



SECTION 10.0

PHASE I ENVIRONMENTAL ASSESSMENT

PROJECT NO. NSD18876

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REPORT TO

ALPHA CHEMICAL LTD.

ON

PHASE I ENVIRONMENTAL SITE ASSESSMENT
533 ROCKY LAKE DRIVE
BEDFORD, NOVA SCOTIA

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EXECUTIVE SUMMARY

Jacques Whitford Limited (JW) conducted a Phase I Environmental Site Assessment (Phase I ESA) of the property located at 533 Rocky Lake Drive, Bedford, Nova Scotia, herein referred to as the "Site". The Phase I ESA was conducted for Alpha Chemical Ltd. in support of their leasing the Site from Municipal Enterprises Ltd. The purpose of the Phase I ESA was to determine if evidence of potential or actual environmental contamination exists in connection with the Site, which may be present as a result of current or past activities on the Site or neighbouring properties.

Background

The Site is located at civic number 533 on Rocky Lake Drive in Bedford, Nova Scotia. The property consists of a small portion of a larger parcel of land located on the east side of Rocky Lake Drive owned by Municipal Enterprises Ltd. The Site is occupied by a warehouse and office building that is currently vacant and was formerly occupied by East Coast Lumber Ltd. A railway spur line runs across the property and a pond is located at the northeastern corner of the property along Rocky Lake Drive. The Site was initially developed in the late 1960's/early 1970's.

Conclusions

Based on information gathered and observations made, the Phase I ESA has not revealed evidence of actual or potential contamination associated with the Site.

In addition, the Phase I ESA identified potential environmental concerns regarding fill material, PCBs, ozone depleting substances and lead-based paints. However, these issues are considered to be related to long-term management and/or site redevelopment and no action is recommended at this time. Long-term recommendations are presented in Table 1.

Please see Table 1 for a summary of the findings and recommendations.

The statements made in this Executive Summary are subject to the same limitations included in the Closure (Section 9), and are to be read in conjunction with the remainder of this report.

Table 1: Summary of Phase I ESA Findings and Recommendations

Potential Source of Contamination	Findings	Recommended Action
Current Site Operations	No potential sources of environmental contamination originating from the current activities on the Site were identified.	None
Fuels, Chemicals and Waste Generation	One approximately 2,273 L empty AST is located near the southeast corner of the building, and appeared to be slightly rusted with minor surficial staining on the surrounding gravel.	None
Building Systems and Equipment	The building is heated by electric heat and is cooled by wall-mounted air conditioning units. No hydraulic equipment was observed	None
Designated Substances	No potential environmental concerns related to asbestos-containing materials (ACMs), or urea formaldehyde foam insulation (UFFI) were identified.	None
	PCBs may be present in older fluorescent light ballasts in the warehouse section of the building.	Prior to removal and disposal, ballasts should be checked for PCBs. If PCBs are present, ballasts should be disposed in accordance with the applicable guidelines and regulations.
	Lead-based paints may be present in original painted surfaces in the warehouse portion of the building.	Prior to activities which may disturb original painted surfaces, paint should be checked for lead. Paint found to contain elevated levels of lead should be handled/disposed in accordance with applicable guidelines and regulations.
	Ozone-depleting substances (ODSs), may be associated with the air conditioning units and refrigerator.	This equipment should be checked for ODSs prior to repair/disposal. If ODSs are identified, repair/disposal should be completed by a certified refrigeration contractor.
Special Attention Items	Noise and vibration is expected to occur at the Site during blasting activities at the nearby quarry operated by Municipal Enterprises.	None
	No potential environmental concerns related to radon gas, mold, EMFs or odours.	None

Table 1: Summary of Phase I ESA Findings and Recommendations

Potential Source of Contamination	Findings	Recommended Action
	Based on regional geology maps and local knowledge of the area, the subject property is suspected to be underlain by bedrock with low acid generating potential.	None
	Aerial photographs indicate the possible presence of fill material on the Site. No information was available to indicate the type of fill or its source, however, it may be associated with the activities/construction of the nearby quarry.	If fill material is removed from the Site in the future it should be tested for potential contamination and disposed at an approved facility.
Historical Site Use	No concerns were identified with historical Site use.	None
Adjacent Properties	No potential sources of environmental contamination originating from current or historic activities on adjacent properties were identified.	None

