REVISED REMEDIATION PLAN
Version 6.0
FORMER SEARS FUEL SITE AND ADJACENT HOUNSFIELD HEIGHTS AREA
1620 – 14th AVENUE NW
CALGARY, ALBERTA
SUNCOR OUTLET NO. 9445
ALBERTA ENVIRONMENT AND PROTECTED AREAS (AEPA) FILE NO. 00141934

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1.0 INTRODUCTION

Parsons Inc. (Parsons) was retained by Suncor Energy Products Partnership (Suncor) to prepare this Revised Remediation Plan, Version 6.0 (RRP 6.0) for the Former Sears Fuel Site located at 1620 - 14th Avenue NW; also including the Mall Properties; Lions Park; The City of Calgary roadways; and portions of the adjacent Hounsfield Heights community (collectively referred to as the "site"). The Adaptive Site Management approach for complex contaminated sites has been adopted for the environmental management strategy at this site (ITRC, 2017).

The site location map is presented as Drawing No. 1. The area topography (grade elevations) and municipal land use districts are shown on Drawing No. 2 and 3, respectively. A site plan showing the groundwater monitoring well, extraction well, and soil vapour well locations is presented as Drawing No. 4.

This report has been prepared in accordance with the Environmental Protection Order No. EPO – 2018/01-SSR and amendments (referred to as the "EPO"), issued by Alberta Environment and Parks (AEP), now referred to as Alberta Environment and Protected Areas (AEPA). In addition, the report abides by Ministerial Order 09/2020 (referred to as the "MO"), issued on February 5, 2020 (AEP, 2020). The MO and EPO are presented in Appendix A. In accordance with the EPO and MO, RRP 6.0 is a subsequent revision of the Revised Remediation Plan, Version 5.0 completed by Parsons, dated March 28, 2024 (Parsons, 2024a).

The following work has been completed since the submission of the Revised Remediation Plan, Version 5.0 (Parsons, 2024a) and has been considered in this revised Remediation Plan:

- Groundwater monitoring wells and extraction wells were monitored for subsurface vapour concentrations, water levels, and the presence or absence of liquid-phase hydrocarbons (LPH) in May/June, September, and December 2024;
- Groundwater samples were collected during three sampling events conducted in May/June, September, and December 2024;
- Soil vapour samples were collected during four sampling events in April, August, October and December 2024;
- The DPVE system continued to operate in 2024 and was monitored and maintained by Sequoia Environmental Remediation Inc. (Sequoia);
- An evaluation of the performance of the Dual Phase Vapour Extraction (DPVE) system was completed in June 2024. This was intended to determine if additional LPH could be recovered in the area of BH1704 and to collect analytical samples of vapour exhaust and groundwater inlet streams to determine a more accurate extraction rate. The assessment included an extraction test on extraction well EX-5 and monitoring the effects in nearby groundwater and extraction wells (Parsons, 2025);

- A supplemental Phase II Environmental Site Assessment (ESA) was conducted which consisted of the advancement of ten boreholes (BH7000, SV600A/B through SV603A/B, and SV604B), the collection of soil samples from the boreholes, and installation soil vapour monitoring wells at eight of the borehole locations (BH600A/B, SV601A/B, SV602B, SV603A/B, SV604B) in July and August 2024 (Parsons, 2025);
- Groundwater monitoring wells BH1918, BH1920, BH1953, and BH1965 were decommissioned at the request of The City of Calgary in August 2024;
- A proposed reduction to the boundary of the EPO area was submitted to the regulator in March 2024 (MEMS, 2024a). The proposed change included removal of areas within the Hounsfield Heights community and Lions Park where groundwater concentrations of the potential contaminants of concern (CoC) are less than the Tier 1 guidelines and are not expected to exceed in the future (Zones 1 and 2, as outlined in the report). The proposed boundary is shown on the drawings in this report;
- An evaluation of Domestic Use Aquifer (DUA) exclusion applicability was completed in October 2024 (MEMS, 2024b). The evaluation concluded that the DUA pathway can be excluded for the site as it meets the requirements outlined in the Guide to Excluding the Domestic Use Aquifer Based on Municipal Bylaws (AEP, 2022);
- An update to the site-specific soil vapour, soil, and groundwater quality guidelines was completed in February 2025 (Intrinsik, 2025), based on feedback received in January 2025 from AEPA. This supersedes the report issued on October 25, 2024 (Intrinsik, 2024a), which was completed to incorporate the updated 2024 Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines (AEPA, 2024a/b). Additional details are presented below;
- Plume stability evaluations were completed (Parsons, 2025a; MEMS, 2025). Additional details are presented below; and,
- Supplemental monitoring plan details were developed for the proposed temporary deactivation of the DPVE system (Parsons, 2025b). A summary of the full plan is described below.

2.0 SITE OVERVIEW AND CONCEPTUAL SITE MODEL

A site overview with associated maps and figured is presented within the Conceptual Site Model (CSM) in Appendix B. The CSM includes a detailed description of the physical, chemical and biological processes occurring at the site, as it relates to the contaminants of concern. The CSM incorporates environmental assessment results up to and including 2024. The CSM includes a summary of each of the following:

- Site history;
- Site topography, geology, hydrogeology and hydrology;

- Previous Phase II ESAs;
- Site remedial activities;
- Extent of impacts and migration;
- Changes in extent of impacts with time;
- Monitored natural attenuation;
- Human health and ecological risk assessment; and,
- Evaluation of the indoor vapour inhalation pathway.

The CSM is considered dynamic in nature and is to be updated as new information becomes available. This iterative process is also described as part of the Adaptive Site Management approach for complex contaminated sites (ITRC, 2017). The Adaptive Site Management approach also recognizes that the remedial strategy for a site can change over time, including as the CSM is updated.

This CSM was completed in general conformance with Alberta Environmental Site Assessment Standard (AEPA, 2024) and the Canadian Council of the Minsters of the Environment (CCME, 2016).

3.0 REGULATORY FRAMEWORK AND REFERENCED GUIDELINES FOR 2025

The Alberta's Contaminated Sites Policy Framework (AEPA, 2023) is the overarching regulatory policy which governs environmental management at the site. This framework describes requirements for Tier 1, Tier 2, SSRA and risk management approaches for contaminant management.

The regulatory guidelines for the site is governed by the Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines, updated in 2024 by Alberta Environment and Protected Areas (AEPA, 2024a,b). The guidelines are applied at the site for soil and groundwater and site-specific guidelines for soil vapour. As there are concentrations above the guidelines in soil and groundwater, risk management is being implemented.

A remedial objectives evaluation within the regulatory framework has been ongoing in 2024 and will continue in 2025, as detailed in Section 4.0 below. Until such time that remedial guideline objectives are proposed and approved by AEPA, the following guidelines will be referenced during 2025:

- Alberta Tier 2 Soil and Groundwater Remediation Guidelines (AEPA 2024a,b); Revised Tier 2 Groundwater Guidelines for the protection of vapour inhalation (Intrinsik, 2025); and,
- Calculated soil vapour quality guidelines protective of indoor air quality (Intrinsik, 2025).

The soil and groundwater guidelines referenced are the Alberta Tier 2 Soil and Groundwater Remediation Guidelines (AEPA, 2024a,b). The guidelines referenced are for fine-grained and coarse-grained soils, and commercial and residential/parkland land use. Tier 2 guidelines are referenced for the vapour inhalation pathway for selected areas, as described below. North of the Hounsfield Heights community, in areas within 30 m of residential-zoned properties, vapour inhalation pathway guidelines for residential land use have been applied, as shown on Drawing No. 4.

The freshwater aquatic life (FAL) pathway has been excluded. The ecological soil contact (ESC) pathway has been excluded for groundwater in areas where the depth to groundwater is deeper than 3 metres below ground surface (mbgs); which is generally areas north of 11th Avenue.

The DUA exposure pathway is shown for comparative purposes only. As described in the 2017 Human Health and Ecological Risk Assessment (HHERA) (Intrinsik, 2017), the potable water pathway was removed from further assessment in the HHERA since potable water is provided by The City of Calgary municipal supply and, therefore, drinking water exposure to impacted groundwater is not expected. In 2022, AEPA published guidance (AEPA, 2022) to allow the exclusion of the potable water pathway where there are applicable municipal bylaws, without the need for risk management. Information was submitted to The City of Calgary and AEPA in 2024 supporting the exclusion of the potable water pathway at this site. The City of Calgary has approved the exclusion of the potable water pathway. A response from AEPA has not been received to-date.

INDOOR VAPOUR INHALATION PATHWAY – TIER 2 SITE-SPECIFIC GUIDELINES

Guidelines for soil vapour protective of indoor air quality were developed by Intrinsik (Intrinsik, 2025) in accordance with the Canadian Council of Minister of the Environment (CCME) protocol Protocol for the Derivation of Soil Vapour Quality Guidelines (CCME, 2014) using parameter values consistent with AEPA guidance (AEPA, 2024a,b). The guidelines were developed for both commercial and residential/parkland land use for various depths below a residential or commercial building foundation. The grain size was assumed to be consistent with the depth of geological unit used to develop the site-specific guidelines, as outlined by Intrinsik (Intrinsik, 2025).

For groundwater, as part of the work conducted by Intrinsik (Intrinsik, 2025), Tier 2 groundwater guidelines protective of the vapour inhalation pathway were calculated for some areas of the site. In the applicable areas (areas N1, N2, S1 and S2, as shown on Drawing No. 4), the calculated Tier 2 guidelines are used in place of the Tier 1 guidelines for the vapour inhalation pathway. In February 2025, the groundwater guidelines for the vapour inhalation pathway were updated to reflect feedback from AEPA that indicated that Tier 2 adjustment cannot include bioattenuation as a factor that can be adjusted for groundwater. Therefore, the calculated guidelines include

only a default adjustment factor of 10 for hydrocarbons, with no adjustment for bioattenuation which may occur with increased vertical separation distances between vapour source and building foundations. This change added additional conservatism; however, the assessment of risks to residents due to inhalation of vapours at this site is focused on the direct measurement of soil vapour concentrations. This provides the most robust and realistic information on the vapour inhalation exposure pathway. Evaluation of concentrations in groundwater is conducted to confirm stability or identify changes in conditions. The increased conservatism in the groundwater guidelines does not change the level of risk to receptors.

For soil, as part of the work conducted by Intrinsik (Intrinsik, 2025), Tier 2 soil guidelines protective of the vapour inhalation pathway were calculated for some areas of the site for depths below the default residential basement foundation depths of 2.44 mbgs (N1, N2, and S1, as shown on Drawing No. 4). These guidelines were developed in accordance with the CCME protocol (CCME, 2014) and AEPA guidance (AEPA, 2024a/b). For areas outside of N1, N2, and S1, and for all samples shallower than the default residential foundation, generic soil guidelines for the vapour inhalation pathway have been applied.

4.0 REMEDIAL OBJECTIVES EVALUATION AND ACTIVITIES FOR 2025

Remedial objectives are defined as the applicable guideline values for each CoC for the purposes of the protection of applicable present and future receptors at the site. The current and applicable regulatory framework documents are the Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines updated in 2024 (AEPA, 2024a,b), which supports the provisions outlined in the Alberta Contaminated Sites Policy Framework (AEPA, 2023). As the EPO does not specifically address the requirements for removal of areas of the site from the EPO, or remedial objectives specifically, the Alberta framework for contaminated sites is appropriate to define the path to closure through a Remediation Certificate for the site. A flowchart summary of the Framework for Contaminated Site Management in Alberta can be referenced in Appendix C.

As per the Framework, the identified CoCs and associated currently applicable remedial objectives have previously been determined for the Hounsfield Heights and Mall areas and are presented in the Human Health and Ecological Risk Assessment (HHERA) completed by Intrinsik (Intrinsik, 2017). Intrinsik subsequently completed an update to the soil vapour, groundwater and soil guidelines to comply with regulatory updates in 2024 (Intrinsik, 2025).

Given the remedial activities that have been completed for the site to date, evolving regulatory guidance and understanding of the current environmental conditions at the site, a review of the site's Remedial Objectives for the Hounsfield Heights and Mall area is in progress.

One such review in progress is to formally exclude the DUA pathway based on municipal bylaws. A request to exclude the DUA pathway based on municipal bylaws has been submitted to AEPA,

following approval received from The City of Calgary. A response from AEPA has not been received to-date. Below is a discussion of further work to be completed.

4.1 SITE MANAGEMENT AREA RE-EVALUATION

The site environmental management area has been re-evaluated in 2024 to review individual properties applicable to the EPO and MO management area within the Hounsfield Heights community. MEMS and Parsons have determined that certain properties no longer require further assessment, monitoring, or active management and, therefore, should be removed from the environmental management area. As such, the environmental management area has been divided into four areas, designated Zones 1 to 4. Zones 1 and 2 are considered appropriate to remove from the EPO management area, based on multiple factors. A detailed review of the applicability of Zones 1 and 2 for removal from the EPO, along with details about the characteristics of the remaining Zones 3 and 4, are presented in the MEMS report (MEMS, 2024a).

Drawing No. 4 provides the proposed Site Management Area updated boundaries and properties, based on the outer limits of Zones 3 and 4. As written approval is pending from AEPA, this report provides both the original site management area boundaries, and the proposed site management boundaries which encompass Zones 3 and 4 only.

Assessment of properties within the management area in the Hounsfield Heights area are on-going and may be updated in future RRPs. Continued assessment will continue for the Mall Area of the site and are presented in the following sections of this RRP.

4.2 2025 REMEDIAL OBJECTIVES ACTIVITIES

Parsons, in collaboration with MEMS, will complete the following activities in 2025:

- Upon approval by AEPA (pending), formally adopt the updated site management area boundaries under the MO, as presented by MEMS (MEMS, 2024a);
- Upon approval by AEPA (pending), update the Tier 2 guidelines to reflect the exclusion of the DUA pathway based on municipal bylaws, as presented by MEMS (MEMS, 2024b);
- Upon approval by AEPA (pending), temporarily deactivate the DPVE system and conduct an evaluation of plume stability;
- Continue ongoing review of the applicability of existing HHERA using additional data collected since the latest HHERA update;
- Continue ongoing evaluation of the site management area boundaries and properties included in the site management area;
- Continue evaluation of Remedial Objectives for the site; and if finalized,
- Submit an update to AEPA and request for approval of the updated Remedial Objectives for site closure.

5.0 RISK MANAGEMENT PLAN FOR 2025

The risk management plan has previously been established to monitor potential risk to receptors identified in the HHERA previously completed by Intrinsik (Intrinsik, 2017, 2019). The indoor inhalation exposure pathway is considered to be the main pathway of potential risk to human health for the site.

Previous risk management measures described within the Revised Remediation Plan - Version 4.0 (Clifton, 2022a) were adopted for the period from December 2022 to March 2025. The previously established risk management activities continue to be effective. Actions conducted in 2024 regarding potential soligenous groundwater are no longer recommended and will be removed for 2025, as discussed in Section 5.3. The risk management plan will continue to be applicable to the site until updated or the finalized remedial objectives have been met.

5.1 SOIL VAPOUR MONITORING PROGRAM

A soil vapour monitoring program will continue to be conducted in accordance with the requirements presented in the *Sears Canada Inc., Revised Soil Vapour Monitoring Program (Update Fall 2016), Hounsfield Heights and North Hill Mall, Calgary, Alberta*, completed by Clifton (Clifton, 2016), which includes a description of the Risk Management and Continency Plan (RM&C Plan) that addresses any exceedances identified within soil vapour at the site.

5.1.1 Conditions and Triggers (Contingency Plan) - Soil Vapour and Groundwater

Conditions and triggers as laid out in the RM&C Plan will continue to be followed in 2025, with the addition of the following:

- In groundwater, where concentrations exceed the Tier 2 vapour inhalation guideline and the depth to groundwater warrants, additional investigative work may be required such as installation and sampling of soil vapour wells and/or sub-slab vapour sampling, which are considered to give a closer estimation of risks to human health via the vapour inhalation pathway. The intent is to be proactive with any further investigative work.

5.1.2 Evaluation of Soil Vapour Well Network

On-going evaluation and optimization of the soil vapour well network will be conducted in 2025. Relevant wells will be replaced as needed. Wells will continue to be repaired as needed during field events.

5.1.3 Reporting Commitments

As per the MO, soil vapour sampling events will be conducted semi-annually in 2025, and activities and results of the sampling will be submitted the second month after the results of the laboratory analyses are received.

5.2 On-Going Assessment of Risk Via Inhalation Exceedances in Groundwater

Groundwater samples are collected from groundwater monitoring wells throughout the site on a semi-annual basis to monitor attenuation of CoCs over time and results are compared to groundwater inhalation guidelines to inform the soil vapour risk management program.

5.2.1 On-Going Review of Groundwater Sentinel Wells

Concentrations of CoCs in samples collected from groundwater monitoring wells will continue to be reviewed for exceedances of the applicable guidelines at least annually, to monitor attenuation toward compliance with remedial objectives, in addition to ensuring un-impacted sentinel wells continue to be present along the edges of the plume. In areas identifying the presence of groundwater inhalation exceedances, a review is completed semi-annually to ensure that associated soil vapour wells are sufficient to assess potential risk to human health for those areas. If deemed necessary following each review, additional soil vapour sampling or installation of soil vapour wells will be considered.

5.2.2 Evaluation of Groundwater Monitoring Well Network

On-going evaluation and optimization of the groundwater monitoring well networks will be conducted in 2025. Relevant wells will be replaced as needed. Wells will continue to be repaired as needed during field events.

5.2.3 Reporting Commitments

As per the MO, groundwater sampling events will be conducted semi-annually in 2025, and activities and results of the sampling will be submitted the second month after the results of the laboratory analyses are received.

5.3 Monitoring for Groundwater Seeps South of 10TH Avenue NW

As discussed in the HHERA, intermittent soligenous groundwater (seeps or springs) associated with stratigraphic Unit 3 was historically identified west-northwest of 10th Avenue NW in the parkland area. As the HHERA indicates, soligenous groundwater which may be potentially impacted with benzene may present a dermal contact and incidental ingestion risk. In 2017, Intrinsik derived a site-specific guideline of 0.8 mg/L for benzene that was designed to be protective of human health risks from soligenous groundwater. The maximum measured

benzene concentration in groundwater monitoring wells in the historical seep area in 2023 were within this guideline. As a supplemental action, Parsons attempted to find the areas of historical and potential seeps during several site visits in 2022, 2023, and 2024, however those areas were found to be consistently dry. No seeps, springs, saturated surface areas or iron precipitate staining were observed. Therefore, no further monitoring for the presence of seeps is warranted, and monitoring will be discontinued in 2025.

6.0 EVALUATION OF CURRENT REMEDIATION ACTIVITIES

Remedial activities conducted at the site historically and currently in progress are summarized below.

6.1 HISTORICAL REMEDIATION ACTIVITIES

As summarized in Appendix B, remediation activities were previously conducted in the vicinity of the former Sears service station and Mall area.

6.2 DUAL PHASE VAPOUR EXTRACTION SYSTEM

The existing DPVE system became operational in October 2010. Operations were suspended in early October 2010 due to noise concerns and, later, resumed on July 27, 2011. It has been operating at the site within the northern portion of the Hounsfield Heights Area for nearly 15 years. LPH has only been detected in one groundwater monitoring well (BH1704) intermittently since 2015 and was last detected in May of 2022. Locations of historical LPH and a summary of apparent thicknesses in BH1704 since 2015 are presented on Drawing No. 5. The operation of the DPVE system within the northern portion of the Hounsfield Heights Area appears to have been successful in removing free-phase LPH to the current extent that is practicable, which was the primary objective.

6.2.1 On-Site DPVE System Overview

Since 2015, LPH has only been detected at the site in one monitoring well (BH1704), and was last detected in BH1704 on May 31, 2022 (5 mm apparent thickness). LPH has not been detected during subsequent monitoring events. The system consists of underground headers connected to seven extraction wells (EX-1 through EX-7) and one groundwater monitoring well (BH1704) located in the northern portion of Hounsfield Heights Area on The City of Calgary property. A DPVE system layout is presented in Drawing No. 6.

Extraction Well #	Header ID
EX-1	1307
EX-2 and EX-3	1305
EX-4, EX-5 and BH1704	1303
EX-6 and EX-7	1301

Extraction headers EX-1, EX-2 and EX-3 were installed in the laneway, south of 13th Avenue NW; EX-4, EX-5 and BH1704 are located on 13th Avenue NW east of 16th Street NW; and, EX-6 and EX-7 are located on 16th Avenue NW, south of 13th Avenue NW. These extraction wells are reportedly screened from approximately 8 to 15 mbgs in the sandy silt and sand and silt of Unit 3. To the end of 2024, an estimated approximately 13,370 L of LPH (in vapour phase equivalents) have been extracted since the DPVE system commenced operations. In 2024, approximately 194 m^3 of groundwater was recovered, treated, and discharged.

The estimated average extraction rate of LPH in 2024 (in vapour phase equivalents) was approximately 1.7 L/day based on ongoing DPVE system monitoring of exhaust parameters performed by Sequoia in 2024. However, a DPVE System Assessment conducted by Parsons in 2024 calculated vapour phase equivalents from more reliable analytical data while conducting a test at extraction well EX-5, which is the closest extraction well to the last known area of LPH in BH1704 (Parsons, 2025). The assessment indicated that the estimated extraction rate was 0.026 L/day from EX-5, indicating that extraction rates for the DPVE system are currently more likely to be below 0.2 L/day.

6.3 PERMEABLE REACTIVE BARRIER

In December 2019, a Permeable Reactive Barrier (PRB) was installed along 11th Avenue SW that included both absorptive and bio-enhancement elements, specifically a commercially available carbon injectant product (PlumeStop and PlumeStop-S) and the oxygen release compound (Oxygen Release Compound-Advanced [ORC-A]) from Regenesis. This included 57 injection locations to a maximum depth of approximately 19.2 mbgs. The total length of the barrier was approximately 165 m and injection locations were spaced approximately 3.05 m apart. Pilot testing was completed prior to this in August 2016 involving nine injection points, at a depth range of 6.1 to 8.8 mbgs, and in September 2018 involving three injection points, at a depth range of 7.6 to 14.9 mbgs. The purpose of the PRB is to mitigate potential future migration of dissolved-phased hydrocarbons and treat dissolved-phased hydrocarbons as it migrated downgradient through the PRB.

An evaluation of the PRB performance has been included in the Annual Summary Report – 2024 by Parsons (Parsons, 2025). As discussed, concentrations of petroleum hydrocarbon constituents and 1,2-Dichloroethane (1,2-DCA) were reduced compared to pre-injection concentrations in those wells located immediately adjacent the PRB, and in many cases, concentrations have been reduced to less than or approaching the laboratory detection limits. For wells located further downgradient of the PRB, concentrations appear to be increasing or probably increasing in some wells but remain less than the Tier 2 site specific guidelines for the vapour inhalation pathway, with the exception of benzene in BH1979. This is attributed to migration of CoCs that were in groundwater in the area prior to the PRB installation. In summary, the PRB appears to be effective in reducing the concentrations of petroleum hydrocarbons and 1,2-DCA. Further evaluation will continue in 2025.

6.4 MICROBIAL MONITORED NATURAL ATTENUATION (MNA) AND AN EVALUATION OF BENZENE BIODEGRADATION RELATED TO BIOGEOCHEMICAL DATA

A comprehensive series of biogeochemical and geochemical analyses were conducted in 2023 and 2024 to directly evaluate microbial MNA at the site (Parsons, 2025c). Selected biogeochemical results are summarized on Drawing No. 7.

As a part of this analyses, a series of direct molecular evaluations was conducted to quantify both the microbial populations and the metabolic functions associated with the biodegradation of benzene in site groundwater. The goal was to determine if native bioattenuation was assisting with benzene degradation and, if so, the size of the responsible microbial communities and their functions. The microbial assessment included QuantArray® by Microbial Insights, Inc. and bacterial analysis of ORM-2 by SiREM, which has recently become a bacterium of interest among PHC biodegradation experts. Biodegradation of CoCs has been confirmed to be occurring at the site at moderate rates. It has been determined that ORM-2 is not a significant contributor to benzene biodegradation at this site and, therefore, it will no longer be assessed in 2025.

The analyses conducted in 2023 and 2024 indicates that in-situ microbial benzene biodegradation is currently occurring at this site. Together with groundwater geochemical data, which supports that subsurface conditions at the site remain favourable for the biodegradation of benzene, the 2023 and 2024 biogeochemical data confirms that in-situ biological degradation of benzene is occurring. Further discussion is presented in the CSM in Appendix B.

In 2025, monitoring for geochemical parameters will continue to be conducted. Evaluations for data collected up to 2024 is presented in the Annual Summary Report for 2024 by Parsons (Parsons, 2025), and summarized in the CSM in Appendix B.

In summary:

- Environmental geochemical conditions known to support and favour the activity of microbial populations known to biodegrade target compounds were observed;
- The 2024 subsurface geochemical conditions in the sampled monitoring wells appears generally consistent with the 2023 assessment, suggesting that subsurface environmental conditions are currently stable under current conditions at the site;
- There is a continued downward trend of benzene concentrations in many site monitoring wells over time;
- There is a confirmed presence of a microbial population known to biodegrade benzene; and,
- The confirmed presence of functional genes specifically involved in benzene biodegradation under the environmental conditions found at the site, which were found in almost all evaluated monitoring wells.

7.0 REMEDIATION PLAN UPDATE FOR 2025

Parsons has conducted an evaluation of the current remedial technologies previously implemented at the site, as detailed in previous sections of this RRP 6.0. In summary, significant removal of CoCs has occurred over previous years as a result of remedial activities, including remedial excavation and removal of some contaminated soils in the original source area (tank nest area), on-site soil treatment in the vicinity of the former Sears service station, treatment and removal of LPH with the long-term operation of the DPVE system, treatment of groundwater flowing through the PRB, and physical and biological processes that have effectively attenuated contaminant concentrations over time at the site.

Stability studies previously conducted by Clifton (Clifton, 2021), and conducted by Parsons and MEMS (Parsons 2025; MEMS, 2025), have indicated that the plume of CoCs is generally decreasing over time as visualized in Drawings No. 8 and 9. The plume north of the PRB is decreasing for all plume characteristics (contaminant mass, plume area, and average concentration for both benzene and 1,2 DCA) and has a stable centre of mass for both benzene and 1,2-DCA. In addition, concentrations of CoCs in soil vapour samples collected within the site management area, which are congruent with the former Sears service station plume, continue to be less than the applicable guidelines.

The plume south of the PRB is decreasing for all plume characteristics, however the overall plume centre of mass appears to be shifting southeast. This shift is attributed to the rapid attenuation that occurred in the upgradient portion of the plume (i.e. the area immediately downgradient of the PRB) following the installation of the PRB in 2019. It is expected that the PRB will continue to be an effective remedial technology at the site during 2025.

The operation of the DPVE system within the northern portion of the Hounsfield Heights Area appears to have been successful in removing free-phase LPH to the current extent that is practicable, which was the primary objective of the system. In addition, extraction rates have appeared to have reached asymptotic levels. As such, the DPVE system is proposed to be temporarily deactivated in 2025.

The current remediation plan, and proposed changes with associated plans, are detailed below.

7.1 DPVE System Temporary Deactivation

The temporary deactivation of the DPVE system is the reasonable next step to evaluate subsurface conditions at the site without the influence of the DPVE system. Upon AEPA approval, the DPVE system will be deactivated and winterized. The system will be temporarily deactivated for up to two years to monitor CoCs in soil vapour and groundwater, assessing for plume stability and rebound, and to evaluate natural attenuation at the site. The temporary deactivation is proposed to begin in Q2 of 2025, and the post-deactivation monitoring and sampling within the DPVE extraction area will commence. If there is no indication of applicable contaminants rebounding during the temporary deactivation, the system will be decommissioned in 2027 with AEPA approval.

As part of the rebound assessment, additional samples will be collected from soil vapour monitoring wells and soil vapour concentrations compared to the calculated guidelines or 90% of the guideline screening threshold values. As a note, pre-deactivation activities were conducted in 2024 to install additional soil vapour wells for this extraction area well network and gather baseline soil vapour analytical data and groundwater monitoring data. A description of the activities and results are presented in the DPVE Temporary Deactivation Monitoring Plan – Supplemental Information, dated March 27, 2025 (Parsons, 2025b). A description of the soil vapour well installations can be referenced in the supplemental Phase II ESA report by Parsons (Parsons, 2025c).

7.1.1 DPVE Extraction Area Monitoring Plan and Frequency

In the Q2 of 2025, with AEPA approval, the DPVE system will be temporarily deactivated and winterized (to protect its components and allow for reactivation as required), based on the purposes and trigger conditions outlined in the RRP, Version 5.0 (Parsons, 2024a).

Following the temporary deactivation of the DPVE system, monitoring and sampling events from the extraction area monitoring well network will commence. Each event will consist of sampling the seven soil vapour monitoring wells for concentrations of petroleum hydrocarbon constituents, 1,2 DCA, and naphthalene. In addition, the ten groundwater monitoring wells will be monitored for subsurface vapour concentrations, water levels, and the possible apparent thickness of LPH. The DPVE extraction area well network is presented on Drawing No. 10.

Following the temporary deactivation of the DPVE system, the frequency of each monitoring event will generally take place as follows:

First Quarter of Year 1	Every One Month (three events)
Second and Third Quarters of Year 1	Every Two Months (three events)
Fourth Quarter of Year 1	Every Three Months (one event)
Year 2	Every Three Months (four events)

The frequency and wells within the extraction area well network (i.e. area of EX-1 through EX-7 and BH1704) will be assessed after each monitoring event during the deactivation period and may be optimized as warranted, in consultation with AEPA. This supplemental information will be included in forthcoming Remediation Plan updates for the site.

7.1.2 Remedial Extraction System Trigger Conditions and Actions

During the temporary deactivation, the site will be monitored for certain triggers that may indicate increased risk through the soil vapour inhalation pathway. These triggers may warrant the restarting of the DPVE system or the use of an alternative remedial system(s) to manage possible increasing risk to human health and/or mitigate plume expansion while other technologies and options are assessed.

The following actions will be taken based on the following triggers:

SOIL VAPOUR TRIGGERS AND ACTIONS

- Any exceedance for soil vapour in the DPVE system extraction area would trigger actions as identified in the RM&C plan, with the exception of exceedances noted in the deeper nested soil vapour wells which were installed close to the groundwater table (the nested shallow well installed closer to basement level would more accurately represent risk).

- The soil vapour well(s) with the exceedance will be sampled again without undue delay (i.e. within 10 days) of receipt of the original analytical data, and then monthly for a further two months to determine if the result is anomalous or persists. If the deeper well of a nested pair, the shallow well will also be sampled.

- If the exceedances persist, investigations will commence to determine if the exceedance may be a result of the deactivation of the DPVE, or another factor. The proposed investigation plan will be shared with AEPA and will include a timeline. Additional investigations may include additional soil vapour probe installation (including nested probes), increased groundwater sampling, and/or investigation of potential surface

sources or spills through soil and groundwater sampling. If the evaluation indicates that the increase in vapour concentrations is related to the DPVE system deactivation, either the system will be restarted or an alternative technology, such as vapour extraction utilizing the existing network of extraction wells, will be deployed, with notification to AEPA.

LPH TRIGGERS AND ACTIONS

- If there are observations of the presence of LPH in monitoring wells located within the DPVE extraction area, then the monitoring of those groundwater monitoring well(s) containing LPH will be increased to monthly until five consecutive monitoring events are completed without observable LPH.

- Should there be LPH observed in the monitoring wells located within the DPVE extraction area with increasing apparent thicknesses over three of the five monitoring events, then a review will take place to determine if the DPVE system is necessary to control migration.

- If the review warrants an immediate action to mitigate migration, the DPVE system will be re-activated, or an alternative technology employed, within two weeks of the data results being received, with notification to AEPA within this timeframe.

These conditions preclude anomalous single events or data errors, and account for oscillations around the plume core in reaction to rainfall levels and other dynamic and seasonal factors.

7.2 ON-GOING USE OF PERMEABLE REACTIVE BARRIER

As discussed in Section 6.3, the performance of the PRB will continue to treat groundwater in the southern portion of the site as an effective remedial technology in 2025.

8.0 FUTURE WORK AND REVISIONS TO THE PROGRAM

Revisions or refinement to the items outlined below may be proposed as the continued evaluation of the site data and information is completed.

The following work is proposed for 2025:

Activity	Description	Schedule/ Implementation
Plume Monitoring and Risk Management	• Continued semi-annual groundwater sampling.	• May and September 2025
	• Continued assessment of dissolved trends in groundwater, including statistical analysis and continued assessment of overall plume stability.	• Annual report (March 31, 2026)
	• Continued sampling and assessment of natural attenuation parameters in groundwater.	• Annual report (March 31, 2026)
	• Continued semi-annual soil vapour sampling; ongoing review of soil vapour data as it is collected and compared to the 90% screening threshold as per the RM&C plan.	• April and October 2025
	• Second attempt to replace groundwater well BH1956 in laneway.	• Q3 2025
	• Re-evaluation of the remedial objectives (guidelines), including the approval from AEPA to eliminate the domestic use aquifer exposure pathway.	• On-going
	• Evaluation and optimization of both the groundwater monitoring well and soil vapour well network.	• On-going
	• Characterization of residual concentrations of contaminants of concern, and their distribution at the Mall Area.	• On-going
	• Monitoring for the presence of seeps is discontinued in 2025.	• Not applicable
Remedial Activities	• Continued operation of the DPVE system until proposed temporary deactivation is approved by AEPA.	• Q1, Q2 2025
	• Temporary DPVE system deactivation monitoring and soil vapour sampling plan (Section 7.1) at the prescribed frequency.	• Q2 2025
	• Assessment of the effectiveness of the PRB, including evaluation of concentration trends in the vicinity of the PRB.	• On-going
Communication	• Community bulletins.	• Q1, Q2, Q3, and Q4 2025
	• Communication strategy.	• On-going

9.0 LIMITATION OF LIABILITY, SCOPE OF REPORT AND THIRD-PARTY RELIANCE

This report has been prepared and the work referred to in this report has been undertaken by Parsons for Suncor Energy Products Partnership (Suncor). It is intended for the sole and exclusive use of Suncor Energy Inc., its affiliated companies and partners and their respective insurers, agents, employees and advisors (collectively, "Suncor"). Any use, reliance on or decision made by any person other than Suncor based on this report is the sole responsibility of such other person. Suncor and Parsons make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigations undertaken by Parsons with respect to this report and any conclusions or recommendations made in this report reflect Parsons' judgement based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information examined at the time of preparation of this report. This report has been prepared for specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed in the report. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by this investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

Other than by Suncor, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of Parsons. Nothing in this report is intended to constitute or provide a legal opinion.

10.0 CLOSURE

We trust the foregoing information is satisfactory for your requirements. If there are any questions or concerns regarding this report, please do not hesitate to contact the undersigned.

