ALBERTA
ENVIRONMENTAL APPEALS BOARD

Report and Recommendations

Date of Report and Recommendations – December 29, 2011

IN THE MATTER OF sections 91, 92, 95, and 99 of the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12;

-and-

IN THE MATTER OF appeals filed by Gas Plus Inc. and Handel Transport (Northern) Ltd. with respect to *Environmental Protection and Enhancement Act* Environmental Protection Order No. EPO-2010/58-SR and Amendments issued to Gas Plus Inc. and Handel Transport (Northern) Ltd. by the Director, Southern Region, Operations Division, Alberta Environment.

Cite as: *Gas Plus Inc. and Handel Transport (Northern) Ltd.* v. *Director, Southern Region, Operations Division, Alberta Environment*, (29 December 2011), Appeal Nos. 10-034, 11-002, 008, & 023-R (A.E.A.B.).

BEFORE:	Justice Delmar W. Perras (ret.), Board Chair; Dr. Alan J. Kennedy, Board Member; and Dr. Nick Tywoniuk, Board Member.
BOARD STAFF:	Mr. Gilbert Van Nes, General Counsel and Settlement Officer; Ms. Denise Black, Board Secretary; and Ms. Marian Fluker, Associate Counsel.
PARTICIPANTS:	
Appellants:	Gas Plus Inc. and Handel Transport (Northern) Ltd., represented by Mr. Richard I. John.
Director:	Mr. Darren Bourget, Director, Southern Region, Operations Division, Alberta Environment,* represented by Mr. William McDonald and Ms. Erika Gerlock, Alberta Justice.
Intervenors:	Bow Liquor Inc., represented by Mr. Harman Toor, McLeod & Company; Dr. Augustine Yip and Dr. Monica Skrukwa, Mr. Terry Floate and Ms. Heather Cummings, Mr. Andy and Ms. Bonnie Ross, and Mr. Francesco Mele and Ms. Alison Hayter, represented by Mr. Richard C. Secord, Ackroyd LLP; City of Calgary, represented by Mr. Timothy E. Haufe; and Alberta Health Services, represented by Ms. Andrea Beckwith-Ferraton, Alberta Health Services.

* For all relevant times during these appeals, the Department was named Alberta Environment. However, as of October 12, 2011, the Department was renamed Alberta Environment and Water. For the purposes of this Report and Recommendations, the Department will be referred to as Alberta Environment.

WITNESSES:

Appellants:	Mr. Sal Handel, Gas Plus Inc. and Handel Transport (Northern) Ltd.; Mr. Ken Hugo, Levelton Consultants Ltd.; Mr. Leon T. Mah, Tiamat Environmental Consultants Ltd.; and Mr. James E. Studer, InfraSUR LLC.
Director:	Mr. Darren Bourget, Director, Southern Region, Operations Division, Alberta Environment;* Mr. Craig Knaus, Environmental Protection Officer, Southern Region, Alberta Environment;* Ms. Kim Kirillo, Contaminated Sites Coordinator, Southern Region, Alberta Environment;* Ms. Kelly Gough, CH2MHill Canada; Dr. Eric Martin, CH2MHill Canada; Mr. Rey Calosing, Environmental Specialist, City of Calgary; and Dr. Dennis Stefani, Supervisor, Risk Management, Science Advisory Team, Alberta Health Services.
City of Calgary:	Mr. Rick Ciezki, Manager, Environmental Assessment and Liabilities Division, City of Calgary.
Alberta Health Services:	Dr. Brent Friesen, Medical Officer of Health, Alberta Health Services; and Mr. Dennis Stefani, Supervisor, Risk Management, Science Advisory Team, Alberta Health Services.
Bow Liquor Inc.:	Mr. Joginder Brar, Bow Liquor Inc.
Residents:	Dr. James Sevigny, Iridium Consulting Inc.; Dr. Monica Skrukwa; Mr. Terry Floate; Mr. Andy Ross; and Ms. Alison Hayter.

EXECUTIVE SUMMARY

Alberta Environment issued an Environmental Protection Order (the Order) to Gas Plus Inc. and Handel Transport (Northern) Ltd. (collectively the Appellants) requiring the remediation of a gas station site (on-site) and surrounding area (off-site) in the City of Calgary. The remediation is required because a release of gasoline contaminated the gas station site and the contamination has migrated from the site into the surrounding area, including a residential area where it has affected a number of homes. Contamination is also believed to be present under a building on the site that is leased to a retail business known as Bow Liquor Inc. Alberta Environment subsequently issued three amendments. The first amendment required the contaminated soil from the gas station site be excavated and removed; the second amendment extended the deadline to start this work; and the third amendment allowed the Appellants to choose whether to deal with the contamination on the gas station site by excavating and removing the soil or by building a secant wall (an underground containment wall) around the perimeter of the site.

The Environmental Appeals Board received Notices of Appeal from the Appellants appealing the Order and each of the amendments. The Board held a hearing to determine the following issues:

1. Are the remediation techniques and timelines included in the amended Environmental Protection Order to address the on-site and off-site contamination appropriate?
2. Should the amended Environmental Protection Order be reversed or varied based on the alleged "frustration" of Gas Plus Inc. with respect to the Bow Liquor Inc. lease?
3. Should the amended Environmental Protection Order be varied to identify only Handel Transport (Northern) Ltd. as the person responsible, as opposed to both Gas Plus Inc. and Handel Transport (Northern) Ltd. as currently identified in the amended Environmental Protection Order?

After considering all of the information before it, the Board confirmed Alberta Environment's decision to issue the Order, subject to a number of recommendations to vary the Order. While all of the contamination needs to be remediated, the Board's most immediate concerns were:

1. the presence of high levels (10-15 mg/L or higher in groundwater) of total BTEX (benzene, toluene, ethylbenzene, and xylene) found both on-site and off-site; and
2. the removal of all contaminated material on-site that is above the Tier 2 Guideline.

High levels of BTEX can pose a human health risk. Therefore, in order to protect human health and the environment, the area of high BTEX need to be remediated in an aggressive manner as soon as possible. Unless the on-site material is removed, it provides a source for the continuing contamination of the off-site area. Therefore, the contaminated material on-site also needs to be remediated as soon as possible.

In order to address these concerns and the other issues raised in the hearing, the Board recommended varying the Order to require the Appellants to:

1. Confirm the location of all contaminated material, both on-site and off-site, by carrying out delineation, including the collection and analysis of groundwater, soil, and soil vapour data.
2. Excavate, remove, and dispose of all contaminated material (exceeding the Tier 2 Guideline, which includes the high BTEX material) on-site. Other aggressive remediation techniques may be used on-site if approved by Alberta Environment. Remediation on-site shall be completed within two months.
3. Excavate, remove, and dispose of the plume of high BTEX material (10-15 mg/L or higher as found in groundwater) off-site. Other aggressive remediation techniques may be used off-site to remediate the high BTEX material if approved by Alberta Environment. Remediation of the entire high BTEX plume shall be completed within two months.
4. In-situ bioremediation technology, or other remediation techniques, approved by Alberta Environment, shall be used to ensure that the remainder of the contamination off-site is remediated. Remediation of the remainder of the contamination off-site shall be commenced within four months. The Board recognized that this remediation work may take some time to complete.
5. Air quality samples shall be taken from all homes and businesses potentially affected by the contamination on both sides of Bow Crescent NW and along the north side of Bowness Road NW. Where an air quality sample indicates that vapours are entering a home or business, a vapour extraction system or some other method of protecting human health, approved by Alberta Environment, shall be installed as soon as possible.
6. If groundwater monitoring shows that contamination is moving in a northeast direction, an interceptor channel, or some other works, approved by Alberta Environment shall be constructed to prevent the contamination from moving towards the Bow River.
7. All remediation work shall be completed to the satisfaction of Alberta Environment.

The Board determined that “frustration” – that the lease prevents the Appellants from complying with the Order - does not apply. The issue of the lease is a private matter between the Appellants and the tenant, Bow Liquor Inc., with respect to which the Board had no jurisdiction. The lease is a matter to be addressed between these parties through negotiation or through the courts.

With respect to the proper parties to be named in the Order, the Board recommended that both Gas Plus Inc. and Handel Transport (Northern) Ltd. remain on the Order. The Board also recommended that Alberta Environment should reassess whether Mr. Sal Handel, one of the corporate directors of both Gas Plus Inc. and Handel Transport (Northern) Ltd., should also be named in the Order.

TABLE OF CONTENTS

I. INTRODUCTION 1

II. BACKGROUND 2

III. PRELIMINARY MATTERS 3

IV. REMEDIATION TECHNIQUES 3

A. Submissions 3

1. Appellants 3
2. Director 4
3. Bow Liquor 8
4. City of Calgary 8
5. Alberta Health Services 10
6. Residents 12

B. Analysis 15

1. Remediation Recommendations 21
2. On-Site Remediation 22
3. Off-Site Remediation 23
4. Timing for the Remediation 24

V. FRUSTRATION 25

A. Submissions 25

1. Appellants 25
2. Director 25
3. Bow Liquor 26
4. City of Calgary 27
5. Residents 27

B. Analysis 28

VI. NAMES ON EPO 30

A. Submissions 30

1. Appellants 30
2. Director 30
3. Bow Liquor 31
4. City of Calgary 31
5. Residents 31

B. Analysis 32

VII. OTHER MATTERS 33

VIII. COSTS 34

IX. RECOMMENDATIONS 34

I. INTRODUCTION

[1] This is the Environmental Appeals Board's Report and Recommendations to the Minister of Environment and Water[1] regarding four appeals of an Environmental Protection Order issued to Gas Plus Inc. ("Gas Plus") and Handel Transport (Northern) Inc. ("Handel Transport") relating to contamination resulting from a release of gasoline at a gas station site in the Bowness neighbourhood of Calgary. Some of the contamination has migrated from the gas station site into adjacent areas, including a residential area where it is impacting a number of homes. The Environmental Protection Order requires the remediation of all the contamination.

[2] Since the Environmental Protection Order was issued, there has been little progress in remediating the contamination. Gas Plus and Handel Transport have not completed the required delineation of the contamination and have not carried out any of the remediation work required by the Environmental Protection Order either on the gas station site (the on-site area) or in the adjacent areas into which the contamination has migrated (the off-site area).[2]

[3] Gas Plus and Handel Transport have objected to the remediation methods and timelines required in the Environmental Protection Order, appealing the original Environmental Protection Order and each of three subsequent amendments. (Gas Plus also filed a number of stay applications with the Board, two of which were formally rejected by the Board and the others were withdrawn.) Gas Plus and Handel Transport have also argued that they are prevented from doing the required work because of a lease they have entered into with respect to a building on the gas station site. They argue that the lease has "frustrated" their ability to carry out the required work because the lease prevents them from demolishing the building to access some of the contamination.[3]

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[1] For all relevant times during these appeals, the Department was named Alberta Environment. However, as of October 12, 2011, the Department was renamed Alberta Environment and Water. For the purposes of this Report and Recommendations, the Department will be referred to as Alberta Environment. However, the Minister will be properly referred to as the Minister of Environment and Water, the proper title of the Minister as of this date.

[2] Gas Plus and Handel Transport have carried out some work pursuant to an Executive Order from Alberta Health Services requiring that they respond to the presence of hydrocarbon vapours in some of the homes.

[3] "Frustration" is a legal doctrine from contract law that relieves a party to a contract from an obligation under the contract because it has become impossible to carry out the obligation. (See: *Black's Law Dictionary*, 6th ed., *s.v.* "frustration of contract.")

II. BACKGROUND

[4] On December 3, 2010, the Director, Southern Region, Operations Division, Alberta Environment (the "Director"), issued Environmental Protection Order No. EPO-2010/58-SR (the "Order" or "EPO") under the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12 ("EPEA") to Gas Plus Inc. and Handel Transport (Northern) Ltd. The Order was issued in relation to a gas station site located near the Bow River, at 6336 Bowness Road NW, in Calgary, Alberta (the "Site"). The Director issued three amendments to the EPO on April 21, 2011, June 1, 2011, and September 13, 2011.[4]

[5] On December 10, 2010, the Environmental Appeals Board (the "Board") received a Notice of Appeal from Gas Plus Inc. ("Gas Plus") and Handel Transport (Northern) Ltd. ("Handel Transport") (collectively the "Appellants") appealing the Order. The Appellants appealed the amendments on April 28, 2011, June 9, 2011, and September 19, 2011 respectively.

[6] In response to the Board's Notification of Hearing, the Board received nine intervenor requests. The Board accepted the intervenor requests of Mr. Terry Floate and Ms. Heather Cummings, Mr. Francesco Mele and Ms. Alison Hayter, Dr. Augustine Yip and Dr. Monica Skrukwa, Mr. Andy and Ms. Bonnie Ross (collectively the "Residents"), the City of Calgary, Alberta Health Services, and Bow Liquor Inc. (collectively, the "Intervenors"). Intervenor requests from Shell Canada Limited and Mr. Tony Pike were withdrawn.

[7] On October 28, 2011, the Board notified the Appellants, Director, and Intervenors (collectively the "Participants") that the issues at the Hearing would be:

> 1. Are the remediation techniques and timelines included in the amended Environmental Protection Order to address the on-site and off-site contamination appropriate?[5]

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[4] The first amendment ("Amendment No. 1") required the contaminated soil from the gas station site be excavated and removed; the second amendment ("Amendment No. 2") extended the dates to commence this work; and the third amendment ("Amendment No. 3") allowed the Appellants to choose whether they would proceed to deal with the contamination on the gas station site by excavating and removing the soil or by building a secant wall (an underground containment wall) around the perimeter of site.