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APPENDICES

Appendix 1 - Drawing

Appendix 2 - Photographs

Appendix 3 - Assessor Qualifications

Appendix 4 - Regulations and Guidelines

1.0 INTRODUCTION

Jacques Whitford Limited (JW) was retained by Mr. Rod Simpson, of Alpha Chemical Ltd., to conduct a Phase I Environmental Site Assessment (Phase I ESA) of the property located at 533 Rocky Lake Drive, Bedford, Nova Scotia, herein referred to as the "Site". The Phase I ESA was conducted for Alpha Chemical Ltd. in support of their leasing the Site from Municipal Enterprises Ltd. The purpose of the Phase I ESA was to identify actual or potential environmental contamination associated with the Site which may exist as a result of current or past activities on the Site or adjacent properties. A Site Plan is included in **Appendix 1** and selected photographs of the Site are included in **Appendix 2**.

2.0 SCOPE AND METHODOLOGY

2.1 SCOPE OF WORK

The Phase I ESA carried out by JW on this property was based on the requirements of the Canadian Standards Association (CSA) *Phase I Environmental Site Assessment Information Product*, Z768-01, November 2001 (CSA standard), and consisted of the following:

- Records review including, but not limited to, publicly available city directories, aerial photographs, fire insurance plans, geological and topographic maps;
- Request to the Nova Scotia Department of Environment and Labour (NSDEL) for available information on the Site and adjoining properties;
- Request to Conseillers en Gestion et Informatique (CGI) for a Historical Environmental Information Reporting System (HEIRS) request for the Site;
- Review of available environmental databases and records;
- Review of previous environmental reports, if made available;
- Interviews with persons associated with the Site;
- A site visit; and
- Evaluation of information and preparation of the report provided herein.

A Phase I ESA does not include sampling or testing of air, soil, groundwater, surface water or building materials. For this Phase I ESA, no enhancements to the CSA standard were made.

2.2 METHODOLOGY

2.2.1 Records Review

The applicable search distance for the records review included the Site, properties immediately adjoining the Site and other neighbouring properties where activities considered to be potential sources of environmental contamination were apparent. Information sources obtained and reviewed as part of the records review are listed below.

Summary of Records Reviewed

Source	Information/Contact
Aerial Photographs	1947, 1966, 1974, 1982, 1992, 1997, 2003 – Jacques Whitford Aerial Photograph Collection
City Directories	2000 – Jacques Whitford Library Collection 1985, 1986, 1987, 1988, 1990, 1993, 1994, 1995, 1997, 1999, 2000 – Alderney Gate Public Library Collection, Dartmouth
Fire Insurance Plans	None available
Insurance Inspection Reports	None available
Topographic Maps	Department of Housing and Municipal Affairs - Nova Scotia Geomatics Centre, Topographic Map, 'Middle Sackville' sheet 10 44 7500 63 600 from aerial photographs taken in May 1991, 1:10,000 scale
Geological and Soil Maps	Geological Map of the Province of Nova Scotia, Nova Scotia Department of Natural Resources, Map ME2000-1, 2000 Surficial Geology Map of Province of Nova Scotia, Nova Scotia Department of Natural Resources, Map 92-3, 1992 Potential Occurrence Radon Gas In Nova Scotia, Plan prepared by Nova Scotia Department of Health
Company Records	Photos of the Site and building plan – see Appendix 5

In addition, available environmental databases and records were searched to determine if the Site, adjacent or neighbouring properties are listed. The databases and search results are presented in Section 6.0.

2.2.2 Site Visit

The site visit was conducted by Mr. Brent Ferguson, P.Geo., of JW, on June 9, 2004 (refer to the professional qualifications of the project team provided in **Appendix 3**). The Site and readily visible and publicly accessible portions of adjoining and neighbouring properties were examined for the presence of potential sources of environmental contamination. The building was accessible and the wooded areas of the Site were viewed from vantage points along the gravel area on the Site.

2.2.3 Interviews

Interviews were carried out with Mr. Rod Simpson of Alpha Chemical Ltd. during the Site visit.