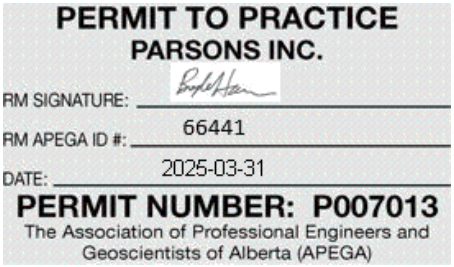
Respectfully submitted,

PARSONS INC.

Michelle S. Patterson, P.Tech.(Eng.)

Ajay Tumber, P.Eng. (British Columbia)

Boyde Hann, P.Geol.



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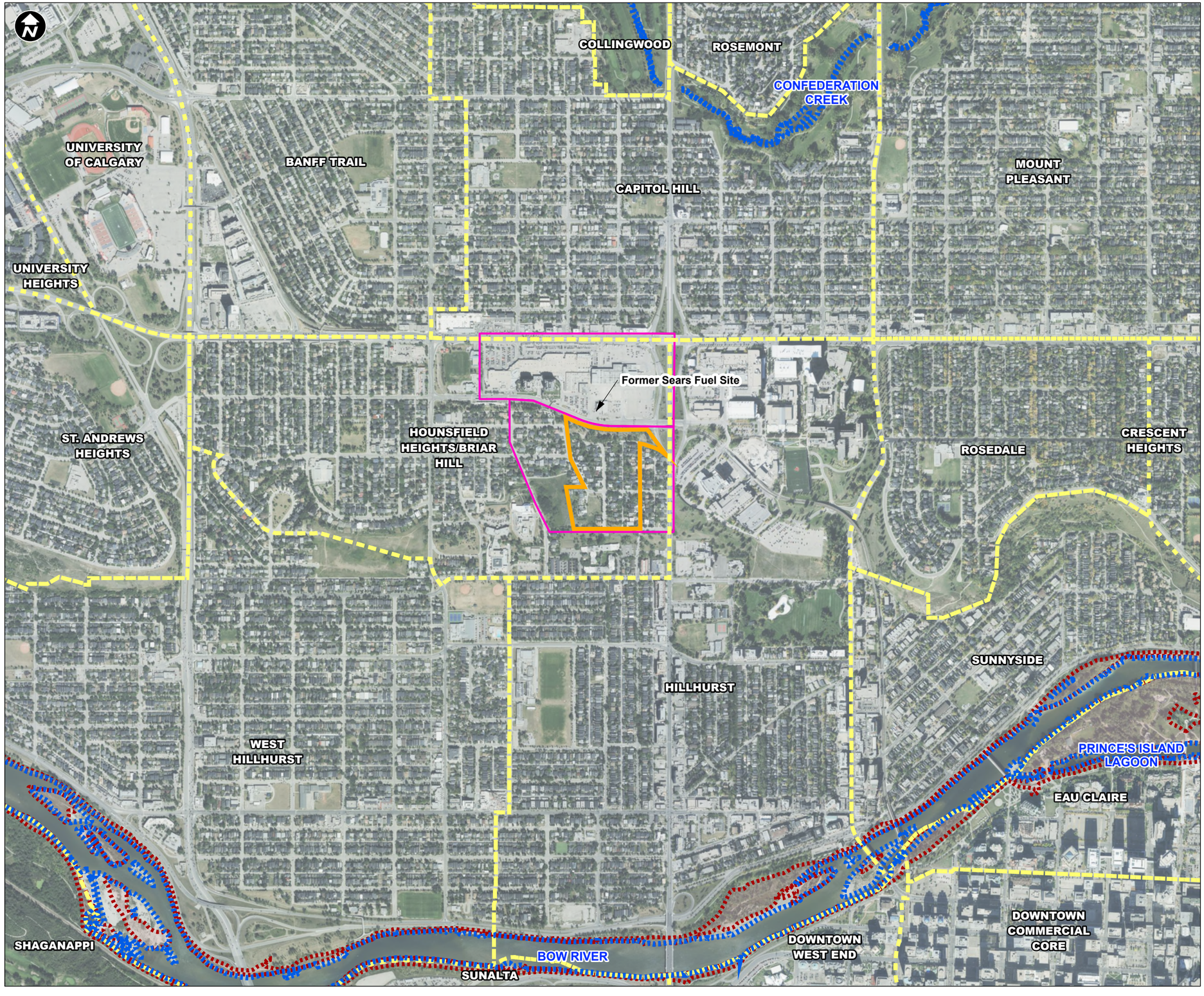

LEGEND

- Study Area
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Water Body
- Neighborhood Boundaries
- Floodway

0 500 1,000
Metres

Notes:
- The ArcGIS Map Service based on City of Calgary Basemap (WMASP).
- The orthophoto based on City of Calgary Basemap (WMASP), June-September 2023.
- Water bodies from City of Calgary Open Data Portal, Hydrology dataset, downloaded February 2025.
- Floodway from City of Calgary Open Data Portal, Regulatory Flood Hazard dataset, downloaded February 2025.
- Neighborhoods from City of Calgary Open Data Portal, Community Boundaries dataset, downloaded February 2025.

Site and Surrounding Area

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 25-Feb-2025
PARSONS		Drawing No.: 1

Document Path: C:\Z_Drive\10-12832\APRX\Site_Plans\12832_Site_and_Surrounding_Area.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

LEGEND

- Grade Elevation Contour (masl) (1m interval)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)

0 25 50 100
Metres

Notes:
- The orthophoto based on City of Calgary Basemap (WMASP), June-September 2023.
- Elevation data based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.

Area Topography

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC/XL	Ref. No.: 10-12832
	Reviewed By: MP	Date: 27-Mar-2025
PARSONS		Drawing No.: 2

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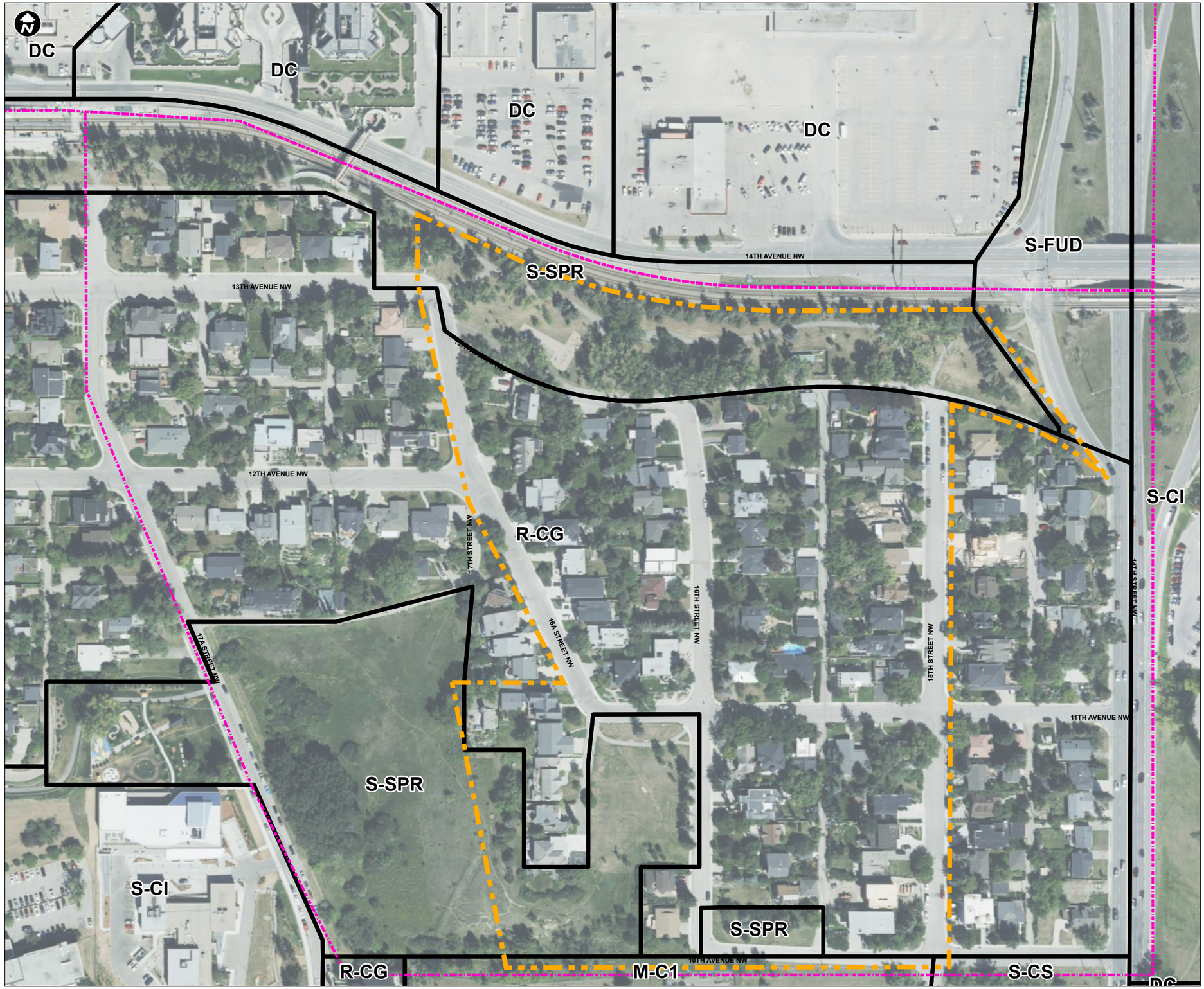
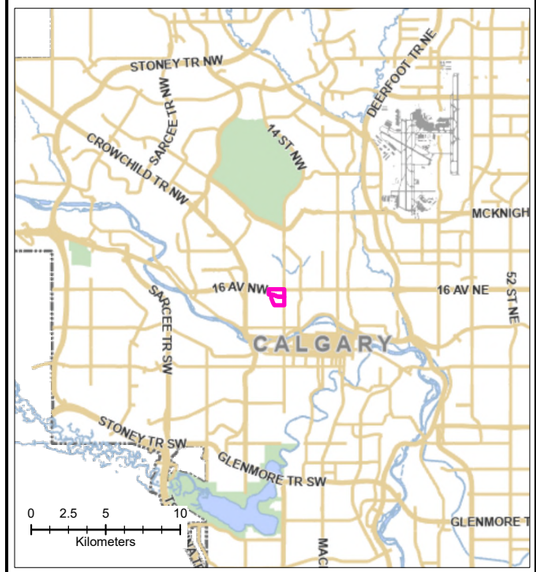


LEGEND

- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- City Of Calgary Zoning

Land Use Districts:

R-C1 (Residential - Contextual One Dwelling)
M-C1 (Multi-Residential - Contextual Low Profile)
M-CG (Multi-Residential - Contextual Ground Oriented)
C-COR1 (Commercial - Corridor 1)
C-COR2 (Commercial - Corridor 2)
S-SPR (Special Purpose - School, Park and Community Reserve)
S-CI (Special Purpose - Community Institution)
S-CS (Special Purpose - Community Service)
S-FUD (Special Purpose - Future Urban Development)
DC (Direct Control District)



0 37.5 75 150
Metres

Notes:
- The ArcGIS Map Service based on City of Calgary Basemap (WMASP).
- The orthophoto based on City of Calgary Basemap (WMASP), June-September 2023.
- Land Use District data based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded February 2025.

Zoning Map

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC/XL	Ref. No.: 10-12832
	Reviewed By: MP	Date: 31-Mar-2025
PARSONS		Drawing No.: 3

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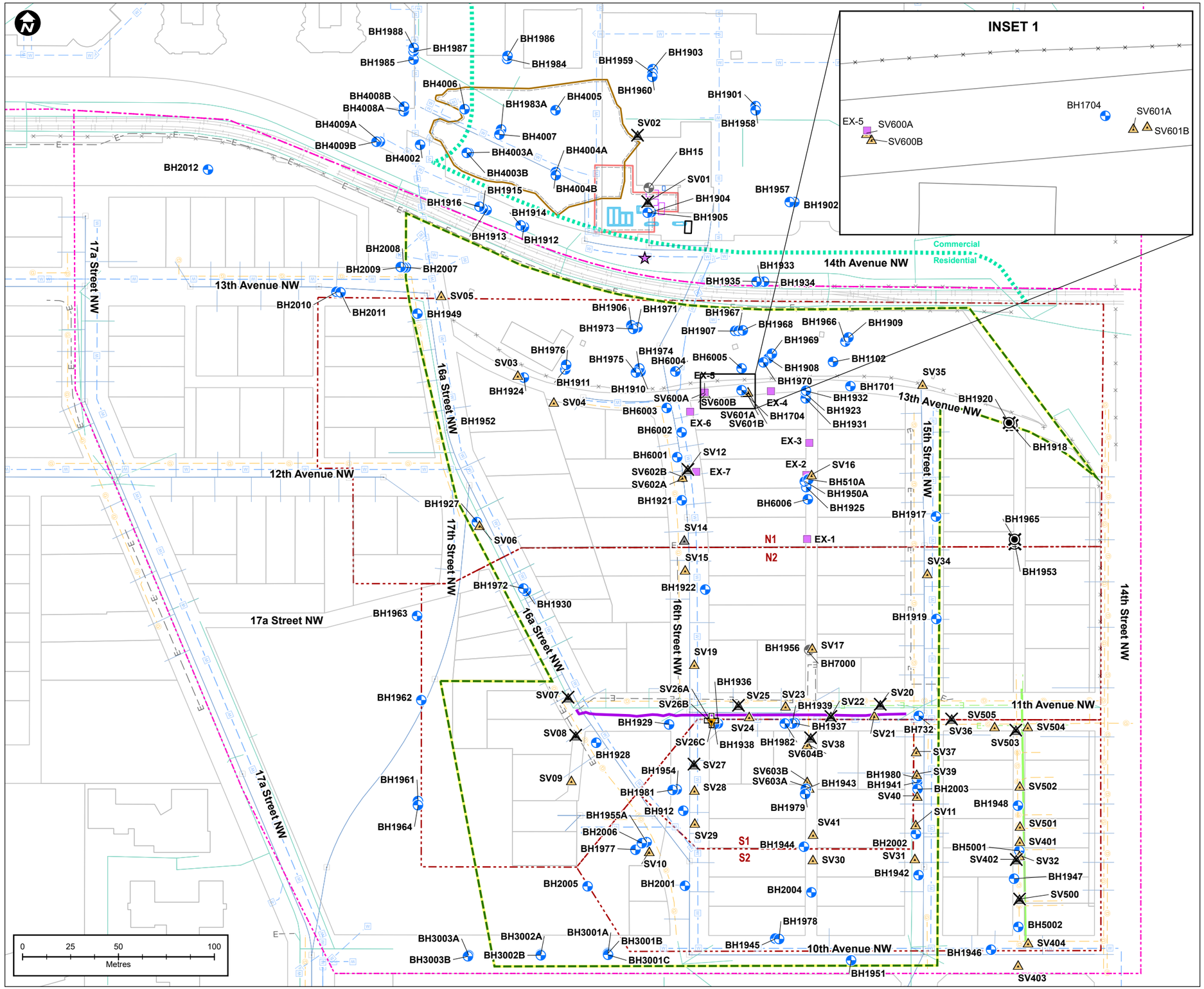

LEGEND

- Borehole (No Monitoring Equipment Installed)
- Extraction Well
- Monitoring Well
- Monitoring Well-Damaged
- Monitoring Well-Decommisioned
- Soil Vapour Probe
- Soil Vapour Probe (Nested)
- Soil Vapour Probe (Sub-slab)
- Soil Vapour Probe-Decommisioned
- Soil Vapour Probe-Damaged
- Soil Vapour Probe-Destroyed
- Utility Trench Excavation Area
- Waste Oil UST
- UST as indicated on 1963 Fire Insurance Plan
- USTs noted on a 1985 Simsons-Sears Contract Drawing
- Former Facilities (Kiosk, Pump Islands, USTs) Decommissioned 1995
- LRT Tracks
- Water
- Storm Sewer
- Sanitary Sewer
- Gas Line
- Overhead Electrical
- Underground Electrical
- Unconfirmed Electrical (Overhead or Underground)
- Tier 2 vapour inhalation pathway groundwater guideline area (N1, N2, S1, S2)
- Residential/parkland 30 m buffer
- Permeable Reactive Barrier (Dec. 2019)
- Former Tank Nest Excavation Area (2003)
- Former Remedial Excavation Extent (2006/2007)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)

Notes:
- Soil vapour wells on private property are not shown.
- The remedial excavation that took place in 1989 is not reflected on the drawing as the exact excavation limits are unknown. This area appears to be included within the subsequent 2003 excavation.
- Remedial excavations that took place in 2004 are not reflected on the drawing as the exact excavation limits are unknown. These areas appear to be included within the subsequent 2006/2007 excavation.

References:
- Well locations, on-site features provided as AutoCAD file by Clifton Engineering Group Inc..
- Property parcel data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.
- Utility data based on City of Calgary's Open Data Portal (City Online, Geospatial Data service, 2023), City of Calgary Block Profiles (City Online, 2024), and private utility locate sweeps near the SV500 series conducted in December 2022.

Site Plan

Groundwater Monitoring and Soil Vapour Well Locations

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 27-Mar-2025
PARSONS		Drawing No.: 4

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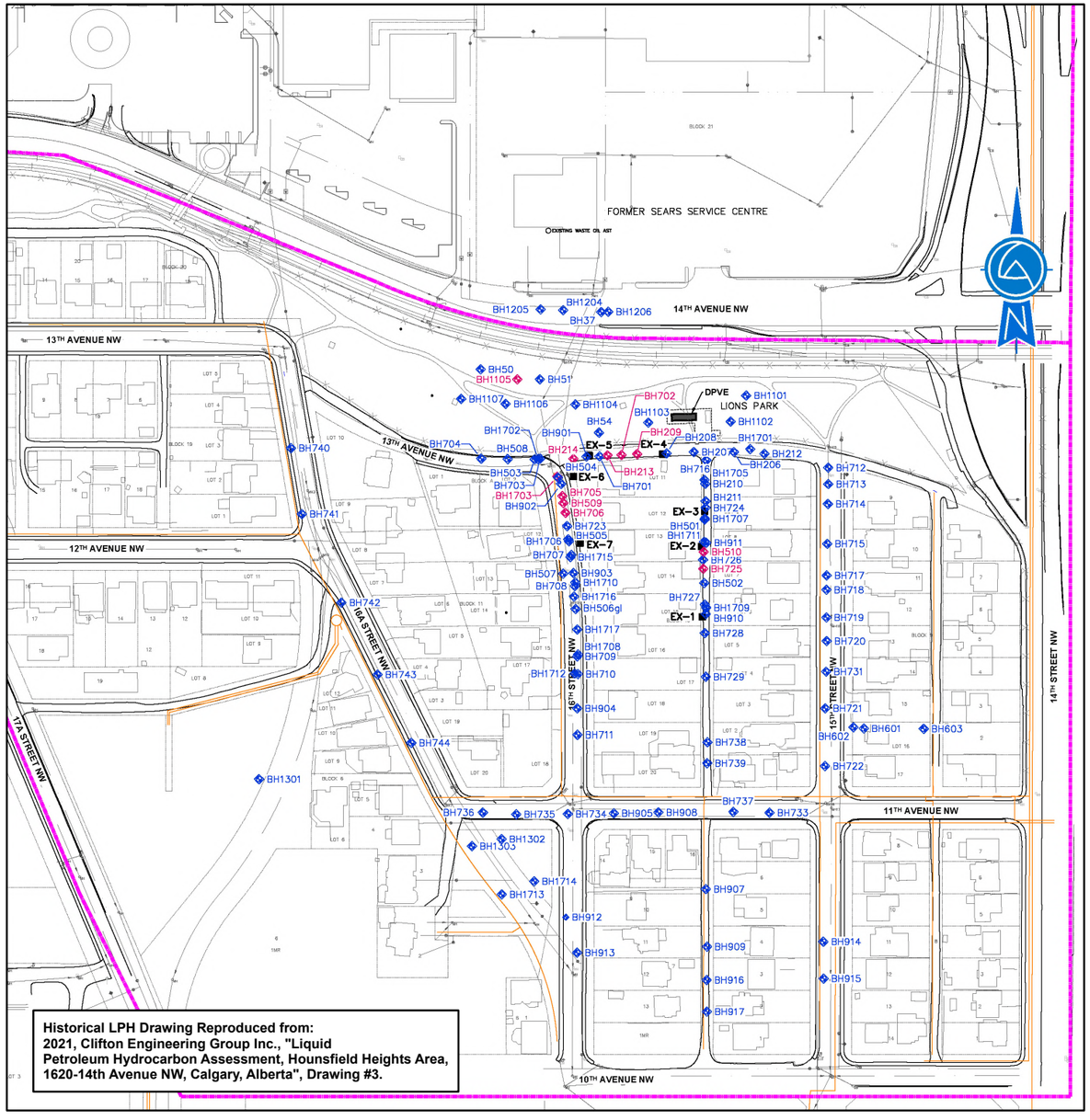
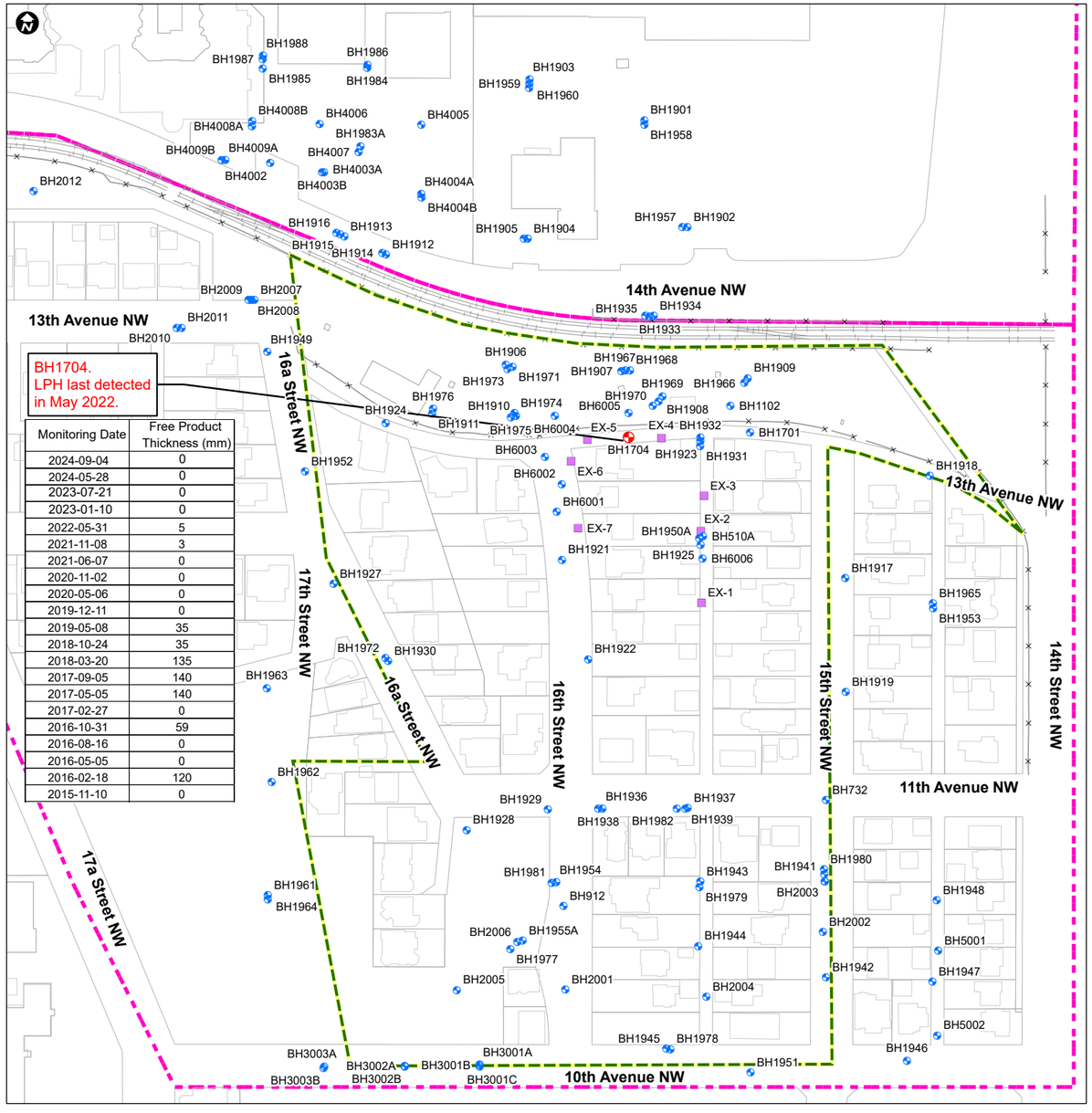
Historical LPH Detected in Monitoring Wells (on One or More Dates between 1998 and 2014)



Historical LPH Drawing Reproduced from:
2021, Clifton Engineering Group Inc., "Liquid Petroleum Hydrocarbon Assessment, Hounsfield Heights Area, 1620-14th Avenue NW, Calgary, Alberta", Drawing #3.

Historical LPH Detected in Monitoring Wells (on one or more dates between 2015 to 2024



Monitoring Date	Free Product Thickness (mm)
2024-09-04	0
2024-05-28	0
2023-07-21	0
2023-01-10	0
2022-05-31	5
2021-11-08	3
2021-06-07	0
2020-11-02	0
2020-05-06	0
2019-12-11	0
2019-05-08	35
2018-10-24	35
2018-03-20	135
2017-09-05	140
2017-05-05	140
2017-02-27	0
2016-10-31	59
2016-08-16	0
2016-05-05	0
2016-02-18	120
2015-11-10	0

LEGEND

- Monitoring Well - no LPH since 2015
- Monitoring Well with LPH on any date after 2015
- Extraction Well
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Groundwater Monitoring Well (1998 to 2014, Clifton)
- Groundwater Monitoring Well Containing LPH (1998 to 2014, Clifton)

Summary of Historical Liquid-Phase Hydrocarbon Locations (1998 to 2024)

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: MP	Date: 12-Feb-2025
PARSONS		Drawing No.: 5

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DPVE

1301

1303

1305

1307

13th Avenue NW

16th Street NW

Screen interval 10.6 to 13.72 mbgs

EX-5

BH1704

EX-4

Screen interval 9.1 to 13.7 mbgs

Screen interval 10.3 to 13.72 mbgs

EX-6

Screen interval 10.6 to 13.11 mbgs

EX-3

Screen interval 10.3 to 13.72 mbgs

EX-7

Screen interval 11.5 to 15.85 mbgs

EX-2

Screen interval 8.8 to 13.41 mbgs

Screen interval 11.7 to 14.63 mbgs

EX-1

0 5 10 20
Metres

LEGEND

- Monitoring Well
- Extraction Well
- Site Boundary
- Sanitary Sewer
- Gas Line
- Water Line
- Fence
- Extraction Network
- 1301 Header ID

Notes:
- System configuration provided by Clifton Engineering Group Inc.; Drawing #4 in report: "Liquid Petroleum Hydrocarbon Assessment, Hounsfield Heights Area, 1620 14th Ave NW, Calgary, Alberta, 29 June 2021."
- Well locations, on-site features provided as AutoCAD file by Clifton Engineering Group Inc..
- Property parcel data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.
- Utility data based on City of Calgary's Open Data Portal (City Online, Geospatial Data service, 2023), City of Calgary Block Profiles (City Online, 2024), and private utility locate sweeps near the SV500 series conducted in December 2022.

Dual Phase Vapour Extraction System Configuration

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: MP	Date: 05-Mar-2025
PARSONS		Drawing No.: 6

Document Path: C:\Z_Drive\10-12832\APRX\20241128 32_DPVE_Configuration_Feb2025.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH4008A	10.5 - 12.0	3	7/11/2023	<0.00040	1.56E+02	8.81E+03	9.85E+03	1.42E+04	2.10E+03	<4.70	5.41E+06

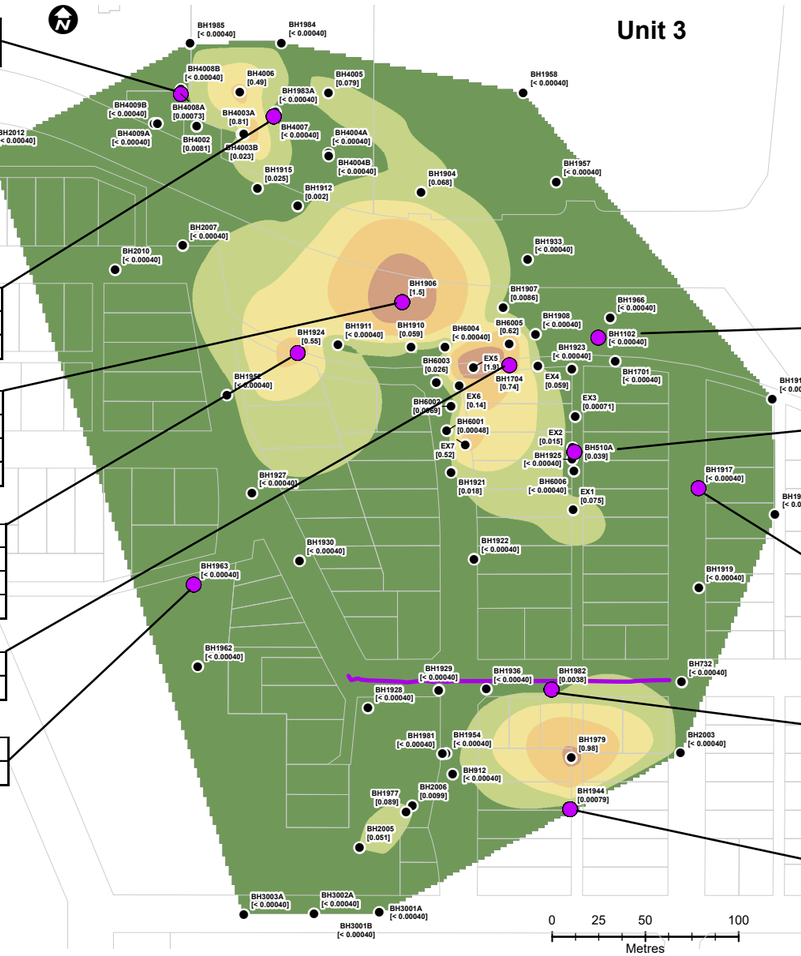
Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH4007	10.6 - 12.1	3	9/3/2024	-	<0.700	1.30E+04	9.60E+02	2.90E+02	1.00E+03	<0.700	5.20E+05
			9/9/2024	0.41	-	-	-	-	-	-	-

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1906	11.6 - 19.2	3	7/11/2023	1.2	1.51E+03	1.14E+02	1.33E+01	4.50E+01	1.25E+02	<5.30	4.41E+04
			9/3/2024	-	<0.760	<0.760	<0.760	<0.760	<0.760	<0.760	6.10E+03
			9/11/2024	0.41	-	-	-	-	-	-	-

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1924	14.9 - 19.8	3	7/13/2023	0.96	<7.70	4.15E+03	6.69E+02	1.35E+03	5.84E+02	<7.70	8.67E+05
			9/3/2024	-	<0.790	1.20E+03	4.90E+02	3.30E+02	3.40E+02	<0.790	3.20E+05
			9/11/2024	0.16	-	-	-	-	-	-	-

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1704	9.1 - 13.7	3	6/27/2024	0.56	<0.250	5.10E+05	2.00E+05	5.70E+05	2.40E+03	<0.250	1.21E+07

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1963	5.5 - 11.3	3	7/11/2023	<0.00040	6.80	<4.70	<4.70	<4.70	<4.70	<4.70	1.04E+04



Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1102	7.6 - 15.2	3	7/13/2023	<0.00040	<4.60	<4.60	<4.60	<4.60	<4.60	<4.60	1.96E+04

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH510A	11.3 - 17.4	3	6/27/2024	0.051	<0.250	9.20E+04	5.80E+04	3.20E+05	5.70E+03	<0.250	4.10E+06

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1917	8.8 - 16.2	3	7/11/2023	<0.00040	<4.60	3.30	<4.60	<4.60	1.40	<4.60	2.67E+03

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1982	1.5 - 7.9	3	7/13/2023	0.098	<4.60	1.46E+04	9.43E+03	1.23E+04	3.10E+03	1.73E+02	2.96E+06

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1944	5.9 - 7.6	3	7/5/2023	0.011	1.79E+01	4.44E+03	6.69E+03	1.19E+04	6.83E+02	<4.70	1.84E+06
			5/24/2024	0.00079	-	-	-	-	-	-	-
			6/27/2024	-	<0.250	2.00E+02	7.90E+01	1.90E+02	1.30E+02	<0.250	6.20E+04

LEGEND

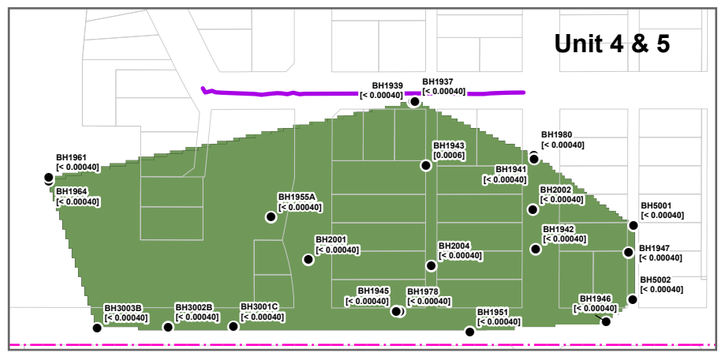
- Monitoring Well Sampled for Microbiological Parameters
- Permeable Reactive Barrier (2019)

Benzene (mg/L) May 2024:

- <= 0.05
- >0.05 - 0.2
- >0.2 - 0.4
- >0.4 - 0.8
- >0.8 - 1.5
- >1.5 - 2
- > 2

[1.5] Benzene Concentration (mg/L)

"-" denotes not analyzed
Benzene concentration is in mg/L
Phenol Hydroxylase (PHE) (cells/mL)
Toluene / Benzene Dioxygenase (TOD) (cells/mL)
Toluene 2 Monooxygenase / Phenol Hydroxylase (RDEG) (cells/mL)
Toluene Ring Hydroxylating Monooxygenases (RMO) (cells/mL)
Benzoyl Coenzyme A Reductase (BCR) (cells/mL)
Benzene Carboxylase (ABC) (cells/mL)
Total Eubacteria (EBAC) (cells/mL)



Microbiological Analysis - Summary of Selected Results (2023, 2024)

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: SLD/XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 15-Nov-2024
PARSONS		Drawing No.: 7

Document Path: C:\Z_Drive\10-12832\APRX\Heat_Maps\12832_GW_Benzene_Heat_Map_and_ MNA_POP_Nov2024.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

May 2015

May 2016

May 2017

April 2018

May 2019

May 2020

June 2021

June 2022

July 2023

May 2024

Sept. 2024

LEGEND

- Monitoring Well Sampled
- Site Boundary
- Permeable Reactive Barrier (2019)

Benzene (mg/L)

- <= 0.05
- >0.05 - 0.5
- >0.5 - 1.0
- >1.0 - 1.5
- >1.5 - 2.0
- >2.0 - 3.5
- >3.5 - 6.0
- >6.0 - 9.0
- > 9.0

Notes:

- The PRB was installed in 2019, with pilot tests in 2016 and 2018. The DPVE system has been in operation generally from 2010/2011 to the current date.
- Analytical data was collected at the specified locations and sampling dates; concentrations at locations that were not investigated may differ.
- Sample duplicates are not shown.
- 2023/2024 analytical data collected by Parsons; 2022 and prior data by Clifton Associates.

