Public Works and Government Services Canada
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Project #: R.065695.006

Iqaluit, Nunavut
DFO Bunkhouse Building 1074,
Hazardous Material Abatement
Solicitation # E0208-151273/A

ADDENDUM #2 February 19, 2015

Drawings & Appendices

DRAWINGS

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region

HAZARDOUS MATERIALS ABATEMENT AND BUILDING DEMOLITION

DRAWING INDEX	
Sheet No.	TITLE
R.065695.006 C00	SHEET LIST
R.065695.006 C01	SITE LOCATION PLAN
R.065695.006 C02	LOCATIONS OF HAZARDOUS MATERIAL

DFO BUNKHOUSE BUILDING 1074
IQALUIT, NUNAVUT

ISSUED FOR TENDER - FEBRUARY 2015

Reference:
FRANZ ENVIRONMENTAL INC. Fig 1, June 2012
GOOGLE EARTH 2011

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

DO NOT SCALE DRAWINGS

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E		
D	ISSUED FOR TENDER	15/02/19
C	ISSUED FOR REVIEW	15/02/06
B	ISSUED FOR REVIEW	15/01/29
A	ISSUED FOR REVIEW	14/09/18
Revision/ Revision	Description/Description	Date/Date

Client/Client
PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet
HAZARDOUS MATERIALS ABATEMENT AND BUILDING DEMOLITION- DFO BUNKHOUSE BUILDING 1074 IQALUIT, NUNAVUT

Approved by/Approuvé par

Designed by/Conçu par
K.SMITH

Drawn by/Dessiné par
I. ZIBA

PWGSC Project Manager/Administrateur de Projets TPSGC
L. SMITH

PWGSC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC

Client/client
PWGSC

Drawing title/Titre du dessin
SITE LOCATION PLAN

Project No./ No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.065695.006	**Figure 1** OF 2	**C**

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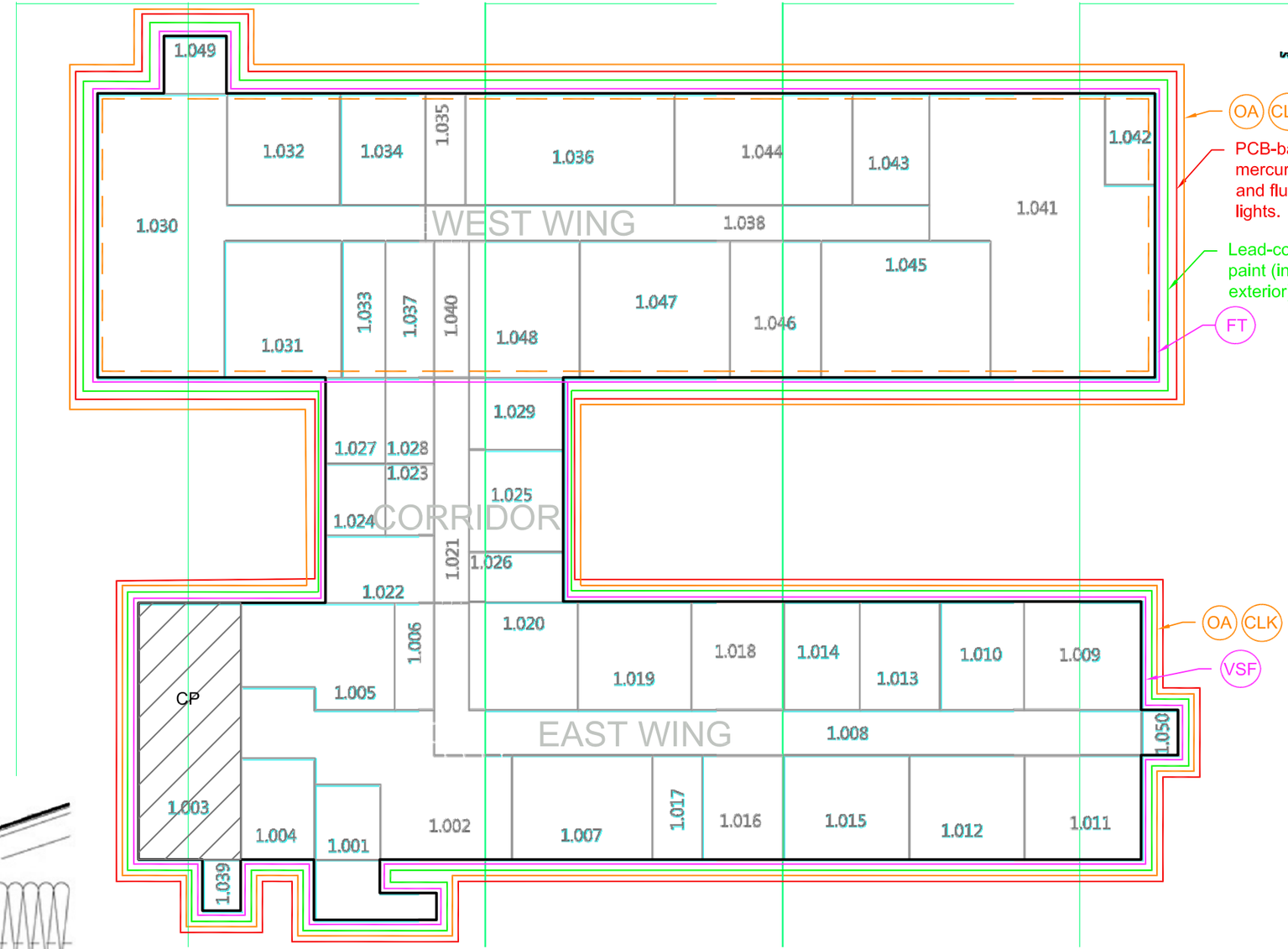

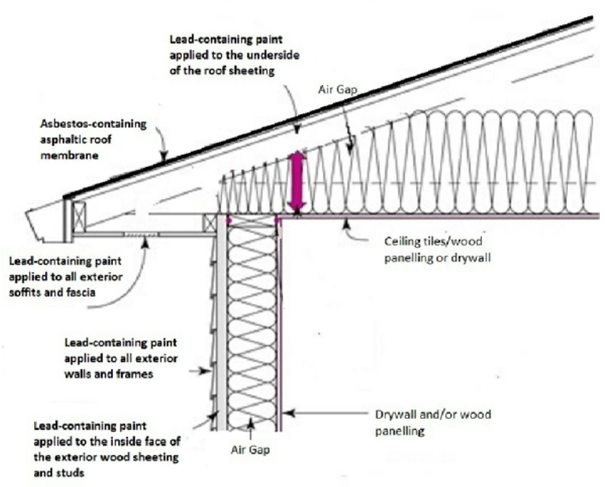

Reference:
FRANZ ENVIRONMENTAL INC. Flg 2, June 2012

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region
SERVICES IMMOBILIERS
Région de l'ouest

LEGEND:

OA/CLK	ASBESTOS WINDOW CAULKING (EXTERIOR) ASBESTOS ROOFING MATERIALS
CLK	ASBESTOS WINDOW CAULKING (INTERIOR)
FT	ASBESTOS FLOORING
VSF	ASBESTOS VINYL SHEET FLOORING
CP	ASBESTOS CEMENT PRODUCT
◯	THROUGHOUT FUNCTIONAL AREA
1.025	ROOM LOCATION NUMBER

DO NOT SCALE DRAWINGS

F		
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D	ISSUED FOR TENDER	15/02/19
C	ISSUED FOR REVIEW	15/02/06
B	ISSUED FOR REVIEW	15/01/20
A	ISSUED FOR REVIEW	14/09/18
Revision/ Révision	Description/Description	Date/Date

