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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

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Title - Sujet Maint. Facility Construction-Fundy	
Solicitation No. - N° de l'invitation EC015-193152/A	Amendment No. - N° modif. 004
Client Reference No. - N° de référence du client EC015-193152	Date 2019-04-03
GETS Reference No. - N° de référence de SEAG PW-\$PWB-013-4426	
File No. - N° de dossier PWB-8-41126 (013)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2019-04-10	
Time Zone Fuseau horaire Atlantic Daylight Saving Time ADT	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
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Signature	Date

Cette modification de l'invitation numéro 4 est soumise et comprend la modification numéro 4 suivante.

La modification qui suit apportée aux documents de soumission entre en vigueur dès maintenant.
L'addenda fera partie des documents de contrat.

Toutes autres conditions ne changent pas

1. PROLONGATION

Veillez prendre avis que la date limite de réception des soumissions dû le **9 avril 2019** est reportée à **14h00 le 10 avril 2019**

2. GENERAL

Geotechnical Report;

Article 5.1;

The statement *“Sand and gravel fill material excavated for footing placement may be reinstated and is pre-approved for use as backfill and/or structural fill during construction, provided any cobbles or boulders greater than 100 mm are removed. Debris and/or organics must be removed if encountered.”* is intended to mean that the contractor may use this excavated material for backfill material under and around foundations and slabs.

Hazmat Report;

Attached Hazmat report of Building #21 Cold Storage Building. Report has been modified to include information related to Building #21 only.

3. SPECIFICATIONS

Section 23 31 13.02:

Article 2.1.2.1; delete the term *“spiral wound”*. Ductwork shall be round.

Section 23 34 00:

Article 2.1; Add the following;

Dust collector shall be complete with (2) 170 Litre capacity collection drums, drum inlet kit, drum cover, flex-hose, clamps, slide gate with integral transition with positive pressure latch system.

Article 2.1.13; Add the following;

The recirculated air connection to the building ductwork shall be complete with spark detection activating the integral abort gate system.

Section 26 12 16.01:

Electrical contractor shall supply and install transformer as indicated on the drawings and shall conform to NRCAN-19 with NEMA 3R enclosures.

All transformers shall be floor mounted with liquid tight flex final connection.

Sound attenuation noted in specification section is based on 30kVa, with acceptable attenuation levels factored for additional larger sized transformers.

Transformer insulation to standard 150 degree C temperature rise.

Section 26 24 02:

Article 2.1.2;

Revise "600 V, 3 phase, 3 wire" to read "600 V, 3 phase, 4 wire".

Article 2.4;

Delete reference to Ground Fault Unit.

Section 26 24 16.01:

Article 2.1;

Contractor shall supply and install drip shields on surface mounted panels and other electrical equipment.

Section 26 32 13:

Article 1.10 & 2.5.7;

Delete the term "Platinum level".

Section 26 36 23:

The breakers indicated for transfer switch shall be integral, built-in to transfer switch OR contractor shall provide separate fused disconnect switches. The power breaker or disconnect shall be service entrance rated.

Section 28 31 00.01:

Article 2.1.6; Add

A digital communicator with two forms of passive communications (phone line & GSM) shall be provided like the DSC HS32-512HC by Tyco Security products.

Wiring for this DSC device shall be 6c#22 from the fire panel to the communicator in conduit or armoured and requires a separate 15A breaker.

A smoke detector is required at the top of the mezzanine stairs.

Isolation modules as required per CAN/ULC-S524.

4. DRAWINGS

Civil:

Drawing C-003:

It is the intent that the existing compound lunch room bldg. will be demolished to permit the propane tank to be installed in the location shown.

Architectural:

Drawing A-001:

Roof Types; the 2 layers of batt insulation should read "blown In insulation.

Drawing A-202:

Plan Detail; the profile of the metal siding shall be from the manufacturer's profile selections that bear the closest resemblance to the profile indicated on the details.

Drawing A-404:

Wall sections; the profile of the metal roofing shall be from the manufacturer's profile selections that bear the closest resemblance to the profile indicated on the sections.

Drawing A-601:

Door/Frame Types; the windows in the overhead doors shall be full view. Insert type windows will not be accepted.

Mechanical:

Drawing M-001:

Mezzanine Piping Plan; delete the heat tracing on the section of cold-water piping that runs in the heated mezzanine. The section of cold water piping that runs through the maintenance garage shall remain heat traced as noted.

Drawing M-002:

Note #9; revise note to read "100mm radon vent pipe up through roof c/w gooseneck fitting, open to atmosphere"

Drawing M-004:

Dust Collector Plan;

Revise BD (balancing damper) to read BG (blast gate)

Ground Floor HVAC Plan;

The five (5) Type A supply grilles, revise air volume to read 215 L/S per grille.

Mezzanine HVAC Plan;

Revise Type H grille air volume to read 1150 L/s.

Drawing M-006:

ERV-1 System Schematic;

Delete the duct representing a mixed air duct between the return and supply duct on the schematic.

Electrical:

Drawing E-001:

.1 Delete: "Remove after trade shop building is refed" and replace with "Remove after new building is complete and trades have moved in"

Drawing E-004:

Fire Alarm Riser Diagram;

The contractor shall supply and install all fire alarm modules for sprinkler flow and tamper switches. Coordinate with sprinkler contractor.

Power Riser Diagram;

The generator is noted as 200kVa, it should read 200kW.



Englobe

Soils Materials Environment

Public Works and Government Services Canada

**Hazardous Building Materials Survey
Fundy National Park Maintenance Compound, Fundy
National Park, NB**

Final Report

Date: September 22, 2017
Ref. N°: P-0010928-0-08-200



Public Works and Government Services Canada

Hazardous Building Materials Survey Fundy National Park Maintenance Compound, Fundy National Park, NB

Final Report | P-0010928-0-08-200

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Test results mentioned herein are only valid for the sample(s) stated in this report.

Englobe's subcontractors who may have accomplished work either on site or in laboratory are duly qualified as stated in our Quality Manual's procurement procedure. Should you require any further information, please contact your Project Manager."

REVISION AND PUBLICATION REGISTER		
Revision N°	Date	Modification And/Or Publication Details
00	2017-08-14	DRAFT Report Issued
01	2017-09-22	FINAL Report Issued



EXECUTIVE SUMMARY

Englobe Corp. (Englobe) was retained by Public Works and Government Services Canada (PWGSC) to undertake a Hazardous Building Materials Survey on nine (9) buildings located throughout the Maintenance Compound at Fundy National Park near Alma, New Brunswick. The survey was conducted in support of planned building renovations under PWGSC Hazardous Materials Standing Offer Agreement EA007-150441/002/PWD.

