Submitted to: **Sherwood Developments (2016) Ltd.**

REMEDIAL ACTION PLAN

1740 FERMOR AVENUE
WINNIPEG, MANITOBA

OCTOBER 2021

FILE NO.: 21-171-02

ENG-TECH
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1.0 INTRODUCTION

1.1 Terms of Reference

ENG-TECH Consulting Limited (ENG-TECH) was retained by Sherwood Developments (2016) Ltd. (SDL) to conduct a file review and develop a Remedial Action Plan for the property located at 1740 Fermor Avenue in Winnipeg, Manitoba (in this report the property will subsequently be referred to as "the Site"). ENG-TECH understands that SDL is considering purchasing the property and requires the current assessment to determine the effort required in remediating the Site.

ENG-TECH received authorization to proceed from Mr. Louis Pereira of SDL.

1.2 Objectives

The purpose of the project was to summarize the findings of previously-completed environmental assessments conducted at the Site and develop a Remedial Action Plan (RAP) for the remaining contaminants at the Site.

1.3 Scope of Work

The scope of work for the environmental file review consisted of the following:

- Conducted a file review of environmental reports related to the Site and other related documents provided by SDL.
- Prepared a RAP outlining the proposed site remediation activities.

2.0 ENVIRONMENTAL REVIEW

2.1 Site Location and Description

The Site is located at 1740 Fermor Avenue in Winnipeg, Manitoba. The Site is an irregular shape with a total size of 2.67 hectares (6.6 acres). The property information for the property from the City of Winnipeg website is summarized in the following table:

Property Information

Roll Number	Address(es)	Notes
06093470075	0 Dawson Road South Southland Park	Area: ~2.67 hectares (6.6 acres) Zoning: Commercial Corridor (C3) Land Use: Vacant Commercial (VCOMM)

The Site is bounded by Fermor Avenue to the north (with industrial property farther north), Dawson Road South to the south (with residential property farther south), industrial property to the east, and Royal Mint Drive to the west (with commercial property farther west). The Site is zoned for commercial use.

2.2 Site Use and Details

The Site is currently vacant. The majority of the northern portion of the Site is paved. The balance of the Site is covered with vegetation, either grassed or natural vegetation. All infrastructure from previous land use (excluding the paved areas), including underground storage tanks (USTs), has

been removed. The only visible structures at the Site are the above-ground well casings for the groundwater monitoring wells.

2.3 Regulatory Guidelines

The Site is located within the province of Manitoba. As directed by Manitoba Conservation and Climate (MCC), the results from the soil analyses were compared to the guidelines outlined in the most recent Canadian Council of the Ministers of the Environment (CCME) publications including:

- CCME *Canadian Environmental Quality (CEQ) Guidelines for Protection of Environmental and Human Health* with the 10^{-5} incremental risk of cancer used for benzene.

- CCME *Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil*.

The Alberta Environment and Parks (AEP) guidelines were also used for comparison to groundwater analytical results and parameters not regulated or included in the CCME Guidelines including:

- *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* Table B-4: Groundwater Remediation Guideline Values for Commercial/Industrial - All Water Uses, January 10, 2019.

Land Use Assessment

The Site and surrounding properties are zoned for commercial use therefore the commercial guidelines were used.

Determination of Grain Size

The primary soil type (coarse or fine grained) governing the potential transport of contaminants at the Site was determined to be fine-grained.

2.3.1 Pathway Applicability

In addition to land use and soil types, the regulatory guidelines further subdivide parameters by exposure pathway. The following is a review of the exposure pathways.

Protection of freshwater aquatic life: the closest body of water is the Seine River, which is more than 3 km to the west-southwest of the Site; therefore, the freshwater aquatic life pathway guidelines were excluded.

Groundwater: Based on previous assessments by other consultants, the drinking water pathway was determined not to be applicable. This includes a search for nearby potable wells, overburden thickness above the potential drinking water aquifer, and hydraulic conductivity testing. Groundwater at the Site is not used for drinking water. Potable water at the Site would be provided through the City of Winnipeg. Previously-installed potable wells at the Site have been decommissioned.

Vapour inhalation (indoor): although there are currently no buildings at the Site, the vapour inhalation guidelines were used for comparison in order to allow for future site development that will likely include buildings.

Ecological soil contact: the guidelines for ecological soil contact pathway were used for comparison since the Site has vegetation growing on the Site.

Management limits: management limits always apply regardless of the depth of impact and take into account the potential for human contact (e.g., excavated soil during construction). Management limits include considerations such as free phase formation, explosive hazards and buried infrastructure effects.