Client/client

PUBLIC WORKS GOVERNMENT SERVICES CANADA

Project title/Titre du projet

HAZARDOUS MATERIALS ABATEMENT AND BUILDING DEMOLITION- DFO BUNKHOUSE BUILDING 1074 IQALUIT, NUNAVUT

Approved by/Approuvé par

Designed by/Concept par
K.SMITH

Drawn by/Dessiné par
I. ZIBA

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Client/Client
PWGSC

Drawing title/Titre du dessin

LOCATIONS OF HAZARDOUS MATERIALS

Project No./ No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.065695.006	Figure 2 OF 2	C

APPENDIX A

Supporting Documentation

DEMOLITION WASTE SURVEY
DEPARTMENT OF FISHERIES AND OCEANS CANADA
BUNKHOUSE BUILDING No. 1074
IQALUIT, NUNAVUT

Prepared for:

Public Works and Government Services Canada
ATB Place, North Tower
5th Floor - 10025 Jasper Avenue
Edmonton, Alberta
T5J 1S6

Prepared by:

SENES Consultants
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Richmond Hill, Ontario
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Revised February 2015

Printed on Recycled Paper Containing Post-Consumer Fibre

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350600-519

2 February 2015

Public Works and Government Services Canada
ATB Place, North Tower
5th Floor - 10025 Jasper Avenue
Edmonton, AB T5J 1S6

Attention: Ms. Liana Smith
Senior Environmental Specialist

Re: **Demolition Waste Survey**
Department of Fisheries and Oceans
Bunkhouse Building No. 1074
Iqaluit, Nunavut

Dear Ms. Smith:

We are pleased to submit our revised report on the above facility.

We trust that the enclosed is suitable for your current purposes. Please call if you have any questions.

Yours very truly,

SENES CONSULTANTS

Charles Gravelle, P.Eng. (ON, NT/NU)
Senior Project Manager

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AT REAR OF REPORT

1.0 INTRODUCTION

SENES Consultants (SENES) was retained by Public Works and Government Services Canada (PWGSC) to conduct a demolition waste survey of the Department of Fisheries and Oceans (DFO) Bunkhouse, located at 1074 Allanngua Road, Iqaluit in Nunavut (see Figure 1). The H-shaped building located centrally on the DFO property is a single storey wood frame structure, with composite wood siding and gently sloped asphalt paper roof. The interior is typically sheeted with gypsum board on the walls and ceiling with vinyl sheet/tile flooring or carpet on the wood framed floor. Wood paneling and ceiling tiles are also present is some pf the rooms within the structure.

The primary goal of the demolition waste survey is to identify and quantify all building materials and infrastructure including hazardous building materials and associated components of the DFO Bunkhouse building prior to demolition. Building material quantities have been estimated based on the previously completed designated substance survey performed by Franz Environmental Inc., observations made by SENES staff during a walk-through of the structure, and a more comprehensive construction material assessment completed by Decommissioning Consulting Services (DCS) staff during completion of an investigation and supplementary testing program.

The Franz Environmental Inc. Designated Substance Survey and the DCS Investigation and Supplementary Testing for Designated Substances report, are provided in Appendix A while photographs of the primary building features and building materials are provided in Appendix B. It should be noted that the appended documents have been included to provide supplemental information only, and are not to be relied upon in entirety.

1.1 SCOPE OF WORK

The scope of work for our investigation included:

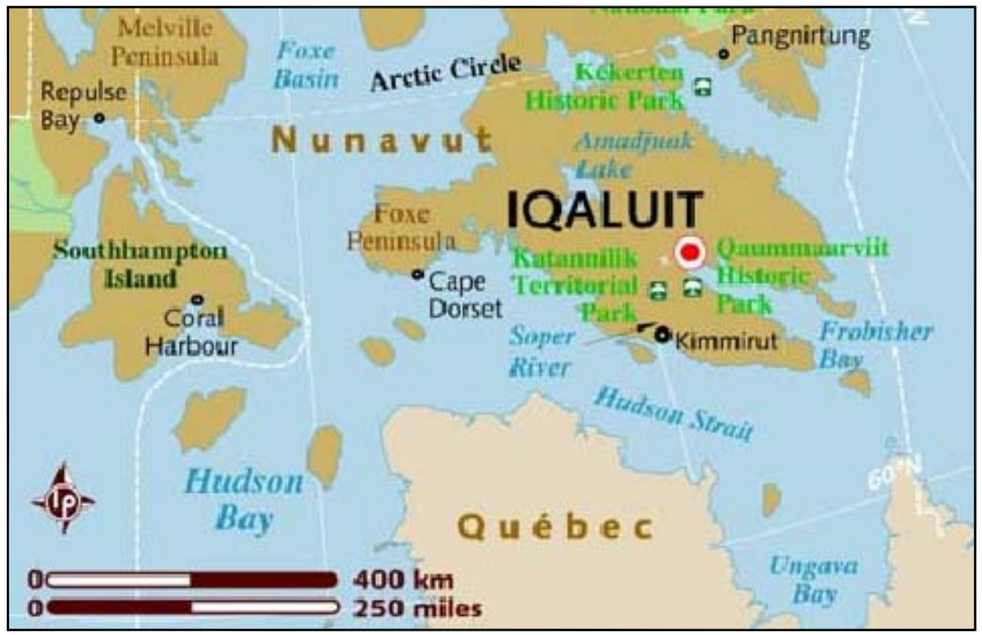
- confirm the location and quantities of the designated substances as reported in the Franz Environmental Inc. Final – Designated Substance Survey;

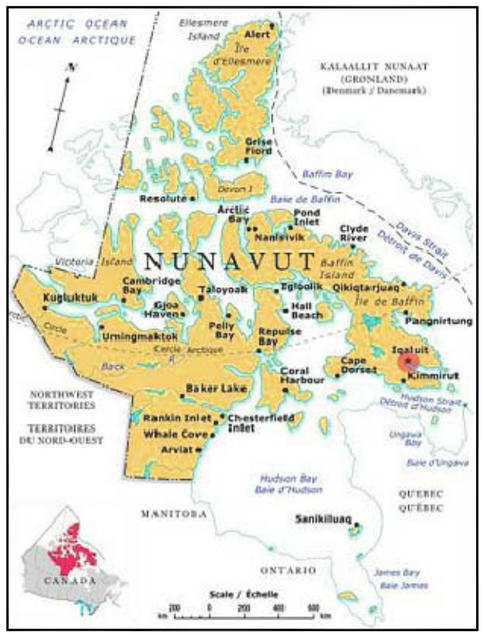
- confirm the quantities of non-hazardous materials within the existing building structure so demolition contractors can quantify the level of effort required to complete the demolition program;

- prepare a comprehensive report that details the type and amount of hazardous and non-hazardous material within the above mentioned facility, and;

- prepare as part of this comprehensive report, a Class B Cost Estimate for the abatement and demolition works for the site.

The revised Class A Estimate for the abatement and demolition work has been provided under separate cover. A preliminary site visit of the building, to confirm the type and volumes of hazardous materials within the structure, was undertaken by our Mr. Dwayne Kellyman on 27 October 2014. In addition, a comprehensive construction material assessment was completed by Decommissioning Consulting Services (DCS) staff on 22 and 23 December 2014 during completion of an investigation and supplementary testing program.