[5] In setting this issue, the Board noted

> "… the Appellants and the Director have identified a number of proposed remediation techniques including: digging up and removing the contaminated material (Option A [- source removal]); using different configurations of secant walls to contain the contaminated material (Option B being a perimeter secant wall, and Option C being a smaller 'triangular' secant wall); using

2. Should the amended Environmental Protection Order be reversed or varied based on the alleged "frustration" of Gas Plus Inc. with respect to the Bow Liquor Inc. lease?

3. Should the amended Environmental Protection Order be varied to identify only Handel Transport (Northern) Ltd. as the person responsible, as opposed to both Gas Plus Inc. and Handel Transport (Northern) Ltd. as currently identified in the amended Environmental Protection Order?

[8] The Hearing was held in Calgary, Alberta, on November 22 to 25, 2011.

III. PRELIMINARY MATTERS

[9] At the start of the Hearing, the Residents raised an issue regarding a report provided by the Appellants outlining the intended evidence of their witness, Mr. James Studer. The Residents noted the report was filed after the deadline for submissions and only included vague information. They argued the information was not disclosed properly, making it difficult for the other participants to prepare for cross-examination. The Residents argued the report should be excluded. The Director supported the Residents' application.

[10] The Appellants admitted the report was provided later than intended, but there was no "ambush" as Mr. Studer based his comments on material provided by the Director and Tiamat Environmental Consultants Ltd. ("Tiamat"), the main consultant for the Appellants. No new evidence was produced by Mr. Studer. None of the other Intervenors provided comments.

[11] The Board determined Mr. Studer could provide oral evidence provided it was relevant to the issues raised in the appeals and the Board would determine the weight that would be applied to his evidence. However, since the Board's rules were not followed, the Board determined that the written report provided by Mr. Studer would not be considered by the Board.

IV. REMEDIATION TECHNIQUES

A. Submissions

1. Appellants

[12] The Appellants explained:

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bioremediation (Option D); or using a combination of these techniques (Option E)." See: Board's letter, dated October 28, 2011.

1. The plume has been sufficiently delineated and there is no longer a data gap.
2. The concentration of hydrocarbons in the groundwater is declining. The residual concentration of hydrocarbons in the soil is small and has reached equilibrium with the groundwater, so there is no value in removing the soil from the Site.
3. Construction of a secant wall, for either as containment or shoring purposes, could cause the plume to move under non-affected houses.
4. Aggressive intervention will interfere with the equilibrium and possibly cause the plume to move. This risk can be avoided if the plume is managed through in-situ bioremediation.
5. The soils on the Site are coarse grained, so the capacity to adsorb contaminants is low. The Director's suggestion the soils are heavily sorbed[6] is not supported by the data.
6. A bio-attenuation zone would effectively deal with the contamination.

[13] The Appellants stated they are ready and willing to commence remediation as indicated in their remediation proposal.

2. Director

[14] The Director noted the Appellants have not denied the substances impacting the Site and areas adjacent to the Site came from the release of gasoline at their Site. Under EPEA, the person responsible for a release of a substance has a legal obligation to immediately take all steps required to report, investigate, and remediate the release. The Director referred to sections 110 to 112 of EPEA.[7] The Director explained that, only in situations where the person

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[6] "Sorbed": when a material has taken up a gas or liquid up by absorption or adsorption. "Absorption": the gas or liquid has completely permeated the material. "Adsorption": the gas or liquid is adhering to the outer layer of the material.

[7] The relevant portions of sections 110 to 112 of EPEA provide:

> "110(1) A person who releases or causes or permits the release of a substance into the environment that may cause, is causing or has caused an adverse effect shall, as soon as that person knows or ought to know of the release, report it to (a) the Director …."
>
> (2) The person having control of a substance that is released into the environment that may cause, is causing or has caused an adverse effect shall, immediately on becoming aware of the release, report it to the persons referred to in subsection (1)(a) … unless the person having control has reasonable grounds to believe that those persons already know of the release. …
>
> 111(1) A person who is required to report to the Director pursuant to section 110 shall report in person, by telephone or by electronic means and shall include the following in the report, where the information is known or can be readily obtained by that person:
>
> (a) the location and time of the release;
> (b) a description of the circumstances leading up to the release;
> (c) the type and quantity of the substance released;
> (d) the details of any action taken and proposed to be taken at the release site;

responsible for the release does not act in an imminent manner to fulfill these legal obligations, that he will be compelled to issue an environmental protection order. The urgency is more critical when the release occurs in a residential area.

[15] The Director submitted the release of gasoline is not complicated from a technical standpoint. However, following the issuance of the EPO in December 2010, a pattern emerged where the Appellants submitted some data and information and the Director responded identifying deficiencies and requesting additional data and information. The Appellants did not meet the deadlines in the original EPO. He issued Amendment No. 1 in April 2011, which set out the specific requirements for how to complete the off-site delineation and directed the Appellants to undertake the source removal program. (The source removal program required the Appellants to excavate, remove, and dispose of all of the contaminated material on the Site.) The Director explained the source removal program was ordered because he lacked confidence in the Appellants' timeline to delineate and address the source material on the Site. He stated there was a significant gap in the data for the Site regarding the contamination plume, characterization of the source materials, and the extent to which the plume has migrated off-site.

[16] The Director explained source removal is a commonly used approach with gasoline releases in residential areas because it efficiently removes the risk of contaminants moving off-site. The Director issued Amendment No. 2 on June 1, 2011 extending the deadline

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(e) a description of the location of the release and the immediately surrounding area.

(2) In addition to a report under subsection (1), the person shall report in writing where required by the regulations.

(3) A person who reports under subsections (1) and (2) shall give to the Director any additional information in respect of the release that the Director requires.

(4) A person who reports under subsection (1) or (2) shall comply with any additional requirements set out in the regulations.

112(1) Where a substance that may cause, is causing or has caused an adverse effect is released into the environment, the person responsible for the substance shall, as soon as that person becomes aware of or ought to have become aware of the release,

(a) take all reasonable measures to
  (i) repair, remedy and confine the effects of the substance, and
  (ii) remediate, manage, remove or otherwise dispose of the substance in such a manner as to prevent an adverse effect or further adverse effect, and
(b) restore the environment to a condition satisfactory to the Director. …."

to start the source removal program. However, the Appellants continued to resist carrying out the source removal program.

[17] The Director explained he issued Amendment No. 3 on September 13, 2011, because he remained concerned with the lack of timely follow-up by the Appellants with respect to the off-site delineation and remedial plans and the reasons given by the Appellants why they could not comply with the amended EPO. Amendment No. 3 enabled the Appellants to proceed with the source removal program or proceed with their proposed alternative of constructing a secant wall around the perimeter of the Site. (The secant wall would create a physical barrier to contain the contamination remaining on the Site.) The completion date for both options was November 15, 2011.

[18] The Director noted that, since the issuance of Amendment No. 3, the Appellants withdrew their proposal for the secant wall stating the wall is not necessary and could be detrimental to the in-situ remediation technique that they are now proposing. The in-situ bioremediation technique proposed by the Appellants would have oxygen-releasing compounds injected into the subsurface to enhance the microbial action that breaks down the hydrocarbons. According to the Director, this change in the remedial plans has caused unnecessary delays, resulting in higher concentrations of hydrocarbons found at the leading edge of the plume.

[19] The Director stated he formed a technical advisory team, the Technical Review Team, to review the technical information provided by the Appellants and to provide him with technical support and advice in relation to the contamination issue. The Technical Review Team consisted of Alberta Environment staff, external environmental experts (CH2MHill Canada Environmental Services), and a City of Calgary engineer.

[20] The Director stated all of the timelines in the EPO and amendments were reasonable and achievable and were based on advice he received from his technical team. He confirmed it is Alberta Environment's process to require the person responsible, in this case the Appellants, to provide the Director with a firm and detailed remediation proposal that he can evaluate.

[21] The Director explained his preferred option to remediate the Site is excavation given:

1. The lack of data regarding contamination on the Site. Information that is not known about the Site includes: horizontal and vertical extent of the contamination; site characteristics including hydraulic conductivity, soil lithology, bedrock characteristics; and delineation of the plume.
2. There is a risk of water flowing through the Site and carrying contaminants off-site with future hydraulic cycles. Remedial action is required if levels exceed Tier 1 or potentially Tier 2 Guidelines regardless if the concentration on the Site is greater or less than off-site levels. A higher groundwater table in spring will liberate many of the hydrocarbon contaminants that are currently in the bedrock and in the soil above the water table level and carry the contaminants off-site.[8]
3. Light non-aqueous phase liquid ("LNAPL") exists on-site and off-site, although the amount of LNAPL on the Site is uncertain.
4. The contaminant plume is not stable. The plume continues to move, including northeast of the Site.

[22] In his written submission, the Director stated the full perimeter secant wall was accepted as an alternative to the source removal program because he felt it would meet his objectives of preventing further migration of the contaminants off-site. At the Hearing, the Director explained he accepted the full secant wall as an alternative to excavation as a compromise. However, as additional data have become available that show the contamination is moving through the bedrock, the Director no longer accepted the secant wall as a viable option. The Director never accepted the triangular wall as an option because it would not enclose the source material given that two test pits excavated on the Site showed high levels of contamination were outside the proposed triangular wall. The desire to not demolish the convenience store and liquor store cannot outweigh the need to remove the contamination from the Site to prevent further off-site migration to adjacent residential properties and create further harm to the environment.

[23] The Director submitted the use of in-situ bioremediation with an oxygen-releasing compound would not, by itself, resolve the contamination issues on the Site. It is better suited to removing any low concentrations of residual contaminants that remain after a more aggressive remedial approach has been taken. Where LNAPL is present, the use of the oxygen-releasing compound is unlikely to be effective.

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[8] *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, (December 2010) and *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, (December 2010). Referred to as the Tier 1 Guidelines or Tier 1 Criteria and the Tier 2 Guidelines or Tier 2 Criteria respectively.

[24] The Director explained that after excavation of the Site and high concentration areas off-site, remedial options could include: multi-phase extraction; a pump and treat groundwater technique; air-sparging; chemical oxidation; or enhanced bioremediation.

3. Bow Liquor

[25] Bow Liquor took no position with respect to the appropriateness of the techniques or timelines proposed for the remediation of the Site. It understood the best interests of the environment are paramount, and it does not want to be used as a pawn to delay a decision about the remediation technique to be used and whether the building it leases will have to be demolished. Bow Liquor confirmed it wants to continue business at its current location, and if the building is not demolished, it will not suffer any damages or losses.

4. City of Calgary

[26] The City of Calgary explained it owns real property and municipal infrastructure adjacent to or near the Site that could be adversely affected by the contamination. Within the city owned roads are water lines, storm water lines, a sanitary line, gas lines, telephone conduit systems, and wooden power poles with electricity lines. One of the properties owned by the City of Calgary in the area has a senior citizens public housing development.

[27] The City of Calgary accepted, supported, and relied on the findings and recommendations of the Technical Review Team. It noted one of its employees was a member of the team. The City believed the Director set out a correct and reasonable process for delineating and developing a remediation program for addressing on-site and off-site impacts.

[28] The City of Calgary noted the following potential impacts on the City's real property and infrastructure:

1. Groundwater impacts have not been delineated to the north and northwest between existing monitoring wells that show exceedances of one or more hydrocarbon constituents on City owned property.
2. Utility corridors have not been assessed to determine whether they are acting as a preferential pathway for the contamination.
3. The soil vapour plume has not been delineated and the hydrocarbon impacts on the City's roads, utilities, and properties have not been assessed.

[29] The City stated that, without a complete delineation and impact assessment of the contamination, it is reasonable and appropriate for the Director to take a conservative, precautionary approach to ensure the protection of the environment and health and safety.

[30] The City listed the potential impacts which may be encountered when repairing, maintaining, replacing, and operating roads and utilities if delineation is not complete:

1. excavation, handling, and disposal of hydrocarbon contaminated soil;
2. dewatering and treatment of groundwater contaminated by hydrocarbons;
3. permeation of sub-surface hydrocarbon contamination into water supply mains and services compromising drinking water quality;
4. corrosion of protective polyethylene sheaths on gas lines and electrical and telecommunication lines resulting in loss of water proofing and corrosion protection;
5. requiring additional measures to prevent utility trenches from acting as preferred pathways for off-site migration; and
6. exposing workers to occupational health and safety hazards and risks.

[31] The City submitted the building of the secant wall around the perimeter of the Site would be the most protective of its roads and utilities, because it would contain any contaminants on the Site and prevent any future releases.

[32] The City stated the reasonableness of the timelines in the EPO is moot, but the reasonableness of any timelines should be considered given the time that has elapsed since the issuance of the EPO to the start of the Hearing. The City stated the Appellants have had more than a reasonable period of time to perform the EPO, and the Appellants have used the appeal process to attempt to delay their obligation to perform the EPO and the discharge of their statutory duty.

[33] The City submitted the Board should recommend the EPO be confirmed and direct the Appellants to immediately complete the delineation and assessment of the hydrocarbon impacts, construct the secant wall, and develop and implement a remediation program to address off-site impacts to the satisfaction of the Director.

5. Alberta Health Services

[34] Alberta Health Services explained the community indoor air monitoring program was undertaken by the Appellants at the direction of Alberta Health Services in December 2010 and was updated in February 2011. The monitoring plan requires periodic testing of indoor air quality of homes and businesses in the 6300 block of Bow Crescent NW. The monitoring provides after-the-fact notification of air quality results since laboratory analytical results take two to three weeks after the sample is collected.

