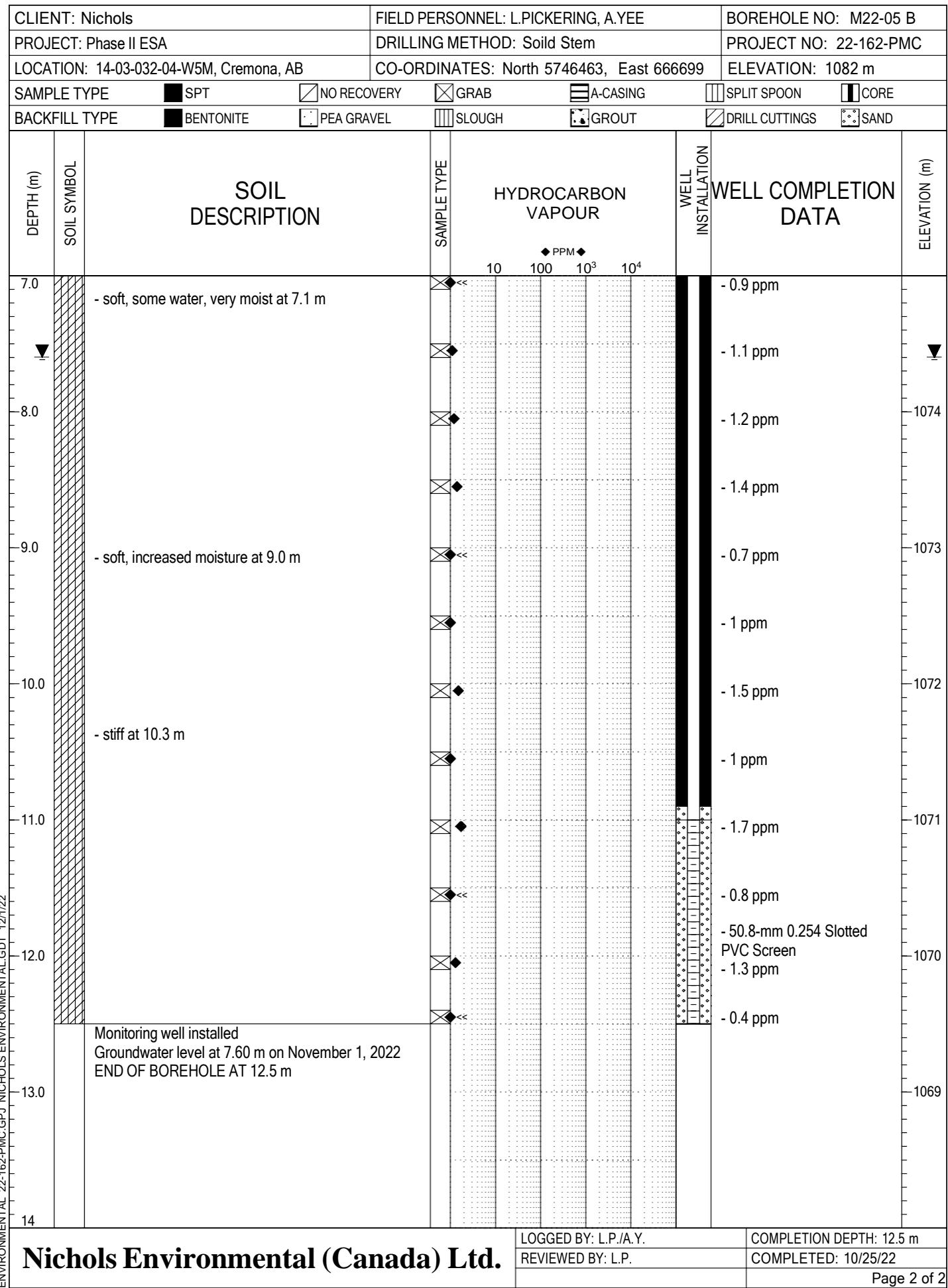
Chart: 4
Title: Cumulative Mass Extraction Over Time
Project #: 22-162-PMC
Client: Plains Midstream Canada ULC
Project: Updated Environmental Site Assessment and Remedial Action Plan
Site: LSD (SE)07-24-033-05-W5M
Location: Mountain View County, Alberta

● Cumulative Mass Extracted



CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-05 B
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746463, East 666699	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		





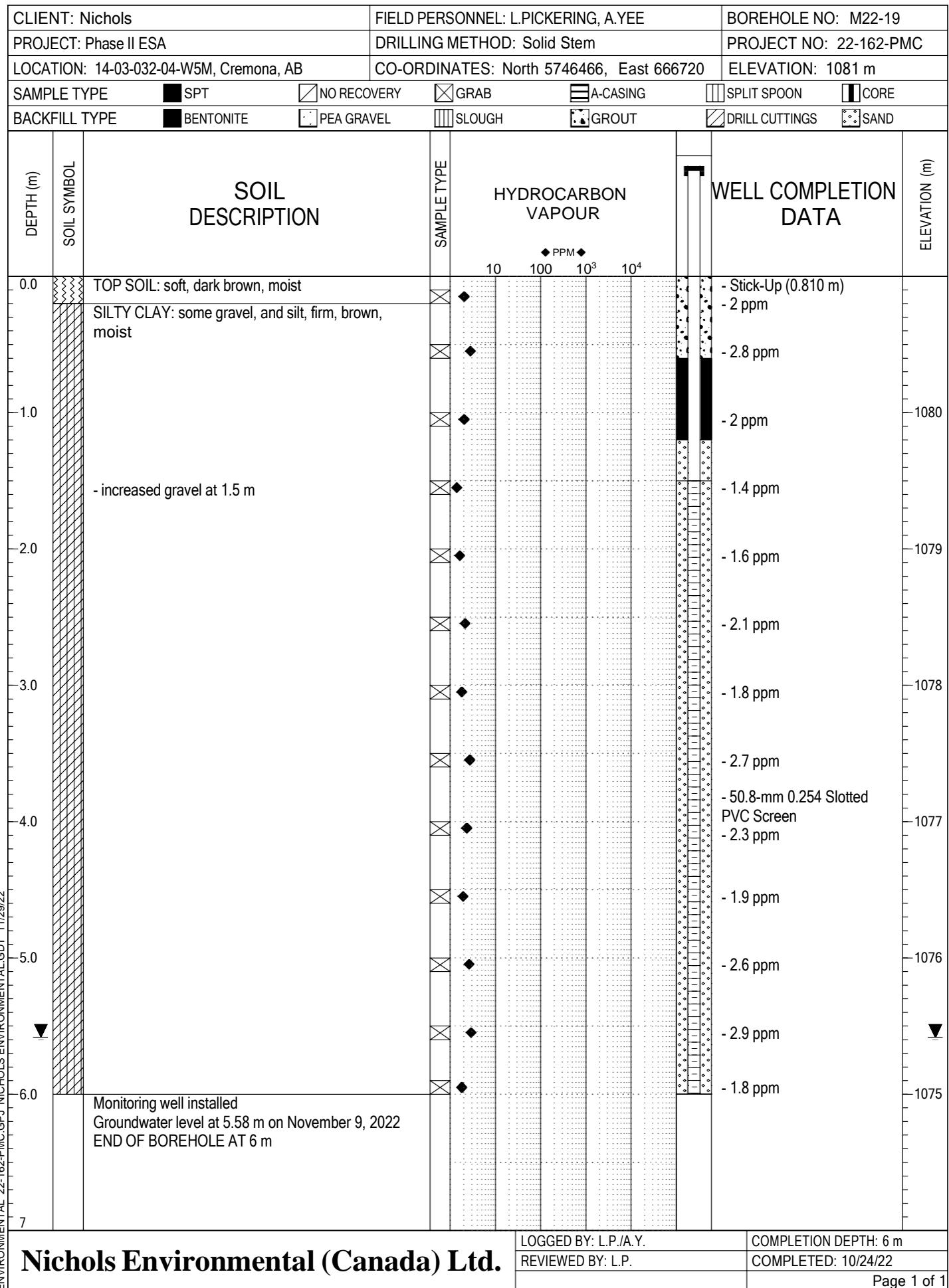
Nichols Environmental (Canada) Ltd.

LOGGED BY: L.P./A.Y.

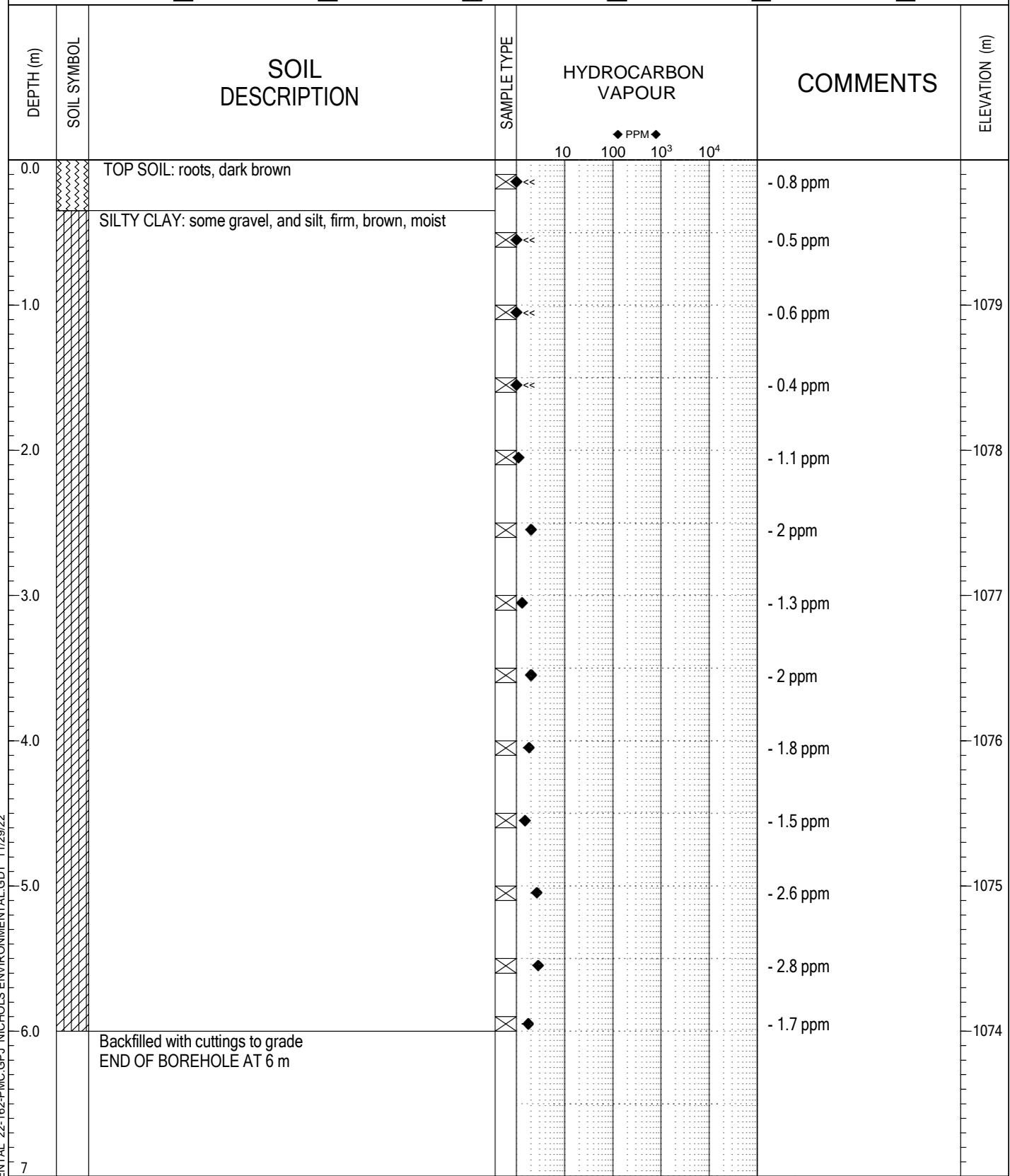
COMPLETION DEPTH: 12.5 m

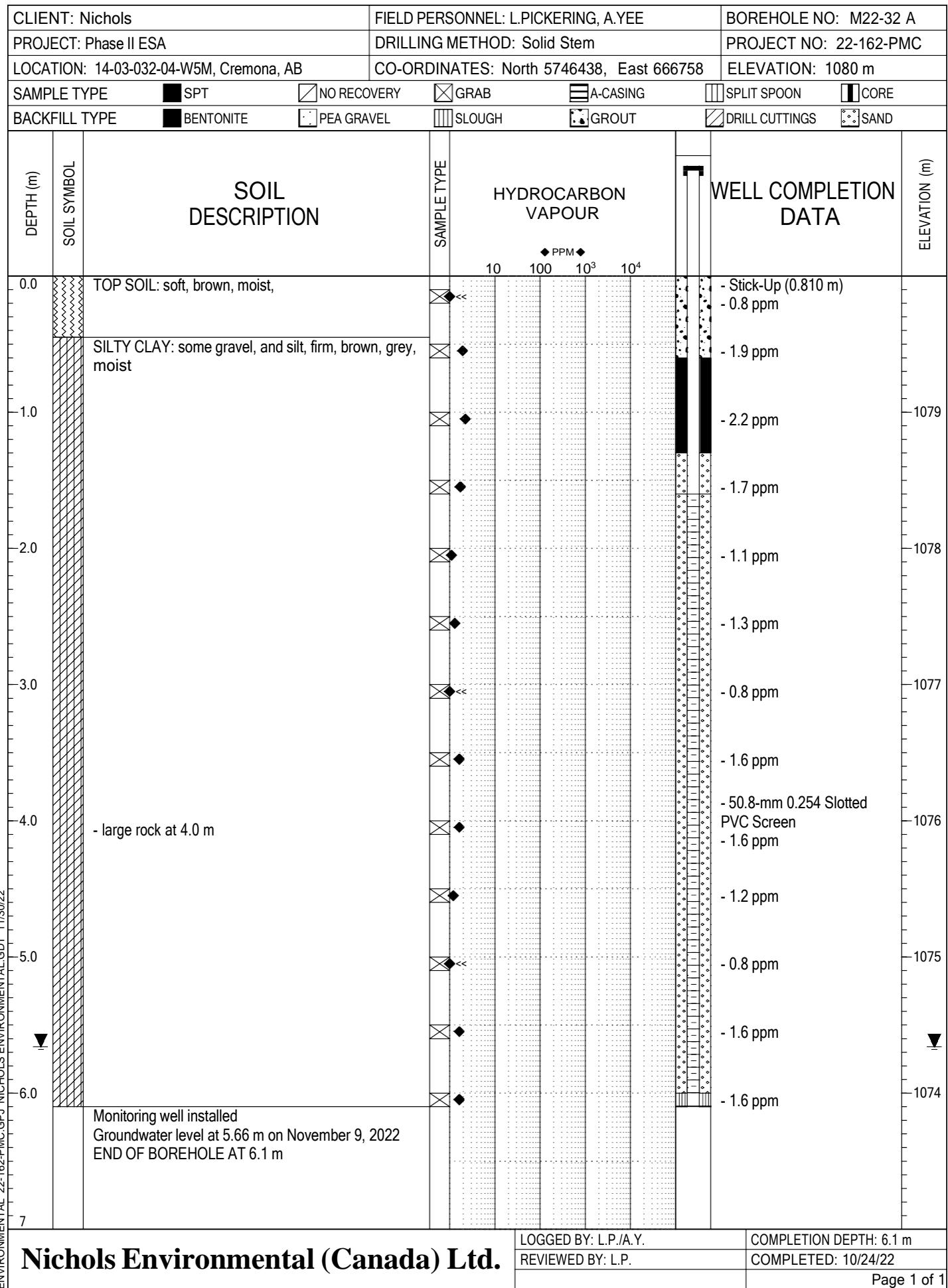
REVIEWED BY: L.P.