3.0 REGULATORY FRAMEWORK

In Nova Scotia, the roles and powers of the Nova Scotia Department of Environment and Labour (NSDEL) when dealing with contaminated sites are outlined primarily in the *Nova Scotia Environment Act* (S.N.S. 1994-95, C.1). The NSDEL has a mandate to deal with situations where there is an *immediate* threat to human health or the environment. This can be initiated by owner driven triggers (e.g. refinancing, resale, etc.) or regulatory driven triggers (e.g. compliance investigation, spill, etc.). The *Guidelines for Management of Contaminated Sites in Nova Scotia* (March 1996) provide advice and information to property owners and consultants to use when assessing the environmental condition of a property, when determining whether or not restoration is required, and in determining the kind of restoration needed to allow continued use or reuse of the site. A Phase I ESA is an initial step in the site assessment process, which may lead to the requirement for restoration work if actual or potential sources of environmental contamination are identified.

During a Phase I ESA samples are not collected, however if there are previous soil or groundwater samples available the results are compared to applicable federal and provincial regulations and guidelines listed in **Appendix 4**.

A Phase I ESA involves a review of any site buildings for the potential presence of hazardous materials related to building components and materials. Specific federal or provincial regulations, guidelines or codes of practice exist for these individual hazardous materials. Where required, this documentation was utilized to determine appropriate conclusions and formulate appropriate recommendations. The appropriate regulations, guidelines and codes of practice are listed in **Appendix 4**.

4.0 SITE DESCRIPTION

4.1 PROPERTY DESCRIPTION

The property consists of a small portion of a parcel of land located on the east side of Rocky Lake Drive, in Bedford, Nova Scotia, owned by Municipal Enterprises Ltd. A Site plan is provided in Drawing No. NSD18876-1, **Appendix 1**; property boundaries are approximate only and are based on a Site plan provided by Alpha Chemical Ltd. which is included in **Appendix 5**. A summary of the property information is presented below. At the time of the assessment, the building on the Site was vacant.

Property Information

Current Site Owner	Municipal Enterprises Ltd.
Property Description	533 Rocky Lake Drive PID number: part of 40237182
Property Area	Approximately 4 acres
Utility Providers	Water– On-Site well supply (suspected to be under office) Sanitary Sewers – Septic Field (currently installing new septic field) Electricity provided by Nova Scotia Power Inc.

4.2 ON-SITE BUILDINGS AND STRUCTURES

The Site is currently occupied by a one-storey warehouse building with a finished office area. The warehouse portion of the building has a concrete slab floor with exposed steel framing and fibreglass insulation. Access to the warehouse is provided by large doors along the back and side of the warehouse. The office is located along the eastern side of the warehouse and the interior is finished in wood and drywall. The roof of the warehouse is metal, while the office portion is finished in wood siding with a shingled roof.

A rail car loading/off-loading dock is located along the railway spur lines, east of the building, and is comprised of a concrete structure.

The following is a summary of the site building information.

	Main Building – Warehouse Portion	Main Building – Office Portion	Loading/Off-Loading Dock
Area	Approximately 460 m ² (5,000 sq.ft.)	Approximately 110 m ² (1,200 sq.ft.)	Approximately 110 m ² (84 sq.ft.)
Date of Construction	Approximately 25 to 30 years ago	Approximately 15 years ago	Approximately 10 years ago
Number of Storeys	One	One	n/a
Basement	None	None	n/a

4.3 PHYSICAL SETTING

4.3.1 Surficial Geology

Based on available surficial geology maps, the native surficial soils at the site are characterized as stony till plain consisting of a stony, sandy matrix derived from local bedrock. Till is expected to be underlain by Meguma Group Goldenville Formation bedrock, consisting of sandstone, turbites, and slate. The characteristic permeability of the soils is considered to be moderate. A site-specific determination of subsurface soils would be required to obtain more detailed soil permeability information for the site.

4.3.2 Topography and Regional Drainage

The majority of the Site is gravel covered and is relatively flat. Regional topography appears to slope west. Some vegetation, consisting of low growth brush and trees, is located along the northern and eastern portions of the Site.

Based on the Middle Sackville Topographic Map 10 44 7500 63 600 and the observed site topography, regional surface drainage (anticipated groundwater flow direction) appears to be west/northwest towards Rocky Lake, located immediately northwest of the Site.