The survey focused on hazardous building materials investigated prior to the planned building renovations including asbestos-containing materials, lead in paint, mould, mercury-containing thermostats, light ballasts containing PCBs, radioactive material in smoke detectors, lead/lithium batteries, ozone-depleting substances (ODS), urea formaldehyde foam insulation (UFFI) and silica.

Hazardous Building Materials Surveys were completed on the following nine (9) buildings:

- ▶ Janitorial and Laundry Building (#25)
- ▶ Large Carpentry Storage Building (#37);
- ▶ Compound Lunch Building (#23);
- ▶ Tire Storage Building;
- ▶ Paint Shop (#44);
- ▶ Green House (#45);
- ▶ Cold Storage Building (#21);
- ▶ Trades Shop (#35); and
- ▶ Bunkhouse (#30).

Note that the Request for Proposal called for hazardous building material surveys on ten buildings, however according to Parks Canada personnel the Janitorial Building and Laundry Building are part of the same structure (Building #25).

During the survey, Englobe staff had access to all of the areas of the structures with the exception of a closet, storage room and basement crawl space in the Bunkhouse, and a storage area in the attic in the Cold Storage Building.

The results of the Hazardous Building Materials Survey for the aforementioned buildings are summarized in the following table:

HAZARDOUS MATERIAL	DESCRIPTION	CONDITION	ESTIMATED QUANTITY	DISPOSAL CRITERIA
Cold Storage Building (#21)				
Lead-Containing Paint	Blue flaking paint on exterior wood siding (sample CS-P1)	Total and leachable lead concentrations exceed NBDELG criteria for C&D and Landfill Disposal.	~125 m ² on the exterior of the building	Any disturbance or removal of lead-containing painted materials that may generate lead dust or respirable aerosols will need to conform to the federal and provincial OSHA Regulations. All work should be carried out by qualified individuals and will require, as a minimum, workers to wear proper PPE (respirators, disposable clothing, etc.). The flaking paint must be disposed of with a hazardous waste contractor for out-of-province disposal and must be manifested as a dangerous good during transport.
	Beige flaking paint on exterior wood siding (sample CS-P2)		~125 m ² on the exterior of the building	
	White flaking paint on exterior wood trim (sample CS-P3)		~36 m ² on the exterior of the building	
PCBs in Equipment	Fluorescent light ballasts	May contain PCBs	~12 Ballasts could not be inspected and should be considered to contain PCBs until confirmed otherwise.	PCB-containing ballasts must be disposed of through a licensed hazardous waste disposal contractor or taken to a licensed recycling facility.

HAZARDOUS MATERIAL	DESCRIPTION	CONDITION	ESTIMATED QUANTITY	DISPOSAL CRITERIA
Mercury	Fluorescent light tubes	Contain mercury vapour	~24 fluorescent light tubes throughout the building	Units should be handled carefully to ensure that they are not broken, and then carefully packaged in suitable boxes for recycle or disposal. Alternatively, light tubes could be broken inside a purpose made sealed enclosure to prevent the release of mercury into the atmosphere.
Lead Piping	Lead solder associated with copper piping and bell fitting joints for cast iron drainage piping, wire connectors, electrical cable sheathing, and other electrical applications	May contain lead	Not quantified however, may be present in building. Based on the age of the building, original copper piping and bell fitting joints should be assumed lead-containing.	These materials, if present, must be recycled or disposed of at an approved facility that accepts this waste.
Silica	All concrete and brick components of building	Freshly-cleaved crystalline silica may be formed when pulverized	Not quantified	Wetting techniques and proper PPE should be used during pulverization to ensure worker safety. Material may be disposed of at a C&D disposal location or Regional Landfill.



wall finishes consist of concrete block and metal-framed glass windows; and the ceiling finishes consist of metal-framed glass windows. The building did not have lighting fixtures. The building is currently unheated. The building is used as a greenhouse for growing plants.

Cold Storage Building (#21)

The building was originally constructed between 1945 and 1953. The building is a wood-framed structure with wood cladding exterior and pitched metal roof. It consists of one level with partial attic with a total area of approximately 245 square metres (2,637 square feet). The building consists of a mechanical work area, mechanical storage, storage and attic. The interior floor finishes consist of concrete and wood planks; the interior wall finishes consist of metal siding and exposed wood studs; and the ceiling finishes consist of plywood and exposed wood studs. Lighting is provided by incandescent and fluorescent fixtures. The building is heated by propane-fired heaters. The building is currently used for storage and mechanical shop.

Trades Shop (#35)

The building was originally constructed between 1976 and 1984. The building is a wood-framed structure with wood cladding exterior and pitched metal roof. It consists of one level with a total area of approximately 225 square metres (2,422 square feet). The building consists of a trades shop, two storage rooms, lunch room, kitchen and furnace room. Interior floor finishes consist of concrete; the interior wall finishes consist of plywood and transite panels; and the ceiling finishes consist of exposed wood beams, plywood, lay-in fibre-glass ceiling tile and transite panels. Lighting is provided by fluorescent fixtures. The building is heated by an oil-fired furnace via ceiling-mounted hot water radiators. The building is used for wood working and storage.

Bunkhouse (#30)

The building was originally constructed between 1945 and 1953. The building is a wood-framed structure with vinyl siding exterior and pitched asphalt roof. It consists of one level with a total area of approximately 457 square metres (4,919 square feet). The building consists of seven offices, seven closets, three storage areas, two hallways, bathroom, washroom, shower room, kitchen, large display room, fire place room and furnace room. Interior floor finishes consist of hardwood, vinyl tiles and concrete; the interior wall finishes consist of drywall, plaster and wood panels; and the ceiling finishes consist of drywall, lay-in ceiling tiles, plywood and transite panels. Lighting is provided by incandescent and fluorescent fixtures. The building is heated by an oil-fired furnace with hot water radiators. The building is currently unoccupied. Past use of the building consisted of housing park employees.

1.2 BACKGROUND INFORMATION

The following reports were provided to Englobe for review:

- ▶ *Phase I Environmental Site Assessment, Maintenance Compound, Fundy National Park, Alma, NB.* Prepared by Conestoga-Rovers and Associates, dated March 2007;
- ▶ *Phase II Environmental Site Assessment, Maintenance Compound, Fundy National Park, Alma, NB.* Prepared by Conestoga-Rovers and Associates, dated August 2008; and
- ▶ *Phase III Environmental Site Assessment, Ecological Screening and Human Health Risk Assessment, Maintenance Compound Fundy National Park, Alma, NB.* Prepared by Conestoga-Rovers and Associates, dated March 30, 2010.