2.4 Previous Assessments

The following documents were reviewed as part of the file review:

Environmental Reports and Related Documents

Date	Report Title	Prepare For/By
2010-OCT-06	Field Data Report Dawson Trail Esso	Imperial Oil Limited / O'Connor Associates
2013-MAR-06	Phase I Environmental Site Assessment Former Petroleum Bulk Plant, Fertilizer Facility, Service Station, Restaurant, Retail Fuel Outlet and Cardlock Facility	Imperial Oil / Parsons Inc.
2013-MAR-27	Supplemental Phase II Environmental Site Assessment Former Petroleum Bulk Plant, Fertilizer Facility, Service Station, Restaurant, Retail Fuel Outlet, and Cardlock Facility	Imperial Oil / Parsons Inc.
2017-MAY-11	Remediation Plan Former Petroleum Bulk Plant, Fertilizer Facility, Service Station, Restaurant, Retail Fuel Outlet, Cardlock Facility	Manitoba Sustainable Development / Parsons Inc.
2018-SEP-21	Risk-Based Fertilizer Guidelines and Estimated Remediation Volume Former Fertilizer Facility, 1740 Fermor Avenue, Winnipeg	Imperial Oil Ltd / Equilibrium Environmental Inc.
2018-OCT-04	Phase II Environmental Site Assessment Former Petroleum Bulk Plant, Cardlock, Retail Outlet and Fertilizer Facility	Imperial Oil / Parsons Inc.
2018-NOV-27	Risk-Based Fertilizer Guidelines and Estimated Remediation Volume Former Fertilizer Facility, 1740 Fermor Avenue, Winnipeg	Imperial Oil / Manitoba Sustainable Development
2020-NOV-17	Phase II Environmental Site Assessment Former Petroleum Bulk Plant, Cardlock, Retail Outlet and Fertilizer Facility	Imperial Oil / Parsons Inc.

The site details for the former infrastructure at the Site that are referred to in this report are presented on Figure 1.

2.4.1 Field Data Report (2010)

The Field Data Report summarized the groundwater monitoring event that was conducted on October 6, 2010. The event included monitoring 45 groundwater monitoring wells.

Findings from this report included:

- There was no light non-aqueous phase liquid (LNAPL, a.k.a. "free product") observed at any of the wells).

- Concentrations of petroleum hydrocarbons (PHCs) in groundwater were less than the applicable regulatory guidelines except at two locations:
    - North of the commercial building (BH-50); and
    - East of the former tank nest northeast of the commercial building (05-16).

2.4.2 Phase I ESA (2013)

The Phase I ESA detailed the land use from 1968 to present. The Executive Summary of the report identified the following Areas of Potential Environmental Concern (APECs) at the Site:

On-Site APECs

No.	APEC
1	Former gasoline, diesel and fuel oil ASTs and USTs and associated distribution facilities (pumps and truck loaders)
2	Former petroleum warehouse
3	Former fertilizer warehouse
4	Former waste oil tank
5	Former oil-water separator

The following off-site APECs were identified:

Off-Site APECs

No.	APEC
6	Former Petro-Canada soil recycling facility located adjacent to the Site to the east.
7	Midland Elevators Ltd., waste oil generator, located approximately 70 m north of the Site at 1395 Niakwa Road East.
8	Former NDL Construction, potential on-site refuelling and maintenance of heavy equipment, located approximately 75 m northwest of the Site at 1389 Niakwa Road East.

The Phase I ESA report referenced 12 reports conducted at the Site; only one of those reports (the Field Data Report, refer to Section 2.4.1) was provided to ENG-TECH to review.

A brief history of the site is as follows:

- The Site had previously been known as the Dawson Trail ESSO, Fifth Wheel Truck Stop and Mint Esso.
- In 1986, a loss of 6000 L of fuel over an 18 month period was observed. This was determined to be the result of the distribution piping. The faulty piping was subsequently replaced and a vapour extraction system (VES) was installed to assist with remediation of the contamination.
- In 1993, the five USTs in the northeast portion of the Site were removed and replaced with four new USTs to the northwest of the five USTs that were removed.
- Facilities at the Site in 2003 included:

- An unoccupied commercial building (constructed in 1967) that previously operated as a petroleum retail outlet, a restaurant and trucker facilities (laundry, showers, lounge);
- Retail PHC product storage (no dispensing equipment);
- A truck weigh scale (west of the commercial building);
- Small wooden structure (formerly Leon's Garden Shed) near the northwest property line;
- North of the commercial building: pump islands and four USTs for the retail facility – 2 x 33,370 L (gasoline), 1 x 22,730 L (gasoline), and 1 x 22,730 L (diesel);
- South of the commercial building: pump islands and two USTs at the cardlock facility – 2 x 35,000 L (diesel); and
- An active water well near the south property line.

- In 2003 the pump for the water well was removed and in 2004 the water well was decommissioned.