0 100 200 400

Metres

Historical Summary of Benzene Concentrations in Unit 3 2015 - 2024

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: 8

May 2015

May 2016

May 2017

April 2018

May 2019

May 2020

June 2021

June 2022

July 2023

May 2024

Sept. 2024

LEGEND

- Monitoring Well Sampled
- Site Boundary
- Permeable Reactive Barrier (Nov/Dec 2019)

1,2-Dichloroethane (mg/L)

- <= 0.008
- >0.008 - 0.04
- >0.04 - 0.07
- >0.07 - 0.09
- >0.09 - 0.12
- >0.12 - 0.14
- >0.14 - 0.17
- >0.17 - 0.2
- > 0.2

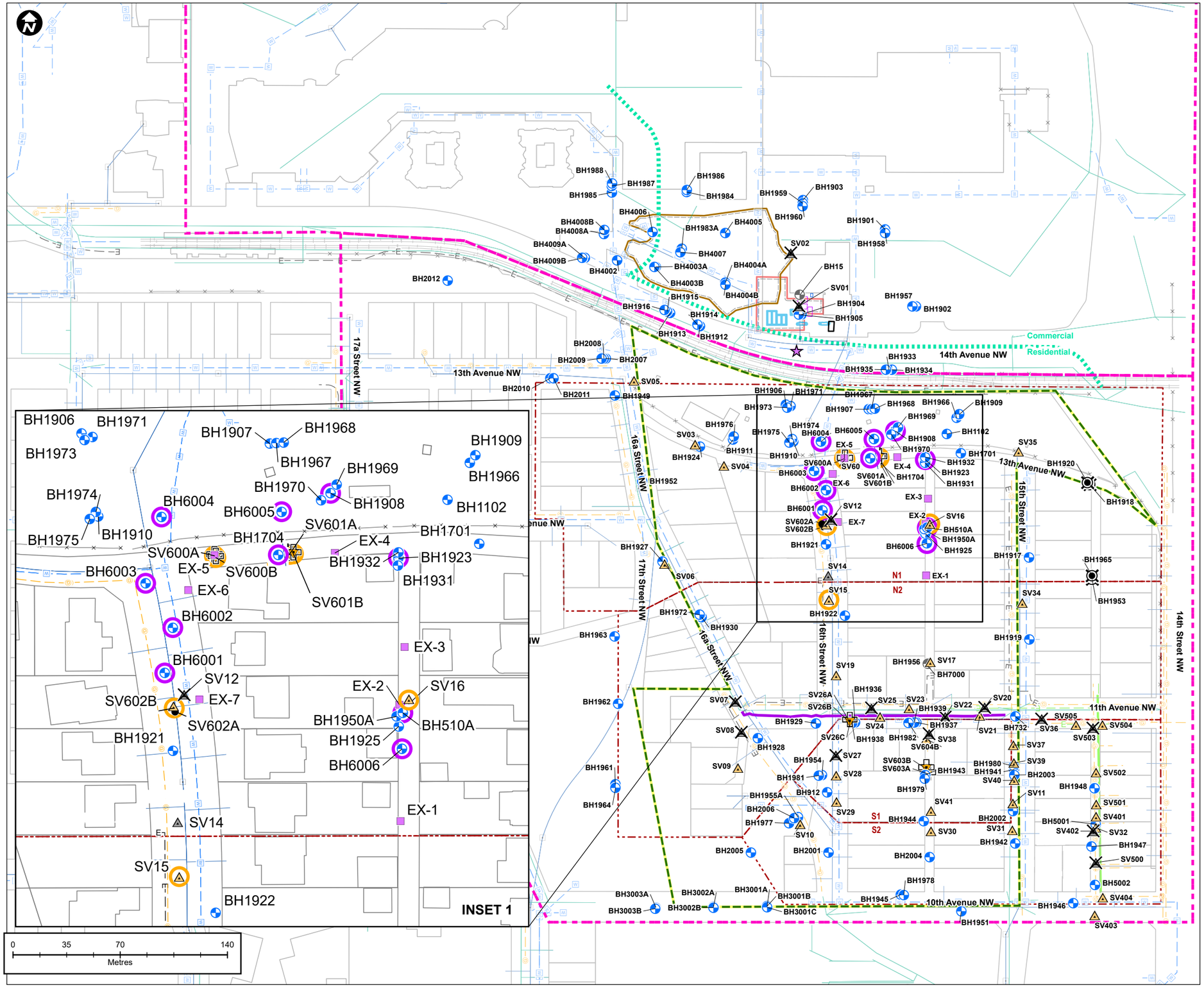
Notes:
- The PRB was installed in 2019, with pilot tests in 2016 and 2018. The DPVE system has been in operation generally from 2010/2011 to the current date.
- Analytical data was collected at the specified locations and sampling dates; concentrations at locations that were not investigated may differ.
- Sample duplicates are not shown.
- 2023/2024 analytical data collected by Parsons; 2022 and prior data by Clifton Associates.

0 100 200 400
Metres

Historical Summary of 1,2-Dichloroethane Concentrations in Unit 3 2015 - 2024

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: 9



LEGEND

- Borehole (No Monitoring Equipment Installed)
- Monitoring Well (10 Total) to Monitor and Dip for Presence of LPH
- Soil Vapour Well (7 Total) to Sample
- Extraction Well
- Monitoring Well
- Monitoring Well-Damaged
- Monitoring Well-Decommisioned
- Soil Vapour Probe
- Soil Vapour Probe (Nested)
- Soil Vapour Probe (Sub-slab)
- Soil Vapour Probe-Decommisioned
- Soil Vapour Probe-Damaged
- Soil Vapour Probe-Destroyed
- Utility Trench Excavation Area
- UST as indicated on 1963 Fire Insurance Plan
- USTs noted on a 1985 Simsons-Sears Contract Drawing
- Waste Oil UST
- Former Facilities (Kiosk, Pump Islands, USTs) Decommissioned 1995
- LRT Tracks
- Water
- Storm Sewer
- Sanitary Sewer
- Gas Line
- Overhead Electrical
- Underground Electrical
- Unconfirmed Electrical (Overhead or Underground)
- Tier 2 vapour inhalation pathway groundwater guideline area (N1, N2, S1, S2)
- Residential/parkland 30 m buffer
- Former Remedial Excavation Extent (2006/2007)
- Former Tank Nest Excavation Area (2003)
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Site Boundary

Notes:
- Soil vapour wells on private property are not shown.
- The remedial excavation that took place in 1989 is not reflected on the drawing as the exact excavation limits are unknown. This area appears to be included within the subsequent 2003 excavation.
- Remedial excavations that took place in 2004 are not reflected on the drawing as the exact excavation limits are unknown. These areas appear to be included within the subsequent 2006/2007 excavation.

References:
- Well locations, on-site features provided as AutoCAD file by Clifton Engineering Group Inc..
- Property parcel data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.
- Utility data based on City of Calgary's Open Data Portal (City Online, Geospatial Data service, 2023), City of Calgary Block Profiles (City Online, 2024), and private utility locate sweeps near the SV500 series conducted in December 2022.

Temporary DPVE Deactivation Plan

Groundwater Monitoring and Soil Vapour Sampling Locations

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 12-Feb-2025
PARSONS		Drawing No.: 10

Document Path: C:\Z_Drive\10-12832\APRX\Site_Plans\12832_SitePlan_2024_NewLocations.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

APPENDIX A

ALBERTA ENVIRONMENT AND PARKS
ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT
AND
MINISTERIAL ORDER 09/2020

ALBERTA
ENVIRONMENT AND PARKS

Office of the Minister
Government House Leader
MLA, Rimbey-Rocky Mountain House-Sundre

Ministerial Order
09 /2020

Environmental Protection and Enhancement Act
R.S.A. 2000, c. E-12

Order Respecting Environmental Appeals Board Appeal Nos. 17-069-070 and 18-013

I, Jason Nixon, Minister of Environment and Parks, pursuant to section 100 of the *Environmental Protection and Enhancement Act*, make the order in the attached Appendix, being an Order Respecting Environmental Appeals Board Appeal Nos. 17-069-070 and 18-013.

Dated at the City of Edmonton, in the Province of Alberta, this 5 day of Feb, 2020.

Jason Nixon
Minister

323 Legislature Building, 10800 97 Avenue, Edmonton, Alberta AB Canada Telephone 780-427-2391 Fax 780-422-6259

Appendix

Order Respecting Environmental Appeals Board
Appeal Nos. 17-069-070 and 18-013

With respect to the decision of the Director, Regional Compliance, South Saskatchewan Region, Alberta Environment and Parks (the "Director"), to issue Enforcement Order No. EPO-2018/01-SSR (the "EPO") and Amendment No. 2 to EPO-2018/01-SSR, I, Jason Nixon, Minister of Environment and Parks, order that:

1. The decision of the Director to name Sears Canada Inc. and Suncor Energy Inc. as parties to the EPO and the amendments thereto is confirmed.

2. The decision of the Director to name Concord North Hill GP Ltd. as a party to the EPO and the amendments thereto is reversed, such that Concord North Hill GP Ltd. is not a party to the EPO and amendments thereto.

3. The decision of the Director not to name BIM North Hill Inc. and Bentall Kennedy Prime Canadian Property Fund Ltd. as parties to the EPO and the amendments thereto is confirmed.

4. Amendment No. 3 to EPO-2018/01-SSR dated the 15th day of November 2019, which is a consolidation of the EPO, Amendment No. 1 to EPO-2018/01-SSR, and Amendment No. 2 to EPO-2018/01-SSR, is amended by deleting the portion of the order that reads:

   "1. The Parties shall immediately recommence the semi-annual soil vapour monitoring..."

   to and including

   "12. The Parties shall post on the communications website:
   a. regular status updates
   b. copies of all finalized and stamped sampling and monitoring reports
   c. a summary of the results of the posted finalized and stamped reports"

   and replacing it as follows:

   "1. The Parties shall immediately recommence the semi-annual soil vapour monitoring (high and low water table events) as described in the Soil Vapour Monitoring Program, (including a sampling event prior to April 30, 2018).

   2. The Parties shall immediately recommence the Groundwater Sampling and Monitoring Program, as described in the most recent program demonstrated in the 2017 Second Quarter Groundwater Monitoring and Sampling Report, July 14, 2017.

   3. The Parties shall complete the delineation of the presence of liquid petroleum hydrocarbons in the Hounsfield Heights neighbourhood, as outlined in the Clifton Report and in accordance with the Remediation Plan approved by the Director, within 18 months of the date of the Ministerial Order issued in EAB Appeals 17-069-070 and 18-013.

4. The Director may extend the 18-month deadline specified in condition 3 if the Parties have difficulty obtaining access to private property, but the intent of the deadline, which is to complete the delineation in a timely manner, should remain.

5. The Parties shall implement the work set out in the Remediation Plan in accordance with the schedule of implementation that is approved by the Director.

6. Within 3 months of the date of the Ministerial Order issued in EAB Appeals 17-069-070 and 18-013, the Parties shall file an amended Remediation Plan for review and approval with the Director. The amended Remediation Plan shall make the remediation in the Hounsfield Heights neighbourhood and Lions Park the first priority for any active remediation. The amended Remediation Plan shall include a schedule of implementation.

7. On or before March 31 of each year, starting in 2021, or on such other frequency specified by the Director in writing, the Parties shall update and revise the Remediation Plan for submission to and approval by the Director. The Remediation Plan shall include a schedule of implementation. The updates and revisions to the Remediation Plan shall consider the report entitled "Review of the Contaminant Situation Associated with the Sears Property and Remedial Approach Assessment," November 4, 2019, Wyndham Environmental Ltd. filed in EAB Appeal Nos. 17-069-070 and 18-013.

8. The Remediation Plan, including each update and revision, should be made available to the residents of the Hounsfield Heights neighbourhood on a timely basis, after being approved by the Director.

9. The Parties shall submit written status reports to the Director as follows:

    a. Final, stamped versions of sampling and monitoring reports (for any media - soil, vapour, groundwater) are to be submitted to the Director by the end of the 2nd month following the month the sampling and/or monitoring event occurred.

    b. Annual Reports are required to be submitted to the Director by March 31 of each year for the previous January 1st to December 31st time period, with the first submission due March 31, 2019.

        (i) At a minimum, each Annual Report shall contain all of the following:

        - Summary of the communications with the affected landowners that occurred during the year;
        - List of any concerns that arose from other parties;
        - An explanation of how these concerns were addressed;
        - Any recommended changes to improve communication;
        - A summary description of all assessment, remediation, and monitoring work undertaken;
        - A summary of the results obtained within the year;
        - Details on the operation of the Soil Vapour Extraction System and an evaluation of the effectiveness of the system;

- Identification of data gaps with recommendations to address them; and
- Recommendations and commitments for future assessment, monitoring, and remediation work.

(ii) Each Annual Report shall also outline the attempts by the Parties to gain access to the properties in the Hounsfield Heights neighbourhood, as needed for the effective delineation and remediation. The Annual Reports should not contain personal information about any individual landowners.

(iii) The Annual Reports shall include a detailed summary of the work done in the Hounsfield Heights neighbourhood during the previous year, the results of that work, and the plans for work for the following year.

(iv) The Annual Reports shall be made available to the community, including the residents of the Hounsfield Heights neighbourhood.

10. The Parties to the EPO shall assign a key contact person to respond to questions or inquiries from the community, including the residents of the Hounsfield Heights neighbourhood, within 5 business days of the question or inquiry being received by the Parties individually or collectively.

11. The Parties to the EPO shall assign a key contact person to work collaboratively with the residents of the Hounsfield Heights neighbourhood and the Parties to develop and implement an effective two-way communication strategy.

12. The Parties shall post on the communications website:

a. regular status updates;

b. copies of all finalized and stamped sampling and monitoring reports; and

c. a summary of the results of the posted finalized and stamped reports."

Alberta Environment and Parks

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT

BEING CHAPTER E-12 R.S.A. 2000 (the "Act")

ENVIRONMENTAL PROTECTION ORDER NO. EPO-2018/01-SSR

Sears Canada Inc. [Sears]
C/O
Lloyd McLellan
FTI Consulting Canada Inc.
1900, 520 – 3rd Avenue SW,
Calgary, Alberta T2P 0R3

And

Concord North Hill GP Ltd. [Concord]
4000, 421 – 7 Avenue SW
Calgary, Alberta T2P 4K9

[Collectively the "Parties"]

WHEREAS Sears or one of its predecessor companies (Contill Realty Ltd.), was the registered owner of the lands legally described as Plan 8210266, Block 21 [the "Lands"] located in the City of Calgary, Alberta from October 31, 1958 until June 18, 2015;

WHEREAS Sears operated both a retail clothing store and an automotive repair/Gas Bar [the "Service Station"], which were located in two separate buildings on the Lands;

WHEREAS Sears owned and/or operated the Service Station from 1958 until the decommissioning in 1995;

WHEREAS in a SEACOR Environmental Engineering Inc. ("SEACOR") report titled "Environmental Activities Synthesis Report – October 1995 To August 1997 – North Hill Sears Gas Bar", dated August 1997 [the "SEACOR August 1997 Report"], the Service Station was identified as commencing operation in 1958 and ceasing operation in 1995;

WHEREAS the SEACOR August 1997 Report identified that an underground storage tank at the Service Station leaked gasoline sometime between the late 1970's to early 1980's;

WHEREAS the SEACOR August 1997 Report identified exceedances of then applicable provincial guidelines of that time (Alberta Environmental Protection (AEP) Risk Management Criteria (RMC) Level II and Level III course grained soil (CGS) criteria) for both the Lands and the adjacent/downgradient properties (the "Off-Site") n both soil and groundwater for hydrocarbon residuals and benzene (the "Substances");

WHEREAS the Lands were purchased by Concord on June 18, 2015 and Concord is the current registered owner of the Lands;

WHEREAS on March 29, 2016, the environmental consultant, Clifton Associates Ltd, ("Clifton") on behalf of Sears, submitted a reported titled "Remedial Action Plan for Mall and Hounsfield Heights Areas Calgary, Alberta" [the "RAP"], which identified in section 4.1 of the RAP, that the Alberta Tier 1 Soil and Groundwater Remediation Guidelines [the "Tier 1 Guidelines'] would be used as remediation targets;

WHEREAS on August 31, 2016, another consultant, Intrinsik Corp. on behalf of Sears, submitted a reported titled "Soil Vapour Quality Guidelines for Hounsfield Heights and Mall Areas" [the "Soil Vapour Guidelines"] to Alberta Environment & Parks ("AEP"), which were accepted by AEP as identified in a letter to Mr. Greg Paliouras of Sears, dated January 27, 2017;

WHEREAS Clifton Associates on behalf of Sears, submitted a report to AEP titled, "Revised Soil Vapour Monitoring Program (Update Fall 2016)", dated October 20, 2016 [the "Soil Vapour Monitoring Program"]. The Soil Vapour Monitoring Program was approved by AEP by letter dated January 27, 2017;

WHEREAS, numerous delineation and sampling events have been undertaken since the SEACOR August 1997 Report. The most recent Annual Summary Report completed by Clifton and dated May 19, 2017 (Annual summary report Hounsfield Heights – Briar Hill Community Calgary Alberta) identified that Substances are still present above the current Alberta Tier 1 Criteria;

WHEREAS there are several data gaps in the information regarding contamination both on the Lands and Off-Site which required additional work including:

- Completion of additional groundwater monitoring wells to characterize benzene and 1,2-DCA in groundwater in the southern extent of the plume in the Off-Site;
- Continue to conduct semi-annual groundwater sampling events to characterize the groundwater plume on the Lands and Off-Site;
- Continue to conduct semi-annual soil vapour sampling events as per the approved Soil Vapour Monitoring Program to characterize soil vapour; and
- Continued operation and maintenance of the DPVE system.

WHEREAS Craig Knaus, Compliance Manager, South Saskatchewan Region, has been appointed a Director for the purposes of issuing environmental protection orders under the Act (the "Director");

WHEREAS the Director is of the opinion that a release of a Substance has occurred, and that the Substance has caused, is causing or may cause an adverse effect on the environment;

WHEREAS the Director is of the opinion that the remedial actions taken to date by the Parties are not sufficient to confine, manage or remediate the Substances and that further work to delineate remediate and/or manage the Substances is required;

WHEREAS the Parties are a "person responsible" for the Substance, as defined in section 1(tt) of the Act;

THEREFORE, I, Craig Knaus, the Director, pursuant to section 113 of the *Environmental Protection and Enhancement Act*, DO HEREBY ORDER:

1. The Parties shall immediately re-commence the semi-annual soil vapour monitoring (high and low water table events) as described in the Soil Vapour Monitoring Program, including a sampling event prior to March 30, 2018);

2. Immediately recommence the Groundwater sampling and monitoring program as described in most recent program demonstrated in 2017 Second Quarter Groundwater Monitoring and Sampling Report, July 14, 2017.

3. By **July 1, 2018**, complete delineation activities to fully delineate the dissolved gasoline plume based on the data gaps identified in the Clifton Associates report July 2016 titled, "2016 Supplemental Drilling Report Hounsfield Heights-Briar Hill Community, Calgary, AB";

4. The Parties shall by **December 15, 2018**, submit a written plan to the Director to remediate the Substances on the Lands or any of the Substances from the Lands that have migrated to the Off-Site areas (the "Remediation Plan").

5. The Remediation Plan shall be prepared by a qualified environmental professional that meets the requirements for professional sign criteria as established by Remediation and Reclamation Sign Off Advisory Committee.

6. The Remediation Plan shall include, at a minimum, the following:

    a. A proposal outlining:

        i. the remediation and/or Risk Management Plan for all Substances in, on or under the Lands including all soil, subsoil and groundwater; and

        ii. the remediation and/or Risk Management Plan for all Substances in, on or under all Offsite areas, including to the North, South, East and West to which the Substances may have migrated including all soil, subsoil and groundwater.

    b. A detailed description of the work that will be undertaken for both the Lands and the Off-Site areas to meet the Soil Vapour guidelines as per Soil Vapour Quality Guidelines for Hounsfield Heights and Mall Areas August 31, 2016 and Alberta Tier 1 Soil and Groundwater Remediation Guidelines, as applicable [the "Criteria"] for all other media; and

    c. A schedule of implementation to implement the

Remediation Plan, with a completion date of no later than **March 4, 2019**, or as otherwise approved by the Director.

7. The Company shall implement the work set out in the Remediation Plan in accordance with the schedule of implementation that is approved by the Director.

8. The Parties shall submit written status reports to the Director as follows:

    a. Final, stamped versions of sampling and monitoring reports (for any media – soil, vapour, ground water) are to be submitted to the Director by the end of the 2nd month following the month the sampling and/or monitoring event occurred.

    b. Annual Report are required to be submitted to the Director by **March 31 of each year** for the previous January 1st to December 31st time period, with the first submission due March 31, 2019.

        i) At a minimum, each Annual Report all of the following:
        - Summary of the communications with the affect landowners that occurred during the year;
        - List of any concerns that arose from other parties;
        - An explanation of how these concerns were addressed;
        - Any recommended changes to improve communication;
        - A summary description of all assessment, remediation and monitoring work undertaken;
        - A summary of the results obtained within the year;
        - Details on the operation of the Soil Vapour Extraction system and an evaluation of the effectiveness of the system;
        - Identification of data gaps with recommendations to address them, and;
        - Recommendations and commitments for future assessment, monitoring and remediation work.

9. The Parties shall respond to inquiries from Off-Site landowners affected by the release within 3 business days of the inquiry being sent to the Parties individually or collectively.

10. The Parties shall within 30 days of the date of this Order, create, publish and activate a communications website.

11. Within 5 business days of the communications website being activated, the Parties shall provide the web address for the website to the Off-Site landowners affected by the release.

12. The Parties shall post on the communications website:

    a. regular status updates
    b. copies of all finalized and stamped sampling and monitoring reports.
    c. A summary of the results of the posted finalized and stamped reports

DATED at the City of Calgary in the Province of Alberta, this 23 day of February, 2018.

Original Signed By: Craig Knaus
Compliance Manager (the Director)
South Saskatchewan Region

Section 91 of the *Environmental Protection and Enhancement Act* may provide a right of appeal against this decision to the Alberta Environmental Appeals Board. There may be a strict time limit for filing such an appeal. A copy of section 91 is enclosed. For further information, please contact the Board Secretary at #306 Peace Hills Trust Tower, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8; telephone (780) 427-6207; fax (780) 427-4693.

Notwithstanding the above requirements, the Parties shall obtain all necessary approvals in complying with this order.

Take notice that this environmental protection order is a remedial tool only, and in no way precludes any enforcement proceedings being taken regarding this matter under this Act or any other legislation.

Alberta Environment and Parks

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT

BEING CHAPTER E-12 R.S.A. 2000 (the "Act")

ENVIRONMENTAL PROTECTION ORDER NO. EPO-2018/01-SSR

Amendment No. 1

Sears Canada Inc. [Sears]
C/O
Lloyd McLellan
FTI Consulting Canada Inc.
1900, 520 – 3rd Avenue SW,
Calgary, Alberta T2P 0R3

And

Concord North Hill GP Ltd. [Concord]
4000, 421 – 7 Avenue SW
Calgary, Alberta T2P 4K9

[Collectively the "Parties"]

WHEREAS on February 28, 2018, Environmental Protection Order No. EPO-2018/01-SR (the "EPO") was issued to Sears Canada Inc. and Concord North Hill GP Ltd.

WHEREAS section 243(1) of the *Environmental Protection and Enhancement Act* states that the Director may amend a term or condition of, or add a term or condition to, or delete a term or condition from the environmental protection order;

THEREFORE, I, Craig Knaus, the Director, pursuant to section 243(1) of the *Environmental Protection and Enhancement Act*, DO HEREBY AMEND or ADD to Environmental Protection Order No. EPO-2018/01-SSR, as follows:

1. In Clause 1, delete "**March 30, 2018**" and replace with "**April 30, 2018**".

DATED at the City of Calgary in the Province of Alberta, this 29 day of March, 2018.

Craig Knaus
Compliance Manager
(the Director)
South Saskatchewan Region

Section 91 of the *Environmental Protection and Enhancement Act* may provide a right of appeal against this decision to the Alberta Environmental Appeals Board. There may be a strict time limit for filing such an appeal. A copy of section 91 is enclosed. For further information, please contact the Board Secretary at #306 Peace Hills Trust Tower, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8; telephone (780) 427-6207; fax (780) 427-4693.

Notwithstanding the above requirements, the Party(ies) shall obtain all necessary approvals in complying with this order.

Take notice that this environmental protection order is a remedial tool only, and in no way precludes any enforcement proceedings being taken regarding this matter under this Act or any other legislation.

Alberta Environment and Parks

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT

BEING CHAPTER E-12 R.S.A. 2000 (the "Act")

Amendment No. 2

to

ENVIRONMENTAL PROTECTION ORDER NO. EPO-2018/01-SSR

I, Craig Knaus, the Director, pursuant to section 243(1) and 243(2) of the *Environmental Protection and Enhancement Act,* DO HEREBY AMEND Environmental Protection Order No. EPO-2018/01-SSR ["Order"] by:

1) adding the underlined words below to the Order;
2) deleting the words crossed out below from the Order; and
3) consolidating Amendment No. 1 dated March 29, 2018, which deleted March 30, 2018 from Clause 1 and replaced it with April 30, 2018, into the Order.

DATED at the City of Calgary in the Province of Alberta, this 11 day of October, 2018.

Craig Knaus
Compliance Manager
(the Director)
South Saskatchewan Region

Section 91 of the *Environmental Protection and Enhancement Act* may provide a right of appeal against this decision to the Alberta Environmental Appeals Board. There may be a strict time limit for filing such an appeal. A copy of section 91 is enclosed. For further information, please contact the Board Secretary at #306 Peace Hills Trust Tower, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8; telephone (780) 427-6207; fax (780) 427-4693.

Notwithstanding the above requirements, the Parties shall obtain all necessary approvals in complying with this order.

Take notice that this environmental protection order is a remedial tool only, and in no way precludes any enforcement proceedings being taken regarding this matter under this Act or any other legislation.

Sears Canada Inc. [Sears]
C/O
Lloyd McLellan
FTI Consulting Canada Inc.
1900, 520 – 3 Avenue SW
Calgary, Alberta T2P 0R3

And

Concord North Hill GP Ltd. [Concord]
4000, 421 – 7 Avenue SW
Calgary, Alberta T2P 4K9

And

Suncor Energy Inc. [Suncor]
150 – 6 Avenue SW
Calgary, Alberta T2P 3E3

[Collectively the "Parties"]

WHEREAS Sears or one of its predecessor companies (Contill Realty Ltd.), was the registered owner of the lands legally described as Plan 8210266, Block 21 [the "Lands"] located in the City of Calgary, Alberta from October 31, 1958 until June 18, 2015;

WHEREAS Sears operated both a retail clothing store and an automotive repair/Gas Bar [the "Service Station"], which were located in two separate buildings on the Lands;

WHEREAS Sears owned and/or operated the Service Station from 1958 until the decommissioning in 1995;

WHEREAS on March 1, 1984, Sunoco Inc. ["Sunoco"], a predecessor company of Suncor, entered into a management agreement with Simpsons-Sears Limited to "manage and operate Sears' facilities for the retail sale of Motor Fuels", including the Service Station ["Sunoco Agreement"];

WHEREAS from April 1984 to June 1994, Sunoco managed and operated the Service Station under the Sunoco Agreement;

WHEREAS between August 1985 and July 1989, Sunoco utilized the existing (two 10,000 gallon and one 4000 gallon) steel underground fuel storage tanks ["USTs"] and related infrastructure for the retail sale of motor fuels at the Service Station;

WHEREAS in June 1989, Sunoco retained Rossmar Construction Ltd. ["Rossmar"] to remove the existing USTs and replace them with two 8000 gallon and two 6000 gallon fiberglass USTs as part of Sunoco's tank replacement program;

WHEREAS in August 1989, during the excavation and removal of the USTs, contaminated soil was discovered at the Service Station. Soil sampling results indicated high concentration levels of benzene, toluene, ethyl benzene, and xylenes ("BTEX"). Sample 3 had a combined concentration of BTEX of 3802 mg/kg with concentrations of Toluene (1340 mg/kg) and Xylenes (2013 mg/kg);

WHEREAS during the removal of the USTs in August 1989, 1075 tonnes of contaminated soil from the Lands were excavated and disposed of at a City of Calgary landfill;

WHEREAS after the removal of the USTs, Sunoco installed venting wells as part of a vapour management program at the Service Station;

WHEREAS Sunoco received and paid invoices from Rossmar and Global Engineering and Testing Ltd. who were involved in the replacement of the USTs, discovery of contaminated soil in 1989, and installation of the vapour management program at the Service Station;

WHEREAS in September 1995, Sunoco retained SEACOR Environmental Engineering Inc. ["SEACOR"] to decommission the Service Station and on or about October 16, 1995, the fiberglass USTs were removed;

WHEREAS on or about October 18, 1995, Seacor advised Sunoco that the USTs were removed and that the tank nest gravels were contaminated. Seacor informed Sunoco that the "test pitting exercise around site identified significant petroleum impacts to soils near the existing Sears Automotive building (could be associated with the previous tank nest.)";

WHEREAS on December 12, 1995, SEACOR provided Sunoco with an interim summary of its findings and recommendations for further environmental investigation activities stating "strong hydrocarbon odours (headspace vapour reading in excess of 10,000 ppmv) and major staining was evident during the excavation" of one test pit in the vicinity of the pump islands at the Service Station;

WHEREAS the decommissioning of the Service Station was postponed to the spring of 1996;

WHEREAS in a SEACOR ~~Environmental Engineering Inc. ("SEACOR")~~ report titled "Environmental Activities Synthesis Report – October 1995 To August 1997 – North Hill Sears Gas Bar", dated August 1997 [the "SEACOR August 1997 Report"], the Service Station was identified as commencing operation in 1958 and ceasing operation in 1995;

WHEREAS the SEACOR August 1997 Report identified that an underground storage tank at the Service Station leaked gasoline sometime between the late 1970's to early 1980's;

WHEREAS the SEACOR August 1997 Report identified exceedances of then applicable provincial guidelines of that time (Alberta Environmental Protection (AEP) Risk Management Criteria (RMC) Level II and Level III course grained soil (CGS) criteria) for both the Lands and the adjacent/downgradient properties (the "Off-Site") in both soil and groundwater for hydrocarbon residuals and benzene (the "Substances");

WHEREAS Sunoco received and paid invoices from SEACOR for the decommissioning of the Service Station in 1995 and initial remediation activities between 1995-1998;

WHEREAS the Lands were purchased by Concord on June 18, 2015 and Concord is the current registered owner of the Lands;

WHEREAS on March 29, 2016, the environmental consultant, Clifton Associates Ltd, ("Clifton") on behalf of Sears, submitted a reported titled "Remedial Action Plan for Mall and Hounsfield Heights Areas Calgary, Alberta" [the "RAP"], which identified in section 4.1 of the RAP, that the Alberta Tier 1 Soil and Groundwater Remediation Guidelines [the "Tier 1 Guidelines'] would be used as remediation targets;

WHEREAS on August 31, 2016, another consultant, Intrinsic Corp. on behalf of Sears, submitted a reported titled "Soil Vapour Quality Guidelines for Hounsfield Heights and Mall Areas" [the "Soil Vapour Guidelines"] to Alberta Environment & Parks ("AEP"), which were accepted by AEP as identified in a letter to Mr. Greg Paliouras of Sears, dated January 27, 2017;

WHEREAS Clifton Associates on behalf of Sears, submitted a report to AEP titled, "Revised Soil Vapour Monitoring Program (Update Fall 2016)", dated October 20, 2016 [the "Soil Vapour Monitoring Program"]. The Soil Vapour Monitoring Program was approved by AEP by letter dated January 27, 2017;

WHEREAS, numerous delineation and sampling events have been undertaken since the SEACOR August 1997 Report. The most recent Annual Summary Report completed by Clifton and dated May 19, 2017 (Annual summary report Hounsfield Heights – Briar Hill Community Calgary Alberta) identified that Substances are still present above the current Alberta Tier 1 Criteria;

WHEREAS there are several data gaps in the information regarding contamination both on the Lands and Off-Site which required additional work including:

- Completion of additional groundwater monitoring wells to characterize benzene and 1,2-DCA in groundwater in the southern extent of the plume in the Off-Site;
- Continue to conduct semi-annual groundwater sampling events to characterize the groundwater plume on the Lands and Off-Site;
- Continue to conduct semi-annual soil vapour sampling events as per the approved Soil Vapour Monitoring Program to characterize soil vapour; and
- Continued operation and maintenance of the DPVE system.

WHEREAS Craig Knaus, Compliance Manager, South Saskatchewan Region, has been appointed a Director for the purposes of issuing environmental protection orders under the Act (the "Director");

WHEREAS the Director is of the opinion that a release of a Substance has occurred, and that the Substance has caused, is causing or may cause an adverse effect on the environment;

WHEREAS the Director is of the opinion that the remedial actions taken to date by the Parties are not sufficient to confine, manage or remediate the Substances and that further work to delineate remediate and/or manage the Substances is required;

WHEREAS the Parties are a "person responsible" for the Substance, as defined in section 1(tt) of the Act;

THEREFORE, I, Craig Knaus, the Director, pursuant to section 113 of the *Environmental Protection and Enhancement Act*, DO HEREBY ORDER:

1. The Parties shall immediately re-commence the semi-annual soil vapour monitoring (high and low water table events) as described in the Soil Vapour Monitoring Program, including a sampling event prior to April 30, 2018);

2. Immediately recommence the Groundwater sampling and monitoring program as described in most recent program demonstrated in 2017 Second Quarter Groundwater Monitoring and Sampling Report, July 14, 2017.

3. By **July 1, 2018**, complete delineation activities to fully delineate the dissolved gasoline plume based on the data gaps identified in the Clifton Associates report July 2016 titled, "2016 Supplemental Drilling Report Hounsfield Heights-Briar Hill Community, Calgary, AB";

4. The Parties shall by **December 15, 2018**, submit a written plan to the Director to remediate the Substances on the Lands or any of the Substances from the Lands that have migrated to the Off-Site areas (the "Remediation Plan").