COMPLETED: 10/25/22

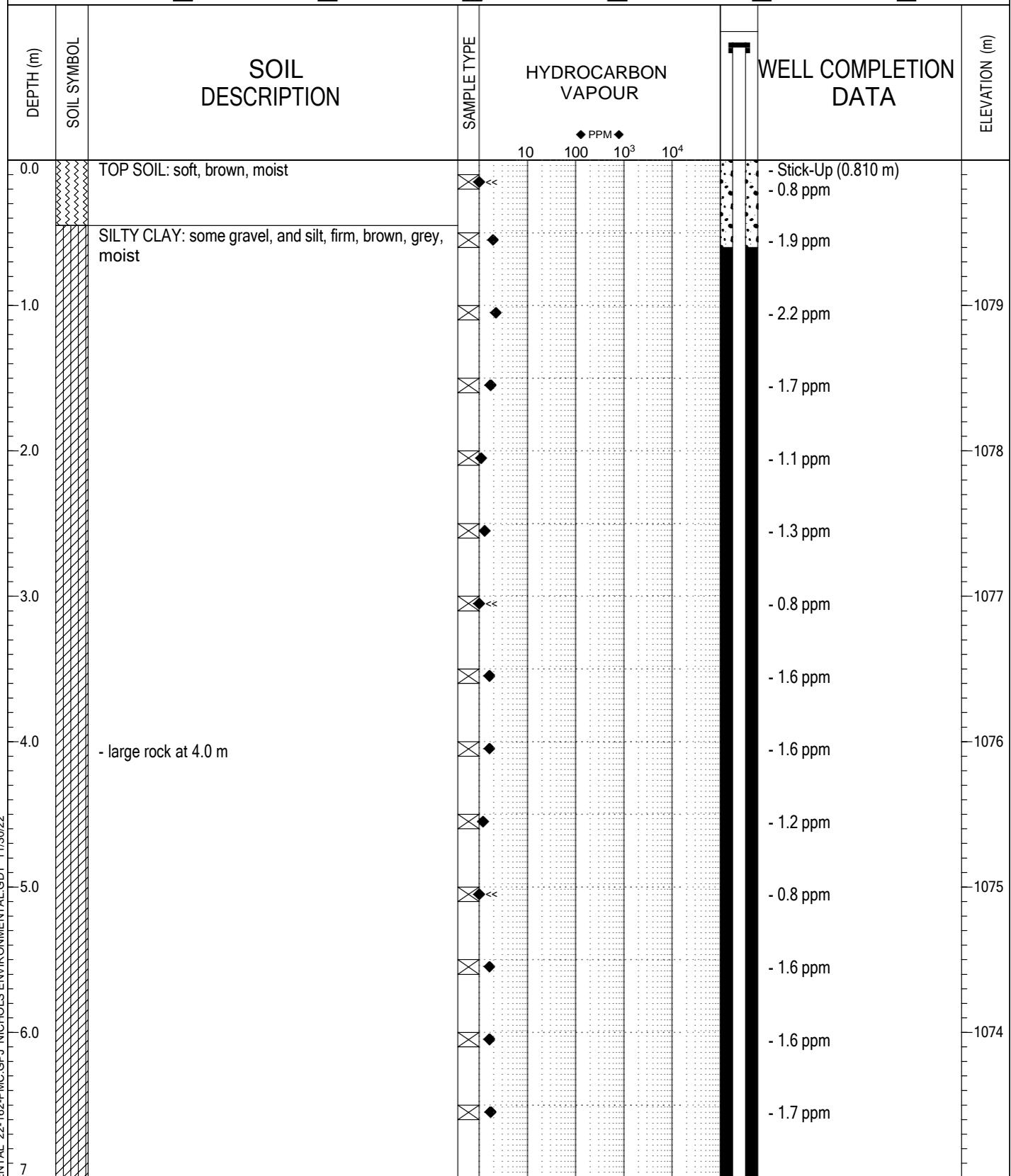


CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-31
PROJECT: Phase II ESA	DRILLING METHOD: Solid Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746466, East 666741	ELEVATION: 1080 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		

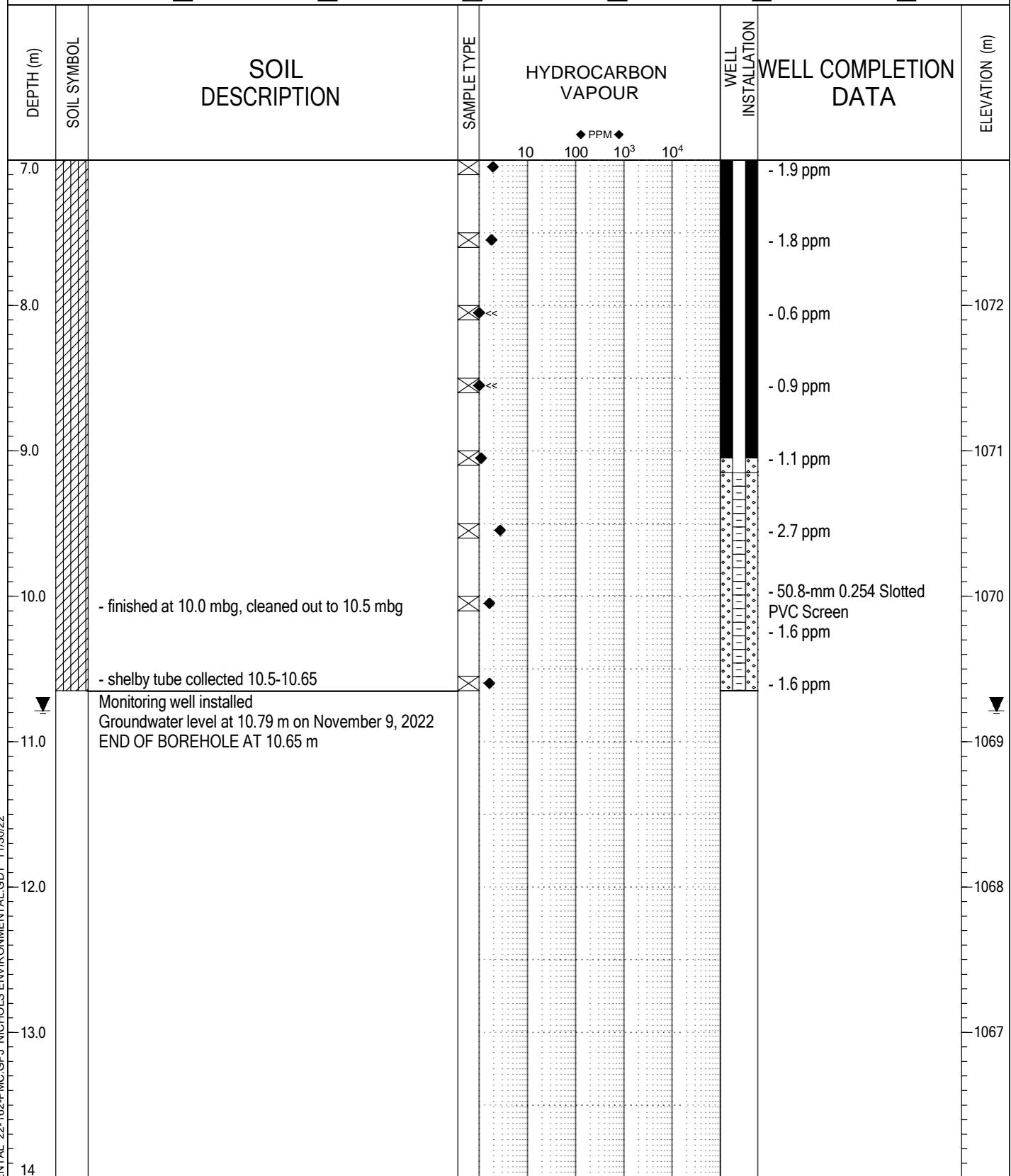




CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-32B
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746439, East 666759	ELEVATION: 1080 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-32B
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746439, East 666759	ELEVATION: 1080 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



ENVIRONMENTAL 22-162-PMC.GPJ NICHOLS ENVIRONMENTAL.GDT 11/30/22

Nichols Environmental (Canada) Ltd.

LOGGED BY: L.P./A.Y.

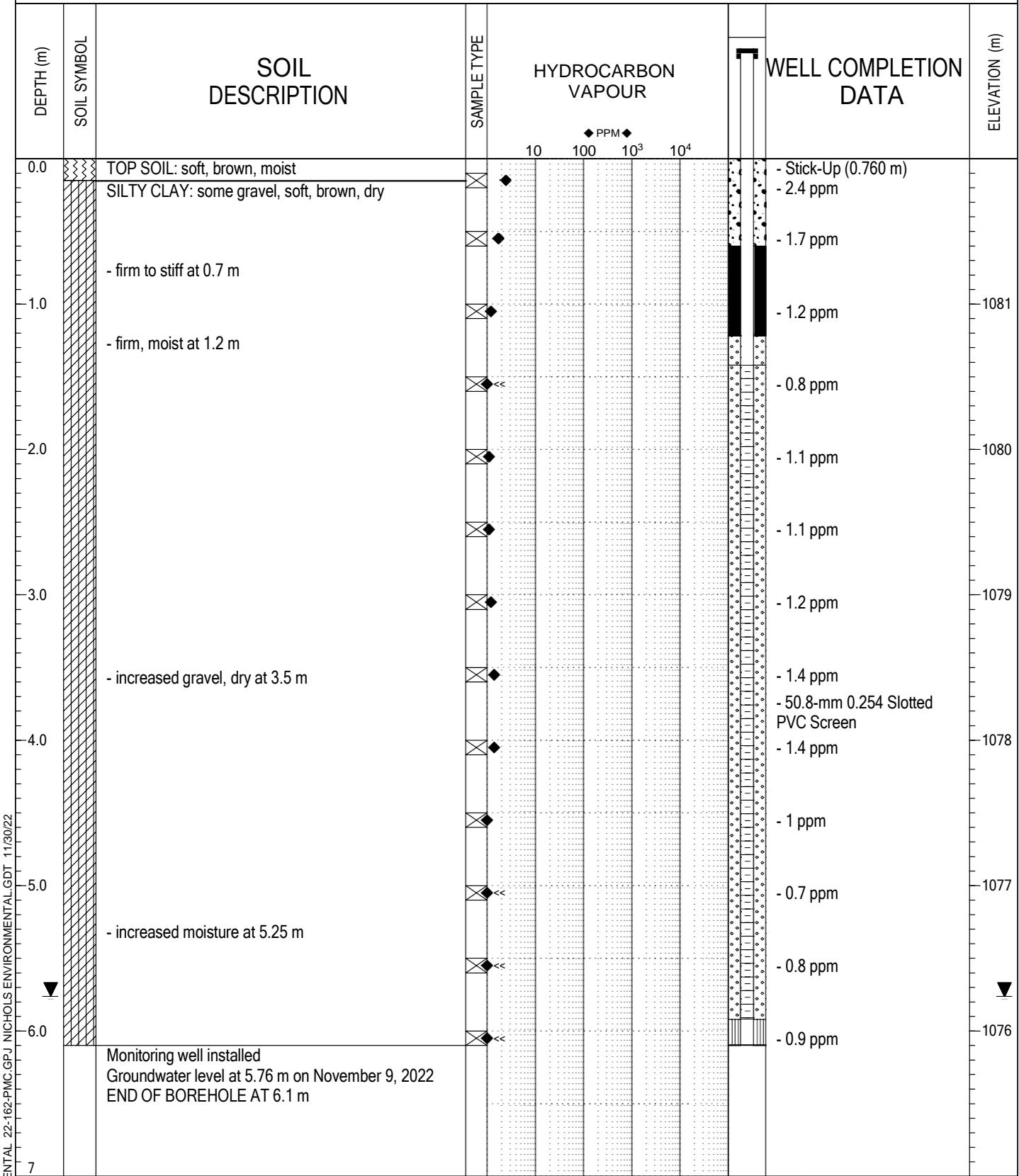
COMPLETION DEPTH: 10.65 m

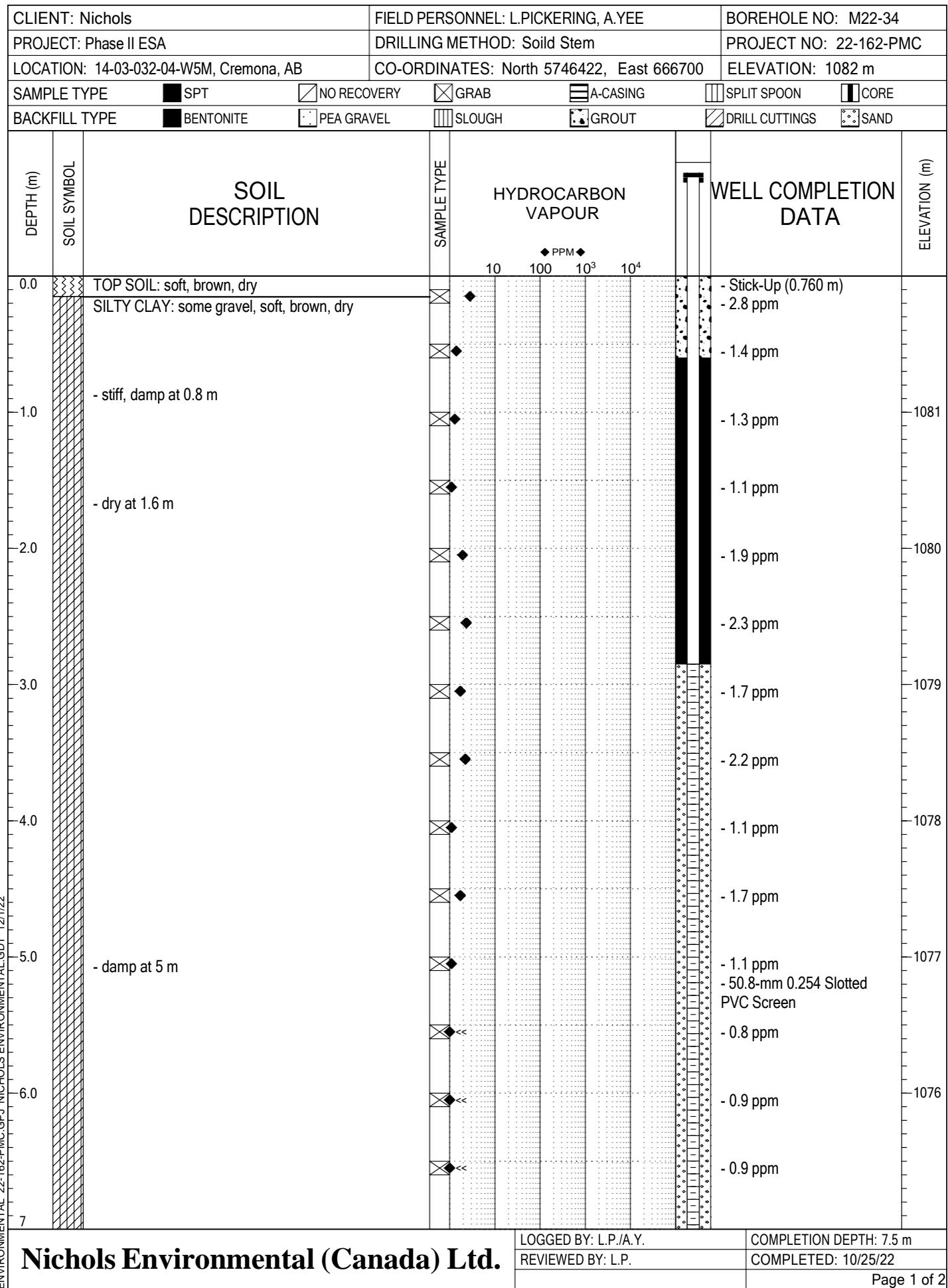
REVIEWED BY: L.P.

COMPLETED: 10/24/22

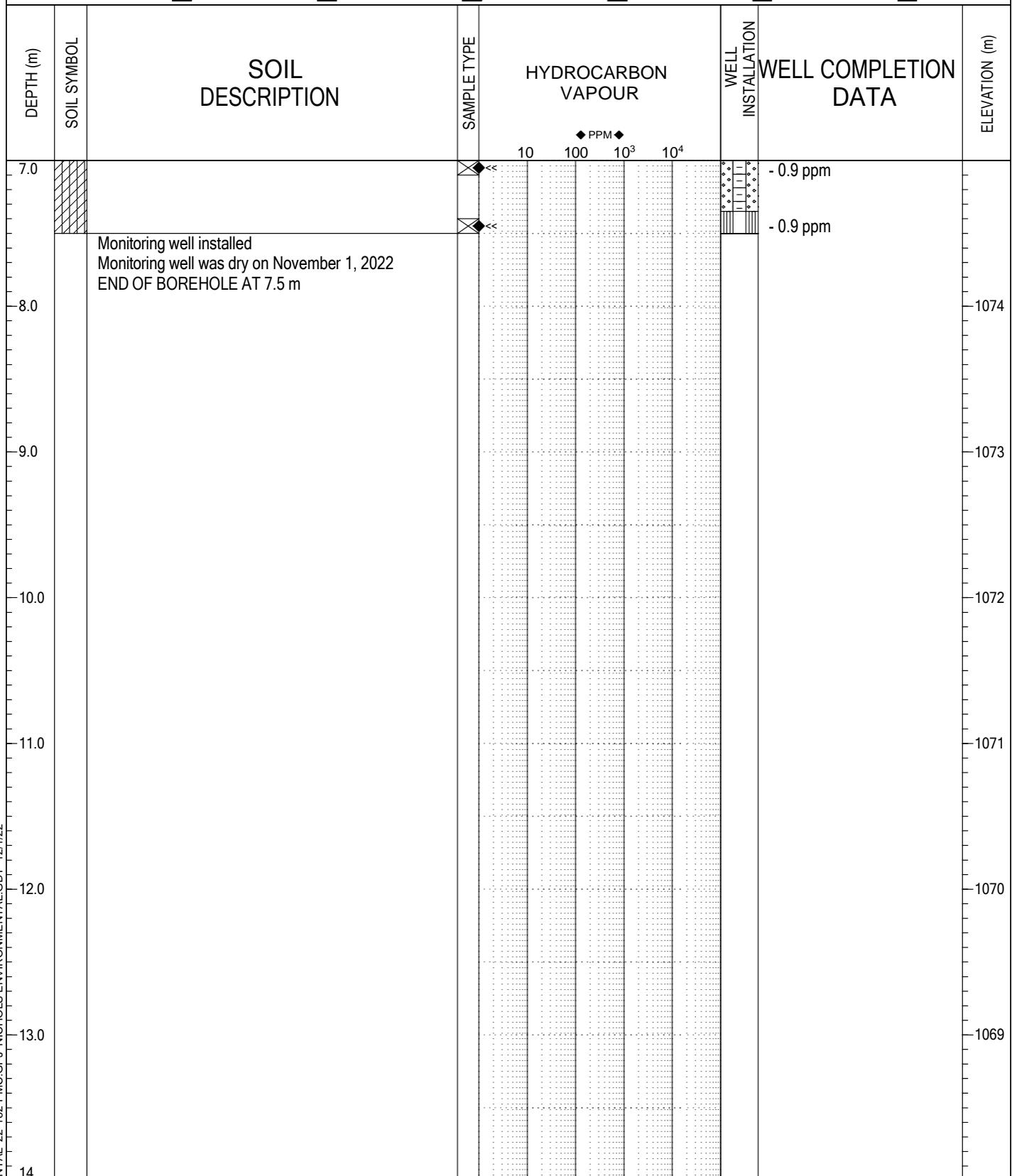
Page 2 of 2

CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-33
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746428, East 666707	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		





CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-34
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746422, East 666700	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



ENVIRONMENTAL 22-162-PMC.GPJ NICHOLS ENVIRONMENTAL.GDT 12/1/22

Nichols Environmental (Canada) Ltd.