[35] Alberta Health Services explained the determination of acceptable and unacceptable indoor air quality results is based on limits set by Health Canada, the Canadian Council of Ministers of the Environment, and the United States Environmental Protection Agency, all of which are described in the Alberta Environment publication, "*Alberta Tier 1 Soil and Groundwater Remediation Guidelines, Appendix C, Protocols for Calculating Tier 1 Soil and Groundwater Quality Guidelines*" (December 2010). Alberta Health Services confirmed the individuals involved in the air monitoring program are supervised by Environmental Diagnostics Inc., a third party environmental consultant, whose employees have received appropriate training and established quality assurance processes.

[36] Alberta Health Services explained possible acute and intermediate worst-case exposures to benzene are its effects on the immune and central nervous systems, blood formation, and eye irritation. The August 2010 reading at the Floate residence demonstrated a 50 times exceedance of the Health Canada Carcinogenic Toxicity Reference Value for benzene, and the value was higher in October 2010. As a result of the increased levels, Mr. Floate and Ms. Cummings were advised by Alberta Health Services to vacate their homes.

[37] The indoor air quality test results taken in December 2010 and January and February 2011 at three residences, including the residence of Mr. Floate and Ms. Cummings, indicated the Canadian cancer and non-cancer chronic exposure toxicity reference value were exceeded for benzene and F1, but not to the same degree as the level measured in August and October 2010. Two other residences were also vacated as a result of Alberta Health Services intervention.

[38] Alberta Health Services advised the Appellants to install sub-slab depressurization at the Floate residence, but the lack of cooperation from the Appellants resulted

in Alberta Health Services issuing an Executive Officer Order under the authority of the *Public Health Act*, R.S.A. 2000, c. P-37. The Executive Officer Order required the Appellants to install effective soil vapour interception systems at the three residences to prevent the intrusion of gasoline vapours into the residences. Alberta Health Services determined it was important to have protective measures implemented as soon as possible due to the high levels of measured indoor hydrocarbon vapours and the potential prior exposures that may have occurred. Alberta Health Services needed to continually follow-up to ensure the Appellants did what was required and met the timelines.

[39] The residents at 6327 returned in September 2011. Two air clearance tests were completed in October 2011 for 6323 Bow Crescent, and they showed satisfactory results. They are waiting for the final air clearance report. Air clearance testing at 6319 Bow Crescent is pending the completion of sealing of concrete cracks and crevices and utility penetrations in the basement floor slab.

[40] Alberta Health Services stated the off-site contaminated groundwater is an existing and future public health concern for inhalation exposure via the vapour intrusion pathway. The potential for rising groundwater to dissolve contaminants in on-site soils and subsequent off-site migration has not been well assessed by the Appellants. The possibility of vapour intrusion is a concern when the ground freezes and residential and commercial buildings will become preferential pathways.

[41] Alberta Health Services noted the deteriorating groundwater on-site and off-site indicate that the on-site soils are acting as a source for off-site contamination, raising public health concerns.

[42] Alberta Health Services noted the monitoring data provided by Tiamat for June and July 2011 show increased numbers of on-site and off-site monitoring wells with exceedances of the Tier 1 Guidelines vapour inhalation criteria for benzene, xylene, and F1 and F2 hydrocarbons in July. Some of the wells had exceedances 10 times greater than the Tier 1 Guidelines vapour inhalation criteria, suggesting a substantially increased public exposure and health risk. Data obtained for September showed a decrease in the number of wells with 10 times exceedances of benzene and F1, suggesting an improvement. However, there was an increase in the number of wells with a 10 times exceedance for F2.

[43] Alberta Health Services stated the deteriorating on-site and off-site groundwater conditions can be attributed to the length of time that has passed since the release occurred.

[44] Alberta Health Services felt a full and comprehensive delineation plan is necessary to develop an informed remediation plan. Alberta Health Services noted the following data gaps:

1. The monitoring well at the southwest corner shows a benzene concentration higher than the Tier 1 Guidelines for vapour inhalation, but there are no other wells west or south of this well, thereby suggesting a need for additional wells to establish the extent of the contamination.
2. More comprehensive data are needed on the Site to assess the potential for source soils to contaminate groundwater and sustain an off-site health risk.
3. On-site and off-site soil vapour measurements in the soil layer are needed.

[45] Alberta Health Services deferred to the Director on how the contaminants should be managed to efficiently and expeditiously remove the risk of continued exposure for area residents.

[46] Alberta Health Services stated either excavation or isolation of the source materials must be expedited to:

1. eliminate or prevent continued on-site generation and off-site migration of contaminated groundwater; and
2. reduce uncertainty and provide assurance to residential and commercial occupants that off-site groundwater contamination and vapour intrusion issues are being addressed effectively and their health is being safeguarded given the concern that winter ground freeze will establish preferential pathways for vapour intrusion into homes and increase the health risk to the public.

[47] Alberta Health Services acknowledged it will continue to oversee the community air monitoring program until the area is remediated to a standard that no longer poses a health risk to residents.

6. Residents

[48] Mr. Mele and Ms. Hayter own property one block northeast of the Site, and their property has been contaminated by the gasoline release. They constructed a home on the property, but due to the contamination, it is uncertain if the residence is safe for habitation.

Alberta Health Services included the Mele and Hayter residence in the community indoor air sampling program, and an indoor air quality test will be done prior to them moving into the house. If the indoor air quality levels are dangerously high, occupancy can be delayed until vapour interception technology is installed. Mr. Mele and Ms. Hayter will have to decide if they will move into a residence with gasoline in the soil and rely on air quality monitoring that will provide after-the-fact notice that air quality is poor or acceptable. The groundwater under the Mele and Hayter property exceeds Tier 1 Guidelines,[9] and it is expected gasoline vapours are in the soil where the groundwater contamination plume is present. Mr. Mele and Ms. Hayter stated the limited involvement that they have been allowed, particularly by the Director, with respect to the delineation and remediation of the contamination, has been unsatisfactory.

[49] Drs. Yip and Skrukwa own property located 100 metres north of the Site, and they were forced from their home in January 2011 due to health concerns for their family. They returned to their home, but they remain concerned about the effects of the contamination. Drs. Yip and Skrukwa explained they were not notified of the release by Alberta Environment or Alberta Health Services, and therefore, they did not trust these regulatory authorities. They had to contact Alberta Health Services and request air monitoring testing. Drs. Yip and Skrukwa explained Mr. Handel's nephew did the air testing in their home, which they considered a conflict of interest. In addition to the air monitoring testing, Drs. Yip and Skrukwa installed vapour probes at their expense to measure subsurface petroleum hydrocarbon vapour concentrations. The data collected suggest contaminated groundwater has reached their property and gasoline vapours were present in the soil under their basement. In addition, the highest F2 readings found in the air quality testing in their home occurred in October 2011.

[50] Mr. and Ms. Ross own property that has also been contaminated by the release. Delineation shows the plume is on their property. They explained they intended to build a home on the property, but the City of Calgary has indicated a building permit could not be issued until an environmental site assessment was completed and, if remediation was required, that a remediation or risk management plan was implemented. The Rosses argued that, since the groundwater monitoring wells have changing pollution concentrations, then the contaminant plume cannot be considered stable as asserted by Tiamat. They submitted Tiamat lacked

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[9] See: *Alberta Tier 1 Soil and Groundwater Remediation Guidelines, Appendix C, Protocols for Calculating*

objectivity and fairness, and it was not holding paramount the health, safety, and welfare of the public or, regard for the environment, and it provided an opinion beyond its expertise.

[51] Mr. Floate and Ms. Cummings own property directly northeast of the Site. They noticed gasoline odours in their residence in July and November 2010. Alberta Health Services recommended Mr. Floate and Ms. Cummings move out of their residence because their property was no longer safe for habitation. They did not vacate their residence, but they installed a high efficiency furnace with an outside air intake for the main floor, and an air exchanger was installed for the basement. Mr. Floate has been experiencing health problems since he began smelling the gasoline odours in his house. Mr. Floate noted the Appellants have not complied with the condition of the EPO requiring the Appellants to seal the foundation cracks in his house.

[52] The Residents and their consultant, Dr. Jim Sevigny, favoured excavation of the contaminated material because it provides certainty that the contaminated material is removed. The Residents wanted the source removed and the area delineated and remediated by a reliable company. The Residents recommended the contaminated material be excavated from the Site no later than February 28, 2012.

[53] The Residents and Dr. Sevigny did not believe the secant wall or the smaller, triangular secant wall would prevent further migration of the contamination off-site, and it would not address remediation of the contaminated material either on-site or off-site.

[54] The Residents and Dr. Sevigny did not agree with the option to use bioremediation. They stated the lack of information prevents the proper assessment of the effectiveness of this option either on-site or off-site. They were also concerned with the length of time that would be required for in-situ bioremediation.

[55] Dr. Sevigny recommended the use of different remediation techniques including:

1. excavation and disposal for the source area (the area defined by Tiamat and illustrated in Figure 2 of Sevigny's report having 10 to 15 mg/l or greater total BTEX in groundwater);[10]

Tier 1 Soil and Groundwater Quality Guidelines" (December 2010).

[10] See: Residents submission, dated November 9, 2011, Appendix G, "Report Concerning the Remediation Techniques and Timelines included in the Amended EPO to Address the On-Site and Off Site Contamination" at pages 12 and 13.

2. a recovery trench coincident with the leading edge of the source;
3. active bioremediation of the source area margins following excavation; and
4. passive remediation (i.e. natural attenuation) for the distal leading edge.

[56] The Residents supported Dr. Sevigny's opinion of the need for soil excavation beneath a number of homes within the groundwater contamination plume and east of the Site and the need to construct a secant wall or recovery trench along the north side of Bow Crescent in front of the homes situated between 6306 and 6332 Bow Crescent.[11] The Residents recommended the contaminated material be excavated from the off-site areas no later than April 30, 2012.

[57] The Residents also requested:

1. Alberta Environment assume the delineation and remediation of the Site and off-site properties;
2. CH2MHill take over the responsibility for providing environmental consulting work and reports; and
3. the Residents be provided with a direct role in participating in the formulation and implementation of the delineation and remediation plans and the air quality monitoring.

B. Analysis

[58] Approximately 7,200 litres of gasoline was released from the initial source, a leak from part of the gas station's pumping system. Tiamat's evidence suggested that 1,510 litres were recovered by vacuum and soil vapour extraction. Therefore, approximately 5,690 litres of gasoline could remain in the subsurface. Tiamat estimated the plume covers an area of 1550 m^2 on-site and has migrated to affect 17,300 to 26,000 m^2 off-site.

[59] From a review of the Director's file and the submissions provided by the Director and Alberta Health Services, it is clear the Appellants have been reluctant to take the necessary steps to minimize environmental and health impacts resulting from the gasoline release.

BTEX is a term used for benzene, toluene, ethylbenzene, and xylene, which are volatile organic compounds found in hydrocarbons such as gasoline. While BTEX is, in and of itself, a concern, total BTEX (the total amount of all of these substances) is also used as an indicator in environmental site assessment. See: www.toxics.usgs.gov/definitions/btex/html.

11 For clarity, the properties identified on Bow Crescent NW are also identified by legal block and lot numbers as follows: 6306 (Block 33, Lot 29B) and 6332 (Block 33, Lot 26A).

Although the Appellants stated they are willing to start remediation work right now, their actions have not supported a timely response to the incident. The delay in taking action has made the situation more difficult to remediate.

[60] Given the Appellants' reluctance to proceed with remediation on their own, the Board confirms the Director acted appropriately in issuing the EPO. The Amendments to the EPO were an attempt to reach compromises with the Appellants and allow them time, and direction, to implement the necessary steps to remediate both the on-site and the off-site areas in a timely manner. Although opportunities were provided to the Appellants, they did not act in a responsive manner. The Director explained the unusually prescriptive nature of Amendment No. 1 was an attempt to get the Appellants to comply. (The details of the remediation plan are most often developed by the persons responsible, as opposed to the Director based on the advice of his Technical Review Team as occurred in Amendment No. 1.)

[61] The Appellants appeared to have a fundamental misunderstanding of their roles, responsibilities, and obligations under the legislation. It is their responsibility, as persons responsible under EPEA and its regulations, to take the necessary steps to mitigate and remediate the contamination. It is not up to the Director to develop a remediation plan, to undertake sampling, or to delineate the plume. The Appellants should not attempt to shift the responsibility to others for their lack of action.

[62] The plume has traveled quickly since the release in April 2010 because of the coarse textured soils in both the on-site and off-site areas allowed for quick movement of the groundwater and migration of the contamination. Given the rate of migration since the release occurred and the evidence given that suggests residual LNAPL from the Site has migrated off-site in the contamination plume, the Board agrees with the Director that excavation appears to be the best method available to curtail further movement of contaminants in the on-site area from continuing to moving off-site. Therefore, as discussed in more detail below, the Board recommends that the Site be excavated to remove and dispose of the contaminated soils and groundwater. Although it will be disruptive to Gas Plus and Bow Liquor, and possibly to the Residents, the disturbance will be for a comparatively short period of time, and with the certainty that is obtained through excavation, all of the parties that have been impacted will benefit from the quick removal of the contaminated material from the Site.

[63] The Appellants retained consultants who should have understood the process when dealing with Alberta Environment and environmental protection orders. As stated, it is not the responsibility of the Director to prepare the remediation plan, as was suggested by the Appellants. The Director's role it to review the detailed plan prepared by the person responsible to ensure the plan will achieve the objective of effectively remediating the impacts in a timely manner.

