

Phase One Environmental Site Assessment

Lansdowne Park and Sylvia Holden Commemorative Park
945-1015 Bank Street
Ottawa, Ontario

prepared for:
City of Ottawa Realty Services



prepared by:
AMEC Earth & Environmental
300-210 Colonnade Road Sout
Ottawa, Ontario K2E 7L5





**PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK AND
SYLVIA HOLDEN COMMEMORATIVE PARK
945-1015 BANK STREET
OTTAWA, ONTARIO**

Submitted to:



**City of Ottawa
Realty Services Branch
110 Laurier Avenue West
Ottawa, Ontario
K1P 1J1**

Submitted by:

**AMEC Environment & Infrastructure
a division of AMEC Americas Limited
300 – 210 Colonnade Road South
Ottawa, Ontario
K2E 7L5**

March 2012

TZ101001

Distribution:

- City of Ottawa - 3 hard copies and 1 electronic copy
- AMEC Environment & Infrastructure - 1 copy



March 7, 2012

TZ101001

City of Ottawa
Realty Services Branch
Real Estate Partnerships and Development Office
110 Laurier Avenue West
Ottawa, Ontario
K1P 1J1

Attention: Nancy Horton
Program Manager, Disposals and Environmental Remediation

Dear Ms. Horton:

RE: Final Report - Phase One Environmental Site Assessment (revised)
Lansdowne Park and Sylvia Holden Commemorative Park
945-1015 Bank Street, Ottawa, Ontario

Please find enclosed three (3) hard copies and one (1) electronic copy (in PDF format on CD), of our report titled "Phase One Environmental Site Assessment, Lansdowne Park and Sylvia Holden Commemorative Park, 945-1015 Bank Street, Ottawa, Ontario". The report represents an update of our original Phase One ESA report dated September 30, 2011, which has been revised to address comments issued by the Ministry of the Environment (MOE) Standards Development Branch in its review of the Risk Assessment Report and the Brownfields Filing and Review Program Support Unit following its review of the Phase One ESA.

Should you have any questions or require any additional information, please do not hesitate to contact the undersigned.

Yours truly,

AMEC Environment & Infrastructure,
a division of AMEC Americas Limited

Kevin D. Hicks, M.Sc., P.Ge., QP_{ESA}
Senior Associate Hydrogeologist

Enclosures (4)

P:\Projects in Progress\1 Environmental\2010\TZ101001 - Lansdowne Park\1000 - Phase I ESA\Report\Phase I ESA - Lansdowne Park - Reg 511 Final Feb29-2012.docx

AMEC Environment & Infrastructure
a division of AMEC Americas Limited
300 - 210 Colonnade Road South
Ottawa (Nepean), Ontario
CANADA K2E 7L5
Tel (613) 727-0658
Fax (613) 727-9465

www.amec.com



1.0 EXECUTIVE SUMMARY

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (“AMEC”), was retained by the City of Ottawa (the “City”) to conduct a Phase One Environmental Site Assessment (ESA) of Lansdowne Park, a commercial entertainment venue, and adjacent Sylvia Holden Commemorative Park, both located at 945-1015 Bank Street in Ottawa, Ontario (hereinafter collectively referred to as the “Phase One Property”). Both properties are currently owned and operated by the City. Lansdowne Park is occupied by various buildings used for administrative, sport, recreational and entertainment purposes. Sylvia Holden Commemorative Park is a municipal park located adjacent to the northwest corner of Lansdowne Park and is developed with benches, pathways and landscaping.

A Phase One ESA is defined as a systematic qualitative process to assess the environmental condition of a property based on its historical and current use. The general objectives of a Phase One ESA are to achieve the following: 1) to develop a preliminary determination of the likelihood that one or more contaminants have affected any land or water on, in or under the Phase One Property; 2) to determine the need for a Phase Two Environmental Site Assessment; 3) to provide a basis for carrying out any Phase Two Environmental Site Assessment required; and 4) to provide adequate preliminary information about environmental conditions in the land or water on, in or under the Phase One Property for the conduct of a risk assessment following completion of a Phase Two Environmental Site Assessment.

The City retained AMEC to provide an evaluation of known and possible environmental issues at the Phase One Property in support of the proposed redevelopment of the Phase One Property by a public-private partnership between the City and the Ottawa Sports and Entertainment Group (OSEG). The proposed redevelopment, referred to as “Lansdowne Live!” was developed by OSEG and was approved in principle by City Council on November 16, 2009. This Phase One ESA was carried out in accordance with the Terms of Reference provided in AMEC’s proposal / work agreement dated June 6, 2011. This report represents an update of AMEC’s report entitled “Phase I Environmental Site Assessment, Lansdowne Park and Sylvia Holden Park, 945-1015 Bank Street, Ottawa, Ontario” dated March 19, 2010 to meet the Phase One ESA reporting requirements under Ontario Regulation 153/04, as amended, and is intended to support the filing of Records of Site Condition (RSC) to accommodate redevelopment of portions of the Phase One Property to mixed residential/commercial and parkland property uses, referred to as the Generic RSC Property and RA RSC Property, respectively.

Under the supervision of Kevin D. Hicks, M.Sc., P.Geo., Qualified Person, Ms. Jennifer Luxton of AMEC conducted a site reconnaissance of the Phase One Property on February 9, 10 and March 2, 2010 to evaluate possible on-site issues, and assess whether any surrounding land uses may have and/or are currently impacting the environmental condition of the Phase One Property. During the site reconnaissance, AMEC interviewed Mr. Mike Villeneuve, Site Technical Coordinator, City of Ottawa (the “Phase One Property representative”). The Phase One Property representative accompanied AMEC during part of the site reconnaissance on February 9 and March 2, 2010. Under the supervision of Kevin Hicks, QP, supplemental site

reconnaissance visits were conducted on September 22, 2011 by Mr. Bryant Jelly and on October 5, 2011 by Mr. Brock Ibbott, B.A., Env. Mgt. The Phase One Property representative accompanied AMEC during both supplemental site reconnaissance visits which were conducted to inspect areas not accessible/visible during the initial site reconnaissance.

Lansdowne Park is a historic exhibition, sports and entertainment facility bordered by Bank Street to the west, Holmwood Avenue to the north and the Queen Elizabeth Drive and Rideau Canal to the east and south. The Phase One Property is currently home to the Ottawa 67's hockey club and is the former home of the Central Canada Exhibition (CCE) and the Ottawa Roughriders and Ottawa Renegades football clubs. There are currently six permanent structures on the Phase One Property, including Frank Clair Stadium, Civic Centre, Aberdeen Pavilion, Coliseum Building, Horticultural Building and Eddie Friel Building which cumulatively comprise approximately 27,200 square metres in total area.

The Phase One Property had hosted the annual Central Canada Exhibition since 1888 up until 2010. From 1941 through to 1946, the Phase One Property was occupied by the Canadian Military (for training purposes) during World War II. As the result of a review in the early 1990s, the City demolished some of the buildings previously present at the Phase One Property (e.g., Coliseum Annex, General Purpose Building/Curl-O-Drome, McElroy Building), and restored some parkland, notably along the Rideau Canal which is now owned by the National Capital Commission (NCC). A weekly farmer's market was started at Lansdowne Park in 2007.

The findings of the Phase One ESA completed by AMEC have identified several past or present uses on, in or under the Phase One Property, and Potentially Contaminating Activities (PCAs) on, in or under the Phase One Property or within the Phase One Study Area, that comprise Areas of Potential Environmental Concern (APECs) on the Phase One Property where one or more contaminants may be present. The APECs identified in this Phase One ESA include:

- 1) Potential remnant soil and/or ground water impact from heating oil impact in the vicinity of the former Coliseum Annex boiler rooms;
- 2) Potential remnant soil and/or ground water impact from heating oil impact in the vicinity of the East Lavatory (Horticultural Building) boiler room;
- 3) The eastern landfill (Ur-27) beneath the eastern portion of the Phase One Property and potential associated soil and/or ground water impact;
- 4) The suspected Southern Landfill in the vicinity of the South Side Stands and potential associated soil and/or ground water impact;
- 5) Potential ammonia impact in the vicinity of the Horticultural Building associated with former indoor ice making activities;
- 6) Potential soil and/or ground water impact from a historic gasoline service station and historic dry cleaning facility formerly located at 1014/1016 Bank Street, approximately 23 metres west of the Phase One Property at the northeast corner of the intersection of Bank Street and Wilton Crescent;

- 7) Potential soil and/or ground water impact from historic gasoline service stations, automotive repair shops and dry cleaners formerly located along Bank Street, including a historic gasoline service station located approximately 25 metres northwest of the Phase One Property at 912 Bank Street;
- 8) Potential soil and/or ground water impact from a historic transformer, potentially containing oil with polychlorinated biphenyls (PCB) additives, located north of the Coliseum Building near the west end of the former Annex at the location of the current transformer within Sylvia Holden Commemorative Park;
- 9) Potential soil and/or ground water impact from the former transformer vault and former boiler room and potential unknown fuel sources at the southeast corner of the former McElroy Building;
- 10) Potential soil and/or ground water impact associated with historic fuel sources and storage methods for the Horticultural Building heating equipment;
- 11) Potential soil and/or ground water impact associated with a former gasoline and oil storage area located near the former General Purpose Building during occupation by the Military from 1941 through to 1946;
- 12) Potential soil and/or ground water impact from a free standing boiler house and the boiler house for the former Agricultural Implement Building/Machinery Hall Building located just east of the Phase One Property on NCC Lands;
- 13) Potential soil and/or ground water impact by ammonia in the vicinity of the Civic Centre ice making equipment;
- 14) Potential soil and/or ground water impact by ammonia in the vicinity of the former McElroy Building and former Curl-o-Drome (a.k.a. General Purpose Building) ice making equipment; and,
- 15) Unknown material types and quality associated with fill that has been placed across the Phase One Property.

Contaminants of potential concern (COPC) associated with the above noted APECs include petroleum hydrocarbons (PHC), volatile organic compounds (VOC) (including chlorinated solvents), heavy metals, polynuclear aromatic hydrocarbons (PAH), PCB, ammonia and landfill leachate related parameters. Several of these COPCs including PAH, metals and PHC in soil and VOC (chloroform) in ground water are known to exist at elevated concentrations on, in or under the Phase One Property through previous subsurface investigations carried out at the Phase One Property (AMEC 2010b).

Based on the findings of this Phase One ESA, a Phase Two ESA will be required at the Phase One Property before a RSC can be submitted. The specific objectives of the investigation would be to assess the APECs identified at the Phase One Property in the context of the existing regulatory framework and legislation regarding contaminated sites and Brownfields in the Province of Ontario to confirm whether contaminants are present on, in or under the Phase

One Property, and, if so, what the contaminants are, where they are located on, in or under the Phase One Property and at what concentrations.

In addition to the above noted environmental concerns, potential operational/management and/or demolition concerns related to asbestos-containing materials (ACMs) have been confirmed to exist at the Phase One Property. Additional concerns regarding lead-containing paints (LCPs) and PCB-containing transformers, capacitors and lamp ballasts may also be present at the Phase One Property. Given that the Phase One Property buildings may be demolished during redevelopment of the Phase One Property, AMEC recommends that these issues be investigated and managed in accordance with applicable regulations, including carrying out Designated Substance and Hazardous Material Surveys in support of the development of appropriate management or abatement plans.

TABLE OF CONTENTS (cont)

	<u>PAGE</u>
4.2.3.6 Ontario Oil, Gas and Salt Resources	43
4.2.4 EcoLog Environmental Risk Information Services Ltd. ("ERIS").....	43
4.3 Physical Setting Sources.....	52
4.3.1 Aerial Photographs	52
4.3.2 Topography, Hydrology, Geology	61
4.3.3 Fill Materials.....	62
4.3.4 Water Bodies and Areas of Natural Significance.....	62
4.3.5 Well Records	62
4.3.5.1 Water Wells	62
4.3.5.2 Oil, Gas and Test Wells.....	62
4.4 Site Operating Records.....	63
4.5 Summary of Records Review	63
5.0 INTERVIEWS.....	66
5.1 Key Phase One Property Representatives.....	66
6.0 SITE RECONNAISSANCE	68
6.1 General Requirements	68
6.2 Specific Observations at Phase One Property	69
6.2.1 Phase One Property Description and Buildings.....	69
6.2.2 Phase One Property Utilities and Services.....	72
6.2.3 Phase One Property Production and Manufacturing	73
6.2.4 Drains, Pits and Sumps	73
6.2.5 Tanks	73
6.2.5.1 Aboveground Storage Tanks.....	73
6.2.5.2 Underground Storage Tanks.....	74
6.2.6 Site Housekeeping.....	74
6.2.7 Chemical Storage/Handling and Floor Condition.....	74
6.2.8 Areas of Stained Soil or Pavement, or Stressed Vegetation	74
6.2.9 Fill / Debris, Methane and Radon	75
6.2.9.1 Fill / Debris.....	75
6.2.9.2 Methane.....	76
6.2.9.3 Radon	76
6.2.10 Air Emissions and Odours	77
6.2.11 Mould 77	
6.2.12 Designated Substances and Hazardous Building Materials	77
6.2.12.1 Asbestos.....	78
6.2.12.2 Lead.....	79
6.2.12.3 Mercury.....	80
6.2.12.4 UFFI.....	80
6.2.13 Other Substances	80
6.2.13.1 Polychlorinated Biphenyls	80
6.2.13.2 Ozone Depleting Substances.....	81
6.2.13.3 Radioactive Materials	82
6.2.13.4 Animals and Pest Control.....	82
6.3 Enhanced Investigation Property Observations	82

TABLE OF CONTENTS (cont)

	<u>PAGE</u>
6.3.1 Industrial/Commercial Operations	83
6.3.2 Hydraulic Lift Equipment.....	83
6.3.3 Vehicle/Equipment Maintenance Areas.....	83
6.3.4 Oil/Water Separators	83
6.3.5 Hazardous Materials Use/Storage.....	84
6.3.6 Generated Wastes.....	84
6.3.6.1 Liquid Waste.....	84
6.3.6.2 Solid Waste	84
6.3.6.3 Liquid Discharge Points and Spills History.....	85
6.4 Written Description of Investigation.....	85
7.0 REVIEW AND EVALUATION OF INFORMATION.....	86
7.1 Current and Past Uses.....	86
7.2 Potentially Contaminating Activities	89
7.3 Areas of Potential Environmental Concern	91
7.4 Phase One Conceptual Site Model	96
8.0 CONCLUSIONS.....	101
8.1 Whether Phase Two Environmental Site Assessment Required Before Record of Site Condition Submitted.....	102
9.0 CLOSURE.....	103
10.0 REFERENCES.....	105

LIST OF APPENDICES

Appendix A	Legal Description and Plan of Survey
Appendix B	RMS Data (FIPs)
Appendix C	Chain of Title
Appendix D	Chemical Products Inventory
Appendix E	Historical Maps and Photographs
Appendix F	EcoLog ERIS
Appendix G	Aerial Photographs
Appendix H	Topographic Map
Appendix I	Regulatory Correspondence
Appendix J	Photographs
Appendix K	Qualifications of the Assessor
Appendix L	Limitations

LIST OF FIGURES (in order after text)

Figure 1	Key Plan
Figure 2	Generalized Site Plan
Figure 3	Phase One Study Area
Figure 4a	Historical Site Plan Compilation – 1896
Figure 4b	Historical Site Plan Compilation – 1900
Figure 4c	Historical Site Plan Compilation – 1922
Figure 4d	Historical Site Plan Compilation – Circa 1946 - 1956
Figure 4e	Historical Site Plan Compilation – 1965
Figure 5	Site Servicing Plan
Figure 6a	Conceptual Site Model – Potentially Contaminating Activities within the Phase One Study Area
Figure 6b	Conceptual Site Model – Areas of Actual and Potential Environmental Concern
Figure 6c	Surrounding Land Use Plan

LIST OF ACRONYMS AND ABBREVIATIONS

ACM	Asbestos Containing Materials
a.k.a.	Also Known As
AMEC	AMEC Environment & Infrastructure
APEC	Area of Potential Environmental Concern
AST	Aboveground Storage Tank
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CCE	Central Canada Exhibition
CCEA	Central Canada Exhibition Association
CFC	Chlorofluorocarbon
CH	Canadian Heritage
CNSC	Canadian Nuclear Safety Commission
COPC	Contaminant of Potential Concern
COV	Combustible Organic Vapour
CSA	Canadian Standards Association
CSFL	Contaminated Site on Federal Land
CWAC	Canadian Women's Army Corporation
CWS	Canada Wide Standards
DFO	Department of Fisheries and Oceans
DND	Department of National Defence
DSS	Designated Substance Survey
DSHMS	Designated Substance and Hazardous Materials Survey
EC	Environment Canada
EPA	Environmental Protection Act
ESA	Environmental Site Assessment
FIP	Fire Insurance Plan
FOI	Freedom of Information
HCFC	Hydrochlorofluorocarbon
HLUI	Historical Land Use Inventory
HVAC	Heating Ventilation and Air Conditioning
INAC	Indian and Northern Affairs
LCP	Lead-Containing Paint
LPH	Liquid Petroleum Hydrocarbon
MAAP	Management of Abandoned Aggregate Properties Program
masl	Metres Above Sea Level
mbgs	Metres Below Ground Surface
MCCR	Ministry of Consumer and Commercial Relations
MNDM	Ministry of Northern Development and Mines
MNR	Ministry of Natural Resources
MOE	Ministry of the Environment
MOL	Ministry of Labour
MSDS	Material Safety Data Sheet

MTO	Ministry of Transportation
MW	Monitoring Well
NCC	National Capital Commission
ODS	Ozone Depleting Substance
OGS	Ontario Geological Survey
OHSA	Occupational Health and Safety Act
OLMS	Old Landfill Management Strategy
ORIS	Occurrence Reporting Information System
OSEG	Ottawa Sports and Entertainment Group
PAH	Polycyclic Aromatic Hydrocarbon
PCA	Potentially Contaminating Activity
PCB	Polychlorinated Biphenyls
PHC	Petroleum Hydrocarbon
QP	Qualified Person
RSC	Record of Site Condition
SAC	Spills Action Centre
SCS	Site Condition Standard
SWMS	Storm Water Management System
TB	Treasury Board
TC	Transport Canada
TOV	Total Organic Vapour
TPH	Total Petroleum Hydrocarbons
TSSA	Technical Standards and Safety Authority
UGAIS	Urban Geology Analysis Information System
UST	Underground Storage Tank
UFFI	Urea Formaldehyde Foam Insulation
VOC	Volatile Organic Compounds
WL	Working Level
YPDT	York Peel Durham Toronto

2.0 INTRODUCTION

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (“AMEC”), was retained by the City of Ottawa (the “City”) to conduct a Phase One Environmental Site Assessment (ESA) of Lansdowne Park and Sylvia Holden Commemorative Park, two contiguous properties located at 945-1015 Bank Street in Ottawa, Ontario (hereinafter collectively referred to as the “Phase One Property”). A key plan showing the location of the Phase One Property is provided on Figure 1.

A Phase One ESA is defined as a systematic qualitative process to assess the environmental condition of a property based on its historical and current use. The general objectives of a Phase One ESA are to achieve the following: 1) to develop a preliminary determination of the likelihood that one or more contaminants have affected any land or water on, in or under the Phase One Property; 2) to determine the need for a Phase Two Environmental Site Assessment; 3) to provide a basis for carrying out any Phase Two Environmental Site Assessment required; and 4) to provide adequate preliminary information about environmental conditions in the land or water on, in or under the Phase One Property for the conduct of a risk assessment following completion of a Phase Two Environmental Site Assessment.

The City retained AMEC to provide an evaluation of known and possible environmental issues at the Phase One Property in support of the proposed redevelopment of Lansdowne Park (the “Phase One Property”) by a public-private partnership between the City and the Ottawa Sports and Entertainment Group (OSEG). This Phase One ESA was carried out in accordance with the Terms of Reference provided in AMEC’s proposal / work agreement dated January 15, 2010 and is intended to meet the requirements of Ontario Regulation 153/04 (as amended) to support the filing of Records of Site Condition (RSC) in support of redevelopment of portions of the Phase One Property to mixed residential/commercial and parkland property uses, referred to herein as the Generic RSC Property and RA RSC Property, respectively.

2.1 Phase One Property Information

Lansdowne Park and the adjacent Sylvia Holden Commemorative Park are located at 945-1015 Bank Street in the Glebe neighbourhood of the City of Ottawa, Ontario (collectively referred to as the “Phase One Property”). Both properties are currently owned and operated by the City. Lansdowne Park is occupied by various buildings used for administrative, sport, recreational and entertainment purposes. Sylvia Holden Commemorative Park is a municipal park developed with benches, pathways and landscaping. A key plan showing the location of the Phase One Property is provided on Figure 1 while a generalized plan of the Phase One Property showing the Generic RSC Property and RA RSC Property is provided on Figure 2.

Lansdowne Park is legally described as Lot 23, Part of Lots 17, 18, 19, 20, 21, 22, 24, 29 and closed streets and lanes on Plan 26085, Part of Lots 44 to 50, Plan 30307, Lots 4 to 62, Part of Lots 1, 2 & 3 and closed streets and lanes on Plan 35722, Part of Lots I & K, Concession C, Rideau Front (formerly Nepean) all being Part 3 on Plan 4R-15305, Ottawa. The municipal address is 945-1015 Bank Street and the Property Identification Number (PIN) is 041390248.

Lansdowne Park is currently improved with six permanent structures which include: Coliseum Building, Horticultural Building, Aberdeen Pavilion (a.k.a Cattle Castle), Civic Centre, Frank Clair Stadium and Eddie Friel Building (hereinafter collectively referred to as the “Phase One Property buildings”). These buildings comprise approximately 27,200 square metres in total area and are used to host a variety of sports, entertainment, exhibition and convention events. The remainder of Lansdowne Park is asphalt surfaced, primarily for use as at grade parking during the various events staged at the Phase One Property throughout the year. Previous buildings including the Curl-O-Drome (a.k.a. General Purpose Building) and McElroy Buildings which abutted the Queen Elizabeth Driveway and a number of other buildings previously adjoining the Coliseum (Coliseum Annex) were demolished in the 1990s. Due to structural problems, the lower South Side Stands of Frank Clair Stadium was demolished in July 2008 and not replaced. The remaining upper South side Stands were demolished in 2011.

Sylvia Holden Commemorative Park, located at the northwest corner of the Phase One Property, is a passive municipal park and open green space established in 1995 in memory of Sylvia Holden. It is roughly rectangular shaped, measuring approximately 0.44 hectares in area with frontages of approximately 50.2 metres and 174.5 metres along Bank Street and Holmwood Avenue, respectively. The park is improved with interlocking stone walkways and gardens at its west end. The remainder of the park is landscaped with grass sod and mature trees.

Sylvia Holden Park is legally described as Part of Lots 17 & 18 in Block 5 on Plan 26085, Part of Lots 1, 2 & 3 and Part of Alexandria Lane, Plan 35722, All being Part 2 on Plan 4R-15305, City of Ottawa. The municipal address is 945 Bank Street and the Property Identification Number (PIN) is 041390249.

The Phase One Property, with a combined area of 15.64 hectares, is bordered by Bank Street to the west, Holmwood Avenue to the north and Queen Elizabeth Driveway followed by the Rideau Canal to the east and south.

AMEC was commissioned by the City of Ottawa, Realty Services Branch, Real Estate Partnerships and Development Office, to carry out this Phase One ESA. The City of Ottawa Project Manager was Nancy Horton. Owner representative contact information is as follows:

Organization:	City of Ottawa
Contact:	Nancy Horton Program Manager, Disposal & Environmental Remediation Realty Services Branch Real Estate Partnerships and Development Office
Address:	110 Laurier Avenue West, Ottawa, Ontario K1P 1J1
Telephone:	(613) 580-2424 ext 21219
e-mail	nancy.horton@ottawa.ca

The Generic RSC Property comprises an L-shaped parcel with an area of 4.34 hectares extending across the north central, northwest and west portions of the Phase One Property (Figure 2) fronting onto Holmwood Avenue and Bank Street. The Generic RSC Property includes the Coliseum Building and Horticultural Building.

The RA RSC Property comprises a crescent-shaped parcel with an area of 5.88 hectares extending across the eastern and southern portions of the Phase One Property fronting onto Queen Elizabeth Drive. The RA RSC Property is not improved with any buildings and is predominantly asphalt surfaced for use as at grade parking during various entertainment, sporting and convention events staged at the Phase One Property. The RA RSC Property was previously developed with the Curl-O-Drome (a.k.a. General Purpose Building) and McElroy Buildings, both of which were demolished in the 1990s.

3.0 SCOPE OF INVESTIGATION

This Phase One ESA was carried out in accordance with the Terms of Reference as provided in AMEC's proposal to the City dated June 6, 2011. The scope of work for the Phase One ESA consisted of the following tasks:

- Reviewing the historical occupancy of the Phase One Property through the use of available archived and relevant (in AMEC's opinion) municipal and business directories, fire insurance plans (FIPs), historical topographical plans (if applicable) and aerial photographs;
- Contacting municipal and provincial agencies to determine the existence of records of environmental regulatory non-compliance, if any, and reviewing such records where available;
- Obtaining an EcoLog Environmental Risk Information Services Ltd. (ERIS) report for the Phase One Property and surrounding properties within a 500 metre radius of the Phase One Property;
- Reviewing available geologic maps, well records and utility maps for the vicinity of the Phase One Property;
- Obtaining a search of land title for the Phase One Property;
- Conducting a "walk-through" visual assessment (i.e., site reconnaissance) of the Phase One Property and building facilities in order to identify the presence of actual and/or potential environmental contaminants or concerns of significance;
- Conducting interviews with designated Phase One Property representative(s) as a resource for current and historical Phase One Property information, as well as to provide AMEC staff with unrestricted access to all areas of the Phase One Property and Phase One Property buildings (as required by O.Reg. 153/04);
- Reviewing the current use of the Phase One Property and any land use practices that may have impacted its environmental condition;
- Reviewing the current use of the surrounding properties and any land use practices that may have impacted the environmental condition of the Phase One Property;
- Reviewing available previous environmental reports prepared for the Phase One Property; and,
- Preparing a report of our findings.

Under the supervision of Kevin D. Hicks, M.Sc., P.Geo., Qualified Person (QP), Ms. Jennifer Luxton of AMEC conducted a site reconnaissance of the Phase One Property on February 9, 10 and March 2, 2010 to evaluate possible on-site issues, and assess whether any surrounding land uses may have and/or are currently impacting the environmental condition of the Phase One Property. During the site reconnaissance, AMEC interviewed Mr. Mike Villeneuve, Site Technical Coordinator, City of Ottawa (the "Phase One Property representative"). The Phase

One Property representative accompanied AMEC during part of the site reconnaissance on February 9 and March 2, 2010.

Due to health and safety concerns, AMEC did not access any roof areas or the second storey within the Coliseum Building. In addition, access was not granted to the two trailers used for administrative office space by the Central Canadian Exhibition Association (CCEA), as well as the soccer dome within Frank Clair Stadium. Based on their current uses, the inaccessibility of these facilities is not considered to be limiting in terms of the conclusions or recommendations provided in this report. The CCEA office trailers have since been removed from the Phase One Property.

Under the supervision of Kevin D. Hicks, M.Sc., P.Geo., QP_{ESA}, supplemental site reconnaissance visits were conducted on September 22, 2011 by Mr. Bryant Jelly and on October 5, 2011 by Mr. Brock Ibbott, B.A., Env. Mgt. The Phase One Property representative accompanied AMEC during both supplemental site reconnaissance visits which were conducted to inspect areas not accessible/visible during the initial site reconnaissance. These included:

- General inspection of the ground surface due to the impediment of snow cover during the initial site reconnaissance;
- Inspection of the field at Frank Clair Stadium subsequent to removal of the soccer dome not accessed during the initial site reconnaissance;
- Inspection of the elevator pits and associated sumps of the piston elevators in the Civic Centre and Eddie Friel Building; and,
- Inspection of a storm water sump at the Civic Centre.

In completing the scope of work, AMEC did not conduct any intrusive investigations, including sampling, analyses or monitoring.

4.0 RECORDS REVIEW

4.1 General

4.1.1 Phase One Study Area Determination

The Phase One Property is located on the southeast corner of the intersection of Bank Street and Holmwood Avenue, and is bordered by Queen Elizabeth Driveway and the Rideau Canal to the east and south, in Ottawa, Ontario (Figure 2). The complete legal description and plan of survey of the Phase One Property is provided in Appendix A. The Phase One Property lies in a typical municipal urban setting in an area of mixed residential, commercial and open space land uses. Owing to the lack of known industrial activities in the area of the Phase One Property, the Phase One Study Area consists of a 250 metre buffer from the boundaries of the Phase One Property (Figure 3).

4.1.2 First Developed Use Determination

According to historical records obtained by AMEC, including street directories, fire insurance plans and aerial photography, and from discussions with the Phase One Property representatives, the Phase One Property was first developed in the mid-1800s for use as a park and agricultural exhibition grounds. The earliest reasonable available record is a reference to the Ottawa Agricultural Society acquiring a portion of the Phase One Property in 1868 on the webpage titled "Historical Dates" that is available to the general public via the Lansdowne Park website (www.lansdownepark.ca). At that time the Phase One Property was located on the outskirts of Ottawa and it is inferred that it consisted of agricultural land. The development of properties surrounding the Phase One Property began prior to the early 1900s. Prior to development, surrounding properties are inferred to have been used primarily for agricultural purposes.

4.1.3 Fire Insurance Plans and Property Underwriters Reports and Plans

Fire insurance plans (FIPs) were obtained from Risk Management Services (RMS) for the years 1912, 1915, 1922 and 1956. Additional FIPs were obtained from the Library and Archives Canada in Ottawa for the years 1878, 1888 and 1902 and from the City of Ottawa Central Archives for 1948. FIPs for the years 1878, 1888 and 1902 did not provide coverage of the Phase One Property or immediately surrounding lands.

The coverage area for the remaining FIPs is described in the table below. It is noted that coverage of FIPs provided by RMS do not extend 250 metres from the Phase One Property perimeter in many cases. Where available, FIPs covering the remainder of the Phase One Study Area were reviewed at Library and Archives Canada and the City of Ottawa Central Archives to determine specific details and identify any environmentally relevant activities on surrounding properties further from the Phase One Property.