LOGGED BY: L.P./A.Y.

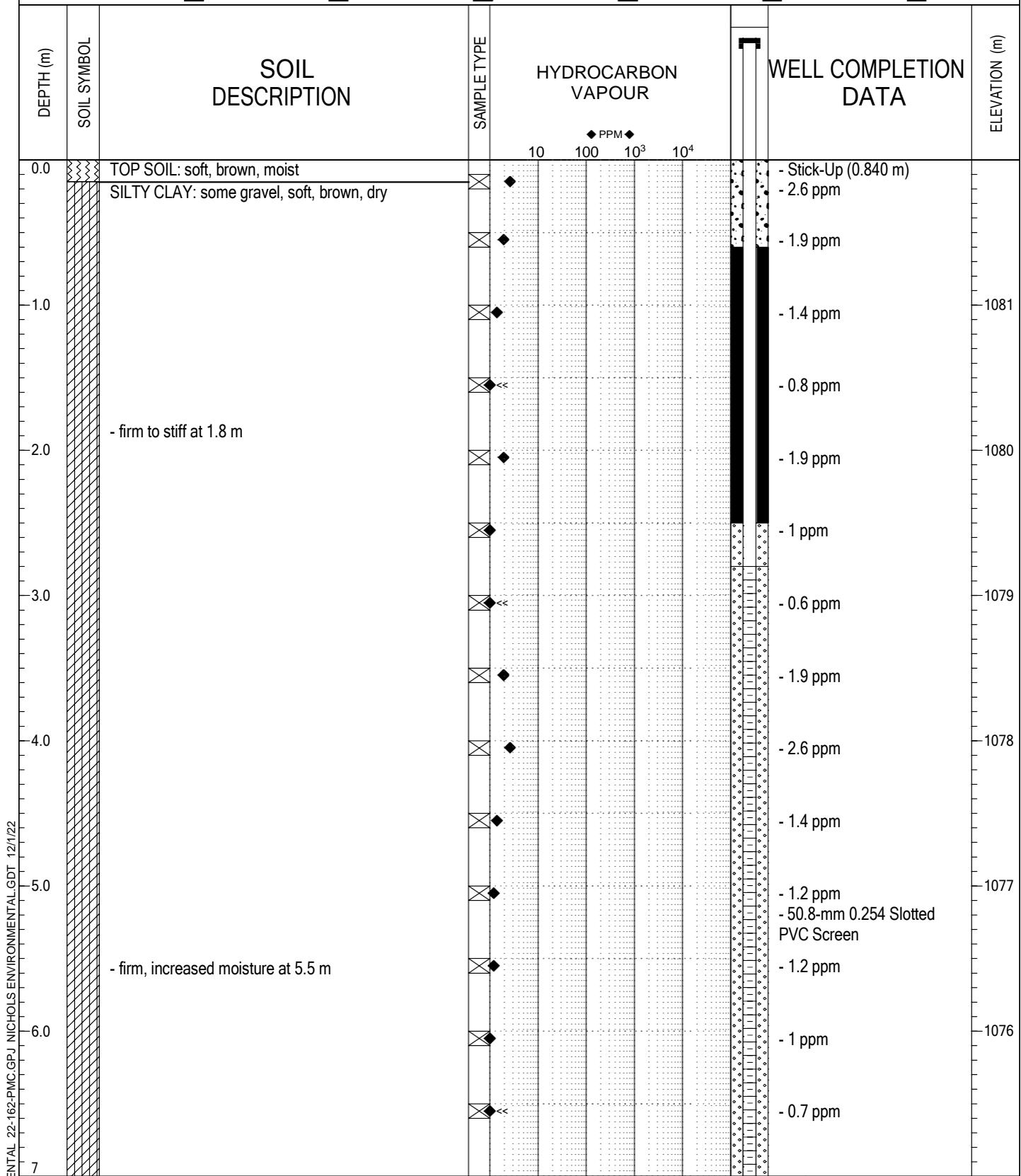
COMPLETION DEPTH: 7.5 m

REVIEWED BY: L.P.

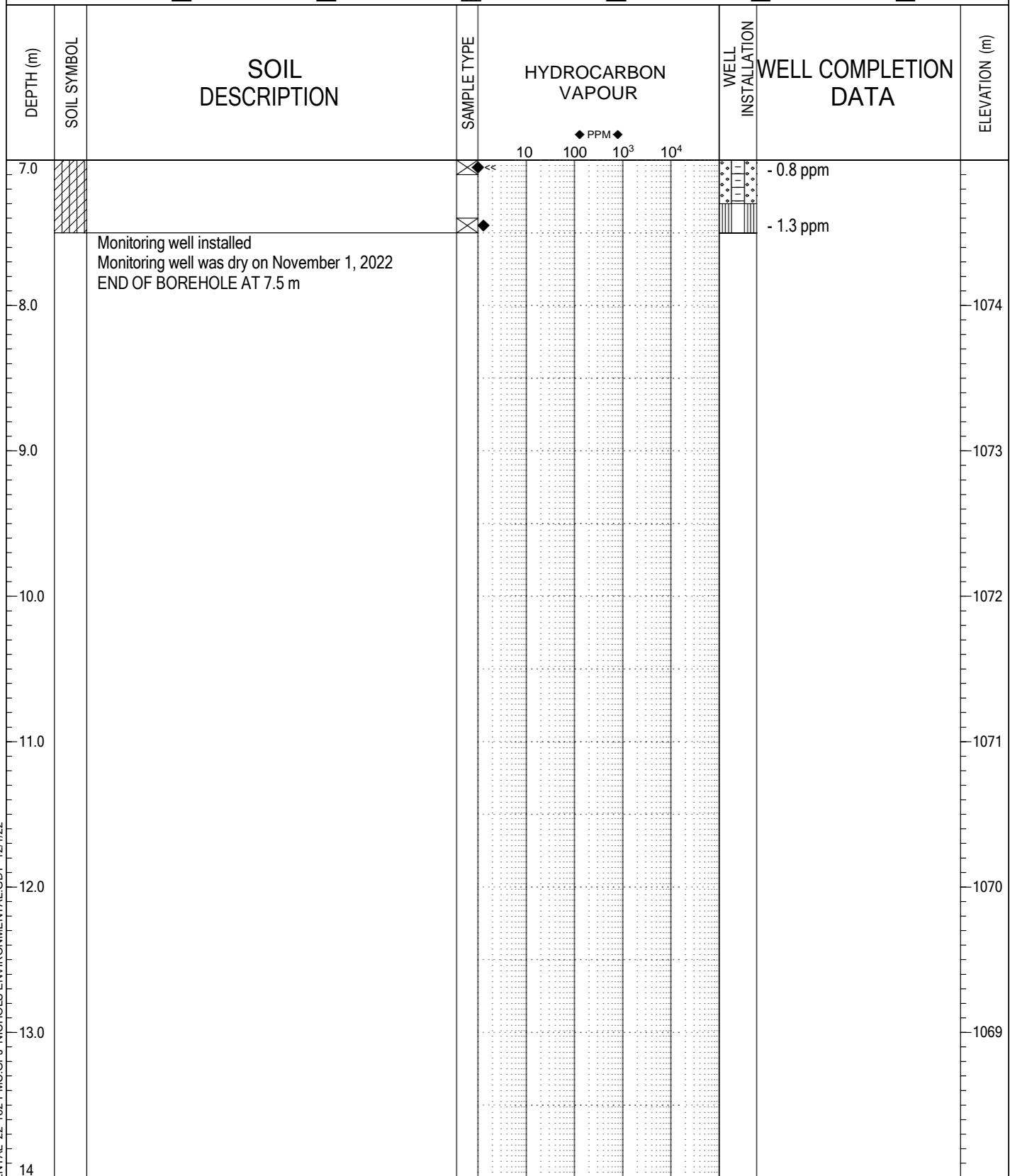
COMPLETED: 10/25/22

Page 2 of 2

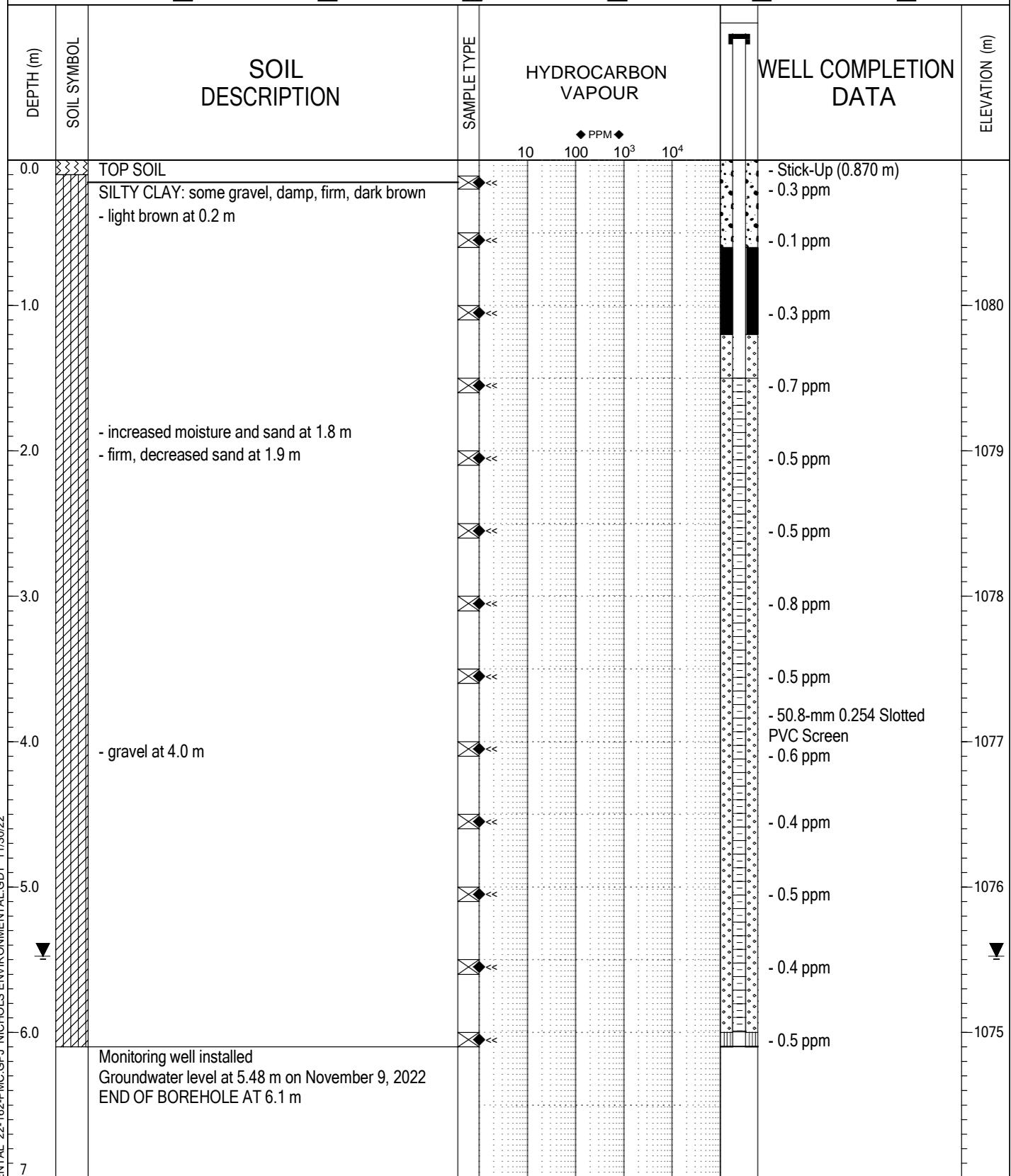
CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-35
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746401, East 666712	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		

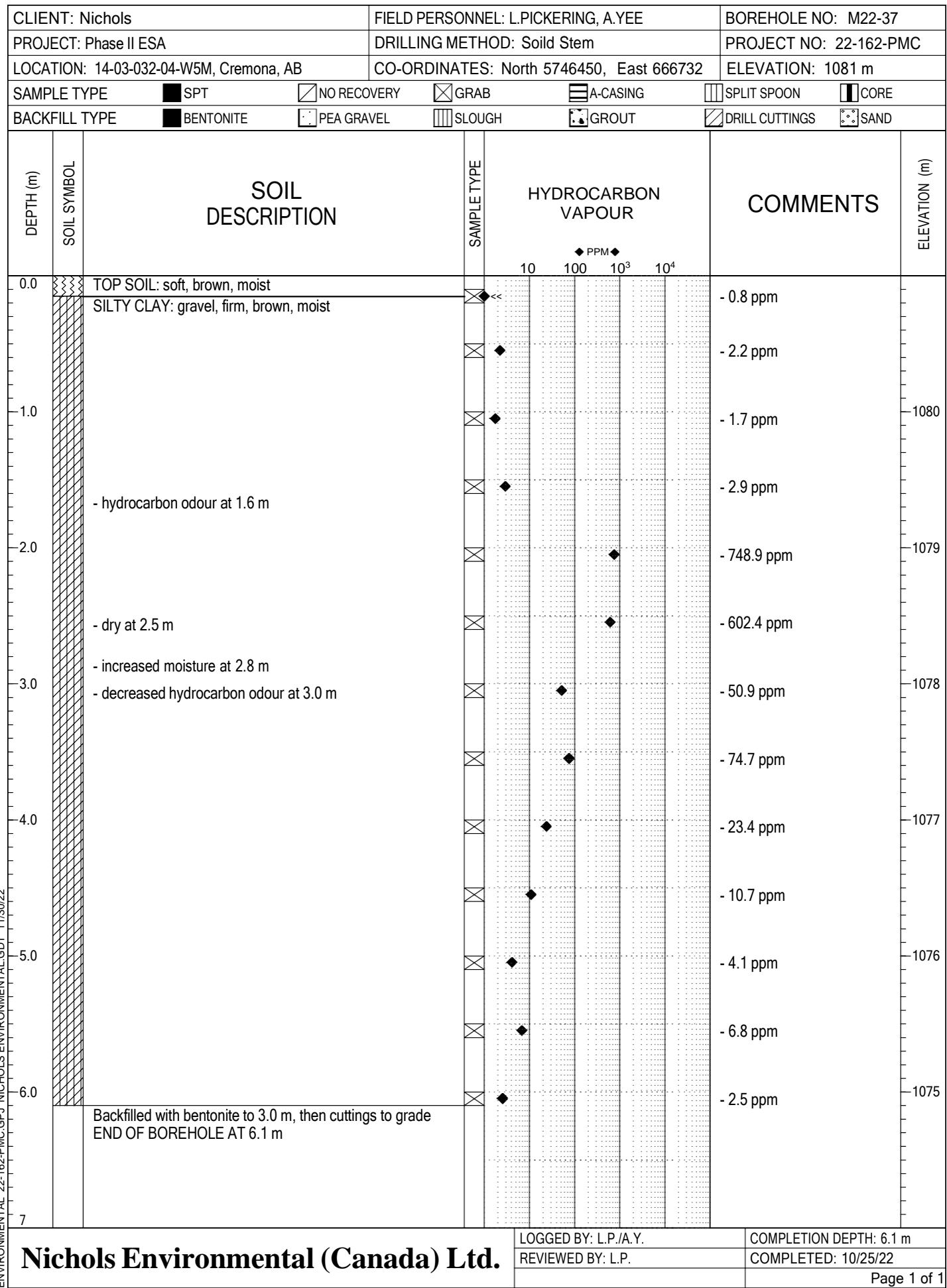


CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-35
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746401, East 666712	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		