[64] In the 18 months that have passed since the gasoline release was discovered, the Appellants have undertaken some delineation work. However, complete delineation of the plume has not been achieved. The Board understands the plume continues to grow and alter in shape. However, this does not prevent the Appellants from defining the extent of the plume. There are areas, including the northwest corner and the south and east areas where monitoring wells indicate there is contamination, but no wells have been placed by the Appellants past this contaminated zone to indicate where the contamination may end. Without this information, it is difficult to prepare a precise remediation plan, but this does not prevent remediation from being started in the areas where the contamination has been identified. The Director clearly recognized the remediation plan will have to be modified as remediation work continues and further tests are completed, but work can start now.

[65] Tiamat suggested in their evidence that they conducted some form of analysis of the various remedial options to determine the best method to remediate the contamination plume. However, such an analysis was not presented to the Director or to the Board. Based on the information before the Board, it appears that Tiamat became invested in the in-situ bioremediation option and failed to communicate any information about its analysis of other viable and possibly more efficient and reliable remediation alternatives. Had Tiamat communicated this information it would likely have been beneficial to the Director in understanding why Tiamat was suggesting bioremediation as its preferred option and may have facilitated a discussion about other options.

[66] The Appellants argued the Director did not approve of their remediation plan, so remediation could not start. The Director disagreed and explained remediation can start immediately without an approved plan. In fact, the Director acknowledged the Appellants took the initial steps to start remediation by removing liquid product from the Site. This was done

without approval because it was deemed necessary to mitigate the contamination issue. However, it was at this point that the Appellants appeared to stop any further remediation work. A remediation plan is still required because the Director needs to know what is being done to ensure the desired outcomes are achieved.

[67] Since more time has passed since the issuance of the EPO and the Amendments to the EPO, additional information has become available. The Director's evidence, provided at the Hearing, shows the contamination is traveling through the bedrock below the Site. As a result, a secant wall would not be effective in containing the contamination. Therefore, the Director now believes it would not be appropriate to allow the Appellants to build the secant wall for containment purposes. The Board agrees. The evidence demonstrates the secant wall would be ineffective in preventing further off-site migration of the contamination plume. Therefore, the Board recommends the EPO, and specifically Amendment No. 3, be varied to remove the reference to the secant wall as an option for containing the remaining contamination on the Site.

[68] The Board realizes that, with an excavation process, shoring walls may be required to protect other properties while excavation is taking place. The Appellants must take the necessary steps to protect adjacent properties when remediation is underway. These shoring walls may be constructed in a similar manner as a secant wall, but they are for providing lateral support to the adjacent properties and not for containing contamination.

[69] The Appellants did not consider it appropriate to remove the contaminated soil from the Site because the hydrocarbon levels on-site have decreased and are now comparable to levels off-site. The Board is not convinced by this argument. What appears to be occurring is the LNAPL is moving off-site with the contamination plume. It is not reasonable to delay remediation of the Site with the expectation that over time the problem on-site will move off-site and it will not be necessary to take aggressive steps to remediate the Site itself. The "horse has left the barn" argument presented by the Appellants demonstrates to the Board that the Appellants do not appreciate that contamination remains on the Site and there remains the potential for further adverse effects on the environment and human health if this contamination continues to migrate off-site.

[70] Based on the evidence presented by the consultants, it appears the Appellants are misinterpreting the data. The consultants at the Hearing, with the exception of Tiamat, explained

that a decrease in recorded levels of contaminants off-site, particularly near the residences, is what is expected in the summer months compared to the levels expected to be found in the winter months. In winter, vapours are caught in the soil because they cannot escape through frozen ground. This causes an increase in the vapours measured in the residences. To say with any level of confidence that the contamination levels are in fact decreasing would require readings from winter and then again in the summer. The Board does not consider it prudent to wait that long before remediation is started. The consultants explained that vapours will use the path of least resistance that, in the winter, is through basements. This puts residents at risk for continued exposure to the contaminants.

[71] The Board is also of the view that additional testing should have been conducted with the respect to the soil and the groundwater both on-site and off-site. Testing should have been completed in the area of the gasoline pumps where the release originally occurred. It is not sufficient to test on-site areas without testing the actual source location to determine the levels at the source of the problem.

[72] The Appellants did not agree with the other consultants regarding the levels of contamination in the groundwater. The Appellants accepted that the groundwater likely had low levels of contamination. They argued there was not enough data to support the other consultants' views that there are high levels of contamination in the groundwater. The Board does not accept the Appellants' argument. Without additional data, it cannot be said with any degree of certainty that higher levels of groundwater contamination are not present. In a situation such as this where there is an off-site impact, it is very important to gather as much relevant data as possible to determine the best course of action to protect the public and the environment.

[73] There was much discussion at the Hearing regarding the presence of LNAPL in the soil both on-site and off-site. Tiamat argued LNAPL was no longer present on-site. The Board does not accept this view. The Board heard all of the other consultants state that, even though LNAPL was not currently found in the groundwater, based on the latest testing from wells on the site, LNAPL is very likely present in the soil attached to soil particles in the smear zone and, when the groundwater rises in the spring, the LNAPL will dissolve in the groundwater and continue to migrate off-site with the groundwater plume. Even Mr. Studer, an independent

consultant retained by the Appellants for the Hearing, acknowledged that LNAPL is, in all likelihood, still present in the soil both on-site and off-site.

[74] During the testimony of Mr. Studer, whose background is using in-situ bioremediation techniques such as the one proposed by Tiamat, he stated this technique would have limited effect on LNAPL. He stated that, although it may be effective in areas with less contamination and without LNAPL, it would not be effective in a timely manner for areas with LNAPL or higher levels of contamination. This bioremediation technique could take up to four to five years to remediate the contamination to an acceptable level. This is not acceptable to the Board. The Residents should not have to wait that long to ensure that their health will not be affected. In addition, there was a concern regarding the effectiveness and ability to drill the appropriate core depth to inject the oxygen-releasing substance in the coarse subsurface underlying the area. Therefore, the Board does not consider in-situ bioremediation the appropriate option in areas with LNAPL or excessively high areas of contamination. This does not mean that in-situ bioremediation cannot be used to remediate other areas that have been contaminated or to ensure complete remediation in areas that have been excavated.

[75] The Residents noted soil vapour plumes have not been delineated, and the Director agreed soil vapour levels would be valuable information. Tiamat acknowledged soil vapour testing was not completed either on-site or off-site, and no explanation was given as to why these data were not gathered. The consultants noted that collecting the data, which would assist the Appellants in delineation and remediation both on-site and off-site, is not difficult. Therefore, as part of the delineation requirement of the EPO, the Board recommends that soil vapour testing be completed both on-site and off-site.

[76] The Indoor Air Monitoring Program has been effective in measuring air quality in the homes that are or are most likely to be affected by vapours from the contamination. Some of the Residents expressed concerns that they were not notified about the gasoline release and resulting contamination off-site until it was reported in the media. To ensure all residents and businesses that could be affected by the contamination in the area know whether their homes or businesses are impacted by vapours, the Board recommends the Appellants collect air quality samples in all homes and businesses from 63rd Street NW to 62nd Street NW on Bow Crescent,

from 6226 to 6416 on the north side and 6227 to 6411 on the south side.[12] Samples should also be taken from homes and businesses on the north side of Bowness Road NW from 6214 to 6404 as the groundwater contamination plume has not been delineated in this area.[13] The air quality samples should be collected by an independent third party and should be analyzed and reported by a qualified, recognized professional, acceptable to the Director. If the results indicate vapours are entering the homes, the Board recommends that the Appellants install vapour extraction systems, or some other mechanism, acceptable to the Director as soon as possible. Alberta Health Services has agreed to continue overseeing this program until there are no longer any health concerns at the residences.

[77] With respect to indoor air quality, there are special circumstances with the home of Mr. Floate and Ms. Cummings, 6323 Bow Crescent NW. This home has cracks in the foundation, which provide a preferred pathway for hydrocarbon vapours to enter. The levels of hydrocarbon vapours were, at one point, sufficiently high to be a potential human health risk and Alberta Health Services recommended that Mr. Floate and Ms. Cummings leave their home. In the EPO, the Director ordered the Appellants to repair the foundation to address this issue. The Board agrees. If this human health risk is still present, the Appellants must address this issue. The potential for harm exists through no fault of the homeowners; it exists because of the presence of the plume underneath the home, which is the sole responsibility of the Appellants. Therefore, the Board will recommend that the requirement in the EPO to address the problem with the foundation at 6323 Bow Crescent NW be confirmed.

1. Remediation Recommendations

[78] At the Hearing, there was a discussion as to whether the Tier 1 or Tier 2 Guidelines for remediation were applicable in this case. The Director confirmed that the Tier 2 Guidelines should be used to assess whether limits have been exceeded for soil quality and vapour inhalation levels. The Board agrees that the Tier 2 Guidelines should be used to identify

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[12] For clarity, the properties identified on Bow Crescent NW are also identified by legal block and lot numbers as follows: 6226 (Block 33, Lot 31), 6416 (Block 33, Lot 23B), 6227 (Block 6, Lot 16), and 6411 (Block 4, Lot 12). The Board has been overly inclusive to ensure that all properties that could be affected are checked.

[13] For clarity, the properties identified on Bowness Road NW are also identified by legal block and lot numbers as follows: 6214 (Block 6, Lot 6) and 6404 (Block 4, Lot 7). The Board has been overly inclusive to insure that all properties that could be affected are checked.

how the contaminated areas should be dealt with. The goal of the remediation is to restore all of the contaminated areas, both on-site and off-site, to below the Tier 2 Guidelines.

[79] The remediation work that needs to be done will differ between the on-site area and the off-site area. Therefore, the Board's recommendations will be divided between those for the on-site area and those for the off-site area that has been contaminated.

[80] The Board's recommendation will also differ depending on the level of contamination. While it is important that all the contamination be remediated to better than the Tier 2 Guidelines, the Board is most concerned with the soil and groundwater that is in the 10-15 mg/L or greater range of total BTEX as discussed at the Hearing. This "High BTEX" contamination is an immediate concern with respect to the protection of the environment and human health and need to be remediated in an aggressive manner as soon as possible.

[81] In stating that it is necessary to remediate the High BTEX portion of the contamination plume, the Board wishes to be clear that the entire extent of the plume that meets the 10-15 mg/L or greater criteria must be remediated in the aggressive manner discussed below. It is <u>not</u> acceptable to only remediate "hot spots" within this portion of plume.

[82] In determining where the High BTEX contamination is located, the Board found the "contour" maps presented by Dr. Sevigny a useful example. The "contour" maps presented by Dr. Sevigny were a "corrected" version of the information developed by Tiamat.[14] The Board believes that the best possible delineation will be achieved using the approach taken by Dr. Sevigny and re-examining the analysis using the most current, relevant, and complete data available. This is part of the work that needs to be done during delineation.

2. On-Site Remediation

[83] The original source of the gasoline release is located on the Site near the pump stations. The contamination plume has migrated from this location to most of the on-site area and also to the off-site area. In order to ensure that the contamination on-site is dealt with as quickly as possible, the Board is recommending that the Appellants shall:

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[14] See: Residents' submission, dated November 9, 2011, Appendix G, "Report Concerning the Remediation Techniques and Timelines included in the Amended EPO to Address the On-Site and Off Site Contamination" Figure 2.

1. confirm the location of all contaminated material on-site by carrying out delineation, including the collection and analysis of groundwater, soil, and soil vapour data, as approved by the Director;
2. excavate, remove, and dispose of all contaminated material (exceeding the Tier 2 Guidelines) on-site, or use other aggressive remediation techniques, as approved by the Director;
3. use vapour extraction technology in combination with the other remediation techniques, as approved by the Director; and
4. complete all work to the satisfaction of the Director.

If a shoring wall is required to protect other properties while excavation is undertaken, the wall shall be constructed to appropriate engineering standards. The shoring wall is for providing lateral support to the adjacent properties and is not to be used for containing any contamination on the Site.

3. Off-Site Remediation

[84] To ensure proper and expedient remediation of the off-site area, the Board is recommending that the Appellants shall:

1. confirm the location of all contaminated material off-site by conducting detailed delineation, including the collection and analysis of groundwater, soil, and soil vapour data, as approved by the Director; [15]
2. excavate, remove, and dispose of the entire plume of High BTEX material (10-15 mg/L or greater as found in groundwater) located by the detailed delineation in the off-site area, or use other aggressive remediation techniques, as approved by the Director;
3. for all other off-site contamination, use in-situ bioremediation technology, or other remediation techniques, as approved by the Director;
4. use vapour extraction technology in combination with the other remediation techniques, as approved by the Director;
5. take air quality samples from all homes and businesses potentially affected by the contamination, including at a minimum from 6226 to 6416 on the north side and from 6227 to 6411 on the south side of Bow Crescent NW and from 6214 to 6404 on the north side of Bowness Road NW, as approved by the Director, within one month of the Ministerial Order being issued in this matter;
6. if an air quality sample indicates that vapours are entering a home or business, install a vapour extraction system or some other method of protecting human health, as approved by the Director, as soon as possible;

[15] The delineation should include the taking of samples systematically and progressively outward from the contamination plume until non-detect samples are encountered indicating that the lead edge has been passed.

7. if the Director determines that a human health risk exists at 6323 Bow Crescent NW, comply with condition 2 of the EPO within one month of the Director making the determination;
8. if groundwater monitoring shows that contamination is moving in a northeast direction, construct an interceptor channel, or some other works, as approved by the Director, to prevent the contamination from moving towards the Bow River; and
9. complete all work to the satisfaction of the Director.