Year	Area Description Related to Phase One Property	Lot/Address Numbers
1912	Phase One Property and 250 metres surrounding with the exception of properties east of the Phase One Property beyond the Rideau Canal.	854-1022 Bank Street 30-192 Mutchmor Road 2-28 Regent Street 18-38 Clarey Avenue 41-198 Centre Street 1-11 Ann Street 7-25 Rupert Street 7-47 Adelaide Street 10-36 Mary Street 8-32 Monk Street 1-36 Thornton Avenue 9-45 Melgund Avenue 9-33 Woodlawn Avenue 1-21 Oakland Avenue 3-25 Wilton Crescent 7-35 Aylmer Avenue 15-46 Euclid Avenue 41-121 Sunnyside Avenue 309-335 Riverdale Avenue
1915	Covers the Phase One Property except area south of the race track (now the field at Frank Clair Stadium), to the Rideau Canal to the east and south, to Brown's Inlet to the west (215 m) and to Centre Street (now Holmwood Avenue) and Mutchmor Avenue (now Fifth Avenue) to the north.	Street numbers are not legible but coverage includes: Bank Street Monk Street Canal Road Wilton Crescent Oakland Avenue Woodlawn Avenue Centre Street O'Connor Street

Year	Area Description Related to Phase One Property	Lot/Address Numbers
1922	Phase One Property and 250 metres surrounding.	852-1040 Bank Street Monk Street (no numbers shown) 3-61 Wilton Crescent 1-20 Oakland Avenue 5-30 Woodlawn Avenue 5-221 Holmwood Avenue 2-68 Clarey Avenue 1-28 Regent Street 1-13 Howick Place 2-25 Rupert Street 7-53 Adelaide Street 632-672 O'Connor Street 30-224 Fifth Avenue 6-45 Melgund Avenue 2-36 Thornton Avenue 80-377 Sunnyside Avenue 31-146 Brighton Avenue 6-55 Southern Drive 684-864 Echo Drive 9-46 Euclid Avenue 2-18 Galt Street 6-72 Aylmer Avenue 68-100 Barton Street 21-200 Riverdale Avenue 25-64 Mason Terrace 2-26 Bower Street 3-68 Mutchmor Road
1948	Phase One Property and 250 metres surrounding.	852-1040 Bank Street Monk Street (no numbers shown) 3-61 Wilton Crescent 1-20 Oakland Avenue 5-30 Woodlawn Avenue 5-221 Holmwood Avenue 2-68 Clarey Avenue 1-28 Regent Street 1-13 Howick Place 2-25 Rupert Street 7-53 Adelaide Street 632-672 O'Connor Street 30-224 Fifth Avenue 6-45 Melgund Avenue 2-36 Thornton Avenue 80-377 Sunnyside Avenue 31-146 Brighton Avenue 6-55 Southern Drive 684-864 Echo Drive

Year	Area Description Related to Phase One Property	Lot/Address Numbers
		9-46 Euclid Avenue 2-18 Galt Street 6-72 Aylmer Avenue 68-100 Barton Street 21-200 Riverdale Avenue 25-64 Mason Terrace 2-26 Bower Street 3-68 Mutchmor Road
1956	Phase One Property and 250 metres surrounding with the exception of some properties east of the Phase One Property beyond the Rideau Canal.	852-1040 Bank Street Monk Street (no numbers shown) 3-61 Wilton Crescent 1-20 Oakland Avenue 5-30 Woodlawn Avenue 5-221 Holmwood Avenue 2-68 Clarey Avenue 1-28 Regent Street 1-13 Howick Place 2-25 Rupert Street 7-53 Adelaide Street 632-672 O'Connor Street 30-224 Fifth Avenue 6-45 Melgund Avenue 2-36 Thornton Avenue 80-377 Sunnyside Avenue 31-146 Brighton Avenue 6-55 Southern Drive 684-864 Echo Drive 9-46 Euclid Avenue 2-18 Galt Street 6-72 Aylmer Avenue 68-100 Barton Street 21-200 Riverdale Avenue 25-64 Mason Terrace 2-26 Bower Street 3-68 Mutchmor Road

The following significant information was inferred from the FIPs reviewed in reference to the Phase One Property and its surrounding properties:

Phase One Property

Year	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1912	<p>The Phase One Property is noted as the Central Canada Exhibition Grounds. Buildings include: the Grand Stand, an office, Dairy Building, Ladies Fine Arts Building, WCTU Building, Poultry Building (Coliseum Building), Main Building (Aberdeen Pavilion), 26 cattle and horse stables, Carriage Building, Machinery Hall (partially on the Phase One Property), six unidentified smaller structures throughout the Phase One Property, and four small buildings along the northern boundary, including a lavatory. The race track occupies the southern portion of the Phase One Property with a driving ring in the centre, the cattle and horse stables are south of the race track along the bank of the Rideau Canal. The Grand Stand is immediately north of the race track with the office, Dairy Building, Ladies Fine Arts Building, WCTU Building and the Poultry Building north of the Grand Stand. The Grand Stand was noted to be constructed of reinforced concrete and steel and that it was under construction in 1909, which suggests that it is not the original wooden Grand Stand. Two buildings on the northeast corner of the Phase One Property are inferred to be residential dwellings. No USTs, ASTs, coal storage or fuel storage is noted to be on Phase One Property.</p>	<ul style="list-style-type: none"> None identified. 	<ul style="list-style-type: none"> None identified.
1915	<p>The office building and WCTU Building located north of the Grand Stand are no longer present. An addition (Coliseum Annex) has been added to the north central and northeast portions of the Poultry Building that is now labelled as Howick Pavilion (Coliseum Building). A boiler is noted in the northeast corner of the newest addition, also located in the northeast corner of the building. The Horticultural Building has been constructed in its current location. The four smaller buildings, as noted on the 1912 FIP, remain along the northern Phase One Property perimeter. Two of those four buildings flank the west and east sides of the Horticultural Building, both are now labelled as "Lavatory". Other areas of the Phase One Property are similar to conditions noted in the 1912 FIP.</p>	<ul style="list-style-type: none"> Heating fuel storage and use (boiler) 	<ul style="list-style-type: none"> Coliseum Annex Boiler Rooms
1922	<p>Two small buildings have been constructed to the east and west of the Horticultural Building and are noted as an office (west) and Press Building (east). The Carriage Building, located on the southeast portion of the Phase One Property, has been renamed the RCMP Barracks. All other areas of the Phase One Property are similar to conditions noted in the 1915 FIP.</p>	<ul style="list-style-type: none"> Heating fuel storage and use (boiler) 	<ul style="list-style-type: none"> Coliseum Annex Boiler Rooms

Year	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1948	<p>The Ladies Fine Arts Building has been renamed Fancy Works Building and a Bandstand has been added to the east side of this building. The Main Building (Aberdeen Pavilion) has been renamed the Manufacturers' Building. An addition labelled the Work Shop was added to the east side of the Horticultural Building. A small building labelled First Aid Post was constructed east of the Press Building. The northeast addition housing the boiler on Howick Hall, now labelled the Coliseum, has been removed. A small outbuilding, connected to the north central addition via a corridor, was added north of the Coliseum Building and is identified as housing two boilers. An addition was also added to the west portion (the current two-storey office) and another branching off to the northwest of the Coliseum Building housing cow stalls. The cattle and horse stalls have been removed from the southern portion of the Phase One Property, as well as the RCMP Barracks. Three smaller buildings located north of the General Purpose Building may fall within the east Phase One Property perimeter. One of the three buildings is noted as the Beaver Boxing Club, while the other two are noted as vacant. Several roads transect the Phase One Property, including: Bright Road, Kent Driveway, Stuart Road, Fisher Road, Grisdale Road, and Paisley Road. No other changes were noted on the Phase One Property.</p>	<ul style="list-style-type: none"> • Heating fuel storage and use (boilers) 	<ul style="list-style-type: none"> • Coliseum Annex Boiler Rooms
1956	<p>A large addition has been added to the north central portion of the Coliseum Building, between the boiler outbuilding and the cow stalls. The addition is identified as housing horses. A transformer is noted west of the new addition, between it and the cow stalls addition. The Dairy Building has been renamed Assembly Hall. An addition, noted as a lavatory, was added to the northeast portion of the Manufacturers' Building (Aberdeen Pavilion). This addition is no longer present. The three buildings located north of the General Purpose Building are no longer present. All other areas of the Phase One Property are similar to conditions noted in the 1948 FIP.</p>	<ul style="list-style-type: none"> • Heating fuel storage and use (boilers) • Transformer Manufacturing, Processing and Use 	<ul style="list-style-type: none"> • Coliseum Annex Boiler Rooms • Coliseum Annex Transformer

Surrounding Properties

Year	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1912	<p>The Phase One Property is bounded by Centre Street (now Holmwood Avenue) to the north, Bank Street to the west, and the Rideau Canal to the south. Properties north, west and south of the Phase One Property are primarily residential in nature including the Protestant Home for the Aged, situated where the current Abbotsford House lies. Two churches are present on either side of Bank Street, south of the Rideau Canal. The Agricultural Building is located north of the east portion of the Phase One Property, where the current community park is located. Machinery Hall is located east of the Phase One Property, on the current NCC lands, with the exception of its southwest corner which encroaches onto the Phase One Property.</p>	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
1915	<p>Machinery Hall is now labelled as the General Purpose Building, the configuration of which has not changed. The property at 911 Bank Street, approximately 40 metres north of the Phase One Property, is shown as a "Chinese Laundry". Surrounding properties to the east and west remain unchanged from the 1912 FIP, while coverage of surrounding properties northwest, north and south of the Phase One Property were not available.</p>	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
1922	<p>Properties immediately surrounding the Phase One Property are unchanged from the 1915 FIP. Properties further beyond the Phase One Property are primarily residential in nature with the exception of limited commercial properties and two churches located along Bank Street. The Bank Garage was noted at 855 Bank Street, approximately 190 metres north of the Phase One Property.</p>	<ul style="list-style-type: none"> • Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles 	<ul style="list-style-type: none"> • Historic Repair Shops located to the north-northwest of the Phase One Property along Bank Street

Year	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1948	<p>Properties west of the Phase One Property remain generally unchanged. The General Purpose Building is still present east of the Phase One Property; however, it has changed from its previous configuration. The General Purpose Building is now half its previous size. A small building is located northeast of the General Purpose Building and is identified as housing a boiler. The Pure Food Building has been constructed north of the east portion of the Phase One Property, along O'Connor Street. The Agricultural Building has changed configuration and is now noted to be the Dog Show Building. A smaller building is also identified north of the Dog Show Building; however, it is not labelled. Commercial properties northwest of the Phase One Property along Bank Street included: gasoline service stations at 912 and 852 Bank Street, approximately 25 and 190 metres from the Phase One Property, respectively; automotive garages at 885 and 855 Bank Street, approximately 98 and 190 metres from the Phase One Property, respectively; a car dealership at 852 Bank Street, approximately 150 metres from the Phase One Property; and a "Chinese Laundry" at 911 Bank Street, approximately 40 metres from the Phase One Property. An electric substation is also noted at 115 Holmwood Avenue, approximately 12 metres from the Phase One Property near the Coliseum Annex.</p>	<ul style="list-style-type: none"> • Heating fuel storage and use (boilers) • Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles • Gasoline and Associated Products Storage in Fixed Tanks • Transformer Manufacturing, Processing and Use 	<ul style="list-style-type: none"> • Former Boiler House located on NCC lands immediately east of the Phase One Property • Historic Gas Station, Repair Shops located to the north-northwest of the Phase One Property along Bank Street
1956	<p>Properties surrounding the Phase One Property remain generally unchanged from the 1948 FIP. Commercial properties northwest of the Phase One Property along Bank Street included: gasoline service stations located at 912, 890 and 852 Bank Street, approximately 25, 98 and 190 metres northwest from the Phase One Property, respectively; and automotive garages at 901, 889, 875 and 855 Bank Street, approximately 55, 98, 105 and 190 metres north from the Phase One Property, respectively. In addition, the property at 911 Bank Street previously noted as a "Chinese Laundry", approximately 40 metres north of the Phase One Property, is now shown as an establishment that provides "cleaning" services.</p>	<ul style="list-style-type: none"> • Heating fuel storage and use (boilers) • Operation of Dry Cleaning Equipment (potential) • Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles • Gasoline and Associated Products Storage in Fixed Tanks • Transformer Manufacturing, Processing and Use 	<ul style="list-style-type: none"> • Former Boiler House located on NCC lands immediately east of the Phase One Property • Historic Gas Station, Repair Shops and Dry Cleaners (potential) located to the north-northwest of the Phase One Property along Bank Street

The electric substation located at 115 Holmwood Avenue north of the Phase One Property was not considered to represent an Area of Potential Environmental Concern (APEC) with respect to the Phase One Property due to the absence of any indication of transformers at the property on either the 1948 or 1956 FIP. In addition, the low mobility of the Contaminants of Potential Concern (COPCs) suspected to be associated with the electric substation (i.e. polychlorinated biphenyls or PCB) precludes the likelihood of soil impact at the Phase One Property. Furthermore, investigations required at the Phase One Property to assess the APEC associated with the former Coliseum Annex transformer would be sufficient to assess potential ground water impacts migrating from the former electric substation property onto the Phase One Property.

Numerous gas stations, service stations, automotive repair garages and dry cleaners were located to the north-northwest of the Phase One Property along Bank Street and have been identified collectively as representing an APEC with respect to the Phase One Property.

Copies of the FIPs obtained from RMS are presented in Appendix B.

4.1.4 Chain of Title

The land title search was subcontracted to Dave Wentzell Titles, a professional land title searcher. The land title review was undertaken to ascertain the potential for environmental impairment or concern related to past ownership, occupancy and activities at the Phase One Property dating back to Crown ownership.

The Corporation of the City of Ottawa acquired the land comprising Sylvia Holden Commemorative Park through individual purchases of land from private citizens from 1888 through to 1905. The remaining portion of the Phase One Property was acquired by the City of Ottawa through individual purchases of land from private citizens from 1888 through to 1907 with the exception of two small, narrow portions located along Queen Elizabeth Driveway to either side of the South Side Stands. These small portions were transferred from Her Majesty the Queen to the National Capital Commission in 1982 and then from the National Capital Commission to the Corporation of the City of Ottawa in 1991. The listed ownership changed to the Regional Municipality of Ottawa-Carleton in 1999 and effective January 2001, the Regional Municipality of Ottawa-Carleton became the City of Ottawa, the current owner of the Phase One Property.

A copy of the legal site survey plan is included in Appendix A while the chain of title is included in Appendix C.

4.1.5 City Directories

AMEC reviewed city directories, available at Library and Archives Canada in Ottawa, Ontario, for the years 1889/90, 1894/95, 1900, 1905, 1910, 1914, 1920, 1925, 1930, 1935, 1940, 1944, 1950, 1955, 1960, 1965, 1970, 1975, 1980, 1986, 1990, 1996, 2000, and 2006/07.

Phase One Property

According to the city directories reviewed, the following occupants were listed as being present at the Phase One Property with a municipal address of 1015 Bank Street, except where otherwise noted:

Year(s)	Occupant
1889/90	Ottawa Agricultural Grounds (no municipal address)
1894/95 - 1900	Lansdowne Park (977 Bank Street)
1900 - 1905	Exhibition Grounds (O'Connor Street)
1905	Lansdowne Park (Fifth Avenue)
1910 - 1930	Exhibition Grounds
1910 - 1935	Lansdowne Park
1910 - 1944	Canal Bridge
1940	Superintendent's Office
1940-1944	Department of National Defence Barracks
1950 - 1990	Central Canadian Exhibition Association
1955 - 1970	Coliseum
1965	Hitsman A C Ltd. (caterers)
1970 - 1990	Ottawa Football Club
1970 - 2006/07	Civic Centre Box Office/Civic Centre
1975 - 1986	Lansdowne Park Administration Office
1975 - 2006/07	Ottawa 67's Hockey Club
1990	Gusken Logistics and Show Services
1996 - 2000	CFRA
1996 - 2000	Eastern Breeders
1996 - 2000	ESPN
1996 - 2000	Global Xchange
1996 - 2000	Inasec Incorporated
1996 - 2000	National Show Group
1996 - 2000	Ogden Entertainment Services
1996 - 2000	Trevi Pools Inc.
1996 - 2006/07	Coliseum Sports and Recreation Centre
1996 - 2006/07	VYVX
1996 - 2006/07	Ottawa Renegades Football Club
2006/07	Visiting Radio
2006/07	Aramark Entertainment Services

No Potentially Contaminating Activities (PCAs) and/or APECs associated with the historic Phase One Property occupants were identified at the Phase One Property from the review of the city directories.

Surrounding Properties

According to the city directories reviewed, the following occupants were noted as undertaking Potentially Contaminating Activities at referenced surrounding properties within the Phase One Study Area. Those PCAs located north of the Phase One Property are considered to represent APECs at the Phase One Property. PCAs located south of the Phase One Property reside hydraulically downgradient or transgradient with respect to the Phase One Property and thus are not considered to comprise APECs at the Phase One Property.

Address	Distance/Direction From Phase One Property	Years	Occupant	Potentially Contaminating Activity
Bank (North of the Rideau Canal)				
817	235 m North	1940	Kleen White Laundry Society (cleaners & dyers)	Operation of Dry Cleaning Equipment
829	235 m North	1970 - 2006/07	Glebe Fashion Cleaners	Operation of Dry Cleaning Equipment
831	235 m North	1955	Blackwell Lyle Cleaners	Operation of Dry Cleaning Equipment
		1965 - 1980	Glebe Fashion Cleaners (additional space)	
837	235 m North	1955 - 1960	George Cleaners and Tailors	Operation of Dry Cleaning Equipment
		1965 - 1970	Vern's Cleaners and Tailors	
852	190 m North	1930 - 1950	Cities Service Oil Co. Ltd. (service station)	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles
		1960	Noel's Cities Service Station	
		1970 - 2006/07	McKale's BP Service Station/Petro Canada/Autopro	
856	150 m Northwest	2000 - 2006/07	Browns Cleaning	Operation of Dry Cleaning Equipment
890	98 m North	1955	Ottawa Motor Sales Service Station	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles Gasoline and Associated Products Storage in Fixed Tanks
		1965 - 1970	Texaco Service Station	
		1980 - 2006/07	Mister Muffler	
911	40 m North	1935	Glebe Laundry	Operation of Dry Cleaning Equipment (potential)
		1940-1944	Help Sing Hand Laundry	
912	25 m Northwest (Kettleman's property)	1940 - 1950	Supertest Petroleum Corp	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles Gasoline and Associated Products Storage in Fixed Tanks
		1955 - 1960	MacLennan's Supertest Service Station	
		1965	MacLennan's Cecil Supertest Service Station	
		1970	Barry's Supertest Service Station	

Address	Distance/Direction From Phase One Property	Years	Occupant	Potentially Contaminating Activity
1014	23 m West (corner Bank & Wilton)	1960	Lansdowne BP Service Station	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles Gasoline and Associated Products Storage in Fixed Tanks
		1965-1970	Lindsay's BP Service Station	
		1975	Blyth's Service Centre	
1016	23 m West (corner Bank & Wilton)	1940	Alladin Cleaners, Dyers and Tailors	Operation of Dry Cleaning Equipment
Bank (South of the Rideau Canal)				
1050	178 m Southwest	1930 - 1955	Imperial Oil Station	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles Gasoline and Associated Products Storage in Fixed Tanks
		1960	Blaney's Esso Service Station	
		1965 - 1975	Edwards Esso Service Centre	
1060	215 m Southwest	1950 - 1965	Burchill's Service Station	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles Gasoline and Associated Products Storage in Fixed Tanks
1063	210 m South	1955	Patterson Motors Ltd.	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles Gasoline and Associated Products Storage in Fixed Tanks
		1960 - 1965	Bowes Fred Services Station	
		1970 - 1990	Roy Barber Service Station	
		2000	MacEwen Petroleum	

4.1.6 Company Records

During the site reconnaissance, AMEC reviewed the Materials Safety Data Sheets (MSDS) for all chemicals used and stored at the Phase One Property. The MSDS are contained in a binder located in the Operations Area of the Civic Centre and are accessible to all employees. Chemicals included: cleaning products, hygiene products, deodorant products, caulking and adhesives, fuels and solvents, gases, de-icing products, and water treatment chemicals. A list of chemicals used and stored at the Phase One Property was provided to AMEC and can be referenced in Appendix D.

4.1.7 Historical Maps and Documentation

4.1.7.1 Historical Documentation

AMEC reviewed the booklet titled *“The Central Canada Exhibition Association, Through 65 Years, 1888-1953”*. The following important historical information was identified:

- 1874 The City was deeded 24.5 acres of Lansdowne Park by the Dominion Government and acquired the remaining 15 acres through purchases from private citizens.
- 1875 Buildings that were constructed included: the Main Building (a.k.a. Agricultural Building, Dog Show Building, and Manufacturers’ Annex), Ladies’ and Arts’ Building and attached band stand, Manitoba Hall, Dairy Building, the Grand Stand, stables for cattle and horses, and pens for sheep and swine. Note: the Main Building was moved from the centre of the Phase One Property closer to the Canal, immediately north of the east corner of the Phase One Property.
- 1875-1887 Three provincial exhibitions were held at Lansdowne Park.
- 1888 The CCEA was incorporated.
- 1891 The Ottawa Electric Railway street cars extended to what is now the main entrance of the Phase One Property on Bank Street.
- 1898 The Aberdeen Pavilion (a.k.a. Manufacturers’ Building, Cattle Castle) opened.
- 1903 The original part (central and east portions) of the Coliseum Building was constructed for use as a Fat Stock and Poultry Show Building. The Aberdeen Pavilion was converted into a hockey rink during the winter months. The Ottawa Football Club began renting the land to the south of the Grand Stand.
- 1906 The main part of the Coliseum Building (a.k.a. Howick Hall) was expanded to the east.
- 1907 The Ladies’ and Arts’ Building, Experimental Farms Building, Dairy Building and the original wooden Grand Stand were all destroyed by fire.
- 1908 The Ladies’ and Arts’ Building (a.k.a. Ladies Fine Arts Building) was constructed.
- 1909 The Grand Stand was rebuilt using steel and concrete construction. The lower level of the Grand Stand housed a dining hall, Secretary’s office, Treasurer’s office, Press Room, Fire Station, Police Station and exhibition hall.
- 1913 The Machinery Hall was constructed immediately adjacent to the east Phase One Property perimeter with only the southwest portion extending onto the Phase One Property.
- 1914 The Horticultural Building was constructed. The Department of Militia and Defence (now the Department of National Defence) used the grounds and buildings during World War I for the training of troops.
- 1920 The Press Building was constructed immediately east of the Horticultural

- Building.
- 1925-1926 The cattle and horse stables and sheep and swine pens were torn down. The livestock was then housed in the additions added to the Coliseum Building in 1926.
- 1926 Extensive additions (Coliseum Annex) were added to the northeast and northwest of the Coliseum to house livestock. The Pure Foods Building, located immediately north of the east portion of the current Phase One Property boundary, was constructed.
- 1941-1946 The Department of National Defence occupied the Phase One Property during World War II for the training of military troops. No exhibitions were staged during this period.
- 1944 Machinery Hall was destroyed by fire. The General Purpose building was constructed in the same location as the previous Machinery Hall.
- 1950 A large addition was added to the Coliseum between the two previous additions in 1926. This newest addition was called the Livestock Pavilion.

4.1.7.2 *Lansdowne Park Website*

AMEC reviewed the internet webpage titled "Historical Dates" that is available to the general public via the Lansdowne Park website (www.lansdownepark.ca). The following important historical information was identified:

- 1868 The City of Ottawa Agricultural Society acquired part of the Phase One Property for use as a show-ground.
- 1875 The first real exhibition was held on the Phase One Property.
- 1888 The CCEA was formed. The City acquired an expanded site and any existing buildings. Horticultural Hall and the Grand Stand were constructed.
- 1898 The Aberdeen Pavilion (a.k.a. Manufacturers' Building, Cattle Castle) was opened. The Aberdeen Pavilion was used as a skating rink during the winter.
- 1903 The Coliseum Building was constructed for use as a fat stock (cattle and horses) and poultry show building.
- 1904 The roof collapsed on the Coliseum Building due to snow accumulation and was re-constructed.
- 1905 The roof of the Coliseum Building collapsed for a second time due to snow accumulation and was re-constructed.
- 1906 Additions were added to the Coliseum Building and the main portion of the building was used as an auditorium and show ring. The auditorium/show ring was named Howick Hall.

- 1909 A new steel and reinforced concrete Grand Stand was constructed.
- 1914 The boiler within the Coliseum Building exploded, killing three men and injuring several others. Major repairs to the roof and other areas of the building were required due to the explosion.
- 1926 Several additions were added to the Coliseum Building.
- 1950 The livestock pavilion was added to the Coliseum Building.
- 1957 The McElroy Building was built.
- 1961 The General Purpose Building was converted into a public pay-as-you-go curling rink (Curl-O-Drome) housing seven sheets of ice.
- 1963 Eight sheets of ice for curling were added to the McElroy Building.
- 1967 Construction of the Civic Centre was completed.
- 1969 Five sheets of ice for curling were added to the Horticultural Building.
- 1973 The City of Ottawa took over the operation of Lansdowne Park from the CCEA.
- 1982 The Aberdeen Pavilion was declared a Heritage Structure.
- 1983 The Aberdeen Pavilion was declared a National Historical Site.
- 1992 The Aberdeen Pavilion was restored. The Curl-O-Drome (General Purpose Building) was demolished and the area converted to green space, now owned by the NCC.

PCAs at the Phase One Property identified in the booklet titled *“The Central Canada Exhibition Association, Through 65 Years, 1888-1953”* and the Lansdowne Park website include Gasoline and Associated Products Storage in Fixed Tanks associated with former Coliseum Annex boiler room. This PCA, along with suspected ice making plants at the former General Purpose Building, former McElroy Building and Horticultural Building are considered to be APECs at the Phase One Property.

4.1.7.3 Historical Maps

Historical maps depicting various stages of the development of Lansdowne Park from various years were provided by the City of Ottawa. The following information was derived upon review of the historical maps:

Year	Observations
1870	The Phase One Property is noted as “Fairground” and consists of a large cross-shaped building and several smaller buildings, primarily located along the Canal. An inlet (bay) of the Canal extends onto the east-central portion of the Phase One Property.

Year	Observations
1896	The Phase One Property does not extend to Centre Street (now Holmwood Avenue). An irregular-shaped building, noted as the Main Building, is located where the Aberdeen Pavilion now stands. Several small buildings are noted north of the Grand Stand including: Horticultural Hall, Dairy Building, Picture Gallery, Central Canada Experimental Farm, Driving Hall and the Poultry Building. The southern limit of the arm of the Canal extending onto the east-central portion of the Phase One Property is noted as having been in-filled. The Agricultural Implement Building and Carriage Building are noted on the east portion of the Phase One Property. Several cattle and horse stables are located on the southern portion of the Phase One Property, south of the race track.
1900	The Main Building (now Aberdeen Pavilion) has been constructed. The north portion of the current Phase One Property is not yet part of Lansdowne Park. It is occupied by individual residential lots and residences as well as Lansdowne Avenue, Alexandria Street and Mary Street (now O'Connor Avenue) extension. The arm of the Canal extending onto the Phase One Property appears to have been further in-filled and made into a pond. The Agricultural Implement Building has been renamed as Machinery Hall.
c.1946	The Main Building (now Aberdeen Pavilion) has been renamed the Manufacturers' Building. The north portion of the Phase One Property has been extended to Holmwood Avenue. The Coliseum Building and its additions, the Horticultural Building, Press Building, and the East and West Lavatories occupy the northwest portion of the Phase One Property. The General Purpose Building on the NCC lands east of the Phase One Property was noted as a garage. The garage was used for storage and parking of equipment and vehicles and not for vehicle repairs and/or maintenance. The pond has been in-filled and several small buildings, including one for gasoline and oil storage, were noted on the east portion of the Phase One Property, near the General Purpose Building. A new Grand Stand has been built, along with three smaller buildings, replacing those previously noted in the historical maps. The buildings located north of the Grand Stand now include the Dairy Building, S.A. Hut, Arts Building, and Telephone Building. The Pure Foods Building and Dog Show Building are noted immediately north of the eastern portion of the Phase One Property. Two buildings, noted as the CWAC mess and quarters, are located immediately east of the Phase One Property. The East Lavatory (east of the Horticultural Building) is noted as a former boiler room used by the Military. A boiler room is also noted in the north Annex of the Coliseum Building, northeast of the current northeast corner of the building. It should be noted that the historic plan is hand drawn and comparison with aerial photographs of the same vintage indicates that the boiler room does not extend as close to Holmwood Avenue as the historic plan indicates.
1953	The Dairy Building has been renamed the Assembly Hall. The General Purpose Building, race track and Dog Show Building (former Agricultural Building) are not identified on the map. Details are not provided for the south and east portions of the Phase One Property.

Historical maps and photographs are provided in Appendix E, while Figures 4a through 4e depict the various stages of development and historic buildings that have been present at Phase One Property. It should be noted that while the utmost care was taken to accurately locate the historic buildings relative to the existing Phase One Property features, the accuracy and/or distortion of the original maps may limit the accuracy of AMEC's figures.

PCAs at the Phase One Property identified on the historical maps include: 1) Gasoline and Associated Products Storage in Fixed Tanks, associated with former boiler rooms located at the former East Lavatory and former Coliseum Annex; and 2) Importation of Fill Material of Unknown Quality used to backfill the former inlet of the Rideau Canal. These PCAs are considered to be APECs at the Phase One Property.

4.1.7.4 Historical Building Plans

Historical plans were provided by the City for the Horticultural Building and McElroy Building.

The plans provided for the Horticultural Building were undated architectural plans prepared by Allan Keefer for the CCEA. The plans included a floor plan of the basement level which depicts a boiler room near the southeast corner of the building. A coal storage room and a coal chute were formerly located south of the boiler room at the front of the building immediately east of the entrance. The boiler room represents a PCA (Gasoline and Associated Products Storage in Fixed Tanks), and together with the former storage and use of coal as heating sources, are considered to be APECs with respect to the Phase One Property.

Historic architectural plans (name not legible) of the McElroy Building prepared for the CCEA and dated 1980 indicate a former boiler room and former transformer vault at the southeast corner of the building. The boiler room appears to have been located on a subgrade level beneath the southeast corner while the former transformer vault was located at grade and slightly north of the southeast corner. Associated PCAs include Gasoline and Associated Products Storage in Fixed Tanks (former boiler room) and Transformer Manufacturing, Processing and Use (former transformer vault), both of which are considered to be APECs at the Phase One Property.

4.1.8 Environmental Reports

The following environmental site assessment reports were provided to AMEC by the City and summarized below:

- *“Commerce Building, Lansdowne Park, Soils Investigation, Ottawa, Ontario”*, Intera Information Technologies (Canada) Ltd. (Intera), September 30, 1993 (Intera 1993).
- *“East Lavatory and Boiler Plant Soil Excavations, Lansdowne Park, Ottawa, Ontario”*, Intera Information Technologies (Canada) Ltd. (Intera), March 31, 1994 (Intera 1994).
- *“Phase I – Environmental Site Assessment, Lansdowne Park, 945 to 1015 Bank Street, Ottawa, Ontario”*, John D. Paterson and Associates Limited, February 6, 1998 (Paterson 1998a).
- *“Limited Phase II Environmental Site Assessment, Lansdowne Park, 945 – 1015 Bank Street, Ottawa, Ontario”*, John D. Paterson and Associates Limited, August 28, 1998 (Paterson 1998b).
- *“Environmental Site Characterization, Lansdowne Park, 945 – 1015 Bank Street, Ottawa, Ontario”*, John D. Paterson and Associates Limited, January 11, 1999 (Paterson 1999a).
- *“Environmental Building Assessment, Coliseum Building, Lansdowne Park, Ottawa, Ontario”*, John D. Paterson and Associates Limited, January 11, 1999 (Paterson 1999b).
- *“Environmental Building Assessment, Horticulture Building, Lansdowne Park, Ottawa, Ontario”*, John D. Paterson and Associates Limited, January 11, 1999 (Paterson 1999c).