The Environmental Site Assessments (ESA) reported that potential asbestos-containing and lead-containing materials may be present throughout the compound however, no previous hazardous material surveys have been conducted at the subject buildings.

1.3 SCOPE OF WORK

The agreed upon scope of work for the survey included the identification and quantification of hazardous materials typically investigated prior to building demolition and renovation, including asbestos-containing materials (ACMs), lead in paint, mould, mercury-containing thermostats, light ballasts containing PCBs, radioactive materials in smoke detectors, lead/lithium batteries, ozone-depleting substances (ODS), urea formaldehyde foam insulation (UFFI) and silica.

Samples of some potentially hazardous materials (asbestos and lead-based paint) were collected for laboratory analyses, while the presence of other potentially hazardous materials was simply noted based on visual identification. Dismantling of emergency lighting, smoke detectors and other electric equipment (with the exception of fluorescent lighting) to identify hazardous materials was not conducted. This type of equipment was simply noted on a presence/absence basis, unless identifying labels indicated the presence of hazardous materials.

Please note, the survey was a non-destructive assessment and intrusive investigation into wall cavities and roofing was not conducted.

2 SURVEY METHODOLOGY

2.1 ASBESTOS

The purpose of the asbestos assessment was to determine the presence and extent of ACMs in the structures by visual inspection and sampling. During the survey, samples were collected of all materials that could have been reasonably expected to contain asbestos. These included drywall joint compound, plaster, mortar, parging cement, tar and coatings, underlay paper, vinyl tile, adhesive, ceiling tile, transite, asphalt shingles and caulking. Seventy-five (75) samples were collected (including seven (7) field duplicate samples) for analysis. Where multiple layers



were present in a sample, each layer was analyzed separately. In total, eighty-five (85) samples (including ten (10) duplicate samples) were analyzed for the presence of asbestos. Representative wall and ceiling cavities were inspected throughout the buildings where access was available. Samples from suspected ACMs were collected in accordance with the *PWGSC Deputy Minister Directive 057 - Asbestos Management*.

The assessment included the sampling of both friable and non-friable material suspected to contain asbestos. The term friable refers to a building material can be reduced to dust by hand or moderate pressure, or any material that is already dust. Friable ACMs pose a greater risk to workers and building users due to the higher likelihood of releasing airborne asbestos fibres when disturbed.

When collecting samples for asbestos analysis, care was taken to avoid disturbing the materials more than necessary to prevent fibre release during sampling and to prevent unnecessary damage to the structures. Samples were collected by penetrating the material in question through the entire thickness with either a clean knife or a clean hammer and chisel. Samples were placed in individual sample bags with zip-locks and labelled with the sample ID. Photographs were taken of each sample location.

Asbestos samples were submitted to EMSL Canada Inc. in Mississauga, ON for analysis by polarized light microscopy (PLM). EMSL is a National Voluntary Laboratory Accreditation Program (NVALP) accredited laboratory for the required analyses.

2.2 LEAD-BASED PAINT

Paint samples were collected to represent the various colours found on the interior and exterior of the buildings, and were submitted for total lead analysis. Paint samples collected for analysis consisted of paint on substrate, where practical, and paint chips only where paint was peeling or flaking. Twenty-two (22) paint samples were collected and submitted for total lead analysis (including two (2) field duplicate samples). Based on the results of the total lead analysis, nine (9) samples were re-submitted for leachable lead analysis.

When collecting samples of paint for analysis, a clean knife or saw was used to cut/scrape an area of paint and underlying layers, including the substrate (where paint was well-adhered). Samples were placed in individual clean zip-lock sealable bags. Sample bags were labeled with the sample ID. Photographs were taken of each sample location. A minimum of 50 grams per sample was collected, as per laboratory requirements.

Total and leachable lead analyses were subcontracted to Maxxam Analytics Inc.'s laboratory in Bedford, NS. Maxxam is a Standards Council of Canada (SCC) accredited laboratory for the required analyses.

2.3 PCBs IN LIGHT BALLASTS AND OTHER EQUIPMENT

Where accessible, a representative number of fluorescent lamp ballasts were inspected. The manufacturers' serial numbers were recorded and compared to the *Environment Canada – Identification of Lamp Ballasts Containing PCBs, Report EPS/CC/2, August 1991* document to determine if the ballasts contain or may contain PCBs.

To inspect lamp ballasts, lights were turned off and the light tube shade, fluorescent light tubes and protective casing were carefully removed. The label on the lamp ballast was then inspected for model, serial number and date code.

In addition, the presence of any electrical transformers or equipment on the premise that were labeled as PCB-containing was documented.

2.4 MICROBIAL GROWTH

Any areas of the buildings where visible water damage and/or visible mould growth was observed were noted during the survey.

No sampling or analysis was performed.

2.5 MERCURY-CONTAINING DEVICES

During the survey, devices that could contain mercury, such as thermometers, thermostats, and fluorescent light tubes, were documented, if present.

2.6 RADIOACTIVE MATERIALS

2.6.1 Smoke Detectors

During the survey, smoke detectors containing radioactive elements were noted, if present.

2.7 LEAD-CONTAINING MATERIALS

2.7.1 Lead/Lithium Batteries

Emergency lighting containing lead/lithium batteries was noted during the walkthrough, if present.

2.7.2 Lead Pipe Solder

Based on the age of the buildings, all original copper piping should be assumed to contain lead in the joint solder. Lead is also common to bell fitting joints for cast iron drainage piping, wire connectors, electrical cable sheathing, and other electrical applications.

2.8 OZONE-DEPLETING SUBSTANCES (ODS)

Equipment suspected of containing ODS, such as refrigeration and air conditioning units, were noted during the survey, if present.

2.9 UREA FORMALDEHYDE FOAM INSULATION (UFFI)

At several locations during the survey, the wall cavities of buildings were examined for the presence of UFFI, where accessible.

2.10 SILICA

Materials known or suspected to contain silica, such as concrete and brick components of buildings, were noted during the survey.

2.11 ADDITIONAL ITEMS OF CONCERN

Any additional hazardous materials such as the storage of car batteries, vehicle fuel tanks and fuel or other chemical staining were noted during the survey.