SENES Consultants
AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

DEMOLITION WASTE SURVEY

DFO BUNKHOUSE BUILDING. 1074
IQALUIT, NUNVUT

SITE LOCATION PLAN

Drawn By: P.A.L.	Approved By: C.F.G.	Project No: 350600-519
Date: FEB. 2015	Scale: AS SHOWN	FIGURE 1

Feb 03, 2015 – 2:58pm – USER plondry
Z:\350000 Series\350600-519 Bunkhouse Bldg. Iqaluit\dwg\350600-505 DSS Bunkhouse 2015.dwg

2.0 BACKGROUND INFORMATION ON HAZARDOUS MATERIALS

The Government of Nunavut *Occupational Health & Safety Regulations* requires that an employer provide any information, instruction, training and supervision that is necessary to protect the health and safety of workers. "Hazardous materials" which require special handling during construction or demolition activities include asbestos, lead, silica, mercury, polychlorinated biphenyls (PCBs), ozone-depleting substances (ODS), man-made mineral fibres (MMMF) mould and urea formaldehyde foam insulation (UFFI).

Other regulatory requirements (and guidelines) which apply to control of exposure to hazardous materials are referenced in the sections below.

2.1 ASBESTOS

Asbestos has been widely used in buildings, both in friable applications (materials which can be crumbled, pulverized or powdered by hand pressure, when dry) such as pipe and tank insulation, sprayed-on fireproofing and acoustic texture material and in non-friable manufactured products such as floor tile, gaskets, cement board and so on. The use of asbestos in friable applications was curtailed around the mid-1970s and, as such, most buildings constructed prior to about 1975 contain some form of friable construction material with an asbestos content. The use of asbestos in certain non-friable materials continued beyond the mid-1970s.

Control of exposure to asbestos is governed in Nunavut by the *Guideline for the Management of Waste Asbestos.* Disposal of asbestos waste (friable and non-friable materials) is governed by the *Guideline for the General Management of Hazardous Waste in Nunavut.*

Public Works and Government Services Canada (PWGSC) Departmental Policy 057 – *Asbestos Management* provides requirements for asbestos management in federal buildings. This document states:

- *"Public Works and Government Services Canada shall comply with all federal, provincial, territorial and municipal regulations, statutes and requirements with regard to asbestos containing materials (ACM) in government owned or leased buildings and facilities."*

PWGSC DP 057 – *Asbestos Management* - defines asbestos-containing material and classifies asbestos work operations into three types (Type 1, 2 and 3) and specifies procedures to be followed in conducting Type 1 and 2 asbestos work. Type 3 procedures are not included in the standard procedures provided in DP 057.

However DP 057 states that procedures for Type 3 work are developed for the particular work to be undertaken, and the specific circumstances and worksite. These procedures are to be developed in compliance with the National Master Specification, Section 02 82 00.03, Asbestos Abatement (maximum precautions).

The Nunavut Occupational Health and Safety Regulations (Draft – September 1, 2010) contains requirements for asbestos management and abatement in Part 24. Sections of this draft regulation state the following with respect to asbestos abatement and demolition:

> "Asbestos process" means any activity that may release asbestos dust, and includes:
> (a) the sawing, cutting or sanding of asbestos-containing materials,
> (b) the repair, maintenance, replacement or removal of asbestos surfaces,
> (c) the cleaning or disposal of asbestos materials,
> (d) the mixing or application of asbestos shorts, cements, grouts, putties or similar compounds,
> (e) the storing or conveyance of materials containing asbestos, and
> (f) the demolition of structures containing asbestos.
>
> Where an asbestos process is undertaken, an employer shall ensure that:
> (a) the area is effectively isolated or otherwise enclosed to prevent the escape of asbestos dust to any other part of the work site;
> (b) a warning notice is conspicuously displayed indicating that asbestos work is in progress;
> (c) all asbestos-containing materials removed are placed in appropriate receptacles that are impervious to asbestos and that are clearly labelled "Asbestos"; and
> (d) the receptacles referred to in paragraph (c) are handled and transported in a manner that will protect them from physical damage.

DP 057 and the Nunavut Draft Regulation classify removal of more than a minor amount of friable asbestos-containing material as "Type 3" and "High Risk" work, respectively.

2.2 LEAD

Lead is a heavy metal that can be found in construction materials such as paints, coatings, mortar, concrete, solder, packings, sheet metal, caulking, glazed ceramic products and cable splices. Lead has been used historically in exterior and interior paints.

The *Environmental Guideline for Waste Lead and Lead Paint* – Department of the Environment, Government of Nunavut revised April 2014 states that "Products that contain lead in excess of 100 parts per million (0.01% by weight) are considered hazardous waste and shall be managed in accordance with this guideline".

Paint having a leachate value for lead of 5.0 milligrams per liter (mg/l) or more is a hazardous waste and must be managed in accordance with this Guideline and the Environmental Guideline for the General Management of Hazardous Waste. Alternatively, a TCLP can be performed on the material. If the resulting leachate value is less than or equal to 5 mg/l, the waste is considered non- hazardous.

2.3 MERCURY

Mercury has been used in electrical equipment such as alkaline batteries, fluorescent light bulbs (lamps), compact fluorescent lamps (CFL), high intensity discharge (HID) lights (mercury vapour, high pressure sodium and metal halide), "silent switches" and in instruments such as thermometers, manometers and barometers, pressure gauges, float and level switches and flow meters. Mercury-containing lamps, the bulk of which are 1.22 m (four foot) fluorescent lamps contain between 7 and 40 mg of mercury each. Mercury compounds have also been used by many manufacturers historically as additives in latex paint to protect the paint from mildew and bacteria during production and storage.

The intentional addition of mercury to Canadian-produced consumer paints for interior use was prohibited in 1991. Mercury may have remained in paints after 1991, however, as a result of impurities in the paint ingredients or cross-contamination due to other manufacturing processes. The Nunavut *Occupational Health and Safety Regulations (Draft) September 2010* sets a contamination limit of $0.025 mg/m^3$ (for inorganic forms, including metallic mercury).

Mercury-containing thermostats and silent light switches are mercury tilt switches which are small tubes with electrical contacts at one end of the tube. A mercury tilt switch is usually

present when no switch is visible. Mercury switches often have the word "TOP" stamped on the upper end of the switch, which is visible after removing the cover plate. A single thermostat switch may contain up to 3,000 milligrams (0.1 ounce) of mercury. If mercury switches are to be removed, the entire switch should be removed and placed into a suitable container for storage and disposal.

Waste light tubes generated during renovations or building demolition and waste mercury from equipment must either be recycled or disposed of in accordance with the requirements of The *Environmental Guideline for Mercury-Containing Products and Waste Mercury* – Department of the Environment, Government of Nunavut November 2010.

Waste mercury from mercury switches or gauges should, however, be properly collected and shipped to a recycling facility or disposed of as a hazardous waste. Removal of mercury-containing equipment (e.g., switches, gauges, controls, etc.) should be carried out in a manner which prevents spillage and exposure to workers.

2.4 SILICA

Silica exists in several forms of which crystalline silica is of most concern with respect to potential worker exposures. Quartz is the most abundant type of crystalline silica. Some commonly used construction materials containing silica include brick, refractory brick, concrete, concrete block, cement, mortar, rock and stone, sand, fill dirt, topsoil and asphalt containing rock or stone.

2.5 PCBS

Any equipment containing PCBs such as transformers, switchgear, light ballasts and capacitors, which is removed from service due to age, failure or as a result of decommissioning, is considered to constitute a PCB waste. Although current federal legislation (effective 1 July 1980) has prohibited the manufacture and sale of new equipment containing PCBs since that time, continued operation of equipment supplied prior to this date and containing PCBs is still permitted. Handling, storage and disposition of such equipment is, however, tightly regulated and must be managed in accordance with provincial and federal government requirements as soon as it is taken out of service or becomes unserviceable.