- *“Environmental Building Survey, Civic Centre and Frank Clair Stadium, Lansdowne Park, Ottawa, Ontario”*, John D. Paterson and Associates Limited, January 11, 1999 (Paterson 1999d).
- *“Old Landfill Management Data Gap Analysis, Lansdowne Park (Ur-27), 945-1015 Bank Street, Ottawa, Ontario”*, John D. Paterson and Associates Limited, November 10, 2003 (Paterson 2003).
- *“Summary of Known Environmental Conditions (Specific to Contaminated Lands Issues), Lansdowne Park, Ottawa, Ontario”*, Golder Associates Ltd., February 1, 2008 (Golder 2008).
- *“Phase I Environmental Site Assessment, Lansdowne Park and Sylvia Holden Park, 945-1015 Bank Street, Ottawa, Ontario”* AMEC Earth & Environmental, a division of AMEC Americas Limited, March 19, 2010 (AMEC 2010a).
- *“Phase II Environmental Site Assessment, Lansdowne Park and Sylvia Holden Park, 945-1015 Bank Street, Ottawa, Ontario”* AMEC Earth & Environmental, a division of AMEC Americas Limited, June 14, 2010 (AMEC 2010b).
- *“Preliminary Geotechnical Investigation, Proposed Lansdowne Park Redevelopment, Bank Street at Holmwood Avenue, Ottawa, Ontario”*, Paterson Group, March 17, 2010 (Paterson 2010a).
- *“Geotechnical Investigation, Proposed Stormwater Management System, Lansdowne Park, Ottawa, Ontario”*, Paterson Group, September 27, 2010 (Paterson 2010b).

Other reports provided to AMEC but not considered relevant to this investigation, either due to the nature of the subject matter or changes to the Phase One Property since their issuance, included:

- *“Environmental Building Survey, McElroy Building, Lansdowne Park, Ottawa, Ontario”*, John D. Paterson and Associates Limited, January 11, 1999.
- Letter to City of Ottawa, *Remediation Cost Estimate of Impacted Areas and Environmentally Sensitive Materials, Lansdowne Park*, John D. Paterson and Associates Limited, January 11, 1999.
- Letter to City of Ottawa, *Asbestos and Contaminated Soil/Waste Remediation Cost Estimates*, John D. Paterson and Associates Limited, January 7, 1999.
- Letter to City of Ottawa, *Asbestos and Contaminated Soil/Waste Remediation Cost Estimates*, John D. Paterson and Associates Limited, December 29, 1998.
- *Asbestos Management Manual, Lansdowne Park.*, Trow and Associates Ltd., undated (pre-1990).

4.1.8.1 *Intera Soils Investigation (1993)*

Intera was retained by the City to investigate surface and potential subsurface soil impacts in the vicinity of the Commerce Building, currently known as the Horticultural Building. Five boreholes were advanced at various locations surrounding the Horticultural Building, which included: west of the East Lavatory (BH-1); east of the north portion of the building (BH-2); west of the south portion of the building (BH-3); south of the southeast corner of the building (BH-4); and east of the southeast corner of the building (BH-5). The boreholes were advanced to assess areas of visible surface staining (BH-1 and BH-3); used oil storage (BH-1 and BH-2); former coal storage (BH-5); a possible former AST (BH-4); and the storage of paint thinner (BH-1).

Soil conditions encountered during Intera's soil investigation consisted primarily of compact, fine to coarse textured sand, with lenses of gravel, silt and clay. No visual or olfactory evidence of petroleum hydrocarbon impact were noted in the soils collected from BH-2 through BH-5. Staining and varsol and petroleum hydrocarbon odours were noted within the soil collected from BH-1, up to 1.8 metres below ground surface. With the exception of BH-2, ground water was not encountered at any of the borehole locations. Given that ground water was not encountered and that soil and ground water within BH-2 did not show signs of petroleum hydrocarbon impact, ground water monitoring wells were not installed during Intera's investigation.

Soil samples collected from 2.4 to 3.0 metres below ground surface from boreholes BH-2, BH-3 and BH-5 were submitted for laboratory analysis of benzene, toluene, ethylbenzene xylenes (BTEX) and total petroleum hydrocarbons (TPH). One soil sample, collected from 0.6 to 1.2 metres below ground surface at BH-5, was submitted for laboratory analysis of polycyclic aromatic hydrocarbons (PAH), sulphur, BTEX, TPH, and select metals and inorganic compounds. In addition, two soil samples, collected from 0.6 to 1.2 and 2.4 to 3.0 metres below ground surface at BH-1, were submitted for laboratory analysis of one or more of BTEX, TPH and select metals and inorganic parameters.

Results were compared to criteria provided in the "*Southeastern Region Decommissioning/Cleanup Protocol*", (MOE, 1992). Laboratory results confirmed that soil impacts were not present in the vicinity of BH-3, BH-4 or BH-5. Elevated levels of TPH were identified at BH-2; however, concentrations did not exceed the applicable criteria. TPH levels within BH-1 were found to exceed the applicable criteria. The impacted soils were estimated to extend approximately 2.4 metres below ground surface.

Intera recommended that further work, including the excavation of TPH impacted soils, would be required in the vicinity of the East Lavatory. Intera estimated the extent of the impacted soils requiring removal from the Phase One Property at 11 cubic meters.

The boiler room at the Horticultural Building and former boiler rooms at the former East Lavatory and former Coliseum Annex are considered to be APECs at the Phase One Property

4.1.8.2 *Intera Soil Excavations (Intera 1994)*

Intera was retained by the City to oversee the excavation of petroleum hydrocarbon contaminated soils in the vicinity of the former East Lavatory and the former boiler plant in the Coliseum Annex.

The excavations were completed by Goode-X-Equipment Limited under the supervision of Intera on March 7 and 14, 1994. Approximately 15 and 270 cubic metres of soil were removed from the former East Lavatory and the Annex boiler plant areas, respectively. The excavations were backfilled with clean fill material. Composite soil samples were collected from each of the excavated soil stockpiles and submitted for laboratory analysis of TPH, flashpoint and leachate characterization as per Ontario Regulation 347. Laboratory results classified the excavated soil as non-hazardous solid waste. Excavated soils were removed from the Phase One Property by Huneault Waste Management (now BFI Canada) for disposal at its landfill in Navan, Ontario. It is noted that the Annex excavation was completed at the location of the second and more central former boiler room location and that no investigation or remediation appears to have been carried out with respect to the original, more easterly boiler room location.

The former boiler rooms at the former East Lavatory and former Coliseum Annex are considered to be APECs at the Phase One Property.

4.1.8.3 *Paterson Phase I ESA (Paterson 1998a)*

John D. Paterson and Associates Limited ("Paterson") was retained by the City to complete a Phase I ESA of the Phase One Property in 1998 (Paterson, 1998a). Paterson's Phase I ESA included the review of 10 previous environmental reports, including: "*Commerce Building, Lansdowne Park, Soils Investigation*" completed by Intera Information Technologies in 1993; and "*East Lavatory and Boiler Plant Soil Excavations*" also completed by Intera Information Technologies dated 1994. Based on information gathered during Paterson's Phase I ESA, the following potential environmental concerns were noted:

- Soil excavations, including the removal of petroleum impacted soils from the Phase One Property, were previously completed at the East Lavatory and Coliseum Annex (north central addition) boiler room;
- Two waste disposal areas were suspected to exist on the south and northeast portions of the Phase One Property;
- PCB containing light ballasts and transformers were likely present at the Phase One Property;
- Lead based paints and lead containing concrete were likely present within the older Phase One Property buildings;
- Asbestos was likely present in some building materials within the older Phase One Property buildings;

- An oil spill had occurred in the basement boiler room of the historic McElroy Building; and,
- Ice making plants for on-site historic curling rinks were formerly located in the basement levels of the Horticultural Building and McElroy Building.

A temporary aboveground storage tank (AST) used for the storage of fuel by snow removal contractors was noted as being located at the north end of the South Side Stands. During Paterson's Phase I property inspection, oil was observed in the storm sewer sump located within the Holding Area of the Civic Centre. The City retained a licensed contractor, Sewer-Matic Services, to pump the oil and oily water from within the sump for off-site disposal. Paterson later returned to inspect the sump and found the water within to be free of visible sheen and product. Paterson further noted that the spill and cleanup were reported to the MOE and the City of Ottawa Sewer Use Branch, who were both satisfied with the cleanup. Due to subsequent reconfiguration of the sump cover, the sump could not be inspected during AMEC's site reconnaissance.

Paterson also observed a hydraulic oil leak within the piston elevator in the Civic Centre. The oil had leaked into the associated sump pit. The City retained its elevator maintenance contractor at that time, Otis, to clean the sump pit of all oil and oily water. AMEC inspected the elevator sump during a site reconnaissance and no evidence of leakage of hydraulic oil was observed.

Based on Paterson's findings, recommendations were made to undertake additional investigations including subsurface soil and ground water sampling programs and designated substance surveys for building materials. Subsurface investigations were recommended to address the following concerns: the two waste disposal (landfill) areas; the two petroleum impacted soil excavations (East Lavatory and Coliseum Annex boiler room); fill quality at the former General Purpose Building, Machinery Building, Dairy Building, Bandstand, Coliseum Annex and Cow Stable; the former oil spill in the basement of the McElroy Building; the former ice making plant in the Horticultural Building; and the ice making plant in the Civic Centre. Designated substance surveys were recommended in the Coliseum Building, Horticultural Building, McElroy Building, Frank Clair Stadium and Civic Centre.

The former boiler rooms at the former East Lavatory and former Coliseum Annex, suspected landfills, oil spill in the basement boiler room of the former McElroy Building, and former ice making plants located in the Horticultural Building and McElroy Building are considered to be APECs at the Phase One Property

4.1.8.4 *Paterson Limited Phase II ESA (Paterson 1998b)*

Paterson was retained by the City to carry out a limited Phase II ESA in 1998 (Paterson 1998b) to investigate the subsurface soil and ground water conditions within the area of the two closed landfills (Eastern Landfill east of Aberdeen Pavilion and a suspected Southern Landfill south of Frank Clair Stadium) and the two areas where petroleum impacted soil had previously been

excavated (East Lavatory and Coliseum Annex boiler room). Thirteen boreholes and three monitoring wells (MW10, MW12 and MW15) were advanced at various locations across the Phase One Property to depths ranging from 3.7 to 7.6 metres below grade.

Six soil samples were collected from select locations and submitted for laboratory analysis of one or more of the following: total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene and xylenes (BTEX), and selected metals and inorganic parameters. All three ground water monitoring wells were sampled and analyzed of one or more of the following: TPH, BTEX, selected metals and inorganics, and volatile organic compounds (VOC).

Paterson identified a discontinuous layer of refuse, debris and peat within the boreholes advanced at the Phase One Property. A sulphur odour was noted in the ground water collected from MW12, located within the northeast landfill area. Shallow ground water flow was inferred to be in a north-easterly direction.

Concentrations of manganese and sodium above the applicable MOE Drinking Water Objectives were detected at MW12. Conductivity, boron and lead concentrations in soil collected from BH13 exceeded the applicable Table B criteria as provided in the MOE "Guideline for Use at Contaminated Sites in Ontario" (revised 1997), referred to hereafter as the MOE 1997 Guideline. Evidence of petroleum hydrocarbon and ammonia impact were noted in the soil and/or ground water collected from BH9, MW10 and BH16, all of which were located near the East Lavatory and next to the Horticultural Building, where an ice making plant was formerly located in the basement level. Based on these findings, Paterson recommended that additional subsurface investigations be completed in the area of the two closed landfills and the area of the former East Lavatory.

The Eastern Landfill (Ur-27), the Suspected Southern Landfill, the former East Lavatory boiler room and the former ice making plant at the Horticultural Building are considered to be APECs at the Phase One Property.

4.1.8.5 *Paterson Environmental Site Characterization (Paterson 1999a)*

Paterson was retained by the City in 1998 to carry out a follow up environmental site characterization (Paterson, 1999a) to further investigate the subsurface soil and ground water conditions in the vicinity of the two closed landfills (Eastern Landfill east of Aberdeen Pavilion and a suspected Southern Landfill south of Frank Clair Stadium) and the area of previously excavated petroleum impacted soil in the vicinity of the East Lavatory. Twenty boreholes and three monitoring wells (MW27, MW31 and MW36) were advanced in the targeted areas of the Phase One Property to depths ranging from 4.4 to 6.7 metres below grade.

Eleven soil samples were collected from select locations and submitted for laboratory analysis of one or more of the following parameters: TPH; BTEX, metals and inorganic parameters. Only one of the ground water monitoring wells, MW27, was sampled and submitted for laboratory

analysis of selected metals and inorganics, methane, and hydrogen sulphide. Ground water results had not been received from the lab upon completion of the report.

The average depth of the waste located beneath the east portion of the Phase One Property ranged between 2 and 5.5 metres below grade with a thickness of up to 3 metres. Conclusions presented in Paterson's Site Characterization report indicated the presence of isolated arsenic, boron, lead and zinc concentrations exceeding MOE 1997 Guideline Table B criteria within the closed landfill area beneath the east portion of the Phase One Property. Recommendations were made to segregate the debris and domestic wastes from the excavated soil and only dispose impacted materials that exceed the MOE 1997 Guideline Table B criteria for residential land use. Paterson estimated that 9,000 square metres of impacted soil exceeding MOE 1997 Guideline Table B criteria and 1,000 square metres of debris within the closed landfill on the east portion of the Phase One Property would require off-site disposal.

Paterson's characterization of the heavy oil impact near the East Lavatory concluded that only minor impacts were present along the northern Phase One Property perimeter. Paterson further concluded that additional work was not required unless soils in this area would require removal during future proposed residential development, at which time, off-site disposal of approximately 200 square metres of soil would have been required. However, issues relating to the former ice making plant at this location were not further assessed.

For reference purposes, soil and ground water data provided in Paterson (1998b, 1999a) were compared to the 2011 Table 3 SCS as provided in *Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act* (April 15, 2011) for non-potable ground water use for sites with coarse textured soils and residential/parkland/institutional property use. The comparison yielded the following results:

- Antimony concentrations reported in soil at BH37 (9.0 µg/g) and BH38 (10 µg/g) exceed the 2011 Table 3 SCS for residential property use (7.5 µg/g) but not the 2011 Table 3 SCS for commercial property use (40 µg/g);
- Arsenic concentrations reported in soil at MW31 (21µg/g) and BH39 (20 µg/g) exceed the 2011 Table 3 SCS for both residential property use (18 µg/g) and commercial property use (18 µg/g);
- The cadmium concentration reported in soil at BH32 (6.0 µg/g) exceeds the 2011 Table 3 SCS for both residential property use (1.2 µg/g) and commercial property use (1.9 µg/g);
- Lead concentrations reported in soil at MW12 (130 µg/g), BH13 (390 µg/g), MW31 (1,600 µg/g), BH32 (200 µg/g), BH33 (840 µg/g), BH38 (290 µg/g) and BH39 (508 µg/g), all located within the eastern closed landfill, exceed the 2011 Table 3 SCS for both residential property use (120 µg/g) and commercial property use (120 µg/g). Several locations also exceed the 2004 Table B SCS for residential (200 µg/g) and/or commercial (1,000 µg/g) property use;

- The selenium concentration reported in soil at BH39 (5.0 µg/g) exceeds the 2011 Table 3 SCS for residential property use (2.4 µg/g) but not the 2011 Table 3 SCS for commercial property use (5.5 µg/g);
- Zinc concentrations reported in soil at BH32 (2,400 µg/g) and BH39 (400 µg/g) exceed the 2011 Table 3 SCS for both residential property use (340 µg/g) and commercial property use (340 µg/g). Sample BH32 also exceeds the 2004 Table 3 SCS for residential (600 µg/g) and/or commercial (600 µg/g) property use.
- Boron concentrations reported at BH13 (2.0 µg/g), BH32 (4.5 µg/g), and BH33 (4.0 µg/g) exceed the 2004 Table 3 SCS for both residential property use (1.5 µg/g) and commercial property use (2.0 µg/g). While these standards are the same for the 2011 Table 3 SCS, they are only applicable to the top 1.5 metres of the soil column as hot water extractable boron. Below 1.5 metres depth the MOE has established a total boron 2011 Table 3 SCS of 120 µg/g for both residential and commercial property use; and,
- Conductivity values reported in soil at BH11 (0.82 mS/cm), BH13 (1.11 mS/cm), MW31 (1.5 mS/cm), BH32 (0.92 mS/cm), BH38 (0.71 mS/cm) and BH39 (1.1 mS/cm) exceed the 2011 Table 3 SCS for both residential property use (0.7 mS/cm). Sample MW31 (1.5 mS/cm) also exceeds the 2011 Table 3 SCS for commercial property use (1.4 mS/cm). The 2011 SCS are identical to the 2004 SCS.

The Eastern Landfill (Ur-27), the Suspected Southern Landfill and the former East Lavatory boiler room are considered to be APECs at the Phase One Property.

4.1.8.6 *Paterson Coliseum Building Assessment (Paterson 1999b)*

Paterson was retained by the City to conduct an asbestos survey within the Coliseum Building (Paterson 1999b). Seven samples were collected from various locations throughout the building. Of the seven samples submitted for analysis, three were found to be positive for asbestos (chrysotile). It was estimated that 25 metres of asbestos-containing piping runs and jacketing and 190 square metres of asbestos-containing floor tiles were present within the Coliseum building.

4.1.8.7 *Paterson Horticultural Building Assessment (Paterson 1999c)*

Paterson was retained by the City to conduct an asbestos survey within the Horticultural Building (Paterson, 1999c). Eleven samples were collected from various locations throughout the building. Of the eleven samples submitted for analysis, seven were found to be positive for asbestos (chrysotile). It was estimated that 25 metres of asbestos-containing piping runs and jacketing, 50 square metres of asbestos-containing floor tiles, and 70 asbestos-containing piping elbows were present within the Horticultural Building.

4.1.8.8 *Paterson Civic Centre and Frank Clair Stadium Building Survey (Paterson 1999d)*

Paterson was retained by the City to conduct an asbestos survey within the Civic Centre and Frank Clair Stadium (Paterson, 1999d). Thirty-six samples were collected from various locations throughout the building. Of the thirty-six samples submitted for analysis, eighteen were found to be positive for asbestos including chrysotile and crocidolite varieties. It was estimated that asbestos-containing materials were present within 100 metres of piping runs and jacketing, 350 metres of roof drain leaders, 10 valves, 54 tees and 70 elbows within the Civic Centre; and 215 square metres of panelling and exterior siding, 1,000 metres of roof drain leaders, 1 valve, and 41 elbows within Frank Clair Stadium.

4.1.8.9 *Paterson Data Gap Analysis (Paterson 2003)*

Paterson was retained by the City in 2003 to carry out a Data Gap Analysis of the Lansdowne Park landfills in accordance with the City's Old Landfill Management strategy (OLMS) (Paterson, 2003). The objective of the Data Gap Analysis was to identify and characterize actual or potential human health risks associated with the closed landfills at the Phase One Property, more specifically the confirmed landfill located on the east portion of the Phase One Property (Ur-27). Based on Paterson's review of previous subsurface investigations and information gathered as part of the Data Gap Analysis, Paterson concluded that the inferred area of fill located on the southern portion of the Phase One Property was not a landfill; however, it was an area reported to contain fill material. The Data Gap Analysis also included the following:

- The advancement of seven boreholes in the closed landfill on the east portion of the Phase One Property. Soil samples were used in the delineation of landfill materials only. No soil was submitted for laboratory analysis;
- Three composite surface soil samples were collected from grassed area on the adjacent NCC lands to the east and submitted for laboratory analysis of metals;
- Two surface water samples were collected from the Rideau Canal, one upstream and one downstream of the closed eastern landfill, and analyzed for metals;
- Three overburden ground water monitoring wells were advanced at the Phase One Property, two in the eastern closed landfill and one in the suspected closed landfill on the southern portion. Ground water was sampled for general chemistry parameters, VOC and metals;
- Five gas probes were installed including four in the eastern closed landfill and one in the suspected southern closed landfill. Methane gas readings were also taken in low-lying areas, such as washrooms and floor drains in the Aberdeen Pavilion, and areas on the lower level of the South Side Stands.

Based on Paterson's findings, no immediate health concerns were identified with respect to surface soil, surface water or methane within the areas of the two closed landfills on the Phase One Property. An elevated copper concentration, exceeding the applicable MOE 1997 Guideline Table B criteria, was detected in one of the ground water samples collected within the eastern closed landfill. A second ground water sample was collected from the same location

and was found to be below the applicable MOE 1997 Guideline Table B criterion for copper. The exceedance was inferred to be caused by leaching of copper from suspended solids entrained in the original sample. As such, no immediate health risks were identified with respect to ground water. Therefore, no additional investigations or remedial activities were recommended by Paterson with respect to the closed landfills at the Phase One Property.

The Eastern Landfill (Ur-27) and suspected Southern Landfill are considered to be APECs at the Phase One Property.

4.1.8.10 *Golder Summary of Known Environmental Conditions (Golder 2008)*

Golder was retained by the City to complete a review of previous environmental reports prepared in reference to the Phase One Property, as well as available data from subsurface investigations completed at the Phase One Property by McRostie Genest St-Louis. The objective of the review was to provide the City with a summary of environmental conditions at the Phase One Property and identify any data gaps within the available information (Golder, 2008).

Based on Golder's review, the following relevant conclusions and recommendations were made with respect to redevelopment of the Phase One Property:

- An updated Phase I ESA should be completed to identify missing information with respect to: the source of petroleum impact and ammonia impact in the vicinity of the Horticultural Building; the source and the removal of petroleum impact near the Coliseum Annex boiler room; the presence of a former gasoline station west of the Phase One Property beyond Bank Street [*AMEC also noted this property to be a historic dry cleaning operation*]; locations of former heating systems, waste storage and fuel storage for the military base; City files available for the Phase One Property; the MOE response from the Paterson Phase I ESA (Paterson, 1998a); and review of all available FIPs;
- Additional soil and ground water investigations should be conducted in order to compare soil and ground water conditions at the Phase One Property to the current MOE Site Condition Standards as provided under O. Reg. 153/04;
- Soil and ground water analysis in the vicinity of the closed landfill areas should include PAH, which are common to landfills;
- The eastern closed landfill has been well delineated with the exception of the southern extent. Additional subsurface investigation and/or a geophysical survey should be completed to define the southern extent;
- It should be determined if the Phase One Property is located within 30 metres of a water body to determine if it is an environmentally sensitive site in accordance with O. Reg. 153/04;
- Confirm if redevelopment of the Phase One Property will include residential development that would trigger the need to file a RSC;

- A subsurface investigation was recommended to assess the following previously un-assessed APECs: the oil spill in the basement of the McElroy Building; the former use of the Aberdeen Pavilion as the Manufacturers' Building; and the former Armory, including the possible presence of any unexploded ordnance, identified on the 1956 FIP [Note: AMEC did not observe an Armory or reference to the storage of ordnance/munitions on or near the Phase One Property on the 1956 FIP or any other historical map/FIP. As such, the presence of an Armory and/or unexploded ordnance is not considered to be an issue at the Phase One Property – see Appendices B and E. Similarly, the Manufacturers' Building was used to display and exhibit Manufacturers' items as opposed to being a building where manufacturing took place.];
- Update of all asbestos surveys should be completed as regulations have changed since the previous building surveys were completed;
- Lead-based paint surveys should be completed within each of the Phase One Property buildings;
- Ground water flow rates and directions should be calculated/confirmed prior to development of the Phase One Property; and,
- Prior to redevelopment, the City's Official Plan and the MOE document "Guideline D4-Land Use on or Near Landfills or Dumps" should be reviewed for any development restrictions or requirements that may apply to the Phase One Property.

4.1.8.11 Phase I Environmental Site Assessment (AMEC 2010a)

AMEC was retained by the City of Ottawa in 2009 to complete a Phase I ESA of the Phase One Property (AMEC 2010). The 2010 Phase I ESA has been superseded by this Phase One ESA report which has been prepared to meet the current Phase One ESA reporting requirements under O.Reg. 153/04, as amended. The findings of the 2010 Phase I ESA were for the most part similar to this Phase One ESA, save and except an additional APEC identified herein being potential ground water impact associated with former curling rink ice making plants at the former Curl-o-Drome (a.k.a. General Purpose Building) and former McElroy Building.

An APEC identified in the 2010 Phase I ESA associated with oil observed in the storm sewer sump located within the Holding Area of the Civic Centre was not identified in this Phase One ESA. Subsequent to the discovery of the oil, the City had retained a licensed contractor, Sewer-Matic Services, to pump the oil and oily water from within the sump for off-site disposal. Upon returning to inspect the sump subsequent to the pump-out, Paterson found the water within the sump to be free of visible sheen and product. Paterson further noted that the spill and cleanup were reported to the MOE and the City of Ottawa Sewer Use Branch who were both satisfied with the cleanup. The storm sewer sump was inspected on September 22, 2011 and found to be free of any evidence of petroleum hydrocarbon impact.

The sump pits for the elevators in the Eddie Friel Building and Civic Centre were inspected during the October 5, 2011 site reconnaissance for evidence of hydraulic fluid leakage, to

determine the integrity of the sump pits and to determine potential release mechanisms (e.g. sump pumps). The inspection was carried out with assistance of the City elevator maintenance contractor (Kone). The elevator sumps were found to be dry at the time of the inspection. In addition, the elevator sumps were observed to be self-contained units of concrete construction connected to the municipal storm sewer system with no open bottoms or potential for release or discharge to the subsurface environs.

4.1.8.12 Phase II Environmental Site Assessment (AMEC 2010b)

An initial Phase II ESA of the Phase One Property was completed by AMEC in June 2010. The initial Phase II ESA was carried out in two stages. The initial stage of the work program included the advancement of 37 boreholes, 29 of which were instrumented with ground water monitoring wells. These test locations were strategically selected to assess the APECs and Areas of Environmental Concern (AECs) outlined in AMEC's Phase I ESA (AMEC 2010a), save and except those associated with the elevator and/or storm sewer sumps which were not investigated. An additional 27 boreholes were advanced in the vicinities of the Coliseum Building, former Coliseum Annex, Horticultural Building and former East Lavatory to further define the extent of PAH impact in shallow soil and to delineate the extent of construction rubble and debris likely associated with the previous demolition of several former on-site structures (i.e., Coliseum Annex, East and West Lavatories). Through these investigations a total of 107 soil samples and 60 ground water samples, exclusive of quality assurance/quality control (QA/QC) samples, were submitted for chemical analyses of various COPCs including petroleum hydrocarbons (PHC), VOC, PAH, metals and PCB and select general chemistry parameters. Thirty-eight (38) soil samples were submitted for pH determination.

The subsurface conditions at the Phase One Property were found to generally consist of surficial fill comprised of various geologic materials (silty sand, gravel, sandy silt and sandy clayey silt) and waste debris (e.g., brick, organics, glass, metal, wood, ash, cinders, coal, etc.) overlying loamy sand, underlain, in turn, by gravely loamy sand. Grain size distribution analyses completed on 10 soil samples indicated that the subsurface soil across the Phase One Property is considered coarse textured for the purposes of assessment. Fill material placed across the Phase One Property varies in thickness from 0.5 metres (at the southwest corner of the Phase One Property) to a maximum of 5.2 metres (MW-2, located between the Civic Centre and the Aberdeen Pavilion). Waste materials including wood, metal, ashes, cinders, coal, brick and decayed organic matter were identified within the fill material in the area of the former Eastern Landfill (Ur-27) to a maximum depth of 5.49 metres below grade. The configuration of the Eastern Landfill (Ur-27) is roughly coincident with a portion of the former inlet from the Rideau Canal and is estimated to occupy an area of approximately 20,500 m².

The depth of the fill material in the area of the suspected Southern Landfill ranged between 0.7 and 1.5 metres in thickness. It is noted that no waste material was identified in any of the boreholes advanced in this area; however, construction/demolition type rubble (e.g., concrete, bricks and glass) was identified at one borehole location. Similar construction and/or demolition

materials were identified in the vicinity of the former East Lavatory and Coliseum Annex occupying estimated areas of 1,900 m² and 8,400 m², respectively.

No free phase liquid petroleum hydrocarbon (LPH), significant odours or staining were observed in any of the soil samples collected from the boreholes advanced at the Phase One Property. Combustible organic vapour (COV) and total organic vapour (TOV) measurements recorded in the soil samples were generally low (in the ppm range) with the exception of four (4) samples: BH10-2; BH10-6; MW10-15; and MW10-21, where slightly elevated COV were noted. These concentrations are not considered to be indicative of significant impact by petroleum hydrocarbons or other organic contaminants and were confirmed through subsequent laboratory analyses for all samples, except MW10-21 which yielded insufficient sample quantity, to facilitate laboratory analysis.

The results of the ground water monitoring indicate that the primary near surface water table resides in the silty sand and gravel; however, ground water was identified at shallower depths, within the fill and waste material, in the vicinity of the former Eastern Landfill (Ur-27). Based on the limited overburden ground water elevations, the ground water flow in the western portion of the Phase One Property appeared to flow to the southeast. The ground water flow in the eastern portion of the Phase One Property was affected by the presence of the Eastern Landfill (Ur-27) and flowed approximately radially outward to the west and south from the landfill.

Measurable LPH accumulations were not observed in any of the monitoring wells installed at the Phase One Property. No hydrocarbon odour, hydrocarbon sheen or iridescence, or other visual or olfactory indication of negative impact were observed in any of the ground water samples collected at the Phase One Property, except MW10-7, where a slight hydrocarbon sheen was observed during the initial ground water sampling event.

Soil impacts in excess of the 2011 Table 3 SCS for Residential/Parkland/Institutional (R/P/I) property use were identified at 17 borehole locations for one or more PAH parameters and at three (3) locations for one or more metals. Additional impacts by metals were identified at six (6) previous borehole locations in the vicinity of the Eastern Landfill (Ur-27) (Paterson 1998, 1999). The majority of the impacts occur within the Eastern Landfill (Ur-27) and in the vicinities of the Horticultural Building and former Coliseum Annex. At the Eastern Landfill (Ur-27) impacts occur in the landfilled waste and/or overlying fill materials and can be attributed to the quality of the waste/fill materials placed in this area. Beyond the Eastern Landfill (Ur-27), PAH impacts exceeding 2011 Table 3 SCS for R/P/I property use were identified in shallow soils at 15 borehole locations in the vicinities of the Horticultural Building and former Coliseum Annex. Both the Horticultural Building and Coliseum Annex were initially heated by coal. As such, the PAH impacts may be associated with the former use and management of coal at these locations.

Ground water beneath the Phase One Property met the 2011 Table 3 SCS for all COPC with the exception of chloroform and PHC at several monitoring well locations. Initial ground water sampling revealed impact by PHC at three monitoring well locations; however, re-sampling on

one (e.g., MW12) or two (e.g., MW10-7, MW10-17) supplemental sampling events reported PHC concentrations below 2011 Table 3 SCS at these locations. Conversely, re-sampling at MW12 on June 4, 2010 yielded a PHC F2 concentration of 217 µg/L versus an initially reported non-detect concentration.

Ground water east of the Civic Centre Arena and south and north of the Aberdeen Pavilion has been mildly impacted by chloroform and/or bromodichloromethane with concentrations reported for chloroform having exceeded 2011 Table 3 SCS at 9 of the monitoring wells. The chloroform impacts were attributed to leaking municipal water supply infrastructure beneath the Phase One Property.

The proposed Phase One Property redevelopment includes mid to high-density residential land use in the vicinity of the northwest corner of the Phase One Property. This change in property use will trigger the need to file a RSC under O.Reg. 153/04, as amended. The Phase II ESA recommended that consideration be given to severing the proposed residential property use redevelopment area from the remainder of the Phase One Property, in order to minimize the overall Phase One Property remedial requirements to meet EPA Table SCS for R/P/I property use. As the proposed redevelopment may include up to two levels of underground parking, it was expected that any soil impacts exceeding R/P/I SCS in the future residential land use area could be addressed during the Phase One Property construction phase.