3 HANDLING AND DISPOSAL

3.1 ASBESTOS

In the Province of New Brunswick, *A Code of Practice for Working with Materials Containing Asbestos in New Brunswick* referenced in *New Brunswick Regulation 92-106* under the *Occupational Health and Safety Act*, defines an ACM as having one percent or greater by volume ($\geq 1\%$ by volume) asbestos. Refer to the above-noted document for proper procedures and practices for handling, transporting and disposing asbestos prior to demolition or renovations.

All work involving ACMs should be carried out by a suitably qualified asbestos abatement contractor.

Asbestos is classified as a hazardous material under the *Transportation of Dangerous Goods Act* (TDGA) and has specific requirements for transfer (i.e. manifests, placards, etc.). Where asbestos is transported, friable materials must be appropriately bagged (placed in two six mil polyethylene bags or a first bag inserted into a suitable rigid container).

Asbestos waste is defined by New Brunswick Department of Environment and Local Government (NBDELG) as friable waste material containing asbestos fibres or asbestos dust in concentration greater than 1% by weight. All asbestos waste is to be disposed at an approved New Brunswick Regional Solid Waste Landfill. Tightly bound, non-friable asbestos waste does not require special disposal considerations.

3.2 LEAD-BASED PAINT

The *Surface Coating Materials Regulations* under the *Consumer Products Safety Act* of Canada considers surfaces with a total lead concentration greater than 90 mg/kg as lead-containing. Any disturbance or removal of lead-containing painted materials that may generate lead dust or respirable aerosols will need to conform to the federal and provincial Occupational Health and Safety Regulations. All work should be carried out by individuals qualified to handle

lead-containing materials and will require, as a minimum, workers to wear proper PPE (respirators, disposable clothing, etc.).

NBDELG has established guidelines that restrict certain materials from Construction and Demolition (C&D) disposal sites and Regional Solid Waste Landfills. The NBDELG document *Disposal of Lead Paint and Lead Painted Materials Guideline* sets the C&D disposal limit for materials with lead-based paint at 1,000 mg/kg of total lead content. Materials with a total lead content less than 1,000mg/kg may be disposed at a C&D disposal site. It should be noted that these guidelines apply only to materials where paint is tightly bound to its substrate; flaking or peeling paint may not be disposed at a C&D disposal site, regardless of its lead concentration.

Materials with a total lead content greater than 1,000 mg/kg must undergo leachable lead analysis to determine the appropriate disposal method. If the leachable lead content of the material is 5 mg/L or greater, the material is considered a hazardous waste and is not approved for disposal at any site located in New Brunswick. If the leachable lead content of the material is less than 5 mg/L, the material may be disposed at a Regional Solid Waste Landfill.

Materials with leachable lead concentrations greater than 5 mg/L must also be manifested as dangerous goods during transport under the federal TDGA Regulations. If materials are to be disposed of out-of-province, transportation must comply with the *Interprovincial Movement of Hazardous Waste Regulations* under the *Canadian Environmental Protection Act (CEPA)*.

3.3 PCBs IN LIGHT BALLASTS AND OTHER EQUIPMENT

As fluorescent light ballasts are removed, the serial numbers should be checked against the document *Environment Canada – Identification of Lamp Ballasts Containing PCBs, Report EPS/CC/2, August 1991* document to determine if the ballasts are PCB- or non-PCB-containing. Should a ballast model be encountered that is not discussed in this reference document, the model and serial number should be checked against the manufacturer's list, if available, to determine the presence of PCBs. Fluorescent light ballasts which contain PCBs cannot be disposed of with other solid waste.

PCB-containing ballasts or other equipment must be disposed of through a licensed hazardous waste disposal contractor or taken to a licensed recycling facility.

3.4 MICROBIAL GROWTH

When removing materials containing mould, the Canadian Construction Association document *CCA 82-2004* should be followed. This document provides three levels of remediation depending on the size or scale of the mould growth, as well as considerations for building demolition. Additional guidance on removal procedures is provided in:

- *Fungal Contamination in Public Buildings: A Guide to Recognition and Management*, Federal-Provincial Committee on Environmental and Occupational Health, June 1995;
- *Mould Abatement Guidelines*, Environmental Abatement Council of Ontario, 2010; and

- *Mould Remediation* (Standard S520), Institute of Inspection, Cleaning and Restoration, 2004.

The primary concern with mould-contaminated materials is human health protection during demolition/renovations. There are no provincial disposal guidelines for mould-impacted building materials. These materials may be disposed of at any C&D disposal site or landfill, provided they do not contain unacceptable levels of other hazardous materials (e.g., metals-based paint, asbestos, etc.).

3.5 MERCURY-CONTAINING DEVICES

Mercury-containing devices should be safely packaged and disposed of through a licensed hazardous waste disposal contractor or recycling facility to prevent the uncontrolled release of mercury.

When fluorescent light tubes are removed, they should be handled carefully to ensure that they are not broken, and then carefully packaged in suitable boxes (i.e. the type in which the tubes were purchased or in similar packaging) for recycling or disposal. Alternatively, light tubes could be broken inside a purpose-made sealed enclosure to prevent the release of mercury into the atmosphere.

3.6 RADIOACTIVE MATERIALS IN SMOKE DETECTORS

The *Canadian Nuclear Substances Radiation Devices Regulation* indicates in Section 6 a list of requirements regarding the disposal of smoke detectors, including that smoke detectors may be disposed of in a landfill if:

- ▶ the smoke detectors do not contain more than 740 kBq of americium 241 (from a commercial or industrial facility);
- ▶ the radiation does not exceed 1 uSv per hour from 0.1 metre away from the surface of any one smoke detector;
- ▶ all labels are visible on the smoke detectors;
- ▶ the smoke detectors conform to International Standard 2919; and
- ▶ the smoke detectors meet tests specified by the Nuclear Energy Agency of the Organisation from Economic Co-operation and Development.

In order to identify some of this information, the smoke detectors must be dismantled. Smoke detectors were not dismantled as part of this survey, but simply noted based on visual identification on a presence/absence basis.

Given the low level of radioactive materials contained with smoke detectors, they are exempt from the Canadian Nuclear Safety Commission (CNSC) *Packaging and Transport of Nuclear Substances Regulations SOR 208/2000, Nuclear Safety and Control Act* and therefore require no special handling or transportation considerations. Smoke detectors containing radioactive



material should be either sent back to the manufacturer or to a licensed hazardous waste disposal contractor.

3.7 LEAD-CONTAINING MATERIALS

3.7.1 Lead / Lithium Batteries

Lead/lithium batteries must be disposed of through a licensed hazardous waste disposal contractor or taken to a licensed recycling facility.