The environmental investigations and remedial activities conducted at the Site (up to the time of the Phase I ESA) are summarized in the following table:

Environmental Investigations and Remedial Activities (1986-2013)

Year	Activity
1986	• Nine boreholes (BH1-BH9) were installed and completed as monitoring wells. LNAPL was detected in BH6 and BH8 (near the former fuel tank nest).
1991	• Eleven boreholes (BH10-BH20) were installed and completed as monitoring wells. The soil sample from BH12 (south tank farm) exceeded the applicable PHC guidelines at the time.
1993	• Five fuel USTs (steel) were removed from the northeast portion of the Site. • Soil samples tested for PHCs from the west, south, and east walls of the excavation exceeded the applicable guidelines at the time. • The surface of the excavation was treated with a liquid nutrient solution (nitrogen, phosphorus and potassium) at a depth of 1.2 mbg (excavation base) to enhance natural attenuation of the hydrocarbons. • All excavated materials were returned to the excavation. • A VES was installed using fifteen extraction wells (E4-E18). 33 L of LNAPL were extracted from the northeast tank nest area using the VES.
1994	• Six boreholes (BH21-BH26) were installed and completed as monitoring wells. PHCs exceedances were observed at BH22 and BH23 (south tank farm).
2000	• Six boreholes (BH27-BH32) were installed with two boreholes completed as monitoring wells. Neither the soil nor the groundwater PHC concentrations exceeded the applicable guidelines at the time.
2003	• 16 boreholes (BH33-BH48) were installed with nine boreholes completed as monitoring wells. • One soil sample (from BH45 south of the south tank farm) exceeded the guidelines for PHCs. • Groundwater samples from BH16 (west of the north pump islands) and BH47 (south of the south tank farm) were greater than the applicable guidelines for PHCs.

Environmental Investigations and Remedial Activities (1986-2013)

Year	Activity
2004	• Four fuel USTs (fibreglass) and associated infrastructure including pump islands were removed from the north portion of the Site. • Soil excavated during the UST removal was returned to the excavation as backfill. • PHC concentrations from samples collected from the excavation limits were greater than the applicable guidelines at the south wall and the floor of the excavation.
2005	• 21 boreholes (05-01 to 05-21) were completed with 16 locations completed as monitoring wells. • PHC concentrations in soil were greater than the applicable guidelines at three locations: 05-03 (south of the south tank farm), 05-06 (west of the south tank farm) and 05-21 (east of the south tank farm). • PHC concentrations in groundwater were all less than the applicable guidelines.
2008	• Two fuel USTs were removed from the area southwest of the commercial building. • PHC concentrations from the soil samples taken from the excavation limits were greater than the applicable guidelines at the south, west, and north walls, and the backfilled materials. • Soil excavated during the UST removal was returned to the excavation as backfill.
	• Eight test pits (TP1 to TP8) were excavated in the two areas of the former pump islands to the north and southwest of the commercial building. • PHC concentrations for the soil samples exceeded the applicable criteria at six of the test pits (TP1 to TP6).
	• Six boreholes (08-1 to 08-6) were installed and completed as monitoring wells. • PHC concentrations for the groundwater samples were all less than the applicable guidelines at that time.

In addition to the above, LNAPL was noted to have been observed in 1986 at BH3 and BH8; in 1987, at BH2, BH3, BH4, BH6, and BH9; in 1991, at BH12 and BH14; and in 2003, at BH47.

Since these reports were not made available for review, details from these assessments including contaminants concentrations, depth of the soil samples, and limits of excavations during UST removals are not known. Locations of the boreholes and test pits were obtained from drawings in the subsequent reports provided for review.

2.4.3 Phase II ESA (2013)

The scope of work for this Phase II ESA included excavating 53 test pits (TP-9 to TP-61) at the Site to depths ranging from 2 to 6.1 mbg. Soil samples were submitted for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), PHC fractions 1 to 4 (F1-F4), lead, 1,2-DBA, 1,2-DCA, and/or fertilizer-related parameters. The test pits were generally located in three primary areas: the former fuel storage and dispensing areas in the north portion of the Site, the former south tank farm, and the fertilizer storage area in the southern portion of the Site.

The analytical results are summarized as follows:

- PHC concentrations at 2 test pits north of the commercial building were greater than the applicable guidelines.

- PHC concentrations at 2 test pits near the card lock area were greater than the applicable guidelines.

- PHC concentrations at 3 test pits south of the south tank farm were greater than the applicable guidelines.

- PHC concentrations at 2 test pits near the south UST and pump island were greater than the applicable guidelines.

- PHC concentrations at 1 test pit south of the fertilizer warehouse were greater than the applicable guidelines.

- Fertilizer-related parameter concentrations at 21 test pits primarily in the southeast portion of the Site were greater than the applicable guidelines.

2.4.4 Remediation Plan (2017)

Although titled “Remediation Plan”, this document is actually a Risk Management Plan (RMP) as the heading on Page 3 confirms.

The RMP recommended to Manitoba Conservation consisted of groundwater monitoring and sampling every three years. Groundwater analyses would include PHC and fertilizer-related parameters. The groundwater monitoring program would include 55 of the existing monitoring wells at the Site.