Based on the proposed re-development, the need to file a RSC, was not anticipated in support of redeveloping the remainder of the Phase One Property. Nevertheless, the Phase II ESA report recommended that consideration be given to either remediating the soil and ground water impacts in the vicinity of the Eastern Landfill (Ur-27), or alternatively and more practically, completing a Risk Assessment to assess the associated potential risks to human and ecological health on a site-specific basis. If necessary, the Risk Assessment could be used to support the development and implementation of a suitable risk management plan to prevent unacceptable exposure risks, where present, and to provide a best practices approach to the Phase One Property redevelopment process.

4.1.8.13 *Geotechnical Investigations (Paterson 2010a and 2010b)*

Paterson group was retained by Ottawa Sports and Entertainment Group to carry out a Preliminary Geotechnical Investigation (Paterson 2010a) and a Geotechnical Investigation (Paterson 2010b) of the Phase One Property in support of redevelopment.

The Preliminary Geotechnical Investigation was carried out in part in conjunction with AMEC's initial Phase II ESA (AMEC 2010b). Twenty (20) boreholes were advanced at the Phase One Property to a maximum depth of 22 metres below existing grade. The borehole locations were distributed in a manner to provide general coverage of the Phase One Property to determine the subsoil and ground water conditions at the Phase One Property and to provide preliminary geotechnical recommendations for the design of the proposed development.

Soil samples were recovered using a 50 mm diameter split-spoon sampler or from the auger flights. Standard Penetration Tests (SPT) were conducted in conjunction with the recovery of the split-spoon samples. Flexible polyethylene standpipes were installed in all boreholes to permit monitoring of the ground water levels subsequent to the completion of the sampling program.

The subsurface conditions encountered at the borehole locations consisted of a pavement structure underlain in turn by silty sand fill, a native loose to dense silty sand to sand deposit, and a dense to very dense glacial till layer. Practical auger refusal was encountered at BH8, BH9, BH10, BH11, BH12 and BH17. Due to the potential presence of boulders in the glacial till deposit, it is possible that refusal was encountered on boulders rather than bedrock. Based on available mapping and borehole data acquired at the Phase One Property, bedrock was estimated to be 10 to 22 metres below surface grade. Depths to ground water ranged from 2.71 to 8.11 metres below surface grade.

A geotechnical investigation (Paterson 2010b) for the proposed storm water management system (SWMS) was carried out on September 8, 2010. Three (3) boreholes were advanced to a maximum depth of 7.5 metres below grade in the vicinity of the Eastern Landfill (Ur-27) (BH2-10 and BH3-10) and south of the former McElroy Building (BH1-10). The subsurface conditions encountered at the borehole locations consisted of a pavement structure underlain in turn by native, loose silty sand followed by glacial till consisting of a well-graded sand with silt and gravel. A thick layer of imported fill, consisting of a loose, dark grey sandy silt with clay, gravel and wood chips, was encountered to 5.3 metres depth at BH2-10 within the Eastern Landfill (Ur-27). The fill in this location was underlain by native glacial till. Depths to ground water at the boreholes ranged from 3.53 to 4.42 metres below surface grade.

4.2 Environmental Source Information

4.2.1 Local Municipal Agencies

4.2.1.1 *Historical Land Use Inventory*

In 1999, the former Region of Ottawa-Carleton (now the City of Ottawa) commissioned the development of a Historical Land Use Inventory (HLUI). The HLUI comprises a database of information on the type and location of land uses within the geographic area of the City of Ottawa, which had or have the potential to cause contamination in soil, ground water or surface water. Sue Petrovic of the City's Realty Services Branch supplied AMEC with the results of a HLUI search.

Two HLUI Activity numbers were registered to the Phase One Property, while several records were provided through the City search for properties surrounding the Phase One Property. Records of environmental significance relative to the Phase One Property are as follows:

- HLUI Activity 6198 was registered to Lansdowne Park Former Landfill, located on the south portion of the Phase One Property. The HLUI identified the landfill as Ur-27. The

period of operation was unknown; however, it was noted to be before 1945 (PCA - Waste Disposal and Waste Management);

- HLUI Activity 3624 was registered to the City of Ottawa, located on the Phase One Property. The facility was listed as general administrative services;
- HLUI Activity 1091 was registered to Alladin Cleaners, Dyers and Tailors, located at 1016 Bank Street, approximately 23 metres west of the Phase One Property, on the northwest corner of the Bank Street and Wilton Crescent intersection (PCA - Operation of Dry Cleaning Equipment);
- HLUI Activity 8032 was registered as Lansdowne B.P. Service Station, located at 1014 Bank Street, approximately 23 metres west of the Phase One Property, on the northwest corner of the Bank Street and Wilton Crescent intersection (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 10046 was registered as Ottawa Electric Railway Sub-Station, located at 115 Holmwood Avenue, approximately 23 metres north of the Phase One Property, near the intersection of Bank Street and Holmwood Avenue. PCA - Transformer Manufacturing, Processing and Use; however, no transformers were noted as being present on this property;
- HLUI Activity 14708 was registered as Wilfrid Teal Limited, located at 905 Bank Street, approximately 45 metres north of the Phase One Property where the current Running Room resides;
- HLUI Activity 8305 was registered as MacLennan's Supertest, located at 912 Bank Street, approximately 25 metres northwest of the Phase One Property where the current Kettleman's Bagel Co. resides. Three gasoline USTs were noted to have been present at this property (PCA - Gasoline and Associated Products Storage in Fixed Tanks);
- HLUI Activity 11555 was registered as Renaud Fleurette (motor vehicle repair shop), located at 890 Bank Street, approximately 98 metres northwest of the Phase One Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 8943 was registered as Mister Muffler (motor vehicle repair shop), located at 890 Bank Street, approximately 98 metres northwest of the Phase One Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 9994 was registered as Ottawa Motor Sales (motor vehicle repair shop), located at 890 Bank Street, approximately 98 metres northwest of the Phase One Property. Three gasoline USTs were noted on this property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 11792 was registered as Roy Proctor Sales & Service (motor vehicle repair shop), located at 895 Bank Street, approximately 98 metres north of the Phase One

Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);

- HLUI Activity 4819 was registered as Excel Radiator (motor vehicle repair shop), located at 891 Bank Street, approximately 98 metres north of the Phase One Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 4820 was registered as Excel Radiator (motor vehicle repair shop), located at 885 Bank Street, approximately 98 metres north of the Phase One Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 408 was registered as Adam's Glebe Bendix Washeteria (laundries and cleaners), located at 871 Bank Street, approximately 125 metres north of the Phase One Property (PCA - Operation of Dry Cleaning Equipment);
- HLUI Activity 7713 was registered as MacDonald Tire Shop (tire and tube industry), located at 34 Regent Street, approximately 125 metres north of the Phase One Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 10235 was registered as Parker Clean (laundries and cleaners), located at 858 Bank Street, approximately 150 metres northwest of the Phase One Property (PCA - Operation of Dry Cleaning Equipment);
- HLUI Activity 9385 was registered as Motosport Plus (motor vehicle repair shop), located at 860 Bank Street, approximately 150 metres northwest of the Phase One Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 2705 was registered as Cities Service Oil Co. Limited (gasoline service station), located at 852 Bank Street, approximately 195 metres northwest of the Phase One Property. Three gasoline USTs were noted on this property (PCA - Gasoline and Associated Products Storage in Fixed Tanks);
- HLUI Activity 8754 was registered as McKale's Service Centre Limited (motor vehicle repair shop), located at 852 Bank Street, approximately 195 metres northwest of the Phase One Property. Three gasoline USTs were noted on this property (PCA - Gasoline and Associated Products Storage in Fixed Tanks);
- HLUI Activity 6072 was registered as Fuel Oil and Equipment Limited (petroleum products, wholesale), located at 857 Bank Street, approximately 185 metres north of the Phase One Property;
- HLUI Activity 13468 was registered as Toilet Laundries Limited (laundries and cleaners), located at 855 Bank Street, approximately 195 metres north of the Phase One Property;
- HLUI Activity 1262 was registered as Bank & Fifth Garage (motor vehicle repair shop), located at 855 Bank Street, approximately 190 metres north of the Phase One Property.

Four gasoline USTs were noted on this property (PCA - Gasoline and Associated Products Storage in Fixed Tanks);

- HLUI Activity 5381 was registered as Roy Barber Services Limited (motor vehicle repair shop), located at 1063 Bank Street, approximately 180 metres south of the Phase One Property (PCA - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles);
- HLUI Activity 1874 was registered as Birchill's Service Station (gasoline service station), located at 1060 Bank Street, approximately 200 metres south of the Phase One Property. Three gasoline USTs were noted on this property (PCA - Gasoline and Associated Products Storage in Fixed Tanks); and,
- HLUI Activity 11047 was registered as Perley Home Nurses (hospital), located at 43 Aylmer Avenue, approximately 235 metres southwest of the Phase One Property. One fuel oil UST was noted on this property (PCA - Gasoline and Associated Products Storage in Fixed Tanks).

One PCA was identified at the Phase One Property, Waste Disposal and Waste Management, associated with the Eastern Landfill (Ur-27). Several PCAs were identified on properties located within the Phase One Study Area including: Gasoline and Associated Products Storage in Fixed Tanks, Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles, Operation of Dry Cleaning Equipment. Several of these properties are considered to comprise APECs at the Phase One Property.

One PCA was identified at 115 Holmwood Avenue, Transformer Manufacturing, Processing and Use; however, no transformers were noted as being present on this property thus the PCA at this location is not considered to be an APEC at the Phase One Property.

All other records can be referenced in the HLUI response provided in Appendix I.

4.2.1.2 *Mapping and Assessment of Former Industrial Sites*

In 1988 the City of Ottawa commissioned a report entitled "*Mapping and Assessment of Former Industrial Sites*" (Intera, 1988). The report lists former industrial sites which have the potential for remnant soil and/or ground water contamination. The identified sites are categorized into three classes designated as Group I, II, or III. Group III sites are low priority sites where it is unlikely that significant quantities of waste exist at the site today and the potential for environmental impact is therefore low. Group II sites are identified as being likely to have wastes present; however, the sites' location with respect to surface water is such that significant environmental impact is not likely to occur. Group I sites document sufficient evidence to indicate that wastes are present at the sites and that the potential for environmental impact is high.

A review of the report indicated that no Group I, II or III sites were identified within 250 metres of the Phase One Property. However, two historic landfills (PCA - Waste Disposal and Waste

Management) were identified, one on the Phase One Property (L-27 Lansdowne Park), and one approximately 400 metres west of the Phase One Property (L-20 Capital Park). The former landfill noted on the Phase One Property was identified on the southern portion, near the Rideau Canal and Bank Street. It is suspected that the intended location of L-27 may actually coincide with Ur-27 (Eastern Landfill) and a possible error in locating L-27 has been the source of the suspected Southern Landfill. No other details on the former landfills were provided. The Eastern Landfill (Ur-27) and suspected Southern Landfill are considered to be APECs at the Phase One Property.

4.2.2 Technical Standards and Safety Authority

Fuel storage at industrial facilities in Ontario is regulated by the *Technical Standards and Safety Act 2000* ("TSS Act"). The TSS Act has consolidated the seven acts that the TSSA previously administered, including the *Gasoline Handling Act* and the *Energy Act*. Under the TSS Act, the *Liquid Fuels Regulation* (O. Reg. 217/01), *Liquid Fuel Handling Code* and the *Environmental Management Protocol* (May 2007) have replaced the *Gasoline Handling Act*, the *Gasoline Handling Code* and GH13 (1993 Environmental Cleanup Guideline). The TSS Act applies to all storage tank systems utilized for the storage and handling of gasoline, diesel and fuel oil. According to discussions with a representative of the Technical Standards and Safety Authority (TSSA) - Fuels Safety Division, underground storage tanks (USTs) and aboveground storage tanks (ASTs) installed under the *Liquid Fuels Regulation*, *Liquid Fuel Handling Code* require registration with the TSSA. Fuel oil tanks utilized in residential buildings will also require registration with the TSSA.

The TSSA was contacted by email, as well as by ordinary mail, and requested to supply any available information concerning the presence of petroleum storage tanks, fuel spill records, accidents, or fuel-related incidents which may be registered in their database as well as in archived files regarding the subject Phase One Property or surrounding properties. AMEC was informed by Prem Lal of the TSSA via email that there are no USTs registered for the Phase One Property or surrounding properties within their database. However, a former gasoline station, cancelled in 1989, was listed at 852 Bank Street (PCA - Gasoline and Associated Products Storage in Fixed Tanks) and is considered to be an APEC at the Phase One Property. No other details regarding this former gasoline station were provided.

A response dated March 17, 2010 pursuant to AMEC's written request was received from the TSSA. The letter indicates that the TSSA has no records pertaining to the Phase One Property.

Copies of the TSSA responses are provided in Appendix I.

4.2.3 Provincial Government Sources

4.2.3.1 Ministry of the Environment Freedom of Information Department

Through the Freedom of Information (FOI) and Protection of Privacy Office the Ministry of the Environment was requested to identify any outstanding actions, violations, control orders,

summons, complaints, spills, hazardous waste documents, or certificates of approval for the subject site. The request to the FOI department involved an electronic search of their records since 1985. Information filed with the MOE prior to 1985 is not included in the FOI records search. Retrieval of such information requires a manual document search by the MOE initiated by a specific request and additional fees.

A response dated March 8, 2010 was received from the MOE (Donna Currie – FOI Coordinator) regarding information pertaining to Sylvia Holden Park located on the northeast corner of the Phase One Property at 945 Bank Street. The response indicated that no records were located within the MOE files for this portion of the Phase One Property.

A response dated April 15, 2010 was received from the MOE (Donna Currie – FOI Coordinator) providing records pertaining to the remaining portions of the Phase One Property (Lansdowne Park). The records included Provisional Certificates of Approval and Certificates of Approval for a Waste Disposal Site. These records are related to the operation of a Municipal Household Hazardous Waste Collection Program at the Phase One Property during the 1990s in which the residents of the City were encouraged to bring their household hazardous wastes to one of several temporary drop off facilities that would be set up in the City, one of which was set up at the Phase One Property. These events would be staged several times a year. The MOE response also included documentation of the transfer of two drums of PCB containing light ballasts from the Phase One Property to Fluorescent Lamp Recyclers Inc. in January 2004. Finally, a letter documenting a change to the Phase One Property's Ontario Waste Generator Registration Number was provided. The change simply reflected the 2001 amalgamation of the Regional Municipality of Ottawa Carleton to the Corporation of the City of Ottawa.

A copy of each MOE response is provided in Appendix I.

4.2.3.2 *Waste Disposal Site Inventory*

AMEC reviewed the document entitled "*Waste Disposal Site Inventory*", prepared by the Waste Management Branch of the MOE (dated June 1991). No active waste disposal sites were listed as being present within one kilometre of the Phase One Property. However, one closed landfill was noted to exist on the Phase One Property (identified therein as #1107), as well as one approximately 400 metres west of the Phase One Property at Brown's Inlet Park (identified therein as #1100). The closed landfill on the southern portion of the Phase One Property was also noted in the 1988 Intera Mapping and Assessment Report (identified therein as L-27). Both the closed landfills on and off the Phase One Property were classified as A5 sites - urban, municipal/domestic wastes, closed 10-20 years. Details on the date of operation of the landfill on the Phase One Property were not provided; however, the landfill to the west of the Phase One Property (Brown's Inlet [Ur-20]) was reportedly closed in 1924.

The Eastern Landfill (Ur-27) has been identified as an APEC at the Phase One Property. The Brown's Inlet Park Landfill (Ur-20) was investigated by the City as part of its OLMS. A Data Gap Analysis of the Brown's Inlet Park Landfill (Ur-20) was completed by the City of Ottawa in 2003

(AMEC 2004). Results of the Data Gap Analysis indicated no evidence to suggest the presence of buried putrescible and/or non-putrescible waste at the Brown's Inlet Park Landfill (Ur-20). The soil samples retrieved during the investigation contained no obvious signs of metal, plastics, glass, ash, cinders or other waste materials. Elevated PAH concentrations exceeding MOE 1997 Guideline Table B criteria were detected in several soil samples at depth; however, no ground water impact was identified. It was concluded by AMEC that the Brown's Inlet Park Landfill (Ur-20) posed no risk to human health and is thus not considered to comprise an APEC at the Phase One Property.

4.2.3.3 *Inventory of Coal Gasification Plant Waste Sites in Ontario*

AMEC reviewed the document entitled "*Inventory of Coal Gasification Plant Waste Sites in Ontario*", prepared for the MOE (dated April 1987) and "*Inventory of Industrial Sites Producing or Using Coal Tar and Related Sites in Ontario*", prepared for the MOE (dated November 1988). No coal tar or waste sites were listed as being present within one kilometre of the Phase One Property.

4.2.3.4 *Brownfields Environmental Site Registry*

The MOE online Brownfields Environmental Site Registry was accessed on March 4, 2010 to determine if any RSCs have been filed under Part XV.1 under the Environmental Protection Act (EPA) for the Phase One Property or any of the surrounding properties. A search of the registry indicated that no RSCs have been filed for the Phase One Property.

A RSC was filed on September 15, 2005 for the surrounding property located at 1014 Bank Street. The information provided in the RSC indicates that Phase I and Phase II ESAs were completed at this property. Contaminants of concern included PHC and BTEX parameters. No Risk Assessment, soil management or ground water management measures were required at this property. However, the property at 1014 Bank Street was identified in this study to have been previously occupied by a service centre, and the adjacent property at 1016 Bank Street was identified to have been previously occupied by a dry cleaning facility. This information was noted in the city directory search and HLUI, as well as the ERIS report (Sections 4.1.5, 4.2.1.1 and 4.2.4). As such, it is AMEC's opinion that soil and ground water investigations completed in support of the RSC should have included samples analyses for VOC given the possibility for chlorinated solvents to have been utilized as part of the historic dry cleaning operations.

4.2.3.5 *Natural Heritage Information Center*

The Ministry of Natural Resources ("MNR") online mapping system "Biodiversity Explorer" (<https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/main.jsp>) was accessed on September 1, 2011 to determine if the Phase One Property or Phase One Study Area are Areas of Natural and Scientific Interest, significant wildlife habits, located within a Provincial park or Areas of Natural Significance. No such areas were indicated in the Phase One Study Area.

4.2.3.6 Ontario Oil, Gas and Salt Resources

The Ontario Oil, Gas and Salt Resources Library (<http://www.ogsrlibrary.com/maps/index.php>), maintained by the *Oil, Gas and Salt Resources Corporation ("OGSRC")* was accessed on September 1, 2011. No oil, gas or salt resources were listed as present in the Phase One Study Area.

4.2.4 EcoLog Environmental Risk Information Services Ltd. ("ERIS")

A complete EcoLog ERIS report for the Phase One Property and surrounding properties within 250 metres was requested. ERIS is a national service that provides site specific environmental and property-use information. An ERIS report contains detailed government and private sector records concerning possible environmental liabilities associated with a property and the surrounding neighbourhoods. For the Phase One Property, the ERIS Project number is 20100106025. Databases searched by ERIS consist of the following:

- "Abandoned Aggregate Inventory" (MAAP)
- "Aggregate Inventory" (MNR)
- "Abandoned Mines Information System" (MNDM)
- "Boreholes" (MTO, OGS, UGAIS, YPDT)
- "Certificates of Approval" (EPA)
- "TSSA Commercial Fuel Oil Tanks" (TSSA)
- "Coal Gasification Plants" (MOE)
- "Compliance and Convictions" (Ontario)
- "Drill Holes" (MNDM)
- "Environmental Registry" (Ontario)
- "TSSA Fuel Storage Tanks" (TSSA)
- "Ontario Regulation 347 Waste Generators Summary" (MOE)
- "Mineral Occurrences" (MNDM)
- "Non-Compliance Reports" (MOE)
- "Ontario Inventory of PCB Storage Sites" (MOE)
- "Pesticide Register" (MOE)
- "Private and Retail Fuel Storage Tanks" (MCCR)
- "Ontario Regulation 347 Waste Receivers Summary" (MOE)
- "Record of Site Condition" (MOE)
- "Ontario Spills" (ORIS, SAC)
- "Wastewater Discharger Registration Database" (MOE)
- "Waste Disposal Site Inventory" (MOE)
- "Waste Disposal Sites – Historical Approval Inventory" (MOE)
- "Water Well Information System" (Ontario)
- "Environmental Effects Monitoring" (Federal)
- "Environmental Issues Inventory System" (Federal)
- "Contaminated Site on Federal Land" (TB)
- "Federal Convictions" (EC)

- “Fisheries & Oceans Fuel Tanks” (DFO)
- “Indian & Northern Affairs Fuel Tanks” (INAC)
- “National Analysis of Trends in Emergencies System” (EC)
- “National Defence & Canadian Forces Fuel Tanks” (DND)
- “National Defence & Canadian Forces Spills” (DND)
- “National Defence & Canadian Forces Waste Disposal Sites” (DND)
- “National Environmental Emergencies System” (Federal)
- “National PCB Inventory” (EC)
- “National Pollutant Release Inventory” (EC)
- “Parks Canada Fuel Storage Tanks” (CH)
- “Transport Canada Fuel Storage Tanks” (TC)
- “Anderson’s Waste Disposal Sites” (Anderson)
- “Automobile Wrecking & Supplies”
- “Chemical Register”
- “Canadian Mine Locations”
- “Oil & Gas Wells”
- “Canadian Pulp & Paper”
- “Retail Fuel Storage Tanks”
- “Scott’s Manufacturing Directory” (Scott)
- “Anderson’s Storage Tanks” (Anderson)

The complete findings of the ERIS search may be referenced in Appendix F. Records provided in the ERIS report deemed potentially significant are summarized in the tables below.

Phase One Property

Title (Author/Source)	Date	Findings	Evaluation of Potentially Contaminating Activities and/or Areas of Potential Environmental Concern						
Anderson's Waste Disposal Sites (Anderson)	1860s - Present	<p>Two (2) properties within the Phase One Study Area were listed as waste disposal sites as follows:</p> <table border="0"> <thead> <tr> <th data-bbox="667 467 768 488">Location</th> <th data-bbox="1058 467 1136 488">Details</th> </tr> </thead> <tbody> <tr> <td data-bbox="600 505 831 721">200 metres northeast of Bank Street, 85 metres north of Rideau Canal, south of the stadium (this reference is inferred to be the suspected Southern Landfill)</td> <td data-bbox="863 505 1325 553">The Lansdowne Park Dump operated in the 1960s. MOE Reference number is 1107.</td> </tr> <tr> <td data-bbox="600 737 831 841">Broadway Ave, west of Ralph, east of Craig, 75 m east of Brown's Inlet Park</td> <td data-bbox="863 737 1283 786">The Brown's Inlet Dump operated in the 1920s. MOE reference number is 1100.</td> </tr> </tbody> </table>	Location	Details	200 metres northeast of Bank Street, 85 metres north of Rideau Canal, south of the stadium (this reference is inferred to be the suspected Southern Landfill)	The Lansdowne Park Dump operated in the 1960s. MOE Reference number is 1107.	Broadway Ave, west of Ralph, east of Craig, 75 m east of Brown's Inlet Park	The Brown's Inlet Dump operated in the 1920s. MOE reference number is 1100.	<p>The Lansdowne Park Dump (PCA – Waste Disposal and Waste Management) occupies the east portion of the Phase One Property and results the following APEC:</p> <ul style="list-style-type: none"> Eastern Landfill (Ur-27) <p>The Brown's Inlet Dump (PCA – Waste Disposal and Waste Management) is located approximately 400 m west of the Phase One Property outside of the Phase One Study Area and is thus not considered to be an APEC. Furthermore, the location is inferred to be hydraulically transgradient to the Phase One Property.</p>
Location	Details								
200 metres northeast of Bank Street, 85 metres north of Rideau Canal, south of the stadium (this reference is inferred to be the suspected Southern Landfill)	The Lansdowne Park Dump operated in the 1960s. MOE Reference number is 1107.								
Broadway Ave, west of Ralph, east of Craig, 75 m east of Brown's Inlet Park	The Brown's Inlet Dump operated in the 1920s. MOE reference number is 1100.								
Boreholes Database (MTO, OGS, UGAIS, YPDT)	1875 - 2009	Nineteen boreholes were identified both on and off of the Phase One Property at various locations. The completion dates of the boreholes ranged from 1933 to 1971.	<p>Details as to why the boreholes were advanced were not provided within the records. Based on the reported depth of the borehole it is likely they was put down at the Phase One Property as part of various geotechnical investigations likely to have been completed in support of various stage of development</p> <p>These records do not constitute PCAs or APECs.</p>						
Certificates of Approval Database (EPA)	1985 - 2002	Nine (9) Certificates of Approval ("C of A") for municipal water were listed within the Phase One Study Area.	C of As for municipal water do not constitute a PCA or APEC.						
		Twenty-one (21) C of As for municipal and/or private sewage were listed within the Phase One Study Area.	C of As for municipal/private sewage do not constitute a PCA or APEC.						
		Three (3) C of As were listed for industrial air emission. Two (2) records are listed for 24 Avenue Road and the third is listed at 43 Aylmer Road.	<p>24 Avenue Road is located approximately 300 m southeast of the Phase One Property and therefore outside of the Phase One Study Area.</p> <p>The C of A at 43 Aylmer Road pertains to the installation of two (2) emergency hot water boilers in 1996. 43 Aylmer</p>						

Title (Author/Source)	Date	Findings	Evaluation of Potentially Contaminating Activities and/or Areas of Potential Environmental Concern									
			Road is located approximately 230 m southwest of the Phase One Property. The C of As at these properties do not constitute PCAs or APECs.									
Environmental Registry Database (Ontario)	1994 - 2009	A 2004 permit to take water is listed for the Glebe Centre Incorporated located at 950 Bank Street.	A permit to take water does not constitute a PCA or APEC.									
ERIS Historical Searches	1999 - 2009	ERIS lists fourteen (14) previous searches within the Phase One Study Area.	The completion of previous ERIS searches does not constitute a PCA or APEC.									
Contaminated Sites on Federal Land (TB)	2000 - 2009	A record of a Contaminated Site on Federal Land (CSFL) was identified to the north of the Phase One Property within the community park.	Based on AMEC's knowledge of the area and the nature of the CSFL described in the report, it is AMEC's opinion that the CSFL is located further west of the Phase One Property at Dow's Lake and is therefore located outside of the Phase One Study Area.									
Ontario Regulation 347 Waste Generators Summary Database (MOE)	1986 - 2009	<p>The Phase One Property and surrounding properties were listed as industrial waste generators with 78 listings in the ERIS report. Several of the records were multiple listings of a single property and have been consolidated, while other listings were at locations out of the Phase One Study Area and have not been included. The records are summarized as follows:</p> <table border="1" data-bbox="577 958 1356 1424"> <thead> <tr> <th data-bbox="577 958 798 990">Address</th> <th data-bbox="800 958 903 990">Years</th> <th data-bbox="905 958 1356 990">Waste Generated</th> </tr> </thead> <tbody> <tr> <td data-bbox="577 992 798 1242">1015 Bank Street (Lansdowne Park) - Regional Municipality of Ottawa-Carleton, City of Ottawa, Cirque Du Soleil, Central Canada Exhibition Assoc.</td> <td data-bbox="800 992 903 1242">1989, 1990, 1992-2001, 2003-2009</td> <td data-bbox="905 992 1356 1356">Acid Waste – Heavy Metals, Alkaline Wastes – Other Metals, Paint/Pigment/Coating Residues, Inorganic Laboratory Chemicals, Aromatic Solvents, Aliphatic Solvents, Petroleum Distillates, Light Fuels, Heavy Fuels, Halogenated Solvents, Halogenated Pesticides, Waste Oils and Lubricants, Pharmaceuticals, Organic Laboratory Chemicals, Non-Halogenated Pesticides, Pathological Wastes, Waste Compressed Gases, Other Specified Inorganics, PCB</td> </tr> <tr> <td data-bbox="577 1357 798 1424">950 Bank Street – The Glebe Centre</td> <td data-bbox="800 1357 903 1424">1992-</td> <td data-bbox="905 1357 1356 1424">Pathological Wastes</td> </tr> </tbody> </table>	Address	Years	Waste Generated	1015 Bank Street (Lansdowne Park) - Regional Municipality of Ottawa-Carleton, City of Ottawa, Cirque Du Soleil, Central Canada Exhibition Assoc.	1989, 1990, 1992-2001, 2003-2009	Acid Waste – Heavy Metals, Alkaline Wastes – Other Metals, Paint/Pigment/Coating Residues, Inorganic Laboratory Chemicals, Aromatic Solvents, Aliphatic Solvents, Petroleum Distillates, Light Fuels, Heavy Fuels, Halogenated Solvents, Halogenated Pesticides, Waste Oils and Lubricants, Pharmaceuticals, Organic Laboratory Chemicals, Non-Halogenated Pesticides, Pathological Wastes, Waste Compressed Gases, Other Specified Inorganics, PCB	950 Bank Street – The Glebe Centre	1992-	Pathological Wastes	<p>The generation of registered industrial wastes at a property does not in itself represent a PCA or result in an APEC but rather can be indicative of PCAs occurring at a property.</p> <p>The records listed at 1015 Bank Street refer to activities on the Phase One Property. The majority of the registered wastes relate to the operation of a Municipal Household Hazardous Waste Collection Program at the Phase One Property as discussed in Section 4.2.3.1. None of the wastes generated at the Phase One Property comprise a PCA or APEC as they are indicative of general operations and maintenance rather than industrial activity.</p> <p>Similarly, the majority of records listed within the Phase One Study area are indicative of various commercial activities and do not comprise PCAs or APECs.</p> <p>Exceptions are those records pertaining to retail fuel outlets, vehicle maintenance garages and dry cleaning operations. These include the records at 860 Bank Street, 829 Bank Street and 779 Bank Street which result in the</p>
Address	Years	Waste Generated										
1015 Bank Street (Lansdowne Park) - Regional Municipality of Ottawa-Carleton, City of Ottawa, Cirque Du Soleil, Central Canada Exhibition Assoc.	1989, 1990, 1992-2001, 2003-2009	Acid Waste – Heavy Metals, Alkaline Wastes – Other Metals, Paint/Pigment/Coating Residues, Inorganic Laboratory Chemicals, Aromatic Solvents, Aliphatic Solvents, Petroleum Distillates, Light Fuels, Heavy Fuels, Halogenated Solvents, Halogenated Pesticides, Waste Oils and Lubricants, Pharmaceuticals, Organic Laboratory Chemicals, Non-Halogenated Pesticides, Pathological Wastes, Waste Compressed Gases, Other Specified Inorganics, PCB										
950 Bank Street – The Glebe Centre	1992-	Pathological Wastes										

Title (Author/Source)	Date	Findings	Evaluation of Potentially Contaminating Activities and/or Areas of Potential Environmental Concern
		<p>Inc. 2001</p> <p>920 Bank Street – 2006 Light Fuels, Waste Oils and Lubricants Diamond Capital Corp.</p> <p>635 O'Connor 2007- Petroleum Distillates Street – City of 2009 Ottawa Fire Services</p> <p>889 Bank Street – 1994- Petroleum Distillates McCrank Cycles 2001</p> <p>875 Bank Street – 1988, Waste Oils and Lubricants E. George Brown 1989, Excavating 1992- 1998</p> <p>27 Monk Street/25- 1988, Halogenated Solvents, Acid Wastes – 27 Monk Street – 1989, Heavy Metals, Alkaline Wastes – Other Richard Branker 1992- Metals, Neutralized Wastes – Heavy Research Ltd. 2001, Metals 2005- 2009</p> <p>860 Bank Street – 1988- Petroleum Distillates, Waste Oils and Motosport Plus 1990, Lubricants 1992- 1998</p> <p>19 Oakland Avenue 2003, No wastes listed – Anne-Gunvor 2004 Arnold</p> <p>99 Fifth Avenue – 1986- Photoprocessing Wastes Keylink Systems 1990, Inc. 1992- 1998</p> <p>829 Bank Street – 1992- Halogenated Solvents Glebe Fashion 2009 Cleaners</p> <p>1069 Bank Street – 1992- Photo processing Wastes</p>	<p>following APEC:</p> <ul style="list-style-type: none"> Historic Gas Stations, Repair Garages and Dry Cleaners <p>It is noted that the dry cleaner at 779 Bank Street falls outside of the Phase One Study Area but was included due to the greater potential for widespread impacts from dry cleaning operations.</p>