4. Timing for the Remediation

[85] A significant issue in these appeals was the timing required to complete the remediation work. The Appellants argued the Director did not provide sufficient time in which to line up contractors to complete the work, obtain the required approvals from the City of Calgary, and to complete the work. The Appellants have had since April 2010 when the release occurred to do the required delineation and start the remediation work. The Director included deadlines in the EPO to provide certainty for the Appellants and the Director to know what was required and by when and to alert the Director if the deadlines were not being met. The fact that the Appellants have been "unable" to meet the deadlines does not convince the Board to allow extended periods of time to complete the work. The City of Calgary stated it was willing to expedite the issuing of the required approvals. Although the Board and the Minister have no jurisdiction on the City of Calgary's approval process, considering the impact the contamination has had on some of Calgary's residents, the potential impact the contamination may have on the City owned properties and utilities, and the Bow River, the Board considers it prudent to accelerate the Appellants' approval applications. Therefore, the Board recommends that all remediation work on-site, as detailed above, should be completed within two months of the date the Ministerial Order issued in this matter. For the remediation work that is required off-site, as detailed above, the Board recommends that the remediation of the High BTEX material also be completed within two months of date of the Ministerial Order, and that the remaining remediation work in the off-site area be commenced within four months of the Ministerial Order. The Board acknowledges that this remaining work may take sometime to complete.

[86] The Board emphasizes to the Appellants and to the Director the importance of good communication and collaboration throughout the implementation of the remediation process. The Director's Order should be viewed as being a framework for iterative and adaptive

decision-making such that, as new information is brought forward, or data is brought forward, subsequent decisions or directions will be required. This concept is particularly relevant to situations such as remediation of a contaminant plume that is a "moving target." It is for this reason, to allow as much adaptive decision-making as possible, that the Board has qualified many of its recommendation by using the phrase "as approved by the Director."

V. FRUSTRATION

[87] As indicated previously, the Appellants have argued that they have been prevented from doing the work required by the EPO because of a lease they have entered into with respect to a building on the Site. They argued that the lease has "frustrated" their ability to carry out the work required by the EPO. "Frustration" is a legal doctrine in contract law that relieves a party to a contract from an obligation under the contract because it has become impossible to carry out the obligation.

A. Submissions

1. Appellants

[88] The Appellants explained the lease with Bow Liquor does not include a *force majeure*[16] clause and there is no provision that allows the Appellants to summarily terminate the lease. They argued that if any portion of the EPO requires the tenant to vacate, then the EPO is frustrated.

2. Director

[89] The Director stated "frustration" is a principle of contract law. There is no authority for the proposition that the frustration principle applies to regulatory actions, and even if it did, the Board has no jurisdiction to decide the matter.

[90] The Director did not name Bow Liquor in the EPO, and the issue of whether it should be named as a person responsible, such that the Director could require them to vacate the building on the Site, is not a matter in these appeals.

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[16] See: *Black's Law Dictionary*, 6th ed., *s.v.* "force majeure." Force majeure is defined as "…superior or irresistible force."

[91] The Director argued the test for frustration was not met. The Director referred to Clauses 39 and 16 of the lease between Gas Plus and Bow Liquor.[17] The Director argued the lease includes provisions to deal with the issuance of the EPO and provides the Appellants with broad immunity from damages if they evict Bow Liquor.

[92] The Director stated that neither he nor the Board has the duty or obligation to address the tenancy obligations of the Appellants since it is a private legal matter between the parties to the lease.

[93] The Director noted the Appellants sought a remedy from the courts to terminate the lease in order to comply with the EPO.

[94] The Director argued an environmental protection order cannot be rendered ineffective by a private business arrangement. This would allow persons responsible to evade their environmental responsibilities by having a contract with a third party.

3. Bow Liquor

[95] Bow Liquor has operated its business in a building on the Site for 11 years. The Appellants asked Bow Liquor to vacate the premises voluntarily without a guarantee that any losses or damages it suffers would be reimbursed by the Appellants. The Appellants will not

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[17] Clause 39 of the lease states:

> "Whenever and to the extent that he Landlords shall be unable to fulfil any obligation hereunder for the supply or provision of any service or utility or the doing of any work or the making of any repairs because they are unable to obtain the material, goods, equipment, service, utility or labour required to enable them to fulfil such obligation or by reason of any statute, law or order-in-council or any regulation or order passed or made pursuant thereto or by reason of the order or direction of any administrator, controller or board, or any government department or officer or other authority, or by reason of not being able to obtain any permissions or authority required thereby, or by reason of any other cause beyond their control, hereby of the foregoing character or not, the Landlords shall be relieved from the fulfillment of such obligation and the Tenant shall not be entitled to compensation for any inconvenience, nuisance or discomfort thereby caused."

Clause 16 of the lease provides:

> "The Landlords shall not be liable or responsible for any personal or consequential injury of any nature whatsoever that may be sustained by any persons, or for any loss of or damage to any property at any time in the demised premises or in the aforesaid building, or for any loss to the business of the Tenant caused directly or indirectly by any latent or other defect in the demised premises and the fixtures thereto belonging to the aforesaid building or by reason of the interruption of any public utility or service, or from any steam, electricity, gas, water, rain or snow which may leak into, issue or flow from any part of the aforesaid building or from the pipes, wires or plumbing works of the same or from any other place or quarter, or from or by any other reason, matter or cause whatsoever."

acknowledge any liability, so if Bow Liquor vacates the premises voluntarily, it may be giving up its right to a potential civil claim against the Appellants. Bow Liquor anticipated the cost to move to a new location would be approximately $200,000.00, and it would take two to three months to relocate.

[96] Bow Liquor believed the courts must decide if the EPO is frustrated due to the lease. It argued the Board cannot reverse or vary the EPO in a manner that ultimately affects the rights of Bow Liquor simply because frustration is being alleged.

4. City of Calgary

[97] The City of Calgary stated the issue of frustration is a doctrine in contract law, and it was not aware of any legal authority that supports using the doctrine of frustration to justify non-compliance with a regulatory order. The City submitted:

> "… the purpose and principles of [EPEA], the public interest in environmental protection and the need to adopt conservative and precautionary remedial measures to protect the environment, human health and safety and the interests of the community and The City outweigh any commercial considerations between Gas Plus as landlord and its tenant, Bow Liquor Inc."[18]

5. Residents

[98] The Residents stated there is no legal authority that states a government order can be frustrated by a private contract. If this was true, all laws could be rendered ineffective by parties entering into contracts that allow them to avoid obligations at law. A person responsible cannot unilaterally end their responsibility through private contractual arrangements. The Appellants cannot use the lease to absolve them of their mandatory duty to the public to remediate the contamination.

[99] The Residents stated the potential monetary consequences of performing a statutory obligation are not relevant and is part of the polluter pays principle.

[100] The Residents stated the lease between the Appellants and Bow Liquor is a private matter. The Appellants are using the lease with Bow Liquor as an excuse to disregard

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[18] City of Calgary submission, dated November 9, 2011, at paragraph 31.

their duty to remediate the Site and off-site. The Residents submitted the Appellants should be directed to terminate the lease and start remediation immediately.

[101] The Residents argued section 250(4) of EPEA[19] provides the Appellants the right to enter Bow Liquor's premises to perform delineation and remediation work. The Appellants also referenced sections 251 and 252 of EPEA.[20]

[102] The Residents submitted the Board recommend to the Minister:

1. declare the Appellants' lease with Bow Liquor has no force or effect on the Appellants' performance of the EPO:
2. pursuant to section 252, direct the Director to apply for a court order requiring Bow Liquor to vacate the premises within a timeframe specified by the Director; and
3. direct the Appellants to pay all costs associated with Bow Liquor vacating the premises.

B. Analysis

[103] The Appellants argument that the EPO is frustrated as a result of an existing lease, and therefore, the Appellants are some how prevented or relieved from complying with the EPO

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[19] Section 250(4) of EPEA provides:

"Where an environmental protection order or an enforcement order orders the person to whom it is directed to carry out any work or do any thing in respect of a place, that person and any other person carrying out the work or doing the thing on that person's behalf may, without incurring liability for doing so, enter the place for the purpose of carrying out the work or doing the thing required by the order."

[20] Section 251 of EPEA provides:

"No person shall interfere with

(a) an inspector or investigator or the Director who is exercising powers or carrying out duties, or attempting to do so, under this Act,
(b) a person accompanying an inspector or investigator or the Director under the authority of section 249, or
(c) a person referred to in section 250(4) who is carrying out any work or doing any thing pursuant to an environmental protection order or enforcement order."

Section 252 of EPEA provides:

If a person interferes with another person contrary to section 251,

(a) the inspector, investigator or Director, as the case may be, in a case referred to in section 251(a) or (b), or
(b) the Director, in a case referred to in section 251(c),

may apply to the Court of Queen's Bench for an order prohibiting the person from so interfering, and the Court may make any order it considers appropriate."

is novel. However, no case law was provided to show a lease can override a statutory order that was issued taking into consideration public health as well as the environment.

[104] Frustration is a legal concept that relates to contract law. It is defined as:

> "This doctrine provides, generally, that where existence of a specific thing is, either by terms of contract or in contemplation of parties, necessary for performance of a promise in the contract, duty to perform promise is discharged if thing is no longer in existence at time of performance."[21]

It applies when, for some unforeseen circumstance, a contract cannot be fulfilled. No substantive arguments were presented to the Board that this doctrine in contract law is applicable to any other area of law, much less the law of regulatory decision making as in the case of this EPO.

[105] The Board acknowledges the remediation work as described above will affect Bow Liquor, because the building in which it operates its business will likely have to be removed in order for proper and complete excavation of the Site. However, as explained by the Director, the EPO was issued to ensure the protection of the environment and human health and safety. It does not seem reasonable that a private, third party contract could prevent the obligations of a statutory order from having full force and effect. In fact, in the Board's view such an interpretation would effectively defeat the broad public interest aspects of environmental legislation.

[106] To complete the remediation work on Site, it is likely the existing building on the Site will have to be demolished. The Board notes the concerns of Bow Liquor and its desire to continue its business at its current location. However, even Bow Liquor recognized the importance of remediating the Site to protect the environment. Bow Liquor should also have concerns regarding the protection of the health of its employees who are working in a building situated on or abutting the initial source of the contamination, even though indoor air quality tests have not exceeded levels for concern. However, the Board cannot and will not order Bow Liquor to vacate the property and will not recommend that the Director make such an order at this time. These are not matters that are within the jurisdiction of the Director or the Board.

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[21] *Black's Law Dictionary*, 6th ed., *s.v.* "frustration of contract."

[107] The Appellants have taken action in the courts to determine whether the lease can be terminated. The Board considers negotiations between the parties to the lease or alternatively the courts as the correct venue to determine the matter. The Board's jurisdiction is limited to making recommendations on whether the EPO should be confirmed, reversed, or varied. The existence of the contract is irrelevant to the Board making these recommendations, and therefore, the Board will not make any recommendations regarding the status or effect of the lease.

VI. NAMES ON EPO

A. Submissions

1. Appellants

[108] In their written submission, the Appellants argued Gas Plus should not be named in the EPO as a person responsible. However, at the Hearing, the Appellants conceded there is no basis in law to support this position and, effectively, did not contest that it is appropriate that both Appellants should be named as persons responsible.

2. Director

[109] The Director noted the "polluter pays" principle is one of the fundamental tenets of EPEA. The Director has wide discretion in deciding which persons responsible should be named in an environmental protection order.

[110] The Director stated Gas Plus holds a business licence to operate "Fuel Sales/Storage" at the Site, and its signage is prominently displayed at the Site. Gas Plus supplies the petroleum products for the storage tanks at the Site. Gas Plus acknowledged having charge, management, or control of the sump pumps that lead to the hydrocarbon release, and it repaired the fuel line and spill box and ordered the fuel lines and underground storage tanks on the Site be tested for further leaks. Gas Plus also took the lead for all the remediation, delineation, and testing of the Site.

[111] The Director submitted it is clear Gas Plus exercised a degree of charge, management, or control over the hydrocarbons at the Site, and it was reasonable for the Director to name Gas Plus as a person responsible in the EPO. Handel Transport is the current landowner and owner of the underground storage tanks and is also a person responsible.

3. Bow Liquor

[112] Bow Liquor acknowledged it may commence an action against the Appellants for losses it may suffer. Bow Liquor stated the request to remove Gas Plus from the Order should be denied if Gas Plus is asking it be removed from the EPO to shield it from any judgments granted against the Appellants as a result of the EPO.

4. City of Calgary

[113] The City of Calgary noted its business licence bylaw prohibits anyone from carrying on a business listed without a valid licence. This includes a business that is the storing, distributing, or selling liquid fuel. The City of Calgary stated its business licence records for 2009, 2010, and 2011 indicate a business licence was issued to Gas Plus for fuel sales and storage. The City of Calgary submitted Gas Plus is a person responsible for the hydrocarbon contamination, because it has management and control of the sale and storage of the substance.

[114] The City stated it is appropriate to name both of the Appellants in the EPO to ensure the persons responsible for the hydrocarbon contamination were fairly included to share the burden of the remedial actions required and to ensure the Director can pursue either or both of the Appellants if the required remedial actions are not taken.

5. Residents

[115] The Residents noted Gas Plus was the operator of the gas station at the time of the release and still operates the gas station, and Handel Transport owns the lands. Gas Plus entered the lease with Bow Liquor even though Handel Transport owned the land and buildings. The Residents argued this demonstrates Gas Plus and Handel Transport are interchangeable and are no different regarding the charge, management, and control of the substance. The shareholders of Gas Plus and Handel Transport are the same.

[116] The Residents noted Gas Plus had management or control of the substance at the time of the release and, therefore, is properly named in the EPO. Handel Transport is the registered owner of the Site and is properly a person responsible for off-site damages and clean up of the release.