In most institutional, commercial facilities and in smaller industrial facilities, the primary source of equipment potentially containing PCBs is fluorescent and HID light ballasts. Small transformers may also be present. In larger industrial facilities, larger transformers and switch gear containing, or potentially containing, PCBs may also be present.

PCB wastes are prohibited from shipment to disposal facilities in the United States. Out-of-Territory facilities that will accept PCB waste solids and liquids for destruction include the Alberta Special Waste Management facility operated by Earth Tech (Canada) Inc. in Swan Hills, Alberta, and the Bennett Environmental facility in Quebec.

Removal of in-service equipment containing PCBs, such as fluorescent light ballasts, capacitors and transformers, is subject to the requirements of the federal *PCBs Regulations* (discussed below). The federal PCB regulations outline the end of use dates for all equipment containing PCBs and storage/disposal requirements.

Exceptions are provided for fluorescent light ballasts and pole-mounted transformers where an end of use date of 31 December 2025 has been specified. The regulations also limit the storage of PCB material to a maximum of one year from the date the regulations came into effect or one year following removal of the equipment from service, whichever is the later date.

The regulations also allow for the filing of applications for exemption from the applicable end of use dates specified above. There are a number of circumstances under which an application may be filed. In addition to the above, there are several other requirements, including filing of annual reports, notification for changes in inventories for stored PCBs, and so forth.

PCBs may be present in caulking used in windows, door frames and masonry columns in buildings built or renovated between 1950 and 1979.

PCBs were also commonly added to industrial paints from the 1940s to the late 1970s. PCBs were added directly to the paint mixture to act as a fungicide, to increase durability and flexibility, to improve resistance to fires and to increase moisture resistance. The use of PCBs in new products was banned in Canada in the 1970s. PCB amended paints were used in speciality industrial/institutional applications prior to the 1970s including government buildings and equipment such as industrial plants, radar sites, ships as well as non-government rail cars, ships, grain bins, automobiles and appliances.

2.6 OZONE-DEPLETING SUBSTANCES

The Federal Halocarbon Regulations, 2003 (FHR 2003) were published in August 2003 under the authority of the Canadian Environmental Protection Act, 1999. The purpose of the FHR 2003 is to reduce and prevent emissions of ozone-depleting substances and of their halocarbon alternatives to the environment from air-conditioning, refrigeration, fire-extinguishing and solvent systems that are:

- located on federal or aboriginal lands; or
- owned by federal departments, boards and agencies, Crown corporations, or federal works and undertakings.

Contractor responsibilities under the FHR 2003 include the following:

- only a certified and licensed technician may install, service, leak test or charge halocarbon containing equipment;
- if a leak test is conducted on a piece of air conditioning or refrigeration equipment, the contractor is to affix a notice containing all of the information as required in Schedule 2, item 2 of the FHR 2003, including: a) name and address of owner of the system, b) name of operator of the system, c) specific location of the system, d) description of the system, e) name of certified person, f) certificate number, g) name of employer of certified person, h) type of halocarbon in the system, i) charging capacity of the system, and j) date of last two leak tests;
- no halocarbons are to be knowingly released from a refrigeration or air conditioning system, or from a fire extinguishing system (unless to fight a fire). If any work is done on an air conditioning, refrigeration, or fire extinguishing system that may result in a release of a halocarbon, the halocarbon shall first be recovered into a container designed for that purpose;

- in the event that a halocarbon-containing system must be charged, a leak test is to first be performed. If a leak is detected for a halocarbon-containing system, the owner of the equipment (and contract authority) must be informed of the leak as soon as possible. In the case of a leak resulting in a release of greater that 100 kg, or of unknown weight from a unit with a capacity equal to or greater than 100 kg, the contractor must report the release within 24 hrs to Environment Canada at (867) 920-8130 via the Northwest Territories Department of Environment and Natural Resources emergency spill line for the Northwest Territories and Nunavut; and

- upon servicing a halocarbon-containing system, the service log book for the unit is to be completed by the contractor. Before dismantling, decommissioning or destroying any halocarbon-containing system; the halocarbon(s) will be recovered and a notice shall be affixed to the system. The notice shall meet the requirements listed in Schedule 2, Item 3 of the FHR 2003.

2.7 MAN-MADE MINERAL FIBRES

Man-made mineral fibres (MMMF), also known as Synthetic Vitreous Fibres (SVF), include mineral wool (rock wool and slag wool), glass wool (fibre glass) and refractory ceramic fibres (RCF). MMMFs have been produced and widely used in Canada for the past 60 years and are commonly used in the construction industry as insulation and fire protection material.

Measures to control worker exposure and the spread of dust created during the disturbance of MMMF-containing materials are provided in *Synthetic Vitreous Fibres Guidelines for Construction*, 2005, a document prepared by The Construction Safety Association of Ontario (CSAO). The following recommendations are made in the CSAO guideline for the removal, maintenance and demolition of materials which contain MMMF:

- Where practicable, the insulation should be lightly misted with water before and during removal.

- The work area should be isolated by safety tape and warning signs.

- In most situations, a United States National Institute for Occupational Safety and Health (NIOSH) approved N95 air-purifying respirator, dust-resistant safety goggles, and disposable coveralls will provide adequate protection. However, if the activity generates substantial amounts of dust, a more protective respirator may be necessary. For example, major demolition may require a full-facepiece respirator or a supplied-air respirator instead of a half-facepiece air-purifying respirator.

- All waste material should be placed in covered, sealed waste disposal containers as it is removed. If the material is wet, it should be placed in waterproof containers.

- Material to be removed should be handled carefully and not thrown about. Rough handling will release dust and fibres into the air.

- Before maintenance or removal, ventilation duct openings and other openings that could permit the spread of fibres should be temporarily sealed.

- Work areas should be kept clean and scrap material removed as often as necessary to keep the area clean.

2.8 MOULD

Moulds are forms of fungi that are found everywhere both indoors and outdoors all year round. Outdoors, moulds live in the soil, on plants and on dead and decaying matter. More than 1000 different kinds of indoor moulds have been found in buildings. Moulds spread and reproduce by making spores, which are all small and light-weight, able to travel through air, capable of resisting dry, adverse environmental conditions, and hence capable of surviving a long time. Moulds need moisture and nutrients to grow and their growth is stimulated by warm, damp and humid conditions.

Recommended work practices are outlined in *Mould Guidelines for the Canadian Construction Industry.* Standard Construction Document CCA 82 2004. Canadian Construction Association.

2.9 UFFI

Urea formaldehyde foam insulation (UFFI) is a polymer manufactured at point-of-use by blending urea formaldehyde resin with a phosphoric acid catalyst and compressed air at a nozzle tip. This nozzle was used to inject the freshly mixed foam product into enclosed wall cavities. UFFI was introduced in Canada in the l970s. In response to concerns about the health effects of formaldehyde gas, the installation of UFFI was banned in Canada in 1980.

2.10 HEATING OIL

Heating oils are regulated under the Used Oil and Waste Fuel Management Regulations provisions of the Nunavut Environmental Protection Act. At the time of the survey the heating oil tank had been removed. The date and details of the tank removal are unknown.

2.11 RADIOACTIVE MATERIALS

Aside from nuclear and biomedical industries, radioactive materials may be present in very small amounts within smoke detectors. Smoke detectors typically contain 1 microcurie of Americium-241. Standard smoke detectors do not require a radioactive licence and are accepted as segregated items at the Iqaluit landfill.