Title (Author/Source)	Date	Findings	Evaluation of Potentially Contaminating Activities and/or Areas of Potential Environmental Concern
		<p>Allegra Print & Imaging, Zippy Print 2006, 2009</p> <p>1073 Bank Street – The Cyclery, Full Cycle 1997-2009 Petroleum distillates</p> <p>281 Sunnyside Avenue – Lansdowne Animal Hospital 201, 2003-2006, 2009 Photoprocessing Wastes, Pathological Wastes</p> <p>779 Bank Street – Bank Street Laundry and Dry Clean 1986-1990, 1992-2001 Halogenated Solvents</p> <p>43 Aylmer Avenue – The Perley Hospital 1989, 1992-2001 Alkaline Wastes – Heavy Metals, Inorganic Laboratory Chemicals, Pharmaceuticals, Organic Laboratory Chemicals, Pathological Wastes</p> <p>1126 Bank Street – La Pause Velo/The Bike Stop 1988-1990, 1992-1998 Petroleum Distillates</p>	
National Analysis of Trends in Emergencies System (NATES)(EC)	1987 - October 2004	The NATES database listed a spill of 20 L of heating oil by Francis Fuels. No date or location was provided; however it is noted in the record that no adverse impacts were reported and that 100% of the spilled fuel oil was recovered by Francis Fuels.	This record does not constitute a PCA or APEC at the Phase One Property.
National Defence & Canadian Forces Fuel Storage Tanks (DND)	1974 – 1994	A record of an active aboveground storage tank for storage of 11,142 L of diesel fuel is provided. No address is provided other than “Colonel By Drive”. It is inferred that the record pertains to DND headquarters at 101 Colonel By Drive which is well beyond the Phase One Study Area.	This record does not constitute a PCA or APEC at the Phase One Property.
National Environmental Emergencies System (NEES)(Federal)	1974 – 2003	Three records of diesel/heating oil spills by Francis Fuels are listed for occurrences in 1987, 1988 and 1989. No details on the locations of the spills are provided.	This record does not constitute a PCA or APEC at the Phase One Property.
Pesticide Register (MOE)	1988 - 2008	The only listing in the pesticide register is Capital Home Hardware	This record does not constitute a PCA or APEC at the

Title (Author/Source)	Date	Findings	Evaluation of Potentially Contaminating Activities and/or Areas of Potential Environmental Concern
		which is located at 736 Bank Street and outside of the Phase One Study Area.	Phase One Property.
Private and Retail Fuel Storage Tanks Database (MCCR)	1989 - 1996	Records of retail fuel storage tanks were listed at 852, 1063 and 1080 Bank Street.	<p>Each record constitutes a PCA (Gasoline and Associated Products in Fixed Tanks) resulting in the following APEC:</p> <ul style="list-style-type: none"> • Historic Gas Stations, Repair Garages and Dry Cleaners <p>The records at 1063 and 1080 Bank Street are not considered APECs as they are located a minimum of 180 m from the Phase One Property and hydraulically downgradient to the Site.</p>
Record of Site Condition (MOE)	1997 – 2001 2004 – 2009	A Record of Site Condition is listed at 1014 Bank Street under the company 6176666 Canada Ltee.(Eco Cite) and dated September 15, 2005. No further details are provided.	This record does not constitute a PCA or APEC at the Phase One Property.
Retail Fuel Storage Tanks	2000 - 2009	Records of retail fuel storage tanks were listed at 852, 1063 and 1080 Bank Street.	<p>Each record represents a PCA (Gasoline and Associated Products in Fixed Tanks) resulting in the following APEC:</p> <ul style="list-style-type: none"> • Historic Gas Stations, Repair Garages and Dry Cleaners <p>The records at 1063 and 1080 Bank Street are not considered APECs as they are located a minimum of 180 m from the Phase One Property and hydraulically downgradient to the Site.</p>
Scott's Manufacturing Directory (Scott)	1992 – 2009	<p>Several manufacturers were registered in directory. A total of 22 records were listed; however some are multiple records for the same property/business and several are for properties outside of the Phase One Study Area. The Phase One Property was not listed.</p> <p>Richard Branker Research Ltd./RBR Ltd. is listed at 27 Monk Street as a manufacturer of measuring, medical and controlling devices and navigation and guidance instruments established in 1975.</p>	<p>Manufacturing listed at 27 Monk Street could be interpreted to fall under the Electronic and Computer Equipment Manufacturing PCA. Richard Branker Research Limited is presently located at 27 Monk Street which is a townhouse. Given the nature of the building at 27 Monk Street it can reasonably be inferred that no large scale manufacturing activities occur there. As such, 27 Monk Street is not inferred to present an environmental concern with respect to the environmental condition of the Phase One Property.</p> <p>None of the other manufacturing activities within the Phase One Study Area are listed PCAs and no APECs were identified.</p>

Title (Author/Source)	Date	Findings	Evaluation of Potentially Contaminating Activities and/or Areas of Potential Environmental Concern
Ontario Spills Databases (ORIS, SAC)	1988 - 2008	<p>36 spill incidents were listed in the databases. Of the 36 recorded spills, 26 were at locations outside of the Phase One Study Area and either of small volume or located hydraulically downgradient of the Phase One Property and therefore were not deemed to present an APEC with respect to the environmental condition of the Phase One Property.</p> <p>Of the ten (10) spills reported within the Phase One Study Area:</p> <ul style="list-style-type: none"> • None were at the Phase One Property; • Three (3) were at locations greater than 100 m from the Phase One Property and hydraulically downgradient or transgradient to the Phase One Property; • Three (3) indicated that environmental impact was not anticipated; • Two (2) pertained to vehicles driving into the Rideau Canal. Impacts from these incidents are unlikely to have impacted soil or ground water in the area due to the concrete walls lining the canal; and, • A spill of 200 L of hydraulic oil from an elevator occurred at 954 Bank Street located approximately 50 metres west of the Phase One Property. The record indicates potential for soil impacts; however the spill would have occurred indoors with the majority of the oil contained in the building. As such, this spill is not inferred to present an APEC with respect to the environmental condition of the Phase One Property; and, • A spill of heating oil was reported from a heating oil AST in the basement of a residential dwelling at 77 Fifth Avenue, approximately 230 metres north of the Phase One Property. Given the distance from the Phase One Property and the fact that a residential heating oil AST would be of limited capacity, this spill is not inferred to present an APEC with respect to the environmental condition of the Phase One Property. 	<p>Spills do not constitute PCAs; however some are noted to be from fuel storage tanks which would fall under the “Gasoline and Associated Products in Fixed Tanks” PCA. AMEC reviewed each spill record in detail and none are inferred to present an APEC with respect to the environmental condition of the Phase One Property.</p>
Waste Disposal Sites – Historical Approval Inventory Database (MOE)	Up to 1990	<p>Two closed waste disposal sites were listed in the EcoLog ERIS report. One is located on the Phase One Property while the second is located approximately 350 metres west of the Phase One Property and therefore outside of the Phase One Study Area.</p>	<p>The waste disposal site on the Phase One Property has been identified in various additional records and results in the following APEC:</p> <ul style="list-style-type: none"> • Eastern Landfill (Ur-27)

Title (Author/Source)	Date	Findings	Evaluation of Potentially Contaminating Activities and/or Areas of Potential Environmental Concern
		<p>The closed landfill identified on the Phase One Property is registered as X1107. Classification of the landfill is A5 - potential human impact-urban municipal domestic waste, closed 10-20 years. The date of closure is unknown.</p>	
<p>Water Well Information System Database (Ontario)</p>	<p>1955 - May 2009</p>	<p>Four water wells were listed in the EcoLog ERIS report, one of which was mapped as being located on the southern portion of the Phase One Property and dated 2008. No other details on the water well construction were provided.</p> <p>The remaining three water wells were at locations outside of the Phase One Study Area.</p>	<p>Based on discussions with the Phase One Property representative and on observations made during the site reconnaissance, no water wells, other than ground water observation and monitoring wells, are present on the Phase One Property. The water well record identified as WWIS-1 in the ERIS report may be a water well tag related to observation wells installed during a previous investigation at the Phase One Property in 2008. These records present neither PCAs nor APECs.</p>

4.3 Physical Setting Sources

4.3.1 Aerial Photographs

Aerial photographs of the Phase One Study Area were obtained from the National Air Photo Library in Ottawa, Ontario, for the years 1925 (the earliest available aerial photograph), 1931, 1938, 1945, 1950, 1952, 1958, 1961, 1965, 1966, 1970, 1975, 1979, 1984, 1987, 1993, 1994, 1998, 2001 and 2009 and from City of Ottawa e-maps for the years 2002, 2005 and 2007. All available aerial photographs covering the Phase One Study Area were reviewed.

The following significant information was inferred from the aerial photographs reviewed in reference to the Phase One Property and its surrounding properties:

Phase One Property

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1925	A26-58 (1:5,000)	The Phase One Property is occupied by six large structures, including: Aberdeen Pavilion, Horticultural Building, Howick Pavilion (known today as the Coliseum Building), Assembly Hall, Ladies' Fine Arts Building, and the Grand Stand. Several smaller buildings are also observed on the Phase One Property, including: two lavatories, a press building and an office next to the Horticultural Building; four ticket booths at the entrance along Bank Street; two small buildings on either side of the Grand Stand; one small building in the middle of the race track; one long narrow building, possibly a horse stable, northeast of the race track; and two small out buildings, northeast of the inferred horse stable. The race track occupied the southern half of the Phase One Property, south of the Grand Stand, where the current Frank Clair Stadium and North Side Stands are situated. A football field is visible within the centre of the race track. The Assembly Hall and the Ladies' Fine Arts Building are located north of the Grand Stand, where the current Civic Centre is located. The Aberdeen Pavilion and Horticultural Building are similar in configuration to their current condition. The Howick Pavilion (Coliseum Building) appears to have had additions constructed adjacent the east and north elevations. Another large building, referred to as the General Purpose Building, is located immediately east of the Phase One Property on lands currently owned by the NCC, with the exception of the buildings southwest corner which encroaches onto the Phase One Property. A roadway was also noted to transect the central portion of the Phase One Property. The roadway extends from the main entrance on Bank Street, through the centre of the Phase One Property in an east-west direction, then turns north and connects to what is now known as O'Connor Street.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
1931	A13332-45 (1:5,000)	The Phase One Property is generally similar in configuration to the 1925 aerial photograph, with the exception of a small building to the west of the south end of the Horticultural Building that is no longer present.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
1938	A6352-30 (1:10,000)	The small office located west of the Horticultural Building, as well as the small structures located in the middle of the race track and west of the Grand Stand, are no longer present. All other areas of the Phase One Property are similar in configuration to the 1925 and 1931 aerial photographs.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1945	A7542-10 (1:9,500)	An addition appears to have been added adjacent the east elevation of the Horticultural Building (the workshop as noted in the 1956 FIP). A narrow building is visible between the Assembly Hall and the Ladies Fine Arts Building, north of the Grand Stand. An H-shaped building is located immediately northeast of the Phase One Property on the lands now owned by the NCC. However, the west portion of this building appears to fall within the Phase One Property boundaries. The purpose of this building is identified on the historical map (c.1946) as the Canadian Women's Army Corporation (CWAC) Quarters.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1950	A12714-19 (1:10,000)	The narrow building located between the Assembly Hall and the Ladies Fine Arts Building and the H-shaped building on and adjacent the northeast portion of the Phase One Property and the race track are no longer present. A baseball diamond appears to have been added to the central portion of the football field, immediately south of the Grand Stand. A small building, noted on the 1956 FIP as the First Aid Post, had been constructed east of the Horticultural and Press Buildings.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1952	A13510-422 (1:14,000)	The Phase One Property generally appears to be similar in configuration to the 1950 aerial photograph; however, due to overexposure of the aerial photograph, specific details are difficult to distinguish.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1958	A16939-14 (1:12,000)	The McElroy Building had been constructed on the southeast portion of the Phase One Property, east of the football field and southwest of the General Purpose building. It appears that bleachers have been constructed on the south side of the stadium. All other areas of the Phase One Property are similar in configuration to the 1950 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1961	A17150-13 (1:15,000)	The Phase One Property is similar in configuration to the 1958 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1965	Unknown	The Phase One Property is similar in configuration to the 1958 and 1961 aerial photographs.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1966	A30013-27 (1:7,000)	The Assembly Hall and Ladies' Fine Arts Building are no longer present north of the Grand Stand and it appears that construction of the Civic Centre has begun. All other areas of the Phase One Property are similar in configuration to the 1958, 1961 and 1965 aerial photographs.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1970	A22226-160 (1:7,000)	The Civic Centre and the North Side Stands, as they exist today, are present on the Phase One Property, immediately north of the football field. The Press Building and the First Aid Post are no longer present to the east of the Horticultural Building. The main entrance and access road through the Phase One Property was realigned north of the Civic Centre and south of the Coliseum Building, where the main entrance currently exists. A small building has been constructed between the McElroy and General Purpose Buildings.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1975	A23955-53 (1:7,000)	The upper level and canopy of the South Side Stands appears to be under construction. The small building noted in the 1970 aerial photograph between the McElroy and General Purpose Buildings is no longer present. The east portion and westernmost addition of the Coliseum Building have been removed.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1979	A25377-377 (1:6,000)	The South Side Stands appear to have been completed. A baseball diamond is present immediately northeast of the Aberdeen Pavilion. The fence and gates currently surrounding the Frank Clair Stadium appear to have been constructed. Paved parking areas surround Frank Clair Stadium and the Aberdeen Pavilion.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1984	A26626-55 (1:12,000)	The Phase One Property is similar in configuration to the 1979 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1987	A27240-40 (1:9,000)	The Phase One Property is similar in configuration to the 1979 and 1984 aerial photographs.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1993	A31659-24 (1:15,000)	The Phase One Property is similar in configuration to the 1979, 1984 and 1987 aerial photographs.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1994	A28146-249 (1:10,000)	A long dome-shaped structure is present immediately east of Frank Clair Stadium. The baseball diamond located northeast of the Aberdeen Pavilion is no longer present. This area has been redeveloped as additional parking. The additions to the north and east of the Coliseum and Horticultural Buildings, respectively, are no longer present. Sylvia Holden Park, located in the northwest corner of the Phase One Property, appears to have been developed.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1998	A28361-82 (1:22,800)	The General Purpose Building located on the east portion of the Phase One Property and immediately east of the Phase One Property on NCC lands is no longer present. All other areas of the Phase One Property are similar in configuration to the 1994 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
2001	A31837-25 (1:15,000)	The Phase One Property is similar in configuration to the 1998 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
2002	Unknown	The Phase One Property is similar in configuration to the 1998 and 2001 aerial photographs.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
2005	Unknown	The McElroy Building and the long dome-shaped structure are no longer present on the Phase One Property. Parking areas now extend to the area where the former McElroy Building was situated. Two structures, similar to the portable trailers that the CCEA currently occupy, are located on the north central portion of the Phase One Property, immediately west of the Horticultural Building.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
2007	Unknown	A third trailer appears to have been placed on the north portion of the Phase One Property next to the existing CCEA trailers. All other areas of the Phase One Property are similar in configuration to the 2005 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
2009	A28554-46 (1:6,000)	The third trailer, as noted in the 2007 aerial photograph appears to have been removed. The Phase One Property is similar in configuration to the current conditions.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified

Surrounding Properties

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1925	A26-58 (1:5,000)	North of the Phase One Property is Holmwood Avenue (a.k.a. Centre Street) followed by numerous residential dwellings, similar to those that currently occupy this area. Commercial buildings are located along Bank Street further northwest of the Phase One Property. Two buildings, the Pure Foods and Agricultural Building (a.k.a. Dog Show Building, a.k.a. Manufacturers' Annex), are located immediately north of the east portion of the Phase One Property, where the community park and dog park currently exist. The Machinery Hall is located east of the Phase One Property and its southwest corner encroaches onto the Phase One Property. The Machinery Hall is in the location of the building known as the General Purpose Building. Queen Elizabeth Driveway runs along the east and south perimeters of the Phase One Property, followed by the Rideau Canal and residences and commercial/institutional buildings, similar to those that currently exist. West of the Phase One Property is Bank Street, followed by residential dwellings, a building identified on the FIPs as the Protestant Home for the Aged, and a small farm with associated structures.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1931	A13332-45 (1:5,000)	Properties surrounding the Phase One Property generally appear similar in configuration to the 1925 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1938	A6352-30 (1:10,000)	Properties surrounding the Phase One Property appear to be similar in configuration to the 1925 and 1931 aerial photographs; with the exception of a small building located on the northwest corner of the intersection of Bank Street and Holmwood Avenue where the current Kettleman's Bagel Co. lies. This building is similar in configuration to the gasoline service station identified on the 1956 FIP.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property
1945	A7542-10 (1:9,500)	An H-shaped building and a T-shaped building have been constructed east of the Phase One Property. Based on a historical map (c.1946), these buildings were constructed by the Military during World War II and used as the CWAC quarters and mess. Part of the H-shaped building encroaches onto the Phase One Property. The Machinery Hall is no longer present; however, a smaller building, identified as the General Purpose Building, is in its place and also encroaches onto the Phase One Property. All other properties surrounding the Phase One Property appear to be similar in configuration to the 1938 aerial photograph.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property
1950	A12714-19 (1:10,000)	Additional residential dwellings are visible to the southeast, south and west of the Phase One Property. The H and T-shaped buildings are no longer present east of the Phase One Property. All other properties surrounding the Phase One Property appear to be similar in configuration to the 1945 aerial photograph.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property
1952	A13510-422 (1:14,000)	Due to overexposure of the aerial photograph, specific details are difficult to distinguish; however, properties surrounding the Phase One Property generally appear similar in configuration to the 1950 aerial photograph.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property
1958	A16939-14 (1:12,000)	Additional commercial buildings have been developed along both sides of Bank Street to the northwest and southwest of the Phase One Property, including a commercial building further northwest, where the current Mister Muffler lies. This building is inferred to be a gasoline service station, based on the 1956 FIP. Properties immediately west of the Phase One Property along Bank Street remain unchanged from previous years. A baseball diamond is visible on the northeast corner of the community park located north of the east portion of the Phase One Property.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1961	A17150-13 (1:15,000)	A commercial building has been developed northwest of the Phase One Property, where the Beer Store is currently located. West of the Phase One Property, on the northwest corner of the Bank Street and Wilton Crescent intersection, is a small building that is inferred to be a gasoline service station. All other properties surrounding the Phase One Property generally appear similar in configuration to the 1958 aerial photograph.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property Historic Dry Cleaning Facility and Gas Station to the West of the Phase One Property
1965	Unknown	Properties surrounding the Phase One Property generally appear similar in configuration to the 1961 aerial photograph.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property Historic Dry Cleaning Facility and Gas Station to the West of the Phase One Property
1966	A30013-27 (1:7,000)	Properties surrounding the Phase One Property generally appear similar in configuration to the 1961 and 1965 aerial photographs.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property Historic Dry Cleaning Facility and Gas Station to the West of the Phase One Property
1970	A22226-160 (1:7,000)	The canopy over the gas pumps has been removed from the gasoline station located west of the Phase One Property at the intersection of Bank Street and Wilton Crescent. All other properties surrounding the Phase One Property generally appear similar in configuration to the 1961, 1965 and 1966 aerial photographs.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property Historic Dry Cleaning Facility and Gas Station to the West of the Phase One Property

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1975	A23955-53 (1:7,000)	The baseball diamond is no longer present north of the Phase One Property, within the community park. The fire station on Fifth Avenue, located north of the Phase One Property beyond the community park, has been constructed. The Lord Lansdowne Retirement Residence appears to have been constructed west of the Phase One Property, on the southwest corner of the intersection of Bank Street and Holmwood Avenue. The field west of the Phase One Property, beyond Bank Street, appears to have been converted into a paved parking lot. It appears that the pump island has been removed from the property now occupied by Kettleman's Bagel Co. located northwest of the Phase One Property. All other properties surrounding the Phase One Property generally appear similar in configuration to the 1970 aerial photograph.	<ul style="list-style-type: none"> Gasoline and Associated Products Storage in Fixed Tanks 	<ul style="list-style-type: none"> Historic Gas Station, Repair Shops and Dry Cleaners to the North-Northwest of the Phase One Property Historic Dry Cleaning Facility and Gas Station to the West of the Phase One Property
1979	A25377-377 (1:6,000)	The gasoline station located further northwest of the Phase One Property has been demolished and replaced with a larger building, similar in configuration to the current Mister Muffler. The pump island associated with the gasoline station located west of the Phase One Property at the Bank Street and Wilton Crescent intersection appears to have been removed. All other properties surrounding the Phase One Property generally appear similar in configuration to the 1975 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1984	A26626-55 (1:12,000)	The baseball diamond in the northeast corner of the community park appears to have been redeveloped. All other properties surrounding the Phase One Property generally appear similar in configuration to the 1979 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1987	A27240-40 (1:9,000)	Properties surrounding the Phase One Property generally appear similar in configuration to the 1984 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1993	A31659-24 (1:15,000)	The Pure Foods and Agriculture Buildings have been demolished and replaced with two baseball diamonds that currently exist within the community park immediately north of the east portion of the Phase One Property. Due to poor quality of the aerial photograph, specific details are difficult to distinguish; however, all other properties surrounding the Phase One Property generally appear similar in configuration to the 1987 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified
1994	A28146-249 (1:10,000)	Properties surrounding the Phase One Property generally appear similar in configuration to the 1993 aerial photograph.	<ul style="list-style-type: none"> None identified 	<ul style="list-style-type: none"> None identified

Date	Roll # (Scale)	Observations	Potentially Contaminating Activities	Areas of Potential Environmental Concern
1998	A28361-82 (1:22,800)	A portion of the Glebe Centre appears to have been constructed west of the Phase One Property, beyond Bank Street. The General Purpose Building and its associated boiler building have been demolished and converted into green space. Due to poor quality of the aerial photograph, specific details are difficult to distinguish; however, all other properties surrounding the Phase One Property generally appear similar in configuration to the 1994 aerial photograph.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
2001	A31837-25 (1:15,000)	Properties surrounding the Phase One Property generally appear similar in configuration to the 1998 aerial photograph.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
2002	Unknown	Properties surrounding the Phase One Property generally appear similar in configuration to the 1998 and 2001 aerial photograph.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
2005	Unknown	The southern portion of the Glebe Centre appears to have been constructed west of the Phase One Property, beyond Bank Street. All other properties surrounding the Phase One Property generally appear similar in configuration to the 2002 aerial photograph.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
2007	Unknown	The former gasoline station building located west of the Phase One Property, at the Bank Street and Winton Crescent intersection has been demolished and the property appears vacant. All other properties surrounding the Phase One Property generally appear similar in configuration to the 2005 aerial photograph.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified
2009	A28554-46 (1:6,000)	The apartment building located west of the Phase One Property at the Bank Street and Winton Crescent intersection has been developed. Properties surrounding the Phase One Property are generally similar in configuration to the current development.	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • None identified

Aerial photographs are presented in Appendix G.

4.3.2 Topography, Hydrology, Geology

The Phase One Property lies at an approximate elevation of 65 to 68.5 metres above sea level (masl). The topography across the Phase One Property gently slopes from Sylvia Holden Park at the northwest to the Rideau Canal in the southeast. The Rideau Canal is located approximately 32 to 100 metres south and east of the Phase One Property and flows north to the Ottawa River, which is located approximately 3 kilometres north of the Phase One Property. It is inferred that the Phase One Property does not include land that contains or is within 30 metres of a “water body” which classifies/would have classified it as a sensitive site under *O. Reg. 153/04*. A topographic map (Ontario Base Map Series) including the Phase One Property and the Phase One Study Area is provided in Appendix H.

Based on previous environmental (AMEC 2010b) and geotechnical (Paterson 2010) investigations at the Phase One Property, as well as previous subsurface investigations completed by others, surficial materials overlying the Phase One Property are noted to be comprised of fill materials extending to depths ranging from 0.36 to 5.18 metres below ground surface (mbgs) underlain by native deposits consisting of combinations of sand, sandy silt, silty sand, and sand and gravel to the termination depths of the boreholes (not on inferred bedrock) ranging from 3.66 to 9.9 mbgs. The depth to bedrock is reported to range from approximately 9 to 21 mbgs (“*Drift Thickness Trend, Ottawa-Hull, Ontario and Quebec*”, Geological Survey of Canada, 1979); however, bedrock has not been encountered at depths less than approximately 7 mbgs in any of the boreholes advanced at the Phase One Property.

The Phase One Property is underlain by bedrock of both the Billings and Lindsay Formations which are Ordovician in age and are composed of dark brown to black shale with laminations of calcareous siltstone; and sublithographic to fine crystalline limestone, nodular in part, with interbeds of calcarenite and shale, respectively (“*Paleozoic Geology Ottawa Area*”, map P.2716, Ontario Geological Survey, 1984).

The regional ground water flow direction, based on topographic features and knowledge gained from other sites in the area, is expected to be to the northeast. Locally, however, the shallow ground water flow may be influenced by underground utility trenches, conduits, and structures, variations in soil type, and minor fluctuations in topography. Based on previous investigations (AMEC 2010b) ground water resides at depths ranging from 1.9 to 8.35 metres below ground surface (mbgs). Beneath the western portion of the Phase One Property ground water flows to the southeast. Ground water flow on the eastern portion of the Phase One Property is affected by the presence of the Eastern Landfill (Ur-27) and flows approximately radially outward to the west and south from the landfill. Ground water beneath the southern portion of the Phase One Property flows beyond the Rideau Canal to the south towards the Rideau River. It should be noted that the Rideau Canal is a losing stream, which means that ground water flows out from the base of the Canal recharging the surrounding water tables. The elevation of the Rideau Canal is near surface grade in the vicinity of the Phase One Property during its regular operational period.

4.3.3 Fill Materials

Fill materials placed for construction and grading purposes are common across the Phase One Property. Significant in-filling is known to have occurred on the south and east portions of the Phase One Property to reclaim a former inlet/bay of the Rideau Canal and includes a known landfill. Fill materials encountered during previous subsurface investigations varied in depth from 0.5 metres at the southwest corner of the Phase One Property to a maximum of 5.2 metres at borehole MW10-2, located between the Civic Centre and the Aberdeen Pavilion (AMEC 2010b).

4.3.4 Water Bodies and Areas of Natural Significance

The Rideau Canal is located approximately 32 to 100 metres east and south of the Phase One Property and flows north to the Ottawa River, which is located approximately 3 kilometres north of the Phase One Property. It is inferred that the Phase One Property does not include land that contains or is within 30 metres of a “water body” which classifies/would have classified it as a sensitive site under *O. Reg. 153/04*.

4.3.5 Well Records

4.3.5.1 *Water Wells*

Ontario Regulation 903 (O.Reg. 903) (amended to O.Reg. 372/07) sets the standards for the construction, maintenance and abandonment of water wells and licensing of water well contractors and technicians in the province of Ontario. Under the regulation, any well that is not being used or maintained for future use as a well must be abandoned in accordance with the procedures set forth in the regulation. This regulation also applies to monitoring and test wells such as those routinely installed for environmental and/or geotechnical testing purposes. O.Reg. 903 does not apply to oil and gas wells.

No water wells were observed at the Phase One Property by AMEC during the site reconnaissance. AMEC was informed by the Phase One Property representative that no water wells are currently present at the Phase One Property, nor have any such wells ever been present at the Phase One Property in the past. One water well was identified in the ERIS report as being located on the southern portion of the Phase One Property. Based on discussions with the Phase One Property representative and on observations made during the site reconnaissance, no water wells, other than those installed for observation purposes, are present on the Phase One Property. As such, the water well record identified as WWIS-1 in the ERIS report may be a water well tag related to observation wells installed during a previous subsurface investigation at the Phase One Property in 2008. No stratigraphic information was provided on the well record.

4.3.5.2 *Oil, Gas and Test Wells*

No test wells, disposal wells, oil wells or gas wells were listed within the Phase One Study Area in the record review or observed at the Phase One Property by AMEC during the site

reconnaissance. AMEC was informed by the Phase One Property representative that, to his knowledge, no test wells, oil wells or gas wells or disposal wells currently exist at the Phase One Property, nor have any such wells ever been present at the Phase One Property.

4.4 Site Operating Records

The Phase One Property is not currently used in whole, or in part, for an industrial use.

4.5 Summary of Records Review

Phase One Property

Based on a review of the available information sources, it appears that the Phase One Property was developed for its use as a park and exhibition grounds beginning in the mid-1800s. Since that time, various buildings have been constructed and demolished on the Phase One Property, with the existing buildings having been constructed from 1898 through to 1987. Today, the majority of the Phase One Property is paved, both for at grade parking and for exhibition and entertainment use. The Phase One Property hosted the annual Central Canada Exhibition between 1888 and 2010, with some exceptions during war years. A weekly farmer's market was started at Lansdowne Park in 2007.

As the result of a review in the early 1990s, the City demolished some of the buildings (Coliseum Annex, General Purpose Building/Curl-o-Drome, McElroy Building) and restored some parkland, notably along the Rideau Canal. The City also restored the Aberdeen Pavilion at that time. Due to structural problems, the lower grandstand of Frank Clair Stadium was demolished in July 2008 and not replaced.

Surrounding Land Use

Based on a review of the available information sources, the development of properties surrounding the Phase One Property began prior to the early 1900s. Prior to development, surrounding properties are inferred to have been used primarily for agricultural purposes.