4.3.3 Surface Water Drainage

Surface water is anticipated to drain by infiltration, with drainage in the vicinity of the pond directed towards the pond.

5.0 PREVIOUS ENVIRONMENTAL REPORTS

No previous environmental reports were provided to JW for this Site.

6.0 ENVIRONMENTAL DATABASE/RECORDS REVIEW

6.1 REGULATORY INFORMATION

We have received the Nova Scotia Department of Environment and Labour's Environmental Registry response to our inquiry for the subject Site and adjoining properties. The information is summarized below and attached in **Appendix 5**.

Regulatory Infractions Search: Nova Scotia Department of Environment and Labour (NSDEL) has no record of infractions for the subject or adjoining properties.

Environmental Investigations: Information pertaining to site assessments, risk assessments, remedial work or other environmental investigations registered with NSDEL for the subject or adjoining properties are available only through "Freedom of Information" requests which require a ninety day turn-around time. Ms. Carla Heggie of NSDEL indicated that there are no records requiring a "Freedom of Information" request on file for the subject Site and adjoining properties.

Tank Registrations: Information from the NSDEL Petroleum Storage Tank Registry indicated that no tanks were registered to the Site. The following tanks were registered to an adjoining property:

548 Rocky Lake Drive, owned by Mobile Ready Mix (located across Rocky Lake Drive, down-gradient of the subject Site)

- One 2,270 L steel gasoline underground storage tank (UST) was listed as installed at an unknown date and removed in March 1999. Contamination was identified, and 178.75 tonnes were reported to have been removed and disposed at Envirosoil.
- One 9,080 L steel gasoline UST was listed as installed at an unknown date and removed in March 1999.
- One 4,540 L steel gasoline UST was listed as installed at an unknown date and removed in March 1999.

This property is located across Rocky Lake Drive from the subject Site. Based on the assumed groundwater flow direction, which is to the west/northwest, this property is assumed to be located down-gradient of the Site, and therefore the presence of the former USTs and identified contamination is not expected to represent significant environmental concern to the Site.

7.0 FINDINGS

The following is a summary of observations made during the site visit, interviews conducted, and information gathered from the records review.

7.1 CURRENT SITE OPERATIONS

The Site building (warehouse and office) is currently vacant, and was formerly used as lumber storage. Activities on-Site are not expected to indicate the potential for environmental concern.

7.2 HISTORICAL LAND USE

Historical land use for the Site was determined through historical records listed in Section 2.2.1. A summary of the historical information is presented below.

Summary of Historical Information

Period/Date	Land Use
Prior to the early 1970's	Undeveloped woodland; development of Site and surrounding land visible in a 1974 air photo.
Between early 1970's to early 2000	Site building present and Site occupied by East Coast Lumber Ltd. warehouse
Present	Building vacant

According to historical information (air photos, topographical maps and city directories) the subject property and adjacent properties were undeveloped prior to 1966. In a 1966 aerial photograph the majority of the Site appears to be wooded, with an area of low growth vegetation, possibly a marshy area, at the southwestern corner of the Site. A cleared area is visible on the northeastern adjoining property that may extend slightly onto the Site boundary. In a 1974 aerial photograph the Site has been cleared along the southwestern half with the warehouse building visible. The Site appears to be mainly dirt-covered, with trailers and vehicles parked on the Site. The portion of the property extending back from the pond is undeveloped woodlot. In a 1982 aerial photograph the Site has been cleared, extending behind the pond. Piles of soil material are visible across the property with various trailers stored on the Site, and may be associated with the construction of roads etc. at the adjoining quarry. The Site is first listed in a 1988 city directory as East Coast Lumber; as well, Rocky Lake Quarry, Dexter Construction and Municipal Contracting are also listed under the same civic address, and are suspected to be associated with activities on adjoining properties south of the Site. In a 1990 city directory East Coast Lumber is listed along with Dexter Construction and Municipal Contracting. In a 1992 aerial photograph the railway lines across the property are visible, with a large pile of soil/fill on the Site, on the far side of the rail lines, as well as near the southwest side of the building; mainly off-Site, but which may extend slightly onto the Site. In a 1994 city directory, East Coast Lumber is the only name listed for the civic address and is listed intermittently through to a 2000 city directory. In a 1997 aerial photograph, the office portion of the building is visible, storage of material is visible around the perimeter of the building, and the piles of soil/fill material appear to have been removed. In a 2003 aerial photograph the loading dock near the railway is visible. Portions of the Site near the pond remain wooded and a portion of the ground cover on the eastern side of the rail line appears to be discoloured. The source of the discolouration was not known, however, no evidence of discolouration was identified in this area during the Site visit and since there have been no reports of spills on the Site, this is not considered to represent a significant environmental concern.