[117] The Residents submitted naming both Gas Plus and Handel Transport is in accordance with the purpose of EPEA, specifically to protect the public and environment.

[118] The Residents argued the Director should have also named Mr. Sal Handel as a person responsible. They argued Gas Plus, Handel Transport, and Mr. Handel cannot be distinguished from each other for the purposes of EPEA. They stated Mr. Handel directed compliance or non-compliance with respect to the EPO. The Residents expressed concern that, if Mr. Handel is not named, the Appellants would not progress with the remediation work.

B. Analysis

[119] At the Hearing, the Appellants conceded that, based on the legislation, both of the Appellants fall within the definition of "person responsible" under section 1(tt) of EPEA.[22] They did not provide any additional arguments on this issue. Handel Transport is the registered owner of the Site, and Gas Plus operates the gasoline station on the Site and holds the City of Calgary business licence for the gasoline station. Gas Plus retained the consultants to conduct the remediation work and Gas Plus accepted responsibility for the release initially by contracting a company to remove free product from the Site. This demonstrates to the Board that Gas Plus is a person responsible since it has had control and management of the hydrocarbons on the Site prior to the release and after.

[120] Handel Transport owns the Site and underground storage tanks. Therefore, it is clear Handel Transport is a person responsible as defined under EPEA.

[121] Based on the Appellants' comments, as well as the submissions provided by the other participants, the Board confirms that both Gas Plus Inc. and Handel Transport (Northern) Ltd. remain named in the EPO as persons responsible.

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[22] Section 1(tt) of EPEA defines "person responsible" as:

"…when used with reference to a substance or a thing containing a substance, means

(i) the owner and a previous owner of the substance or thing,
(ii) every person who has or has had charge, management or control of the substance or thing, including, without limitation, the manufacture, treatment, sale, handling, use, storage, disposal, transportation, display or method of application of the substance or thing,
(iii) any successor, assignee, executor, administrator, receiver, receiver-manager or trustee of a person referred to in subclause (i) or (ii), and
(iv) a person who acts as the principal or agent of a person referred to in subclause (i), (ii) or (iii) …."

[122] The Residents argued Mr. Sal Handel, one of the corporate directors of both Gas Plus and Handel Transport, should also be included in the EPO as a person responsible. The Board notes the Director has named directors of corporations responsible in previous environmental protection orders. Throughout this process, the Director and Alberta Health Services have had difficulty in getting the Appellants to comply with the Order. Without deciding the matter, based on the information before the Board at this point it appears that Mr. Handel is the operating mind of both Gas Plus and Handel Transport. Further, it appears to the Board that it has been Mr. Handel's decisions that have resulted in delays in the remediation process. The Director has broad discretion to determine who should be named in an environmental protection order. Although the Board will not recommend the EPO be amended to name Mr. Handel personally, this is an option the Director should investigate further if he continues to have issues with the Appellants complying with the EPO and any order issued by the Minister.

VII. OTHER MATTERS

[123] As part of their submission, the Residents included three remedies they considered appropriate to consider.

[124] The first remedy was to have Alberta Environment assume the delineation and remediation work on the Site and off-site. Alberta Environment has the responsibility of ensuring the area is remediated to appropriate levels to ensure the environment and the public are protected. It is not the role of Alberta Environment to do or oversee the actual remedial work. It is only in special circumstances where the Director should take over the role of actually completing the remediation work. The Appellants agreed they are responsible for doing the work and state that they have the funds available, so the Board considers it appropriate that the Appellants complete the work as required under the EPO and any order issued by the Minister.

[125] The second remedy requested was to have CH2MHill take over the environmental consulting work from Tiamat. Since CH2MHill has been acting as a consultant to the Director, it would not be appropriate for CH2MHill to now start consulting for the Appellants. This would be a professional conflict of interest for CH2MHill.

[126] The third recommendation was to allow the residents in the area to have a direct role in participating in the formulation and implementation of the delineation and remediation plans and the air quality monitoring. In this regard, the Appellants will clearly have to obtain the consent of the individual landowners before carrying out the remediation work on their respective land and the Director will need to be involved in these discussions.

[127] However, some Residents also expressed concern on how the regulators dealt with the release and resulting contamination. They felt they should have been notified by the regulators and should not have had to hear about the issue in the media. The Board agrees that more information exchange in situations like this is always better. The Board considers it important to keep the area residents fully informed of the progress of the remedial work affecting them, and the Director should certainly take their views and concerns into account. However, at the end of the day, the decisions regarding the EPO need to be made by the Director and the Director's decisions cannot be delegated or, in the general sense, made subject to the approval of the affected parties.

VIII. COSTS

[128] The Residents reserved their right to submit a final costs application. The Board requests that an application for costs be provided to the Board within two weeks of the date of the Minister's Order with respect to this Report and Recommendations. The Board will then provide the Parties with information regarding the submission process should a costs application be made. None of the other parties reserved their right to apply for costs.

IX. RECOMMENDATIONS

[129] The Board recommends the Environmental Protection Order be varied. With respect to the contamination on-site, the EPO should be varied by requiring the Appellants to:

1. confirm the location of all contaminated material on-site by carrying out delineation, including the collection and analysis of groundwater, soil, and soil vapour data, as approved by the Director;
2. excavate, remove, and dispose of all contaminated material (exceeding the Tier 2 Guidelines) on-site, or use other aggressive remediation techniques, as approved by the Director;

3. use vapour extraction technology in combination with the other remediation techniques, as approved by the Director; and
4. complete all work to the satisfaction of the Director.

The Board recommends that the remediation work on-site be completed within two months of the Minister issuing the Ministerial Order in this matter.

[130] With respect to the contamination in the off-site area, the EPO should be varied by requiring the Appellants to:

1. confirm the location of all contaminated material off-site by conducting detailed delineation, including the collection and analysis of groundwater, soil, and soil vapour data, as approved by the Director;
2. excavate, remove, and dispose of the entire plume of High BTEX material (10-15 mg/L or greater as found in groundwater) located by the detailed delineation in the off-site area, or use other aggressive remediation techniques, as approved by the Director;
3. for all other off-site contamination, use in-situ bioremediation technology, or other remediation techniques, as approved by the Director;
4. use vapour extraction technology in combination with the other remediation techniques, as approved by the Director;
5. take air quality samples from all homes and businesses potentially affected by the contamination, including at a minimum from 6226 to 6416 on the north side and from 6227 to 6411 on the south side of Bow Crescent NW and from 6214 to 6404 on the north side of Bowness Road NW, as approved by the Director, within one month of the Ministerial Order being issued in this matter;
6. if an air quality sample indicates that vapours are entering a home or business, install a vapour extraction system or some other method of protecting human health, as approved by the Director, as soon as possible;
7. if the Director determines that a human health risk exists at 6323 Bow Crescent NW, comply with condition 2 of the original EPO within one month of the Director making the determination;
8. if groundwater monitoring shows that contamination is moving in a northeast direction, construct an interceptor channel, or some other works, as approved by the Director, to prevent the contamination from moving towards the Bow River; and
9. complete all work to the satisfaction of the Director.

The Board recommends that the excavation or remediation of the High BTEX material in the off-site areas be completed within two months of the Minister issuing the Ministerial Order in this matter, and that the remaining remediation work in the off-site area be commenced within four months of the Ministerial Order being issued.

[131] The Board determined that it will not make any recommendations regarding the "frustration" argument presented by the Appellants. The doctrine of "frustration" is not applicable in this circumstance and the Board does not have jurisdiction to make any recommendations that would affect the lease said to be the source of the "frustration." Finally, the Board is of the view that both Gas Plus and Handel Transport are properly named on the EPO.

[132] With respect to sections 100(2) and 103 of EPEA, the Board recommends that copies of this Report and Recommendations, and of any decision by the Minister, be sent to the following:

1. Mr. Richard John, on behalf of Gas Plus Inc. and Handel Transport (Northern) Ltd.;
2. Mr. William McDonald and Ms. Erica Gerlock, Alberta Justice, on behalf of the Director, Southern Region, Operations Division, Alberta Environment;
3. Mr. Harman Toor, McLeod & Company, on behalf of Bow Liquor;
4. Mr. Timothy Haufe, City of Calgary;
5. Ms. Andrea Beckwith-Ferraton, Alberta Health Services; and
6. Mr. Richard Secord, Ackroyd LLP, on behalf of the Residents.

Dated on December 29, 2011, at Edmonton, Alberta.

- original signed -

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D.W. Perras
Chair

- original signed -

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Alan J. Kennedy
Board Member

- original signed -

_____

Nick Tywoniuk
Board Member

ALBERTA
ENVIRONMENT AND WATER

Office of the Minister
MLA, Drayton Valley-Calmar

Ministerial Order
02/2012

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

Order Respecting Environmental Appeals Board
Appeal Nos. 10-034, 11-002, 008, and 023

I, Diana McQueen, Minister of Environment and Water, pursuant to section 100 of the *Environmental Protection and Enhancement Act*, make the following order in the attached Appendix, being an Order Respecting Environmental Appeals Board Appeal Nos. 10-034, 11-002, 008, and 023.

Dated at the City of Edmonton, in the Province of Alberta, this 25th day of January, 2012.

Diana McQueen
Minister

425 Legislature Building, 10800 - 97 Avenue, Edmonton, Alberta T5K 2B6 Canada Telephone 780-427-2391 Fax 780-422-6259
5136B - 52 Avenue, Box 7272, Drayton Valley, Alberta T7A 1S5 Canada Telephone 780-542-3355 Fax 780-542-3331

Printed on recycled paper

Appendix

Order Respecting Environmental Appeals Board Appeal Nos. 10-034, 11-002, 008, and 023

With respect to the decision of the Director, Southern Region, Operations Division, Alberta Environment and Water, to issue Environmental Protection Order No. EPO-2010/58-SR (dated December 3, 2010), Amendment No. 1 (dated April 21, 2011), Amendment No. 2 (dated June 1, 2011), and Amendment No. 3 (dated September 13, 2011) (collectively the "EPO") under the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12, to Gas Plus Inc. and Handel Transport (Northern) Ltd., I, Diana McQueen, Minister of Environment and Water, order that the EPO is varied by repealing the EPO in its entirety and replacing it with the attached document being "**VARIED ENVIRONMENTAL PROTECTION ORDER NO. EPO-2010/58-SR**". The VAIRED ENVIRONMENTAL PROTECTION ORDER NO. EPO-2010/58-SR is effective as of the date of this Ministerial Order.

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT

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

VARIED ENVIRONMENTAL PROTECTION ORDER NO. EPO-2010/58-SR

(This EPO was varied by Ministerial Order and is effective January 25, 2012.)

Gas Plus Inc.
c/o Registered Office
5910 - 50 Avenue S.E.
Calgary, Alberta
T2B 3C1

Handel Transport (Northern) Ltd.
c/o Registered Office
5910 - 50 Avenue S.E.
Calgary, Alberta
T2B 3C1

WHEREAS Handel Transport (Northern) Ltd. ("Handel") is the current registered owner of the lands legally described as Plan Calgary 4610AJ, Block 5, Lots 1-3, in the City of Calgary, Alberta, municipally known as 6336 Bowness Road NW (the "Site"), and has owned the Site since 2000;

WHEREAS Gas Plus Inc. ("Gas Plus") currently operates a retail gas station on the Site and at which petroleum products are stored and sold to the public;

WHEREAS the Directors and Shareholders of both Handel and Gas Plus (collectively the "Parties") are the same individuals;

WHEREAS the Site is surrounded by the following properties:

- on its north side across an alley are residential properties, which front onto Bow Crescent NW, and the Bow River, which is approximately 175 metres north of the Site;
- on its west side across 63 Street NW are commercial and retail businesses;
- on the east side, on the same parcel of land that comprises the Site, is the Bow Liquor store, while on the adjacent property to the east, are Providence Real Estate and Crystal Glass; and
- on its south side across Bowness Road NW are commercial and retail properties, including the Start Outreach Alternative School for Teens;

WHEREAS since approximately 1965, the Site was previously owned and operated as a "Shell" retail gas station;

WHEREAS prior to the Parties owning the Site, the following environmental investigations and audits have been conducted at the Site:

- September 1987: "Geotechnical Investigation" (by O'Connor Associates);
- December 16, 1987: "Decommissioning Investigation" (by O'Connor Associates);
- December 1994: "Environmental Audit and Phase II Environmental Assessment" (by J.A. Smith & Associates);
- May 1996: "Phase I Assessment" (by J.A. Smith & Associates);
- July 1996: "Phase II Environmental Assessment" (by SENTAR Consultants);
- October 1996: "Contamination Delineation" (by SENTAR Consultants);
- November 1996: "Tank Test Results" (by Tankology Canada Inc.); and
- July 7, 1997: "Phase II Environmental Assessment" (by Stanley Environmental);

WHEREAS the underground storage tanks in the northwest corner of the Site were decommissioned in 1987, and during the above field investigations, various boreholes and groundwater monitoring wells have been installed to measure soil and groundwater contamination at the Site;

WHEREAS the report by Stanley Environmental, dated July 7, 1997, indicates that any hydrocarbons in the soils and groundwater found during the previous Site investigations did not exceed the criteria of the day, and their findings included that the groundwater and soil samples did not identify any hydrocarbon or lead concentrations above the then applicable criteria, the "Remediation Guidelines for Petroleum Storage Tank Sites (AENV:1994)", and stated that no remediation of soils in the vicinity of the pumps was required;