Summary

Based on the historical review completed, the following significant environmental issues were identified concerning the Phase One Property and the surrounding historical land use activities:

- Two closed landfills are known or suspected to exist at the Phase One Property, one on the eastern portion of the Phase One Property (Eastern Landfill [Ur-27]) and one on the southern portion (suspected Southern Landfill). The Southern Landfill remains unconfirmed through previous subsurface investigations. While some fill has been observed in this area, it is suspected that the fill was of construction or demolition origin as opposed to an intentional landfill or waste disposal area;

- Previous investigations did not delineate the southern extent of the eastern closed landfill, nor were all parameters of concern typical of landfill sites analyzed in soil and ground water samples collected (e.g., PAH);
- Prior to the supply of natural gas for the on-site heating equipment, fuel sources and fuel storage methods and locations for the some of the current and historic buildings remain unconfirmed, primarily due the unavailability of suitable records or documentation and/or the potential unknown absence of heating at some of the buildings;
- The Phase One Property has been listed as a waste generator since at least 1986 for the generation of various liquid and solid wastes, including: halogenated solvents and pesticides, petroleum distillates, and light and heavy fuels.
- Ammonia impact near the Horticultural Building was not investigated sufficiently. In addition, potential ammonia impact may reside in the vicinity of the former McElroy Building, former General Purpose Building (Curl-O-Drome) and existing Civic Centre ice making plants;
- Previous subsurface investigations completed at the Phase One Property did not address neighbouring gasoline stations, automotive repair and dry cleaning facilities, more specifically those located northwest and west of the Phase One Property at 912 and 1014/1016 Bank Street, respectively, and are considered to represent a potential environmental concern to the Phase One Property;
- Comparison of previous sampling and analytical data to the amended O. Reg. 153/04 2011 Table 3 SCS indicated additional metals impacted soil at the Phase One Property, notably in the vicinity of the eastern landfill. Potential remnant petroleum impacted soils may reside in the vicinity of the former oil spills east of the Horticultural Building (East Lavatory and north of the Coliseum Building (Annex boiler room). Several fuel related APECs at the Phase One Property remain un-assessed including the boiler room and a reported heating oil spill at the former McElroy Building and the General Purpose Building boiler house;
- Historical information indicated that the Phase One Property was occupied by the Military from 1941 through to 1946 for training of military troops. Gasoline and oil storage was noted on the southeast portion of the Phase One Property near the former General Purpose Building. The East Lavatory east of the Horticultural building was noted to have been used as a boiler room by the Military. Several smaller buildings were noted northeast of the General Purpose Building that may have been used for the storage of fuel;
- Several registered waste generators are and have been located in the vicinity of the Phase One Property since at least 1982, including gasoline service stations and dry cleaning facilities. Those of particular environmental concern to the Phase One Property are the gasoline service station formerly located at 912 Bank Street (now Kettleman's Bagel Co.); and the gasoline service station and dry cleaning facility formerly located at 1014/1016 Bank Street at the corner of Bank Street and Wilton Crescent; and,

- A closed landfill (Brown's Inlet [Ur-20]) is located approximately 400 metres west of the Phase One Property near Brown's Inlet. This closed landfill ceased operations in 1925. The Brown's Inlet closed landfill was investigated by the City of Ottawa as part of its Old Landfill Management Strategy (AMEC, 2004). The landfill was concluded to pose no significant risks.

5.0 INTERVIEWS

5.1 Key Phase One Property Representatives

Contacts were made as required to evaluate the existing/historical Phase One Property operations and obtain additional information, as follows:

Name and Company or Affiliation	Position	Interview Details (Date, Place, Method, Reason for Interview)	Relevant Information from Interview
Richard Haycock, City of Ottawa	Manager, Lansdowne Park	January 22, 2010 (9 am to 10 am)	<p>Provided a copy of the current facility event schedule to facilitate scheduling of the Phase One Property inspection on inactive days.</p> <p>Made arrangements to obtain plans of the Horticultural Building which had not been previously provided.</p>
Mark Hennigar, City of Ottawa	Portfolio/Property Manger, Lansdowne Park	February 2, 2010 (1 pm to 2 pm)	<p>Provided information to indicate that there are no Potentially Contaminating Activities currently taking place at Lansdowne Park, excluding the transformers currently located at Sylvia Holden Commemorative Park and in the basement of the Civic Centre.</p> <p>Provided a Phase One Property servicing plan indicating the locations and types of subsurface utilities currently present beneath the Phase One Property.</p> <p>Provided copies of asbestos surveys and asbestos management plans for existing buildings at the Phase One Property.</p>
Richard Haycock, City of Ottawa	Manager, Lansdowne Park		<p>Obtained contact information for Mike Villeneuve to accompany AMEC during site reconnaissance.</p> <p>Indicated that one ice making plant is currently in operation at the Phase One Property, being present at the Civic Centre.</p> <p>Former ice making plants were previously present at the Horticultural Building as wells as the former McElroy Building and former Curl-o-Drome.</p> <p>Did not have knowledge of the prior use of the Phase One Property.</p> <p>Indicated that there are no water wells currently present at the Phase One Property.</p>

<p>Mike Villeneuve, City of Ottawa</p>	<p>Maintenance Supervisor</p>	<p>Interviewed on-site for information pertaining to current Phase One Property operations and possible historical knowledge. Interviews took place on February 9 (11 am to 4 pm), February 10 (12 pm to 1 pm), February 25 (2 pm to 4 pm) and March 2 (12 pm to 1 pm), 2010.</p> <p>Supplemental interviews took place on September 22, 2011 and October 5, 2011 concurrent with inspection of the Civic Centre storm sewer sump in the loading bay and elevator sump pits in the Civic Centre and Eddie Friel building.</p>	<p>Provided information concerning current Phase One Property operations.</p> <p>Provided copies of MSDS and chemical inventories.</p> <p>Provided confirmation that no USTs are currently present at the Phase One Property.</p> <p>Small AST for antifreeze within the paint room (Operations Area) in the Civic Centre.</p> <p>950 litre AST for the diesel generator that is contained within the generator enclosure at the southwest corner of the Civic Centre.</p> <p>Confirmed that all heated buildings are currently fuelled by natural gas.</p> <p>A transformer vault is located at the southwest corner of the Civic Centre.</p> <p>A former transformer vault was located beneath the lower portion of the south side stands that were demolished in July 2008.</p> <p>Indicated that two sanitary and two storm sump pits are located in the basement of the Civic Centre.</p> <p>Indicated that the Phase One Property is connected to the municipal sanitary/combined and storm sewer systems.</p> <p>Indicated that no industrial or manufacturing activities currently take place at the Phase One Property.</p> <p>Indicated that there are two hydraulically operated piston type elevators at the Phase One Property, one in the Civic Centre and one in the Eddie Friel Building.</p>
--	-------------------------------	---	---

These individuals were contacted as they may have information related to the environmental condition of the Phase One Property. It should be noted that the Phase One Property has a long operational history dating back to the mid to late 1800s. City of Ottawa staff currently stationed at the Phase One Property lack intricate knowledge of the historic Phase One Property operational activities; however, through the site reconnaissance and historical review, the information provided by the above noted individuals was found to be true and accurate.

6.0 SITE RECONNAISSANCE

6.1 General Requirements

Under the supervision of Mr. Kevin Hicks, M.Sc., P.Geo., Qualified Person (QP), Ms. Jennifer Luxton, B.A. of AMEC conducted site reconnaissance visits on February 9, 10 and March 2, 2010 to evaluate possible on-site issues, and assess whether any surrounding land uses may have and/or are currently impacting the environmental condition of the Phase One Property. During the site reconnaissance, AMEC interviewed Mr. Mike Villeneuve, Site Technical Coordinator, City of Ottawa (the "Phase One Property representative"). The Phase One Property representative accompanied AMEC during part of the site reconnaissance on February 9 and March 2, 2010.

Due to safety concerns, AMEC did not access any roof areas or the second storey within the Coliseum Building. In addition, access was not granted to the two trailers used for administrative office space by the Central Canadian Exhibition Association (CCEA), as well as the soccer dome within Frank Clair Stadium. Based on their current uses, the inaccessibility of these facilities is not considered to be limiting in terms of the conclusions or recommendations provided in this report. The CCEA office trailers have since been removed from the Phase One Property.

Under the supervision of Kevin Hicks, QP, supplemental site reconnaissance visits were conducted on September 22, 2011 by Mr. Bryant Jelly and on October 5, 2011 by Mr. Brock Ibbott, B.A., Env. Mgt. The Phase One Property representative accompanied AMEC during both supplemental site reconnaissance visits which were conducted to inspect areas not accessible/visible during the initial site reconnaissance. These included:

- General inspection of the ground surface due to the impediment of snow cover during the initial site reconnaissance;
- Inspection of the field at Frank Clair Stadium subsequent to removal of the soccer dome not accessed during the initial site reconnaissance;
- Inspection of the elevator pits and associated sumps of the piston elevators in the Civic Centre and Eddie Friel Building; and,
- Inspection of a storm water sump at the Civic Centre.

At the time of the site reconnaissance visits there was little activity taking place at the Phase One Property. Given the nature and use of the Phase One Property, activities pertaining to the various events to which the Phase One Property is host occur on an as needed basis. Daily activities are limited to maintenance and upkeep of the Phase One Property. The Phase One Property is not an operating industrial facility and is not an enhanced investigation property as defined in O.Reg. 153/04, as amended.

6.2 Specific Observations at Phase One Property

6.2.1 Phase One Property Description and Buildings

The Phase One Property is located on the southeast corner of the intersection of Bank Street and Holmwood Avenue, and is bordered by Queen Elizabeth Driveway and the Rideau Canal to the east and south, in Ottawa, Ontario (Figure 2). The Phase One Property lies in a typical municipal urban setting in an area of mixed residential, commercial and open space land uses.

The Phase One Property is an irregular-shaped property measuring approximately 15.64 hectares. Details on the Phase One Property buildings are as follows:

Coliseum Building: is a partial two-storey recreational and office building located on the northwest portion of the Phase One Property. The building has a footprint of 3,860 square metres and was constructed in approximately 1903. Exterior finishes include brick veneer, a sloped tin roof on the central and east portions, and a flat built-up roof system on the west portion. Interior ceiling finishes include exposed roof decking in the central and east portions and suspended ceiling tiles in the west portion. Flooring includes carpet, vinyl floor tiles and Astroturf™. Interior walls include painted concrete block and gypsum board walls. The building is heated via natural gas-fired heating/ventilation/air conditioning (HVAC) units in the office and hot water boiler and ceiling mounted hot water radiant heaters. Illumination includes fluorescent and metal halide lighting.

The main portion of the building currently houses an indoor soccer field (central and east portion), while the west portion of the building is currently used for office space. Only the west portion of the building has a second storey, which was inaccessible at the time of the Phase One Property assessment due to safety concerns as the floor is unstable. The Phase One Property representative advised that the second storey is used to house the circulating pump, a small expansion tank and associated piping for the hot water radiator heating system for the offices.

Historically, the Coliseum Building was called Howick Hall and was used to show and house livestock. Former additions, referred to as the Annex, were constructed adjacent the north and east elevations of the building between 1912 and 1925 and later removed in 1970, 1975 and 1993/94. By 1993/94 the Coliseum Building was similar in configuration to its current condition. Two boiler rooms had previously existed within the Annex: the first was located at the northeast corner of the building and was later removed and replaced with the second located in a more central portion of the Annex (north of the northeast corner of the current Coliseum Building). Subsurface investigations and remediation in the area of the later boiler room suggest heating oil was the fuel for that boiler; however no investigations have been carried out in the vicinity of the earlier boiler which may have been fuelled by heating oil and/or coal.

An electrical transformer was also noted to have formerly existed within the west portion of the Annex at a location coincident with the existing electrical transformer. The Coliseum Building was also used as a former hockey arena.

Horticultural Building: is a partial two storey building located on the central-north portion of the Phase One Property. The building has a footprint of 1,760 square metres and was constructed in approximately 1914. Exterior finishes include brick veneer, a sloped tin roof on the central and north portions and flat roof system on the south portion. Interior ceiling finishes include exposed wooden roof decking in the central and north portions, painted gypsum board ceilings on the second storey and ceiling tiles in the basement. Floor finishes include hardwood floors and vinyl floor tiles on the second storey and unfinished concrete floors throughout the main floor. Interior walls are finished with painted brick in the central and north portions and gypsum board and concrete block in the south portion. Interior lighting is provided by mercury vapour lamps in the central and north portions and fluorescent and incandescent lights in the south portion.

The building is currently used as a storage warehouse for exhibition and tradeshow equipment and materials. The second storey is located above the south portion of the building only and is currently abandoned. A small area within the southwest corner of the main level is leased to a private citizen for use as a workshop. A basement level is also located beneath the south portion of the building. A natural gas-fired boiler is located in the southwest corner of the basement level. The workshop area is heated via a natural gas-fired hot water radiant system connected to a boiler in the northwest corner of the basement. Based on historic architectural plans provided by the City, the Horticultural Building was originally heated by a coal-fired boiler located at the southeast corner of the basement level.

Significant black mould and/or mildew was observed within the basement level. A small addition, known as “the workshop”, was constructed adjacent the east elevation in approximately the early 1940s and was removed in 1993/94. The Horticultural Building was historically used as a curling rink and formerly housed ice making equipment. Historical maps identified lavatories to the west and east of the building, the latter of which had been used by the Canadian Military as a boiler room during the early to mid 1940s.

Aberdeen Pavilion: is a single-storey building located on the central portion of the Phase One Property. The building has a footprint of 4,380 square metres and was constructed in approximately 1893. The building underwent significant restoration in the early 1990s. Exterior finishes include painted metal siding and sloped metal roof decking. Interior finishes include painted wood walls, finished concrete floors and painted wooden ceilings. The building is heated via natural gas-fired ceiling mounted infrared heaters and heating/ventilation/air conditioning (HVAC) units. Prior to the 1990 renovation the Aberdeen Pavilion was not heated. The building is lighted via metal halide and fluorescent lighting.

The building was vacant at the time of the site reconnaissance, but is used to house tradeshows and exhibitions. The Aberdeen Pavilion was known historically as the Manufacturers Building (c.1948), Cattle Castle and the Main Building (c.1922). This building was noted to have been used solely for showcasing and exhibiting livestock and other products (i.e., cars, airplanes, telephones). Despite the one time title of Manufacturers’ Building, the building was never used

for manufacturing, but was used for the display of manufactured items during the various fairs and exhibitions that took place at the Phase One Property.

Frank Clair Stadium: is an open air football stadium consisting of the North and South Side Stands with concession stands, washroom facilities and storage areas located below each. The South Side Stands also housed dressing rooms used before construction of the Eddie Friel Building. The stadium has a footprint of 5,100 square metres and is constructed of reinforced concrete and concrete blocks with a sloped metal roof. Interior finishes within the press boxes include carpeted flooring, painted gypsum board walls, and suspended ceilings. The press boxes are climate controlled via air conditioning units and electric heaters. The stadium is lighted via fluorescent and metal halide lights.

The North Side Stands are constructed above the Civic Centre. The lower South Side Stands were constructed in the 1950s, while the upper portion was completed in the mid-1970s. The North Side Stands were constructed in 1966 as part of the combined construction with the Civic Centre. Due to structural concerns, the lower portion of the South Side Stands was demolished in July 2008 and not replaced. Ramps and an overhead cable elevator provide access to the South Side Stands.

Civic Centre: is a split two-level building located beneath the North Side Stands of Frank Clair Stadium, on the west-central portion of the Phase One Property. The building has a footprint of 11,700 square metres and is constructed of poured concrete and concrete block construction. Exterior finishes include a flat roof system, reinforced concrete, exposed structural steel supports, vertical metal sheeting and curtain walls. Interior finishes include concrete, carpet, vinyl tile and terrazzo floors; concrete, concrete block and painted gypsum board walls; and exposed metal roof decking, concrete and suspended tile ceilings. The building is lighted via fluorescent, incandescent and metal halide lights. Since its construction heating is provided via a combination of natural gas-fired boilers feeding suspended hot water heaters, forced air furnaces, rooftop HVAC units, and infrared ceiling mounted heaters for the arena seating. A piston type elevator services this building.

Only the north portion of one level of the Civic Centre is above grade (second level seating and concourse). The Civic Centre was constructed in approximately 1966 and includes a hockey arena, assembly hall, an office area, five salons (Salons A through E), dressing rooms, kitchens and food preparation areas, and maintenance areas. The lowest level (ice level) extends approximately 20 metres north of the north elevation, beneath the parking area. The extension of the lower level houses a servery tunnel, one kitchen and two food preparation areas, which service the five Salons. One piston type elevator services this building and is located in the southwest portion of the building.

Eddie Friel Building: is a two-storey building with a basement level, located on the southwest portion of the Phase One Property, west of the South Side Stands. This building was constructed in approximately 1987 for its current use as a dressing room and training centre.

The building is climate controlled via air conditioning units and natural gas fired, forced air furnaces. A piston type elevator services this building.

Exterior finishes include a flat roof system, fibreglass reinforced plaster panels, and brick veneer. Interior finishes include: finished concrete, ceramic tile, terrazzo and vinyl tile floors; concrete, painted block and gypsum board, and wood panel walls; and concrete and suspended tile ceilings. The building is illuminated via fluorescent lighting.

Other: Two trailers were located west of the Horticultural Building at the time of the site reconnaissance and were occupied by the CCEA; however, access was not granted during the site reconnaissance. The trailers were removed from the Phase One Property in spring 2010. Sylvia Holden Park occupies the northwest corner of the Phase One Property.

The Phase One Property buildings cover approximately 18% of the total Phase One Property area. Selected photographs of the Phase One Property are presented in Appendix J.

Areas surrounding the Phase One Property buildings consist primarily of asphalt paved parking areas and vehicle access laneways, with the exception of landscaped areas along the north and west perimeters, including Sylvia Holden Park located on the northwest corner of the Phase One Property. AMEC observed that the Phase One Property was fenced along the north, east and south perimeters.

6.2.2 Phase One Property Utilities and Services

According to the Phase One Property representative, the Phase One Property is connected to the municipal water supply and sanitary sewer systems. Stormwater is directed via grade control to on-site catch basins and flows off-site and discharges to the Rideau River via the municipal storm sewer system. Electrical service is supplied to the Phase One Property by Hydro Ottawa via transformers located within locked transformer vaults in the basement level of the Civic Centre and beneath the South Side Stands. The Phase One Property representative confirmed that the transformers are located on concrete surfaces and that there have been no leaks associated with either of these transformer locations. Although they are recognized as a PCA, neither of the transformer locations is considered to be a APEC at the Phase One Property.

The Coliseum Building draws its power from a small pad-mounted transformer (PCA - Transformer Manufacturing, Processing and Use) located on the northwest corner of the Phase One Property, within Sylvia Holden Park. The location of the transformer is consistent with those identified on historic plans and FIPs and is considered to be an APEC at the Phase One Property. The Phase One Property has been provided with natural gas since approximately the mid 1960s. Prior to the installation of natural gas, heating equipment at the Phase One Property was fuelled by fuel oil and/or coal.

Mapping of sewer and water utilities at the Phase One Property is provided on Figure 5. Storm and sanitary sewers beneath the Phase One Property exit near the intersection of Holmwood Avenue and O'Connor Street where they connect to the municipal sewers. The sewer inverts at this location lie at a depth of approximately 2.75 metres below grade at an elevation of 62.285 masl in the vicinity of the Phase One Property and are generally above the water table. Preferential flow within the sewer and watermain trenches is considered unlikely due to the highly permeable nature of the subsurface fills and native soils which would be conducive to rapid infiltration of any water present within the trenches.

6.2.3 Phase One Property Production and Manufacturing

No manufacturing, large scale or otherwise, takes place on Phase One Property.

6.2.4 Drains, Pits and Sumps

No major drain systems or pits were observed at the Phase One Property; however sumps that service hydraulic elevators are present as well as a storm water sump are present.

Sumps serving the hydraulic elevators are located in the Civic Centre and the Eddie Friel Building. The elevator sumps were inspected during a site reconnaissance visit and no evidence of leakage of hydraulic oil was observed. The sumps were noted to be of concrete construction with no open bottoms. The sumps are connected to the municipal storm sewer system.

The storm water sump is located within the south portion of the Holding Area of the Civic Centre. The interior of the sump was inspected and no evidence of negative impact was observed and no sheen or odour were noted.

6.2.5 Tanks

6.2.5.1 *Aboveground Storage Tanks*

The Phase One Property representative advised AMEC that, in addition to holding tanks for water, there is a small AST for antifreeze within the paint room (Operations Area) in the Civic Centre and a 950 Litre AST (PCA - Gasoline and Associated Products Storage in Fixed Tanks) for the diesel generator that is contained within the generator enclosure. No evidence of leaks or spills was observed at the location of the 950 Litre diesel AST. The Phase One Property Representative confirmed that there have been no reported leaks. The 950 L AST is therefore not considered to represent an APEC at the Phase One Property.

No other ASTs were observed at the Phase One Property during the site reconnaissance. The historical review confirmed two historic fuel oil ASTs located adjacent the Horticultural Building that leaked, and in turn, were removed. The historical review also identified two other fuel oil spills, one in the basement of the McElroy Building and one in the former boiler room of the Coliseum Building. This information suggests that fuel oil was stored at the McElroy Building

and the Coliseum Building in ASTs. As noted in Section 2.4, the Phase One Property has only been provided with natural gas since approximately the 1960s.

6.2.5.2 *Underground Storage Tanks*

The Phase One Property representative advised AMEC that there are currently no USTs at the Phase One Property. USTs may have been present at the Phase One Property historically; however, there are limited available records to confirm or refute this possibility. AMEC did not observe fill or vent pipes during the site reconnaissance that would suggest the presence of USTs on the Phase One Property. Information obtained during the historical review detailed two fuel oil spills, one in the basement of the McElroy Building and one in the former boiler room of the Coliseum Building. As noted in Section 2.4, the Phase One Property has only been provided with natural gas since approximately the 1960s.

6.2.6 *Site Housekeeping*

In general, the Phase One Property appeared to be well maintained and in good order. AMEC did not observe any debris, staining, outdoor chemical storage or uncontrolled waste storage on-site at the time of the site reconnaissance. The parking and laneway areas were free of snow, with some on-site snow storage along the perimeters of the parking areas and adjacent several buildings.

6.2.7 *Chemical Storage/Handling and Floor Condition*

In addition to small quantities (i.e., 1 to 5 litres) of janitorial cleaning and maintenance supplies, AMEC also observed larger quantities (i.e., 1 to 20 litres) of various chemicals throughout the Phase One Property, including: adhesives, paints, oils and lubricants, water treatment chemicals, antifreeze, gasoline, and diesel. The noted chemicals were located in the Civic Centre and the Coliseum Building. The storage areas for these chemicals generally appeared to be tidy and free of significant staining. The concrete floors in the storage areas were observed to be generally in good physical condition with no visible signs of cracking or pitting. No open floor drains were observed to be present near the storage areas. Furthermore, no other chemicals or hazardous materials were observed indoors or outdoors at the time of the site reconnaissance. Based on the previously referenced observations, no significant environmental issues regarding chemical storage at the Phase One Property were identified. A list of the on-site chemical inventory may be referenced in Appendix D.

6.2.8 *Areas of Stained Soil or Pavement, or Stressed Vegetation*

The Phase One Property representative advised AMEC that no chemical spills have occurred at the Phase One Property (not including the fuel spill referenced above). No evidence of chemical spills, accidental releases or significant staining was observed inside the Phase One Property buildings. AMEC conducted a walkover of the Phase One Property to identify any areas of significant surface staining, stressed vegetation or any other potential indicators of

surface spills or leaks. No areas of significant surface staining or stressed vegetation were observed at the Phase One Property at the time of the site reconnaissance visits.

The information provided here concerning spills, surface staining and stressed vegetation is considered to be limited given the period of time that the Phase One Property has been in operation, the availability of persons with knowledge of the Phase One Property within that time period, and available recordkeeping.

6.2.9 Fill / Debris, Methane and Radon

6.2.9.1 *Fill / Debris*

AMEC did not observe amounts of fill, debris or uncontrolled waste storage at the Phase One Property at the time of the site reconnaissance.

The Phase One Property is generally graded even with the surrounding properties. Previous environmental and geotechnical investigations carried out at the Phase One Property indicate that fill materials placed for construction and grading purposes are common across the Phase One Property. Significant in-filling is known to have occurred on the south and east portions of the Phase One Property to reclaim a former inlet/bay of the Rideau Canal. The inlet/bay extended across the eastern portion of the Phase One Property in a southwesterly direction to the area east of the South Side Stands. An historic map from 1896 indicates that the southern portion of the inlet/bay was to be filled to create a “pond” that would roughly coincide with the location of the eastern landfill (Ur-27). The north end of the inlet/bay was to remain connected to the Rideau River. The 1900 historic plan indicates that this was done; however, the north end of the inlet/bay was also filled to completely isolate the pond from the Rideau River. The pond which is shown on the 1900 plan also roughly coincides with the location of the eastern landfill (Ur-27). The presence of non-geologic materials in the fill including decomposed refuse, ashes and cinders, bricks, glass, asphalt, and wood pieces was observed during previous subsurface investigations in the vicinity of the eastern landfill (Ur-27) (Paterson 1998b, 1999a) (see Section 4.1.8).

The southern portion of the Phase One Property is a registered closed landfill site, formerly used for the disposal of urban municipal wastes. This location is interpreted to be the location of the suspected Southern Landfill and not the Eastern Landfill (Ur-27) located east of the Aberdeen Pavilion. MOE records indicate that the landfill was closed in the 1960s; however, this does not seem plausible given the development of the Phase One Property at that time. In addition, as the inlet/bay of the Rideau River did not extend as far as the suspected landfill, the existence of the landfill is considered unlikely as common disposal practices at that time were to fill existing depressions, open bodies of water or other low lying areas, as opposed to excavating existing ground for waste disposal. Boreholes advanced during previous subsurface investigation in this area of the Phase One Property did not identify any refuse or deleterious fill materials. Earthen fill materials are present in the area, however, these are generally shallow (approximately 1.5 metres) compared to the eastern landfill area and are more likely to have been placed for Phase One Property development purposes.

6.2.9.2 *Methane*

Methane is a colourless and odourless gas commonly formed by the decomposition of organic material. Methane is a large component of natural gas associated with active and closed waste disposal sites. Natural sources of methane include marshes, swamps, bogs, fens or coal and/or peat deposits. Potential risks associated with methane include explosion hazards where methane enters closed spaces and concentrations exceed the lower explosive limit.

Fill materials were not observed on Phase One Property at the time of the site reconnaissance; however, one closed landfill and one suspected (unconfirmed) landfill are known to exist on the east and south portions of the Phase One Property, respectively. In addition, peat has been observed in some of the boreholes advanced at the Phase One Property, notably in the vicinity of the former inlet of the Rideau Canal.

Methane monitors were previously installed within the areas of the Eastern Landfill (Ur-27) and the suspected Southern Landfill. Based on methane gas monitoring, low levels of methane were found to exist at the Eastern Landfill (Ur-27) in 2003; however, no immediate health concerns were identified with respect to the closed Eastern Landfill (Ur-27) or the Suspected Southern Landfill (Section 4.1.8.9). Consequently, methane gas is not inferred to be a significant environmental issue at the Phase One Property at this time. However, should the development of the Phase One Property involve the construction of buildings in the area of the Eastern Landfill (Ur-27) or the Suspected Southern Landfill, consideration should be given to further assess the potential for methane migration into below grade spaces, if any.

6.2.9.3 *Radon*

Radon is a naturally occurring gas produced by the decay of Uranium-238 that tends to concentrate in formations of granite, sandstone, coal, phosphate and uranium deposits. Radon is colourless, odourless and tasteless and tends to percolate up through soil where it may enter and accumulate in basements of buildings through foundation cracks and joints. Because the existence of radon is dependent upon geological factors, it is more of a regional concern than site-specific.

The concentration of radon daughters is measured in units of working level (WL), which is a measure of the potential alpha particles' energy per litre of air. The annual exposure limit for the general public is 0.01 WL with the annual occupational exposure limit being 4.0 WL. In homes and other non-occupational settings, the maximum permissible annual average concentration of radon daughters caused by the operation of a nuclear facility is 0.02 WL. Health Canada recommends 0.1 WL as an upper limit.

AMEC has previously contacted the City of Ottawa Public Health Department requesting information regarding potential radon concerns in the City of Ottawa. AMEC was informed by the Public Health Department that radon studies and monitoring have not been conducted in the City of Ottawa, however, testing kits are available for testing in individual buildings. AMEC is not aware of other records (federal or provincial) of the presence or emission of radon gas in the

immediate area of Ottawa, Ontario. AMEC does not suspect radon gas to be a significant environmental issue at the Phase One Property.

6.2.10 Air Emissions and Odours

AMEC did not observe the presence of air emission sources at the time of the site reconnaissance that could possibly affect the environmental condition of the Phase One Property (i.e., building surfaces and / or surficial soils). The only air emission sources observed at the Phase One Property by AMEC were exhausts from the HVAC systems and kitchen and washroom vents. No significant environmental issues regarding air emissions at the Phase One Property have been identified based on the nature of the emission sources observed during the site reconnaissance.

6.2.11 Mould

Moulds (also known as “fungi”) are present everywhere in the natural environment, indoors and outdoors. Exposure to mould may occur indoors on water damaged building materials during occupancy, building maintenance and/or repair operations. The most common types of moulds are generally not hazardous. However, some moulds may be problematic to some people.

AMEC was advised by the Phase One Property representative that mould surveys or assessments have not been conducted at the Phase One Property and that mould is not known to be a problem at the Phase One Property.

Evidence of conditions that may promote mould growth (e.g., moist or wet conditions) were observed during the site reconnaissance within the basement level of the Horticultural Building the lower concourse and basement levels of the Civic Centre, the press box in Frank Clair Stadium, and on the second level of the Eddie Friel Building. Significant black mould growth/staining and damp conditions, which may be indicative of suspected mould growth, were observed within the basement level of the Horticultural Building.

Mould observations were made only in readily accessible areas of the existing buildings (i.e., did not include concealed spaces such as behind walls or above ceilings).

6.2.12 Designated Substances and Hazardous Building Materials

Individual designated substance regulations have been developed for eleven chemical contaminants and are enforced by the Ministry of Labour (MOL) under the Occupational Health and Safety Act (OHSA). Special regulations were made to prohibit, regulate, restrict, limit, or control worker exposure to designated substances due to their toxic nature. The designated substances identified in OHSA include:

Asbestos	Mercury	Coke Oven Emissions
Arsenic	Silica	Acrylonitrile

Lead	Vinyl Chloride	Isocyanates
Ethylene Oxide	Benzene	

Given the nature of the Phase One Property building and property use, AMEC has focused on specific designated substances as described in the following subsections.

6.2.12.1 Asbestos

Asbestos is a generic term that refers to a group of naturally occurring fibrous mineral silicates. The ability of asbestos to withstand high temperatures as well as its tensile strength, spinnability, chemical resistance, and other properties have resulted in hundreds of applications. Friable asbestos refers to materials which can be readily pulverized using hand pressure. Non-friable material refers to asbestos which is associated with a binding agent (such as, but not limited to, tar, mastics, vinyl, caulking, cement), that prevents the ready release of airborne fibres. Friable asbestos is commonly found in boiler and pipe insulation, fireproofing and textured coatings. Non-friable or bound asbestos is typically found in roofing tars, floor and drywall compound, plaster and pre-cast asbestos cement products commonly referred to as “transite”. Please note that this is not an exhaustive list and that many other products do contain asbestos.

AMEC was advised by the Phase One Property representative that asbestos surveys have been conducted for each building at the Phase One Property, and that asbestos-containing materials (ACMs) are known to be present at the Phase One Property. An Asbestos Management Plan is currently in place for the Civic Centre and Frank Clair Stadium. It should also be noted that a designated substance and hazardous materials survey (DSHMS) was being completed on the Horticultural Building and Aberdeen Pavilion by AMEC, concurrent to the completion of this report. The results of AMEC’s DSHMS are provided under separate cover.

Suspect ACMs were observed within the Coliseum Building, Horticultural Building, Civic Centre, Frank Clair Stadium and the Eddie Friel Building. Suspect ACMs observed as part of the Phase One ESA, included but are not limited to, one or more of the following: pipe wrap, tank wrap, vinyl floor tiles, ceiling tiles and plaster. Where observed, the suspected ACMs were noted to be in good physical condition.

The presence of ACMs can only be verified through multiple samples and analysis of suspect material samples as outlined in Ontario Regulation 278/05 “*Asbestos on Construction Projects and in Buildings and Repair Operations*”. If present at the Phase One Property, ACMs must be addressed through the implementation of an appropriate management or abatement plan to protect the health of persons working at the Phase One Property, as required under the OSHA and O. Reg. 278/05. Where ACMs are in poor or deteriorated condition and potential human health exposure concerns exist, ACMs may be addressed through repair, encapsulation, enclosure or removal. Appropriate management plans are also required where maintenance, alteration, renovation, or demolition activities undertaken at a Phase One Property may disturb these materials.