7.3 WASTE GENERATION

7.3.1 Solid and Liquid Wastes

No solid or liquid wastes suspected to pose significant environmental concern to the Site were observed or reported during the Site visit.

7.3.2 Wastewater Discharges, Drains and Sumps

Wastewater from the office area of the building is anticipated to drain to a septic system, and a new septic system/field bed is to be installed at the front of the building. A floor drain was observed in the warehouse building and it is not known where it drains. No staining was observed in the vicinity of the floor drain.

Currently no process effluent, discharges, sumps or other potential sources of environmental contamination related to wastewater discharges were observed on the Site during the site visit.

7.3.3 Air Discharges

No sources of air emissions that are suspected to result in residual contamination to the property were identified to be present on the Site.

7.4 FUEL, CHEMICAL AND WASTE STORAGE

7.4.1 Storage Tanks

One approximately 2,273 L fuel oil AST is near the loading dock in the yard of the building and appears to be empty. The tank is cylindrical and situated on a wooden pad. The tank appears to be rusted, and there are small areas of surficial staining on the gravel (approximately 0.1 m²) in the vicinity of the tank. However, the staining appears to be minimal and the presence of the AST is not expected to represent significant environmental concern to the Site. The building is currently heated with electric heat and Mr. Simpson was not aware of any former tanks associated with the building; there are currently no tanks associated with the building.

7.4.2 Storage Containers

No storage containers were observed on the Site.

7.5 BUILDING SYSTEMS AND EQUIPMENT

7.5.1 Heating and Cooling Systems

Heating is provided to the Site via electrical baseboard heaters. Cooling is provided to the office portion of the building by two wall-mounted air conditioning units.

7.5.2 Hydraulic Equipment

No hydraulic equipment related to building systems was identified to be present on the Site.

7.6 EXTERIOR SITE OBSERVATIONS

7.6.1 Surface Features

The majority of the exterior ground cover of the Site is gravel with some vegetation growth in the vicinity of the pond and the northeastern portion of the Site.

With the exception of the minor staining discussed in Section 7.4.1, no other surface staining was observed at the Site.

A large pond occupies the northwestern corner of the property, and is bordered by grass and Rocky Lake Road to the west and trees and shrubs to the east. A small stream was observed to be heading southeast across the property and disappeared into the gravel on the Site. Several areas of standing water were observed between where the pond was located and where the stream disappeared due to infiltration on the Site. No obvious hydrocarbon sheen was observed in the water.

No ditches, pits, or lagoons were identified to be present on the Site.

7.6.2 Fill Materials

Aerial photographs indicate the possible presence of fill material on the Site. No information was available to indicate the type of fill or its source, however, it may be associated with the activities/construction of the nearby quarry.

7.6.3 Wells

A water well is expected to be present on the Site, suspected to be beneath the office building, however it was not observed at the time of the Site visit. No other abandoned or existing wells (water, oil, gas or disposal) were identified to be present on the Site.

7.7 HAZARDOUS MATERIALS

JW reviewed the Site for the potential presence of the following hazardous materials during the site visit. These substances are regulated through federal or provincial legislation and may represent a health concern, and/or require proper handling, storage and disposal. The hazardous materials assessment was based on a visual review of the Site. No destructive testing was completed and concealed areas (e.g. inside wall and ceiling cavities) were not assessed.

7.7.1 Asbestos-Containing Materials (ACMs)

The inhalation of asbestos fibres can cause serious diseases of the lungs and other organs that may not appear until years after the exposure has occurred. The common use of asbestos-containing materials (ACMs) in construction generally ceased voluntarily in the mid 1970s. However, ACMs are known to be present in buildings constructed up to the late 80's and early 90's. Further, asbestos is still utilized in the manufacturing of some vinyl floor tile and cement products.