5. The Remediation Plan shall be prepared by a qualified environmental professional that meets the requirements for professional sign criteria as established by Remediation and Reclamation Sign Off Advisory Committee.

6. The Remediation Plan shall include, at a minimum, the following:

    a. A proposal outlining:

        i. the remediation and/or Risk Management Plan for all Substances in, on or under the Lands including all soil, subsoil and groundwater; and

        ii. the remediation and/or Risk Management Plan for all Substances in, on or under all Offsite areas, including to the North, South, East and West to which the Substances may have migrated including all soil, subsoil and groundwater.

    b. A detailed description of the work that will be undertaken for both the Lands and the Off-Site areas to meet the Soil Vapour guidelines as per Soil Vapour Quality Guidelines for Hounsfield Heights and Mall Areas August 31, 2016 and Alberta Tier 1 Soil and Groundwater Remediation Guidelines, as applicable [the "Criteria"] for all other media; and

c. A schedule of implementation to implement the Remediation Plan, with a completion date of no later than **March 4, 2019,** or as otherwise approved by the Director.

7. The ~~Company~~ Parties shall implement the work set out in the Remediation Plan in accordance with the schedule of implementation that is approved by the Director.

8. The Parties shall submit written status reports to the Director as follows:

   a. Final, stamped versions of sampling and monitoring reports (for any media – soil, vapour, ground water) are to be submitted to the Director by the end of the 2nd month following the month the sampling and/or monitoring event occurred.

   b. Annual Reports are required to be submitted to the Director by **March 31 of each year** for the previous January 1st to December 31st time period, with the first submission due March 31, 2019.

      i) At a minimum, each Annual Report shall contain all of the following:
      - Summary of the communications with the affected landowners that occurred during the year;
      - List of any concerns that arose from other parties;
      - An explanation of how these concerns were addressed;
      - Any recommended changes to improve communication;
      - A summary description of all assessment, remediation and monitoring work undertaken;
      - A summary of the results obtained within the year;
      - Details on the operation of the Soil Vapour Extraction system and an evaluation of the effectiveness of the system;
      - Identification of data gaps with recommendations to address them and;
      - Recommendations and commitments for future assessment, monitoring and remediation work.

9. The Parties shall respond to inquiries from Off-Site landowners affected by the release within 3 business days of the inquiry being sent to the Parties individually or collectively.

10. The Parties shall within 30 days of the date of this Order, create, publish and activate a communications website.

11. Within 5 business days of the communications website being activated, the Parties shall provide the web address for the website to the Off-Site landowners affected by the release.

12. The Parties shall post on the communications website:
    a. regular status updates
    b. copies of all finalized and stamped sampling and monitoring reports
    c. a summary of the results of the posted finalized and stamped reports

DATED at the City of Calgary in the Province of Alberta, this 28 day of February, 2018.

[Original Order signed and dated February 28, 2018]

Craig Knaus
Compliance Manager
(the Director)
South Saskatchewan Region

Section 91 of the *Environmental Protection and Enhancement Act* may provide a right of appeal against this decision to the Alberta Environmental Appeals Board. There may be a strict time limit for filing such an appeal. A copy of section 91 is enclosed. For further information, please contact the Board Secretary at #306 Peace Hills Trust Tower, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8; telephone (780) 427-6207; fax (780) 427-4693.

Notwithstanding the above requirements, the Party(ies) shall obtain all necessary approvals in complying with this order.

Take notice that this environmental protection order is a remedial tool only, and in no way precludes any enforcement proceedings being taken regarding this matter under this Act or any other legislation.

Alberta Environment and Parks

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT

BEING CHAPTER E-12 R.S.A. 2000 (the "Act")

Amendment No. 3

to

ENVIRONMENTAL PROTECTION ORDER NO. EPO-2018/01-SSR

I, Craig Knaus, the Director, pursuant to section 243(1) and 243(2) of the *Environmental Protection and Enhancement Act,* DO HEREBY AMEND Environmental Protection Order No. EPO-2018/01-SSR ["Order"] by:

1) deleting the words crossed out below from the Order because the Parties have completed clauses 3 to 6 inclusive, clause 10 and clause 11 to my satisfaction; and
2) consolidating Amendment No. 2 dated October 11, 2018, which added Suncor Energy Inc. as a party to the Order.

DATED at the City of Calgary in the Province of Alberta, this 15TH day of November, 2019.

Craig Knaus
Compliance Manager
(the Director)
South Saskatchewan Region

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Sears Canada Inc. [Sears]
C/O
Lloyd McLellan
FTI Consulting Canada Inc.
1900, 520 – 3 Avenue SW
Calgary, Alberta T2P 0R3

And

Concord North Hill GP Ltd. [Concord]
4000, 421 – 7 Avenue SW
Calgary, Alberta T2P 4K9

And

Suncor Energy Inc. [Suncor]
150 – 6 Avenue SW
Calgary, Alberta T2P 3E3

[Collectively the "Parties"]

WHEREAS Sears or one of its predecessor companies (Contill Realty Ltd.), was the registered owner of the lands legally described as Plan 8210266, Block 21 [the "Lands"] located in the City of Calgary, Alberta from October 31, 1958 until June 18, 2015;

WHEREAS Sears operated both a retail clothing store and an automotive repair/Gas Bar [the "Service Station"], which were located in two separate buildings on the Lands;

WHEREAS Sears owned and/or operated the Service Station from 1958 until the decommissioning in 1995;

WHEREAS on March 1, 1984, Sunoco Inc. ["Sunoco"], a predecessor company of Suncor, entered into a management agreement with Simpsons-Sears Limited to "manage and operate Sears' facilities for the retail sale of Motor Fuels", including the Service Station ["Sunoco Agreement"];

WHEREAS from April 1984 to June 1994, Sunoco managed and operated the Service Station under the Sunoco Agreement;

WHEREAS between August 1985 and July 1989, Sunoco utilized the existing (two 10,000 gallon and one 4000 gallon) steel underground fuel storage tanks ["USTs"] and related infrastructure for the retail sale of motor fuels at the Service Station;

WHEREAS in June 1989, Sunoco retained Rossmar Construction Ltd. ["Rossmar"] to remove the existing USTs and replace them with two 8000 gallon and two 6000 gallon fiberglass USTs as part of Sunoco's tank replacement program;

WHEREAS in August 1989, during the excavation and removal of the USTs, contaminated soil was discovered at the Service Station. Soil sampling results indicated high concentration levels of benzene, toluene, ethyl benzene, and xylenes ("BTEX"). Sample 3 had a combined concentration of BTEX of 3802 mg/kg with concentrations of Toluene (1340 mg/kg) and Xylenes (2013 mg/kg);

WHEREAS during the removal of the USTs in August 1989, 1075 tonnes of contaminated soil from the Lands were excavated and disposed of at a City of Calgary landfill;

WHEREAS after the removal of the USTs, Sunoco installed venting wells as part of a vapour management program at the Service Station;

WHEREAS Sunoco received and paid invoices from Rossmar and Global Engineering and Testing Ltd. who were involved in the replacement of the USTs, discovery of contaminated soil in 1989, and installation of the vapour management program at the Service Station;

WHEREAS in September 1995, Sunoco retained SEACOR Environmental Engineering Inc. ["SEACOR"] to decommission the Service Station and on or about October 16, 1995, the fiberglass USTs were removed;

WHEREAS on or about October 18, 1995, Seacor advised Sunoco that the USTs were removed and that the tank nest gravels were contaminated. Seacor informed Sunoco that the "test pitting exercise around site identified significant petroleum impacts to soils near the existing Sears Automotive building (could be associated with the previous tank nest.)";

WHEREAS on December 12, 1995, SEACOR provided Sunoco with an interim summary of its findings and recommendations for further environmental investigation activities stating "strong hydrocarbon odours (headspace vapour reading in excess of 10,000 ppmv) and major staining was evident during the excavation" of one test pit in the vicinity of the pump islands at the Service Station;

WHEREAS the decommissioning of the Service Station was postponed to the spring of 1996;

WHEREAS in a SEACOR report titled "Environmental Activities Synthesis Report – October 1995 To August 1997 – North Hill Sears Gas Bar", dated August 1997 [the "SEACOR August 1997 Report"], the Service Station was identified as commencing operation in 1958 and ceasing operation in 1995;

WHEREAS the SEACOR August 1997 Report identified that an underground storage tank at the Service Station leaked gasoline sometime between the late 1970's to early 1980's;

WHEREAS the SEACOR August 1997 Report identified exceedances of then applicable provincial guidelines of that time (Alberta Environmental Protection (AEP) Risk Management Criteria (RMC) Level II and Level III course grained soil (CGS) criteria) for both the Lands and the adjacent/downgradient properties (the "Off-Site") in both soil and groundwater for hydrocarbon residuals and benzene (the "Substances");

WHEREAS Sunoco received and paid invoices from SEACOR for the decommissioning of the Service Station in 1995 and initial remediation activities between 1995-1998;

WHEREAS the Lands were purchased by Concord on June 18, 2015 and Concord is the current registered owner of the Lands;

WHEREAS on March 29, 2016, the environmental consultant, Clifton Associates Ltd, ("Clifton") on behalf of Sears, submitted a reported titled "Remedial Action Plan for Mall and Hounsfield Heights Areas Calgary, Alberta" [the "RAP"], which identified in section 4.1 of the RAP, that the Alberta Tier 1 Soil and Groundwater Remediation Guidelines [the "Tier 1 Guidelines'] would be used as remediation targets;

WHEREAS on August 31, 2016, another consultant, Intrinsic Corp. on behalf of Sears, submitted a reported titled "Soil Vapour Quality Guidelines for Hounsfield Heights and Mall Areas" [the "Soil Vapour Guidelines"] to Alberta Environment & Parks ("AEP"), which were accepted by AEP as identified in a letter to Mr. Greg Paliouras of Sears, dated January 27, 2017;

WHEREAS Clifton Associates on behalf of Sears, submitted a report to AEP titled, "Revised Soil Vapour Monitoring Program (Update Fall 2016)", dated October 20, 2016 [the "Soil Vapour Monitoring Program"]. The Soil Vapour Monitoring Program was approved by AEP by letter dated January 27, 2017;

WHEREAS, numerous delineation and sampling events have been undertaken since the SEACOR August 1997 Report. The most recent Annual Summary Report completed by Clifton and dated May 19, 2017 (Annual summary report Hounsfield Heights – Briar Hill Community Calgary Alberta) identified that Substances are still present above the current Alberta Tier 1 Criteria;

WHEREAS there are several data gaps in the information regarding contamination both on the Lands and Off-Site which required additional work including:

- Completion of additional groundwater monitoring wells to characterize benzene and 1,2-DCA in groundwater in the southern extent of the plume in the Off-Site;
- Continue to conduct semi-annual groundwater sampling events to characterize the groundwater plume on the Lands and Off-Site;
- Continue to conduct semi-annual soil vapour sampling events as per the approved Soil Vapour Monitoring Program to characterize soil vapour; and
- Continued operation and maintenance of the DPVE system.

WHEREAS Craig Knaus, Compliance Manager, South Saskatchewan Region, has been appointed a Director for the purposes of issuing environmental protection orders under the Act (the "Director");

WHEREAS the Director is of the opinion that a release of a Substance has occurred, and that the Substance has caused, is causing or may cause an adverse effect on the environment;

WHEREAS the Director is of the opinion that the remedial actions taken to date by the Parties are not sufficient to confine, manage or remediate the Substances and that further work to delineate remediate and/or manage the Substances is required;

WHEREAS the Parties are a "person responsible" for the Substance, as defined in section 1(tt) of the Act;

THEREFORE, I, Craig Knaus, the Director, pursuant to section 113 of the *Environmental Protection and Enhancement Act*, DO HEREBY ORDER:

1. The Parties shall immediately re-commence the semi-annual soil vapour monitoring (high and low water table events) as described in the Soil Vapour Monitoring Program, including a sampling event prior to April 30, 2018);

2. Immediately recommence the Groundwater sampling and monitoring program as described in most recent program demonstrated in 2017 Second Quarter Groundwater Monitoring and Sampling Report, July 14, 2017.

3. By **July 1, 2018**, complete delineation activities to fully delineate the dissolved gasoline plume based on the data gaps identified in the Clifton Associates report July 2016 titled, "2016 Supplemental Drilling Report Hounsfield Heights-Briar Hill Community, Calgary, AB";

4. The Parties shall by **December 15, 2018**, submit a written plan to the Director to remediate the Substances on the Lands or any of the Substances from the Lands that have migrated to the Off-Site areas (the "Remediation Plan").

5. The Remediation Plan shall be prepared by a qualified environmental professional that meets the requirements for professional sign criteria as established by Remediation and Reclamation Sign Off Advisory Committee.

6. The Remediation Plan shall include, at a minimum, the following:

    a. A proposal outlining:

        i. the remediation and/or Risk Management Plan for all Substances in, on or under the Lands including all soil, subsoil and groundwater; and

        ii. the remediation and/or Risk Management Plan for all Substances in, on or under all Offsite areas, including to the North, South, East and West to which the Substances may have migrated including all soil, subsoil and groundwater.

    b. A detailed description of the work that will be undertaken for both the Lands and the Off-Site areas to meet the Soil Vapour guidelines as per Soil Vapour Quality Guidelines for Hounsfield Heights and Mall Areas August 31, 2016 and Alberta Tier 1 Soil and Groundwater Remediation Guidelines, as applicable [the "Criteria"] for all other media; and

~~c. A schedule of implementation to implement the Remediation Plan, with a completion date of no later than **March 4, 2019**, or as otherwise approved by the Director.~~

7. The Parties shall implement the work set out in the Remediation Plan in accordance with the schedule of implementation that is approved by the Director.

8. The Parties shall submit written status reports to the Director as follows:

   a. Final, stamped versions of sampling and monitoring reports (for any media – soil, vapour, ground water) are to be submitted to the Director by the end of the 2nd month following the month the sampling and/or monitoring event occurred.

   b. Annual Reports are required to be submitted to the Director by **March 31 of each year** for the previous January 1st to December 31st time period, with the first submission due March 31, 2019.

      i) At a minimum, each Annual Report shall contain all of the following:
      - Summary of the communications with the affected landowners that occurred during the year;
      - List of any concerns that arose from other parties;
      - An explanation of how these concerns were addressed;
      - Any recommended changes to improve communication;
      - A summary description of all assessment, remediation and monitoring work undertaken;
      - A summary of the results obtained within the year;
      - Details on the operation of the Soil Vapour Extraction system and an evaluation of the effectiveness of the system;
      - Identification of data gaps with recommendations to address them and;
      - Recommendations and commitments for future assessment, monitoring and remediation work.

9. The Parties shall respond to inquiries from Off-Site landowners affected by the release within 3 business days of the inquiry being sent to the Parties individually or collectively.

~~10. The Parties shall within 30 days of the date of this Order, create, publish and activate a communications website.~~

~~11. Within 5 business days of the communications website being activated, the Parties shall provide the web address for the website to the Off-Site landowners affected by the release.~~

12. The Parties shall post on the communications website:
    a. regular status updates
    b. copies of all finalized and stamped sampling and monitoring reports
    c. a summary of the results of the posted finalized and stamped reports

DATED at the City of Calgary in the Province of Alberta, this 28 day of February, 2018.

[Original Order signed and dated February 28, 2018]

Craig Knaus
Compliance Manager
(the Director)
South Saskatchewan Region

Section 91 of the *Environmental Protection and Enhancement Act* may provide a right of appeal against this decision to the Alberta Environmental Appeals Board. There may be a strict time limit for filing such an appeal. A copy of section 91 is enclosed. For further information, please contact the Board Secretary at #306 Peace Hills Trust Tower, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8; telephone (780) 427-6207; fax (780) 427-4693.

Notwithstanding the above requirements, the Party(ies) shall obtain all necessary approvals in complying with this order.

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APPENDIX B

CONCEPTUAL SITE MODEL

APPENDIX B
CONCEPTUAL SITE MODEL

INTRODUCTION

Parsons Inc. (Parsons) was retained by Suncor Energy Products Partnership (Suncor) to provide an updated Conceptual Site Model (CSM) for the Former Sears Fuel Site located at 1620 - 14th Avenue NW; also including the Mall Properties; Lions Park; The City of Calgary roadways; and portions of the adjacent Hounsfield Heights community (collectively referred to as the "site").

The site location map is presented as Drawing No. B-1. The area topography (grade elevations) and municipal land use districts are shown on Drawing No. B-2 and B-3, respectively. A site plan showing the groundwater monitoring well, extraction well, and soil vapour well locations is presented as Drawing No. B-4. The configuration of the DPVE system is presented on Drawing No. B-5. The known utilities present at the site are shown on Drawing No. B-6.

The CSM incorporates environmental assessment results up to and including 2024. Historical reports reviewed to complete this CSM are listed in the references and include Clifton's Updated Site Management Plan (Clifton, 2014), which provides a detailed summary of previous environmental site assessments (ESAs) and remedial activities at the Site.

The CSM is considered dynamic in nature and is to be updated as new information becomes available. This iterative process is also described as part of the Adaptive Site Management approach for complex contaminated sites (ITRC, 2017). The Adaptive Site Management approach also recognizes that the remedial strategy for a site can change over time, including as the CSM is updated.

This CSM was completed in general conformance with Alberta Environmental Site Assessment Standard (AEPA, 2024) and the Canadian Council of the Minsters of the Environment (CCME, 2016).

SITE HISTORY

The Mall Area includes the Kal-Tire automotive shop, the shopping centre to its north, and a midrise mixed commercial and residential property (addressed as 1700, 1710, 1718 and 1726 14th Avenue NW) to its west.

The former Sears service station is located along the mall's southern property boundary and is north of 14th Avenue NW. The Site was originally developed as a Sears fuel service station and automotive centre in 1958. The service station operated under the Sears brand from 1958 to

APPENDIX B
CONCEPTUAL SITE MODEL

1984 and, thereafter, as a Sunoco until 1995. In 1989, three steel underground storage tanks (USTs) and associated facilities were replaced with four fiberglass USTs. All fuel handling equipment and the associated USTs were removed during decommissioning of the fuelling operations in October 1995.

The following is a summary of the aerial photograph reviewed from The City of Calgary, documenting the historical development of the Site:

YEAR	SEARS SERVICE STATION	SURROUNDING SITE PROPERTIES (MALL AND MID-RISE, LIONS PARK, HOUNSFIELD HEIGHTS NEIGHBOURHOOD)
1924-1948	Not developed	Early residential development in Hounsfield Heights Area
1953	Not developed	Ground disturbance noted in Mall Area. Hounsfield Heights Area fully developed to presently observed residential land use. Ground disturbance noted at Lions Park.
1957	Under construction.	Mall under construction. No other visible changes to surrounding properties.
1962-1979	Former Sears service station operational	Mall and Lions Park developed. No other visible changes to surrounding properties.
1982	Former service station addition visible.	No visible changes.
1982-2006	No visible changes.	No visible changes.
2006-2007	A remedial excavation is visible at the former Sears service station and includes the reported “bio-piling” in the parking lot east of excavation.	No visible changes.
2008-2010	The excavation west of the service station is no longer visible; the area has been paved.	No visible changes.
2011-2023	No visible changes.	No visible changes.

APPENDIX B
CONCEPTUAL SITE MODEL

Following the decommissioning of the service station, ESAs identified petroleum hydrocarbon (PHC) and volatile organic compounds (VOC) impacts to soil and groundwater, including an area impacted by liquid petroleum hydrocarbons (LPH) beneath Lions Park and the northern portion of the Hounsfield Heights community. Beyond the area of LPH impacts, dissolved and soil adsorbed phase impacts extend downgradient across 11th Avenue NW to approximately 10th Avenue NW, and to a lesser extent cross-and-up gradient.

It is not anticipated that future land use at the Site will significantly change in either the near or distant future.

SITE TOPOGRAPHY, GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

Geological and hydrogeological cross-sections are shown on Drawings No. B-7, B-8 and B-9. Cross-section A-A' (Drawing No. B-7) is parallel to the groundwater follow direction. Cross-section B-B' (Drawing No. B-8) is cross-gradient through Lions Park. Cross-section C-C' (Drawing No. B-9) is cross-gradient through the permeable reactive barrier (PRB).

As presented on Drawing No. B-2, the Site topography generally consists of a relatively flat and gently south-sloping plateau over the northern portion of the Site (i.e., encompassing the Mall Area and the Lions Park portion of the Hounsfield Heights Area). This transitions to a moderately sloping valley wall in the southern portion of the Hounsfield Heights Area (i.e., through the residential community). The topography in the northern portion of the Hounsfield Heights area suggests that some grading, including the importation of fill, may have occurred during its development; while, the southern portion appears to retain its natural topography. The Site varies in elevation from approximately 1,094 m above sea level (masl) in its northwestern corner along 13th Avenue NW to approximately 1,068 masl in the southeastern corner near the intersection of 15th Street NW and 10th Avenue NW (i.e., 26 m of total relief).

Based on geological maps of Calgary (Moran, 1986), the soil stratigraphy of the Site is comprised of a relatively heterogeneous sequence of post-glacial lacustrine/alluvial sediments of sand, silt, and clay, specifically, the Calgary Formation. This is underlain by the till and lacustrine sediments of the Lochend formation, and another post-glacial lacustrine/alluvial deposit of the Spy Hill formation.

Overall, the Calgary Formation is a heterogeneous sequence of variably graded sand, silt, and clay that has been historically divided into five units (Units 1, 2 3, 4, and 5), based on relative percentages of sand, silt, and clay. The approximate extents of Units 1 to 5 have been interpreted onto the cross-sections on Drawings No. B-7, B-8, and B-9 to the extent possible. Characterization of soils during subsurface investigations at the Site included numerous samples for grain size

analysis and classification in accordance with Unified Soil Classification System, and is considered generally reliable, as presented in Drawing No. B-10.

The Units can be described as:

- Unit 1: Silty Sand, or Sand and Silt (coarse-grained unit). Unsaturated, or only locally saturated with perched groundwater. The unit is brown, well sorted, fine to medium grained, and loose near surface that transitions to silty sand with depth, with more clay near its base. Unit 1 is thickest in the Mall Area and Lions Park to its south and thins further to the south, pinching-out north of 11th Avenue NW. It ranges in thickness from 0.5 to 9.1 m.

- Unit 2: Clayey Silt and Silty Clay (fine-grained unit). Variably saturated and increasing towards its base approaching the groundwater table. The unit is brown, moist plastic clay that transitions to silty clay or clayey silt with depth. Unit 2 ranges in thickness from 2 to 4 m. It also pinches-out north of 11th Avenue NW. From the hydrogeological perspective, Unit 2 is potentially a confining layer over Unit 3.

- Unit 3: Sandy Silt or Silt and Sand (fine-grained) unit. Mostly saturated and has been referred to as being “confined” by Unit 2; however, where Unit 3 outcrops one would expect its upper portions to become unsaturated with a shallow unconfined groundwater table. Unit 3 appears be the most impacted unit at the Site and evidently the most preferred for contaminant migration. The unit outcrops south of 11th Avenue NW.

- Unit 4: Clayey Silt or Silty Clay (fine-grained) unit. Likely saturated throughout the Site, other than where it outcrops at the southern limit near 10th Avenue NW. It is comprised of grey, plastic clay in its upper portion and a silty clay or clayey silt throughout, with more clay near its base.

- Unit 5: poor defined; likely saturated in the south. The unit has been previously reported as silty sand and gravel, however based on grain size and hydraulic conductivity results, it appears to be a low permeability fine-grained unit.

- Unit 6 consists of backfill in two remedial excavations completed in the Mall Area, one at the location of the former Sears fuel handling area, and the other to its northwest adjacent to mid-rise tower.

Based on limited subsurface investigation information regarding Unit 5, Units 4 and 5 have been grouped together on the cross-sections.

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The direction of groundwater flow has been consistently southerly in Units 1 to 5, with some minor variations between units. The potentiometric surface elevations for Unit 1 to 5 in May and September 2024 are shown on Drawings No. B-11 and B-12, respectively. Generally, the 2024 groundwater flow patterns are the same as determined historically.

Surface seeps have reportedly been previously observed in the most southern area of the Site near 10th Avenue NW; however, Parsons has not observed the presence of these seeps or any iron precipitate staining that would be expected at such seeps from a petroleum hydrocarbon contaminated site. Currently, there does not appear to be an identified exposure risk related to such seeps; additional information is provided in a following section.

The depth to groundwater varies with topography and typical ranges reported were from approximately 1 to 15 metres below ground surface (mbgs). The deeper depths are found in the Mall Area and Lions Park, Groundwater is shallower further southward in the Hounsfield Heights Area. Groundwater levels do not appear to vary significantly over the years or seasons.

Drawing No. B-13 presents a summary of hydraulic conductivity results for testing conducted at the Site and, where possible, the applicable unit tested is identified. The hydraulic conductivity estimates range from 4.4 x 10^{-8} m/s to 3.2 x 10^{-6} m/s.

SUMMARY OF PREVIOUS PHASE II ENVIRONMENTAL SITE ASSESSMENTS

The following Phase II ESAs have been previously completed at the site:

- Between 1996 and 1998, boreholes BH1 to BH55 were drilled by SEACOR Environmental Engineering Inc. (SEACOR) to a maximum depth of 9.1 mbgs, with 29 of the locations completed as groundwater monitoring wells;

- In 1998, boreholes BH201 to BH214, BH301 to BH304, and BH401 to BH413 were drilled by Clifton Associates Ltd. (Clifton) to a maximum depth of 15.3 mbgs, with all of the locations completed as groundwater monitoring wells;

- In 2002, boreholes BH500 to BH510 were drilled by Clifton to a maximum depth of 16.76 mbgs, with all of the locations completed as groundwater monitoring wells;

- In 2003, boreholes BH601 to BH603, BH701 to 744, and BH801 to BH803 were drilled by Clifton to a maximum depth of 21.3 mbgs, with 47 of the locations completed as groundwater monitoring wells;

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- In 2004, boreholes BH510-A, BH902 to BH917, BH1006, BH1007, BH1009 to BH1011, BH1015, BH1016, BH1101 to BH1107, BH1201, BH1202, BH1204 to BH1208, and BH1301 to BH1303 were drilled by Clifton to a maximum depth of 18.3 mbgs, with 35 of the locations completed as groundwater monitoring wells;

- In 2005, boreholes BH1403, and BH1501 to BH1505 were drilled by Clifton to a maximum depth of 9.1 mbgs, with three of the locations completed as groundwater monitoring wells;

- In 2006, boreholes BH1001 to BH1005, BH1008, BH1012 to BH1014, BH1203, BH1401, BH1402, BH1404, and BH1405 were drilled by Clifton to a maximum depth of 16.8 mbgs;

- In 2008, boreholes BH1601, BH1701 to BH1711 were drilled by Clifton to a maximum depth of 18.29 mbgs, with all of the locations completed as groundwater monitoring wells;

- In 2008, extraction wells EX-01 to EX-07 were drilled by Clifton to a maximum depth of 15.85 mbgs, with all of the locations completed as groundwater monitoring and extraction wells;

- In 2009, boreholes BH1712 to BH1717 and BH1801 to BH1810 were drilled by Clifton to a maximum depth of 19.30 mbgs, with all of the locations completed as groundwater monitoring wells;

- Between 2014 and 2015, boreholes BH1901 to BH1988 were drilled by Clifton to a maximum depth of 30.5 mbgs, with all of the locations completed as groundwater monitoring wells;

- In 2016, boreholes BH2001 to BH2012 were drilled by Clifton to a maximum depth 19.8 mbgs, with all of the locations completed as groundwater monitoring wells;

- In 2016, boreholes SV01 to SV41 were drilled by Clifton to a maximum depth of 6.0 mbgs, with all of the locations completed as soil vapour sampling wells;

- In 2018, boreholes BH3001A/B/C to BH3003A/B were drilled by Clifton to a maximum depth of 9.1 mbgs, with all of the locations completed as groundwater monitoring wells;

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- In 2019, boreholes BH4001 to BH4009A/B were drilled by Clifton to a maximum depth of 18.0 mbgs, with 12 of the locations completed as groundwater monitoring wells;

- In 2019, boreholes SV321 to SV323 were drilled by Clifton to a maximum depth 1.0 mbgs, with all of the locations completed as soil vapour sampling wells;

- In 2020, boreholes MW5001 and MW5002 were drilled by Clifton to a maximum depth of 3.05 mbgs, with all of the locations completed as groundwater monitoring wells;

- In 2020, boreholes SV321B and SV401 to SV404 were drilled by Clifton to a maximum depth of 1.5 mbgs, with all of the locations completed as soil vapour sampling wells;

- In 2021, boreholes MW6001 to MW6006 were drilled by Clifton to a maximum depth of 16.77 mbgs, with all of the locations completed as groundwater monitoring wells;

- In 2022, boreholes SV500 to SV505 were drilled by Parsons to a maximum depth 1.5 mbgs, with all six of the locations completed as soil vapour samplings wells; and,

- In 2024, boreholes BH7000, SV600A/B through SV603A/B, and SV604B were drilled by Parsons to a maximum depth of 7.01 mbgs, with eight of the locations completed as soil vapour wells (BH600A/B, SV601A/B, SV602B, SV603A/B, SV604B).

The historical soil sampling locations for ESAs conducted between 2014 and 2024 are shown on Drawing No. B-14.

SUMMARY OF SITE REMEDIAL ACTIVITIES

REMEDIATION ACTIVITIES COMPLETED BETWEEN 1989 AND 2004:

During site upgrade work that took place in 1989, approximately 1,075 tonnes of contaminated soil was excavated and disposed of at a City of Calgary landfill. This area may be included in the subsequent 2003 excavation area. The former USTs and other fuel handling equipment were decommissioned and removed from the site in October 1995.

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From approximately 2000 to 2004, Hobbs-Miller-Maat Inc. (HMM) completed remedial activities that were monitored by Clifton in the Mall Area adjacent and northwest of former Sears service station. The activities included excavation of PHC impacted soil that was treated using an ALLU-bucket to volatize impacts, and, then, re-used to backfill the excavation. The remedial effort also included significant nutrient injections (see quantities as discussed below) along with pneumatic fracturing to increase permeability.

The general details are as follows (as summarized in Clifton, 2014):

- In 2000, HMM began operating an in-situ biotreatment system that included blowers.

- From 2000 to 2002, HMM added numerous wells to supplement an already installed horizontal injection/extraction system and reported having injected 109,000 gallons of "blended bioproduct".

- In 2001, Clifton reported removing 998 tonnes of PHC impacted soil from City property (south of the Kal-Tire on 14th avenue) during utility replacement activities.

- In 2002, HMM completed pneumatic fracturing followed by injection of 27,000 gallons of "bioproducts".

- In 2003, HMM excavated 5,500 m^3 (approximately 11,000 tonnes) of PHC impacted soil that was reportedly treated on-site and reused as backfill.

- In 2004, HMM reports injected 118,000 gallons of "concentrated bioproducts" that were supplemented with "enzyme, nutrient, and hydrogen peroxide".

- In 2004, HMM excavated 875 m^3 (approximately 1,750 tonnes) of soil with 200 m^3 being PHC impacted that was treated and planned to be removed in spring 2005. In addition, another 770 m^3 of PHC impacted soil was excavated treated and reused with PHC impacts remaining at the margins. This area appears to be included in the subsequent 2006/2007 excavation area.

- In late 2004, Clifton completed a remedial excavation (measuring 22 m wide, 34 m long and 4.75 m deep). The excavation was backfilled with un-impacted soils including imported "pit-run". Sheens were observed on groundwater that seeped into the excavation, and PHC impacts was noted to have remained along the excavation final walls, however, the condition of the excavation base was not discussed. This area appears to be included in the subsequent 2006/2007 excavation area.

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REMEDIAL EXCAVATION FROM 2006 TO 2007

A large remedial excavation was conducted from 2006 to 2007, under the direction of Clifton, in the Mall Area northwest of the former Sears fuel handling equipment. A total of 69,000 m^3 of impacted soil and 12,000 m^3 of un-impacted soil was excavated. The impacted soil was treated by biopiling in the mall parking lot east of the former service station, with treated soil replaced within the excavation. A PHC-resistant, 38-mil Isoflex geotextile liner was installed along the south and east walls of the excavation to a depth of approximately 12 mbgs.

DUAL-PHASE VAPOUR EXTRACTION SYSTEM (2011 TO PRESENT):

A Dual Phase Vapour Extraction (DPVE) system was installed in the northern portion of the Hounsfield Heights Area in November 2008 by Ground Effects Environmental Services Inc., on behalf of Clifton. The DPVE became operational in October 2010. Operations were suspended in early October 2010 due to noise concerns and later resumed on July 27, 2011. The DPVE system layout is shown on Drawing No. B-5. Its at-surface operational components are in Lions Park in a fenced enclosure and connected to seven extraction wells (EX-1 to EX-7) and one groundwater well (BH1704) installed to the south on The City roads/laneway. The system discharges the recovered treated groundwater to the sanitary sewer and the treated vapours to the air.

The primary objective of the DPVE system was to recover mobile LPH, which appears to have been achieved.

A LPH assessment was conducted in 2021 by Clifton (Clifton, 2021) which indicated that a cumulative volume of 12,683 L of vapour equivalent LPH had been recovered by the system up to May 28, 2021. A total of 2,219,000 L of impacted groundwater was measured to have been recovered, treated and discharged by the system up to the end of May 2021. Between January 2022 and December 2024, another 998 L of vapour equivalent LPH was recovered. Prior to May 2022, small volumes of LPH were also manually bailed from monitoring wells when encountered.

Following DPVE operation for nearly 15 years, LPH has only recently been observed in one monitoring well (a 5 mm apparent thickness in monitoring well BH1704 on May 31, 2022) with no LPH detected during subsequent monitoring events. The 2021 LPH assessment indicated that residual LPH is likely still present, but there is no mobile or migrating LPH (Clifton, 2021).

In June 2024, an evaluation of the performance of the DPVE system was completed (Parsons, 2025a). The evaluation was intended to determine if additional LPH could be recovered in the area of BH1704. The assessment included an extraction test on extraction well EX-5, monitoring the effects in nearby groundwater and extraction wells, and sampling of vapour exhaust and groundwater inlet streams.

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Key observations from the DPVE assessment are provided below:

- No LPH Observed: Free phase liquid petroleum hydrocarbons were not observed in any of the monitoring wells/extraction wells, the inlet recovery stream, or the oil/water separator during testing;

- Low Hydrocarbon Recovery Rates: The average rate of hydrocarbon recovery in the vapour phase was 0.026 L/day, with a combined total of 0.22 L of equivalent hydrocarbons (all in vapour phase) extracted during the 7-day testing period. The total volume of equivalent hydrocarbons extracted through groundwater recovery was less than 0.0005 L;

- Groundwater Extraction: A total of approximately 7100 L of groundwater was extracted, at a rate of approximately 1000 L/day, during the 7-day testing period; and,

- Induced Drawdown and Vacuum Influences: These were evident during testing, indicating the system's operational effectiveness.