6.2.12.2 Lead

Lead is a heavy metal which is typically found in the following three forms:

- Metallic lead used to make water distribution pipes, electrical batteries, lead solder, and electric cable sheathes;
- Inorganic compounds often occurring as components of products, such as insecticides, pigments, paints, and glass; and,
- Organic lead compounds, the most commonly known of which are tetramethyl lead and tetraethyl lead, used as antiknock additives to gasoline.

The presence of lead-containing paints (LCPs) in buildings represents the most significant hazard of all the above noted lead containing products where persons, notably small children, may ingest peeling or flaking LCPs. The generation of airborne lead containing dust created during renovation, demolition, or construction activities (i.e., during sanding and grinding), or like actions on deteriorated painted surfaces also comprises a potential health concern.

In 1976, the federal government passed the Hazardous Products (Liquid Coating Materials) Regulations under the Hazardous Products Act limiting the amount of lead for interior paints to 0.5%. Exterior and commercial paints could still contain lead. In 1991, members of the Canadian Paint and Coatings Association agreed to voluntarily eliminate all added lead from their products. In April 2005, under the Canadian Hazardous Products Act, the Federal Government issued the Surface Coating Materials Regulations SOR/2005-109, which limits the amount of lead permissible in paints and other surface coating materials to 0.06% lead by dry weight (600 µg/g).

Some of the interior walls of the Phase One Property buildings contained painted surfaces. Given the dates of construction of the Phase One Property buildings (i.e., 1898 – 1966, and 1987), it is probable that LCPs are present at the Phase One Property, given that the legislative definition of LCP in Canada was recently revised (2005) to include a much lower acceptable concentration of lead than was previously regulated. Observations made at the time of the site reconnaissance indicated that the painted surfaces were generally in good physical condition (i.e., not peeling or flaking) with the exception of peeling paint within some areas within the Horticultural Building, Civic Centre and Eddie Friel Building. As noted above, a DSHMS was being completed on the Horticultural Building and Aberdeen Pavilion by AMEC concurrent to the completion of this report. The results of AMEC's DSHMS are provided under separate cover.

The presence of LCPs can only be verified through sampling and analysis of suspect paint samples. If present at the Phase One Property, LCPs may be addressed through the implementation of an appropriate management or abatement plans to protect the health of persons working at the Phase One Property, as required under the OHSA. Where LCPs are in poor condition (i.e., peeling or flaking) and potential human health concerns exist, LCPs may be addressed through encapsulation or removal. Appropriate management plans are also required

where maintenance, alteration, renovation, or demolition activities undertaken at a Phase One Property may disturb these materials.

6.2.12.3 Mercury

Minor amounts of mercury are commonly found in a variety of building materials including mercury vapour lamps and thermostats and other electrical control switches. Given the potential quantities of mercury present and their intended use, no potential concerns are expected.

6.2.12.4 UFFI

Urea formaldehyde foam insulation (UFFI) is a thermal insulation material that is pumped into interstitial spaces between the walls of buildings where it hardens to form a solid layer of insulation. The sale and installation of UFFI was banned for health-related reasons because of the generation of formaldehyde gas, which is released from the UFFI to the building interior.

AMEC was advised by the Phase One Property representative that he is not aware of the presence of UFFI at the Phase One Property. Visual indicators suggesting the possible presence of UFFI were not observed at the Phase One Property. Given the date of construction of the majority Phase One Property buildings (i.e., 1898 – 1966), it is possible that UFFI may be present at the Phase One Property since UFFI was used for a short period in the early 1970s, primarily for re-insulation and/or retrofitting purposes.

6.2.13 Other Substances

6.2.13.1 Polychlorinated Biphenyls

PCB were most commonly used in capacitors, transformers, circuit breakers, switch gears, lamp ballasts and large electrical cables as synthetic insulating materials. The use of PCB in electrical equipment was prohibited on July 1, 1980. However, PCB may be present in older hydraulic equipment still in use after the July 1, 1980 cut-off date. In addition, PCB were used in some hydraulic oils, particularly those used in high temperature applications such as casting shop presses.

As noted in Section 6.2.2, electrical service is supplied to the Phase One Property by Hydro Ottawa via transformers located within locked transformer vaults in the basement level of the Civic Centre accessible only by Hydro Ottawa. A similar hydro vault was previously located beneath the South Side Stands of Frank Clair Stadium. The Phase One Property representative indicated that there have been no spills at either of these locations. The Coliseum Building draws its power from a small pad-mounted transformer located on the northwest corner of the Phase One Property within Sylvia Holden Park. Since the Phase One Property and surrounding areas were developed prior to the 1980s, these transformers may contain PCB, as the use of PCB in oil-filled transformers was not discontinued until the early 1980s. Staining of the ground surface was not observed in the vicinity of the pad-mounted

transformer. No other suspect PCB-containing equipment was observed at the Phase One Property.

The presence of fluorescent, incandescent, mercury vapour and/or metal halide light fixtures were observed throughout the Phase One Property buildings. Given the date of construction of the Phase One Property buildings (with the exception of the Eddie Friel Building) (i.e., 1898 – 1966), the light ballasts at the Phase One Property may contain PCB, as the use of PCB in light ballasts was not discontinued until the early 1980s. The Phase One Property representative advised that many of the fluorescent light ballasts, specifically within the Civic Centre, have been replaced through on-going maintenance and upkeep.

PCB-containing lamp ballasts in good condition and still in service do not require removal or replacement. Leaking ballasts should be verified for PCB content, and if found to be PCB containing, managed in accordance with MOE regulations regarding PCB wastes. Where maintenance alteration, renovation, or demolition activities undertaken at a Phase One Property may result in the generation of more than 1.0 kg of PCB waste, it will be necessary to establish a secure licensed PCB storage facility at the Phase One Property or dispose of the wastes at an approved PCB disposal or destruction facility. PCB wastes totalling less than 1.0 kg may be disposed as non-hazardous waste at any licensed waste disposal site.

As discussed in Section 5.4, the ERIS report did not identify the Phase One Property as a registered PCB waste storage site in the MOE “*Ontario Inventory of PCB Storage Sites.*” The ERIS report identifies Lansdowne Park as a generator of PCB wastes from 2000 until 2008. This registration was associated with the household hazardous waste compound that is staged at Lansdowne Park during the spring. The MOE FOI response also included documentation of the transfer of two drums of PCB containing light ballasts from the Phase One Property to Fluorescent Lamp Recyclers Inc. in January 2004.

6.2.13.2 *Ozone Depleting Substances*

Ozone depleting substances (ODSs) include any substances containing chlorofluorocarbon (CFC), hydrochlorofluorocarbon (HCFC), halon or any other material capable of destroying ozone in the atmosphere. ODSs have been used in rigid polyurethane foam and insulation, laminates, aerosols, air conditioners, fire extinguishers, cleaning solvents and the sterilization of medical equipment. Federal regulations introduced in 1995 required the elimination of production and import of CFCs by January 1, 1996 (subject to certain essential uses) and a freeze on the production and import of HCFC-22 by January 1, 1996. These regulations also require the complete elimination of HCFC-22 by the year 2020.

The Phase One Property representative advised AMEC that some of the Phase One Property buildings are climate controlled through the use of HVAC units. Commonly, HVAC units located at similar facilities are charged with known ODSs. The Phase One Property representative advised AMEC that the HVAC units are serviced on an “as-needed” basis by contract technicians certified to handle ODSs. Furthermore, the Phase One Property representative

advised AMEC that ODSs were not stored on the Phase One Property. ODSs were not observed to be stored on the Phase One Property at the time of the site reconnaissance.

In addition to the HVAC equipment for the Phase One Property buildings previously described, the presence of the following equipment commonly known to contain ODSs was observed:

- Restaurant style coolers and freezers;
- Walk-in coolers and freezers; and,
- Chiller system.

No other equipment was observed at the Phase One Property that could potentially contain ODSs.

Ice making equipment currently in service at the Civic Centre utilizes ammonia as the refrigerant.

6.2.13.3 *Radioactive Materials*

The Canadian Nuclear Safety Commission (CNSC), formerly the Atomic Energy Control Board, under the Nuclear Safety and Control Act, is responsible for the management and licensing of radioactive materials, to ensure that the use of nuclear energy does not pose undue risk to health, safety, security and the environment. The CNSC achieves regulatory control of nuclear facilities and nuclear materials through a comprehensive licensing system, which is administered through the cooperation of federal and provincial government departments such as health, environment, transport and labour.

Radioactive materials or equipment (labelled as such) were not observed at the Phase One Property. No testing for the presence of radioactive material was undertaken.

6.2.13.4 *Animals and Pest Control*

Exposure to bird/bat droppings, rodent excreta and raccoon droppings can cause adverse health effects in humans. As a result, accumulation of this material should be kept to the lowest practical level.

Visible bird/bat droppings, evidence of rodent excreta or raccoon droppings were not observed during the site reconnaissance; however, observations were made only in readily accessible areas of the existing buildings (i.e., did not include concealed spaces such as behind walls or above ceilings).

6.3 Enhanced Investigation Property Observations

Part VI, 22(1) of *O.Reg 511/09* defines an *enhanced investigation property* as a property: 1) that is used, or has ever been used, in whole or in part for an industrial use; or 2) that is used or has

been used, in whole or in part, as a garage, as a bulk liquid dispensing facility, including a gasoline outlet, or for the operation of dry cleaning equipment.

The Phase One Property does not qualify as an enhanced investigation property as it is not and never has been subject to industrial use and is not and never has been used as a garage, as a bulk liquid dispensing facility, including a gasoline outlet, or for the operation of dry cleaning equipment.

6.3.1 Industrial/Commercial Operations

The Phase One Property consists of a sports and entertainment facility that is currently home to the Ottawa 67's hockey club and is used to host a variety of sports, entertainment, exhibition and convention events supported by offices and concession operations.

6.3.2 Hydraulic Lift Equipment

Mechanical equipment including piston type elevators, vehicle hoists, loading dock lifts, and compactors comprise typical hydraulically operated devices. Such equipment contains hydraulic oils which are operated under high pressures and can be released into the environment as a result of leaks or equipment failure.

The Phase One Property is presently serviced with two piston type elevators, one located in the Civic Centre and one located in the Eddie Friel Building. The elevator sumps were inspected during a supplemental site reconnaissance conducted on October 5, 2011 and no evidence of leakage of hydraulic oil was observed. Furthermore, the Phase One Property representative indicated that periodic topping up of the hydraulic reservoirs is not required and that monthly maintenance of the elevators is conducted by a licensed contractor.

During a previous Phase I ESA (Paterson, 1998a) oil was identified within the Civic Centre elevator sump pit. At that time, the City retained a licensed contractor to remove the oil within the pit. Paterson later returned to inspect the sump and found it to be free of oil. It was not confirmed in the Paterson report as to whether or not the leak within the elevator piston had been repaired or if there was any potential for soil and/or ground water impact beyond the confines of the sump pit.

The elevator shaft and sump pit in the Eddie Friel Building were found to be free of visible oil and staining during a previous the previous Phase I ESA (Paterson, 1998a).

6.3.3 Vehicle/Equipment Maintenance Areas

No vehicle maintenance currently takes place at the Phase One Property.

6.3.4 Oil/Water Separators

No oil-water separators are present at the Phase One Property.

6.3.5 Hazardous Materials Use/Storage

The use and/or storage of hazardous materials beyond the small quantities discussed in Section 6.2.7 was not observed during the site reconnaissance.

6.3.6 Generated Wastes

6.3.6.1 *Liquid Waste*

The Phase One Property representative advised AMEC that, in addition to sanitary wastewater, the Phase One Property generates, stores and disposes of liquid wastes from general operations which include waste hydraulic oil and waste cooking oil. The waste hydraulic oil is stored in pails within the condenser room, located in the southeast corner of the Civic Centre and removed for off-site disposal by Cimco, a licensed waste hauler, on an as-needed basis. The waste cooking oil is managed by Aramark and is stored within a metal bin located in the northeast corner of the concrete gated enclosure surrounding Frank Clair Stadium. The waste cooking oil is removed on an as-needed basis by a licensed waste hauler. No other liquid wastes were observed on the Phase One Property during the site reconnaissance.

During the previous Phase I ESA (Paterson, 1998a) oil was identified within the storm water sump pit located within the south portion of the Holding Area of the Civic Centre. At that time, the City retained a licensed contractor to remove the oil and oily water from within the pit. Paterson later returned to inspect the sump and found it free of oil. Paterson further noted that the spill and cleanup were reported to the MOE and the City of Ottawa Sewer Use Branch who were both satisfied with the cleanup. The oil was inferred to have been sourced from an oil spill from a tow truck within the Holding Area two days prior. The sump pit was inspected during a supplemental site reconnaissance on September 22, 2011 and no evidence of negative impact was observed and no sheen or odour were noted.

6.3.6.2 *Solid Waste*

Based on discussions with the Phase One Property representative, and on observations made by AMEC during the site reconnaissance, it is AMEC's understanding that the Phase One Property generates only non-hazardous solid waste from general operation and office activities. Non-hazardous solid waste generated at the Phase One Property is stored in metal containers located within the Holding Area of the Civic Centre and in the east portion of the concrete gated enclosure surrounding the Frank Clair Stadium and is removed for off-site disposal by Carl's Waste Services, a licensed waste hauler, on a regular basis.

Based on discussions with the Phase One Property representative, and on observations made by AMEC during the site reconnaissance, the Phase One Property also generates recyclable material (i.e., paper, cardboard, etc.) from general operation and office activities. Recyclable materials generated at the Phase One Property are stored in plastic containers within the Holding Area and metal bins in the same locations as the non-hazardous solid wastes, and are removed for recycling by Goulbourn Sanitation, on a regular basis.

6.3.6.3 *Liquid Discharge Points and Spills History*

The only liquid discharge points at the Phase One Property are the municipal storm drains located within the parking lot, and sanitary sewer lines. The Phase One Property representative was unable to advise AMEC where the sewer lines entered the Phase One Property. Figure 5 depicts the layout of the municipal infrastructure that currently services the Phase One Property.

6.4 **Written Description of Investigation**

Findings of AMEC's inspection and interviews were outlined throughout this section of our report. In summary, the site reconnaissance and related inquiries identified the following APECs:

- Significant black mould and/or mildew was observed within the basement level of the Horticultural Building;
- The Civic Centre has operated as a hockey arena since 1966 with ammonia having been used in the ice making operations since that time. While there are no known or reported spills, it is possible that soil and/or ground water in the vicinity of the ice making equipment may be impacted by ammonia as a result of historic losses/releases that may have occurred during operation of this ice making plant, as well as the ice making plants that were formerly present in several of the other Phase One Property buildings including the Horticultural Building, the former McElroy Building and the former Curl-o-Drome Building; and
- Fill materials placed for construction and grading purposes are common across the Phase One Property. Significant in-filling is known to have occurred on the south and east portions of the Phase One Property to reclaim a former inlet/bay of the Rideau Canal and includes a known landfill.

7.0 REVIEW AND EVALUATION OF INFORMATION

7.1 Current and Past Uses

Years	Owner	Description of Property Use	Property Use	Other Observations from Aerial Photographs, Fire Insurance Plans, Etc.
1868-1888	City of Ottawa Agricultural Society (portion of the Phase One Property)	Exhibition grounds	Recreational/ Commercial	Buildings present during this period included: the Main Building (a.k.a. Agricultural Building, Dog Show Building, and Manufacturers' Annex), Ladies' and Arts' Building and attached band stand, Manitoba Hall, Dairy Building, the Grand Stand, stables for cattle and horses, and pens for sheep and swine. The area south of the Grand Stand included a race track and various show rings.
1888-1907	Various Private Citizens (north portion of Phase One Property)	Residential	Residential	The north portion of the current Phase One Property was not yet part of Lansdowne Park and was occupied by individual residential lots and residences as well as Lansdowne Avenue, Alexandria Street and Mary Street (now O'Connor Avenue) extension. These properties were acquired by the City of Ottawa piecemeal from 1888 to 1907.
	The City of Ottawa (24.5 acres on the south portion of Phase One Property)	Multi-purpose exhibition and recreation facility	Recreational/ Commercial	<p>The southern limit of the arm of the Rideau Canal extending onto the east-central portion of the Phase One Property was in-filled by 1896. Further in-filling was completed by 1900 creating a roughly rectangular pond. The pond was filled in at some point prior to 1925.</p> <p>Aberdeen Pavilion was opened in 1898. In 1903 it was converted into a hockey rink during the winter months.</p> <p>The original part (central and east portions) of the Coliseum Building was constructed for use as a Fat Stock and Poultry Show Building in 1903 and was expanded to the east in 1906. Further additions were built to the northeast and northwest in 1926 and used to house livestock.</p> <p>The Ottawa Football Club began renting the land to the south of the Grand Stand in 1903. Over time this area evolved into Frank Clair Stadium.</p> <p>A fire in 1907 destroyed the Ladies' and Art's Building, Experimental Farms Building, Dairy Building and the original wooden Grand Stand.</p>
1907-1982	Corporation of the City of Ottawa	Multi-purpose exhibition and recreation facility	Recreational/ Commercial	The Ladies' and Arts' Building (a.k.a. Ladies Fine Arts Building) was rebuilt in 1908 and later demolished in 1966 to make way for construction of the Civic Center. The Grand Stand was rebuilt using steel and concrete construction in 1909. The lower level of the Grand Stand housed a dining hall, Secretary's office, Treasurer's office, Press Room, Fire Station, Police Station and exhibition hall.



				<p>In 1913 the Machinery Hall was constructed immediately adjacent the east Phase One Property perimeter with only the southwest portion extending onto the Phase One Property. The Machinery Hall was later destroyed by fire in 1944 and replaced by the General Purpose Building constructed in the same location. A historic Phase One Property plan circa 1946 identifies the General Purpose Building as a Garage. In 1961 the General Purpose Building was converted to a curling facility with seven sheets of ice.</p> <p>In 1914 the Horticultural Building was constructed. Undated building plans identify a basement level boiler room near the southeast corner of the building as well as a coal storage room and chute south of the boiler room. Five sheets of ice for curling were added to the Horticultural Building in 1969.</p> <p>Beginning in 1914 the Department of Militia and Defence (now the Department of National Defence) used the grounds and buildings during World War I for the training of troops. This was repeated during World War II. This included construction of two buildings identified as the CWAC mess and quarters, both located immediately east of the Phase One Property and both of which were no longer present by 1950. A Lavatory located east of the Horticultural Building is noted as a former boiler room used by the Military.</p> <p>The Press Building was constructed in 1920 immediately east of the Horticultural Building and was demolished by 1970.</p> <p>The Assembly Hall was built circa 1925 and later demolished in 1966 to make way for the current Civic Centre.</p> <p>The cattle and horse stables and sheep and swine pens were torn down in 1925 and 1926.</p> <p>The Pure Foods Building, located immediately north of the east portion of the current Phase One Property boundary, was constructed in 1926.</p> <p>Various pre-1945 records indicate two landfills located on-site: one on the south portion of the Phase One Property and one on the east portion of the Phase One Property roughly corresponding to the in-filled arm of the Rideau Canal once present at the Phase One Property.</p> <p>By 1950 a large addition called the Livestock Pavilion was added to the Coliseum Building between the two previous additions of 1926. By 1975 the east portion and western most addition of the Coliseum Building were removed and by 1994 additions to the north had been removed as well. FIPs and an historic Phase One Property plan circa 1946 indicated a boiler</p>
--	--	--	--	--

				<p>at the northeast corner of an addition to the northeast corner of the Coliseum Building; a boiler room in the north Annex of the Coliseum Building, northeast of the current northeast corner of the building; two boilers in a small outbuilding constructed north of the Coliseum Building and connected via a corridor; and a transformer located west of an addition built north of the Coliseum Building.</p> <p>In 1957 the McElroy Building was built. Eight sheets of ice for curling were added to the McElroy Building supported by an ice making plant in the basement in 1963. A previous Phase I ESA (Paterson, 1998a) identified an oil spill in the basement boiler room of the McElroy Building.</p> <p>Bleachers were constructed on the south side of Frank Clair Stadium in 1958. An upper level and canopy were added in 1975. The Civic Centre and the North Side Stands, as they exist today were constructed by 1970. By 1979 Frank Clair Stadium existed as it appears today with the exception of variations in the field configuration (e.g., baseball diamonds added and removed over time).</p> <p>During this period of time numerous other small buildings were erected and demolished, most of which were not identified in any detail or were deemed insignificant for the purposes of this Phase One ESA. One noteworthy structure, however, is a small building for gasoline and oil storage noted on the east portion of the Phase One Property, near the General Purpose Building on a circa 1946 Phase One Property plan.</p>
1982-1991	National Capital Commission	Multi-purpose exhibition and recreation facility	Recreational/ Commercial	No noteworthy changes observed.
1991-present	The City of Ottawa	Multi-purpose exhibition and recreation facility	Recreational/ Commercial	<p>In 1992 the Curl-O-Drome (General Purpose Building) was demolished and the area converted to green space, now owned by the NCC. A restoration of the Aberdeen Pavilion was also undertaken in 1992.</p> <p>By 1994 the addition to the east of the Horticultural Building was no longer present and Sylvia Holden Park had been developed.</p> <p>The McElroy Building was demolished in 2003.</p> <p>In 2008 the lower portion of the south side stands at Frank Clair Stadium was demolished.</p>

Based on a review of available information sources, it appears that the Phase One Property was developed for its use as a park and exhibition grounds beginning in the mid-1800s. Since that time, various buildings have been constructed and demolished on the Phase One Property, with the existing buildings having been constructed from 1898 through to 1987. Today, the majority of the Phase One Property is paved, both for at grade parking and for exhibition and entertainment use. The Phase One Property hosted the annual Central Canada Exhibition between 1888 and 2010, with some exceptions during war years. A weekly farmer's market was started at Lansdowne Park in 2007.

As the result of a review in the early 1990s, the City demolished some of the buildings and restored some parkland, notably along the Rideau Canal. The City also restored the Aberdeen Pavilion at that time. Due to structural problems, the lower grandstand of Frank Clair Stadium was demolished in July 2008 and not replaced.

7.2 Potentially Contaminating Activities

Several PCAs were identified both at the Phase One Property and within the Phase One Study Area. PCAs are identified on Figure 6a and described below. Those resulting in APECs at the Phase One Property are identified on Figure 6b.

Phase One Property

- **Gasoline and Associated Products Storage in Fixed Tanks (O.Reg. 153/04, Schedule D, Table 2, Item 28)** – Several boilers have been present at the Phase One Property including the former Coliseum Annex, the former East Lavatory, the former McElroy Building and potentially the Horticultural Building. In some cases the boilers are known to have been fueled by heating oil while others such as the Coliseum Building are speculated to have been fueled by heating oil for periods between the use of coal and natural gas. In addition, a former gasoline and oil storage building was present on the east portion of the Phase One Property during military occupation during WWII. A 950 Litre diesel AST for the emergency generator is located in the basement of the Civic Centre;
- **Importation of Fill Material of Unknown Quality (O.Reg. 153/04, Schedule D, Table 2, Item 30)** – the Phase One Property has been subjected to various degrees of site-wide filling to achieve the existing grade elevations. Trace waste materials including wood, glass, brick and ash have been reported at borehole locations in the vicinity of the McElroy Building, Civic Centre and Aberdeen Pavilion; however, no evidence of contamination was reportedly observed at these locations (Golder 2008);
- **Transformer Manufacturing, Processing and Use (O.Reg. 153/04, Schedule D, Table 2, Item 55)** – A historic transformer was noted to exist north of the west end of Coliseum Building, between two adjacent buildings comprising the former Annex. A Hydro Ottawa transformer that currently supplies the Phase One Property presently resides at this location. A transformer vault is located at the southeast corner of the

basement of the Civic Centre. A transformer vault was previously located in the former South Side Stands that were demolished in July 2008; and,

- **Waste Disposal and Waste Management (O.Reg. 153/04, Schedule D, Table 2, Item 58)** – The former Lansdowne Park Landfill (Ur-27) is located on the east portion of the Phase One Property, while a suspected second landfill is inferred to be present beneath and to the south of the South Side Stands.

Phase One Study Area

- **Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicle (O.Reg. 153/04, Schedule D, Table 2, Item 27)** – A number of automotive garages were noted within the Phase One Study Area at 852, 855, 875, 885, 889, 890, 901 and 1063 Bank Street. The garages currently and/or historically located within the Phase One Study Area vary from 55 to 190 metres from the Phase One Property and were either located hydraulically downgradient to the Phase One Property or at distances great enough that they are not inferred to present significant concern with respect to the environmental condition of the Phase One Property.
- **Gasoline and Associated Products Storage in Fixed Tanks (O.Reg. 153/04, Schedule D, Table 2, Item 28)** – Several historic gasoline service stations were noted within the Phase One Study Area at 812, 852, 890, 912, 1014/1016, 1063, 1080 Bank Street. Two of the historic gasoline service stations were located in close proximity to the Phase One Property. One was located at 1014/1016 Bank Street, approximately 23 metres west of the Phase One Property at the northeast corner of the intersection of Bank Street and Wilton Crescent. The second was located at 912 Bank Street, approximately 25 metres northwest of the Phase One Property at the northeast corner of the intersection of Bank Street and Holmwood Avenue. The remaining gasoline service stations historically located within the Phase One Study Area along Bank Street were either located hydraulically downgradient to the Phase One Property or at distances great enough that they are not inferred to present significant concern with respect to the environmental condition of the Phase One Property.
- **Operation of Dry Cleaning Equipment (O.Reg. 153/04, Schedule D, Table 2, Item 37)** – Historic dry cleaning facilities were identified at 779, 817, 829, 831, 837 and 1014/1016 Bank Street. A current dry cleaner has been present at 856 Bank Street since approximately 2000. The location of the historic dry cleaning facility formerly located at 1014/1016 Bank Street is approximately 23 metres west of the Phase One Property at the northeast corner of the intersection of Bank Street and Wilton Crescent.
- **Transformer Manufacturing, Processing and Use (O.Reg. 153/04, Schedule D, Table 2, Item 55)** – A historic electrical substation was identified at 115 Holmwood Avenue, approximately 12 metres from the Phase One Property. Details of equipment at the substation were not found; however transformer(s) may have been present.

7.3 Areas of Potential Environmental Concern

AMEC's findings regarding APECs as a result of the records review are presented in Section 4.5, and findings as a result of interviews and the site reconnaissance are presented in Section 5.1. In addition, they are summarized in the table below. Section 7.4, Phase One Conceptual Site Model, provides more detailed discussion on these findings and their supporting rationale.

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potential Contaminating Activity	Location of PCA (on Phase One Property or off Phase One Property)	Contaminants of Potential Concern	Media Potentially Impacted
APEC-1: Coliseum Annex Boiler Room	Near the north Phase One Property perimeter, north of the east portion of the Coliseum Building.	- Gasoline and associated products storage in fixed tanks (heating oil and coal).	On Phase One Property	BTEX PHC PAH	Soil and ground water
APEC 2: East Lavatory Boiler Room	At north Phase One Property perimeter immediately east of the Horticultural Building.	- Gasoline and associated products storage in fixed tanks (heating oil).	On Phase One Property	BTEX PHC	Soil and ground water
APEC 3 and APEC 4: Eastern and suspected Southern Closed Landfills	Former Lansdowne Park Landfill (Ur-27) is located on the east portion of the Phase One Property, while a suspected second landfill is inferred to be present beneath and to the south of the South Side Stands.	- Waste Disposal and Waste Management - Importation of Fill of Unknown Quality	On Phase One Property	Metals PAH PHC Landfill leachate related parameters	Soil and ground water
APEC 5: Horticultural Building Former Ice-Making Plant	Near the center of the north Phase One Property perimeter.	- Ice making plant using ammonia (non-listed PCA)	On Phase One Property	Ammonia	Soil and ground water
APEC 6: Historic Dry Cleaning Facility and Gas Station	West portion of the Phase One Property across from the northwest corner of the intersection of Bank Street and Wilton Crescent.	- Operation of Dry Cleaning Equipment - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles - Gasoline and Associated Products Storage in Fixed Tanks	Off Phase One Property	VOC BTEX PHC	Soil and ground water

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potential Contaminating Activity	Location of PCA (on Phase One Property or off Phase One Property)	Contaminants of Potential Concern	Media Potentially Impacted
APEC 7: Historic Gas Stations, Repair Garages and Dry Cleaners	Northwest corner of the Phase One Property at the intersection of Bank Street and Holmwood Avenue and north of Phase One Property along Bank Street.	<ul style="list-style-type: none"> - Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles - Gasoline and Associated Products Storage in Fixed Tanks - Operation of Dry Cleaning Equipment 	Off Phase One Property	VOC BTEX PHC	Soil and ground water
APEC 8: Coliseum Annex Transformer	On Phase One Property, north of the west end of Coliseum Building, between two adjacent buildings comprising the former Annex. The precise location of the transformer is unknown; however, its former location is inferred to lie within Sylvia Holden Park and appears to be coincident with the existing transformer.	- Transformer Use	On Phase One Property	PCB PHC	Soil and ground water
APEC 9: Former McElroy Building Boiler Room, Oil Spill and Former Transformer Room	On Phase One Property, near the Phase One Property perimeter approximately 85 m south of the Aberdeen Pavilion and 95 m east of Frank Clair Stadium.	<ul style="list-style-type: none"> - Heating fuel storage and use (boiler) - Historic oil spill - Transformer Use 	On Phase One Property	BTEX PHC PCB	Soil and ground water
APEC 10: Horticultural Building Historic Fuel Sources and Storage	On Phase One Property at the center of the north Phase One Property perimeter.	- Heating fuel storage and use	On Phase One Property	BTEX PHC PAH	Soil and ground water
APEC 11: Former Gasoline and Oil Storage Building	On southeast portion of the Phase One Property, just east of the former McElroy Building.	- Gasoline and Associated Products Storage in Fixed Tanks	On Phase One Property	BTEX PHC	Soil and ground water

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potential Contaminating Activity	Location of PCA (on Phase One Property or off Phase One Property)	Contaminants of Potential Concern	Media Potentially Impacted
APEC 12: Former Boiler Houses	On neighbouring NCC land just east of the Phase One Property.	- Heating fuel storage and use	Off Phase One Property	BTEX PHC	Soil and ground water
APEC 13: Civic Centre Ice Making Plant	On central portion of the Phase One Property immediately north of Frank Clair Stadium.	- Ice making plant using ammonia (non-listed PCA)	Off Phase One Property	Ammonia	Soil and ground water
APEC 14: Ice Making Plants at former McElroy Building and Curl-o-Drome	Southeastern portion of Phase One Property	- Ice making plant using ammonia (non-listed PCA)	On Phase One Property (McElroy) Off Phase One Property (Curl-o-Drome)	Ammonia	Soil and ground water
APEC 15: Site-wide Filling	Across Phase One Property	- Importation of Fill Material of Unknown Quality - Storage and handling of coal (non-listed PCA) - Management of spent coal wastes and residues (non-listed PCA)	On Phase One Property	PHC PAH Metals	Soil and ground water

Coliseum Annex Boiler Room (APEC 1)

Two boiler rooms were previously located in the former Coliseum Annex. The initial boiler room was located at the northeast corner of the building and was later moved to a more central portion. A subsurface investigation of the Annex west boiler room area was completed in 1993 (Intera 1993) followed by the excavation of approximately 270 cubic metres of petroleum contaminated soil in 1994 (Intera 1994). An additional investigation of the area was completed in 1998 which indicated soil and ground water in the area to be free of petroleum hydrocarbon related impact. It is noted that the investigations and remediation carried out in regards to the Annex boiler room focused on the later, more central boiler room location. No investigations (prior to AMEC 2010b) appear to have been carried out at the initial, eastern location.