The Remediation Plan was accepted by Manitoba Sustainable Development (currently Manitoba Conservation and Climate) on August 1, 2018.

2.4.5 Phase II ESA (2018)

The scope of work for this Phase II ESA included drilling 11 boreholes (BH-18-01 to BH-18-11) in the southeast portion of the Site in the area of the former fertilizer area. None of the boreholes were completed as monitoring wells. Soil samples were submitted for analysis of fertilizer parameters including sodium adsorption ratio (SAR), pH, and electrical conductivity (EC). All of the previously-installed monitoring wells were measured for depth to water level. Groundwater samples from three monitoring wells were submitted for analysis of fertilizer-related parameters and tested for hydraulic conductivity.

The results of the Phase II ESA are summarized as follows:

- Groundwater flow direction was primarily to the south with depth to water ranging in depth from 0.28 to 1.93 mbg.

- LNAPL was not observed at any monitoring well.

- Hydraulic conductivities ranged from 1.9×10^{-5} cm/s to 6.6×10^{-7} cm/s.

- In general, the underlying native soil was classified as fine grained.

- Concentrations of fertilizer-related parameters in the soil were greater than the applicable guidelines at 10 of the 11 borehole locations. Vertical delineation of fertilizer impact was not achieved. Fertilizer impact was observed from samples collected at surface to as deep as 9.0 mbg.

2.4.6 Risk-Based Guidelines and Estimated Remediation Volume (2018)

This work was conducted to assess the fertilizer impacts (including ammonium, nitrate, and nitrite) resulting from apparent surface spills and develop soil remediation guidelines (SRGs) and groundwater remediation guidelines (GRGs) for the Site. Key findings and conclusions from the report follow:

- The impacts from fertilizer were noted to extend to a depth of 7 mbg.
- The plume of the fertilizer impact has been migrating to the southeast at depths greater than the water table depth of approximately 1.4 mbg.
- Fertilizer concentrations in both soil and groundwater in the impacted area were greater than background concentrations.

The report concluded that when assessed with the Fertilizer Guideline Calculator (FGC), there were no unacceptable risks for the predicted exposure pathways for fertilizer impacts. All measured concentrations of the fertilizer parameters were noted to be less than their respective guidelines with the exception of one location ("SubArea1") that was predicted not to pose an unacceptable risk to receptors based on a mass balance approach. No remediation areas or depths were calculated since the report determined that all concentrations of contaminants met the SRGs and GRGs as determined by the FGC.

2.4.7 Response to Risk-Based Guidelines and Estimated Remediation Volume Report (2018)

This letter was a response by Manitoba Sustainable Development to the report summarized in Section 2.4.6. The response was that they concurred with the report.

This letter also restated that PHC concentrations in groundwater remained above the applicable guidelines and therefore the Site would continue to be designated as an "impacted site".

2.4.8 Phase II ESA (2020)

The scope of work for this Phase II ESA included shallow hand excavated sampling (SVW-1 to SVW-11) to depths ranging from 0.3 to 0.6 mbg, drilling 27 boreholes (BH-59 to BH-85) to 10.1 mbg, and excavating 39 test pits (TP-102 to TP-140) to a maximum depth of 4.9 mbg. None of the boreholes were completed as monitoring wells.

Soil samples were submitted for analysis of BTEX, PHC F1-F4, lead, lead scavengers, hexane, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), metals, glycols, and polychlorinated biphenyls (PCBs). Groundwater samples from select monitoring wells were submitted for analysis of BTEX, PHC F1 and F2, lead, lead scavengers, hexane, PAHs, VOCs, metals, glycols, and PCBs.

The results of the Phase II ESA are summarized as follows:

- Groundwater flow direction was primarily to the south and north groundwater mounding in the central portion of the Site. Depth to water ranged in depth from 0.59 mbg to greater than 6.1 mbg (dry well condition).
- Concentrations of VOCs, metals, glycols, and PCBs in soil and groundwater were less than the applicable guidelines.

- PHC concentrations in soil were greater than the applicable guidelines in the following areas:
    - Four locations to the north of the commercial building;
    - One location to the northeast at the former tank nest; and
    - Eleven locations near the south tank farm, the south UST and pump island and areas migrating from those points.
- PHC concentrations in groundwater were greater than the applicable guidelines at one location north of the commercial building;
- PAH concentrations were greater than the applicable guidelines at the following areas:
    - One location east of the former card lock area; and
    - Two locations west of the former south tank farm.

In general, it appears that the south tank farm, and south UST and pump island areas have merged into one larger impacted area. The PHC impact in the north portion of the Site appears to have decreased; however, impact remains greater than the applicable guidelines.

2.5 Discussion of Environmental Review

There are four primary areas of concern at the Site: the fuelling areas in the northern portion of the Site, the fuel tank farm in the southern portion of the Site, the former UST and pump island in the south portion of the Site, and the fertilizer area in the southern portion of the Site.