WHEREAS following the Parties' acquisition of the Site in 2000, a "Limited Phase II Environmental Site Assessment" of the "Bowness Gas Plus Station" was conducted by Seacor Environmental Inc., with the analytical data from the soil and groundwater samples indicating that the levels were below the then applicable criteria;

WHEREAS the report by Seacor Environmental Ltd. also stated the inferred groundwater gradient was to the northwest, being toward the alley and the residential properties to the north of the Site;

WHEREAS on May 3, 2010, Alberta Environment sent a letter to Gas Plus regarding contamination originating from the Site moving towards neighbouring properties. The letter requested full delineation of the plume;

WHEREAS on June 7, 2010, Gas Plus replied to the May 3, 2010 letter stating the outcome of their 2006 investigation. The investigation indicated that there was no hydrocarbon contamination identified on the Site. In addition, Gas Plus retained a consultant to inspect the Site. During the inspection, the consultant discovered a small leak of hydrocarbons from a sump under one of the pumps. Actions were taken to repair the leak;

WHEREAS in August of 2006, Sabatini Earth Technologies Inc. ("Sabatini") conducted a groundwater sampling event of the groundwater monitoring wells installed on the Site, and reviewed data from previous sampling conducted on a property directly north of the Site (6335 Bow Crescent NW);

WHEREAS in a report dated September 25, 2006, Sabatini found evidence of some hydrocarbons in the monitoring wells located on 6335 Bow Crescent NW, but confirmed that the predominant groundwater flows are cross-gradient to the Site flowing in a east/northeast direction;

WHEREAS on August 4, 2010, Alberta Environment received a call from the Calgary Fire Department who responded to a public complaint from the resident at 6323 Bow Crescent NW (northeast of the Site across the alley, and two residences east of 6335 Bow Crescent NW) regarding gasoline odours in the basement that the owner had noticed for the previous 6 to 8 months;

WHEREAS the Calgary Fire Department, while responding to the August 4, 2010 call, detected hydrocarbon vapours of 12% LEL (lower explosive limit) in the basement of 6323 Bow Crescent NW;

WHEREAS on August 5, 2010, Sabatini informed Alberta Environment as follows:

- liquid petroleum was found in two groundwater monitoring wells on the Site: one immediately north of the tank bed/pump island and the second on the northeast side of the Site;
- the likely source of the liquid petroleum (the "Substances") being released on the Site was from an improper connection on a pump that was causing a leak of liquid petroleum into the spill box below the pump;
- the Substances leaking into the spill box in turn leaked through a hole in the spill box into the underlying gravelly soil strata; and
- they estimated that approximately 7000 to 9000 litres of the Substances had been released into the environment over a period of several months;

WHEREAS in a report dated November 2, 2010, Levelton Consultants Ltd. ("Levelton"), provided results of an indoor air quality sampling event at 6323 Bow Crescent NW taken in October 2010, and confirmed that decommissioning an old water well dug in the concrete floor of the basement had not improved indoor air quality;

WHEREAS the level of benzene found in the air samples taken from 6323 Bow Crescent NW in October 2010 was approximately 100 times the limit for the carcinogenic Toxicity Reference Value ("TRV") for inhalation and the levels the level was approximately 10 times the non-carcinogenic TRV as set out in the *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* (the "Tier 1 Criteria");

WHEREAS on November 16, 2010, Levelton collected two groundwater samples from boreholes located in the alley north of the Site, and analytical results have confirmed that the samples exceed various limits

in the Tier 1 Criteria (residential coarse-grained soils) for benzene, toluene, ethylbenzene, xylene, F1 (C6-10), F1-BTEX, and F2 (C10-16);

WHEREAS in a report dated November 26, 2010, Levelton advised:

- free-product (the Substances) is continuing to be removed from the Site with a vacuum truck, with over 1500 litres of liquid gasoline having been removed since June 2010;
- a subsurface vapour extraction system was installed at the Site;
- the water well in the basement of 6323 Bow Crescent NW was decommissioned;
- two monitoring wells to be used for vapour extraction was installed in the alley north of the Site, with one directly across from the residence at 6323 Bow Crescent NW;
- the proposed installation of an air purification system in the basement of the residence at 6323 Bow Crescent NW;
- further indoor air testing will be conducted at 6323 Bow Crescent NW; and
- further delineation of the contaminant plume at the Site will be conducted;

WHEREAS Alberta Health Services was consulted about the indoor air contamination issues at 6323 Bow Crescent NW and have recommended against the air purification system, and have instead recommend that a sub-slab vapour extraction system plus an effective ventilation system are immediately required to mitigate the impacts of the hydrocarbon vapours on the residents;

WHEREAS to date, the immediate measures recommended by Alberta Health Services have not been implemented by the Parties to mitigate the adverse impacts of the Substances on the residents at 6323 Bow Crescent NW;

WHEREAS to date, the Parties have not fully delineated the extent of the release of the Substances to the Site, or the off-Site area in to which the Substances may have migrated (the "Off-Site Area"), nor have the Parties fully analyzed the extent of the contamination that has resulted from the release of the Substances;

WHEREAS to date, the Parties have not conducted any remedial work regarding the contamination resulting from the release of the Substances on the Site, or the Off-Site Area, other than the removal of some of the Substances in the free-product phase from the Site only;

WHEREAS the Parties are persons responsible for the Substances, as the current registered owner of the Site, and the owner and/or operator of the Gas Plus gas station from which the Substances have originated, respectively, and at all times, have had care, management and control of the Substances;

WHEREAS Darren Bourget, Regional Compliance Manager, Southern Region, (the "Director") has been appointed a Director under the Act for the purposes of issuing environmental protection orders;

WHEREAS the Director is of the opinion that a release of Substances into the environment has occurred at the Site, and that the release of the Substances has resulted in an adverse effect to the Site and to the Off-Site Area, and that work is required to remediate the adverse effects;

THEREFORE, I, Darren Bourget, the Director, pursuant to section 113(1) of the Act, DO HEREBY ORDER THAT:

Immediate Vapour Removal for 6323 Bow Crescent NW

1. The Parties shall **immediately** implement vapour removal for 6323 Bow Crescent NW, to decrease and maintain the levels of hydrocarbon constituents of benzene, toluene, ethylbenzene, xylene (collectively "BTEX"), and the F1 and F2 hydrocarbon fractions, to below the limits identified in Table C-7 of the Tier 1 Criteria.

2. If the Director determines that a human health risk exists at 6323 Bow Crescent NW, based on the information provided to him pursuant to the Indoor Air Monitoring for 6323 required by Clause 3, the Director shall notify the Parties in writing that they must comply with Clause 2.1.

2.1 Within **one month** of receiving written notification from the Director pursuant to Clause 2, the Parties shall complete all of the following steps at 6323 Bow Crescent NW:

a) Seal off around all pipes, foundation cracks, holes, etc. that provide a means of ingress into the basement from the surrounding soils;
b) Installation of a sub-slab vapour extraction system for the residence to intercept all vapours to prevent contact with the residence foundation;

c) Ensure adequate ventilation measures are in place to ensure protection of the residents; and
d) Any other measures required by the Director.

All work performed pursuant to this Clause shall be to the satisfaction of the Director.

Indoor Air Monitoring for 6323 Bow Crescent NW

3. The Parties shall by **December 10, 2010**, commence weekly indoor air sampling and analysis at 6323 Bow Crescent NW for total volatile organic carbon ("TVOC"), benzene, toluene, ethylbenzene, xylene, and F1 and F2 hydrocarbon fractions (the "Indoor Air Monitoring for 6323").

4. The weekly air samples in the Indoor Air Monitoring for 6323 shall be taken on the same day each week and immediately submitted for analytical testing. The air samples shall be collected, analyzed, and reported by an independent qualified professional, acceptable to the Director.

5. At a minimum, air samples shall be taken in the main living area of the residence, and in the basement.

6. Within **seven days** of each weekly sampling event in the Indoor Air Monitoring for 6323, the Parties shall submit a written report to the Director and Alberta Health Services containing the analytical data of the air samples taken during that sampling event.

7. The Parties shall submit monthly written status reports to the Director on all actions taken to meet the Tier 1 Criteria for the hydrocarbon parameters listed in Clause 3, in the residence.

Indoor Air Monitoring Program

7.1 Within **one month** of the date of this order, the Parties shall complete indoor air sampling, analysis, and reporting for the residences and businesses in the neighbourhood surrounding the Site (the "Indoor Air Monitoring Program"). The Indoor Air Monitoring Program shall:

a) sample for total volatile organic carbon (TVOC); benzene, toluene, ethylbenzene, xylene; and F1 and F2 hydrocarbon fractions;
b) be carried out at all residences and businesses potentially affected by the Substances, including at a minimum 6226 to 6416 on the north side and 6227 to 6411 (excluding 6323) on the south side of Bow Crescent NW and from 6214 to 6404 on the north side of Bowness Road NW;
c) be carried out by an independent qualified professional, acceptable to the Director;
d) at a minimum, have the air samples taken in the main living area of the residence, or working area of the business, and in the basement, and immediately have the air samples submitted for analysis; and
e) be carried out in a manner that is satisfactory to the Director.

7.2 Within **seven days** of each sampling events in the Indoor Air Monitoring Program, the Parties shall submit a written report to the Director and Alberta Health Services containing the analytical data and all other information collected.

7.3 If the Indoor Air Monitoring Program indicates that vapours are entering a residence or business, the Parties shall **immediately** take steps to decrease and maintain the levels of hydrocarbon constituents of benzene, toluene, ethylbenzene, xylene, and the F1 and F2 fractions, to below the limits identified in Table C-7 of the Tier 1 Criteria by installing a vapour extraction system or some other method of protecting human health as approved by the Director.

7.4 The Indoor Air Monitoring Program is in addition to any monitoring or other work required by Alberta Health Services.

Delineation Program – On-Site and Off-Site

8. Within **one month** of the date of this order, the Parties shall submit a written plan to the Director for approval to conduct and complete the required delineation of the Substances on the Site and the delineation of the Substances that have migrated into the Off-Site Area (the "Delineation Plan"). The delineation shall include the collection and analysis of groundwater, soil and soil vapour data. The main purpose of the Delineation Plan is to accomplish additional drilling to fully delineate the full extent of the contamination plume resulting from the Substances in soils and groundwater, and assess the potential health impacts to any occupants or residents from vapours in all surrounding businesses and residences.

8.1 Completion of the Delineation Plan is not required before the Parties may undertake any work approved by the Director or any work that does not required the approval of the Director.

9. The Delineation Plan shall be prepared by an independent qualified professional, acceptable to the Director.

10. The Delineation Plan shall include, at minimum, all of the following:

a) The installation of additional boreholes completed as groundwater monitoring wells, in an adequate number to ensure the protection of human health receptors at any of the required locations to which the delineation data is deficient in any Off-Site Area.
b) A schedule for soil sampling from the newly installed boreholes, including laboratory analysis of soil samples for benzene, toluene, ethylbenzene, and xylene, and Total Petroleum Hydrocarbons ("TPH") Fractions 1 to 4 (F1-4).
c) A schedule for groundwater monitoring of the newly installed wells, following installation, as well as all other groundwater monitoring wells currently associated with the Site and the Off-Site Area.
d) Laboratory analysis of groundwater samples from all groundwater monitoring wells, both the newly installed and those currently associated with the Site and the Off-Site Area, for analysis of BTEX and TPH Fractions 1 and 2 (F1-2) and groundwater characterization.
e) A plan and schedule for the monitoring of soil vapour on the Site and in the Off-Site Area.
f) A schedule of implementation for the Delineation Plan, with a completion date for the delineation work as specified by the Director.

11. The Parties shall implement the work set out in the Delineation Plan in accordance with the schedule of implementation approved by the Director.

Additional Off-Site Delineation Requirements

11.1 An independent qualified professional, acceptable to the Director, shall actively supervise all aspects of the delineation activities undertaken pursuant to the Delineation Plan, or as further directed in this order.

11.2 The Parties shall conduct an assessment of all utility corridors within the 6300 block of Bow Crescent NW and the 6300 block of Bowness Road NW, including the alley to the north of the Site to determine if there are any impacts from petroleum hydrocarbons. This shall include an assessment of the outfall locations associated with the stormwater mains that drain the 6300 blocks of Bow Crescent NW and Bowness Road NW.

11.3 The Parties shall assess the accuracy of the lithology and evaluate the construction of the six delineation wells along the south side of Bow Crescent NW starting at 6335 Bow Crescent NW and ending at 6311 Bow Crescent NW and the three delineation wells located in the alley to the north of the Site.

11.4 The Parties shall obtain soil samples for all other delineation wells not included in Clause 11.3.

11.5 The assessment of the construction of the wells identified in Clauses 11.3 and 11.4 shall be undertaken by drilling adjacent to the delineation wells with a sonic drilling rig.

11.6 The Parties shall use a sonic drilling rig to install any new delineation wells subsequent to this order.

11.7 The Parties shall conduct a water well search for all potentially impacted groundwater wells located within a 300-metre perimeter around the Site.

11.8 Once all water wells have been identified in accordance with Clause 11.7, the Parties shall conduct an assessment of each well to determine if they are impacted by petroleum hydrocarbons that have migrated from the Site.

11.9 Soil samples shall be taken at 0.5 metre intervals.

11.10 All soil samples taken from the delineation wells shall be analyzed for benzene, toluene, ethylbenzene, and xylene, and Petroleum Hydrocarbons (TPH) Fractions 1 to 4 (F1-4) for soil.