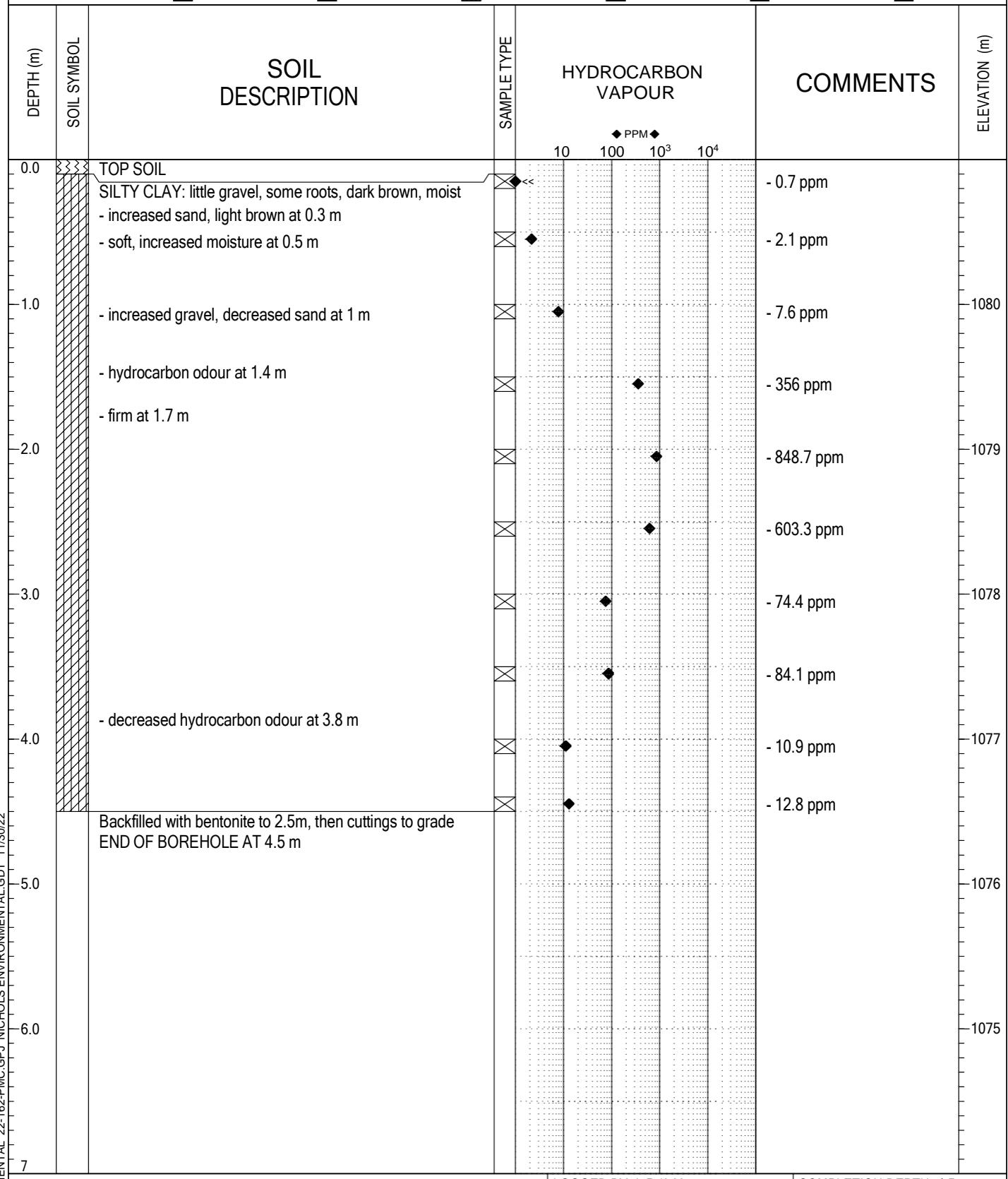


CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-36
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746348, East 666739	ELEVATION: 1081 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		

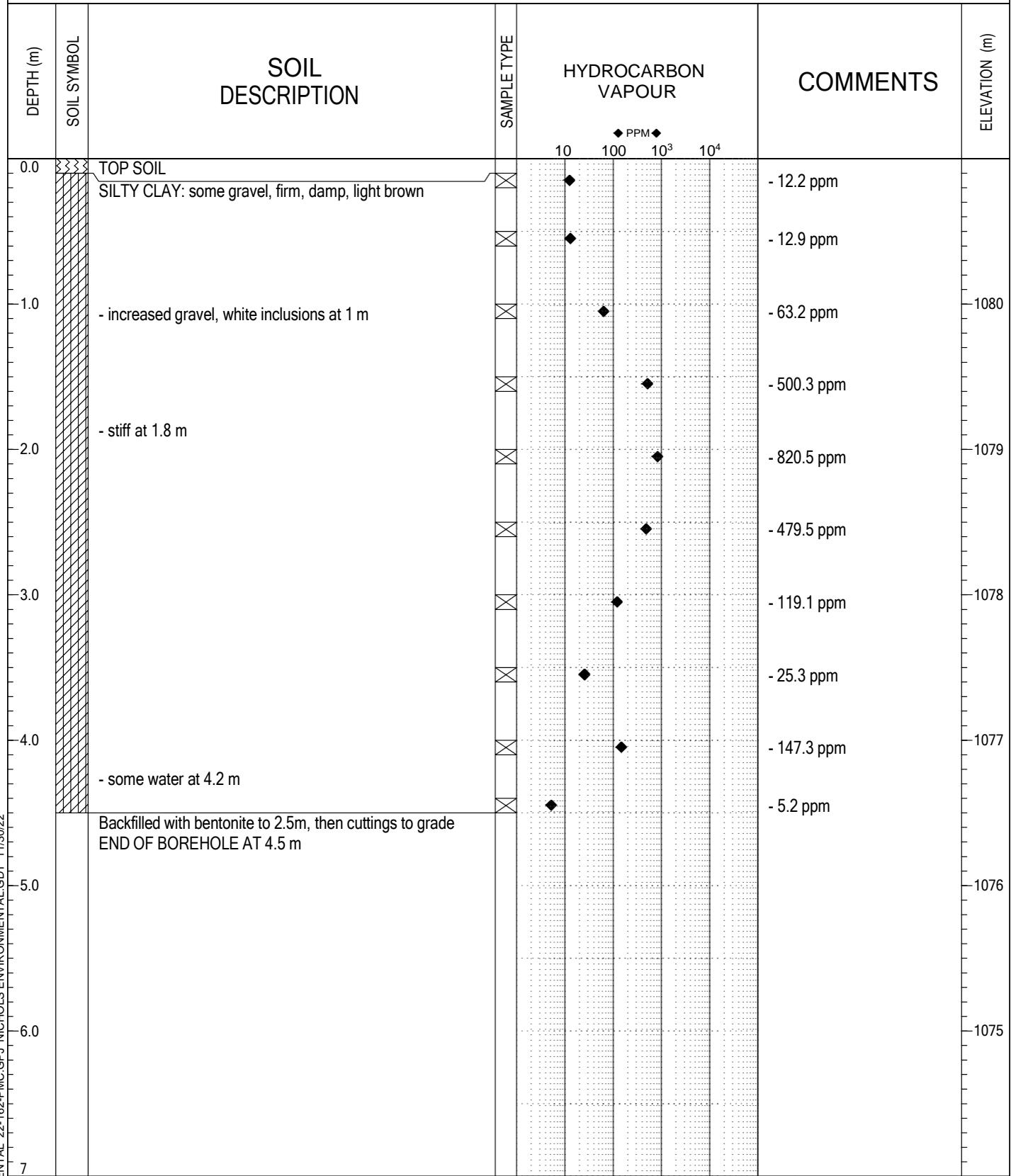




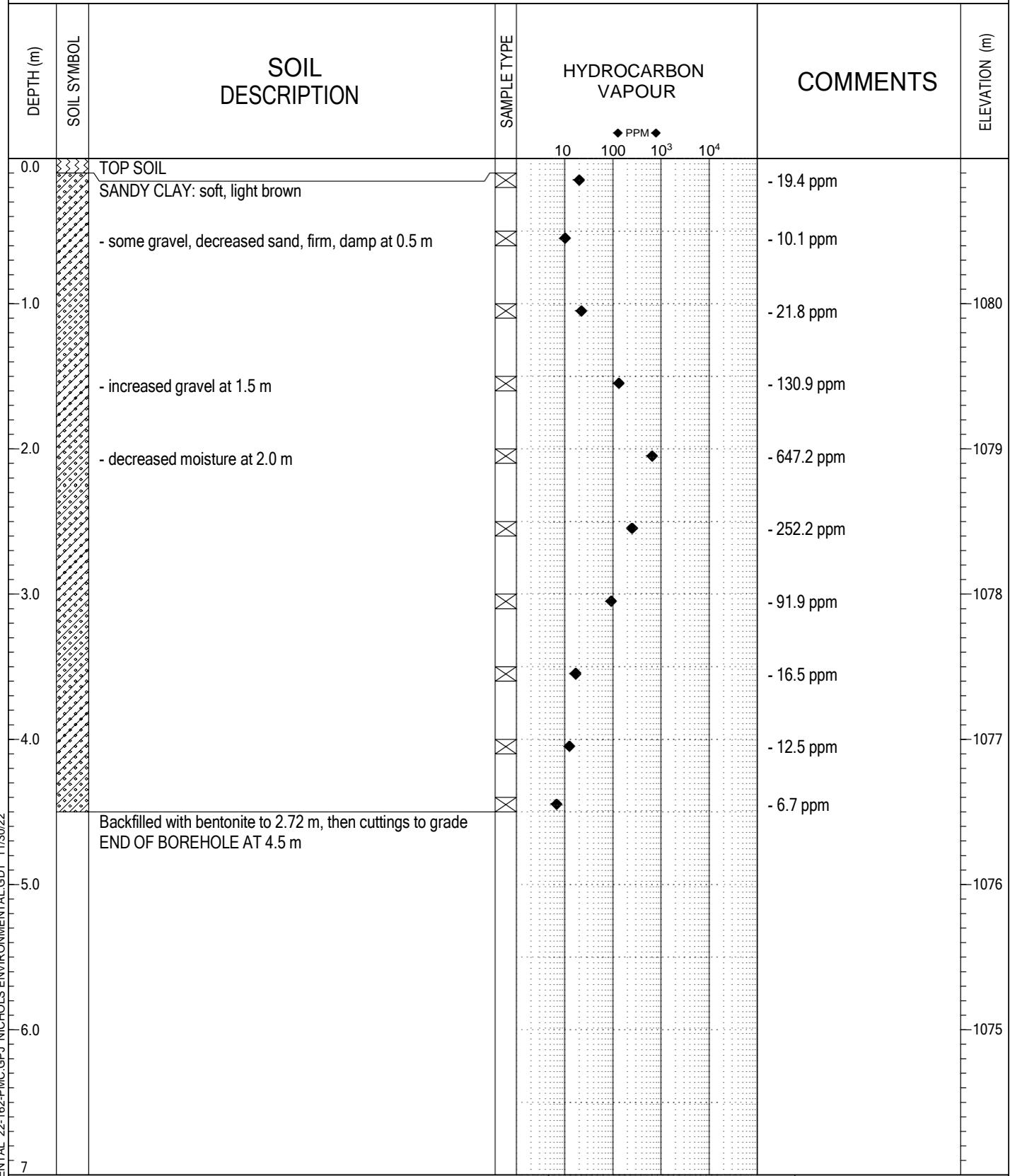
CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-38
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746408, East 666745	ELEVATION: 1081 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



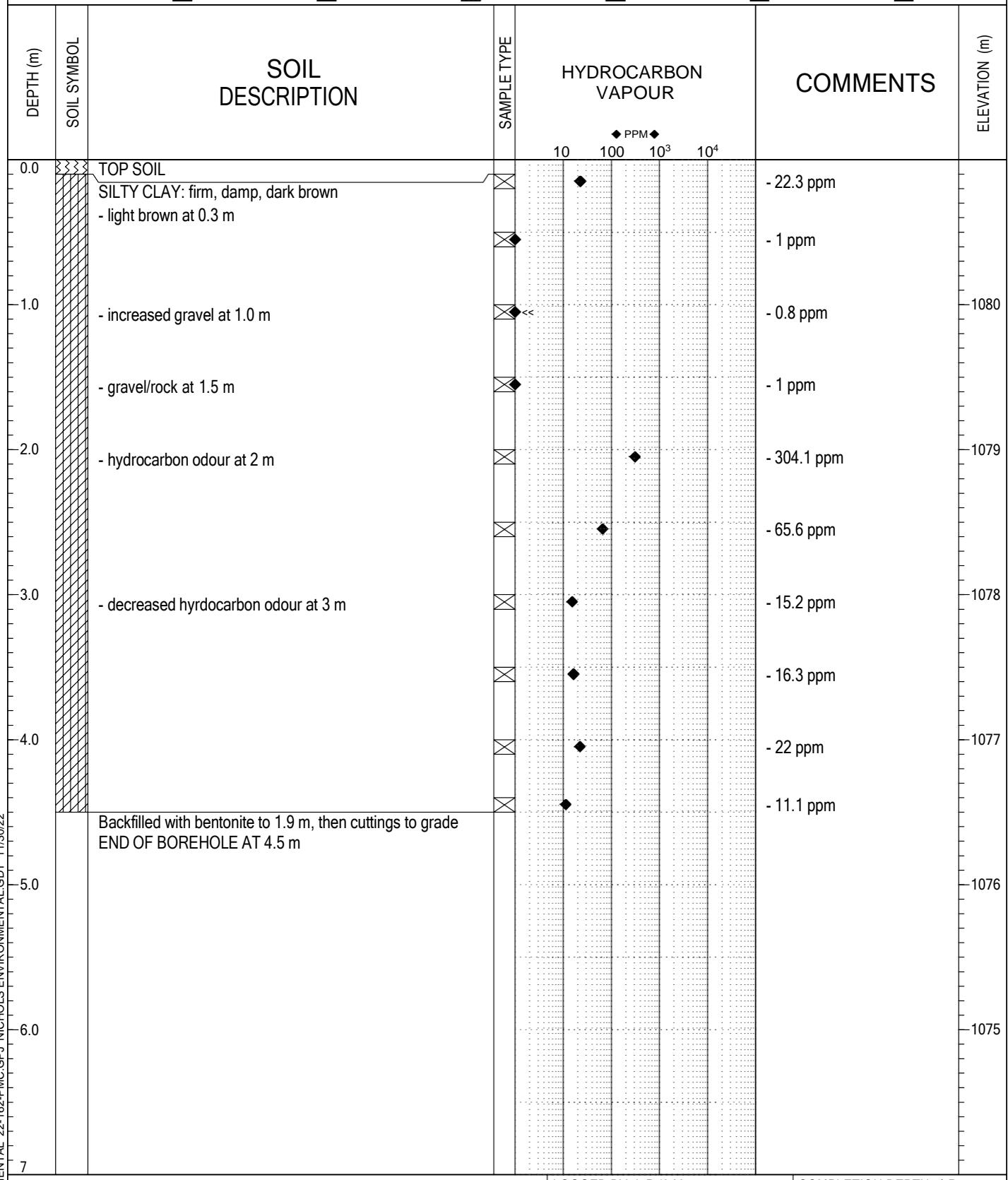
CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-39
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746426, East 666737	ELEVATION: 1081 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



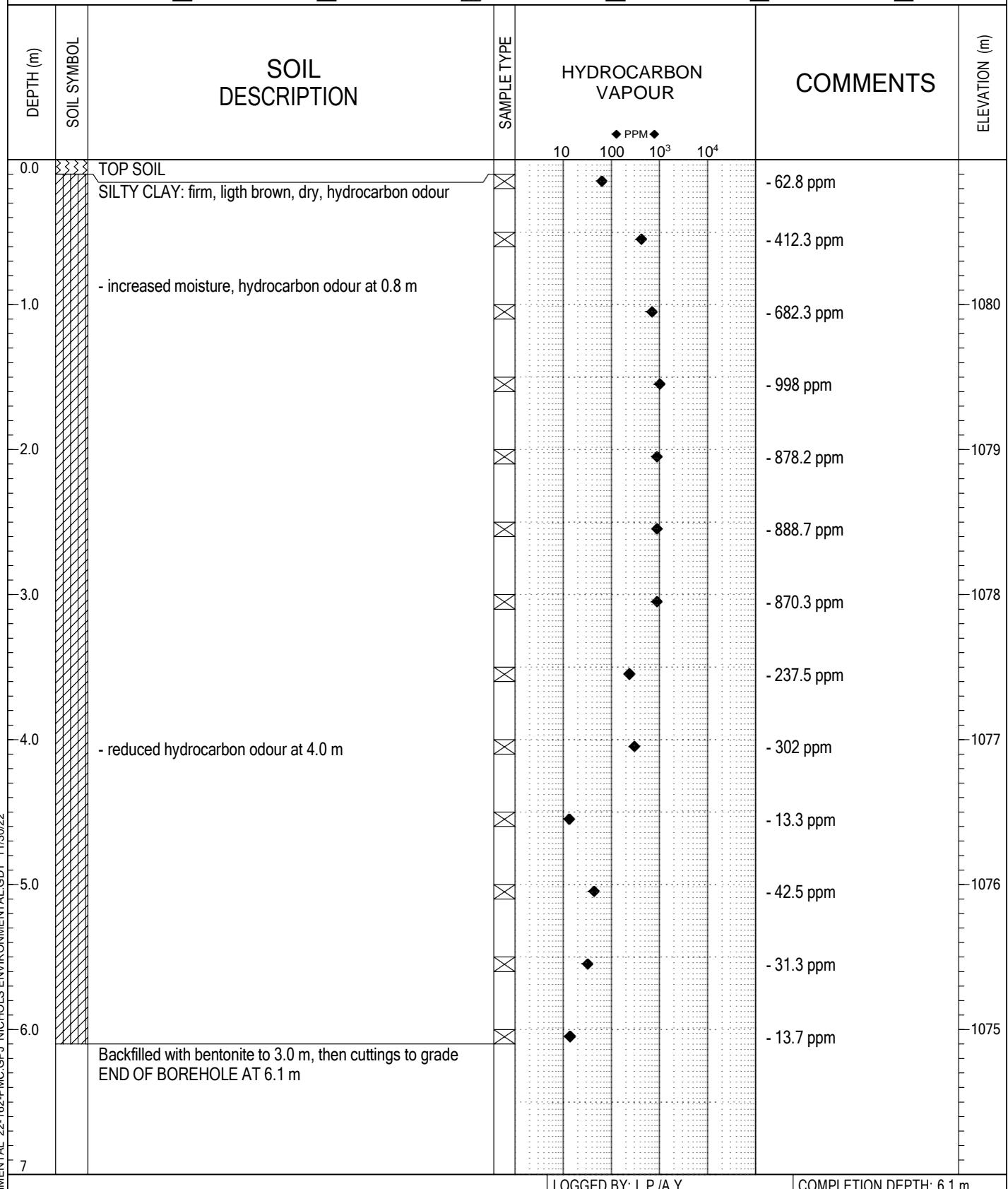
CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-40
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746443, East 666725	ELEVATION: 1081 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