Regarding the fertilizer area, Manitoba Conservation has accepted the assessment of the fertilizer area that determined that the impacts from fertilizer storage and handling did not pose an environmental concern. Although there may be elevated fertilizer-related parameters (i.e., EC) in the groundwater, these were predicted not to pose an unacceptable risk to plants (i.e., the receptor).

Regarding the fuelling areas:

- Several excavations have taken place at the Site to remove the fuel USTs at three locations in the north portion of the Site: north, northeast, and southeast of the former commercial building. Impacted soil that was encountered in these excavations was not removed from the Site and all materials removed during the UST removals were placed back in the excavation. Soil samples from the excavation limits indicated that residual PHC concentrations were greater than the applicable guidelines.
- PHC impact at the tank nests in the north portion of the Site has been encountered as deep as 5.0 mbg; however, PHC impact could potentially be deeper since vertical delineation was not achieved at a number of locations.
- PHC impact at the south tank farm appears to extend from the south side of the tank farm to the south of this area. The depth of impact appears to be up to approximately 3.5 mbg; however, vertical delineation was not achieved in all areas. At one location near the petroleum warehouse, the depth of impact was 7.0 mbg.

- Major impact from PHCs (i.e., LNAPL) that was previously observed at the Site does not appear to be present according the most recent site assessments. The VES and natural attenuation appears to have remediated the LNAPL at the Site.

- PAH impact noted in the 2020 Phase II ESA appears to be relatively shallow and in only two locations at the Site.

- Based on the 2020 Phase II ESA, PHC concentrations in groundwater appear to be decreased.

- The Site has been managed according to a Risk Management Plan accepted by Manitoba Conservation in 2018 that involves groundwater monitoring of all existing wells every three years.

2.6 Environmental Review Conclusions and Recommendations

Based on the review of the previous environmental reports, ENG-TECH concludes that the environmental impact from the fertilizer storage and handling in the southern portion of the Site is no longer a concern and further action in that area is not required by Manitoba Conservation and Climate. Regarding the PHC impacts in the northern and southern portions of the Site, PHC-impacted soil and/or groundwater is present at the Site.

3.0 REMEDIAL ACTION PLAN

Although Manitoba Conservation and Climate has approved a Risk Management approach to the PHC impact at the Site, the timeframe expectation for the Site to naturally attenuate would potentially take years or possibly decades. In order to expedite the remediation of the PHC impact, ENG-TECH recommends excavation and off-site disposal of the impacted soil in the areas of the former fuel ASTs, USTs, and pump islands.

The estimated excavation size is based primarily on PHC impact in soil and groundwater. The locations of the limited PAH impact at the Site would be contained within the excavations and so no additional excavation would be required to remediate the PAHs.

It should be recognized that the ESAs at the Site used the commercial regulatory guidelines for comparison to the laboratory results. If the future land use will be re-zoned (i.e., residential), the size of the excavations may need to be increased since the residential guidelines are more stringent than the commercial guidelines.

3.1 Excavation Areas

Based on a review of the PHC impact at the Site, excavations would need to be conducted at three locations as summarized in the following table:

Excavation Details

Excavation Number	Areas to be Remediated	Comments
EX1	North tank nest, northeast tank nest and the pump islands north of the commercial building.	The north limit of the excavation will potentially be the north property line. The former location of the north tank nest appears to extend across the current north property line.

Excavation Details

Excavation Number	Areas to be Remediated	Comments
EX2	Tank nest and pump islands southeast of the commercial building.	The contaminant plume at EX2 does not appear to be connected to EX1.
EX3	South tank farm and area south of the south tank farm where PHC impact has migrated. UST and pump island near the south property line.	The PHC impact appears to start at the south tank farm and extends to the southwest and southeast and has merged with the impact previously noted at the south UST and pump island.

The estimated sizes of the excavations are summarized in the following table:

Estimated Excavation Sizes

Excavation Number	Area	Depth	Volume
EX1	1,560 m² (52 m x 30 m)	5.0 m	7,800 m³
EX2	875 m² (35 m x 25 m)	5.0 m	4,375 m³
EX3	3,200 m²	3.5 m	11,200 m³
TOTAL VOLUME FOR ALL EXCAVATIONS			23,375 m³

The actual size of the excavations will be based on field screening, observations during excavation, and analytical results of confirmatory sampling. The excavation sizes presented in the table should be considered an estimate; the actual excavations could be larger or smaller than the estimates.

The proposed excavation locations showing the approximately excavation footprint are presented on Figure 2.

3.2 Confirmatory Sampling

After the excavation appears to have achieved removal of the PHC-impacted soil at the Site, confirmatory soil samples at each excavation will be collected to confirm that the residual concentrations of PHCs are less than the applicable regulatory guidelines. Confirmatory samples will be collected and submitted from each wall and the base of each excavation.