11.11 Any water samples taken from any of the wells being used for delineation activities shall be analyzed for dissolved oxygen and reduction/oxidation potential measurements, BTEX,

Petroleum Hydrocarbons (TPH) Fractions 1 to 2 (F1-2) for groundwater, and vapour measurements for the well headspace for all sampled wells. Temperature, pH, Total Suspended Solids (TSS) or Electrical Conductivity (EC) are to be monitored in the purged groundwater.

11.12 All delineation wells shall be sampled for the parameters listed in Clause 11.11 at a minimum frequency of once every 30 days.

11.13 All sampling activities shall be undertaken with defined Quality Assurance/Quality Control procedures, including 10% duplicate samples, one trip/field blank, and one equipment blank (as required) for each sampling event.

11.14 Locking caps shall be installed on all delineation wells.

11.15 The Parties shall conduct survey elevations of the top of the well casing and recorded for each delineation well that has been, or that will be, installed. The ground elevation shall also be measured and recorded.

11.16 On or before a **date specified by the Director** in writing, the Parties shall submit to the Director a written final delineation report (the "Final Delineation Report") prepared by the independent qualified professional who prepared the Delineation Plan, summarizing all of the delineation work that includes at a minimum the following information:

a) Water table level measurements taken with a weekly grab sample or using a continuous data logger to measure the changes in water levels and direction.
b) A weekly comparison of the current water levels, and an indication if the water level is within the screened interval of the well.
c) Elevation survey data for delineation wells that had been not previously surveyed, including raw data and calculations used to determine the groundwater gradient, direction, and velocity.
d) Volume of all Substances recovered from any delineation wells during the reporting period.
e) Lithology data for each new delineation well drilled during the reporting period.
f) All sampling data and analytical results for all groundwater and soil samples taken at any of the delineation wells as referenced in Clause 11.16(e).
g) Evaluation and interpretation of all data collected during the reporting period.
h) A summary of all delineation activities that have taken place in the reporting period and the delineation activities that are planned for the next reporting period.

11.17 The Final Delineation Report shall also include a Conceptual Site Model that shall provide a visual representation and written description of the physical, chemical, and biological processes occurring or that has occurred at the Site and the Off-Site Area as related to the contamination and contaminated migration.

11.18 Completion of the Final Delineation Report is not required before the Parties may undertake any work approved by the Director or any work that does not required the approval of the Director.

Interceptor Channel

11.19 If the delineation of the Substances in the groundwater or other monitoring of the groundwater shows that the Substances are moving in a northwest direction, the Parties shall construct an interceptor channel, or some other works, as approved by the Director in order to protect the Bow River.

Remediation Plan for the Off-Site Area

12. The Parties shall, within **one month** of the date of this order, submit a written plan to the Director to remediate the Substances that have migrated to the Off-Site Area (the "Remediation Plan").

13. The Remediation Plan shall be prepared by an independent qualified professional, acceptable to the Director.

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

a) A written proposal outlining;
   i. the remediation of all Substances in, on, or under the Off-Site Area, including all soil, subsoil, and groundwater, that falls within the plume of high BTEX material, being the

material that exceeds a total BTEX level of 10-15 mg/L or greater as found in groundwater (the 'High BTEX Material");

ii. the remediation of all Substances in, on, or under the remainder of the Off-Site Area, including to the north, south, east, and west, in to which the Substances may have migrated, including all soil, subsoil, and groundwater; and

iii. a proposal for monitoring to ensure that all the remedial work for the Off-Site Area has been successful.

b) A detailed description of the work that will be undertaken for the Off-Site Area to meet the *Alberta Tier 2 Soil and Groundwater Remediation Guidelines* ("Tier 2 Criteria").

b.1) A schedule of implementation for the Remediation Plan, with a completion date for the remediation work relating to the High BTEX Material plume of **two months** from the date of the order.

c) A schedule of implementation for the Remediation Plan for the remainder of the Off-Site Area, with a commencement date of no later than **four months** from the date of the order, or as otherwise approved by the Director.

d) The schedule of implementation shall have a completion date for the remedial work for the remainder of the Off-Site Area as specified by the Director in writing.

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

16. Within **thirty days** of the commencement of the remedial work described in the Remediation Plan, the Parties shall submit written monthly status reports regarding the remedial work, until otherwise authorized by the Director in writing.

High BTEX Material Removal Program Off-Site

16.1 The Parties shall submit a written exposure control plan (the "Off-Site Exposure Control Plan") to the Director **two weeks** prior to commencing the excavation work under the High BTEX Material Removal Program.

16.2 The Off-Site Exposure Control Plan shall detail the activities that will be taken to address any risks to exposure during the High BTEX Material Removal Program from:

a) dust,
b) odours,
c) hydrocarbon vapours,
d) noise, and
e) other risks to human health.

16.3 The High BTEX Material Removal Program shall be conducted and supervised by an independent qualified professional, acceptable to the Director.

16.4 The High BTEX Material Removal Program shall include:

a) Identification of the horizontal and vertical location of all soils that are contaminated with the Substances within the High BTEX Material plume.

b) Excavation, removal, and disposal of all soil that has been contaminated with the Substances ("the Contaminated Soil") that are above the Tier 2 Criteria within the High BTEX Material plume.

c) Removal and disposal of all groundwater and surface water that has been contaminated by the Substances that is above the Tier 2 Criteria within the High BTEX Material plume.

d) All soil samples taken from any excavated area during the High BTEX Material Removal Program shall be analyzed for BTEX, F1-4, lead, and Polyaromatic Hydrocarbon (PAH).

e) Soil sampling must occur at 0.5 metre intervals.

f) Confirmatory soil samples shall be taken on all walls and the base of all excavated areas to show that all Contaminated Soil above the applicable criteria referenced in Clause 16.4(b) have been removed.

g) All water collected during the High BTEX Material Removal Program will be analyzed for BTEX, F1-2, lead, and PAH.

h) Any Contaminated Soil that is above the Tier 2 Criteria that are excavated from within the High BTEX Material plume shall be disposed of at a waste management facility approved by Alberta Environment and Water.

i) A complete record of the total volume of Contaminated Soil that is excavated from within the High BTEX Material plume and the final disposal or storage locations will be maintained and available for inspection.
j) At a minimum, the record required in Clause 16.4(i) will contain dates of excavation work, the volume of clean fill excavated and where it is being stored and the volumes of Contaminated Soil excavated and its disposal locations.
k) Groundwater flow shall be controlled and limited from entering the excavation area, and groundwater in the excavation area shall be prevented from leaving.
l) All collected groundwater and surface water must be tested as per Clause 16.4(g), and if above the Tier 2 Criteria, it must be transported and disposed of at a waste management facility approved by Alberta Environment and Water.
m) Any collected groundwater and surface water that is below the Tier 2 Criteria may be disposed of otherwise, subject to the prior written permission of the City of Calgary.
n) Industry standard site management practices, including perimeter fencing of the excavation, posting of warning signs, and other public safety precautions, shall be taken at the excavation at all times during the High BTEX Material Removal Program.
o) Where approved by the Director, the Parties may use other aggressive remediation techniques to ensure that the entire High BTEX Material plume is remediated to above Tier 2 Criteria.
p) Where approved by the Director, the Parties may use vapour extraction technology in combination with other reclamation techniques.
q) All work carried out to remediate the Off-Site Area shall be carried out to the satisfaction of the Director.

16.5 The High BTEX Material Removal Program shall be completed no later than **two months** from the date of this order.

16.6. Within **three months** from the date of this order**,** the Parties shall submit a written final High BTEX Material Removal Program Report prepared by the independent qualified professional who conducted the source removal work, which includes:

a) A summary of the excavation activities conducted during the High BTEX Material Removal Program.
b) The final confirmatory results of all of the excavation sampling conducted.
c) The final volumes of all Contaminated Soil and water that was collected during the excavation work and removed.
d) The disposal locations and records for any Contaminated Soil and water removed during the High BTEX Material Removal Program.
e) A summary of the findings and conclusions of the independent qualified professional regarding the success of the High BTEX Material Removal Program.

Off-Site Remediation Program

16.7 The Off-Site Remediation Program shall be conducted and supervised by an independent qualified professional, acceptable to the Director.

16.8 The Off-Site Remediation Program (the "Off-Site Remediation Program") shall include:

a) The Off-Site Remediation Program shall be applied to the Off-Site Area where the Substances are present beyond the High BTEX Material plume.
b) Identification of the horizontal and vertical location of all soils that are contaminated with the Substances, beyond the High BTEX Material plume, that are above the Tier 2 Criteria.
c) The Off-Site Remediation Program shall remediate the Substances using in-situ bio-remediation technology, or other remediation techniques, as approved by the Director.
d) All water collected during the Off-Site Remediation Program will be analyzed for BTEX, F1-2, lead, and PAH.
e) All collected groundwater and surface water that is above the Tier 2 Criteria shall be transported and disposed of at a waste management facility approved by Alberta Environment and Water.
f) All collected groundwater and surface water that is below the Tier 2 Criteria may be disposed of otherwise, subject to the prior written permission of the City of Calgary.

g) Industry standard site management practices shall be used for all work carried out under the Off-Site Remediation Program, to ensure public and worker safety.
h) Where approved by the Director, the Parties may use vapour extraction technology in combination with other reclamation techniques.
i) All work carried out to remediate the Off-Site Area shall be carried out to the satisfaction of the Director.

16.9 The Off-Site Remediation Program shall be commenced no later than **four months** from the date of this order.

16.10 Within **one month** of the Off-Site Remediation Program being completed, the Parties shall submit a written final Off-Site Remediation Program Report prepared by the independent qualified professional who conducted the Off-Site Remediation Program, which includes:

a) A summary of the remediation activities conducted during the Off-Site Remediation Program.
b) The final confirmatory results of all of the sampling conducted.
c) A summary of the findings and conclusions of the independent qualified professional regarding the success of the Off-Site Remediation Program.

Source Removal Program (On-Site Remediation)

17. The Parties shall submit a written exposure control plan (the "Exposure Control Plan") to the Director **two weeks** prior to commencing the excavation work under the Source Removal Program.

18. The Exposure Control Plan shall detail the activities that will be taken to address any risks to exposure during the Source Removal Program from:

a) dust,
b) odours,
c) hydrocarbon vapours,
d) noise, and
e) other risks to human health.

19. The Source Removal Program shall be conducted and supervised by an independent qualified professional, acceptable to the Director.

20. The Source Removal Program (the "Source Removal Program") shall include:

a) Identification of the horizontal and vertical location of all soils that are contaminated with the Substances on the Site.
b) Excavation, removal, and disposal of all soil that has been contaminated with the Substances (the "Contaminated Soil") from the Site that contains levels of the Substances that are above the Tier 2 Criteria.
c) Removal and disposal of all groundwater and surface water from the Site that has been contaminated by the Substances that is above the Tier 2 Criteria.
d) All soil samples taken from any excavated area during the Source Removal Program shall be analyzed for BTEX, F1-4, lead, and Polyaromatic Hydrocarbon (PAH).
e) Soil sampling must occur at 0.5 metre intervals.
f) Confirmatory soil samples will be taken on all walls and the base of all excavated areas to show that all Contaminated Soil above the applicable criteria referenced in Clause 20(b) have been removed.
g) All water collected from the Site during the Source Removal Program will be analyzed for BTEX, F1-2, lead, and PAH.
h) Any Contaminated Soil that is above the Tier 2 Criteria that are excavated from the Site shall be disposed of at a waste management facility approved by Alberta Environment and Water.
i) A complete record of the total volume of Contaminated Soil that is excavated from the Site and the final disposal or storage locations will be maintained and available for inspection.
j) At a minimum, the record required in Clause 20(i) will contain dates of excavation work, the volume of clean fill excavated and where it is being stored and the volumes of Contaminated Soil excavated and its disposal locations.
k) Groundwater flow shall be controlled and limited from entering the excavation area, and groundwater in the excavation area shall be prevented from leaving.

l) All collected groundwater and surface water must be tested as per Clause 20(g), and if above the Tier 2 Criteria, it must be transported and disposed of at a waste management facility approved by Alberta Environment and Water.
m) Any collected groundwater and surface water that is below the Tier 2 Criteria may be disposed of otherwise, subject to the prior written permission of the City of Calgary.
n) Industry standard site management practices, including perimeter fencing of the Site, posting of warning signs, and other public safety precautions, shall be taken at the Site at all times during the Source Removal Program.
o) Where approved by the Director, the Parties may use other aggressive remediation techniques to ensure that the entire Site is remediated to above Tier 2 Criteria.
p) Where approved by the Director, the Parties may use vapour extraction technology in combination with other reclamation techniques.
q) All work carried out to remediate the Site shall be carried out to the satisfaction of the Director.

21. The Source Removal Program shall be completed no later than **two months** from the date of this order.

22. Within **three months** from the date of this order, the Parties shall submit a written final Source Removal Program Report prepared by the independent qualified professional who conducted the source removal work, which includes:

a) A summary of the excavation activities conducted during the Source Removal Program.
b) The final confirmatory results of all of the excavation sampling conducted.
c) The final volumes of all Contaminated Soil and water that was collected during the excavation work and removed.
d) The disposal locations and records for any Contaminated Soil and water removed during the Source Removal Program.
e) A summary of the findings and conclusions of the independent qualified professional regarding the success of the Source Removal Program.

SIGNED at the City of Calgary in the Province of Alberta. The date of this order is January 25, 2012.

- signed -

Darren Bourget
Regional Compliance Manager
Southern Region

The Director reserves the right to issue such further and additional amendments to this Environmental Protection Order as may be necessary to ensure that all remedial measures are taken to meet the applicable environmental standards.

Notwithstanding the above requirements, the Parties shall obtain all necessary approvals in complying with this order, including as may be required from other regulatory agencies.

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.**