3.0 PROPERTY DESCRIPTION

The subject property is located on the south side of Allanngua Road in the City of Iqaluit. The property roughly 45 m by 55 m equating to approximately 0.2 hectares (0.5 acres) with a single storey wood frame structure, with wood siding. The building is on City services for water, sewer and electrical power. The electric power comes to the building from a pole located in the south east corner of the subject site. One transformer was observed on the pole. All services to the building were disconnected prior to the survey. The building was heated by one oil-fired forced air furnace in the mechanical room. The oil tank was removed prior to the survey.

The former DFO Bunkhouse (Building 1074) is composed of two (2) single-storey structures connected by a central corridor. The “H” shaped structure was originally constructed circa 1962 for the Canadian Coast Guard (CCG) as a seasonal bunkhouse building. There have been several renovations completed since that time to suit the needs of the users. It was reported that all furnishing and equipment located inside the building had been removed. However, at the time of the preliminary site visit and the investigation and supplementary testing program in October and

December 2014, respectively, multiple items still remain in place including minor furnishings, a large safe and large-scale printer.

The roof construction is asphaltic roof membrane, and likely, tyvek building paper over plywood on a 50 x 200 mm wood frame with 150 mm fiberglass insulation, polyethylene vapour barrier, 12 mm plywood, with gypsum board or ceiling tiles on the inside.

Wall construction is typical for this type of structure. The main floor exterior walls are 50 x 150 mm wood construction and are comprised of wood siding over 12 mm plywood, 150 mm fiberglass insulation (between the wood studs) with polyethylene vapour barrier, and finished on the inside with 12 mm plywood and 12 mm drywall. The interior walls are 12 mm drywall on both sides of a 50 x 100 mm wood frame wall.

Typical floor construction is generally 50 x 200 mm floor joists, 150 mm fiberglass insulation (between the wood joists), 12 mm plywood and a finishing. The building floor finishes comprise vinyl sheet/tile flooring, under carpeting with the exceptions being the bathrooms, corridors and foyers which only had the vinyl sheet flooring.

A summary of the Non-Hazardous Material Quantities is included in Table 5.1.

4.0 RESULTS AND DISCUSSION

4.1 ASBESTOS

During the Designated Substance Survey (DSS) conducted by Franz Environmental Inc. in May of 2012, fifty-six (56) samples were collected and analysed, four (4) of the samples contained asbestos concentrations in excess of the recommended limit of the Government of Nunavut. The results of analysis are presented in Table 1 of the Franz report attached in Appendix A.

Additional representative and confirmatory bulk samples of materials were collected by DCS staff during the course of our supplementary inspection. The samples were forwarded to EMSL Canada Inc., a commercial laboratory in Mississauga, Ontario for asbestos analysis. The results of analyses are presented in Table 4.1 with the laboratory reports attached to the DCS report in Appendix A.

Confirmation of the locations of asbestos-containing material was made based on the results of the bulk sample analysis, visual observations and physical characteristics of the applications as well as our knowledge of the uses of asbestos in building materials. The locations of the asbestos-containing materials are shown in place on Figure 2.

TABLE 4.1
SUMMARY OF RESULTS OF ANALYSES OF BULK SAMPLES FOR ASBESTOS CONTENT

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	ASBESTOS CONTENT
FT-1	1.022	Vinyl Floor Tile 12” x 12” - White	None detected (PLM) None detected (TEM)
FT-1	1.022	Mastic under Vinyl Floor Tile 12” x 12” - White	None detected (PLM) None detected (TEM)
PA-1	1.022	Paper backing under floor tile (FT-1)	None detected
FT-2A	West Wing	Vinyl Floor Tile under plywood - Orange	None detected (PLM) None detected (TEM)
FT-2A	West Wing	Mastic under Vinyl Floor Tile under plywood - Orange	None detected (PLM) None detected (TEM)
FT-2B	West Wing	Vinyl Floor Tile under plywood - Orange	None detected

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	ASBESTOS CONTENT
FT-2B	West Wing	Mastic under Vinyl Floor Tile under plywood - Orange	None detected
FT-2C	West Wing	Vinyl Floor Tile under plywood - Orange	None detected
FT-2C	West Wing	Mastic Vinyl Floor Tile under plywood - Orange	None detected
FT-3A	West Wing	Vinyl Floor Tile 12” x 12” – Beige	None detected (PLM) None detected (TEM)
FT-3A	West Wing	Mastic Vinyl Floor Tile 12” x 12” – Beige	None detected (PLM) None detected (TEM)
FT-3B	West Wing	Vinyl Floor Tile 12” x 12” – Beige	None detected
FT-3B	West Wing	Mastic under Vinyl Floor Tile 12” x 12” – Beige	None detected
FT-3C	West Wing	Vinyl Floor Tile 12” x 12” – Beige	None detected
FT-3C	West Wing	Mastic under Vinyl Floor Tile 12” x 12” – Beige	None detected
VFS-1	1.020	Vinyl Floor Sheeting – Diamond Pattern (Orange)	**21.3% Chrysotile**
VFS-1	1.020	Mastic under Vinyl Floor Sheeting – Diamond Pattern (Orange)	**1.9% Chrysotile**
VFS-2	1.005	Vinyl Floor Sheeting – Grey/Blue Mottled	None detected (PLM) None detected (TEM)
CT-1	East Wing	Suspended Ceiling Tile	None detected
CT-2	West Wing	Acoustic Ceiling Tile	None detected
EXT-1	Exterior	Fibreboard under exterior sheathing	None detected
1-A	Exterior	Fiberboard Sheathing (Exterior Wall)	None detected (1)
1-B	Exterior	Fiberboard Sheathing (Exterior Wall)	None detected (1)
1-C	Exterior	Fiberboard Sheathing (Exterior Wall)	None detected (1)

NOTES:

(1) Sample collected during SENES walk thorough of the building in November 2014.

Bulk samples were analyzed by Polarized Light Microscopy (PLM) analysis, except where “TEM” is noted, in which case Transmission Electron Microscopy analysis was also performed.

Based on review of existing information, visual observations and results of laboratory analyses of samples collected by Franz, SENES and DCS, the following asbestos-containing materials were found to be present at the site:

- vinyl sheet floor flooring with asbestos-containing paper backing located under existing non-asbestos sheet flooring and plywood throughout the east building and connecting corridor;
- asphaltic roof membrane applied to the entire roof structure;
- sections of cement sheet panels present in the ceiling space of Room 1.003 in the west portion of the building;
- asbestos-containing gasket on forced-air furnace electrical junction box;
- window caulking applied to interior of all windows in the west portion of the building; and
- window caulking applied to exterior of all windows in the west and east portion of the building.

Asbestos may also be present in materials which were not sampled during the course of the DSS, including, but not limited to, gaskets in piping, internal components of boilers, components of electrical equipment (e.g. electric wiring insulation, non-metallic sheathed cable, electrical panel partitions, arc chutes, high-grade electrical paper, etc.), and/or in locations that are presently inaccessible (e.g., in pipe chases, above suspended gypsum board ceilings, etc.). Confirmatory testing of any such materials could be undertaken as the need arises (i.e., at the time of demolition) or the materials can be assumed to contain asbestos based on findings in adjacent areas.

If any materials which may contain asbestos and which were not tested during the course of the designated substances survey are discovered during any construction/demolition activities, the work shall not proceed until such time as the required notifications have been made and an appropriate course of action is determined.