3.7.2 Lead Pipe Solder

Lead solder on copper piping, lead used in bell fitting joints for cast iron drainage piping, wire connectors, electrical cable sheathing, and other electrical applications must be recycled or disposed of at an approved facility that accepts these wastes.

3.8 OZONE-DEPLETING SUBSTANCES (ODS)

The *Federal Halocarbon Regulations, 2003*, control the use and handling of halocarbons in refrigeration, air-conditioning, fire-extinguishing and solvent systems that are located on federal lands or owned by federal departments. This regulation also requires any servicing, installation or charging work be conducted by an appropriately-certified person.

The CCME *National Action Plan for the Environmental Control of Ozone-Depleting Substances (ODS) and their Halocarbon Alternatives (2001)* requires recovery and recycling of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs).

The CEPA *Ozone-Depleting Substances Regulations (1998)* has requirements for the import, export and manufacture of ODS and ODS that are no longer in use. In addition, the use of certain CFCs and HCFCs is banned under this regulation.

3.9 UREA FORMALDEHYDE FOAM INSULATION (UFFI)

The main concern associated with UFFI would be off-gassing of the chemicals. In general, off-gassing is no longer considered to be a concern due to the considerable time that has elapsed since UFFI has been in use. UFFI waste may be disposed of at municipal landfills.

3.10 SILICA

Typically, buildings that are constructed with concrete components, including foundations, footings, walls, and slabs-on-grade, the crushing, pulverizing or smashing of concrete and brick leads to the possible formation of freshly cleaved crystalline silica. It is our recommendation that during work with these materials, wetting techniques be applied to ensure that any dust created is immediately wetted to prevent the release of potential crystalline silica into the air. Proper PPE and procedures should be implemented to ensure worker safety. The PPE and procedures required would depend on the type of activity undertaken. For demolition, these typically would include properly fitted full-face powered respirators with P-, N- or R-100 filters, suitable dust control in enclosed indoor areas which could include wetting of debris and use of

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE LOCATION	ASBESTOS PRESENT	REFERENCE PHOTO #	REFERENCE FIGURE
Green House (#45)					
GH-A1	Window caulking, grey	Exterior window	4% chrysotile asbestos	13	7
GH-A2	Exterior wall caulking, dark grey	Exterior wall	2% chrysotile asbestos	14	7
GH-A3	Burlap coating, black	Exterior wall	None detected	-	7
GH-A4	Window caulking, black	Exterior window	None detected	-	7
GH-A5	Concrete block mortar, grey	Exterior wall	None detected	-	7
GH-FD1	Blind field duplicate of GH-A5		None detected	-	7
GH-A6	Concrete mortar, light grey	Exterior wall, wall cap	None detected	-	7
GH-A7	Door caulking, grey	Interior door frame	None detected	-	7
GH-A8	Window caulking, grey	Interior window frame	5% chrysotile asbestos	15	7
GH-A9	Caulking, black	Interior wall between window frames and concrete block	1% chrysotile asbestos	16	7
Cold Storage Building (#21)					
CS-A1	Door caulking, white	Exterior door frame	None detected	-	8
CS-A2	Window caulking, white	Exterior window	None detected	-	8
Trades Shop (#35)					
FTS-A1	Transite Shingle	Exterior wall	8% chrysotile asbestos	23	9
FTS-A2	Tar paper, black	Exterior wall, behind transite shingles	None detected	-	9
FTS-A3	Transite board	Furnace room, wall	10% chrysotile asbestos	24	9
FTS-A4	Window caulking, white	Exterior window	2% chrysotile asbestos	25	9

- The beige paint on the drywall ceiling in the lunch room (LB-P1) contains 440mg/kg total lead.
- The white (with underlying grey) paint on the wooden baseboard in the janitor closet (LB-P2) contains 260 mg/kg total lead.

Both paints satisfy the NBDELG criteria and may be disposed of at a C&D disposal site, as long as the paint is well adhered to its substrate. Paint chips or materials with flaking paint, regardless of lead content, are not suitable for C&D disposal. If flaking or peeling, these paints may be disposed of at a Regional Landfill.

Paint Shop (#44)

Four paint samples were collected from the Paint Shop (#44) during the survey.

- The white paint on exterior wood trim (PS-P1) contains 86 mg/kg of total lead.
- The bluish grey paint on exterior wood siding (PS-P2) contains 21 mg/kg of total lead.
- The bluish grey paint flaking from the exterior wood siding (PS-P3) contains 2,600 mg/kg total.
 - Sample PS-P3 was re-submitted for leachate analysis and was found to contain 6.8mg/L leachable lead.
- The light grey paint on the wooden shingles of the paint storage area (PS-P4) contains 110mg/kg total lead.

Based on the results, the white paint on exterior wood trim and the light grey paint on the wooden shingles in the paint storage area satisfy the NBDELG criteria and may be disposed of at a C&D disposal site as long as the paint is well adhered to its substrate. Paint chips or materials with flaking paint, regardless of lead content, are not suitable for C&D disposal. If flaking or peeling, these paints may be disposed of at a Regional Landfill.

If the bluish grey exterior paint is well adhered to the wooden substrate (siding, trim, etc.) it also satisfies the NBDELG criteria and may be disposed of at a C&D disposal site. However, the paint chips (i.e. not adhered to a substrate) exceed C&D and Regional Landfill disposal criteria. The flaking paint is considered hazardous waste and must be disposed of with a hazardous waste contractor for out-of-province disposal and must be manifested as a dangerous good during transport.

Cold Storage Building (#21)

Three paint samples were collected from the Cold Storage Building (#21) during the survey.

- The blue flaking paint on exterior wood siding (CS-P1) contains 36,000 mg/kg total lead.



- Sample CS-P1 was re-submitted for leachate analysis and was found to contain 38 mg/L leachable lead.
- The beige flaking paint on exterior wood siding (CS-P2) contains 45,000 mg/kg total lead.
 - Sample CS-P2 was re-submitted for leachate analysis and was found to contain 38 mg/L leachable lead.
- The white flaking paint on the wood siding (CS-P3) contains 41,000 mg/kg total lead.
 - Sample CS-P3 was re-submitted for leachate analysis and was found to contain 41 mg/L leachable lead.

The paints on the exterior of the building were in poor condition and were peeling and flaking all over. The paint chips (i.e. not adhered to a substrate) exceed C&D and Regional Landfill disposal criteria. The flaking paints are considered hazardous waste and must be disposed of with a hazardous waste contractor for out-of-province disposal and must be manifested as a dangerous good during transport.

Trades Shop (#35)

Two paint samples were collected from the Trades Shop (#35) during survey.