Based on the results provided, the DPVE system has achieved its primary goal of reducing mobile LPH at the site.

PERMEABLE REACTIVE BARRIER (2019 TO PRESENT):

In November and December 2019, a permeable reactive barrier (PRB)) was installed along 11th Avenue southwest to mitigate potential further southerly migration of the dissolved phase PHC-impacts. The PRB was constructed using commercial products - PlumeStop™ (an adsorptive element) and Oxygen Release Compound-Advanced (ORC-A) (an aerobic treatment element to enhance down-gradient biodegradation). Both products are developed by Regenesis. PlumeStop™ is a microscopic colloidal carbon product suitable for injection in fine textured soil. ORC-A is a low soluble calcium peroxide, which based on information from Regenesis, was estimated to last two or three years.

The installation included 57 injection locations to a maximum depth of approximately 19.2 mbgs. The total length of the barrier was approximately 165 m and injection locations were spaced approximately 3.05 m apart. Pilot testing was completed prior to this in August 2016 involving nine injection points at a depth range of 6.1 to 8.8 mbgs; and, in September 2018 involving three injection points at a depth range of 7.6 to 14.9 mbgs. The injections were completed using a direct-push rig and a bottom-up approach (i.e., no injection wells were installed).

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Concentrations of benzene and 1,2-DCA immediately downgradient of the PRB have substantially reduced compared to pre-injection concentrations, and in many cases, concentrations in these wells have been reduced to less than or approaching the laboratory detection limits.

As indicated on Drawing Nos. B-15, groundwater monitoring wells BH1981 and BH1979, located further downgradient of the PRB, statistical trend analysis indicated increasing or probably increasing trends for 1,2-DCA for analytical data collected after installation of the PRB. However, concentrations of 1,2-DCA remain substantially less than the guidelines and are concentrations are generally consistent with those measured prior to installation of the PRB, with any changes in concentration being at relatively low concentrations.

An evaluation of the plume stability south of the RPB using the Ricker Method® (Ricker, 2008) was completed in 2024 (MEMS, 2025). Results indicate that the plume south of the PRB is decreasing in contaminant mass, plume area, and average concentration for both benzene and 1,2-DCA, with significant decreasing trends for all plume characteristics. The overall plume centre of mass shifting southeast. This shift is attributed to the rapid attenuation that occurred in the upgradient portion of the plume (i.e. the area immediately downgradient of PRB) following installation of the PRB in 2019. In this scenario, it is expected that the centre of mass will migrate in a downgradient direction (i.e. increasing trend in distance from the source) although the plume has undergone a significant reduction in mass, area, and average concentration.

Overall, the PRB appears to have been effective in reducing concentrations of benzene and 1,2-DCA south of the PRB.

DESCRIPTION OF SOURCE AREA

The primary source of the contamination release (steel UST tanks) has been removed, along with some source contaminated soils from the UST excavation area. It is unknown what quantity of impacted soils and groundwater had remained after the UST replacement and excavation activities. Additional excavation and remedial treatment of the soils in the vicinity of the former service station had been conducted to reduce contaminant concentrations within the soils in the Mall area.

EXTENT OF CONTAMINANTS OF CONCERN, SOURCE AND MIGRATION

Impacts at the Site appear to resemble that of weathered gasoline, including concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) and PHC fraction F1, with relatively lower concentrations of PHC fraction F2. There are also 1,2-DCA impacts, likely from its use as a gasoline additive. Naphthalene, a polycyclic aromatic hydrocarbon (PAH), has also been identified as a

contaminant of concern, however, it should not be considered a driver for decision making at this Site in isolation. Reports to date use benzene and 1,2-DCA to reasonably depict the extent of impacts.

The northern portion of the Site was impacted by LPH, from beneath the former Sears service station petroleum handling equipment to beneath 14th Avenue NW and the adjacent C-Train corridor to its south, then further south beneath Lions Park, and finally to the most northern portion of the Hounsfield Heights Area. LPH has been historically detected in some monitoring wells in Lions Park and the northern portion of the Hounsfield Heights area, as shown on Drawing No. B-16. The former primary source (i.e., the former Sears fuel handling equipment) of LPH likely percolated downward through the vadose zone to the relatively deep groundwater table. This migration resulted in ever increasing LPH 'heads' throughout the vadose zone until contacting the groundwater table in the lower portions of Unit 2, or upper portions of Unit 3, where there was sufficient LPH head pressure to overcome the applicable units pore entry pressures and begin preferential migration in this relatively more permeable unit between the less permeable Unit 2 and Unit 4. Continued migration, DPVE operation, and biodegradation appears to have reduced LPH saturations to residual (i.e., non-mobile) levels and a generally decreasing residual LPH area of impact. LPH was last detected in BH1704 in May 2022, and was not detected on subsequent monitoring dates in 2023 and 2024.

The extent of dissolved phase PHC impacts at the Site extends from the former Sears service station downward through the vadose zone (predominantly comprised of Unit 1 and the upper portions of Unit 2) to Unit 3 and, from there, to the south to the southern limit of delineation between 11th Avenue NW and 10th Avenue NW (i.e., approximately 400 m from the source at the Mall Area).

The overall extent of impacts for the vapour inhalation pathway for groundwater and soil vapour in 2024 are shown on Drawing No. B-17. Lateral delineation has been achieved to the north, west, and east, as well as in the downgradient wells located to the south.

CHANGES IN EXTENT OF IMPACT WITH TIME

A visual representation of the changes in concentration of benzene and 1,2-DCA in groundwater between 2015 and 2024 are illustrated on Drawing No. B-18 and B-19.

Changes in groundwater concentrations with time were analyzed in 2024 using two methods, trend analysis on individual wells, as well as overall plume stability analysis (Parsons, 2025b; MEMS, 2025). Trend analysis completed on individual wells included plotting groundwater concentrations with time, and Mann-Kendall statistical analysis. Overall plume stability analysis

was conducted using the Ricker Method® (Ricker, 2008) which can be used for comparing relative changes in contaminant plume characteristics over time. This differs from trend analysis for individual wells (such as Mann-Kendall) in that it considers overall plume characteristics, including plume-wide estimates of plume area, average concentration, contaminant mass, and centre of mass, with plume mass being the primary plume metric for the Ricker Method®.

MANN-KENDALL TREND ANALYSIS FOR INDIVIDUAL WELLS

Results of the Mann-Kendall trend analysis completed with data up to 2024 is shown on Drawing No. B-20 indicates that:

- North of the PRB: 34 of 37 monitoring wells had decreasing, probably decreasing, stable or no trend, with 3 of 37 monitoring wells indicated increasing or probably increasing trends for either benzene and/or 1,2-DCA. These are BH4002 (screened 11.7 - 13.2 m), BH4003B (screened 14.9 - 16.4 m), and BH6003 (screened 9.75 - 12.8 m), all screened within Unit 3; and,

- South of 11th Avenue and the PRB: 8 of 12 monitoring wells indicated decreasing, probably decreasing, stable or no trend; and, 4 of 12 monitoring wells indicated increasing or probably increasing trends for 1,2-DCA. These are BH1979 (screened 2.8 - 6.7 m), BH1981 (screened 3.0 - 9.1 m), BH2001 (screened 3.4 -4.9 m), and BH2005 (screened 3.95 - 7.0 m).

For the four groundwater monitoring wells located south of PRB/11th Avenue NW with increasing or probably increasing trends in 1,2-DCA, concentrations remain substantially less than the vapour inhalation guidelines, as shown on Drawing No. 10. The only well with a concentration exceeding the vapour inhalation guideline in this area (BH1979 for benzene) indicated a probably decreasing trend for benzene. Delineation in groundwater has been achieved to the south (downgradient) and southeast, with concentrations less than the guidelines and less than or approaching the laboratory detection limits for benzene and 1,2-DCA.

PLUME STABILITY ASSESSMENT

The results of the plume stability evaluation indicate:

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- North of PRB: the plume is decreasing in contaminant mass, plume area, and average concentration for both benzene and 1,2-DCA, with significant decreasing trends for all plume characteristics; and, the plume centre of mass for both benzene and 1,2-DCA is stable; and,

- South of 11th Avenue and the PRB: the plume is decreasing in contaminant mass, plume area, and average concentration for both benzene and 1,2-DCA, with significant decreasing trends for all plume characteristics. The overall plume centre of mass appears to have shifted southeast between 2019 and 2020. This shift is attributed to the rapid attenuation that occurred in the upgradient portion of the plume (i.e. the area immediately downgradient of PRB) following installation of the PRB in 2019.

Overall, the plume stability assessment indicates that the plume is generally decreasing with time. There are statistically significant decreasing trends overall, for all plume characteristics evaluated using the Ricker Method®. The decrease in the plume with time is further supported by evaluation of the plume centre of mass, which is generally stable.

MONITORED NATURAL ATTENUATION ASSESSMENT

Monitored Natural Attenuation (MNA) is a remedial approach that relies on the demonstration, through multiple lines of evidence, that naturally occurring physical (advection and dilution), chemical (volatilization, adsorption, and abiotic transformation), and/or biological processes (biodegradation, and biotransformation) can reduce the mass and concentrations of contaminants of concern to site-specific remedial objectives within a reasonable time frame. MNA is a widely accepted technology for contaminant remediation (Young and Mulligan, 2003). It has been successfully used worldwide for a wide range of contaminants, including those found at this Site. Basic protocols for monitoring biological natural attenuation have also been outlined for decades by organizations such as the USEPA and the US Air Force (Wiedemeier et al., 1999; US Geological Survey, 2006).

Documenting plume stability (LPH and dissolved phase impacts) and potentially decreasing contaminant concentrations is the primary line of evidence for MNA. Supporting lines of evidence can include patterns in the geochemical and redox conditions indicting increased biodegradation activity within a petroleum hydrocarbon plume. Tertiary lines of evidence generally provide information regarding the degradation of specific contaminants of concern based on the presence of specific biomarkers, genes, microorganisms, intermediary compounds and isotopic changes to the contaminant of concern.

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Evaluation of indirect MNA groundwater parameters included dissolved oxygen (DO), oxidation-reduction potential (ORP), sulfate, nitrate, ferrous iron, manganese, and methane. The concentrations of these parameters can help determine the redox state of the subsurface, which can then indirectly suggest if subsurface conditions can support the microbial degradation of a target contaminant, and if so, through which metabolic pathways. When these groundwater parameters are collected over time, trends can be discerned such as variations across seasons. Furthermore, these trends can also help to indirectly monitor MNA activity to determine if contaminant biodegradation is continuing, or if there is an unexpected change in the subsurface biogeochemistry that warrants further investigation. As such, the monitoring of targeted contaminants and MNA parameters provides additional (but indirect) lines of evidence for remedial effectiveness.

A comprehensive series of biogeochemical analyses were conducted in 2023 and 2024 to directly evaluate microbial MNA at the site (Parsons, 2025c). Selected biogeochemical results are summarized on Drawing No. B-21.

As a part of this analyses, a series of direct molecular evaluations was conducted to quantify both the microbial populations and the metabolic functions associated with the biodegradation of benzene in site groundwater. The goal was to determine if native bioattenuation was assisting with benzene degradation, and if so, the size of the responsible microbial communities and their functions.

An analysis of the 2023 and 2024 molecular microbial data indicates that in-situ microbial benzene biodegradation is currently occurring at this site. This is due to the confirmed presence of a native microbial population capable of benzene biodegradation. In addition, genes associated with multiple metabolic steps associated with benzene-biodegradation were found to be present in most evaluated monitoring wells, and at moderate concentrations. Gene concentrations remained relatively stable between 2023 and 2024. Together with groundwater geochemical data, which supports that subsurface conditions at the site remain favourable for the biodegradation of benzene, the 2023 and 2024 biogeochemical data confirms that in-situ biological degradation of benzene is occurring.

In summary, multiple lines of biogeochemical evidence have been documented at this site demonstrating that the in situ microbial biodegradation of benzene is occurring and remains a valid remedy for this site. These lines of evidence include:

- Environmental geochemical conditions known to support and favour the activity of microbial populations known to biodegrade target compounds were observed;

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- The 2024 subsurface geochemical conditions in the sampled monitoring wells appears generally consistent with the 2023 assessment, suggesting that subsurface environmental conditions are currently stable;

- There is a continued downward trend of benzene concentrations in many site monitoring wells over time;

- There is a confirmed presence of a microbial population known to biodegrade benzene; and,

- The confirmed presence of functional genes specifically involved in benzene biodegradation under the environmental conditions found at the site, which were found in almost all evaluated monitoring wells.

Results of this analysis are further detailed in the report entitled the Evaluation of Benzene Biodegradation Related Biogeochemical Data (Parsons, 2025c).

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT (2017 AND UPDATES)

Intrinsik Corp. (Intrinsik) completed a human health and ecological risk assessment (HHERA) for the Site in 2017 (Intrinsik, 2017) in accordance with guidance provided by AEP, Health Canada, and CCME. The 2017 risk assessment was based on the analytical data from a 2014 and 2015 environmental site investigation. In 2019, Intrinsik provided a letter response to the regulator based on feedback received regarding the 2017 HHERA, including revised Tier 2 groundwater guidelines for the protection of vapour inhalation in the Hounsfield Heights Area (Intrinsik, 2019). The Tier 2 guidelines for the protection of vapour inhalation were subsequently updated in December 2022 (based on the release of the 2022 AEP Tier 1 and 2 guidelines), in March 2024 (based on regulatory feedback in 2023), in October 2024 (based on the release of the 2024 AEPA Tier 1 and 2 guidelines), and in February 2025 (based on regulatory feedback in 2025). Updates to the site-specific guidelines are further detailed in the 2024 Annual Report (Parsons, 2025b).

The 2017 risk assessment identified that the vapour inhalation pathway was the main exposure pathway of concern for the Site.

For the vapour inhalation pathway, site-specific guidelines have been developed for BTEX, PHC fractions F1 and F2, naphthalene and 1,2-DCA for soil vapour, groundwater and soil. For soil vapour, guidelines were calculated for residential and commercial buildings for fine and coarse-textured soil, for various depths below foundation. For the calculation of groundwater guidelines

for the vapour inhalation pathway, the Site was divided into four areas (designated N1, N2, S1 and S2) from Lions Park and to the south in the Hounsfield Heights Area (the Mall Area north of the park was not included). For the calculation of soil guidelines for the vapour inhalation pathway, the Site was divided into the same four areas (designated N1, N2, S1 and S2), for various depths below the default residential basement foundation depths of 2.44 mbgs. The site-specific guidelines are further detailed in the 2024 Annual Report (Parsons, 2025b).

Select indoor air and sub-slab soil vapour testing was completed in three homes within the S1 area between September 2014 and May 2015, due to groundwater benzene concentrations exceeding the vapour inhalation pathway guideline in two groundwater monitoring wells in the area in 2015. Results indicated indoor air and sub-slab soil vapour benzene concentrations were less than the guidelines, or within the range of documented background concentrations. It was concluded that actual human health risks in the S1 area were lower than the risks predicted based on the exceedance of the calculated Tier 2 groundwater guideline.

The HHERA ruled out risks to ecological receptors for the direct contact pathway where the depth to groundwater is deeper than 3 mbgs. It also demonstrated that risks to freshwater aquatic life from groundwater migration are low (i.e., 1,2-DCA), and that PHC impacts can be ruled out as there is no surface water body within 300 m down gradient or 100 m up gradient of groundwater flow direction. The potable water pathway was removed from further assessment in the HHERA since potable water is provided by The City of Calgary municipal supply and, therefore, drinking water exposure to impacted groundwater is not expected. The HHERA also ruled out risks to human health for the direct contact pathway, including dermal contact and incidental ingestion with potentially impacted soligenous groundwater (i.e., groundwater that comes to surface as a seep and spring) for most contaminants of concern. Only benzene presented a potential risk from dermal contact and incidental ingestion with soligenous groundwater; the risk assessment included risk management options should impacted seeps or springs be observed in the future. The risk appears to be low, as ongoing observations in the area have not identified any indication of the presence of seeps.

OVERALL EVALUATION OF THE INDOOR VAPOUR INHALATION PATHWAY

In the northern portion to the site (in the vicinity of Lions Park and the Hounsfield Heights Community, north of 11th Avenue NW), groundwater monitoring wells with concentrations of benzene, F1, or 1,2-DCA that exceeded the vapour inhalation pathway are screened at depths greater than 9 mbgs and up to 19 mbgs. In these areas, and in other key areas of the site that exhibit the highest concentrations in groundwater (such as BH1704, EX-5, BH1906, EX-7), there are either groundwater or soil vapour wells screened at shallower depths (i.e. at depths between the deeper impact and the presumed depth of residential basements). These shallow installs are

considered more representative for evaluating vapour risks at depths closer to the breathing zone of receptors in basements than samples collected from a deeper depth (i.e. samples collected from shallow installs closer to the bottom of the basement can provide a better indication of the concentration of vapours before they enter an indoor environment). In these areas, as demonstrated on Drawing No. B-16, results from the shallower wells (either groundwater or soil vapour) were less than the guidelines for the vapour inhalation pathway during 2024. Plume stability assessment in this area indicates an overall decreasing plume, based on data collected up to 2024. The current groundwater and soil vapour network in this area, including the new vapour wells installed during 2024, will allow for monitoring of any potential changes with the proposed temporary deactivation of the DPVE system.

South of the PRB, where depths to groundwater are generally shallower, groundwater monitoring well BH1979 (screened 2.8 to 6.7 m, with a depth to groundwater of approximately 5.5 m) is the sole groundwater well that exceeds the vapour inhalation guidelines (for benzene). At this location, nested soil vapour wells SV603A (screened 4.27 to 4.57 m) and SV603B (screened 1.73 to 1.98 m) are used to further assess the vapour pathway. Soil vapour samples collected from both of these wells in 2024 did not exceed the soil vapour guidelines. Additionally, concentrations in groundwater in BH1979 indicate a probably decreasing trend for benzene since installation of the PRB in 2019, and overall plume stability assessment in this area indicates a generally decreasing plume.

Results of select indoor air and sub-slab soil vapour testing completed in three homes between September 2014 and May 2015 (south of the PRB within the S1 area, where groundwater exceeded the vapour inhalation pathway guidelines) indicated that indoor air and sub-slab soil vapour benzene concentrations were less than the guidelines, or within the range of documented background concentrations. It was concluded that actual human health risks in the S1 area were lower than the risks predicted based on the exceedance of the calculated Tier 2 groundwater guideline.

SUMMARY

An overall evaluation of vapour inhalation pathway indicates that concentrations exceeded in groundwater in some monitoring wells in 2024; however, the current monitoring well network includes shallower groundwater wells and/or soil vapour wells installed in key areas (and installed at depths between the deeper impact and the presumed depth of residential basements) that did not exceed in 2024. These are considered more representative for evaluation of actual vapour risk as they are at depths closer to the depth of residential basements.

APPENDIX B
CONCEPTUAL SITE MODEL

Lateral delineation of impacts in groundwater has been achieved to the north, west, and east, as well as in the downgradient wells located to the south. Groundwater samples from the wells on the southern extent remain less than the guidelines and were also less than or approaching the reported laboratory detection limits for benzene and 1,2-DCA.

An overall plume stability assessment indicates that the plume is generally decreasing with time. There are statistically significant decreasing trends overall, for all plume characteristics evaluated using the Ricker Method®. The decrease in the plume with time is further supported by evaluation of the plume centre of mass, which is generally stable.

Multiple lines of biogeochemical evidence have been documented at this site demonstrating that in-situ microbial biodegradation of benzene is occurring and remains a valid remedy for this site. These lines of evidence include the confirmed presence of a microbial population known to biodegrade benzene, confirmed presence of functional genes involved in benzene biodegradation, geochemical conditions known to support the microbial communities, as well as the decrease in benzene concentrations over time.

There are two remediation systems currently present at the site, the DPVE system (in operation since 2010/2011) located in the northern part of the site, and the Permeable Reactive Barrier (PRB) installed in 2019, located under 11th Avenue NW.

Overall, the PRB appears to have been effective in reducing concentrations of benzene and 1,2-DCA south of the PRB.

The DPVE system has achieved its primary goal of reducing mobile LPH at the site. The absence of free phase LPH since May 2022, and the low hydrocarbon recovery rates observed in both groundwater and soil vapour during the recent assessment, provide lines of evidence to support a temporary deactivation of the DPVE system, as discussed in the *Revised Remediation Plan, Version 5.0* (Parsons, 2024a). The current groundwater and soil vapour network in the northern portion of the site, including the new vapour wells installed during 2024, will allow for monitoring of any potential changes with the proposed temporary deactivation of the DPVE system.

APPENDIX B
CONCEPTUAL SITE MODEL

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APPENDIX B
CONCEPTUAL SITE MODEL

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Clifton, 2019b. Revised Remediation Plan, Hounsfield Heights and Mall Areas, Calgary, Alberta. Prepared by Clifton Associates Ltd. (Clifton) for Sears Canada Inc. August 13, 2019.

Clifton, 2020a. Annual Summary Report – 2020, Hounsfield Heights – Briar Hill Community, Calgary, Alberta. Prepared by Clifton Associates Ltd. (Clifton) for Sears Canada Inc. March 31, 2020.

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APPENDIX B
CONCEPTUAL SITE MODEL

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CONCEPTUAL SITE MODEL

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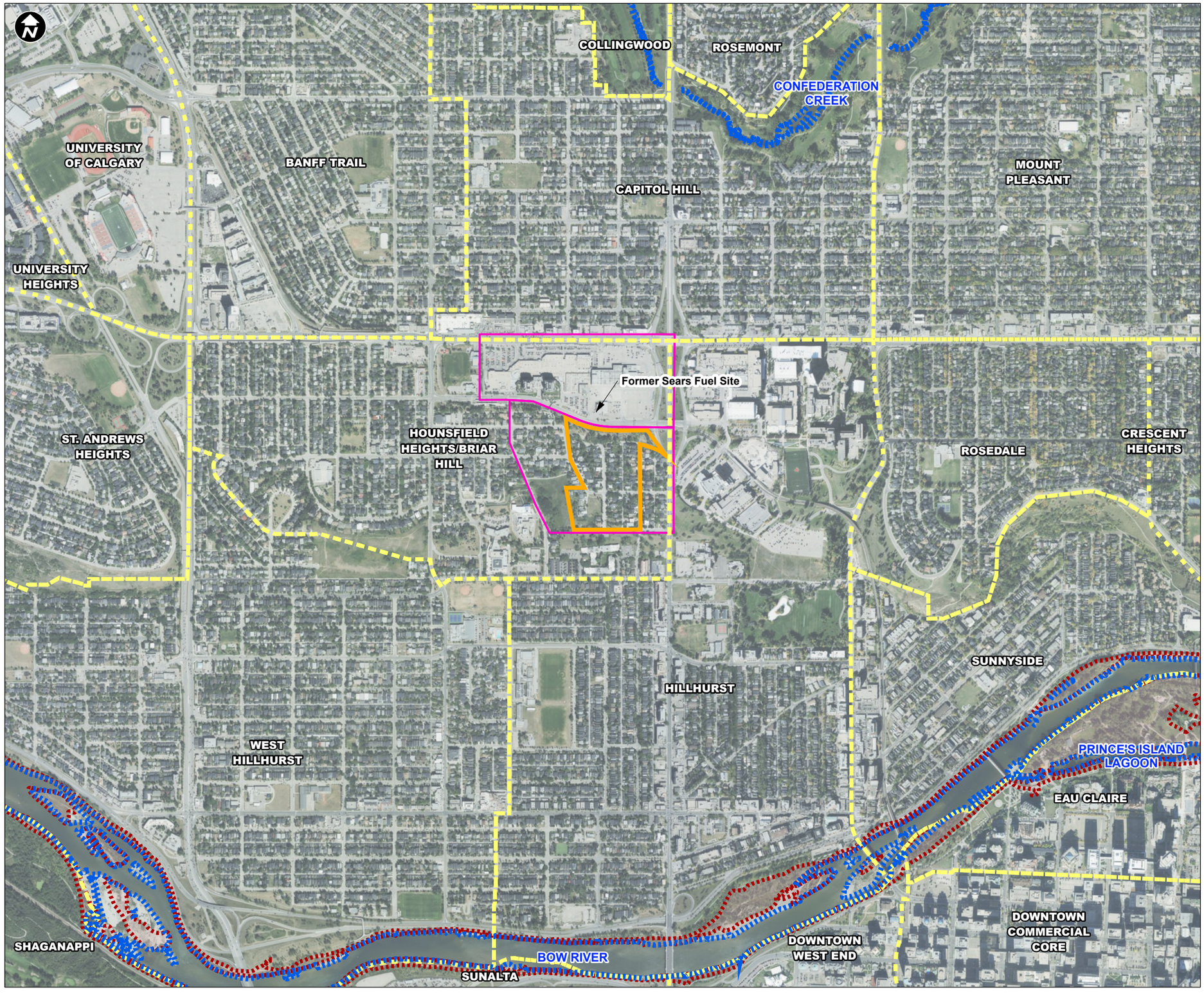

LEGEND

- Study Area
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Water Body
- Neighborhood Boundaries
- Floodway

0 500 1,000
Metres

Notes:
- The ArcGIS Map Service based on City of Calgary Basemap (WMASP).
- The orthophoto based on City of Calgary Basemap (WMASP), June-September 2023.
- Water bodies from City of Calgary Open Data Portal, Hydrology dataset, downloaded February 2025.
- Floodway from City of Calgary Open Data Portal, Regulatory Flood Hazard dataset, downloaded February 2025.
- Neighborhoods from City of Calgary Open Data Portal, Community Boundaries dataset, downloaded February 2025.

Site and Surrounding Area

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 25-Feb-2025

PARSONS

Drawing No.: B-1

Document Path: C:\Z_Drive\10-12832\APRX\Site_Plans\12832_Site_and_Surrounding_Area.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

LEGEND

- Grade Elevation Contour (masl) (1m interval)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)

0 25 50 100
Metres

Notes:
- The orthophoto based on City of Calgary Basemap (WMASP), June-September 2023.
- Elevation data based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.

Area Topography

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC/XL	Ref. No.: 10-12832
	Reviewed By: MP	Date: 27-Mar-2025

PARSONS

Drawing No.: B-2

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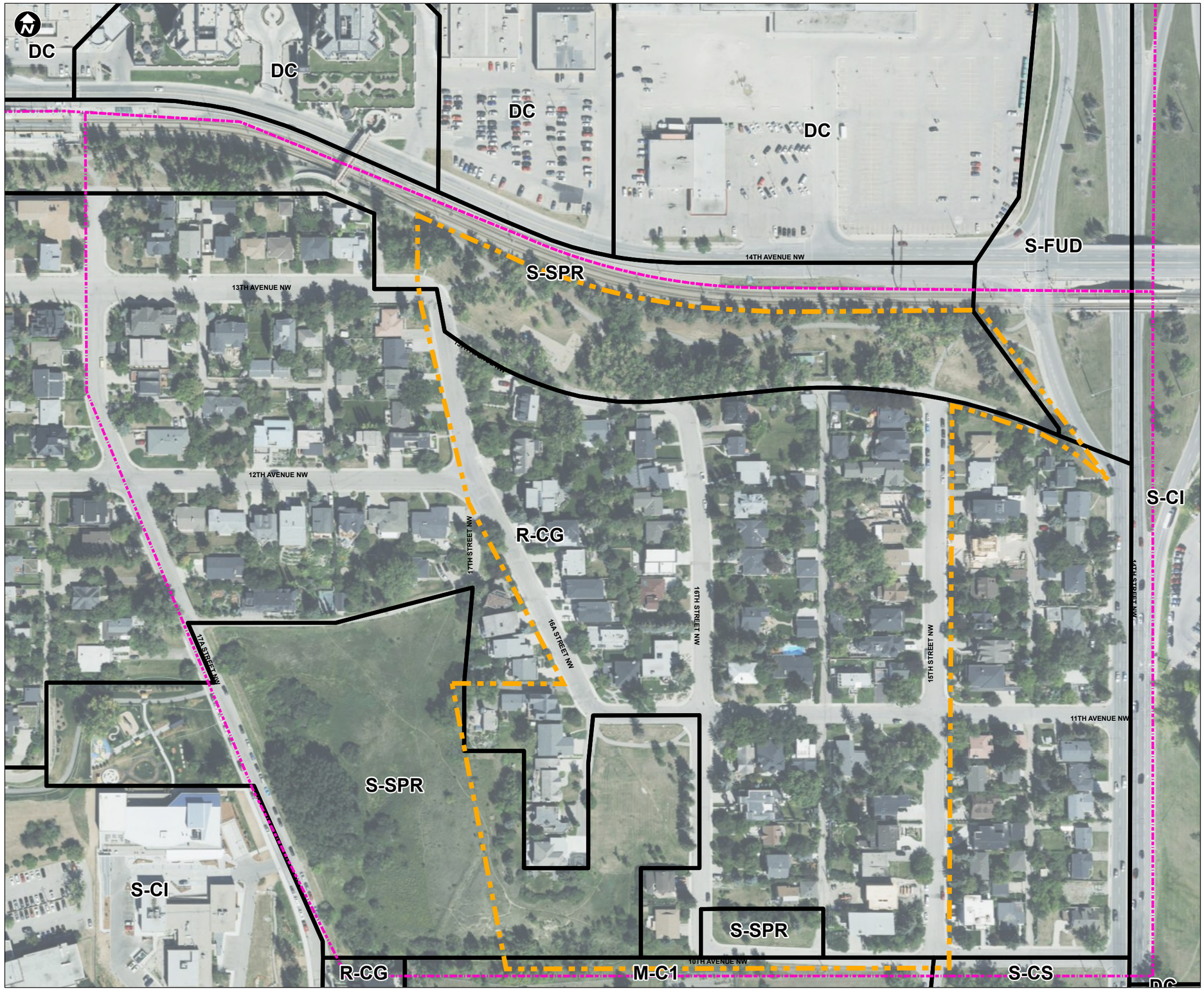

LEGEND

- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- City Of Calgary Zoning

Land Use Districts:

R-C1 (Residential - Contextual One Dwelling)
M-C1 (Multi-Residential - Contextual Low Profile)
M-CG (Multi-Residential - Contextual Ground Oriented)
C-COR1 (Commercial - Corridor 1)
C-COR2 (Commercial - Corridor 2)
S-SPR (Special Purpose - School, Park and Community Reserve)
S-CI (Special Purpose - Community Institution)
S-CS (Special Purpose - Community Service)
S-FUD (Special Purpose - Future Urban Development)
DC (Direct Control District)

0 37.5 75 150
Metres

Notes:
- The ArcGIS Map Service based on City of Calgary Basemap (WMASP).
- The orthophoto based on City of Calgary Basemap (WMASP), June-September 2023.
- Land Use District data based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded February 2025.

Zoning Map

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: JDC/XL	Ref. No.: 10-12832
	Reviewed By: MP	Date: 31-Mar-2025

PARSONS

Drawing No.: B-3

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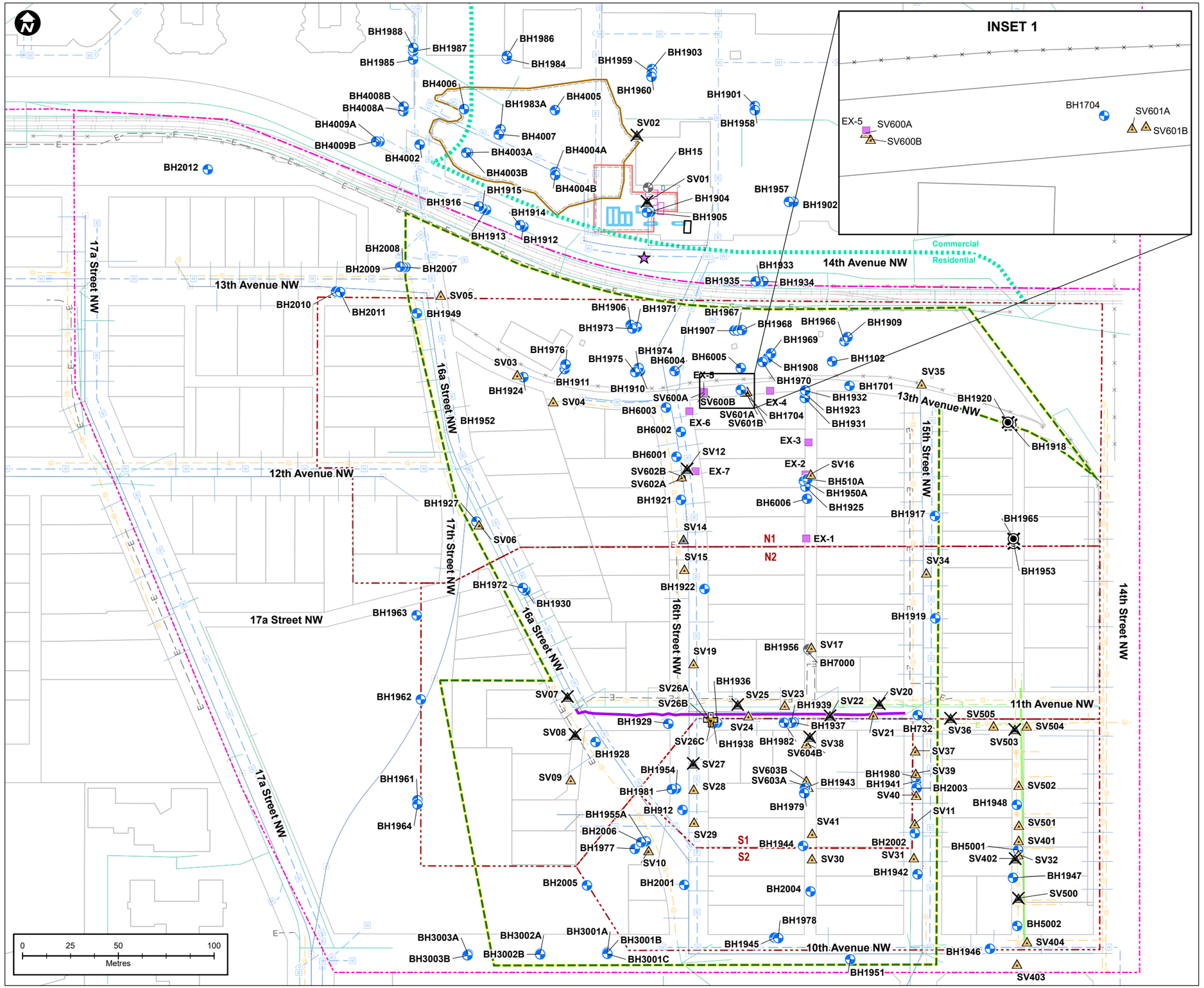

LEGEND

- Borehole (No Monitoring Equipment Installed)
- Extraction Well
- Monitoring Well
- Monitoring Well-Damaged
- Monitoring Well-Decommisioned
- Soil Vapour Probe
- Soil Vapour Probe (Nested)
- Soil Vapour Probe (Sub-slab)
- Soil Vapour Probe-Decommisioned
- Soil Vapour Probe-Damaged
- Soil Vapour Probe-Destroyed
- Utility Trench Excavation Area
- Waste Oil UST
- UST as indicated on 1963 Fire Insurance Plan
- USTs noted on a 1985 Simsons-Sears Contract Drawing
- Former Facilities (Kiosk, Pump Islands, USTs) Decommissioned 1995
- LRT Tracks
- Water
- Storm Sewer
- Sanitary Sewer
- Gas Line
- Overhead Electrical
- Underground Electrical
- Unconfirmed Electrical (Overhead or Underground)
- Tier 2 vapour inhalation pathway groundwater guideline area (N1, N2, S1, S2)
- Residential/parkland 30 m buffer
- Permeable Reactive Barrier (Dec. 2019)
- Former Tank Nest Excavation Area (2003)
- Former Remedial Excavation Extent (2006/2007)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)

Notes:
- Soil vapour wells on private property are not shown.
- The remedial excavation that took place in 1989 is not reflected on the drawing as the exact excavation limits are unknown. This area appears to be included within the subsequent 2003 excavation.
- Remedial excavations that took place in 2004 are not reflected on the drawing as the exact excavation limits are unknown. These areas appear to be included within the subsequent 2006/2007 excavation.