4.2 LEAD

During the Designated Substance Survey (DSS) conducted by Franz Environmental Inc. in May of 2012, fifteen (15) samples were collected and analysed, seven (7) of the paint samples contained lead concentrations in excess of the recommended limit of the Government of Nunavut. The results of analysis are presented in Table 2 of the Franz report attached in Appendix A.

Twenty-two additional samples of paint were collected from the site by DCS during the course of the supplementary testing conducted in December 2014. The samples were submitted to

Maxxam Analytics in Mississauga, Ontario for analysis of lead content. The results of analyses are presented in Table 4.2 with the laboratory report attached to the DCS report in Appendix A.

TABLE 4.2
SUMMARY OF RESULTS OF ANALYSES OF BULK SAMPLES FOR LEAD CONTENT

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	LEAD CONTENT MG/KG (PPM)
PT-1	Exterior Wood Paneling	Wall Paint – White	95
PT-2	Exterior Wood Paneling	Wall Paint – White	**270**
PT-3	Exterior Wood Paneling	Wall Paint – White	**1140**
PT-4	Exterior Wood Paneling	Wall Paint – White	120
PT-5	Exterior Wood Paneling	Wall Paint – White	8.6
PT-6	Exterior Wood Paneling	Wall Paint – White	6.9
PT-7	Exterior Wood Paneling	Wall Paint – White	11
PT-8	Exterior Wood Paneling	Wall Paint – White	8.1
PT-9	Exterior Wood Paneling	Wall Paint – White	**180**
PT-10	Exterior Wood Paneling	Wall Paint – White	**230**
PT-11	Exterior Metal Window Frame	Trim Paint – White	Not Analyzed
PT-12	Exterior Metal Window Frame	Trim Paint – White	Not Analyzed
PT-13	Exterior Wood Window Frame	Trim Paint – White	**430**
PT-14	Exterior Wood Window Frame	Trim Paint – White	**400**
PT-15	Interior Wood Paneling	Wall Paint – White	4.6
PT-16	Interior Wood Paneling	Wall Paint – White	15
PT-17	Interior Wood Paneling	Wall Paint – White	5.4
PT-18	Interior Wood Sheathing	Ceiling Paint - Green	**80000**
PT-19	Interior Wood Sheathing	Wall Paint - Green	**91000**
PT-20	Interior Wood Sheathing	Wall Paint - Green	**71000**
TCLP-1	Exterior Paint	Wall Paint – White	55
TCLP-2	Exterior Paint	Wall Paint – White	**120**

Lead was detected at levels in excess of 100 mg/kg in the exterior white wall paint applied to the wall paneling, window frames, fascia and soffits, and in the interior green paint applied to underside of the roof sheeting and applied to the inside face of the exterior wood sheeting and studs throughout the building (including under neutral painted surfaces).

If paint (or other lead-containing coatings or materials) will be disturbed during the course of construction work, the measures and procedures outlined in the Nunavut Environmental Guideline for Waste Lead and Lead Paint (March 2014) should be followed.

Lead may also be present in the glazing on ceramic tiles and in the solder on the sweated-on joints between copper pipe and fittings.

4.3 MERCURY

During the course of our site inspections, one-hundred twenty-eight (128) interior fluorescent light tubes were counted. No exterior H.I.D. lights were observed. Mercury should be assumed to be present as a gas in all fluorescent light tubes. Six (6) mercury thermostats were observed in the building. The locations of the fixtures that contain mercury are shown in place in the Franz DSS Report (see Appendix A).

Any silent light switches or tilt switches should be checked for mercury at the time of demolition.

Waste light tubes generated during renovations or building demolition and waste mercury from equipment must either be recycled or disposed of in accordance with the requirements of The *Environmental Guideline for Mercury-Containing Products and Waste Mercury* – Department of the Environment, Government of Nunavut November 2010.

4.4 SILICA

Materials observed in the study areas which should be considered to contain silica included gypsum board, drywall joint compound, ceramic tiles, ceiling tiles and concrete.

Measures and procedures recommended for demolition activities, including dismantling and break up of concrete, masonry, etc. are as follows:

- workers exposed to silica should wear a half-mask particulate respirator with N, R-, or P-series filters and 95, 99 or 100% efficiency;
- clean up after each operation should be done to prevent dust containing silica from spreading;
- compressed air should not be used for removing dust from clothing;
- workers exposed to silica should be provided with or have access to washing facilities equipped with clean water, soap, and individual towels;
- silica dust on personal protective clothing and equipment should be removed by damp wiping or HEPA vacuuming;
- contaminated personal protective clothing and equipment should be handled with care to prevent disturbing the silica dust and the generation of airborne silica dust;
- washing facilities and laundering procedures must be suitable for handling silica-contaminated laundry; and
- warning signs should be posted in sufficient numbers to warn of the silica hazard. There should be a sign, at least, at each entrance to the work area. The signs should display the following information in large, clearly visible letters:
    - there is a silica dust hazard;
    - access to the work area is restricted to authorized persons;
    - respirators must be worn in the work area.

4.5 PCBs

Sixty four (64) fluorescent light ballasts were observed in the subject building. The ballasts will have to be examined by a licensed electrician prior to disposal to confirm the presence of PCBs.

Light ballasts, such as those associated with the type of fluorescent lights (T12s) identified at the site, are typically a magnetic type which may contain PCBs. Inspection of product codes and date codes on the ballasts can be used to determine the likely presence or absence of PCBs.

The electric power comes to the building from a pole located in the south east corner of the subject site. One pole mounted transformer was observed on the pole; however it is not associated with this building. No other PCB-containing equipment or materials were identified during the waste survey.

Removal of in-service equipment containing PCBs, such as fluorescent light ballasts, capacitors and transformers, is subject to the requirements of the federal *PCBs Regulations* (discussed in Section 2.5 of this report).

4.6 OZONE-DEPLETING SUBSTANCES

No equipment potentially containing ODS was identified on site during the course of the supplementary testing.

4.7 MAN-MADE MINERAL FIBRE

Glass fibre insulation was observed in the wall spaces of the exterior walls.

The procedures outlined in Section 2.7 of this report should be followed during handling of this insulation.

4.8 MOULD

Suspect mould was observed in the building, and should be assumed to be present on surfaces inside wall cavities (e.g. on gypsum board, etc.), and possibly in other “hidden” areas. During demolition, any mould-impacted materials should be misted or wetted with water to reduce airborne dust. The materials should then be placed into a disposal bin and sealed. Workers involved in the demolition of mould-impacted materials should wear appropriate protective clothing and equipment and follow decontamination practices as outlined in the Canadian Construction Association Standard Construction Document CCA-82 2004 – Mould guidelines for the Canadian Construction Industry.

4.9 UFFI

No UFFI was observed on site.

4.10 HEATING OIL

No heating oil tank was observed during the survey. The tank is reported to have been removed by others at an earlier date.

4.11 RADIOACTIVE MATERIALS

Five smoke detectors were observed in the building during the inspection. Smoke detectors typically contain 1 microcurie of Americium-241. Standard smoke detectors do not require a radioactive licence and are accepted as segregated items at the Iqaluit landfill.

4.12 HAZARDOUS MATERIALS SUMMARY

A summary of the estimated Hazardous Material Quantities is provided included in Table 4.3.