Friable ACMs (breakable by hand) are a potential health concern as asbestos fibres can be easily exposed and become airborne. Further, non-friable ACMs can be considered friable if disturbed. However, if identified to be present, friable ACMs can remain in a building provided that they are in good condition or encapsulated, and a management plan is implemented. Non-friable ACMs are not a concern until removal of the material is required or the material is to be disturbed (e.g. by cutting). In place, they do not pose a potential health risk to occupants of the building.

The roof was reportedly replaced approximately 2 years ago and therefore roofing materials are not expected to contain ACMs. Based on the age of the office building, and observed conditions in both the warehouse building and office building during the Site visit, potential ACMs are not suspected to be present, and no suspected friable ACMs were observed during the Site visit. These comments are based on a visual review of accessible areas of the building and no destructive testing was completed in concealed areas (for example the inside of wall and ceiling cavities were not assessed).

7.7.2 Polychlorinated Biphenyls (PCBs)

From the 1930s to the 1970s, PCBs were widely used as ingredients in a number of industrial materials, including sealing and caulking compounds, inks and paint additives. They were also used to make

...kinds of electrical equipment, including transformers and capacitors. PCBs are an environmental concern as they do not readily degrade and have been identified to bioaccumulate. In Canada, the federal *Environmental Contaminants Act* (1976), prohibited the use of PCBs in heat transfer and electrical equipment installed after September 1, 1977, and in transformers and capacitors installed after July 1, 1980. In addition, the storage and disposal of PCB waste materials is regulated.

Fluorescent lights were observed and appear newer but the actual age of the ballasts is not known. The office building is reportedly 15 years old and therefore PCBs would not be expected in the ballasts in the newer portion of the building, however fluorescent lights associated with the older warehouse section may contain PCB ballasts.

7.7.3 Lead-Based Paints

In 1976, the lead content in interior paint was limited to 0.5% by weight under the federal *Hazardous Products Act*. Lead is also associated with plumbing solder and old pipes as well as other lead-based products such as wall shielding (x-ray rooms). Lead occurs naturally in the environment and has many industrial uses. However, small amounts of lead, particularly lead dust, can be hazardous to human health, especially to young children.

Due to the age of the subject building, lead-based paints may be present on the older painted surfaces associated with the warehouse.

7.7.4 Urea Formaldehyde Foam Insulation (UFFI)

During the 1970s, when concerns about energy efficiency led to efforts to improve home insulation in Canada, UFFI became an important insulation product for existing houses. Most installations occurred between 1977 and its ban in Canada in 1980 under the federal *Hazardous Products Act*.

No evidence of UFFI was observed and due to conditions observed during the Site visit, UFFI is not suspected to be present.

7.7.5 Ozone-Depleting Substances (ODSs)

In 1994, the federal government filed the *Ozone-depleting Substances Regulations* to amend controls on production and consumption of chlorofluorocarbons (CFCs), halons, carbon tetrachloride and methyl chloroform.

ODSs may be associated with the wall-mounted air conditioning units, and refrigerator in the office area.

7.8 SPECIAL ATTENTION ITEMS

JW reviewed the Site for the potential presence of the following items during the site visit.

7.8.1 Radon Gas

Radon gas is a product of the decay series that begins with uranium. Radon is produced directly from radium, which can be commonly found in bedrock that contains black shale and/or granite. Radon emits alpha particles and produces several solid radioactive products called radon daughters. Harmful levels of radon and radon daughters can accumulate in confined air spaces, such as basements and crawl spaces. Exposure to high levels of radon increases the risk of developing lung cancer.

Based on the geology of the area, and the 'Potential Occurrence Radon Gas In Nova Scotia' map, radon gas accumulation is not expected to be an issue at the Site.

7.8.2 Mold

The growth of mold in indoor environments is typically due to a moisture problem related to building envelope or mechanical systems deficiencies or design. Potential health effects and symptoms associated with mold exposures include allergic reactions, asthma, and other respiratory complaints.

Evidence of water leaks or mold growth was not observed during the Site visit.