3.3 PHC Impact in Groundwater

Since the elevated PHC concentrations in the groundwater appear to be within the footprint of the areas to be excavated, it is anticipated that residual PHC concentrations in the groundwater will be less than the applicable regulatory guidelines. Additionally, based on the 2020 Phase II ESA, it appears that groundwater concentrations have decreased with only one location (BH-50) greater than the applicable guidelines.

The groundwater at the Site is relatively shallow with depth to groundwater typically ranging from approximately 0.3 to 2.0 mbg. As a result, it is anticipated that the excavations will need to be dewatered during excavation of the impacted soil. The water removed from the excavation will need to be treated as contaminated and disposed of appropriately. Alternately, the water could be stored on site and tested; if the PHC concentrations are less than the applicable guidelines, the water would not need to be treated as contaminated.

3.4 Groundwater Monitoring Wells

ENG-TECH understands that there are at least 55 groundwater monitoring wells at the Site. Ideally, the groundwater monitoring wells would be decommissioned if they no longer serve a useful purpose (i.e., to be used for ongoing groundwater monitoring). Monitoring wells could remain at the Site; however, the monitoring wells should be periodically inspected to ensure that they have not been damaged and therefore provide a potential pathway for contaminants.

In the areas where excavations will take place, these wells will need to be completely removed. If the well is relatively shallow, the simplest method of decommissioning at excavations would be to excavate the entire well; however, many of the wells noted to be at least 6.7 m. In the case where it is not practical to excavate the entire well, the well could be backfilled with bentonite pellets (ideally after the PVC well casing has been removed).

Monitoring wells located outside of the excavation areas could be decommissioned in one of two ways: (a) excavate the wells and backfill with clean soil, or (b) drill out the well and backfill with bentonite pellets.

3.5 Reporting

After completion of the site remediation, ENG-TECH will prepare a report summarizing the details of the fieldwork and analytical results. The site remediation report will be submitted to Manitoba Conservation and Climate for their review since one of the primary objectives of the site remediation is to have the Site removed from the Manitoba Designated Impacted Sites List.

4.0 THIRD PARTY USE AND STATEMENT OF LIMITATIONS

The content of this document is not intended for the use of, nor is it intended to be relied upon by any person, firm or corporation, other than the Client and ENG-TECH. ENG-TECH denies any liability whatsoever to other parties for damages or injury suffered by such third party arising from the use of this document by them, without the express written authority of ENG-TECH and the Client. This document is subject to further restrictions imposed by the contract between the Client and ENG-TECH, and these parties' permission must be sought regarding this document in all other circumstances. ENG-TECH disclaims responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

As with any environmental site assessment the intent is to identify and address, not eliminate, potential environmental concerns. The observations made at the Site do not apply to areas which could not be observed. In addition, other materials or compounds not investigated or addressed or beyond the scope of work could be present at the Site. If this occurs, ENG-TECH must be notified to determine whether modification to any part of this report should be conducted.

5.0 CLOSURE

The conclusions and recommendations presented in this report were based on the scope of work outlined for the purpose of the investigation, and were prepared in accordance with accepted professional engineering/geo-science principles and practices. If you have any questions or concerns, please contact the undersigned.