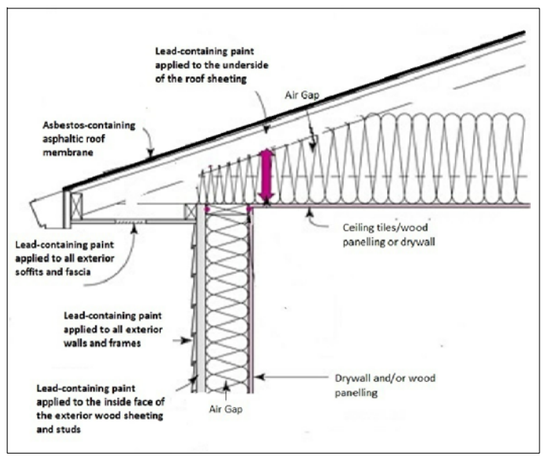
TABLE 4.3
SUMMARY OF HAZARDOUS MATERIAL QUANTITIES

Hazardous Material	Quantity	Location
Asbestos		
vinyl sheeting with paper backing	320 m^2	under existing non-asbestos sheet flooring and plywood throughout the east building and connecting corridor.
window caulking	30 m^2	applied to interior of all windows in the west portion of the building; and to exterior of all windows in the west and east portion of the building.
transite panel	2 m^2	east wing room 1.003
asphaltic roof membrane	750 m^2	entire roof structure
Lead Based Paint Applications		
lead content >0.01%	1300 m^2	interior side of exterior sheeting (vertical and horizontal surfaces)
lead content >0.01%	550 m^2	exterior paint on wood cladding and window frames
Mercury		
switches	6	thermostats located throughout building
fluorescent light tubes	128	estimate for entire building
Ozone Depleting Substances		N/A
	0	
PCBs		
light ballasts	64	Estimate for entire building

5.0 ASSESSMENT OF NON-HAZARDOUS MATERIAL

Non-hazardous material observed in the building consisted of wood in the form of wooden studs and joists, roof decking and wall sheathing in the form of plywood, interior and exterior doors and frames, stairs and rails. Other items are ceramic tiles, vinyl floor tiles and sheeting, ceiling tiles, drywall, carpets and copper pipes, porcelain bathroom fixtures, office furniture, millwork and windows.

A summary of the estimated Non-Hazardous Material Quantities is provided included in Table 5.1. These volumes are intended to provide guidance to the demolition contractor with respect to the in-situ volume of material within the structure. The volumes do not include for any bulking factor as would be observed during demolition works. Construction methods and equipment used to demolish, containerize and transport the demolition debris would dictate the final bulked volume of debris generated during any future demolition works.



LEGEND:

OA/CLK	ASBESTOS WINDOW CAULKING (EXTERIOR) ASBESTOS ROOFING MATERIALS
CLK	ASBESTOS WINDOW CAULKING (INTERIOR)
FT	ASBESTOS FLOORING
VSF	ASBESTOS VINYL SHEET FLOORING
CP	ASBESTOS CEMENT PRODUCT
◯	THROUGHOUT FUNCTIONAL AREA
1.045	ROOM LOCATION NUMBER

NOTES:

REVISIONS:

No.	Date:	By:	Revisions

REFERENCE:

1.

SENES Consultants
AN ARCADIS COMPANY

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

DEMOLITION WASTE SURVEY

DFO BUNKHOUSE BUILDING 1074

FLOOR PLAN

Drawn By: P.A.L.	Approved By: C.F.G.	Project No: 350600-519
Date: FEB. 2015	Scale: 1:200±	FIGURE 2

TABLE 5.1
SUMMARY OF HAZARDOUS MATERIAL QUANTITIES [(1)]

Volume Calculations for Demolition				
Item	**Portion of Structure**			Total Volume (m3)
Building Dimensions	west bldg.	corridor	east bldg.	
two trailers connected				
length (m)	38	8.4	38	
width (m)	9.5	6	8.5	
exterior height (m)	3	3	3	
surface area (sq.m)	361	50.4	323	734.4
Metal				
miscellaneous piping (see note 1)				2
Wood				
total plywood (exterior sheathing (1 layer), interior sheathing (2 layers) floor, ceiling and roof) (cu.m)	18.88	2.45	16.99	38.33
wood framing (exterior 2x6, interior 2x4, floor and ceiling 2x8) (cu.m)	27.57	3.58	24.81	55.97
exterior siding (cu.m)	2.85	0.37	2.57	5.79
Drywall/Ceiling Tiles				
interior (walls and ceiling) (cu.m)	8.83	1.15	7.95	17.92
Ceramics				
sinks, toilets and urinals				3
tiles				1
Insulation				
rigid styrofoam (cu.m)				TBD
fiberglass (cu.m)	187.1	24.32	168.39	379.81
pipe insulation (cu.m)				TBD
Misc.				
stairs				0.5
furniture & Misc Debris Located Inside Structure				3
cabinetry				2
carpet (cu.m)	1.8	0.23	1.62	3.65
vinyl flooring (cu.m)	0.54	0.07	0.49	1.1
Total construction waste volume	247.57	32.18	222.81	513.07

Note (1) – Volume are based on in-situ measurements and does not include any bulking factor

6.0 USE AND LIMITATIONS OF THIS DEMOLITION WASTE SURVEY REPORT

This report, prepared for PWGSC, does not provide certification or warranty, expressed or implied, that the investigation conducted by SENES identified all hazardous materials in the subject facility. The work undertaken by SENES was directed to provide information on the presence of hazardous materials in building construction materials based on review of existing information, visual inspection of readily accessible areas of the building and on the results of laboratory analysis of a limited number of bulk samples of material for asbestos content, laboratory analysis of a limited number of paint samples for lead content. The survey did not include for identification of asbestos in process materials, equipment (including electrical equipment and wiring), nor material outside of the building (e.g. asphaltic pavement).

The material in this report reflects SENES' best judgment in light of the information available at the time of the investigation, which was performed on 27 October, and 22 and 23 December 2014.

This report was prepared by SENES for PWGSC. Any use which any other party makes of the report, or reliance on, or decisions to be based on it, is the responsibility of such parties.

APPENDIX A

FRANZ ENVIRONMENTAL INC.
DESIGNATED SUBSTANCE SURVEY

DCS
INVESTIGATION AND SUPPLEMENTARY TESTING
FOR DESIGNATED SUBSTANCES REPORT

FRANZ ENVIRONMENTAL INC.
♦ CONSULTING ♦ ENGINEERING ♦ TECHNOLOGIES ♦

June 26, 2012 Project No. 2419-1201

Public Works and Government Services Canada
Environmental Services – Edmonton Office
10025 Jasper Avenue
Edmonton, Alberta T5J 1S6
Canada

Private and Confidential

RE: FINAL - Designated Substance Survey
Bunkhouse Building – Department of Fisheries and Oceans
Iqaluit, Nunavut

FRANZ Environmental inc. (FRANZ) Inc. was retained by Public Works Government Services Canada (PWGSC) to conduct a comprehensive Designated Substance Survey (DSS) of the CFO Bunkhouse Building located in Iqaluit, Nunavut (the site). The purpose of the DSS is to assemble a quantitative inventory of any potentially hazardous substances which may be present within the building prior to any scheduled demolition activities. The building was originally constructed circa 1962 for the Canadian Coast Guard (CCG) as a seasonal bunkhouse building. There have been several renovations completed since that time to suit the needs of the PWGSC. The entire building is vacant and is scheduled for complete demolition. This report summarizes the results of the DSS undertaken at the site by FRANZ on May 29 and 30, 2012.

1.0 INTRODUCTION

This DSS was conducted in accordance with the requirements set under *Ontario Regulation 490/09, Designated Substances* (O. Reg. 490/09) and *Ontario Regulation 278/05, Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations* (O. Reg. 278/05). The Ontario regulations were used as there are no Nunavut regulations regarding the sampling of designated substances. At the time of the DSS, the single structure was vacant with no heat or electrical power. All doors and windows were boarded up to prevent unlawful entry.