7.8.3 Electromagnetic Frequencies (EMFs)

With the exception of electrical transmission lines no other high-voltage transmission lines or electrical substations, which could generate significant electromagnetic frequencies, were identified on or adjacent to the Site.

7.8.4 Noise and Vibration

The building is on a property owned by Municipal Enterprises and it is expected that from time to time blasting at the adjacent quarry will occur.

With the exception of traffic along Rocky Lake Drive and the railway spur line on-Site no other major or persistent sources of noise and vibration were identified to be present on the Site at the time of the site visit.

7.8.5 Acid Generating Bedrock

Suspected sulphide bearing bedrock is identified through the use of existing geological mapping. Sulphides occur naturally in many Nova Scotia geological formations. Acid Rock Drainage (ARD) problems occur when sulphide bearing bedrock is exposed, disturbed, or used as fill. Bedrock is considered acid producing if sulphide sulphur concentrations exceed 0.4% by weight.

Based on regional maps and local knowledge of the area, the subject property is suspected to be underlain by bedrock of the Goldenville Formation of the Meguma Group, which is considered to have low acid generation potential when exposed to the atmosphere.

7.9 NEIGHBOURING PROPERTIES

The current activities on neighbouring properties observed at the time of the site visit and a summary of historic information gathered through the records review are presented in the following sections.

7.9.1 North

North (Adjoining) 585 Rocky Lake Drive

Current: Ambassador Recreational Services N.S. Ltd. (RV Sales & Service)

Historic: Prior to the mid 1960's – vacant/undeveloped

Mid 1960's/early 1970's to present – Building present on property

Early 1970's to present – RV Sales & Service – vacant/undeveloped

Currently, the property is occupied by an RV Sales & Service company. During the Site visit, fill and vent pipes for a suspected basement fuel oil AST were observed at this property. An aerial photograph from 1947 indicates the property was undeveloped. In a 1966 aerial photograph, a building had been constructed, and construction appears recent, due to the unfinished ground cover. In a 1974 aerial photograph a second L-shaped building had been constructed closer to the pond on the subject Site and recreational vehicles (RVs) appear to be parked across the Site. Between 1974 and the present, the property appears to have been operated as an RV Sales & Service company, as the same two buildings and parked RVs are located on the property. In several aerial photographs, it appears that one or two of the RVs were parked adjacent to the pond, and may have extended slightly onto the subject Site, however the parking of the vehicles is not expected to represent significant environmental concern. This property was not listed in the city directory's searched.

Based on the assumed groundwater flow direction, this property is assumed to be located cross-gradient of the subject Site and therefore historical and current activities are not expected to represent significant environmental concern to the Site.

7.9.2 East

East (Adjoining)

Current:	Owned by Municipal Enterprises Ltd. and undeveloped (part of the same parcel of land as the Site)
Historic:	Mid 1940's to the late 1960's/early 1970's – undeveloped woodlot Early 1970's to the mid 1990's – partially cleared with adjoining properties, some storage of equipment associated with the Site. Late 1990's to present – vacant with vegetation growth/trees

Currently, this property is vacant and it is mainly covered in vegetation growth (trees and low brush). This property is owned by Municipal Enterprises Ltd. and is approved to be operated as a quarry.

Historically, aerial photographs indicate that this property was originally an undeveloped woodlot (photographs from 1947 and 1966) and was then partially cleared along with the adjoining properties (the subject Site and southern adjoining property) through 1974 to 1997; some of the materials identified in aerial photographs for the subject Site during this period may have been stored on this property as well.

Based on the assumed groundwater flow direction, this property is located up-gradient of the subject Site however current and historical activities are not expected to pose the potential for environmental contamination to the Site.

7.9.3 South

South (Adjoining)

Current:	Owned by Municipal Enterprises Ltd. and currently cleared and vacant (part of the same parcel of land as the Site)
Historic:	Mid 1940's to the early 1970's – Undeveloped woodland; development of property along with Site visible in a 1974 air photo. Mid 1970's to present – Cleared with soil/fill stored on property; rail line extending from Site.

Currently, this property is vacant with the cleared gravel area from the subject Site extending onto this property. This property is owned by Municipal Enterprises Ltd. and is approved to be operated as a quarry.