Sincerely,
ENG-TECH Consulting Limited

Walter Holowka, C.E.T., NCSO
Senior Geoenvironmental Technologist

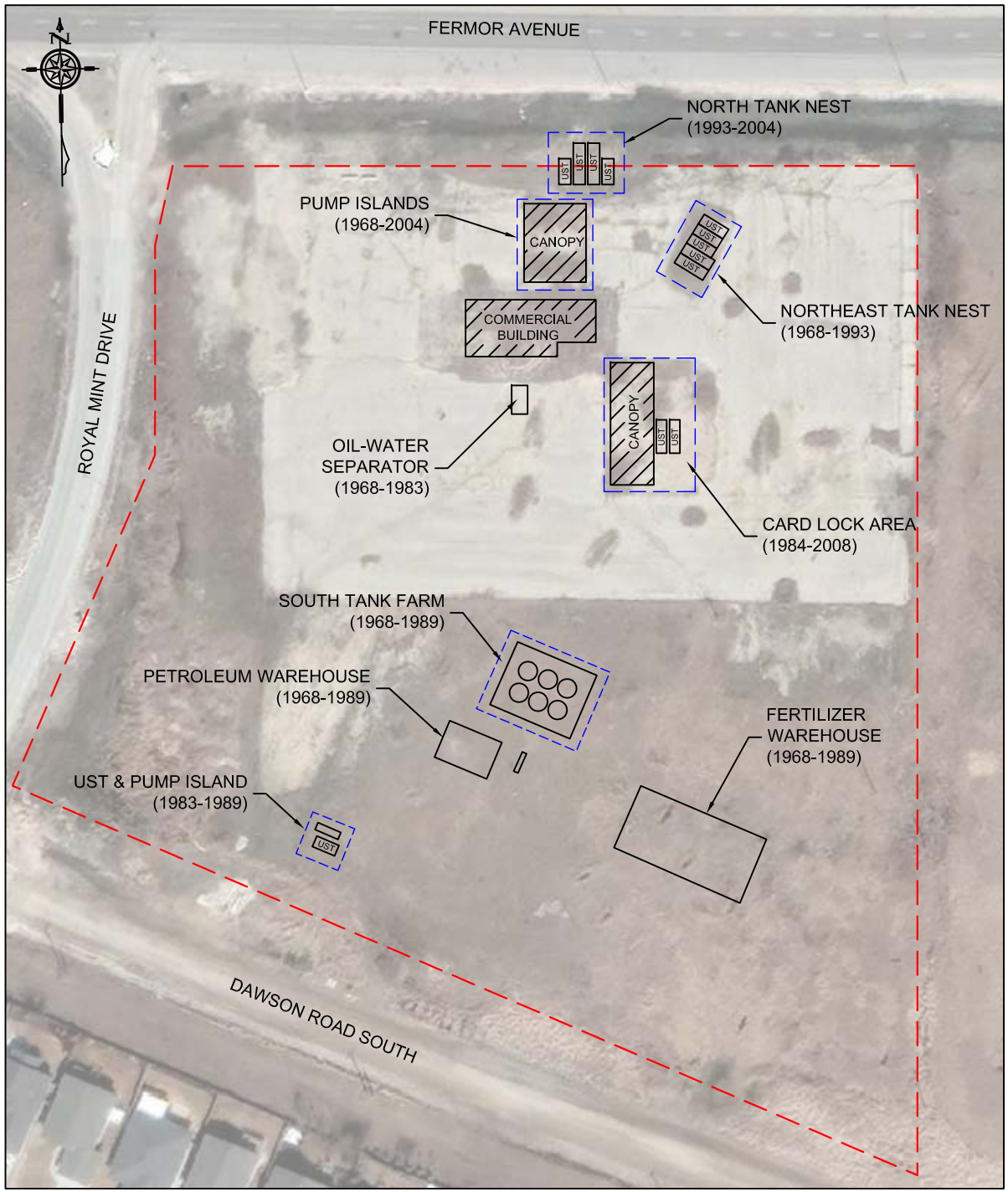
Clark Hryhoruk, M.Sc., P. Eng.
Principal

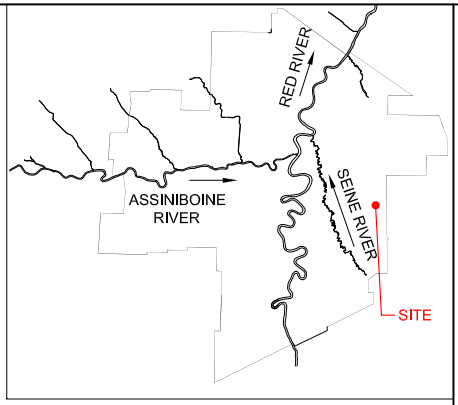
CDH/wgh

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
ENG-TECH Consulting Limited
No.2475

PROVINCE OF MANITOBA
C. D. HRYHORUK
Oct 20/21
REGISTERED PROFESSIONAL ENGINEER

1999 20 2019
YEARS OF EXCELLENCE





KEYMAP

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- INFRASTRUCTURE LOCATION

NOTES:

THE LOCATIONS OF THE FORMER INFRASTRUCTURE AT THE SITE ARE BASED ON THE FIGURES FROM PREVIOUS REPORTS.

NO.	DATE	ISSUE / REVISION
0	OCT 2021	REPORT

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No.2475

CLIENT:
SHERWOOD DEVELOPMENTS (2016) LTD.

PROJECT:
REMEDIAL ACTION PLAN
1740 FERMOR AVENUE
WINNIPEG, MANITOBA

DWG DESCRIPTION:
SITE PLAN AND FORMER SITE INFRASTRUCTURE

SCALE:
1:1,250

DRAWN BY:	DATE:
WGH	OCTOBER 2021

FILE No.:	CLIENT DWG/FIG. No.:
21-171-02	

ENG-TECH DWG/FIG. No.:	NO.:
1	0

SCALE

0 m 20 m 40 m 60 m 80 m 100 m 150 m 200 m

P:\2021\171(Sherwood Developments)\02(1740 Fermor Avenue)\Figures\21-171-02 Figure 1 Site Plan.dwg