References:
- Well locations, on-site features provided as AutoCAD file by Clifton Engineering Group Inc..
- Property parcel data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.
- Utility data based on City of Calgary's Open Data Portal (City Online, Geospatial Data service, 2023), City of Calgary Block Profiles (City Online, 2024), and private utility locate sweeps near the SV500 series conducted in December 2022.

Site Plan

Groundwater Monitoring and Soil Vapour Well Locations

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 27-Mar-2025

PARSONS

Drawing No.: B-4

Document Path: C:\Z_Drive\10-12832\APRX\Site_Plans\12832_SitePlan_2024_NewLocations.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

DPVE

1301

1303

1305

1307

13th Avenue NW

16th Street NW

Screen interval 10.6 to 13.72 mbgs

EX-5

BH1704

EX-4

Screen interval 9.1 to 13.7 mbgs

Screen interval 10.3 to 13.72 mbgs

EX-6

Screen interval 10.6 to 13.11 mbgs

EX-3

Screen interval 10.3 to 13.72 mbgs

EX-7

Screen interval 11.5 to 15.85 mbgs

EX-2

Screen interval 8.8 to 13.41 mbgs

Screen interval 11.7 to 14.63 mbgs

EX-1

0 5 10 20
Metres

LEGEND

- Monitoring Well
- Extraction Well
- Site Boundary
- Sanitary Sewer
- Gas Line
- Water Line
- Fence
- Extraction Network
- 1301 Header ID

Notes:
- System configuration provided by Clifton Engineering Group Inc.; Drawing #4 in report: "Liquid Petroleum Hydrocarbon Assessment, Hounsfield Heights Area, 1620 14th Ave NW, Calgary, Alberta, 29 June 2021."
- Well locations, on-site features provided as AutoCAD file by Clifton Engineering Group Inc..
- Property parcel data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.
- Utility data based on City of Calgary's Open Data Portal (City Online, Geospatial Data service, 2023), City of Calgary Block Profiles (City Online, 2024), and private utility locate sweeps near the SV500 series conducted in December 2022.

Dual Phase Vapour Extraction System Configuration

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: MP	Date: 05-Mar-2025
PARSONS		Drawing No.: B-5

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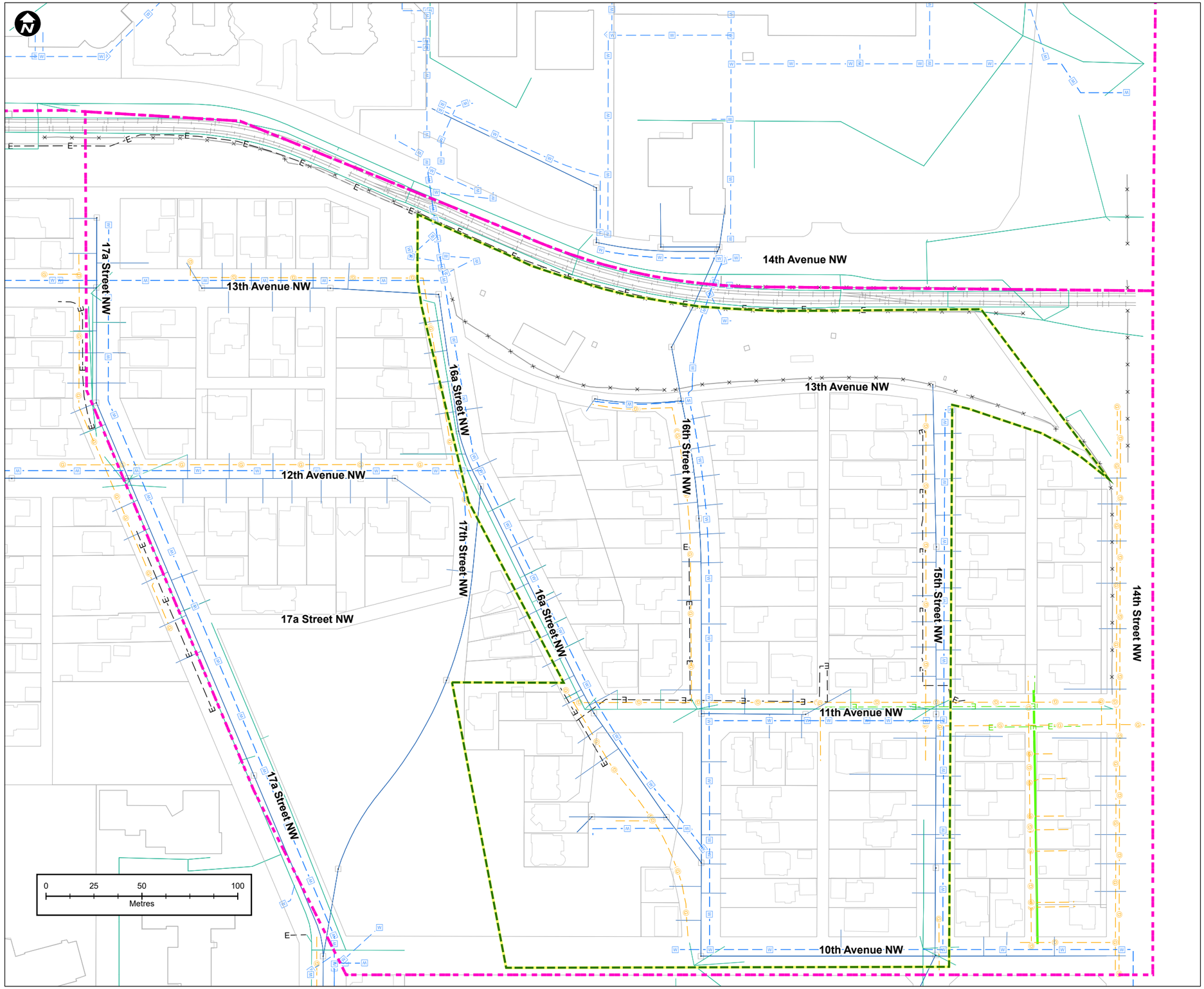


LEGEND

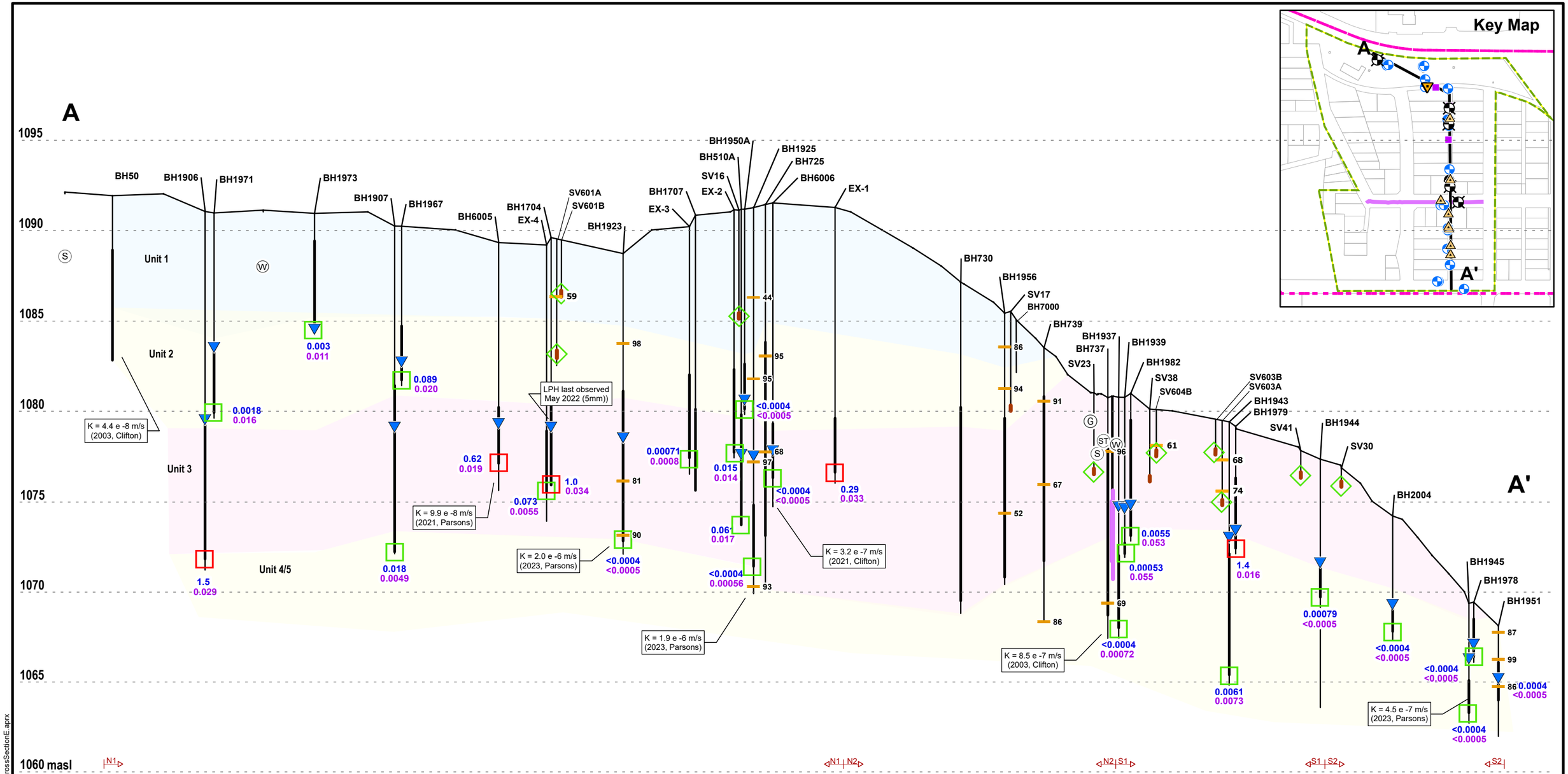
- LRT Tracks
- Water
- Storm Sewer
- Sanitary Sewer
- Gas Line
- Overhead Electrical
- Underground Electrical
- Unconfirmed Electrical (Overhead or Underground)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)

Notes:
- Property parcel data based on City of Calgary's Open Data Portal, City Online, Geospatial Data service. Downloaded March 2023.
- Building based on City of Calgary's Open Data Portal, City Online, Base Map Data service. Downloaded January 2023.
- Utility data based on City of Calgary's Open Data Portal (City Online, Geospatial Data service, 2023), City of Calgary Block Profiles (City Online, 2024), and private utility locate sweeps near the SV500 series conducted in December 2022.

Site Plan
Utilities

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: MR	Ref. No.: 10-12832
	Reviewed By: MP	Date: 28-Mar-2025
PARSONS		Drawing No.: B-6



LEGEND

- Groundwater Less than referenced guideline (2024)
- Groundwater Exceeds referenced guideline (2024)
- Soil Vapour Less than referenced guideline (2024)
- (G) Gas (assumed depth)
- (S) Sanitary (approximate depth)
- (ST) Storm (approximate depth)
- (W) Water (approximate depth)
- % Silt and Clay from Grain Size Analysis
- Groundwater Piezometric (masl) July 2023
- Permeable Reactive Barrier
- Soil Vapour Well Screen
- Groundwater Well Screen
- 0.5 Benzene (mg/L) maximum 2024 concentration
- 0.5 1,2-DCA (mg/L) maximum 2024 concentration
- N1 Site-Specific Soil Vapour Guideline Area

Notes:
- Utliity depths are approximate (from City block profiles where given, otherwise based on typical installation depths provided by City. Gas lines assumed at 1.5 mbgs. Residential branches from the main lines are not shown.
- Utility diameters are not to scale.
- Some locations are projected on to the cross-section.
- Vapour well screen intervals were not given and have been assumed to be 0.3 m from the total install depth.
- Lateral distance for nested groups has been exaggerated.
- Permeable Reactive Barrier: Injected Nov-Dec 2019 with PlumeStop and Oxygen Release Compound-Advanced.
- Stratigraphic data from BH510 has been combined with the data for BH510A.
- Grade elevation has been estimated for some locations.
- Highest of non-detect values are shown where detection limits differ.

0 20 40
metres

Geological Cross-Section A-A'

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: MR/SLD	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 2025-Mar-28
PARSONS		Drawing No.: B-7

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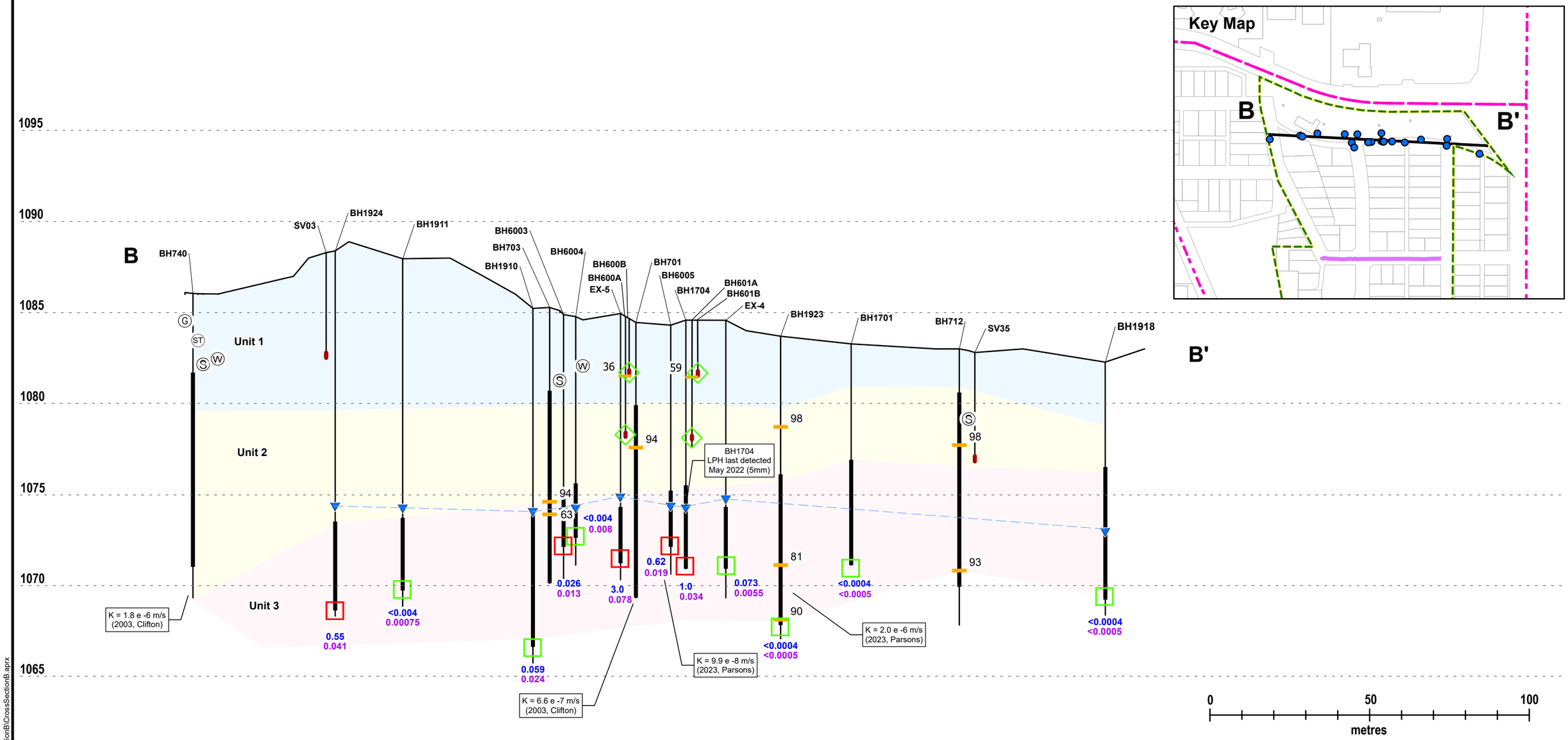


LEGEND

- Groundwater Less Than Referenced Guideline (2024)
- Groundwater Exceeds Referenced Guideline (2024)
- Soil Vapour Referenced Guideline (2024)
- (G) Gas (assumed depth)
- (S) Sanitary (approximate depth)
- (ST) Storm (approximate depth)
- (W) Water (approximate depth)
- Soil Vapour Well Screen
- Groundwater Well Screen
- 0.5 Benzene (mg/L) maximum 2024 concentration
- 0.5 1,2-DCA (mg/L) maximum 2024 concentration
- % <75 microns (% Silt and Clay) from Grain Size Analysis
- Groundwater Piezometric (masl) July 2023

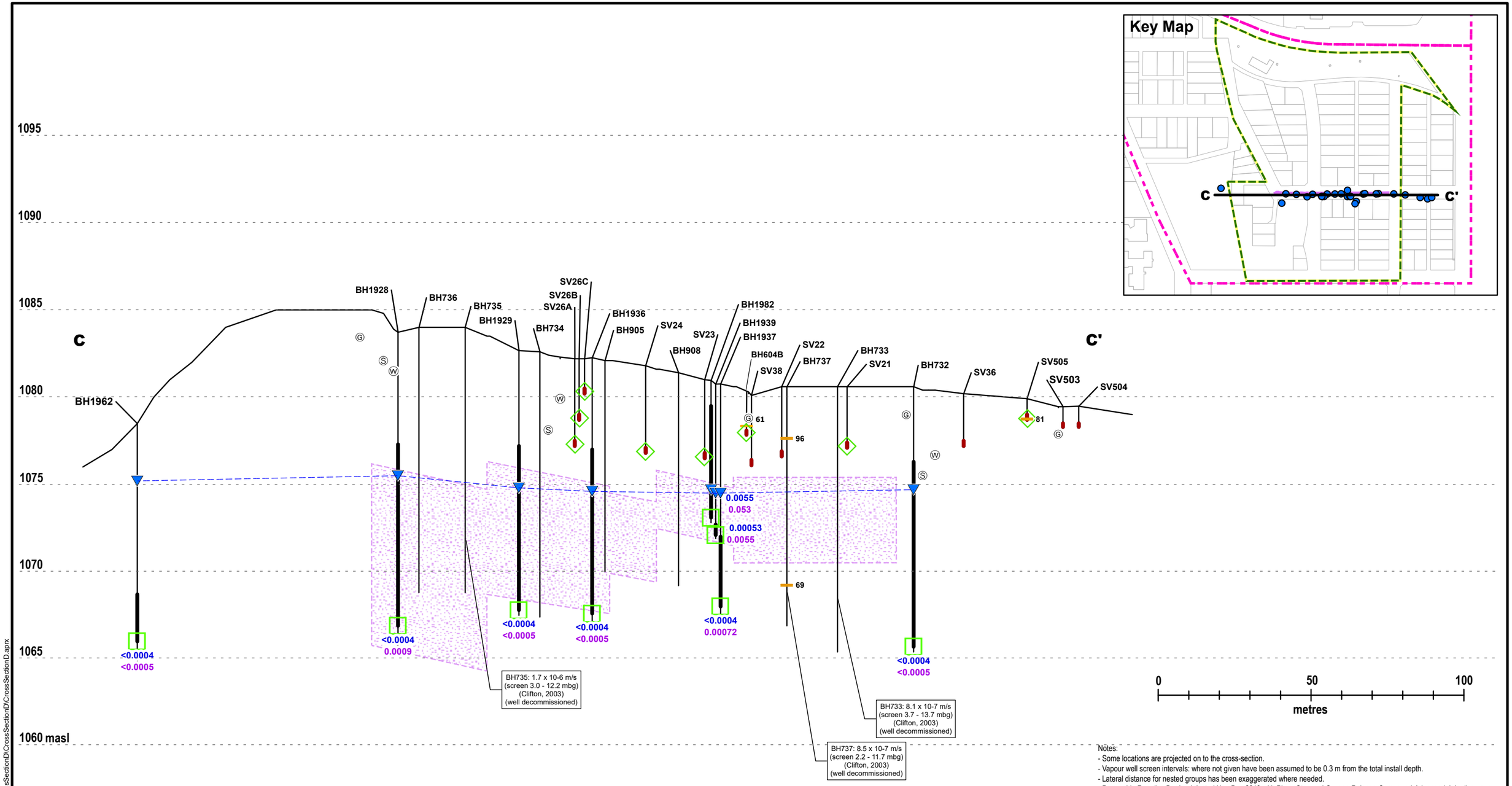
Notes:
- Utlity depths are approximate (from City block profiles where given, otherwise based on typical installation depths provided by City.
  Gas lines assumed at 1.5 mbgs. Residential branches from the main lines are not shown.
- Utility diameters are not to scale.
- Some locations are projected on to the cross-section.
- Vapour well screen intervals were not given and have been assumed to be 0.3 m from the total install depth.
- Lateral distance for nested groups has been exaggerated.
- Permeable Reactive Barrier: Injected Nov-Dec 2019 with PlumeStop and Oxygen Release Compound-Advanced.
- Grade elevation has been estimated for some locations.
- Highest of non-detect values are shown where detection limits differ.

Geological Cross-Section B-B'

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: MR	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 2025-Mar-28
PARSONS		Drawing No.: B-8

Document Path: C:\Z_Drive\10-12832\CrossSections\CrossSectionB\CrossSectionB\CrossSectionB.aprx



LEGEND

- 2024 Vapour Sample(s) Less Than Guideline (all analytes)
- Groundwater Less than referenced guideline (2024)
- Groundwater Exceeds referenced guideline (2024)
- Groundwater Piezometric (masl) July 2023
- % <75 microns (% Silt and Clay) from Grain Size Analysis
- Permeable Reactive Barrier Injection Depths (Nov/Dec 2019)
- Soil Vapour Well Screen
- Groundwater Well Screen
- Ⓖ Gas (assumed depth)
- Ⓢ Sanitary (approximate depth)
- Ⓦ Water (approximate depth)
- **0.5** Benzene (mg/L) maximum 2024 concentration
- **0.5** 1,2-DCA (mg/L) maximum 2024 concentration

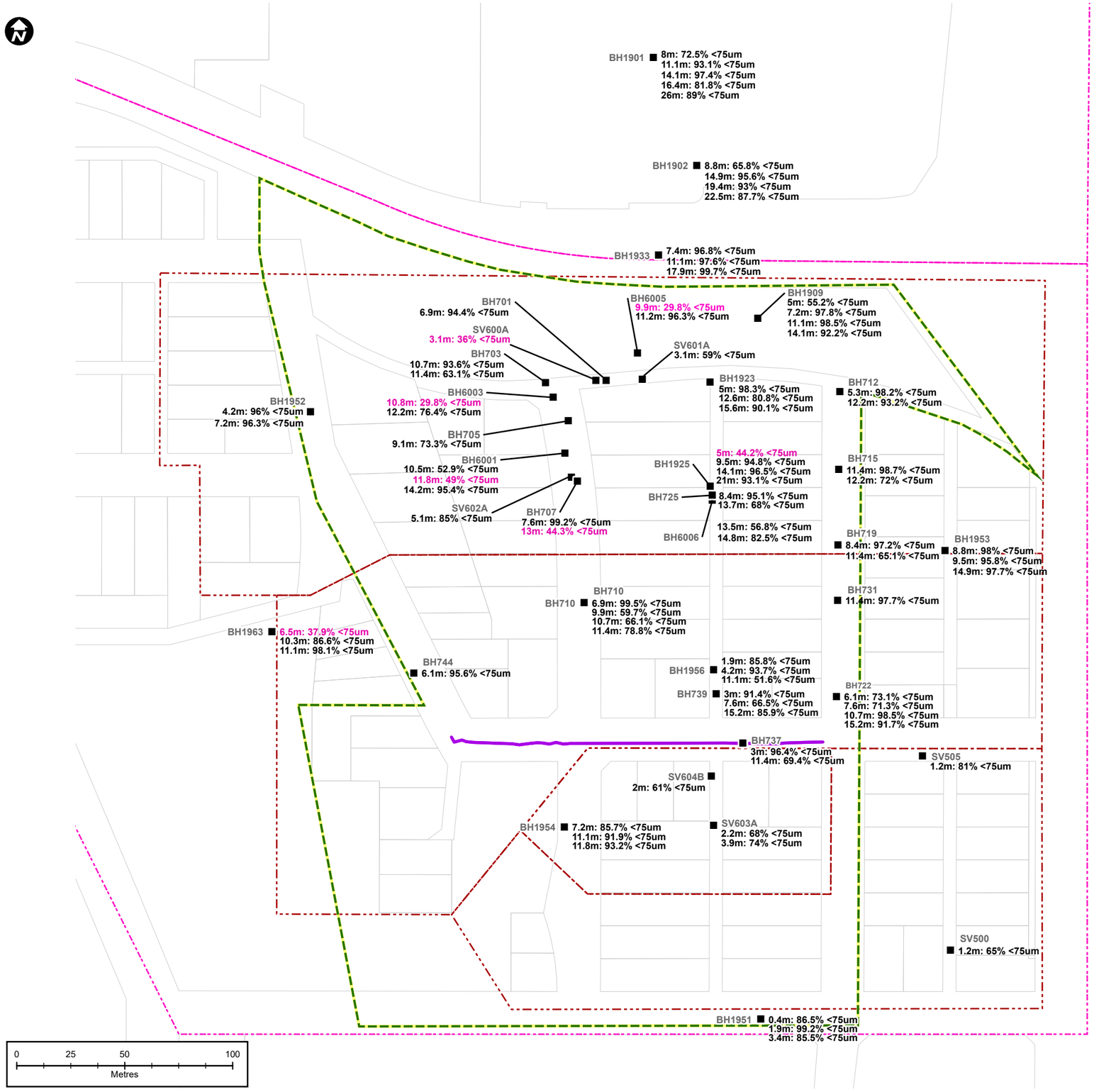
Notes:
- Some locations are projected on to the cross-section.
- Vapour well screen intervals: where not given have been assumed to be 0.3 m from the total install depth.
- Lateral distance for nested groups has been exaggerated where needed.
- Permeable Reactive Barrier: Injected Nov-Dec 2019 with PlumeStop and Oxygen Release Compound-Advanced. Injection zone based on InSitu Remediation Services Injection Summary, Dec. 14, 2019, as quote in Appendix C of Clifton 2020.
- Screens for decommissioned wells are not shown.
- Grade elevation has been estimated for some locations.
- All utility depths are estimated and may vary. Source: City block profiles where given, otherwise depths have been estimated or assumed. Gas lines assumed at 1.5 mbg. Residential branches from the main lines are not shown.
- Utility diameters are not shown to scale.
- Highest of non-detect values are shown where detection limits differ.

Geological Cross-Section C-C'

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

Drawn By: SLD	Ref. No.: 10-12832
Reviewed By: SLD	Date: 2025-Mar-28
PARSONS	Drawing No.: B-9

Document Path: C:\Z_Drive\10-12832\CrossSections\CrossSectionD\CrossSectionD.aprx



LEGEND

- Permeable Reactive Barrier (Dec. 2019)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Tier 2 vapour inhalation pathway groundwater guideline area (N1, N2, S1, S2)

96% <75um Fine-Grained (i.e. sieve results indicate >50% is < 75 microns, i.e. silt and clay)

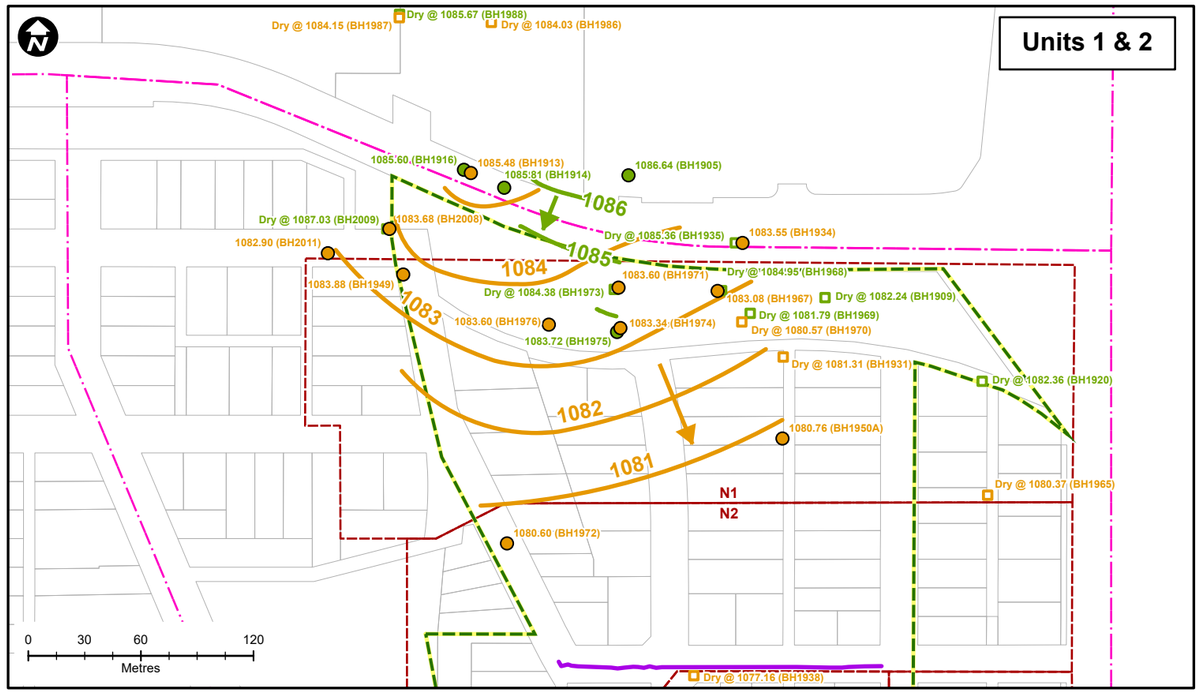
40% <75um Coarse-Grained (i.e. sieve results indicate <50% is < 75 microns)

Summary of Grain Size Results (Sieve Analysis Results: % of soil < 75 microns)

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: B-10

Document Path: C:\Z_Drive\10-12832\APRX\2024\12832_GW_GrainSize_Feb2025.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada



Notes:
- Wells that were not monitored for water levels are not shown.