- The white paint adhered to the exterior wooden trim (FTS-P1) contains 6,600 mg/kg total lead.
 - Sample FTS-P1 was re-submitted for leachate analysis and was found to contain 33 mg/L leachable lead.
- The grey paint on the interior wooden wall Storage Room #1 (FTS-P2) contains 1,800 mg/kg total lead.
 - Sample FTS-P2 was re-submitted for leachate analysis and was found to contain 2.9 mg/L leachable lead.

The white paint on the exterior wooden trim exceeds C&D and Regional Landfill disposal criteria and is considered hazardous waste. The paint and painted material and must be disposed of with a hazardous waste contractor for out-of-province disposal and must be manifested as a dangerous good during transport.

The grey paint on the wooden walls in Storage Room #1 exceeds C&D disposal criteria but satisfies Regional Landfill disposal criteria. The grey paint may be disposed of at a Regional Landfill.

Bunkhouse (#30)

Five paint samples were collected from the Bunkhouse (#30) during the survey.



SAMPLE ID	SAMPLE DESCRIPTION	TOTAL LEAD (mg/kg)	LEACHABLE LEAD (mg/L)	REFERENECE PHOTO #	REFERENECE FIGURE
LB-P2	Janitor Closet – White over grey paint on wood baseboard	260	-	-	13
Paint Shop (#44)					
PS-P1	Exterior – White paint on wood trim	86	-	-	14
PS-P2	Exterior – Bluish grey paint on wood siding shingle	21	-	-	14
PS-P3	Exterior – Bluish grey flaking paint on wood siding	2,600	6.8	11	14
PS-P4	Paint Storage – Light grey paint on wood siding shingle	110	-	-	14
Cold Storage Building (#21)					
CS-P1	Exterior – Blue flaking paint on wood siding	36,000	38	19	15
CS-P2	Exterior – Beige flaking paint on wood siding	45,000	38	20	15
CS-P3	Exterior – White flaking paint on wood trim	41,000	41	21	15
Trades Shop (#35)					
FTS-P1	Exterior – White paint on wood trim	6,600	33	26	16
FTS-P2	Storage #1 – Grey paint on wood	1,800	2.9	27	16
Bunkhouse (#30)					
BH-P1	Room #6 – Beige over multiple layers of paint on drywall	150	-	-	17
BH-FDP1	Blind field duplicate of BH-P1	150	-	-	17
BH-P2	Room #6 – Beige over multiple layers of paint on wood	820	-	34	17
BH-FDP2	Blind field duplicate of BH-P2	1,000	0.83	34	17
BH-P3	Large Display Room – White over multiple layers of paint on wood trim	3,600	0.69	35	17
BH-P4	Fire Place Room – Light blue over multiple layers of paint on drywall	6.6	-	-	17
BH-P5	Fire Place Room – Blue over multiple layers of paint on wood	280	-	-	17
Disposal Criteria		1,000	5	-	-

Notes:

(value) – Values in parentheses indicate laboratory duplicate analysis results.

Black boxed test: concentration exceeds applicable disposal guideline.

4.3 POLYCHLORINATED BIPHENYLS (PCBs)

4.3.1 Fluorescent Lamp Ballasts

Janitor and Laundry Building (#25)

Five fluorescent lamp ballasts were observed in the Janitor/Laundry Building (#25). One of the ballasts was inspected and determined to be a non-PCB-containing ballasts (Philips Advance Optanium 10PA-2P32-LW-N).

Large Carpentry Storage Building (#37)

One fluorescent lamp ballast is present in the Large Carpentry Storage Building (#37). The ballast was inspected and determined to be a non-PCB-containing ballast (Philips HM-2S20-TPC).

Compound Lunch Building (#23)

Fourteen fluorescent lamp ballasts (two ballasts per light fixture) are present in the Compound Lunch Building (#23). Two of the ballasts were inspected and determined to be non-PCB-containing ballasts (Philips RQM-2S40-TPC).

Tire Storage Building

No ballasts were observed in the Tire Storage Building during the survey.

Paint Shop (#44)

Eleven fluorescent lamp ballasts are present in the Paint Shop (#44). Two of the ballasts were inspected and determined to be non-PCB-containing ballasts (Advance IOP-2P32-SC).

Green House (#45)

No ballasts were observed in the Green House during the survey.

Cold Storage Building (#21)

Twelve fluorescent lamp fixtures are present in the Cold Storage Building (#21). Due to height restrictions, the ballasts could not be inspected at the time of the survey and should be considered PCB-containing until the serial numbers can be checked against the document *Environment Canada – Identification of Lamp Ballasts Containing PCBs, Report EPS/CC/2, August 1991* document to determine if the ballasts are PCB- or non-PCB-containing.

Trades Shop (#35)

Forty-two fluorescent lamp ballasts are present in the Trades Shop (#35). Four ballasts were inspected and determined to be non-PCB-containing ballasts (Advance IOP-2P32-SC, Howard Industries E4/32IS 120, Electronic Ballasts YC-322516E-2 and Philips RQM-2S40-TPC).

HAZARDOUS MATERIAL	DESCRIPTION	CONDITION	ESTIMATED QUANTITY	DISPOSAL CRITERIA
Cold Storage Building (#21)				
Lead-Containing Paint	Blue flaking paint on exterior wood siding (sample CS-P1)	Total and leachable lead concentrations exceed NBDELG criteria for C&D and Landfill Disposal.	~125 m ² on the exterior of the building	Any disturbance or removal of lead-containing painted materials that may generate lead dust or respirable aerosols will need to conform to the federal and provincial OSHA Regulations. All work should be carried out by qualified individuals and will require, as a minimum, workers to wear proper PPE (respirators, disposable clothing, etc.). The flaking paint must be disposed of with a hazardous waste contractor for out-of-province disposal and must be manifested as a dangerous good during transport.
	Beige flaking paint on exterior wood siding (sample CS-P2)		~125 m ² on the exterior of the building	
	White flaking paint on exterior wood trim (sample CS-P3)		~36 m ² on the exterior of the building	
PCBs in Equipment	Fluorescent light ballasts	May contain PCBs	~12 Ballasts could not be inspected and should be considered to contain PCBs until confirmed otherwise.	PCB-containing ballasts must be disposed of through a licensed hazardous waste disposal contractor or taken to a licensed recycling facility.