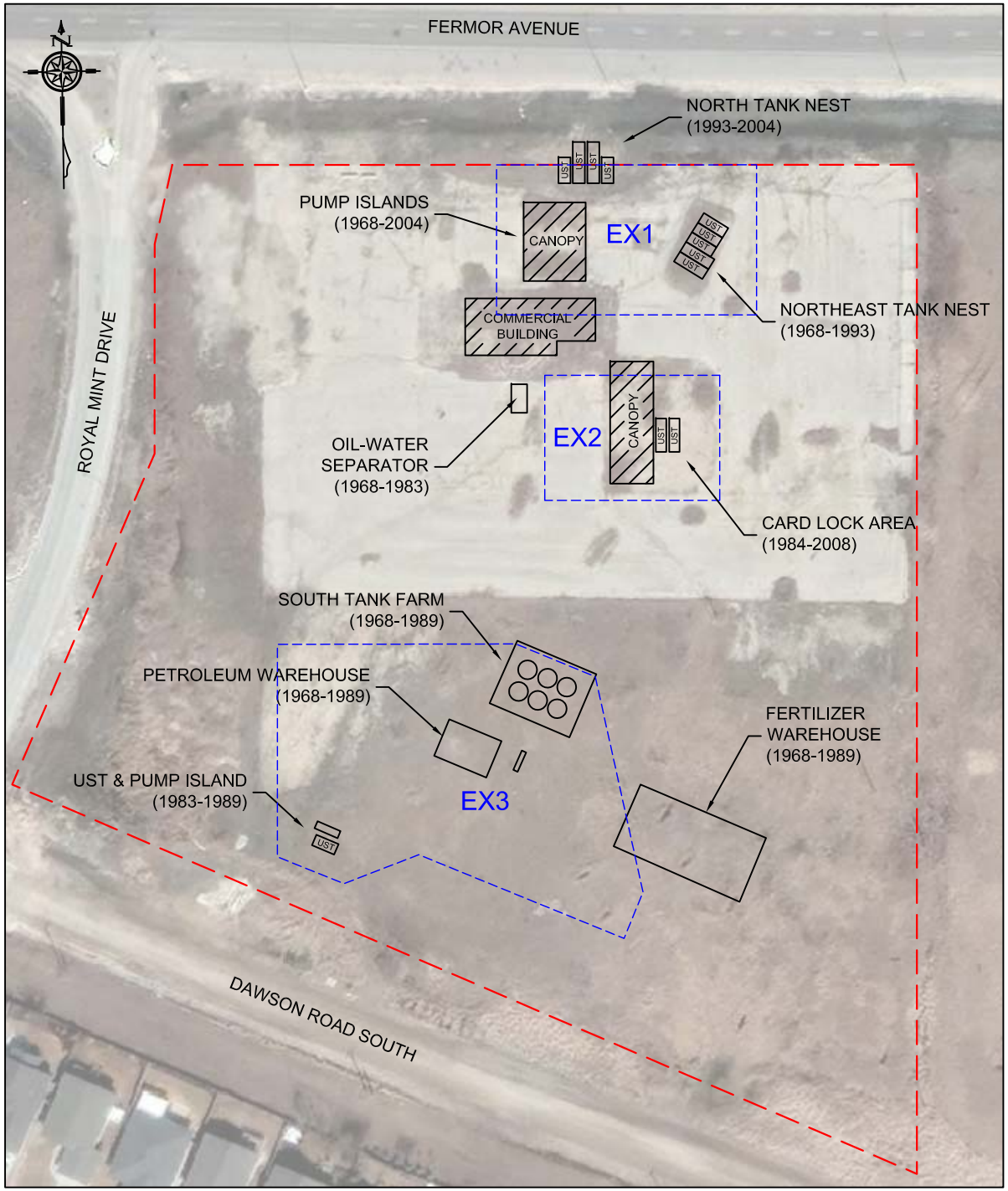

IMAGE © 2021 MAXAR TECHNOLOGIES (IMAGE DATE: APRIL 21, 2020)

SCALE

0 m 20 m 40 m 60 m 80 m 100 m 150 m 200 m

P:\2021\171(Sherwood Developments)\02(1740 Fermor Avenue)\Figures\21-171-02 Figure 2 Excavations.dwg

LEGEND

APPROXIMATE PROPERTY BOUNDARY

EX1 EXCAVATION LOCATION AND NUMBER

NOTES:

THE LOCATIONS OF THE FORMER INFRASTRUCTURE AT THE SITE ARE BASED ON THE FIGURES FROM PREVIOUS REPORTS.

NO.	DATE	ISSUE / REVISION
0	OCT 2021	REPORT

ENG-TECH CONSULTING LIMITED
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ENG. STAMP:

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
ENG-TECH Consulting Limited
No.2475

CLIENT:
SHERWOOD DEVELOPMENTS (2016) LTD.

PROJECT:
REMEDIAL ACTION PLAN
1740 FERMOR AVENUE
WINNIPEG, MANITOBA

DWG DESCRIPTION:
PROPOSED EXCAVATION LOCATIONS

SCALE:
1:1,250

DRAWN BY: WGH
DATE: OCTOBER 2021

FILE No.: 21-171-02
CLIENT DWG/FIG. No.:

ENG-TECH DWG/FIG. No.: 2
NO.: 0