LEGEND

- Permeable Reactive Barrier (2019)
- Site Boundary
- Tier 2 vapour inhalation pathway guideline area (N1, N2, S1, S2)

Monitoring Well and Potentiometric Surface Elevation (masl):

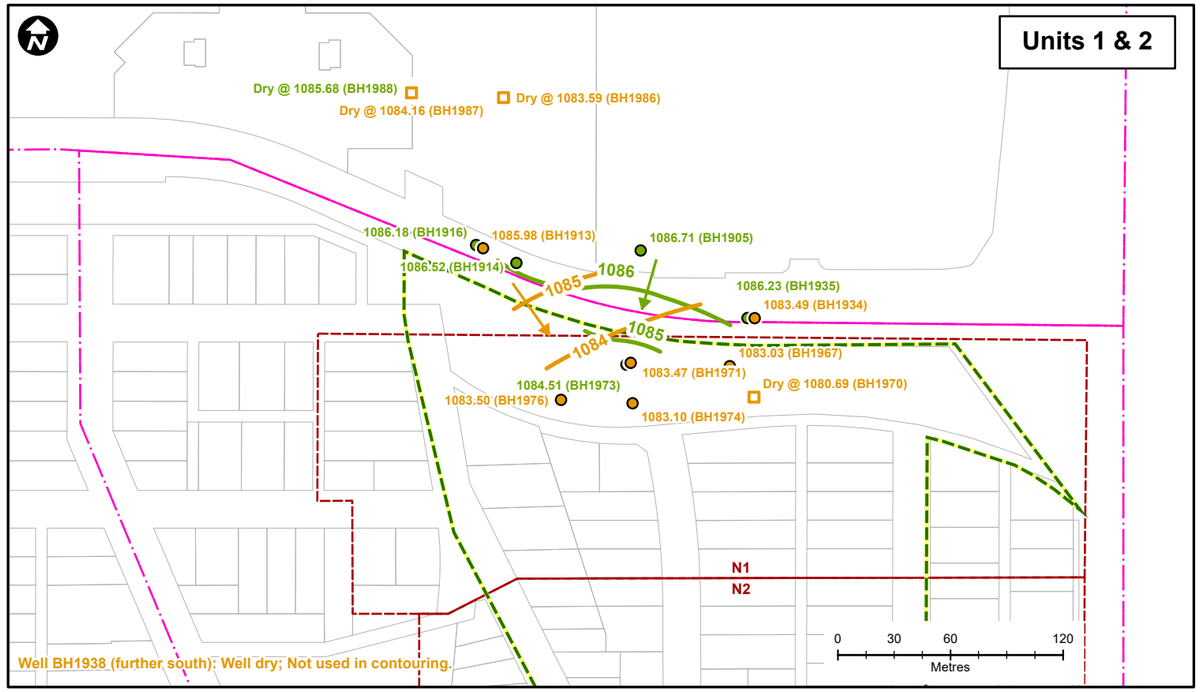
- Unit 1
- Unit 2
- Unit 3
- Unit 4 and 5
- Inferred direction of groundwater flow
- Well dry, could not be found (CNF), could not be monitored (NM), or value [ ] not used in contouring
- [] Value not used in contouring

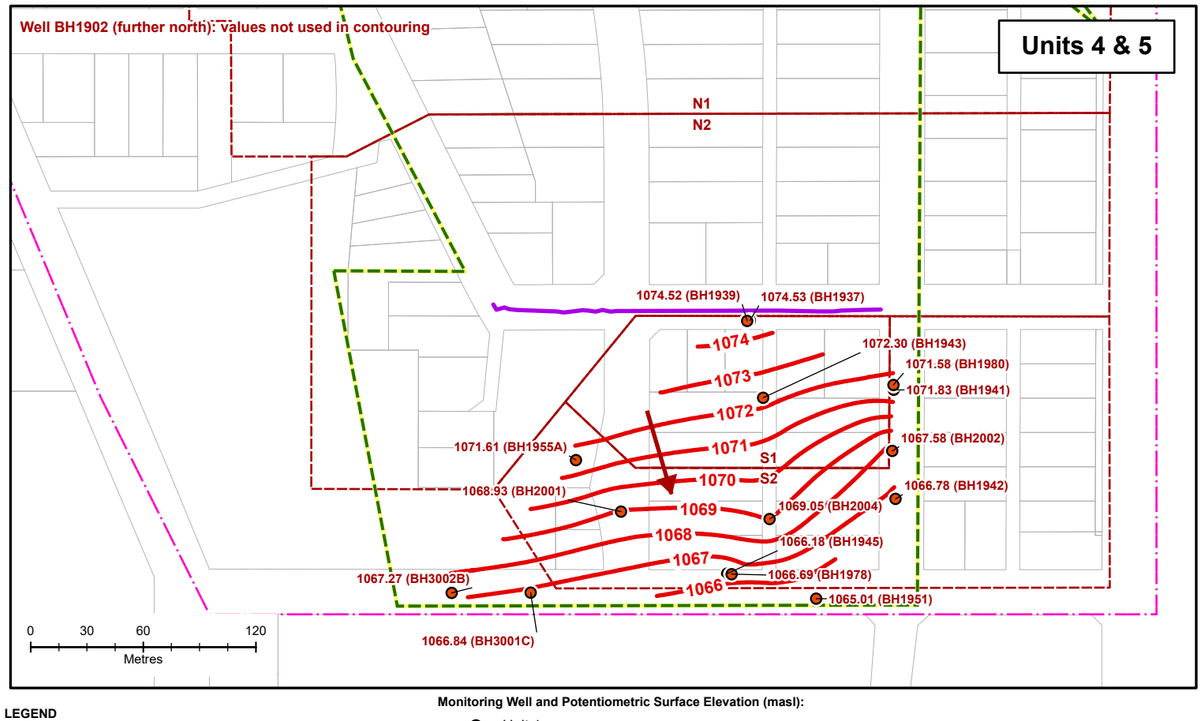
Elevation of the Groundwater Potentiometric Surface (masl) (May 2024)

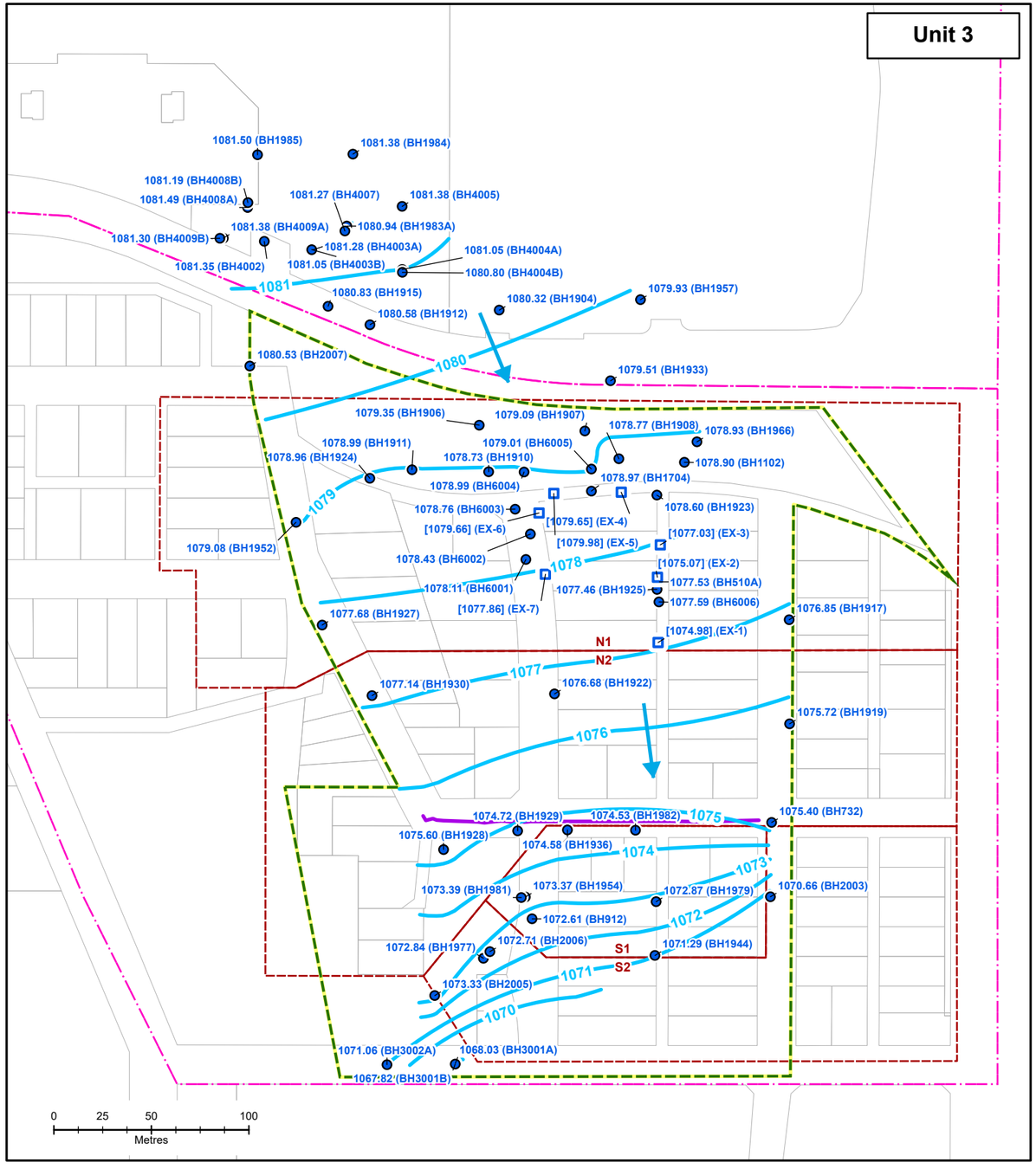
Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: MR	Ref. No.: 10-12832
	Reviewed By: AT/MP	Date: 30-Mar-2025
PARSONS		Drawing No.: B-11

Document Path: C:\Z_Drive\10-12832\APRX\20241\2832_GW_Contours_May_June_2024\12832_GW_Contours_May_June_2024.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada







Notes:
- Wells that were not monitored for water levels are not shown.

LEGEND

- Permeable Reactive Barrier (2019)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Tier 2 vapour inhalation pathway guideline area (N1, N2, S1, S2)

Monitoring Well and Potentiometric Surface Elevation (masl):

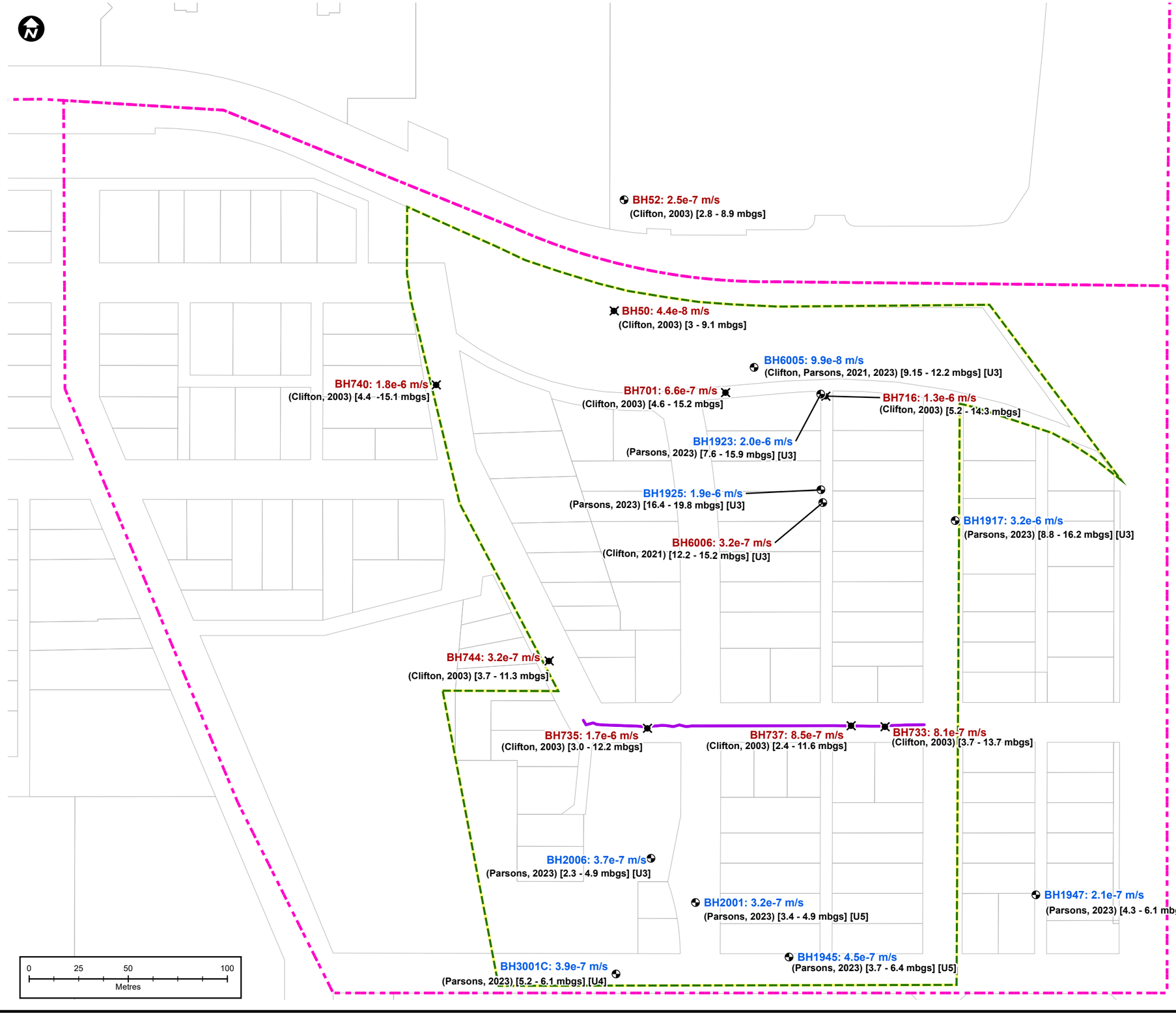
- Unit 1
- Unit 2
- Unit 3
- Unit 4 and 5
- Inferred direction of groundwater flow
- Well dry, could not be found (CNF), could not be monitored (NM), or value [ ] not used in contouring
- [] Value not used in contouring

Elevation of the Groundwater Potentiometric Surface (masl) (September 2024)

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

Drawn By: MR	Ref. No.: 10-12832
Reviewed By: SLD	Date: 30-Mar-2025
PARSONS	Drawing No.: B-12

Document Path: C:\Z_Drive\10-12832\APRX\2024\12832_GW_Contours_Sept_2024.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada



LEGEND

- Monitoring Well
- Permeable Reactive Barrier (Dec. 2019)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)

1.3 x 10-7	Hydraulic Conductivity (m/s) - 2023
1.3 x 10-7	Hydraulic Conductivity (ms/) - historical
(Parsons, 2023)	Consultant and Test Date
[1 - 5 mbgs]	Well Screen
[U3]	Geological Unit

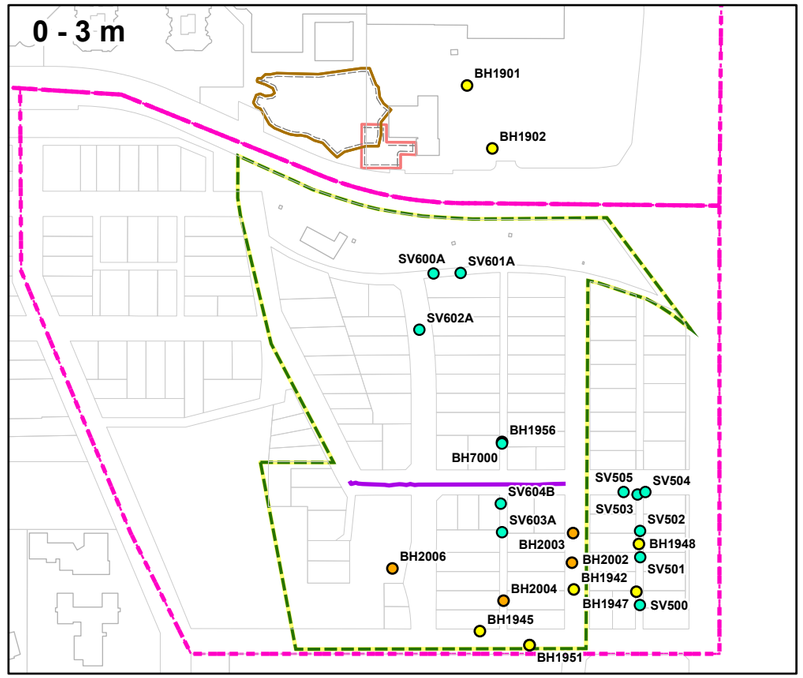
The average is shown where more than one test result is available for a well.

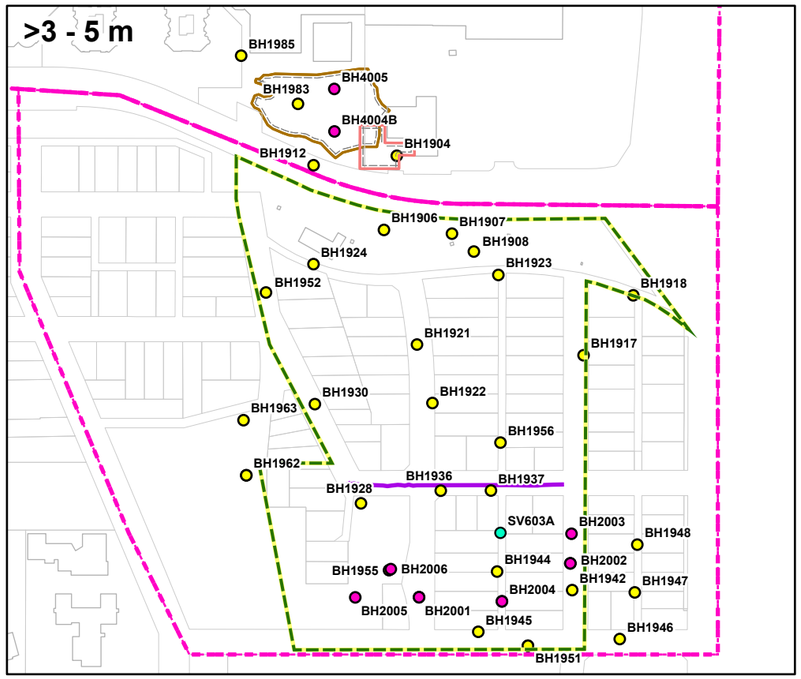
Summary of Hydraulic Conductivity Test Results (m/s)

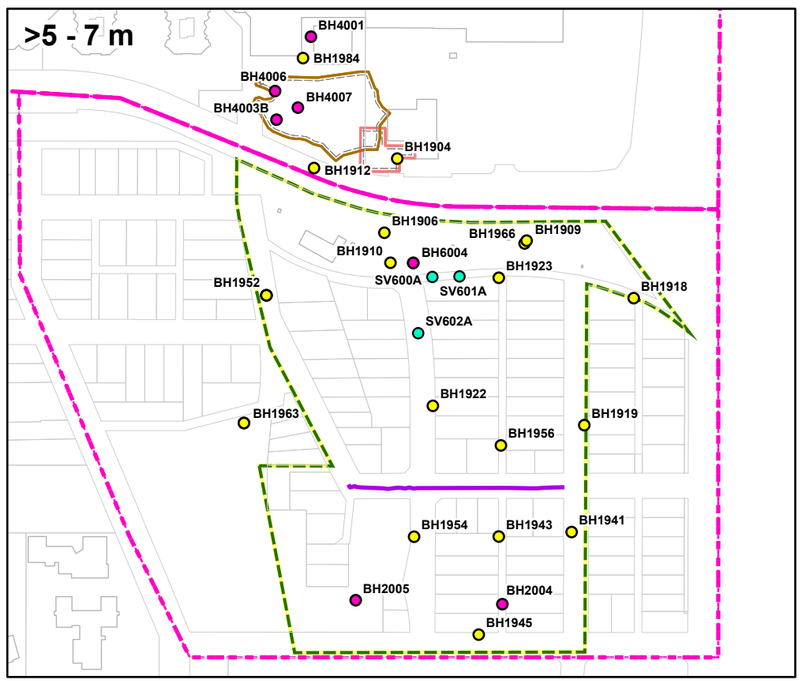
Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

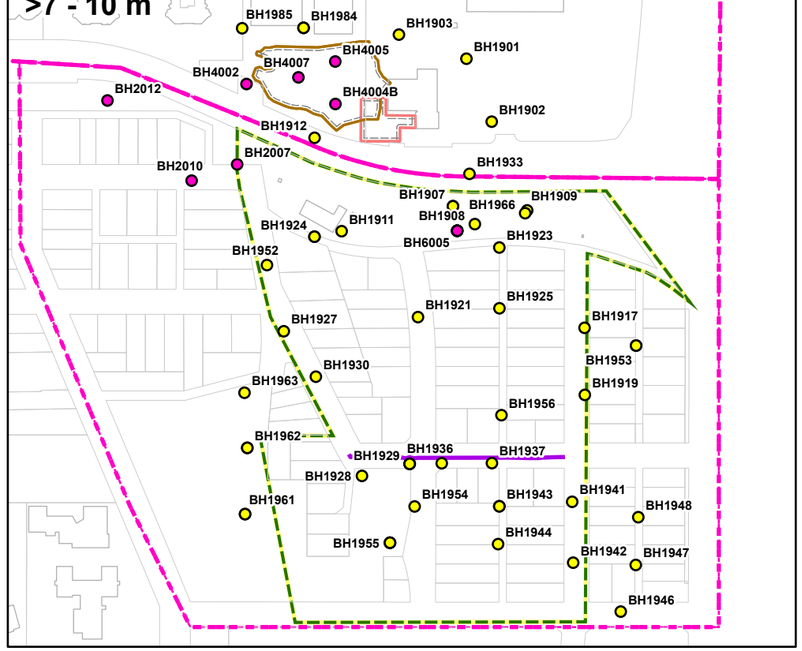
	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: B-13

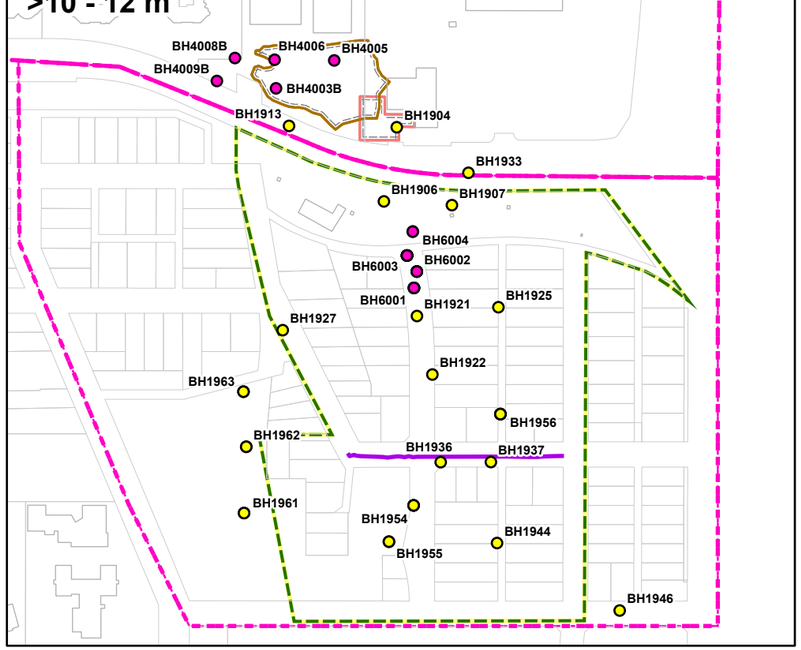
Document Path: C:\Z_Drive\10-12832\APRX\K_TestK_Test.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

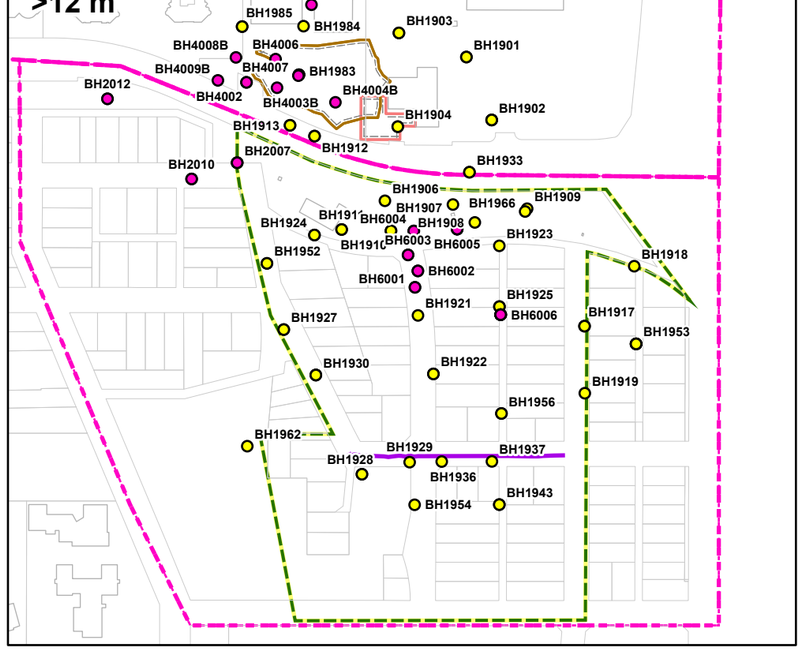












LEGEND

- Soil Sample Location (2014, 2015)
- Soil Sampling Location (2016, 2019, 2021)
- Soil Sampling Location (2022, 2024)
- Permeable Reactive Barrier (Dec. 2019)
- Site Boundary
- Former Excavation Extent (2008)
- Former Tank Nest Excavation Area (2004)

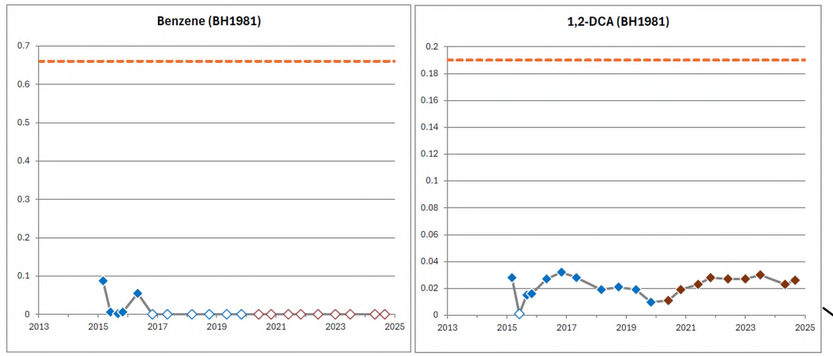
0 50 100 200
Metres

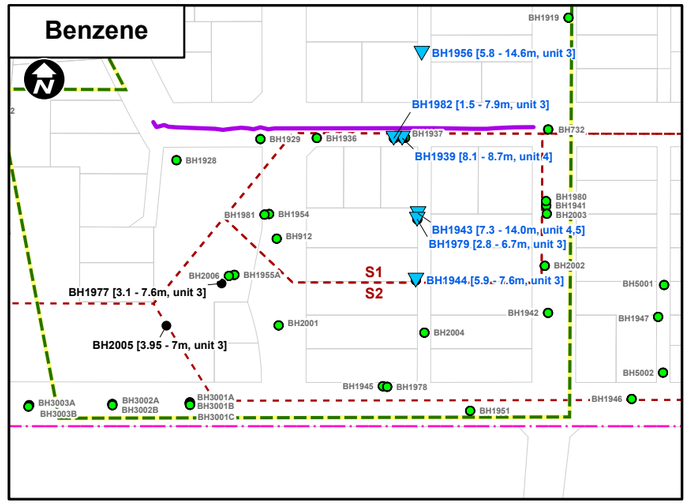
Historical Soil Locations Sampled for Benzene
2014, 2015, 2016, 2019, 2021, 2022, 2024

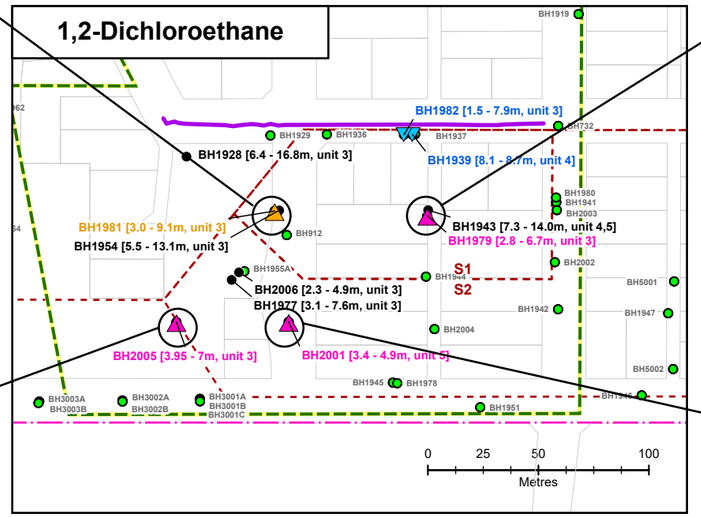
Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

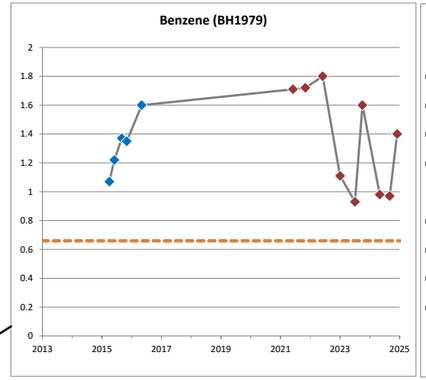
Drawn By: MR/SLD	Ref. No.: 10-12832
Reviewed By: SLD	Date: 28-Mar-2025
PARSONS	Drawing No.: B-14

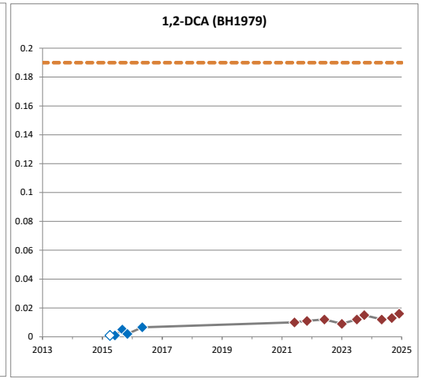
Document Path: C:\Z_Drive\10-12832\APRX\Soil_Locations\Soil_Locations.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

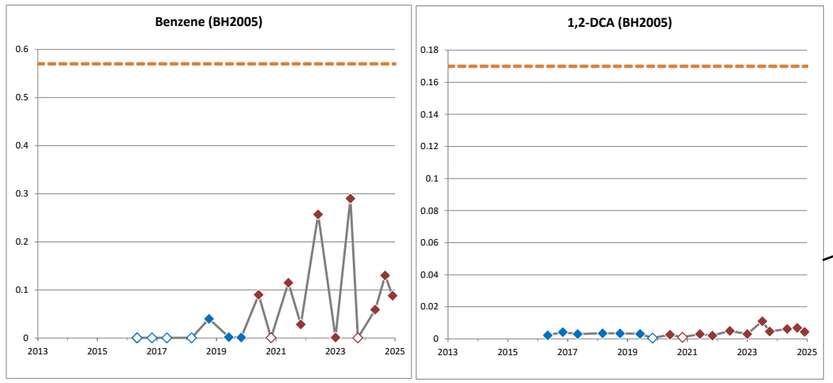


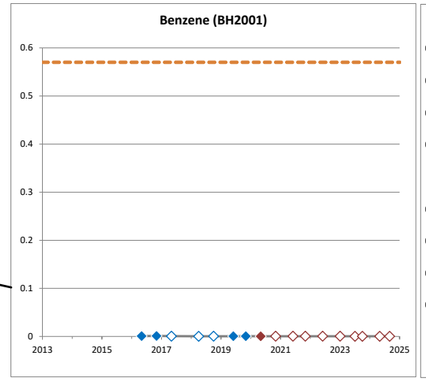


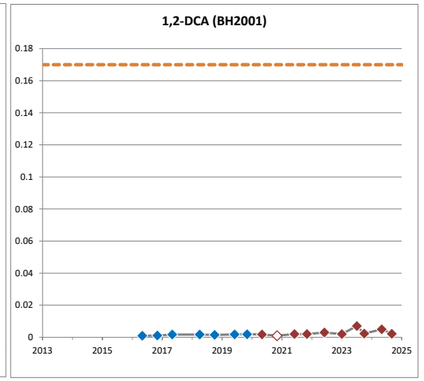












LEGEND

- Probably Increasing Trend
- Increasing Trend
- Stable or No Trend
- Decreasing or Probably Decreasing Trend
- Data less than laboratory detection limits during last 3 and/or majority of events
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Permeable Reactive Barrier (2019)
- Vapour Inhalation Guideline
- [1-8 m, unit 1] Screen interval (mbgs) and Geological Unit

Units are in mg/L

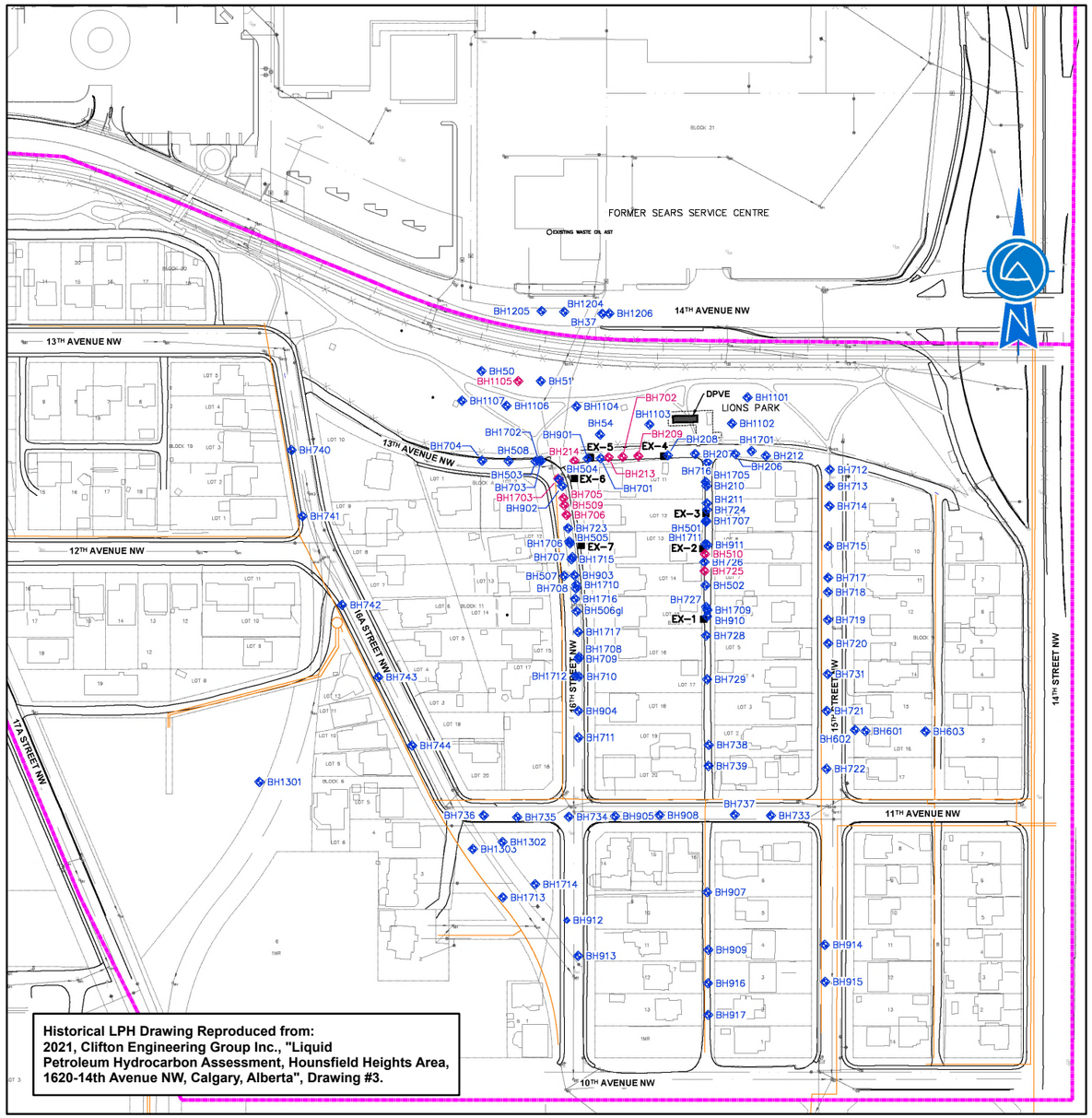
Trend Analysis Summary for Selected Wells South of the PRB
Benzene and 1,2-Dichloroethane
Groundwater Analytical Data

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: XL/SLD	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: B-15

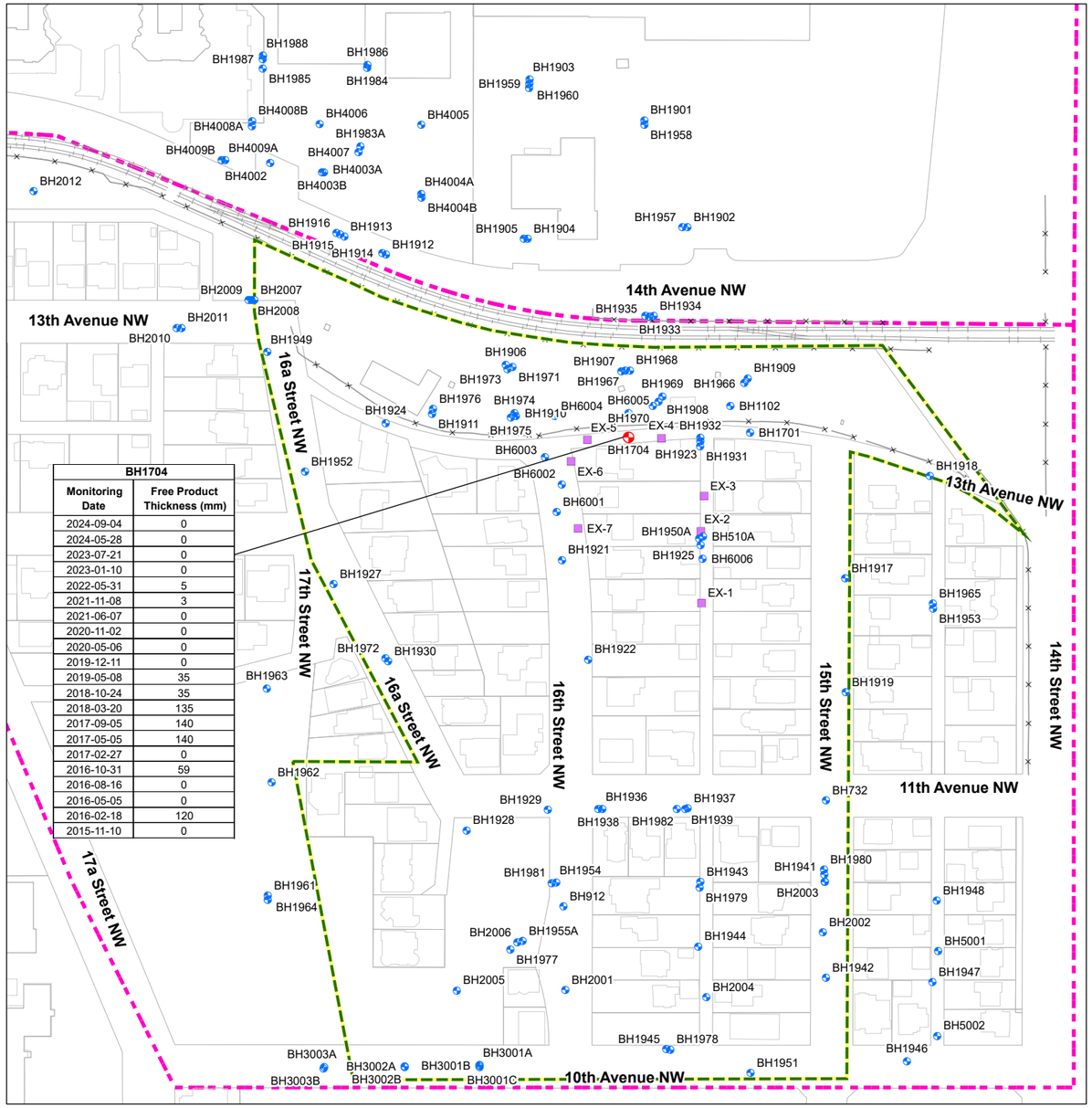
Document Path: C:\Z_Drive\10-12832\APRX\Trend_plot\Trend_plot_V2.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

Historical LPH Detected in Monitoring Wells between 1998 and 2014



Historical LPH Drawing Reproduced from:
2021, Clifton Engineering Group Inc., "Liquid Petroleum Hydrocarbon Assessment, Hounsfield Heights Area, 1620-14th Avenue NW, Calgary, Alberta", Drawing #3.