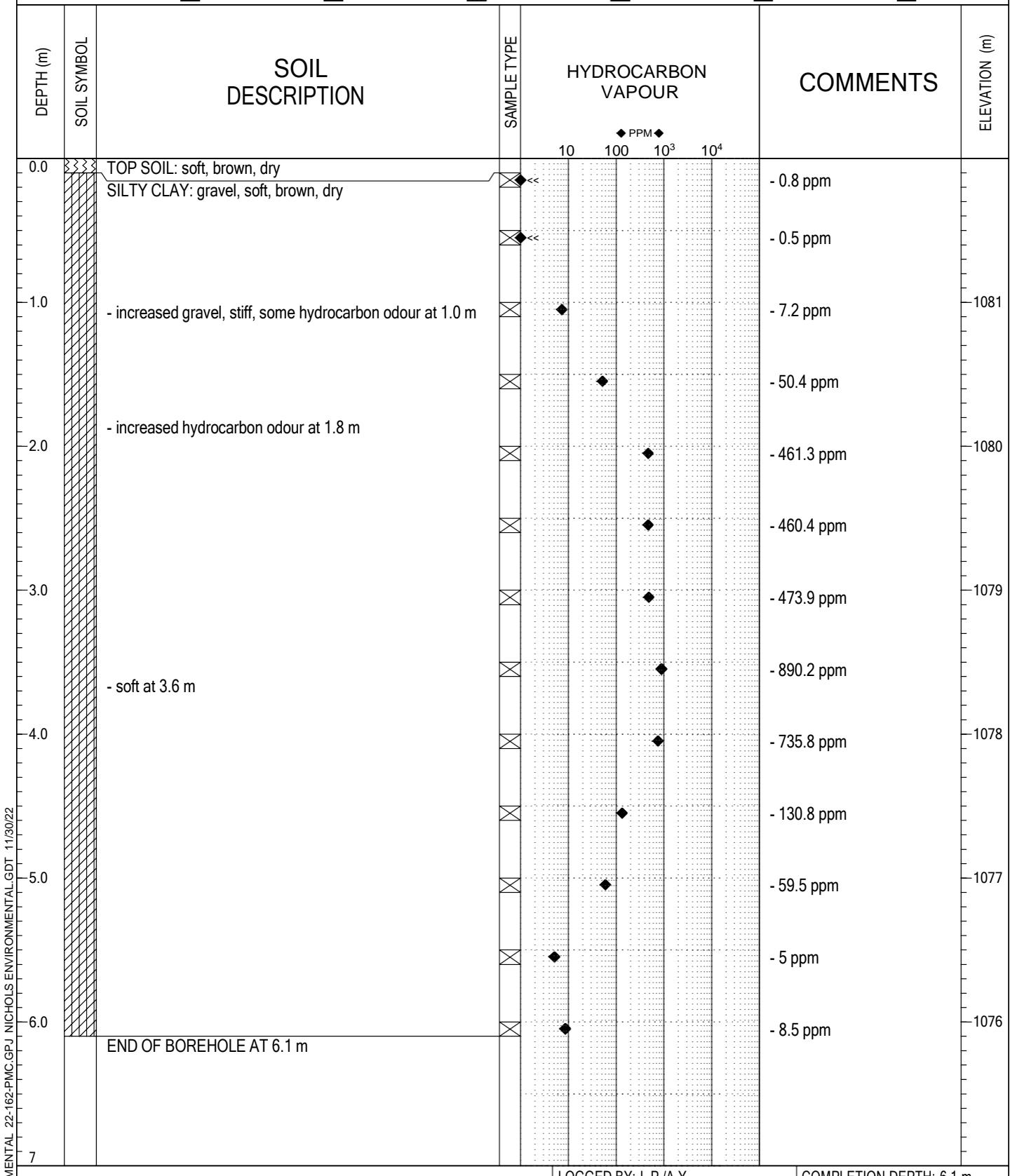
CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-41
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746403, East 666738	ELEVATION: 1081 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		

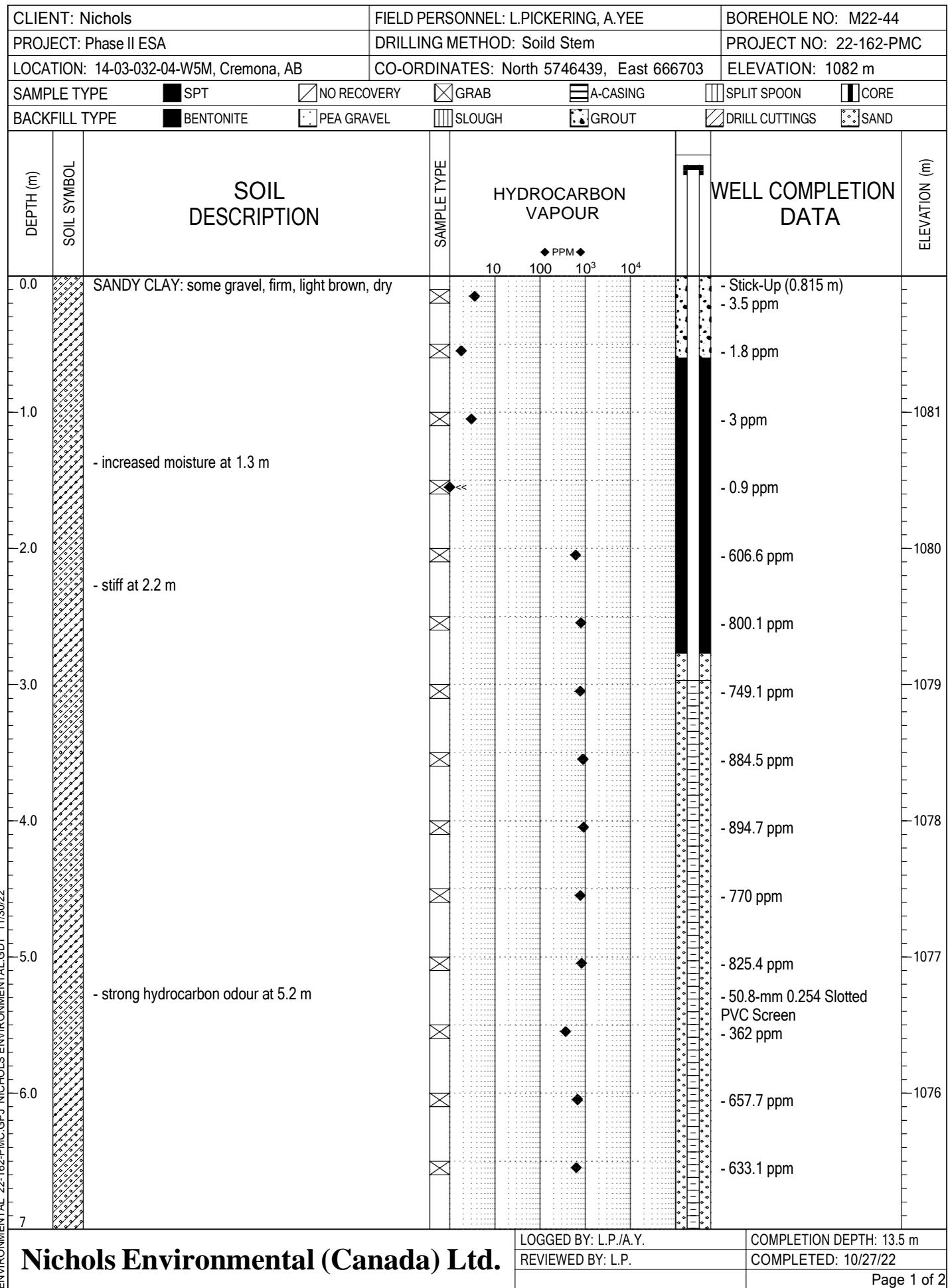


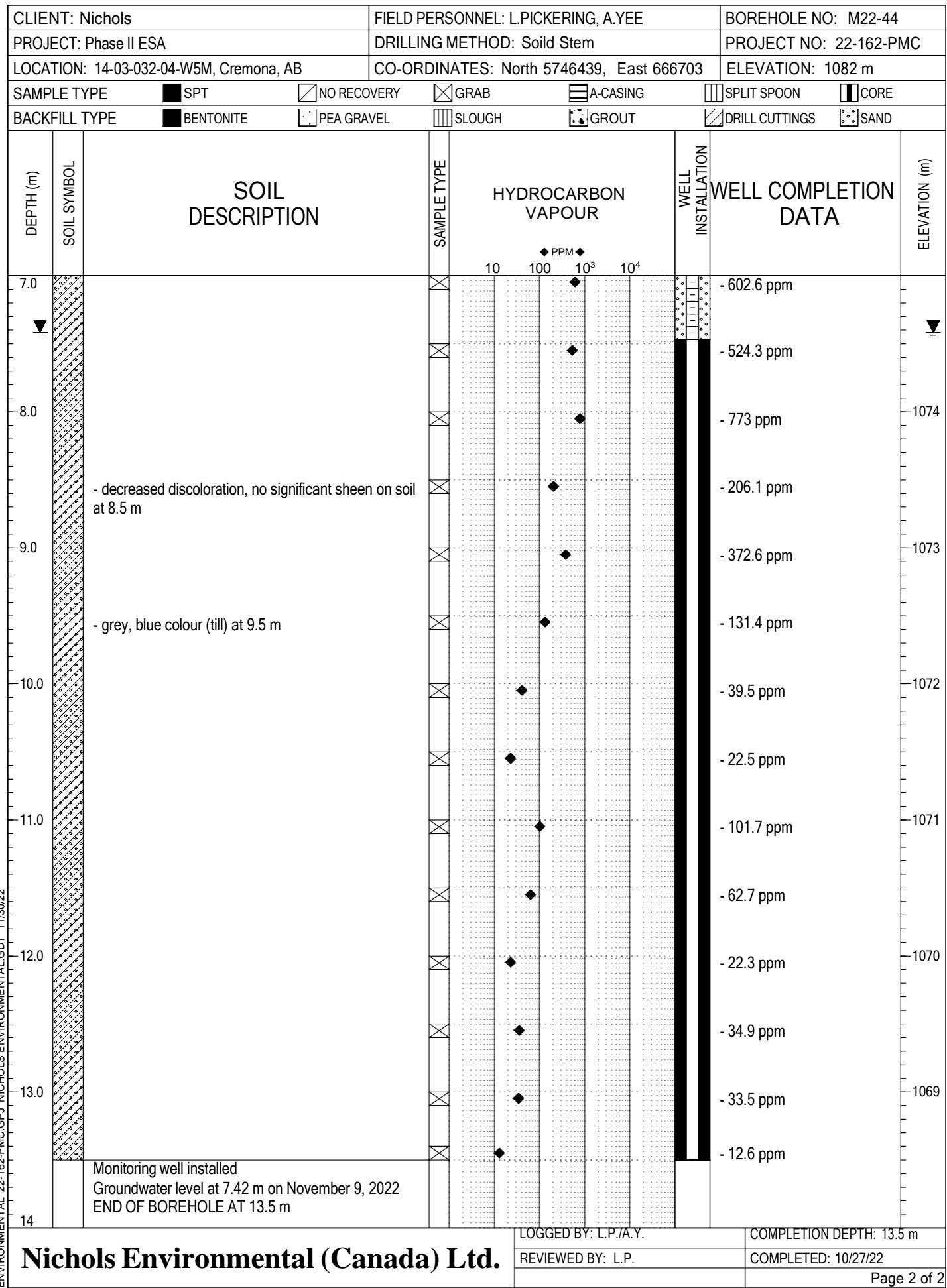
CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-42
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746428, East 666726	ELEVATION: 1081 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-43
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746432, East 666716	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		

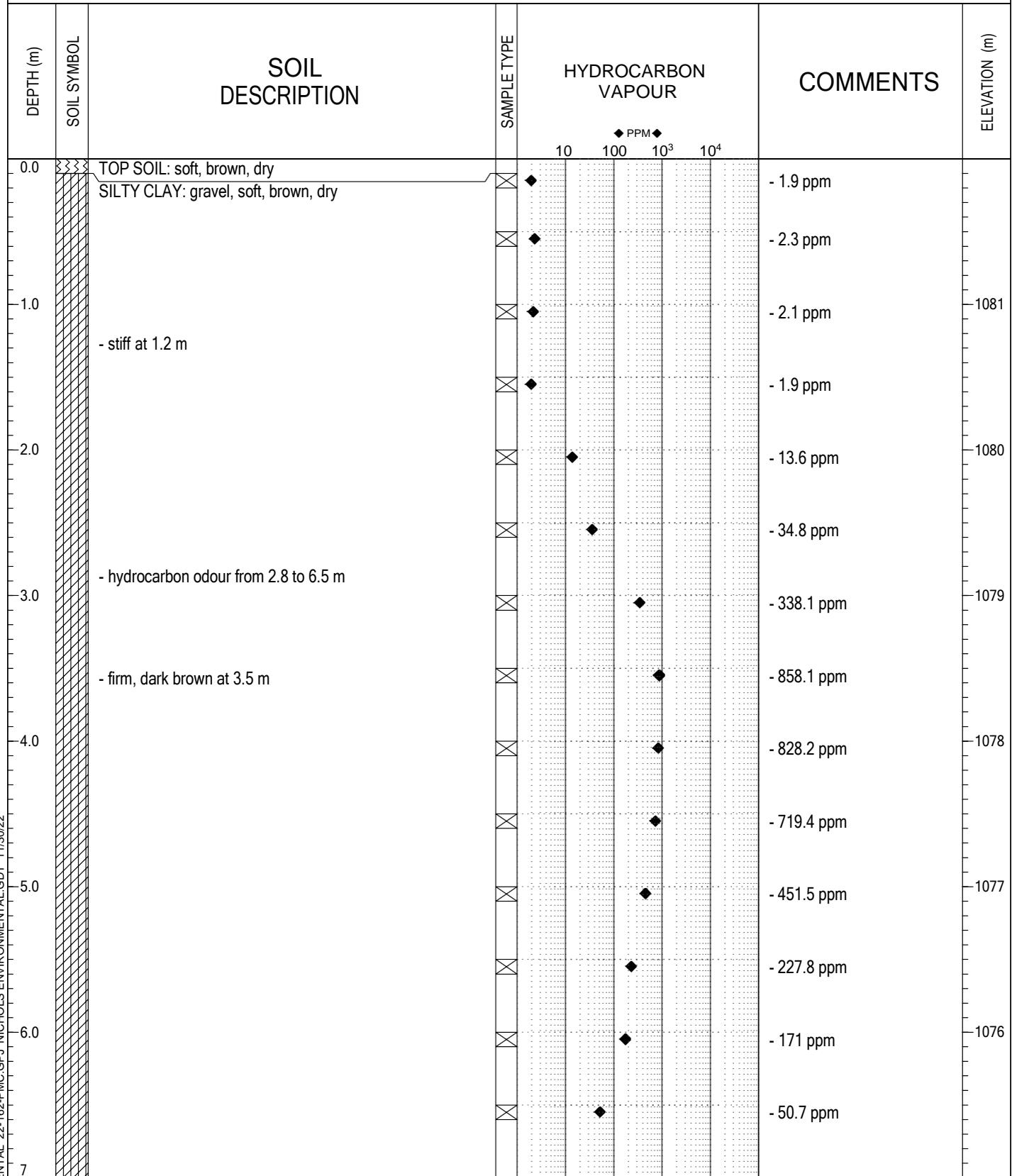




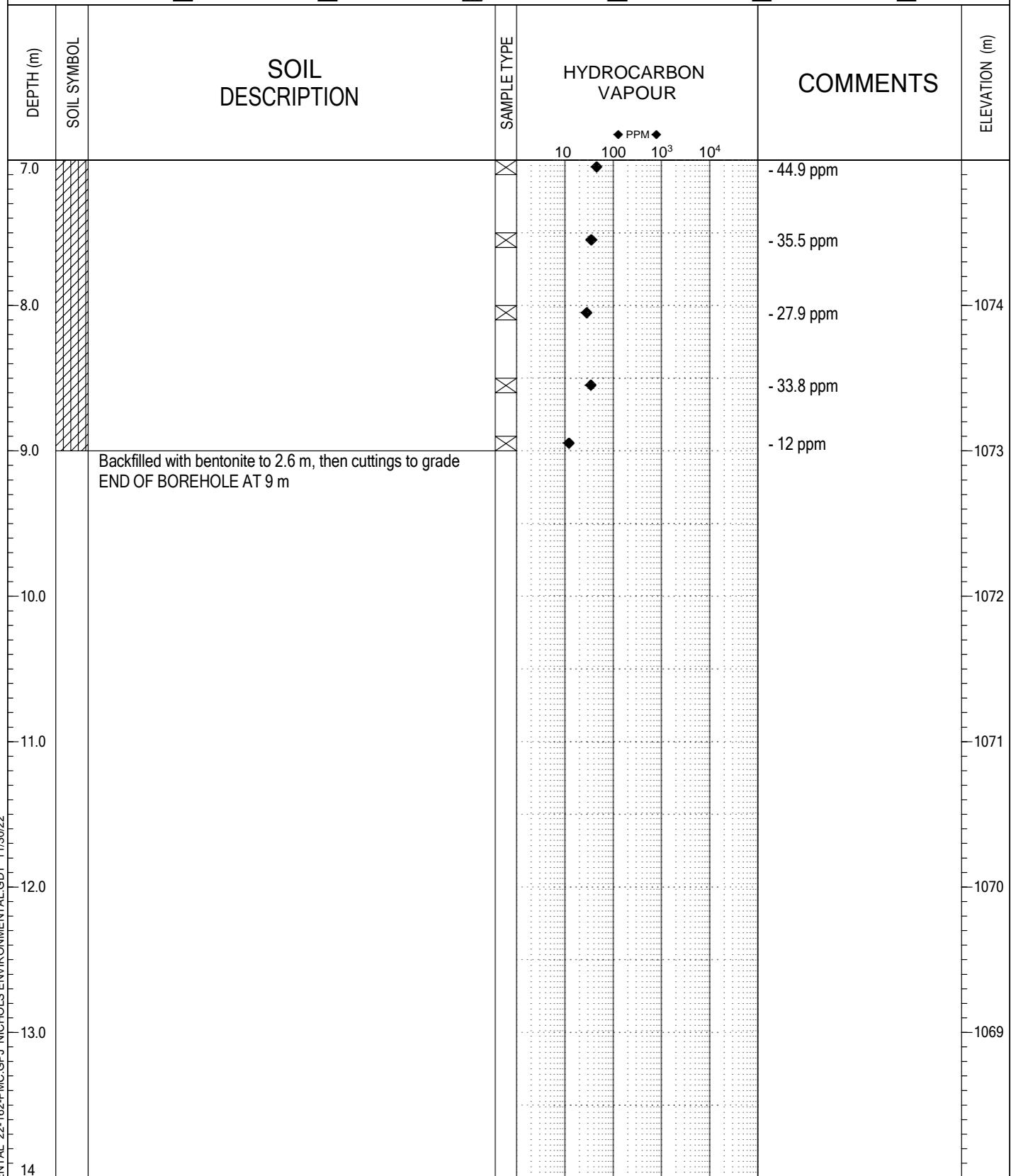


Nichols Environmental (Canada) Ltd.

CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-45
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746430, East 666708	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



CLIENT: Nichols	FIELD PERSONNEL: L.PICKERING, A.YEE	BOREHOLE NO: M22-45
PROJECT: Phase II ESA	DRILLING METHOD: Soild Stem	PROJECT NO: 22-162-PMC
LOCATION: 14-03-032-04-W5M, Cremona, AB	CO-ORDINATES: North 5746430, East 666708	ELEVATION: 1082 m
SAMPLE TYPE <input checked="" type="checkbox"/> SPT <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> A-CASING <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND		



DANGEROUS GOODS DECLARATION

Manifest # 12109



CARRIER

Box 727 Bentley, Alberta T0C 0J0 Phone: (403) 748-3016 Fax: (403) 748-3036
Email tayriverltd@xplornet.com

Driver Name:	BRIAN GORTI.		Unit #:	Vacuum Truck
Consignor:	PLAINS Midstream		Address:	
24 Hour Emergency Number/Name:	Keith Schellenburg 1403-586-3135		LSD#:	2-24-33-5-w5
Destination of Shipment	Same as Consignor		Date of Shipment:	June 19/22
Consignee: Or Other:	<input type="checkbox"/> Secure Energy <input checked="" type="checkbox"/> MOR		Address:	<input type="checkbox"/> 11-21-39-3-W5 Eckville (403) 746-2092 Eckville 1-29-39-3-w5
Product	D.G.	X	VOL	REMARKS
UN2924, PGII MIXED OILFIELD Production Fluids Treat as Flammable Liquid Corrosive, N.O.S. Class 3 (8) May Release Hazardous Vapor	1100	<input type="checkbox"/> L		Permit# 2021-3293 Expiry March 31, 2023 Sludge hydro carbon CEMUL MROE rec. 1.1m 09810BJW
OTHER:		<input type="checkbox"/> L		
Residue Last Contained	Wash Water		<input type="checkbox"/> Other	
Consignor's Signature		Consignee's Signature		Carrier's Signature

DANGEROUS GOODS DECLARATION				Manifest # 12112
 CARRIER		Box 727 Bentley, Alberta T0C 0J0 Phone: (403) 748-3016 Fax: (403) 748-3036 Email tayriverltd@xplornet.com		
Driver Name:	Brian Catozi		Unit #:	Vacuum Truck
Consignor:	Plains Midstream		Address:	
24 Hour Emergency Number/Name:	Keith Schenberg 403		LSD#:	2-24-33-5-w5
Destination of Shipment	Same as Consignor		Date of Shipment:	June 21/21
Consignee: Or Other:	<input type="checkbox"/> Secure Energy <input checked="" type="checkbox"/> MOR 1		Address:	<input type="checkbox"/> 11-21-39-3-W5 Eckville (403) 746-2092 Eckville 1-29-39-3-w5
Product UN2924, PGII MIXED OILFIELD Production Fluids Treat as Flammable Liquid Corrosive, N.O.S. Class 3 (8) May Release Hazardous Vapor		D.G. X	VOL	REMARKS
		1000	<input type="checkbox"/> L	Permit# 2021-3293 Expiry March 31, 2023
OTHER:			<input type="checkbox"/> L	Sludge by product
Residue Last Contained	Wash Water	<input type="checkbox"/> Other MROR Rec 1.9m ³ @ 90%		
Consignor's Signature		Consignee's Signature		Carrier's Signature

DANGEROUS GOODS DECLARATION

Manifest # 11560

		Box 727 Bentley, Alberta T0C 0J0 Phone: (403) 748-3016 Fax: (403) 748-3036 Email tayriverltd@xplornet.com		
CARRIER				
Driver Name:	Ryan Gyorfi		Unit #:	Vacuum Truck
Consignor:	Plains Midstream		Address:	
24 Hour Emergency Number/Name:	Keith Schlegel 403-586-3135		LSD#:	2-24-33-5-W5
Destination of Shipment	Same as Consignor		Date of Shipment:	June 24/2022
Consignee: Or Other :	<input type="checkbox"/> Secure Energy <input type="checkbox"/> MROR		Address:	<input type="checkbox"/> 11-21-39-3-W5 Eckville (403) 746-2092 1-2a-39-03-W5
Product UN2924, PGII MIXED OILFIELD Production Fluids. Treat as Flammable Liquid Corrosive, N.O.S. Class 3 (8) May Release Hazardous Vapor		D.G. X	VOL <input checked="" type="checkbox"/> L 2000	REMARKS Permit# 2021-3293 Expiry March 31, 2023 Sludge hydro carbon
OTHER: Sludge hydro carbon			<input type="checkbox"/> L	MROR Rec 3m³ & @ 90%
Residue Last Contained	Wash Water		<input type="checkbox"/> Other	
Consignor's Signature		Consignee's Signature		Carrier's Signature <i>Ryan Gyorfi</i>

DANGEROUS GOODS DECLARATION

Manifest # 12118



Box 727 Bentley, Alberta T0C 0J0 Phone: (403) 748-3016 Fax: (403) 748-3036
Email tayriverltd@xplornet.com

CARRIER				
Driver Name:	BRIAN GYORZ		Unit #:	Vacuum Truck
Consignor:	PLAINS Midstream		Address:	1408-607 8th Ave SW
24 Hour Emergency Number/Name:	Keith Schellenborg- 403		LSD#:	2-24-33-S-W5
Destination of Shipment	Same as Consignor		Date of Shipment:	JUNE 28/22
Consignee: Or Other:	<input type="checkbox"/> Secure Energy <input checked="" type="checkbox"/> MOR		Address:	<input type="checkbox"/> 11-21-39-3-W5 Eckville (403) 746-2092 Eckville 1-29-39-3-W5
Product UN2924, PGII MIXED OILFIELD Production Fluids Treat as Flammable Liquid Corrosive, N.O.S. Class 3 (B) May Release Hazardous Vapor	D.G.	X	VOL	REMARKS Permit# 2021-3293 Expiry March 31, 2023 Sludge Hydrocarbons MOR Rec 2m³ @ 85%
OTHER:			<input type="checkbox"/> L	<input type="checkbox"/> Other
Residue Last Contained	Wash Water			
Consignor's Signature		Consignee's Signature		Carrier's Signature <i>B. Gy.</i>

CARRIER		Box 727 Bentley, Alberta T0C 0J0 Phone: (403) 748-3016 Fax: (403) 748-3036 Email tayriveritd@xplornet.com		
Driver Name:	BRITAN GORD		Unit #:	Vacuum Truck
Consignor:	PLAINS Midstream		Address:	
24 Hour Emergency Number/Name:	Keith Schellenberg 1403 586 - 3135		LSD#:	2-24-33-5-W5
Destination of Shipment	Same as Consignor		Date of Shipment:	July 12/22
Consignee: Or Other :	<input type="checkbox"/> Secure Energy <input type="checkbox"/> MNR		Address:	<input type="checkbox"/> 11-21-39-3-W5 Eckville (403) 746-2092 Eckville 1-29-39-3-W5
UN2924, PGII MIXED OILFIELD Production Fluids Treat as Flammable Liquid Corrosive, N.O.S. Class 3 (8) May Release Hazardous Vapor		1000 L	<input type="checkbox"/> L	Permit# 2021-3293 Expiry March 31, 2023 Sludge Hydrocarbon
OTHER:			<input type="checkbox"/> L	MNR Rec 1m³ @ 100%
Residue Last Contained	Wash Water	<input type="checkbox"/> Other		
Consignor's Signature		Consignee's Signature		Carrier's Signature

Load confirmation copy

Tax registration number: 857304323



INVOICE TO:

ROFST-040346

Plains Midstream Canada ULC

Loads from: 10/14/2022

Load confirmation date: Oct 17, 2022

Suite 1400, 607 - 8th Ave SW
Calgary, AB T2P 0A7
CAN

To: 10/14/2022

Facility: Rocky Mountain FST

Facility UWI: 03-04-040-08W5

Attention: Accounts Payable - Plains Midstream Ca - Calgary

Unique Well Identifier (UWI): 1F1-07-24-033-05W5-00

Owner/Producer of UWI: Plains Midstream Canada ULC

SCA Number: SESC233843

Charge To

Service Provided	Volume	Currency
Waste Pad Fluids Disposal	17.00 M3	CAD
Truck Flush	1.00 EA	CAD

Load confirmation amount

****PLEASE DO NOT PAY**
THIS IS A LOAD CONFIRMATION FOR APPROVAL. PROCESSING
CHARGES ARE FINAL, CREDIT PRICES ARE ESTIMATES.**

Signatory: Keith Schellenberg

If you have any questions regarding this load confirmation, please contact Bridget Overgaard

Phone : 1-855-391-9738 Fax : 1-800-858-4783

Email : rofstadmin@secure-energy.com

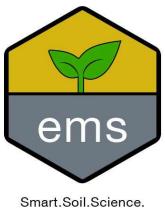
Secure Energy thanks you for your business!

LOAD CONFIRMATION SUMMARY

UWI: 1F1-07-24-033-05W5-00
Owner: Plains Midstream Canada ULC
Load confirmation #: ROFST-040346



Date	Trucking Company	Manifest #	Bill of Lading		Meter / Scale Receipt		
			Service Description	Volume Units	% of Load	Rate	Amount
Oct 14, 2022	Capital Pressure	N		472045			ROFST039718-WT
	Waste Pad Fluids Disposal			9.00 M3			
Oct 14, 2022	Capital Pressure	2153672		473546			ROFST039723-WT
	Waste Pad Fluids Disposal			8.00 M3			
	Truck Flush			1.00 EA			



Memorandum

Environmental Material Science Inc.
3038 Faithfull Avenue
Saskatoon, SK S7K 0B1

To: Ryan Hill, Plains Midstream Canada; David Nuell and Lauren Pickering, Nichols Environmental (Canada) Ltd.

From: Steven Siciliano, Environmental Material Science, Inc.

CC: Amy Jimmo, Environmental Material Science, Inc.

Date: 1 November 2022

Subject: Soil Sense April 2022 – October 2022 Update for RPL Cremona 7-24 Incident, Mountain View County, AB

Executive Summary

A Soil Sense network was installed at three locations within and around a hydrocarbon plume on April 6th, 2022, with an additional two locations installed August 17th, 2022. We operationally define a plume as a discrete spatial interval with hydrocarbon signals or surrogates¹ above Alberta Tier 2 Soil and Groundwater Remediation Guidelines for agricultural land use for coarse-grained soils excluding the protection of freshwater aquatic life pathway (e.g., 0.2 mg kg⁻¹ for benzene here). The network collected 4,360,500 data points from April 6th, 2022, to October 25th, 2022, providing the following estimates:

- Plume areal extent based on soil vapour estimates was 2,195 m², with peak plume volume located at ~2.5 m below ground. Plume volume decreased ($t_{2,201} = -11.536$, $P = 5.886\text{e}^{-24}$), with a mean of 3,727 m³. During the June 2022 report, high water table prevented installation of two Soil Senses (i.e., there should have been five total). Thus, volume and extent estimates were underestimates. Current estimates based on five soil senses are greater and more representative.
- Mean natural source zone depletion (NSZD) was estimated to be 11.5 g m² day⁻¹ of benzene. Site wide activity was estimated at 14.9 kg day⁻¹.
- SVE and MPE installations increased NSZD by a mean of 12.6% in late June/early July and 16.3% starting in September.

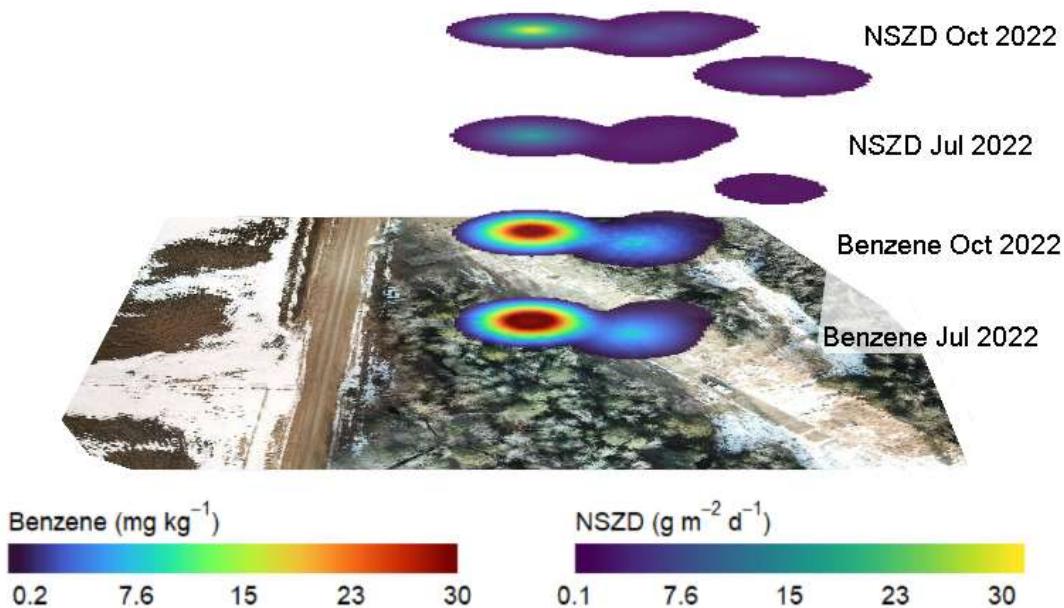


Figure 1. Top-down: Numerical models of NSZD estimates and benzene concentrations at 1 m depth. Background image obtained from Nichols Environmental (Canada) Ltd. (2022).