HAZARDOUS MATERIAL	DESCRIPTION	CONDITION	ESTIMATED QUANTITY	DISPOSAL CRITERIA
Mercury	Fluorescent light tubes	Contain mercury vapour	~24 fluorescent light tubes throughout the building	Units should be handled carefully to ensure that they are not broken, and then carefully packaged in suitable boxes for recycle or disposal. Alternatively, light tubes could be broken inside a purpose made sealed enclosure to prevent the release of mercury into the atmosphere.
Lead Piping	Lead solder associated with copper piping and bell fitting joints for cast iron drainage piping, wire connectors, electrical cable sheathing, and other electrical applications	May contain lead	Not quantified however, may be present in building. Based on the age of the building, original copper piping and bell fitting joints should be assumed lead-containing.	These materials, if present, must be recycled or disposed of at an approved facility that accepts this waste.
Silica	All concrete and brick components of building	Freshly-cleaved crystalline silica may be formed when pulverized	Not quantified	Wetting techniques and proper PPE should be used during pulverization to ensure worker safety. Material may be disposed of at a C&D disposal location or Regional Landfill.

7 REFERENCE DOCUMENTS

Table 7-1 Reference Documents for Hazardous & Regulated Materials

CATEGORY	REFERENCE DOCUMENT
General	<p>Canadian Environmental Protection Act (CEPA), 1999 http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=26A03BFA-1</p> <p>Canadian Hazardous Products Act. R.S. 1985. C H-3 http://laws.justice.gc.ca/eng/acts/H-3/</p> <p>Canadian Interprovincial Movement of Hazardous Waste Regulations. 2002 http://laws.justice.gc.ca/eng/regulations/SOR-2002-301/</p> <p>Canada Labour Code, R.S.C., 1985, C.L-2 http://laws-lois.justice.gc.ca/eng/acts/l-2/</p> <p>Canada Occupational Safety and Health Regulation (SOR/86-304, as amended) – Part X, Hazardous Substances, Human Resources and Development Canada, May 2002</p> <p>Canadian Transportation of Dangerous Goods Act. 1992. C. 34 http://www.tc.gc.ca/eng/acts-regulations/acts-1992c34.htm</p> <p>Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations. 2005. (SOR/2005-149) http://laws-lois.justice.gc.ca/eng/regulations/SOR-2005-149/</p>
Asbestos-Containing Materials	<p>Canada Occupational Safety and Health Regulations, Human Resources Development Canada, May 2002</p> <p>Dangerous Goods and Hazardous Wastes Management Act, Asbestos Waste Regulations, December 1988</p> <p><i>A Code of Practice for Working with Materials Containing Asbestos in New Brunswick</i> referenced in <i>New Brunswick Regulation 92-106</i> under the Occupational Health and Safety Act</p>
Lead-Containing Paint	<p>Health Canada. August 2006. Workplace Health and Public Safety – Programme Guidelines on Lead in Paint, Dust and Soil. August 2006</p> <p>Consumer Products Safety Act of Canada <i>Surface Coating Materials Regulations</i></p> <p>Ontario Ministry of Labour. 2011. Lead on Construction Projects. http://www.labour.gov.on.ca/english/hs/pdf/gl_lead.pdf</p> <p>NBDELG, <i>Disposal of Lead Paint and Lead Painted Materials Guideline</i> (August 2014)</p>
Mould	<p>Canadian Construction Association. Mould Guidelines for the Canadian Construction Industry (CCA, 82-2004) http://www.cca-acc.com/documents/cca82/cca82.pdf</p>

CATEGORY	REFERENCE DOCUMENT
	<p>Federal Provincial Committee on Environmental Occupational Health. Fungal Contamination in Public Buildings: A Guide to Recognition and Management, June 1995 http://individual.utoronto.ca/jscott/fpwgmaqpb001.pdf</p> <p>Health Canada. Fungal Contamination in Public Buildings: Health Effects and Investigative Methods, 2004 http://www.hc-sc.gc.ca/ewh-semt/pubs/air/fungal-fongique/index-eng.php</p> <p>Institute of Inspection, Cleaning and Restoration. Mould Remediation (Standard S520), 2004</p>
PCB-Containing Equipment	<p>Canadian Environmental Protection Act (CEPA), 1999</p> <p>Environment Canada. 1991. <i>Environmental Protection Series. Identification of Lamp Ballasts Containing PCBs. Report EPS 2/CC/2 (revised)</i></p> <p>Federal PCB Regulation, 2008</p>
Mercury-Containing Equipment	<p>Canadian Council of Ministers of the Environment. Canada Wide Standard for Mercury-Containing Lamps, May 2001 http://www.ccme.ca/assets/pdf/merc_lamp_standard_e.pdf</p> <p>Canadian Council of Ministers of the Environment. Canada Wide Standards for Mercury Emissions, June 2000 http://www.ccme.ca/files/Resources/air/mercury/mercury_emis_std_e1.pdf</p>
Radioactive Materials	<p>Canadian Nuclear Safety Commission 1-800-668-5284</p> <p>Canadian Nuclear Substances and Radiation Devices Regulation, SOR/2000-207, June 2013</p> <p>Controlled Products Regulations, SOR/88-66 http://laws.justice.gc.ca/eng/regulations/SOR-88-66/</p> <p>General Nuclear Safety and Control Regulations, SOR/2000-202 http://laws-lois.justice.gc.ca/eng/regulations/sor-2000-202/index.html</p> <p>Hazardous Products Act (R.S., 1985, c. H-3) http://laws.justice.gc.ca/eng/acts/H-3/</p> <p>Nuclear Safety and Control Act, 1997 http://laws-lois.justice.gc.ca/eng/acts/N-28.3/</p> <p>Nuclear Substances and Radiation Devices Regulations, SOR/2000-207 http://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-207/</p> <p>Radiation Protection Regulations, SOR/2000-203 http://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-203/</p> <p>Transportation and Dangerous Goods Act, 1992 http://www.tc.gc.ca/eng/acts-regulations/acts-1992c34.htm</p>

CATEGORY	REFERENCE DOCUMENT
ODS / Halocarbons	<p>Canadian Council of Ministers of the Environment. National Action Plan for the Environmental Control of Ozone-Depleting Substances (ODS) and their Halocarbon Alternatives, 2001 http://www.ccme.ca/files/Resources/air/ods/nap_ods_1314_e.pdf</p> <p>Canadian Environmental Protection Act. Ozone-Depleting Substances Regulations, 1998 http://laws-lois.justice.gc.ca/eng/regulations/SOR-99-7/index.html</p> <p>Canadian Environmental Protection Act. Federal Halocarbons Regulations, 2003 http://laws-lois.justice.gc.ca/eng/regulations/SOR-2003-289/index.html</p>
UFFI	<p>Hazardous Products Act (R.S., 1985, c. H-3) http://laws.justice.gc.ca/eng/acts/H-3/</p> <p>Health Canada. Exposure Guidelines Residential Indoor Air Quality, 1987 http://www.hc-sc.gc.ca/ewh-semt/pubs/air/exposure-exposition/index-eng.php</p>
Silica	<p>Ontario Ministry of Labour – Occupational Health and Safety Branch. 2011. Guideline – Silica on Construction Projects. https://www.labour.gov.on.ca/english/hs/pubs/silica/</p>

8 REPORT USE AND CONDITIONS

This report was prepared for the exclusive use of Public Works and Government Services Canada and is based on data and information obtained during a site visit by Englobe at the subject site and the condition of the site on the date of such inspection, supplemented by information obtained and described herein.