Historical LPH Detected in Monitoring Wells Between 2015 and 2024



BH1704	
Monitoring Date	**Free Product Thickness (mm)**
2024-09-04	0
2024-05-28	0
2023-07-21	0
2023-01-10	0
2022-05-31	5
2021-11-08	3
2021-06-07	0
2020-11-02	0
2020-05-06	0
2019-12-11	0
2019-05-08	35
2018-10-24	35
2018-03-20	135
2017-09-05	140
2017-05-05	140
2017-02-27	0
2016-10-31	59
2016-08-16	0
2016-05-05	0
2016-02-18	120
2015-11-10	0

LEGEND

- Monitoring Well - no LPH since 2015
- Monitoring Well with LPH on any date after 2015
- Extraction Well
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Groundwater Monitoring Well (1998 to 2014, Clifton)
- Groundwater Monitoring Well Containing LPH (1998 to 2014, Clifton)

Summary of Historical Liquid-Phase Hydrocarbon Locations (1998 to 2024)

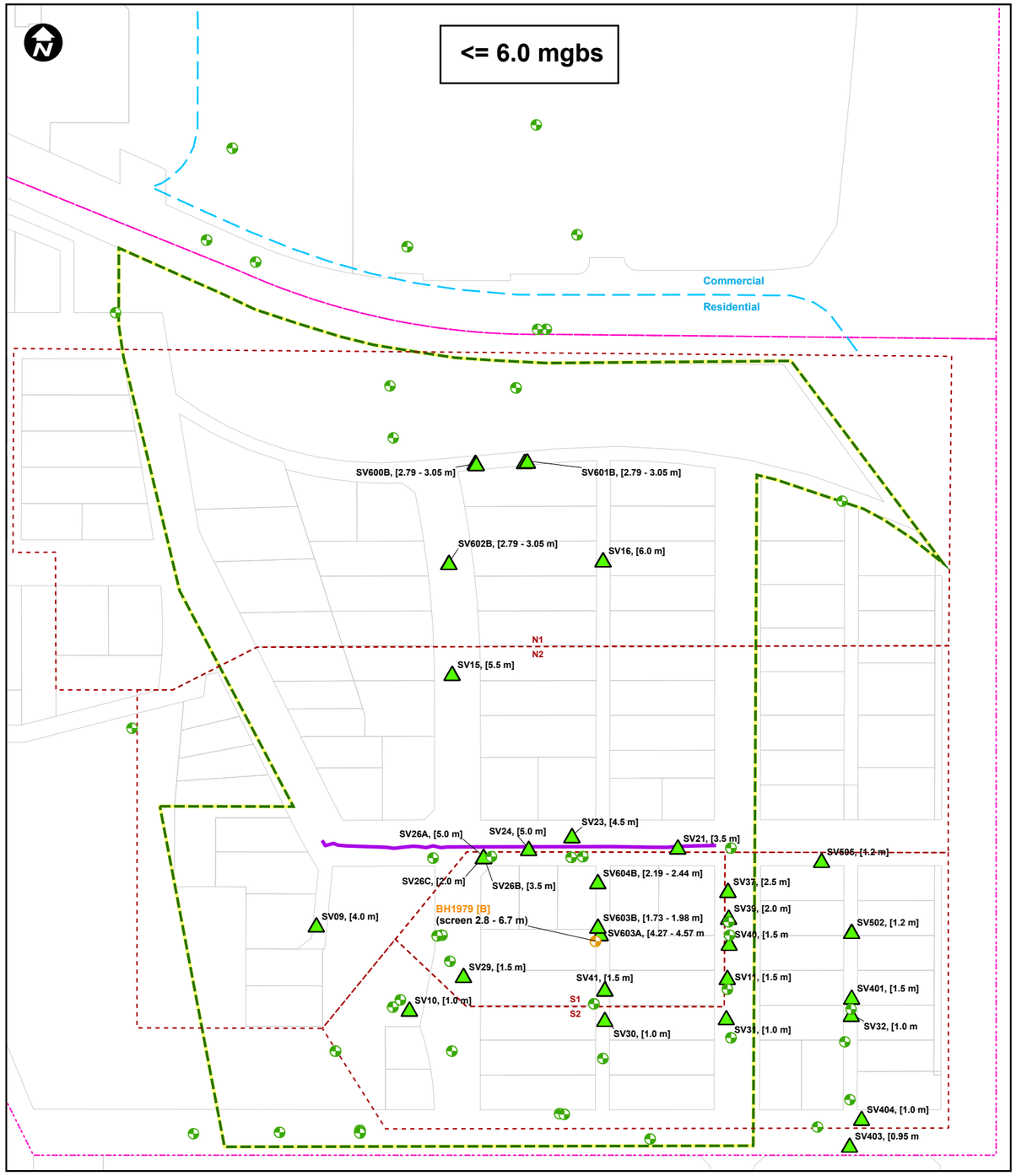
Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

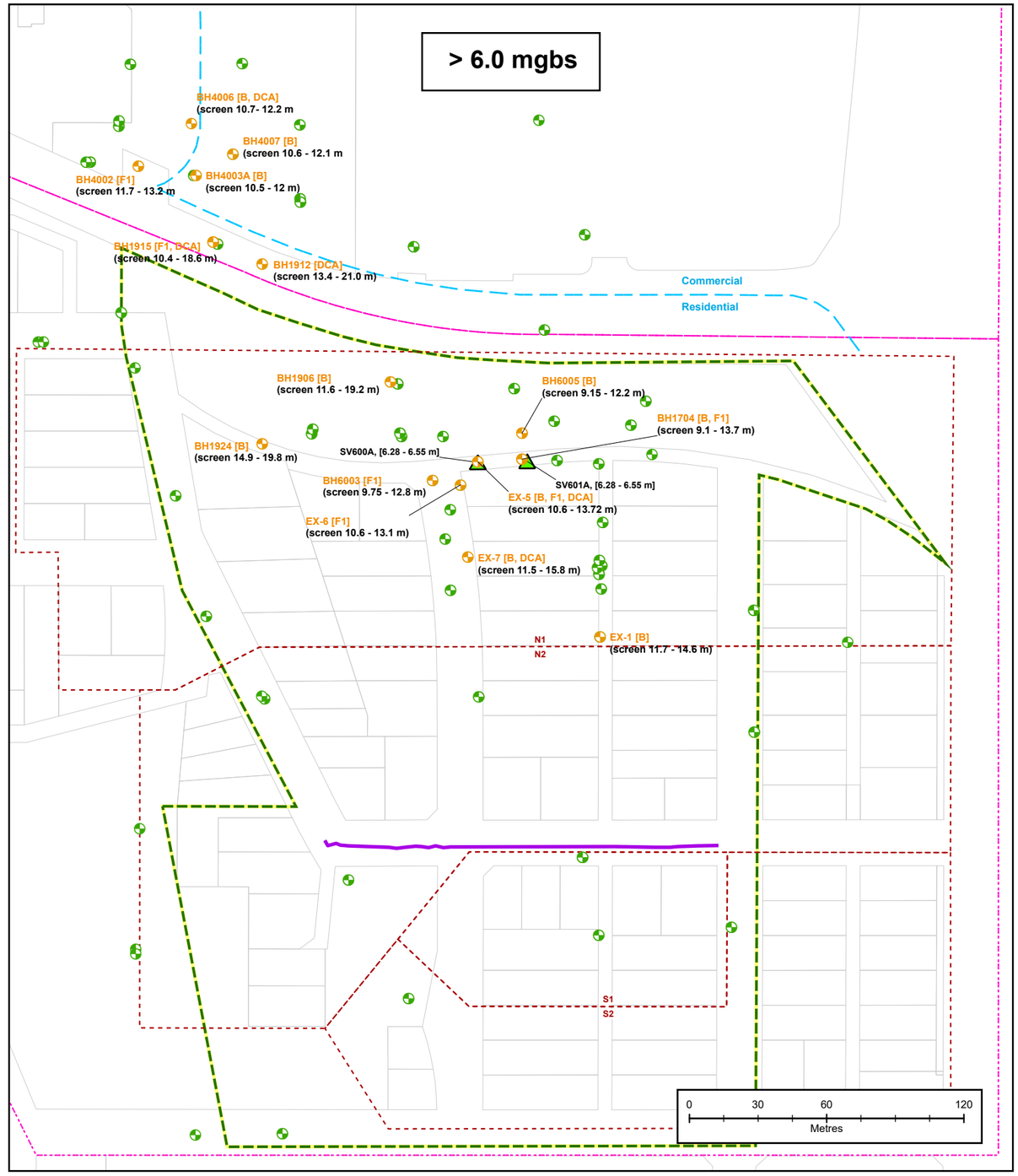
Drawn By: XL	Ref. No.: 10-12832
Reviewed By: SLD	Date: 31-Mar-2025

PARSONS

Drawing No.: **B-16**

Document Path: C:\Z_Drive\10-12832\APRX\LPH\12832_LPH_Locations.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada





LEGEND

- Tier 2 vapour inhalation pathway groundwater guideline area (N1, N2, S1, S2)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Permeable Reactive Barrier (Dec. 2019)
- Residential/parkland 30 m buffer
- GROUNDWATER sample(s) less than vapour inhalation pathway guideline for all 2024 sampling events (all units)
- GROUNDWATER sample(s) exceeds guideline for vapour inhalation pathway (guideline varies based on area) for one or more 2024 sampling events (all units)
- VAPOUR sample(s) less than applicable guideline for all analytes (2024 sampling events)
- VAPOUR sample(s) exceeds guideline for any analyte (2024 sampling events)
- VAPOUR sample(s) exceeds 90% threshold for any analyte (2024 sampling events) but does not exceed the guideline

[B, DCA] Groundwater: Analyte that exceeds vapour inhalation guideline
[3 m] Total depth of vapour well (mbgs)
[3 - 5 m] Well Screen (mbgs)

Notes:
- Nested soil vapour sample results have been adjusted for display purposes.

Vapour Inhalation Pathway: 2024 Groundwater Analytical Data & 2024 Soil Vapour Analytical Data

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: B-17

May 2015

May 2016

May 2017

April 2018

May 2019

May 2020

June 2021

June 2022

July 2023

May 2024

Sept. 2024

LEGEND

- Monitoring Well Sampled
- Site Boundary
- Permeable Reactive Barrier (2019)

Benzene (mg/L)

- <= 0.05
- >0.05 - 0.5
- >0.5 - 1.0
- >1.0 - 1.5
- >1.5 - 2.0
- >2.0 - 3.5
- >3.5 - 6.0
- >6.0 - 9.0
- > 9.0

Notes:

- The PRB was installed in 2019, with pilot tests in 2016 and 2018. The DPVE system has been in operation generally from 2010/2011 to the current date.
- Analytical data was collected at the specified locations and sampling dates; concentrations at locations that were not investigated may differ.
- Sample duplicates are not shown.
- 2023/2024 analytical data collected by Parsons; 2022 and prior data by Clifton Associates.

0 100 200 400

Metres

Historical Summary of Benzene Concentrations in Unit 3 2015 - 2024

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: 12

May 2015

May 2016

May 2017

April 2018

May 2019

May 2020

June 2021

June 2022

July 2023

May 2024

Sept. 2024

LEGEND

- Monitoring Well Sampled
- Site Boundary
- Permeable Reactive Barrier (Nov/Dec 2019)

1,2-Dichloroethane (mg/L)

- <= 0.008
- >0.008 - 0.04
- >0.04 - 0.07
- >0.07 - 0.09
- >0.09 - 0.12
- >0.12 - 0.14
- >0.14 - 0.17
- >0.17 - 0.2
- > 0.2

Notes:
- The PRB was installed in 2019, with pilot tests in 2016 and 2018. The DPVE system has been in operation generally from 2010/2011 to the current date.
- Analytical data was collected at the specified locations and sampling dates; concentrations at locations that were not investigated may differ.
- Sample duplicates are not shown.
- 2023/2024 analytical data collected by Parsons; 2022 and prior data by Clifton Associates.

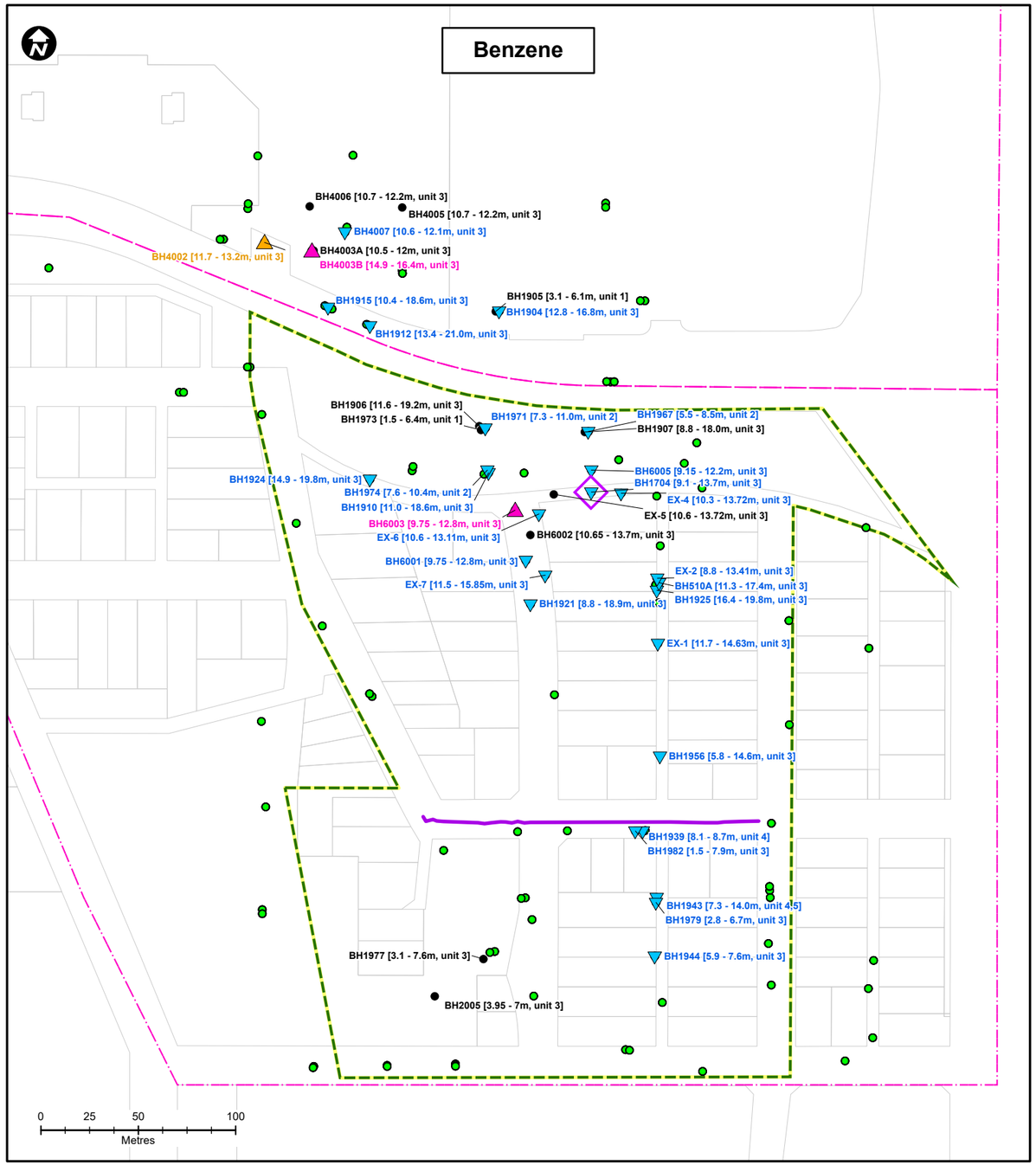
0 100 200 400
Metres

Historical Summary of 1,2-Dichloroethane Concentrations in Unit 3 2015 - 2024

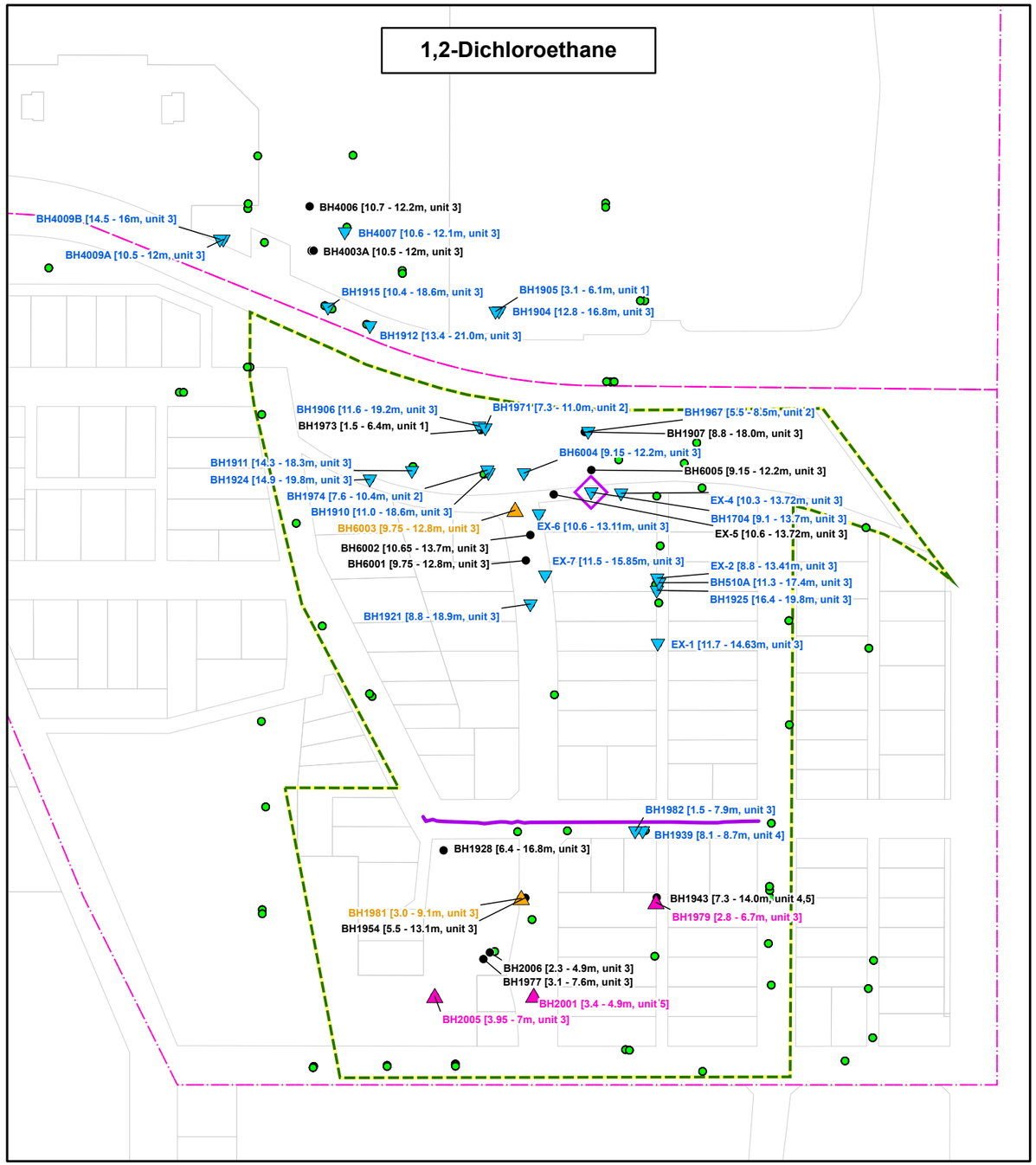
Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

	Drawn By: XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 28-Mar-2025
PARSONS		Drawing No.: B-19

Benzene



1,2-Dichloroethane



LEGEND

- Probably Increasing Trend
- Increasing Trend
- Stable or No Trend
- Decreasing or Probably Decreasing Trend
- Data less than laboratory detection limits during last 3 and/or majority of events

[1-8 m, unit 1] Screen interval (mbgs) and Geological Unit

- LPH (BH1704, last detected in May 2022)
- Site Boundary
- Proposed Site Management Area (Lions Park and Hounsfield Heights)
- Permeable Reactive Barrier (2019)

Note: DPVE system started operating in 2010/2011

Mann-Kendall Trend Analysis Summary
Benzene and 1,2-Dichloroethane

Hounsfield Heights And Lion's Park, 1620-14th Ave NW Calgary, Alberta

Drawn By: XL	Ref. No.: 10-12832
Reviewed By: SLD	Date: 28-Mar-2025

PARSONS

Drawing No.: **B-20**

Document Path: C:\Z_Drive\10-12832\APRX\Trend_plot\GW_2024Trend.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH4008A	10.5 - 12.0	3	7/11/2023	<0.00040	1.56E+02	8.81E+03	9.85E+03	1.42E+04	2.10E+03	<4.70	5.41E+06

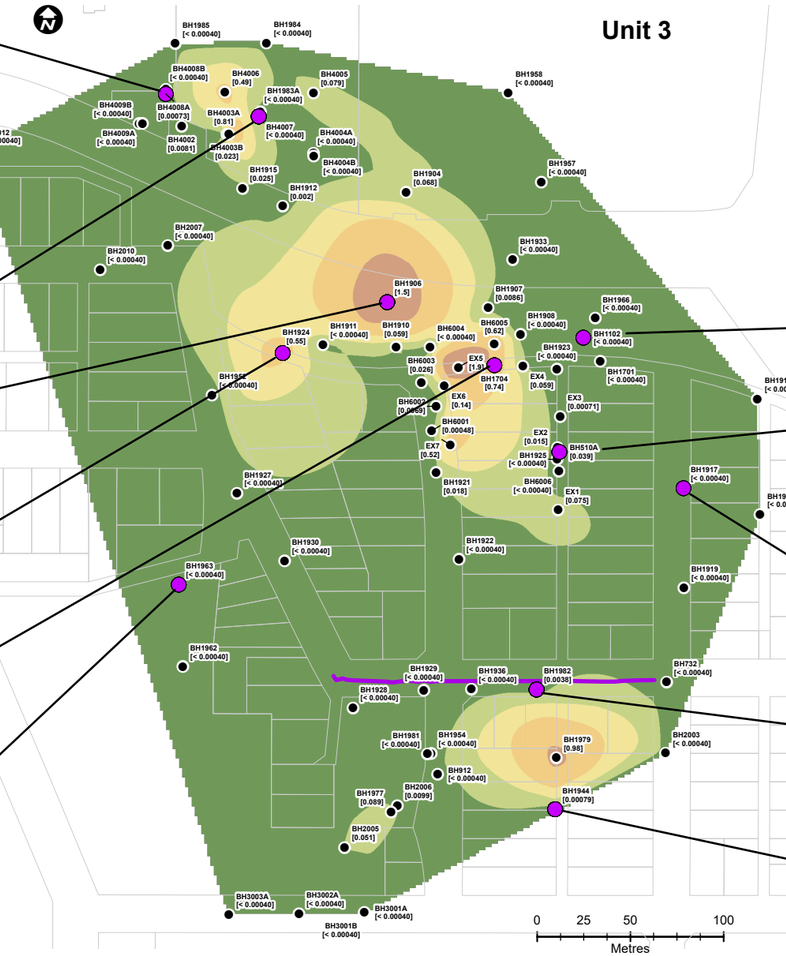
Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH4007	10.6 - 12.1	3	9/3/2024	-	<0.700	1.30E+04	9.60E+02	2.90E+02	1.00E+03	<0.700	5.20E+05
			9/9/2024	0.41	-	-	-	-	-	-	-

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1906	11.6 - 19.2	3	7/11/2023	1.2	1.51E+03	1.14E+02	1.33E+01	4.50E+01	1.25E+02	<5.30	4.41E+04
			9/3/2024	-	<0.760	<0.760	<0.760	<0.760	<0.760	<0.760	6.10E+03
			9/11/2024	0.41	-	-	-	-	-	-	-

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1924	14.9 - 19.8	3	7/13/2023	0.96	<7.70	4.15E+03	6.69E+02	1.35E+03	5.84E+02	<7.70	8.67E+05
			9/3/2024	-	<0.790	1.20E+03	4.90E+02	3.30E+02	3.40E+02	<0.790	3.20E+05
			9/11/2024	0.16	-	-	-	-	-	-	-

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1704	9.1 - 13.7	3	6/27/2024	0.56	<0.250	5.10E+05	2.00E+05	5.70E+05	2.40E+03	<0.250	1.21E+07

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1963	5.5 - 11.3	3	7/11/2023	<0.00040	6.80	<4.70	<4.70	<4.70	<4.70	<4.70	1.04E+04



Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1102	7.6 - 15.2	3	7/13/2023	<0.00040	<4.60	<4.60	<4.60	<4.60	<4.60	<4.60	1.96E+04

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH510A	11.3 - 17.4	3	6/27/2024	0.051	<0.250	9.20E+04	5.80E+04	3.20E+05	5.70E+03	<0.250	4.10E+06

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1917	8.8 - 16.2	3	7/11/2023	<0.00040	<4.60	3.30	<4.60	<4.60	1.40	<4.60	2.67E+03

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1982	1.5 - 7.9	3	7/13/2023	0.098	<4.60	1.46E+04	9.43E+03	1.23E+04	3.10E+03	1.73E+02	2.96E+06

Well ID	Screen (mbgs)	Unit	Date	Benzene	TOD	PHE	RDEG	RMO	BCR	ABC	EBAC
BH1944	5.9 - 7.6	3	7/5/2023	0.011	1.79E+01	4.44E+03	6.69E+03	1.19E+04	6.83E+02	<4.70	1.84E+06
			5/24/2024	0.00079	-	-	-	-	-	-	-
			6/27/2024	-	<0.250	2.00E+02	7.90E+01	1.90E+02	1.30E+02	<0.250	6.20E+04

LEGEND

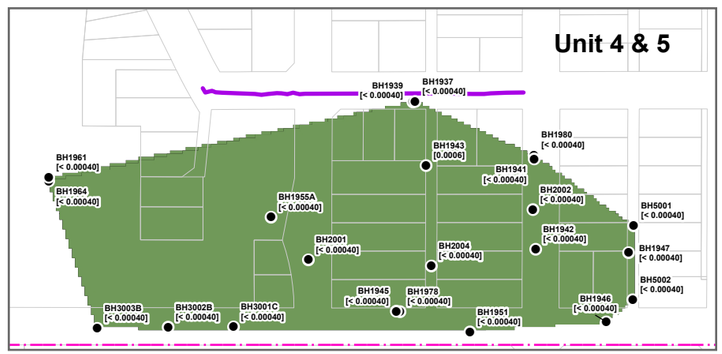
- Monitoring Well Sampled for Microbiological Parameters
- Permeable Reactive Barrier (2019)

Benzene (mg/L) May 2024:

- <= 0.05
- >0.05 - 0.2
- >0.2 - 0.4
- >0.4 - 0.8
- >0.8 - 1.5
- >1.5 - 2
- > 2

[1.5] Benzene Concentration (mg/L)

"-" denotes not analyzed
Benzene concentration is in mg/L
Phenol Hydroxylase (PHE) (cells/mL)
Toluene / Benzene Dioxygenase (TOD) (cells/mL)
Toluene 2 Monooxygenase / Phenol Hydroxylase (RDEG) (cells/mL)
Toluene Ring Hydroxylating Monooxygenases (RMO) (cells/mL)
Benzoyl Coenzyme A Reductase (BCR) (cells/mL)
Benzene Carboxylase (ABC) (cells/mL)
Total Eubacteria (EBAC) (cells/mL)



Microbiological Analysis - Summary of Selected Results (2023, 2024)

Hounsfield Heights And Lion's Park
1620-14th Ave NW, Calgary, Alberta

	Drawn By: SLD/XL	Ref. No.: 10-12832
	Reviewed By: SLD	Date: 15-Nov-2024
PARSONS		Drawing No.: B-21

Document Path: C:\Z_Drive\10-12832\APRX\Heat_Maps\12832_GW_Benzene_Heat_Map_and_ MNA_POP_Nov2024.aprx Coordinate System: NAD83 UTM 114 Longitude Meter Province of Alberta Canada

APPENDIX C

FRAMEWORK FOR CONTAMINATED SITE MANAGEMENT IN ALBERTA (ESRD, 2023)

APPENDIX C
FRAMEWORK FOR CONTAMINATED SITE MANAGEMENT IN ALBERTA

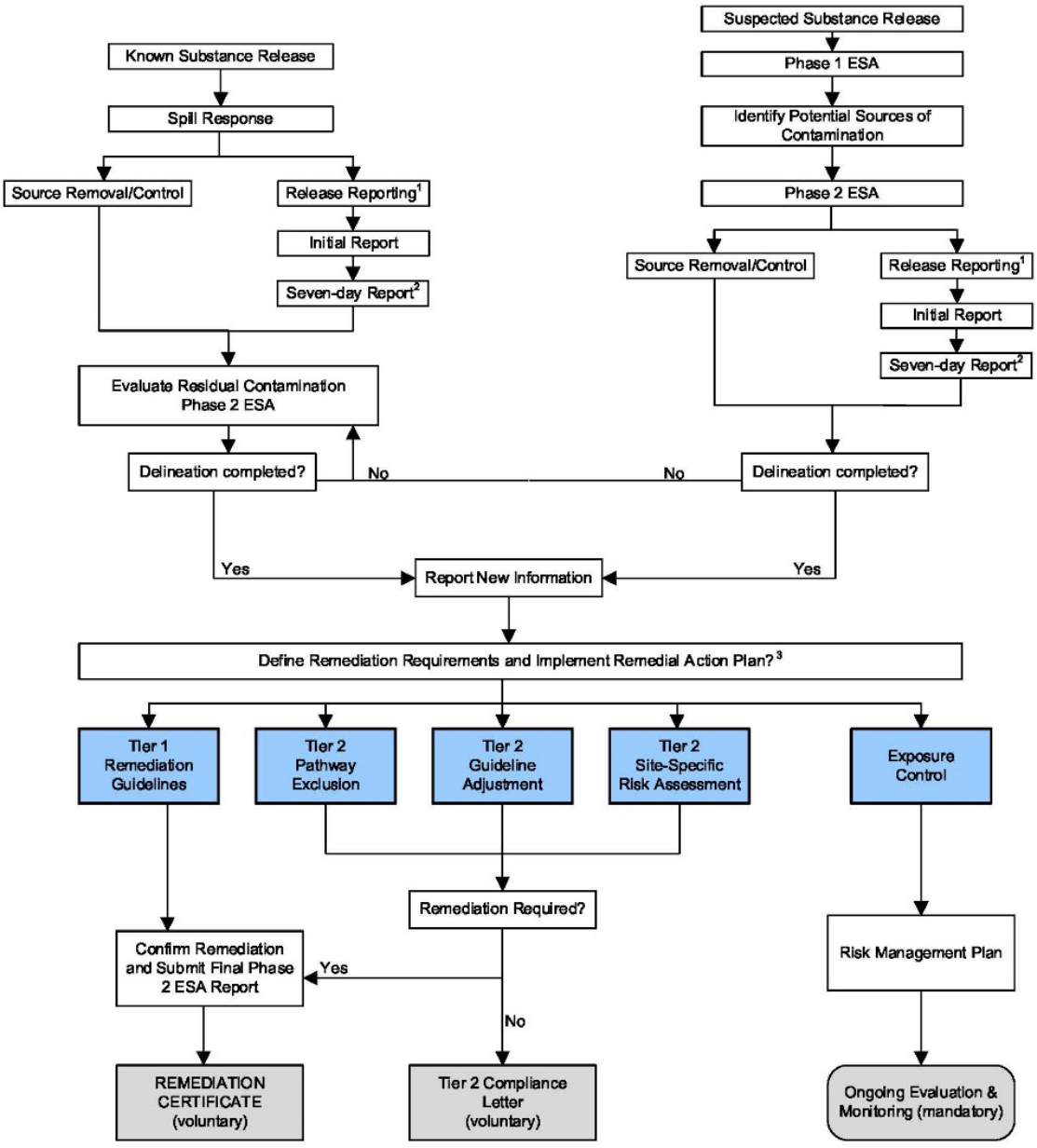


FIGURE 2: FRAMEWORK FOR CONTAMINATED SITE MANAGEMENT IN ALBERTA