NSZD rates peaked in July 2022 and were concentrated at the northwest edge of the plume around Q04. NSZD activity spreads towards the leading edge of the plume (Figure 2). With the installation SVE and MPE equipment, which ran from April 1st onwards, NSZD increased by 5.5 to 24.9% (mean of 12.6%) in June/July and 0 to 64.0% (mean of 16.3%) in September/October relative to mean NSZD among 12 sites across Alberta and Saskatchewan (Figure 3)

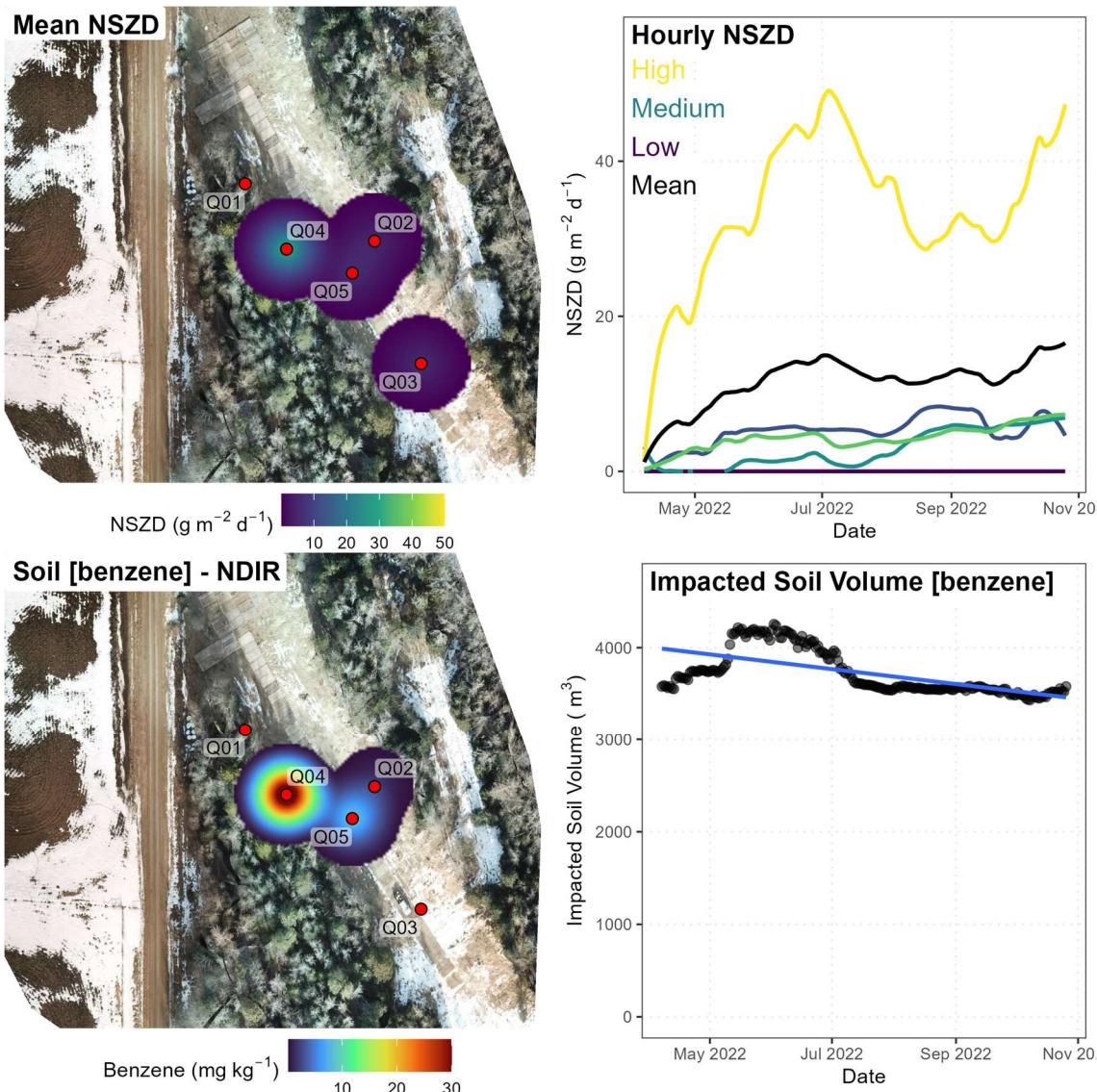


Figure 2. Left: Numerical model estimated mean NZSD rates (top) and 2D model of benzene concentrations (1 m depth) derived from IR detectors (bottom) across the site April 6th, 2022, to October 25th, 2022. Right: NSZD time series (loess smoothed) for each Soil Sense colored by lowest (violet) to highest (yellow) total NSZD rates (top; means are represented by thick black lines) and total benzene-impacted soil volume (bottom). The regression line is represented by the equation: volume = $5.376e^{+04} - 0.521 \cdot \text{day}$; $R^2_{\text{adj}} = 0.395$, $F_{2,201} = 133.087$, $P = 5.886e^{-24}$). Background image obtained from Nichols Environmental (Canada) Ltd. (2022).

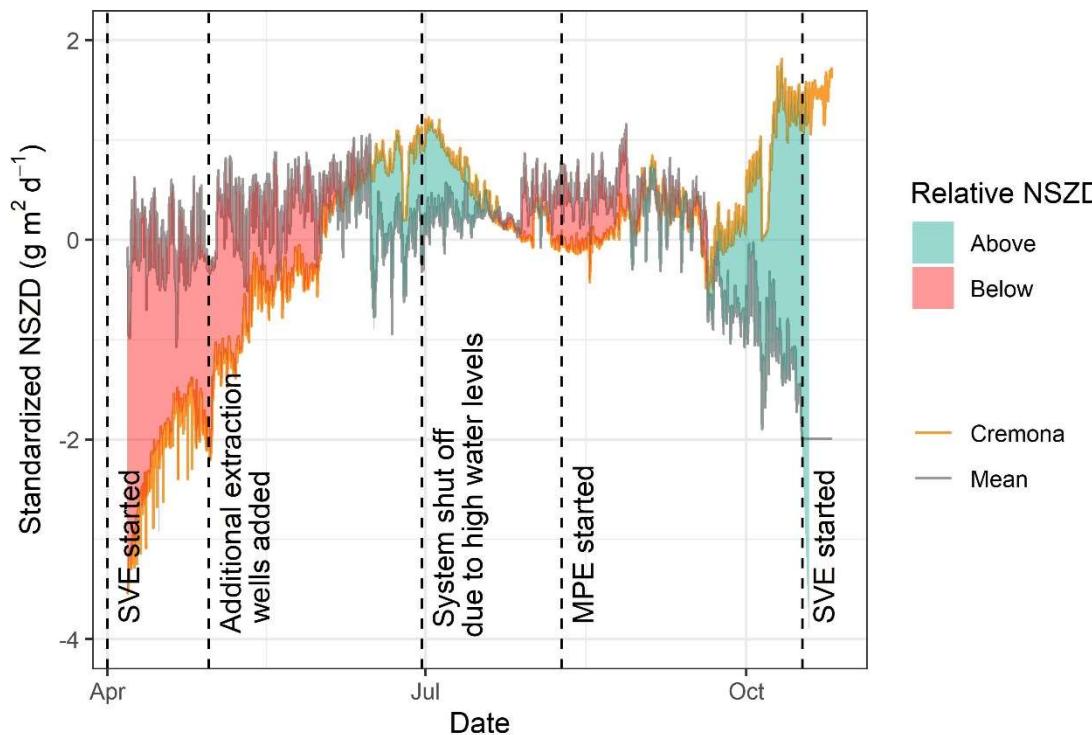


Figure 3. Standardized NSZD estimates across 12 sites in Alberta and Saskatchewan (grey line) compared to mean NSZD at the RPL Cremona 7-24 site (orange line). Time series were standardized to a mean = 0 and variance = 1 to facilitate comparison among series. Notable events during remediation are indicated by vertical dashed lines. Red regions indicate where NSZD rates were below mean NSZD for the region and blue indicates above.

NSZD rates are a combination of CH₄-oxidation and CH₄ released to the atmosphere. The Soil Sense can estimate CH₄ oxidation NSZD rates by CO₂ and O₂ profiles, and O₂ profiles indicate greater NSZD rates. NSZD rates using CO₂ and O₂ fluxes are based off averages of the two as they are complementary surrogates of the same process (i.e., CH₄ + 2O₂ → CO₂ + 2H₂O; also see equation 14). CH₄ profiles were comparable to NSZD rates estimated from O₂.

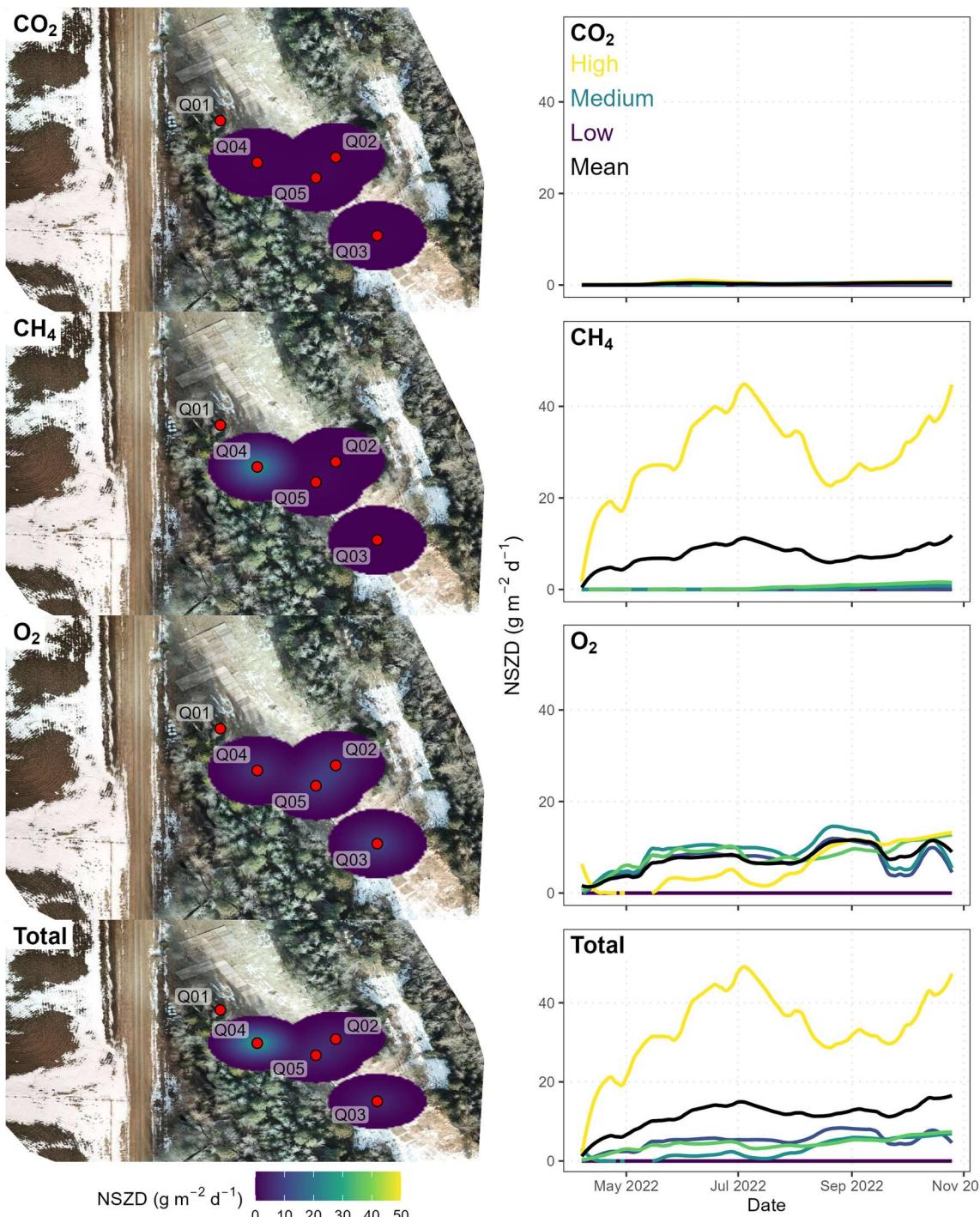


Figure 4. Spatiotemporal analysis of NSZD rates based on CO_2 , CH_4 , O_2 , and a combination of the three. Left: numerical models representing mean NSZD rates April 6th, 2022, to October 25th, 2022. Right: NSZD time series (loess smoothed) for each Soil Sense colored by lowest (violet) to highest (yellow) total NSZD rates. Means are represented by thick black lines. Background image obtained from Nichols Environmental (Canada) Ltd. (2022).

Results

Plume Persistence

Using numerical models, we estimated plume volume of the benzene impacted soil (above AB Tier 2 EQGs) using soil core lithology (i.e., bulk densities of the various strata) and IR-derived benzene concentrations within each stratum. Volume estimates for December through May ranged from 3,434 to 4,254 m³, with a mean of 3,727 m³. The current areal extent of the benzene plume is estimated at 2,195 m².

Benzene impacted soil volume estimated using numerical models and soil cores.

Year	Data	Volume (m ³)
2021	Soil cores	3,950
2022	IR	3,727

Spring NSZD rates suggested that most of the hydrocarbon mass would be depleted in approximately 250 years. After SVE work this summer, this estimate decreased to 200 years (Figure 5).

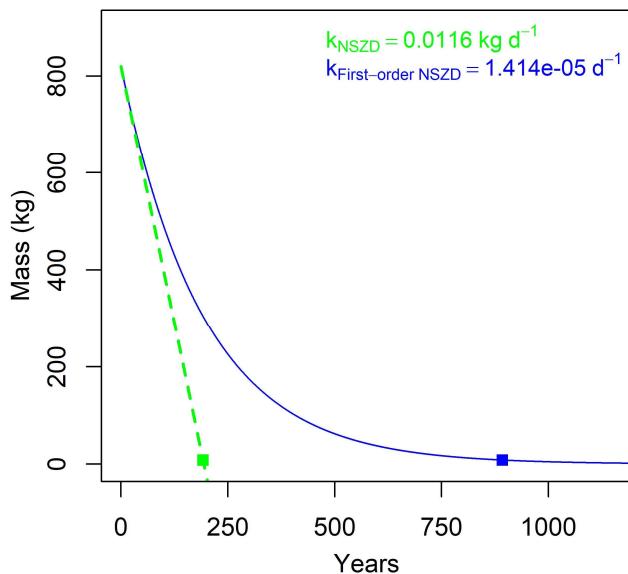


Figure 5. Zero- and first-order degradation rates of petroleum hydrocarbon mass at Cremona. Minimum NSZD estimates were based on 5 Soil Senses.

Background to Soil Sense Network Installation and Operation

A pressure anomaly was reported for the Plains Midstream-operated condensate pipeline (AB00001386-3) near Cremona, AB (the Site) in December 2021. An estimated 20 m³ of condensate was released into the soil surrounding the pipeline². The Site is relatively flat and is a naturally forested area within agricultural land use. There are three Plains Midstream-owned pipelines with the right-of-way (ROW) at the Site: one abandoned (AB00003644-1), one crude oil (AB00001386-11) at the northeast perimeter of the ROW, and the condensate pipeline at the southwest ROW perimeter.

Groundwater flow is typically towards the northeast at a gradient of 0.047 m m⁻¹.

Groundwater levels at the site in January 2022 ranged from 3.4 to 9.0 mbgs, with a mean of 5.77 mbgs².

A Phase II Environmental Site Assessment (ESA) was completed in 2022. Benzene, toluene, and xylene (BEX), and petroleum hydrocarbon (PHC) fractions 1 and 2 (F1 and F2) were identified as contaminants that exceed AB Tier 2 EQG for soil and groundwater. The highest PHC concentrations were identified 1.5 m bgs at M21-11². However, AB Tier 2 EQG exceedances were also found at M21-07, M21-08, M21-09, M21-15, M21-16, M21-17, and M21-18, ranging from 1 to 3 mbgs.

Soil Sense Installation in 2022

On April 6th, 2022, three Soil Senses were installed to create a Soil Sense network, with an addition two Soil Senses installed August 17th^{^A}, 2022. The network was designed to track NSZD rates and the change in plume dynamics. The sensor packs of the EMS-Soil Sense were installed at approximately: 2.0, 2.5, and 3.0 mbg. Location and depth details are provided in Appendix A. Installation within the plume allows for NSZD rates to be calculated using methane concentrations and is also more indicative of plume dynamics as the infrared (IR) sensors will be able to better track changes in the hydrocarbons.

Benzene concentrations

Benzene soil concentrations were calculated from vapor concentrations using Henry's and Raoult's laws following Park³ (equation 1). Henry's law states that the amount of dissolved gas in a liquid is proportional to its partial pressure above the liquid, whereas Raoult's law states that the partial pressure of each component of an ideal mixture of liquids is equal to the vapor pressure of the pure component multiplied by its mole fraction in the mixture. Mathematically, this combination works out to:

$$C_{T,i} = \frac{C_{a,i}(\theta_w + K_{OC,i}f_{OC,i}\rho_b + H_i\theta_a)}{H_i\rho_b} \quad [1]$$

Where: $C_{T,i}$ = total soil concentration of component i (mg L^{-1})

$C_{a,i}$ = soil vapour concentration (from PIDs; mg L^{-1})

H_i = Henry's constant for each component i at the temperature of interest (0.230 for benzene at 25°C; however, see equations 2 and 3 below; dimensionless)

ρ_b = dry soil bulk density (1.85 g m^{-3})

θ_w = volumetric water content in vadose zone (see equation 9; dimensionless)

θ_a = volumetric air content (see equation 10; dimensionless)

$K_{OC,i}$ = organic carbon water partitioning coefficient for each component (79.4 L kg^{-1} for benzene)

$f_{OC,i}$ = organic carbon fraction (0.001; dimensionless)

However, mean subsurface soil temperatures are typically less than standard state (i.e., 25°C) and use of Henry's law constant under these conditions may overpredict contaminant volatility resulting in artificially low soil concentrations. Henry's law constant may be corrected for mean soil temperature using the Clausius-Clapeyron relationship⁴. First, we approximate the enthalpy of vaporization of the contaminant at mean soil temperature ($\Delta H_{v,TS}$) from the enthalpy of vaporization at the normal boiling point:

$$\Delta H_{v,TS} = \Delta H_{v,b} \left[\frac{\left(1 - \frac{T_s}{T_c}\right)}{\left(1 - \frac{T_b}{T_c}\right)} \right]^n \quad [2]$$

Where: $\Delta H_{v,TS}$ = enthalpy of vaporization at the mean soil temperature (kJ mol⁻¹)

$\Delta H_{v,b}$ = enthalpy of vaporization at the normal boiling point (kJ mol⁻¹)

T_S = mean soil temperature (K)

T_C = critical temperature (K)

T_B = normal boiling point (K)

n = exponent (dimensionless)

$\Delta H_{v,TS}$ is then substituted into equation 3 to derive Henry's law constant corrected for mean soil temperature:

$$H'_{TS} = \frac{\exp\left[\frac{\Delta H_{v,TS}}{R_C}\left(\frac{1}{T_S} - \frac{1}{T_R}\right)\right] H_R}{RT_S} \quad [3]$$

Where: H'_{TS} = Henry's law constant at the mean soil temperature (dimensionless)

T_R = Henry's law constant reference temperature (K)

H_R = Henry's law constant at the reference temperature (atm-m³ mol⁻¹)

R_C = gas constant (J K⁻¹ mol⁻¹)

R = gas constant (atm-m³ K⁻¹ mol⁻¹)

We used a Radial Basis Function (RBF) interpolant numerical model to visualize plume extents. An RBF interpolant describes a physical quantity that varies continuously in space. RBF is an advanced approximation method for constructing high-order accurate interpolants of unstructured data.