The hazardous building materials survey addresses the specified hazardous building materials only. An attempt was made to identify all materials in the site structures with potential to contain hazardous substances. However, it is possible that hazardous or regulated materials other than those mentioned in this report may be present.

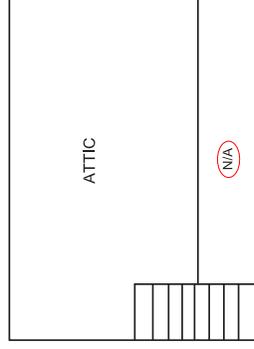
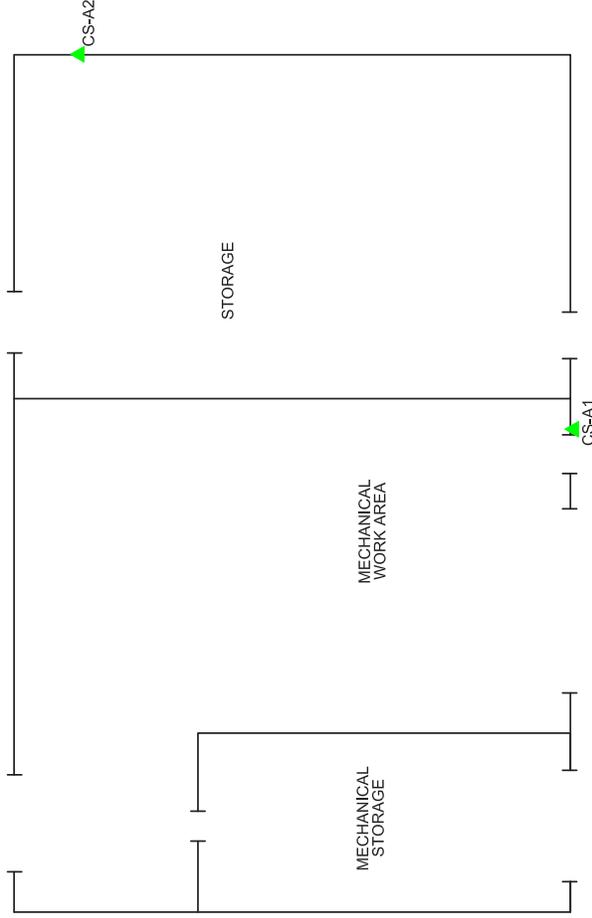
The survey was a non-destructive assessment and intrusive investigation into wall cavities and roofing was not conducted. Equipment and infrastructure (other than paint) was not sampled for lead content. Equipment was not disassembled to identify hazardous materials (other than fluorescent lamp ballasts).

The scope of the assessment encompassed only the buildings and structures at the Fundy National Park Maintenance Compound noted herein. Additional hazardous materials may be present on-site in areas not included in the scope of the current assessment.

As discussed in Section 6, *Summary of Hazardous Materials*, the quantity of hazardous materials is based on either physical measurements taken during the survey or were estimated based on their assumed layout in the structures. It is possible that the quantity of hazardous materials present in the building differs from the number provided in the survey.

The survey did not include investigations for contaminated soils/groundwater.

The statements and conclusions presented in this report are professional opinions based upon data and information obtained during a site survey by Englobe, visual observations made during the site survey, information provided to us by PWGSC, and on interpretation of asbestos and paint laboratory analyses. The opinions in this report are given using generally accepted scientific judgement, principles, and practices; however, because of the inherent uncertainty in this process no guarantee of conclusion is intended or can be given.



LEGEND:

- ▲ - Asbestos Sample Location. No Asbestos Detected.
- ▲ - Asbestos Sample Location. Asbestos Detected.
- (N/A) - Not Accessible.

<p>Public Works and Government Works Canada</p> <p>Englobe Corp. 118 - 1067 Champlain Street Dieppe New Brunswick E1A 1P9</p>	<p>Hazardous Building Materials Assessment Maintenance Compound, Cold Storage Building (#21) Fundy National Park, Alma, New Brunswick</p> <p style="text-align: center;">Asbestos Sample Location Plan</p>	<p>1 2 3 4m</p> <p><small>CONFIDENTIALITY STATEMENT: This document, protected by law, is the property of Englobe and is for the sole use of the intended purpose. Any distribution or modification, partial or total, is strictly prohibited without prior written approval from Englobe Corp.</small></p>																																				
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">No.</td> <td style="width: 15%;">Version</td> <td style="width: 15%;">August 2017</td> <td style="width: 15%;">JL</td> <td style="width: 15%;">CM</td> <td style="width: 15%;">SF</td> </tr> <tr> <td colspan="2">Discipline: Environment</td> <td>Prepared by: CM</td> <td>By: JL</td> <td>Checked by: CM</td> <td>Approved by: SF</td> </tr> <tr> <td colspan="2">Scale: 1:100</td> <td>Drafted by: JL</td> <td colspan="3">Verified by: CM</td> </tr> <tr> <td colspan="2">Date: August 2017</td> <td colspan="2">Figure no.: 8</td> <td colspan="2">Register no.: P-0010928</td> </tr> <tr> <td colspan="2">Page step: Fig. 8</td> <td colspan="2">Paper size: 11X17</td> <td colspan="2">Electronic reference: Rev.</td> </tr> <tr> <td>Man.</td> <td>Project</td> <td>Op</td> <td>Project</td> <td>Phase</td> <td>Electronic reference</td> </tr> </table>			No.	Version	August 2017	JL	CM	SF	Discipline: Environment		Prepared by: CM	By: JL	Checked by: CM	Approved by: SF	Scale: 1:100		Drafted by: JL	Verified by: CM			Date: August 2017		Figure no.: 8		Register no.: P-0010928		Page step: Fig. 8		Paper size: 11X17		Electronic reference: Rev.		Man.	Project	Op	Project	Phase	Electronic reference
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