Standing water is visible near the road on this property in aerial photographs. The southeastern portion of this property is partially wooded with low-growth vegetation. Historically, this property was cleared along with the subject Site. A 1974 aerial photograph indicates that trailers were stored on this property. As well the property had been cleared with storage of piles of soil/fill material, possibly associated with the quarry located to the southeast of this property. A small building also appeared to be present along

Rocky Lake Road. In a 1982 aerial photograph, piles of soil/fill material continue to be present and in a 1992 aerial photograph the railway spur line is present running across this property to the subject Site. In a 1997 photograph, most of the soil/fill material piles appear to have been removed and in a 2003 photograph the property appears to be cleared and possibly gravel covered near the road, the same as the Site, with vegetation growth along the back of the property.

Based on the assumed groundwater flow direction, this property is considered to be cross-gradient of the Site, and therefore current and historical activities are not expected to pose the potential for environmental contamination to the Site.

7.9.4 West

West (Across Rocky Lake Drive) – 548 Rocky Lake Drive

Current: Mobile Ready-Mix Ltd.(owned by Dartmouth Ready-Mix)

Historic: Mid 1940's to the late 1960's/early 1970's – undeveloped, mainly woodland with low-lying/marshy area extending from Site.

Early 1970's to present – site cleared and developed; commercial activities.

Currently, the property is owned by Dartmouth Ready Mix and occupied by Mobile Ready-Mix Ltd., a concrete company.

An aerial photograph from 1974 indicates the property has been cleared, one building has been constructed and several trucks (possibly concrete mixing trucks) are visible parked on the property. Additionally, a railway line runs along the western border of this property. In a 1982 aerial photograph, several other buildings have been constructed across the property and additional trucks are present in parking areas. Mobile Ready-Mix is first listed in a 1990 city directory, however the civic number at that time was 237 Rocky Lake Drive, which may or may not be for this property. However, Mobile Ready Mix is listed at 548 Rock Lake Drive in city directories from 1997 through to 2000. In a 1992 aerial photograph, additional buildings have been constructed, and the property appears similar in a 2003 aerial photograph. As mentioned in Section 6.1, USTs were reportedly removed from this property along with some contaminated soil. However, based on the assumed groundwater flow direction, which is to the west/northwest, this property is assumed to be located down-gradient of the Site, and therefore the presence of the former USTs and historical and current activities identified on the property are not expected to represent significant environmental concern to the Site.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on information gathered and observations made, the Phase I ESA has not revealed evidence of actual or potential contamination associated with the Site.

In addition, the Phase I ESA identified potential environmental concerns regarding fill material, PCBs, ozone depleting substances and lead-based paints. However, these issues are considered to be related to long-term management and/or site redevelopment and no action is recommended at this time. Long-term recommendations are presented in Table 1 in the Executive Summary.

9.0 CLOSURE

This report has been prepared for the sole benefit of Alpha Chemical Ltd. The report may not be used by any other person or entity without the express written consent of Alpha Chemical Ltd. and Jacques Whitford Limited (JW). Any use which a third party makes of this report, or any reliance on decisions made based on it, are the responsibility of such third parties. JW accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Some of the information presented in this report was provided through existing documents and interviews. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, JW in certain instances has been required to assume that the information provided is accurate.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of JW based on the data obtained during the assessment. Due to the nature of the assessment and the limited data available, JW cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be construed as legal advice.

Since the purpose of a Phase I ESA is to identify evidence of potential or actual contamination, the identification of site conditions which may pose a non-environmental risk to buildings or people on the site is beyond the scope of this investigation. Examples include but are not limited to underground mine workings, volcanic or earthquake activities, severe weather, and/or flood plains in the area. JW accepts no responsibility for damages, if any, suffered as a result of any non-environmental risk.



Should additional information become available which differs significantly from our understanding of conditions presented in this report, we request that this information be brought to our attention so that we may reassess the conclusions provided herein. Historical information (air photos, city directory search, topographical information) was collected by Ms. Barbara MacKenzie. This report was prepared by Ms. Erika Ryter, B.Sc.(Eng.), EIT, and reviewed by Mr. Marc Dunning, P.Eng.

Respectfully submitted,

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