East Lavatory Boiler Room (APEC 2)

The East Lavatory was used as a boiler room by the Canadian Military during the early to mid 1940s. A subsurface investigation of the East Lavatory Boiler Room area was completed in 1993 (Intera 1993) followed by the excavation of approximately 15 cubic metres of petroleum contaminated soil in 1994 (Intera 1994). An additional investigation of the area was completed in 1998 which indicated that soil and ground water in the area met the MOE assessment and remediation guidelines in force at that time (Paterson 1998b, 1999a). Some uncertainty exists with respect to the historic fuel sources and storage methods/locations for the on-site heating equipment at this location.

Eastern (APEC 3) and Southern (APEC 4) Closed Landfills

Former Lansdowne Park Landfill (Ur-27) is located on the east portion of the Phase One Property, while a suspected second landfill is inferred to be present beneath and to the south of the South Side Stands. Both landfills were the focus of several previous investigations, including those carried out under the City's Old Landfill Management Strategy (OLMS), which concluded that the landfills posed no immediate risk to human health (Paterson 2003). The southern extent of the eastern landfill has not been properly defined and all COPC commonly associated with old closed landfills were not analyzed during previous investigations at the Phase One Property (i.e., PAH).

Horticultural Building (APEC 5)

The Horticultural Building was formerly used as a curling rink and was serviced with an ammonia ice making plant in 1969. Ground water impacted by ammonia was reported during the previous 1998 investigation near the East Lavatory east of the Horticultural Building (Paterson 1998b); however, the magnitude and extent of the ground water impact was not assessed.

Historic Dry Cleaning Facility and Gas Station (APEC 6)

A historic gasoline service station and historic dry cleaning facility were formerly located at 1014/1016 Bank Street, approximately 23 metres west of the Phase One Property at the northeast corner of the intersection of Bank Street and Wilton Crescent. Previous subsurface investigations completed at the Phase One Property (prior to AMEC 2010b) did not assess potential soil and ground water impact that may be associated with this APEC.

Historic Gas Station, Repair Shops and Dry Cleaners (APEC 7)

Historic gasoline service stations, automotive repair shops and dry cleaners were formerly located along Bank Street, including a historic gasoline service station located approximately 25 metres northwest of the Phase One Property at 912 Bank Street. This property is currently occupied by Kettleman's Bagel Co. Previous subsurface investigations completed at the Phase One Property (prior to AMEC 2010b) did not assess potential soil and ground water impact that may be associated with this APEC.

Coliseum Annex Transformer (APEC 8)

A historic transformer, potentially containing PCB-containing oil, was noted to exist north of the west end of Coliseum Building, between to adjacent buildings comprising the former Annex. The precise location of the transformer is unknown; however, its former location is inferred to lie within Sylvia Holden Park. This APEC has not been the focus of any previous investigations carried out at the Phase One Property (prior to AMEC 2010b).

Former McElroy Building (APEC 9)

The McElroy Building was located at the Phase One Property between 1957 and 2003. Based on a review of the aerial photographs and historic plans, a subgrade boiler room is inferred to have been located at the southeast corner of the building; however, the fuel sources and storage locations are unknown. Historical information indicated a former oil spill within the basement level of the building. The McElroy Building was also formerly used as a curling rink and ammonia was used in the ice making plant. A grade level transformer vault was located slightly north of the boiler room along the east elevation. This APEC was not assessed during any of the previous investigations carried out at the Phase One Property (prior to AMEC 2010b).

Horticultural Building (APEC 10)

There is some uncertainty with respect to the historic fuel sources and storage methods and locations for the Horticultural Building heating equipment. Undated architectural plans prepared for the CCEA indicate a boiler room and coal storage room at the front of the building and east of the main entrance. A coal chute leading to the coal room was also located immediately east of the main entrance. The southeast portion of the basement level currently houses the natural gas-fired boiler; however, it remains unknown if the Horticultural Building was heated by alternate means (e.g. fuel oil) prior to the current natural gas and subsequent to the original development. Historical information (i.e., FIPs) did not identify any boilers within the Horticultural Building. This APEC was not assessed during any of the previous investigations carried out at the Phase One Property.

Former Gasoline and Oil Storage (APEC 11)

The Phase One Property was occupied by the Military from 1941 through to 1946 for the training of military troops. A small building identified on a historical map (c.1946) was noted to have been used by the Military for the storage of gasoline and oil. This building was located on the southeast portion of the Phase One Property near the General Purpose Building. This APEC was not assessed during any of the previous investigations carried out at the Phase One Property (prior to AMEC 2010b).

Former Boiler Houses (APEC 12)

Two former buildings located just east of the Phase One Property, on NCC Lands, the former General Purpose Building and former Agricultural Implement Building, were noted to have housed boiler (as noted the 1956 FIP). There is no information with respect to the historic fuel sources and storage methods and locations for the heating equipment; however, given their use

as boiler houses, it is possible that liquid fuel (i.e., heating oil) or coal may have been stored at this location. Previous investigations did not address the possibility of petroleum hydrocarbon impacted soil and/or ground water along the eastern Phase One Property perimeter adjacent to these former boiler houses (prior to AMEC 2010b).

Civic Centre Ice Making Plant (APEC 13)

The Civic Centre has operated as a hockey arena since 1966 with ammonia having been used in the ice making operations since that time. While there are no known or reported spills, it is possible that soil and/or ground water in the vicinity of the ice making equipment may be impacted by ammonia. The presence of ammonia in the soil and/or ground water in the vicinity of the ice making equipment was not investigated during previous assessments (prior to AMEC 2010b).

Former McElroy and Curl-o-Drome Ice Making Plants (APEC 14)

In 1961 the General Purpose Building was converted into a public pay-as-you-go curling rink (Curl-O-Drome) housing seven sheets of ice. In 1963 eight sheets of ice for curling were added to the McElroy Building. While there are no known or reported spills, it is possible that soil and/or ground water in the vicinity of the ice making equipment may be impacted by ammonia. The presence of ammonia in soil and/or ground water in the vicinity of the ice making equipment was not investigated during previous assessments

Site-Wide Filling (APEC 15)

In addition to the known landfilling areas, the Phase One Property has been subjected to various degrees of site-wide filling to achieve the existing grade elevations. Trace waste materials including wood, glass, brick and ash have been reported at borehole locations in the vicinity of the McElroy Building, Civic Centre and Aberdeen Pavilion; however, no evidence of contamination was reportedly observed at these locations (Golder 2008).

7.4 Phase One Conceptual Site Model

Figure 2 illustrates the existing layout of the Phase One Property while Figure 6c illustrates the current uses of properties within the Phase One Study Area. The Rideau Canal is located approximately 32 to 100 metres south and east of the Phase One Property and flows north to the Ottawa River, which is located approximately 3 kilometres north of the Phase One Property. There are no Areas of Natural Significance located within the Phase One Study Area. There are no drinking water wells on the Phase One Property.

Surface topography is relatively flat with a gentle slope from Sylvia Holden Park in the northwest to the Rideau Canal in the southeast. Grade elevation varies from 65 to 68.5 meters above sea level (masl). Areas surrounding the Phase One Property buildings consist primarily of asphalt paved parking areas and vehicle access laneways, with the exception of landscaped areas along the north and west perimeters, including Sylvia Holden Park located on the northwest

corner of the Phase One Property. AMEC observed that the Phase One Property was fenced along the north, east and south perimeters.

The Phase One Property is currently improved with six permanent structures which include: Coliseum Building, Horticultural Building, Aberdeen Pavilion (a.k.a Cattle Castle), Civic Centre, Frank Clair Stadium and Eddie Friel Building (hereinafter collectively referred to as the "Phase One Property buildings"). These buildings comprise approximately 27,200 square metres in total area and are used to host a variety of sports, entertainment, exhibition and convention events. The remainder of Lansdowne Park is asphalt surfaced, primarily for use as at grade parking during the various events staged at the Phase One Property throughout the year. Previous buildings including the Curl-O-Drome (a.k.a. General Purpose) and McElroy Buildings which abutted the Queen Elizabeth Driveway and a number of other buildings previously adjoining the Coliseum; these were demolished in the 1990s.

Based on AMEC's review of available geological maps and previous subsurface investigations carried out at the Phase One Property, the stratigraphy of the overburden from the ground surface is anticipated to consist of fill materials extending to depths ranging from 0.36 to 5.18 metres below grade (mbg.) underlain by native deposits consisting of combinations of sand, sandy silt, silty sand, and sand and gravel to the termination depths of the boreholes (not on inferred bedrock) ranging from 3.66 to 9.9 mbg. The depth to bedrock is reported to range from approximately 9 to 21 mbg. ("*Drift Thickness Trend, Ottawa-Hull, Ontario and Quebec*", Geological Survey of Canada, 1979); however, bedrock has not been encountered at depths less than approximately 7 mbg in any of the boreholes advanced at the Phase One Property. The Phase One Property is underlain by bedrock of both the Billings and Lindsay Formations which are Ordovician in age and are composed of dark brown to black shale with laminations of calcareous siltstone; and sublithographic to fine crystalline limestone, nodular in part, with interbeds of calcarenite and shale, respectively ("*Paleozoic Geology Ottawa Area*", map P.2716, Ontario Geological Survey, 1984).

The regional ground water flow direction, based on topographic features and knowledge gained from other sites in the area, is expected to be to the northeast. Locally, however, the shallow ground water flow may be influenced by underground utility trenches, conduits, and structures, variations in soil type, and minor fluctuations in topography. Based on previous investigations (AMEC 2010b) ground water resides at depths ranging from 1.9 to 8.35 metres below grade (mbg). Beneath the western portion of the Phase One Property ground water flows to the southeast. Ground water flow on the eastern portion of the Phase One Property is affected by the presence of the Eastern Landfill (Ur-27) and flows approximately radially outward to the west and south from the landfill. Ground water beneath the southern portion of the Phase One Property flows to the south towards the Rideau River. It should be noted that the Rideau Canal is a losing stream, which means that ground water flows out from the base of the canal recharging the surrounding water tables. The elevation of the Rideau Canal is near surface grade in the vicinity of the Phase One Property during its regular operational period.

Mapping of sewer and water utilities at the Phase One Property is provided on Figure 5. Storm and sanitary sewers beneath the Phase One Property exit near the intersection of Holmwood Avenue and O'Connor Street where they connect to the municipal sewers. The sewer inverts at this location lie at a depth of approximately 2.75 m below grade at an elevation of 62.285 masl in the vicinity of the Phase One Property and are generally above the water table. Preferential flow within the sewer and watemain trenches is considered unlikely due to the highly permeable nature of the subsurface fills and native soils which would be conducive to rapid infiltration of any water present within the trenches.

The results of this Phase One ESA indicate the existence of numerous APECs that have impacted and/or may be impacting soil and ground water quality at the Phase One Property. Several of the APECs have been realized through previous subsurface investigations and sampling programs completed at the site by others on behalf of the City. These include targeted investigations and soil excavation programs that were conducted to address known concerns at that time (e.g., petroleum spill at the Coliseum Annex and East Lavatory) and investigations that were conducted to assess APECs identified during a previous Phase I ESA of the Phase One Property (Paterson, 1998a). As a result of the findings of these investigations, several of the APECs identified by Paterson (1998b, 1999) have been confirmed as APECs including the eastern landfill (Ur-27) and ammonia impact in the vicinity of the Horticultural Building.

In addition to the previously identified APECs, several additional APECs have been identified at the Phase One Property. Several of the APECs include previously identified concerns that were either not assessed as part of subsequent investigations or were, in AMEC's opinion, not subject to a sufficient level of investigation to qualitatively and quantitatively dismiss them as APECs. In addition, the previous investigations carried out at the Phase One Property were primarily focussed with respect to potential concerns on the Phase One Property specific to current or former Phase One Property activities and did not address APECs beyond the Phase One Property.

Figure 6a illustrates occurrences of PCAs within the Phase One Study Area while Figure 6b identifies the locations of APECs. APECs resulting from current and historical activities on the Phase One Property include the use of heating equipment fuelled by coal and heating oil at various locations, gasoline and oil storage, the presence of a transformer, an oil spill, the presence of two closed landfills on the Phase One Property as well as general filling and grading and the operation of ice making plants using ammonia. Activities beyond the Phase One Property resulting in APECs are limited to historic gas stations and a dry cleaner located on Bank Street within 25 metres of the Phase One Property, the ice making plant at the former Curl-o-Drome, and the former boiler rooms/houses associated with the former General Purpose Building and former Agricultural Implement Building located on the NCC property to the east.

Contaminants of potential concern include PHC, VOC (including chlorinated solvents), heavy metals, PAH, PCB, ammonia and landfill leachate related parameters. With the exception of former dry cleaners located along Bank Street to the west and northwest of the Phase One

Property and trihalomethanes associated with leaking municipal infrastructure beneath the Phase One Property, chlorinated VOC are not considered to represent COPCs on the Phase One Property based on the findings of the Phase I ESA (AMEC, 2010a) and Phase II ESA (AMEC, 2010b). As such, VOC, other than BTEX, sourced from properties beyond the Phase One Property would, in the absence of any significant screening data to indicate otherwise, require further investigation in ground water only. Based on available historical information, the Eastern Landfill (Ur-27) was closed some time prior to 1910. According to Health Canada, PCB were first manufactured in 1929 (<http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/pcb-bpc-eng.php>). Organochlorine pesticides were not in use until after the Second World War (<http://www.chemistryexplained.com/Ny-Pi/Pesticides.html>). As such, neither PCB nor chlorinated pesticides were in use at the time the landfill was closed and thus are not reasonably expected to be present in the landfill.

Other potential COPCs identified at the Phase One Property during the environmental database review (EcoLog ERIS report) include pharmaceuticals, halogenated and non-halogenated pesticides, pathological wastes, aromatic solvents and aliphatic solvents. During the 1990s and early 2000s the City of Ottawa (and prior to municipal amalgamation in 2000 the Region of Ottawa-Carleton) operated a Household Hazardous Waste Collection Program in which the residents of the City were encouraged to bring their household hazardous wastes to one of several temporary drop off facilities that would be set up in the City. These events would be staged several times a year. Lansdowne Park was one such location where these events were staged. A Provisional Certificate of Approval for the use and operation of a Waste Transfer Station was issued by the MOE which cited a number of waste classes. Additional waste classes were added over the operating years as more varied types of waste were accepted, including pharmaceuticals and pesticides among others. The household hazardous wastes collected during the events were stored in secure facilities with no reported incidents or spills. Based on the available information, pesticides, pharmaceuticals, acid wastes, alkaline wastes, aliphatic solvents and halogenated solvents were excluded as COPCs.

The findings of the 2010 Phase I ESA (AMEC 2010a) were for the most part similar to this Phase One ESA, with the exception of an additional APEC identified herein being potential soil and/or ground water impacts associated with former curling rink ice making plants at the former Curl-o-Drome (a.k.a. General Purpose Building) and former McElroy Building.

An APEC identified in the 2010 Phase I ESA (APEC-10 - AMEC, 2010a) associated with oil observed in the sanitary sump located within the Holding Area of the Civic Centre was not identified as an APEC in this Phase One ESA. Subsequent to the discovery of the oil, the City had retained a licensed contractor, Sewer-Matic Services, to pump the oil and oily water from within the sump for off-Site disposal. Upon returning to inspect the sump subsequent to the pump-out, Paterson found the water within the sump to be free of visible sheen and product. Paterson further noted that the spill and cleanup were reported to the MOE and the City of Ottawa Sewer Use Branch who were both satisfied with the cleanup.

Similarly, potential soil and/or ground water impact associated with oil observed in the Civic Centre elevator sump pit (APEC 8 – AMEC 2010a) and potential hydraulic oil leaks and subsurface soil and/or ground water impact at the piston elevator shaft and sump pit in the Eddie Friel Building (APEC 11 – AMEC 2010a) were not identified as APECs in this Phase One ESA. These APECs could not be inspected at the time of the Phase I ESA (AMEC 2010a) due to confined space access restrictions and thus could not be dismissed as APECs. The sump pits for the elevators in the Eddie Friel Building and Civic Centre were inspected during this Phase One ESA for evidence of hydraulic fluid leakage, to determine the integrity of the sump pits and to determine potential release mechanisms (e.g. sump pumps). The inspection was carried out with assistance of the City elevator maintenance contractor (Kone). The elevator sumps were found to be dry at the time of the inspection. In addition, the elevator sumps were observed to be self-contained units of concrete construction connected to the municipal storm sewer system with no open bottoms or potential for release or discharge to the subsurface environs.

Brown's Inlet, a closed landfill located 350 metres southeast of the Phase One Property was not considered to pose an APEC at the Phase One Property due to its separation from the Phase One Property. In addition, the Brown's Inlet Landfill was previously investigated by the City of Ottawa as part of its Old Landfill Management Strategy and was found to pose no potential risk to off-site receptors.

All former heating oil tank locations and boiler rooms fuelled by coal or heating oil have been identified as APECs. Heat for the Coliseum was previously provided by the two boiler rooms located in the former Coliseum Annex Buildings. The boiler rooms were originally coal fired and subsequently converted to heating oil with the westernmost of the two former boiler room locations having been supplied by an underground storage tank (UST). The former heating oil UST was the focus of a previous remediation program. The Coliseum was converted to natural gas prior to final demolition of the Annex Buildings. A former UST was also present at the former East Lavatory boiler room. Aboveground storage tanks for heating oil were present at the Horticultural Building and former McElroy Building. The Aberdeen Pavilion was never heated prior to renovations undertaken in the early 1990s. The building has since been heated by natural gas. A 950 L diesel tank for an emergency generator is present at the southeast corner on the basement level of the Civic Centre.

8.0 CONCLUSIONS

The findings of the Phase One ESA completed by AMEC have identified several past or present uses on, in or under the Phase One Property, and PCAs on, in or under the Phase One Property or within the Phase One Study Area, that comprise APECs on the Phase One Property where one or more contaminants may be present. The APECs identified in this Phase One ESA include:

- 1) Potential remnant soil and/or ground water impact from heating oil impact in the vicinity of the former Coliseum Annex boiler rooms;
- 2) Potential remnant soil and/or ground water impact from heating oil impact in the vicinity of the East Lavatory (Horticultural Building) boiler room;
- 3) The eastern landfill (Ur-27) beneath the eastern portion of the Phase One Property and potential associated soil and/or ground water impact;
- 4) The suspected Southern Landfill in the vicinity of the South Side Stands and potential associated soil and/or ground water impact;
- 5) Potential ammonia impact in the vicinity of the Horticultural Building associated with former indoor ice making activities;
- 6) Potential soil and/or ground water impact from a historic gasoline service station and historic dry cleaning facility formerly located at 1014/1016 Bank Street, approximately 23 metres west of the Phase One Property at the northeast corner of the intersection of Bank Street and Wilton Crescent;
- 7) Potential soil and/or ground water impact from historic gasoline service stations, automotive repair shops and dry cleaners formerly located along Bank Street, including a historic gasoline service station located approximately 25 metres northwest of the Phase One Property at 912 Bank Street;
- 8) Potential soil and/or ground water impact from a historic transformer, potentially containing oil with polychlorinated biphenyls (PCB) additives, located north of the Coliseum Building near the west end of the former Annex;
- 9) Potential soil and/or ground water impact from the transformer vault and boiler room and potential unknown fuel sources at the southeast corner of the former McElroy Building;
- 10) Potential soil and/or ground water impact associated with historic fuel sources and storage methods for the Horticultural Building heating equipment;
- 11) Potential soil and/or ground water impact associated with a former gasoline and oil storage area located near the former General Purpose Building during occupation by the Military from 1941 through to 1946;
- 12) Potential soil and/or ground water impact from a free standing boiler house and the boiler house for the former Agricultural Implement Building/Machinery Hall Building located just east of the Phase One Property on NCC Lands;

- 13) Potential soil and/or ground water impact by ammonia in the vicinity of the Civic Centre ice making equipment;
- 14) Potential soil and/or ground water impact by ammonia in the vicinity of the former McElroy Building and former Curl-o-Drome (a.k.a. General Purpose Building) ice making equipment; and,
- 15) Unknown material types and quality associated with fill that has been placed across the Phase One Property.

Contaminants of potential concern (COPC) associated with the above noted APECs include petroleum hydrocarbons (PHC), volatile organic compounds (VOC), including chlorinated solvents, heavy metals, polynuclear aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), ammonia and landfill leachate related parameters. Several of these COPCs including PAH, metals and PHC in soil and VOC (chloroform) in ground water are known to exist at elevated concentrations on, in or under the Phase One Property through previous subsurface investigations carried out at the Phase One Property (AMEC 2010b).

8.1 Whether Phase Two Environmental Site Assessment Required Before Record of Site Condition Submitted

Based on the findings of this Phase One ESA, a Phase Two ESA will be required at the Phase One Property before a RSC can be submitted. The specific objectives of the investigation would be to assess the APECs identified at the Phase One Property in the context of the existing regulatory framework and legislation regarding contaminated sites and Brownfields in the Province of Ontario to confirm whether contaminants are present on, in or under the Phase One Property, and, if so, what the contaminants are, where they are located on, in or under the Phase One Property and at what concentrations

In addition to the above noted environmental concerns, potential operational/management and/or demolition concerns related to asbestos-containing materials (ACMs) have been confirmed to exist at the Phase One Property. Additional concerns regarding lead-containing paints (LCPs) and PCB-containing transformers, capacitors and lamp ballasts may also be present at the Phase One Property. Given that the Phase One Property buildings may be demolished during redevelopment of the Phase One Property, AMEC recommends that these issues be investigated and managed in accordance with applicable regulations, including carrying out Designated Substance and Hazardous Material Surveys in support of the development of appropriate management or abatement plans.

9.0 CLOSURE

The undersigned physically attended the Phase One property (and Phase One Study Area from publicly accessible locations) during the site reconnaissance and interview, completed and assessed the results of the records review and prepared this report, including the findings and conclusions presented herein, acting either as a Qualified Person or under the supervision of a Qualified Person. Any practice of geoscience documented within this report was undertaken by or under the supervision of a Professional Engineer or Professional Geoscientist licensed in the Province of Ontario. The Qualifications of the Assessors are provided in Appendix K.

This report was prepared for the exclusive use of the City of Ottawa, and is intended to provide a Phase One Environmental Site Assessment (ESA) of Lansdowne Park and Sylvia Holden Commemorative Park, 945 – 1015 Bank Street, Ottawa, Ontario at the time of the site reconnaissance visits. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. Should additional parties require reliance on this report, written authorization from AMEC will be required. With respect to third parties, AMEC has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The report is based on data and information collected during the Phase One ESA of the property conducted by AMEC. It is based solely on the conditions of the Phase One Property encountered at the time of the site reconnaissance visits on February 9, 10 and March 2, 2010, September 22 and October 5, 2011 and supplemented by a review of historical information and data obtained by AMEC as described in this report, and discussion with Phase One Property representatives, as reported herein. Except as otherwise maybe specified, AMEC disclaims any obligation to update this report for events taking place, or with respect to information that becomes available to AMEC after the time during which AMEC conducted the Phase One ESA.

In evaluating the property, AMEC has relied in good faith on information provided by other individuals noted in this report. AMEC has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information provided by the current owner/occupant. AMEC accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

AMEC makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

This report is also subject to the further Standard Limitations contained in Appendix L.



By application of the signature and professional seal affixed below, the Qualified Person hereby confirms the carrying out of this Phase One Environmental Site Assessment and the findings and conclusions contained herein. It is also certified that those sections to be completed by a Qualified Person as required by O.Reg.153/04 were completed by the undersigned Qualified Person.

We trust that the information presented in this report meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact the undersigned.

**AMEC Environment & Infrastructure,
a division of AMEC Americas Limited**

Prepared by:

Original signed by:

Brock Ibbott, B.A. Env. Mgt.
Project Manager

Original signed and sealed by:

Kevin D. Hicks, M.Sc., P.Geo., QP_{ESA}
Senior Associate Hydrogeologist

10.0 REFERENCES

Allan Keefer, architectural plan, *Horticultural Hall, Lansdowne Park, Ottawa, Ont., for the Central Canada Exhibition Association*, undated.

AMEC Earth & Environmental, a division of AMEC Americas Limited, "Ur-20 – Brown's Inlet Park, Data Gap Analysis, Old Landfill Management Strategy, City Of Ottawa", January 2004, (AMEC 2004)

AMEC Earth & Environmental, a division of AMEC Americas Limited, "Phase I Environmental Site Assessment, Lansdowne Park and Sylvia Holden Park, 945-1015 Bank Street, Ottawa, Ontario", March 19, 2010 (AMEC, 2010a).

AMEC Earth & Environmental, a division of AMEC Americas Limited, "Phase II Environmental Site Assessment, Lansdowne Park and Sylvia Holden Park, 945-1015 Bank Street, Ottawa, Ontario", March 19, 2010 (AMEC, 2010b).

City of Ottawa, *Historical Dates*. (n.d.). Accessed at www.lansdownepark.ca/history_en.html.

City of Ottawa, *Plan of Exhibition Buildings in Lansdowne Park, August 26, 1896*.

City of Ottawa, *Plan of Exhibition Buildings in Lansdowne Park, December 19, 1900*.

City of Ottawa Department of Planning & Development, *Plan of Lansdowne Park*, December 11, 1953.

Geological Survey of Canada, "*Drift Thickness Trend, Ottawa-Hull, Ontario and Quebec*", 1979.

Intera Information Technologies (Canada) Ltd., "Commerce Building, Lansdowne Park, Soils Investigation, Ottawa, Ontario", September 30, 1993 (Intera, 1993).

Intera Information Technologies (Canada) Ltd., "East Lavatory and Boiler Plant Soil Excavations, Lansdowne Park, Ottawa, Ontario", March 31, 1994 (Intera, 1994).

Intera Technologies Ltd., "*Mapping and Assessment of Former Industrial Sites*", 1988 (Intera, 1988).

John D. Paterson and Associates Limited, "Phase I – Environmental Site Assessment, Lansdowne Park, 945 to 1015 Bank Street, Ottawa, Ontario", February 6, 1998 (Paterson, 1998a).

John D. Paterson and Associates Limited, "Limited Phase II Environmental Site Assessment, Lansdowne Park, 945 – 1015 Bank Street, Ottawa, Ontario", August 28, 1998 (Paterson, 1998b).

John D. Paterson and Associates Limited, "Environmental Site Characterization, Lansdowne Park, 945 – 1015 Bank Street, Ottawa, Ontario", January 11, 1999 (Paterson, 1999a).

John D. Paterson and Associates Limited, "Environmental Building Assessment, Coliseum Building, Lansdowne Park, Ottawa, Ontario", January 11, 1999 (Paterson, 1999b).

John D. Paterson and Associates Limited, "Environmental Building Assessment, Horticulture Building, Lansdowne Park, Ottawa, Ontario", January 11, 1999 (Paterson, 1999c).

John D. Paterson and Associates Limited, "Environmental Building Survey, Civic Centre and Frank Clair Stadium, Lansdowne Park, Ottawa, Ontario", January 11, 1999 (Paterson, 1999d).

Golder Associates Ltd., "Summary of Known Environmental Conditions (Specific to Contaminated Lands Issues), Lansdowne Park, Ottawa, Ontario", February 1, 2008 (Golder, 2008).

John D. Paterson and Associates Limited, "Old Landfill Management Data Gap Analysis, Lansdowne Park (Ur-27), 945-1015 Bank Street, Ottawa, Ontario", November 10, 2003 (Paterson, 2003).

Ministry of the Environment, "*Waste Disposal Site Inventory*", June 1991.

Ministry of the Environment, "*Inventory of Coal Gasification Plant Waste Sites in Ontario*", April 1987.

Ministry of the Environment, "*Inventory of Industrial Site Producing or Using Coal Tar and Related Sites in Ontario*", November 1988.

Ministry of the Environment, "*Brownfields Environmental Site Registry*", accessed at www.ene.gov.on.ca/environment/en/subject/brownfields/STDPDPROD_075742.html.

Ministry of Natural Resources, "*Biodiversity Explorer*", accessed at www.biodiversityexplorer.mnr.gov.on.ca.

Ministry of the Environment, *Ontario Regulation 153/04 – Records of Site Condition*, as amended by O.Reg. 511/09, 29 December 2009.

Ministry of the Environment, *Ontario Regulation 347 – General - Waste Management*, as amended by O.Reg. 337/09, 31 December 2009.

Ministry of the Environment, May 2004, *Ontario Regulation 903 - Wells*, as amended by O.Reg. 389/09, 08 October 2009.

Oil, Gas and Salt Resources Corporation, "*The Ontario Oil, Gas and Salt Resources Library*", accessed at www.ogsrlibrary.com/maps/index.php.

Ontario Geological Survey, "*Paleozoic Geology Ottawa Area*", map P.2716, 1984.

Paterson Group, "Preliminary Geotechnical Investigation, Proposed Lansdowne Park Redevelopment, Bank Street at Holmwood Avenue, Ottawa, Ontario", March 17, 2010 (Paterson 2010a).

Paterson Group, "Geotechnical Investigation, Proposed Stormwater Management System, Lansdowne Park, Ottawa, Ontario", September 27, 2010 (Paterson, 2010b).

Unaccredited, "*The Central Canada Exhibition Association, Through 65 years, 1888-1953*" (n.d.)

Unaccredited site plan, c.1870.

Unaccredited site plan, *Drawing No. A-43.C.*, c.1946.

Unaccredited architectural plan, *The H.H. McElroy Building for the C.C.E.A, Ottawa, Ont.*, 1980.

APPENDIX A

Legal Description and Plan of Survey

APPENDIX B
RMS Data (FIPs)

APPENDIX C

Chain of Title

APPENDIX D

Chemical Products Inventory

APPENDIX E

Historical Maps and Photographs

APPENDIX F

EcoLog ERIS

APPENDIX G
Aerial Photographs

APPENDIX H
Topographic Map

APPENDIX I

Regulatory Correspondence

APPENDIX J

Photographs

APPENDIX K

Qualification of the Assessor

APPENDIX L

Limitations

Limitations

- 1) The work performed in the preparation of this report and the conclusions presented are subject to the following:
 - (a) The Standard Terms and Conditions which form a part of our January 27, 2010 Professional Services Contract;
 - (b) The Scope of Services;
 - (c) Time and Budgetary limitations as described in our Contract; and,
 - (d) The Limitations stated herein.
- 2) No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
- 3) The conclusions presented in this report were based, in part, on visual observations of the site and attendant structures. Our conclusions cannot and are not extended to include those portions of the site or structures which were not reasonably available, in AMEC's opinion, for direct observation.
- 4) The environmental conditions at the site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the site with any applicable local, provincial or federal by-laws, orders-in-council, legislative enactments and regulations was not performed.
- 5) The site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
- 6) Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on site and may be revealed by different of other testing not provided for in our contract.
- 7) Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, AMEC must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
- 8) The utilization of AMEC's services during the implementation of any remedial measures will allow AMEC to observe compliance with the conclusions and recommendations contained in the report. AMEC's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
- 9) This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or in part, or any reliance thereon, or decisions made based on any information of conclusions in the report, is the sole responsibility of such third party. AMEC accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
- 10) This report is not to be given over to any third party for any purpose whatsoever without the written permission of AMEC.
- 11) Provided that the report is still reliable, and less than 12 months old, AMEC will issue a third-party reliance letter to parties client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on AMEC's report, by such reliance agree to be bound by our proposal and AMEC's standard reliance letter. AMEC's standard reliance letter indicates that in no event shall AMEC be liable for any damages, howsoever arising, relating to third-party reliance on AMEC's report. No reliance by any party is permitted without such agreement.