Natural Source Zone Depletion: Spatial and Temporal Analysis

NSZD manifests itself as changes in CO₂, CH₄, and O₂ concentrations above the hydrocarbon-impacted soil. After correction for natural soil respiration, the change in concentration with depth at a monitoring location (i.e., concentration gradients) can be used to estimate the gas flux^{5,6}. The gradient method uses soil gas measurements taken at discrete depths to estimate the diffusive flux through the vadose zone. Because NSZD directly impacts CO₂, O₂, and CH₄, either the diffusive flux of O₂ (consumption) or CO₂/CH₄ (production) can be stoichiometrically equated to an NSZD rate.

NSZD rates were estimated modifying the protocols of CRC CARE⁷. Briefly, CO₂, O₂, and CH₄ fluxes were estimated using Fick's Law of Diffusion (equation 4), then the amount of hydrocarbon depleted per g of gas flux were estimated using guideline values outlined in CRC CARE⁷ and the American Petroleum Institute⁸.

$$J_{total} = D_V^{eff} \left(\frac{dC}{dz} \right) \quad [4]$$

Where: J_{total} = steady-state diffusive flux (g m⁻² soil s⁻¹)

dC/dz = change in gas concentration (C, g m⁻³) over change in depth (z, m)

D_V^{eff} = effective diffusivity (M² s⁻¹), specific to the soil and gas being measured.

The Millington and Quirk⁹ equation can be used to estimate D_V^{eff} , which can be expressed as either $D_{CO_2}^{eff}$, $D_{O_2}^{eff}$, or $D_{CH_4}^{eff}$, depending on the gas used for the flux estimate.

$$D_{gas}^{eff} = D_{gas}^{air} \left(\frac{\theta_a}{\theta_T} \right) \quad [5]$$

Where: D_{gas}^{air} = effective diffusivity of the gas of interest in air ($\text{m}^2 \text{ s}^{-1}$)

θ_a = air filled porosity (calculated using equations 6-8 below; dimensionless)

θ_T = total soil porosity (0.610; dimensionless)

Note: $D_{gas}^{air} = 0.16 \times 10^{-4}$, 0.16×10^{-4} , and $0.22 \times 10^{-4} \text{ m}^2 \text{ s}^{-1}$ for CO₂, O₂, and CH₄, respectively.

Diffusive efflux rates were corrected by subtracting the average background total efflux from the total efflux at locations above the LNAPL footprint within the same ground cover:

$$J_{corr} = J_{total} - J_{background} \quad [6]$$

NSZD rates are calculated as:

$$NSZD = J_{corr} SR_{PHC:gas} \quad [7]$$

Where: J_{corr} = background corrected steady-state diffusive flux ($\text{g m}^{-2} \text{ soil s}^{-1}$) of the gas of interest

$SR_{PHC:gas}$ = stoichiometric ratio of the petroleum hydrocarbon of interest: gas produced/consumed

Using benzene as an example: $2\text{C}_6\text{H}_6 + 15\text{O}_2 \rightarrow 12\text{CO}_2 + 6\text{H}_2\text{O}$

Benzene has molecular weight (MW) of 156 g mole^{-1} ($2 \times (12.011 \text{ g mole}^{-1} \times 6 \text{ moles of C} + 1.008 \text{ g mole}^{-1} \times 6 \text{ moles of H})$) and CO₂ has a MW of 528 g mole^{-1} ($12 \times (12.011 \text{ g mole}^{-1} \text{ C} + (2 \times 15.999 \text{ g mole}^{-1} \text{ O}_2))$). This means that when 156 g of benzene are consumed, 528 g of CO₂ are produced. The stoichiometric ratio of benzene to CO₂ is then $156 / 528 = 0.296$.

The unique capabilities of the Soil Sense allow for EMS to provide a more refined estimate of flux by (i) continuously estimating soil air filled porosity and (ii) simultaneously measuring multiple gas fluxes.

Continuous Estimates of Soil Air Filled Porosity

The first modification included estimating soil volumetric air content from relative humidity¹⁰ measurements from each Soil Sense sensor pack. Pedotransfer equations relate the soil hydraulic functions to easily measured soil properties¹¹. A four-parameter water retention model is used commonly in fluid transport models: the van Genuchten¹² equations. First, we calculated capillary pressure from relative humidity (RH) using the Kelvin equation¹³ (equation 8), then volumetric water content from capillary pressure using the van Genuchten equation (equation 9).

Finally, soil volumetric air content was estimated using equation 10.

$$\Psi = \frac{RT}{M} \ln(RH) \times 0.010 \text{ cm}_{H_2O} \text{ Pa}^{-1} \quad [8]$$

$$\theta_w = \theta_r + \left(\frac{(\theta_s - \theta_r)}{((1 + (\alpha\Psi)^n)^m)} \right) \quad [9]$$

$$\theta_a = \theta_T - \theta_w \quad [10]$$

Where: Ψ = capillary pressure (cm)

M = molecular weight of water ($0.018 \text{ kg mol}^{-1}$)

R = gas constant ($8.314 \text{ J mol}^{-1} \text{ K}^{-1}$)

RH = relative humidity (proportion)

T = temperature (K)

θ_a = volumetric air content (dimensionless)

θ_w = volumetric water content (dimensionless)

θ_r = residual water content (0.010; dimensionless)

θ_s = saturated water content (0.538; dimensionless)

θ_T = total soil porosity (clay = 0.610; dimensionless)

α = parameter corresponding to the inverse of the air-entry value (0.017 cm^{-1})

h_b = air-entry pressure (α^{-1} , cm)

m = 0.068 (dimensionless)

n = 1.073 (dimensionless)

m and n are empirically derived curve shape-defining parameters.

As expected, during December through May, soil porosity changes due to precipitation were minimal. Our volumetric air content estimates ranged from 0.082 to 0.103, with a mean of 0.086 (Figure 6). Volumetric water content estimates ranged from 0.507 to 0.528, with a mean of 0.523.

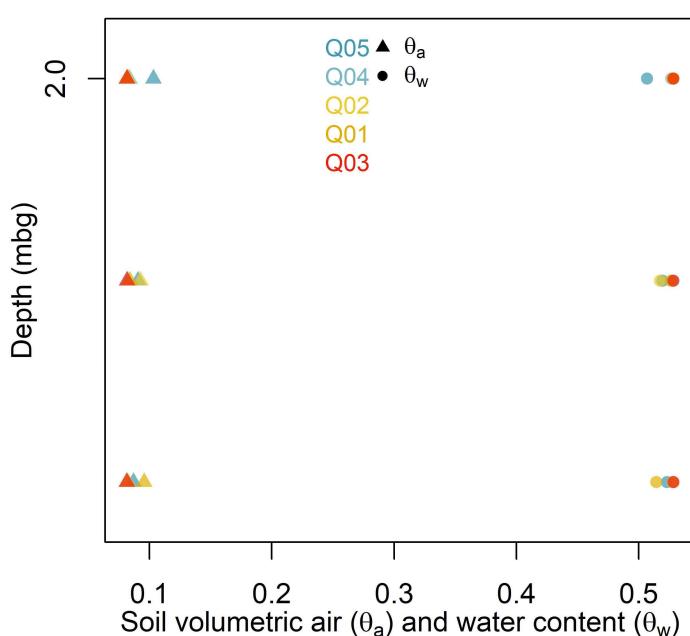


Figure 6. Empirical soil volumetric air and water estimates at each depth within each Soil Sense.

Gas Data Fusion

The measurement of multiple analytes allows EMS the ability to build heuristics based on background, and typical, and atypical soil gas profiles above LNAPL-impacted soils (Figure 7) that provide a more robust estimate of NSZD. Below is an example of the soil gas profiles at 5 locations with the surface gas concentrations estimated from the NOAA Global Monitoring Laboratory.

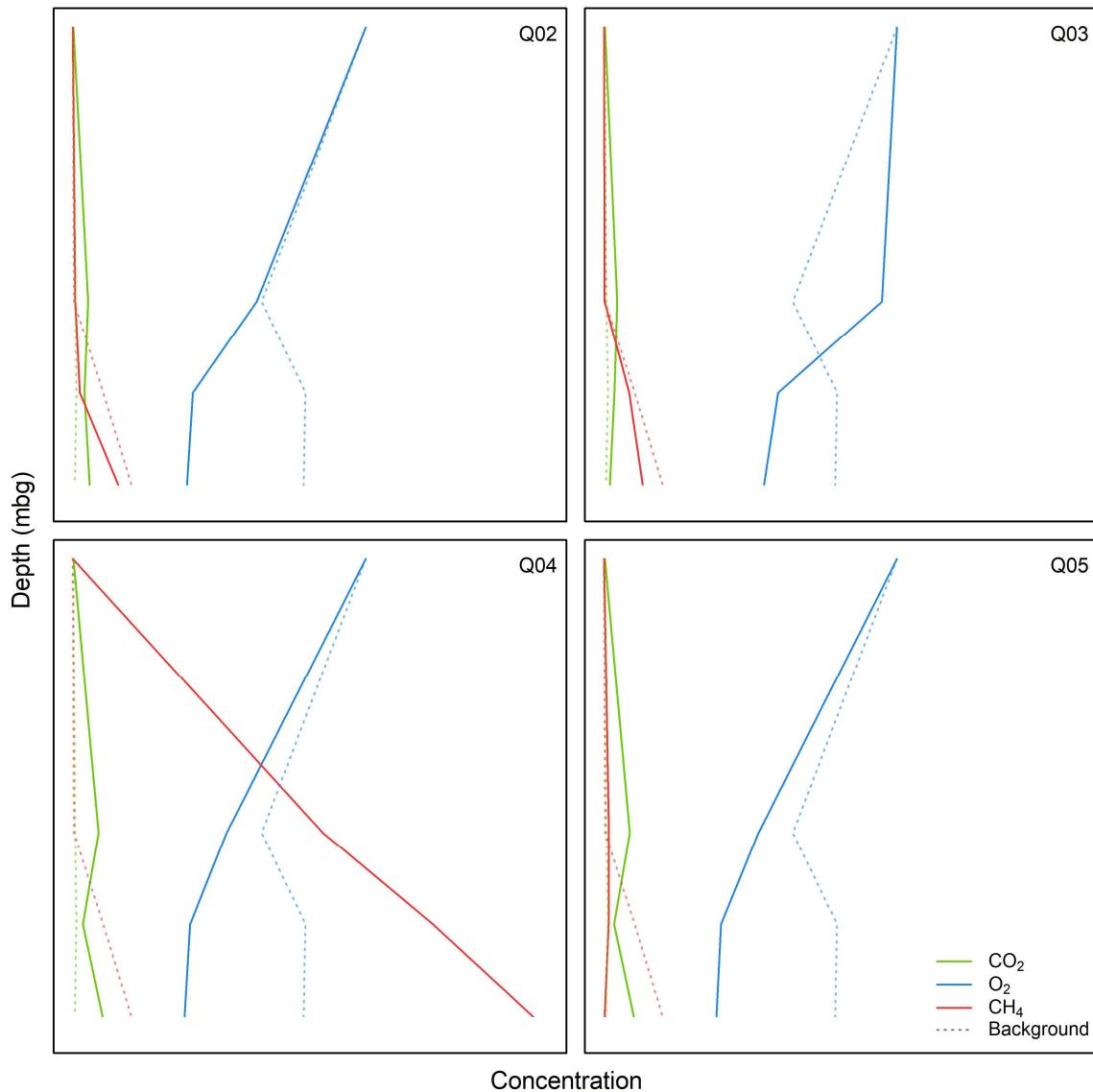


Figure 7. Soil gas concentration profiles at 5 Soil Sense locations. Background values (Q01) are presented in each panel (dotted lines).

Surface estimates of CO₂ and CH₄ were obtained from NOAA Global Monitoring Laboratory^{14,15}, and average atmospheric O₂ was assumed to be 21%¹⁶. If CO₂ concentrations at 3.0 metres below grade (mbg) were greater than concentrations at both 2.0 and 2.5 mbg, CO₂ fluxes (and subsequent NSZD rates – see equations 6 and 7 above) were calculated following equation 11:

$$NSZD_{CO_2} = \frac{[CO_2]_{2.0 \text{ m}bg} - [CO_2]_{\text{ground surface}}}{2.0 \text{ m}} \quad [11]$$

Otherwise, they were calculated using equation 12:

$$NSZD_{CO_2} = \frac{[CO_2]_{1.5 \text{ m}bg} - [CO_2]_{\text{ground surface}}}{1.5 \text{ m}} \quad [12]$$

O₂ fluxes were calculated using a complementary procedure to CO₂. If O₂ concentrations at 3.0 mbg were less than at 2.0 and 2.5 mbg, fluxes were calculated as:

$$NSZD_{O_2} = \text{abs} \left(\frac{[O_2]_{2.0 \text{ mbg}} - [O_2]_{\text{ground surface}}}{2.0 \text{ m}} \right) \quad [13]$$

Otherwise as:

$$NSZD_{O_2} = \text{abs} \left(\frac{[O_2]_{1.5 \text{ mbg}} - [O_2]_{\text{ground surface}}}{1.5 \text{ m}} \right) \quad [14]$$

Where CH₄ concentrations at 2.0 mbg were non-zero, CH₄ fluxes were calculated using equation 15:

$$NSZD_{CH_4} = \text{abs} \left(\frac{[CH_4]_{1.0 \text{ mbg}} - [CH_4]_{\text{ground surface}}}{1.0 \text{ m}} \right) \quad [15]$$

Otherwise NSZD_{CH₄} = 0.

Thus, where CH₄ concentrations were zero, NSZD rates (g m⁻² day⁻¹) were calculated using equation 16:

$$NSZD_{\text{Total}} = \frac{NSZD_{CO_2} + NSZD_{O_2}}{2} \quad [16]$$

Otherwise following equation 17:

$$NSZD_{\text{Total}} = \frac{NSZD_{CO_2} + NSZD_{O_2} + NSZD_{CH_4}}{2} \quad [17]$$

As of October 25th, 2022, hourly NSZD rates across the site varied between 0 and 50.8 g m⁻² day⁻¹, with a mean of 11.5 g m⁻² day⁻¹.

References

1. Camilli, R. et al. [Tracking Hydrocarbon Plume Transport and Biodegradation at Deepwater Horizon](#). *Science* **330**, 201–204 (2010).
2. Ltd., N. E. *Phase II Environmental Site Assessment RPL Cremona 7-24 Incident, LSD (SE)07-24-033-05-W5M, Mountain View County, Alberta. Prepared for Plains Midstream Canada ULC.* (2022).
3. Park, H. S. A method for assessing soil vapor intrusion from petroleum release site: Multi-phase/multi-fraction partitioning. *Global NEST Journal* **1**, 195–204 (1999).
4. EPA. [Fact Sheet: Correcting the Henry's Law Constant for Soil Temperature](#). (2001).
5. Johnson, P., Lundegard, P. & Liu, Z. [Source Zone Natural Attenuation at Petroleum Hydrocarbon Spill Sites—I: Site-Specific Assessment Approach](#). *Groundwater Monitoring & Remediation* **26**, 82–92 (2006).
6. Lundegard, P. D. & Johnson, P. C. [Source Zone Natural Attenuation at Petroleum Hydrocarbon Spill Sites—II: Application to a Former Oil Field](#). *Groundwater Monitoring & Remediation* **26**, 93–106 (2006).
7. Care, C. Technical measurement guidance for LNAPL natural source zone depletion, Technical Report Series no. 44. (2018).
8. API. *Quantification of Vapor Phase-related Natural Source Zone Depletion Processes*. 124 https://www.techstreet.com/standards/api-publ-4784?product_id=1984357 (2017).
9. Millington, R. J. & Quirk, J. P. [Permeability of porous solids](#). *Transactions of the Faraday Society* **57**, 1200–1207 (1961).
10. Vereecken, H. et al. Explaining soil moisture variability as a function of mean soil moisture: A stochastic unsaturated flow perspective. *Geophysical Research Letters* **34**, L22402 (2007).
11. Guber, A. K. & Pachepsky, Y. A. Multimodeling with pedotransfer functions: Documentation and user manual for PTF Calculator (CalcPTF), version 3.0. *USDA Rep., Beltsville Agricultural Research Center, Beltsville, Md* **26**, (2010).
12. Genuchten, M. Th. van. [A Closed-form Equation for Predicting the Hydraulic Conductivity of Unsaturated Soils](#). *Soil Science Society of America Journal* **44**, 892–898 (1980).
13. Thomson, W. 4. On the equilibrium of vapour at a curved surface of liquid. *Proceedings of the Royal Society of Edinburgh* **7**, 63–68 (1872).
14. Dlugokencky, E. [Trends in Atmospheric Methane](#). NOAA/GML (2021).
15. Dlugokencky, E. & Tans, P. [Trends in Atmospheric Carbon Dioxide](#). NOAA/GML (2021).
16. Oceanography, S. I. of. [Scripps O₂ Program](#).



Appendix A: Soil Sense locations and depth information

Soil Sense	Easting (m) ^a	Northing (m)	Surface elevation (masl)	Sensor depths (mbgs)	Status
Q01	666,690	5,746,466	1,082.6	2.0, 2.5, 3.0	Operational
Q02	666,737	5,746,445	1,081.2	2.0, 2.5, 3.0	Operational
Q03	666,754	5,746,400	1,081.2	2.0, 2.5, 3.0	Operational
Q04	666,727	5,746,446	1,081.6	2.0, 2.5, 3.0	Operational
Q05	666,728	5,746,433	1,081.2	2.0, 2.5, 3.0	Operational

^aUTM 11U, WGS84;