The following substances are considered designated under O. Reg. 490/09: acrylonitrile, arsenic, asbestos, benzene, coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica, and vinyl chloride. Four (4) of these eleven substances are commonly encountered in structures such as the on-site building, and include:

- Asbestos in building insulation materials and boiler refractory;
- Lead in paint applications and in solder used in joints of copper pipe;
- Mercury in thermostats, pressure gauges, electrical switches and relays, and as a preservative in some paints; and
- Silica in concrete, masonry, paint, stone, and boiler refractory.

Section 30 (1) of the Ontario *Occupational Health and Safety Act* (OHSA) requires that an owner determine whether any designated substances are present at the project site. If so, a list of these substances must be compiled and provided to all bidders [Section 30(2)] at the tendering stage prior to demolishing or renovating a building. A DSS identifies the designated substances present, their locations, concentrations, and quantities. This information allows contractors involved in demolition or renovation activities to take the appropriate steps in controlling exposure of workers and the general public to designated substances that are present. For the purposes of this DSS survey, FRANZ will utilize legislation and regulations in the Province of Ontario as well as any applicable regulations and guidelines in Nunavut, that specifically address designated substances and hazardous materials management/disposal.

During the DSS, FRANZ staff collected samples of potential asbestos and lead-containing materials which were submitted for laboratory analysis. FRANZ also made observations of any potential mercury, polychlorinated biphenyls (PCBs), or Ozone Depleting Substances (ODS) for the purpose of identifying any additional substances which may be considered hazardous.

2.0 SITE INSPECTION / ANALYTICAL RESULTS

FRANZ representative Mr. Brian Ryell and Simon Novalinga of Nunatta Environmental Services (Nunatta) conducted a visual inspection of the site on May 29 and 30, 2012. The site inspection was completed without escort. A representative selection of photographs taken during the site inspection are presented in Appendix B.

The site is located in the Town of Iqaluit, Nunavut (see Figure 1; Appendix A). Currently, on site is an “H” shaped vacated bunkhouse structure divided into east and west sections connected by an enclosed corridor. The single-storey building was originally constructed in 1962 for the Canadian Coast Guard (CCG) as a seasonal bunkhouse building. There have been several renovations completed since that time. The building is vacant and is scheduled for complete demolition. The single building is approximately 660 m^2 in size.

The building is constructed of wood framing with hardboard wood exterior siding. Windows are also constructed of wood. Roof and floor areas are supported by plywood box beams. The roof is sloped and finished with asphalt shingles.

In general, the interior floor surfaces of the building were finished with either exposed vinyl sheet flooring (VSF), vinyl floor tiles (VFTs), or carpeting. A few rooms had hardwood flooring under the carpeting. Walls were finished with drywall or wooden paneling and the ceiling areas were finished with either ceiling tiles (CTs) or drywall. Lighting is provided through a combination of suspended fluorescent lighting and single bulb fixtures.

As a component of this DSS, FRANZ completed selected destructive surveying in order to access behind ceiling and wall areas not normally accessed during DSS surveys. Holes were cut into a random number of drywall or panelled finished walls and ceilings in order to assess the presence of potential hidden hazardous materials (i.e., asbestos insulation). This destructive surveying was completed in addition to standard access of building features via existing ceiling access hatches, panels, or tiles. The roof area was accessed as part of the DSS.

3.0 ANALYTICAL RESULTS

3.1 Asbestos

During the DSS, FRANZ observed several areas where asbestos-containing materials (ACMs) may be present. The following provides a brief summary of potential ACMs identified within the building at the site:

- Ceiling tiles (CTs) in several rooms throughout the west section of building;
- Drywall joint compound (DJC) along the drywall wall and ceiling areas throughout most of entire building;
- Vinyl Floor Tiles (VFTs) and Vinyl Sheet Flooring (VSF) in various offices, maintenance rooms, and bedrooms throughout building;
- Window caulking (CK) along windows of building;
- Vapour barrier insulating paper (PR) behind wall in one room;
- Roofing shingles (RF) along exterior roof area of entire building; and
- Non-Friable asbestos-containing cement Transite paneling (TR) in ceiling area of several rooms.

For the purposes of this DSS, FRANZ submitted 56 bulk samples for analysis of ACMs. During the survey, FRANZ identified four (4) visually distinct homogenous patterns of VFTs in the building. FRANZ collected representative samples of the VFTs material but did not submit them for analysis. Polarized Light Microscopy (PLM) analysis is the primary analytical technique used for asbestos determination; however, it can show significant bias leading to false negatives and

false positives for certain types of materials, including VFTs. PLM is limited by the visibility of the asbestos fibres. Many floor tiles contain fibres too small to be resolved by PLM. Should PWGSC remove any VFTs as part of the proposed demolition project, FRANZ can submit the tile samples for Transmission Electron Microscopy (TEM), which is a higher cost and more precise form of laboratory analysis. TEM analysis is not required under current legislation when dealing with bulk material issues. This level of analysis is recommended for sites where no other ACMs were documented and confirmation of non-ACM in VFTs would eliminate the requirement to prepare an Asbestos Management Plan (AMP) for a site. Otherwise, the regulation requires that these materials be assumed to contain asbestos; therefore, FRANZ is assuming the VFTs are asbestos.

The bulk asbestos samples were submitted to the EMSL Canada Inc. Laboratory in Mississauga, Ontario for PLM analysis. Table 1 presents the results of the laboratory asbestos testing on the bulk samples. The laboratory Certificates of Analysis are included in Appendix B. For Room Location Number references, see Figure 2: Sample Locations (Appendix B).

Table 1: Bulk Asbestos Sampling Results, CFO Bunkhouse, Iqaluit, Nunavut

Sample ID	Sample Description	Room Location Number	Asbestos Concentration (%) and Type	Condition
RF-01a	Roofing Tile	Exterior	None Detected	Good
RF-01b	Roofing Tile	Exterior	None Detected	Good
RF-01c	**Roofing Tile**	**Exterior**	**3% Chrysotile Asbestos**	**Good**
DJC-01a	Drywall Joint Compound	1-002	None Detected	Good
DJC-01b	Drywall Joint Compound	1-008	None Detected	Good
DJC-01c	Drywall Joint Compound	1-008	None Detected	Good
DJC-01d	Drywall Joint Compound	1-021	None Detected	Good
DJC-01e	Drywall Joint Compound	1-027	None Detected	Good
DJC-01f	Drywall Joint Compound	1-038	None Detected	Good
DJC-01g	Drywall Joint Compound	1-041	None Detected	Good
PR-01a	Cavity wall paper Insulation	1-025	None Detected	Good

Sample ID	Sample Description	Room Location Number	Asbestos Concentration (%) and Type	Condition
PR-01b	Cavity wall paper Insulation	1-025	None Detected	Good
PR-01c	Cavity wall paper Insulation	1-025	None Detected	Good
CT(1)-01a	Ceiling Tile	1-022	None Detected	Good
CT(1)-01b	Ceiling Tile	1-023	None Detected	Good
CT(1)-01c	Ceiling Tile	1-024	None Detected	Good
CT(2)-01a	Ceiling Tile	1-030	None Detected	Good
CT(2)-01b	Ceiling Tile	1-031	None Detected	Good
CT(2)-01c	Ceiling Tile	1-041	None Detected	Good
CK-01a	Window caulking	1-036	None Detected	Good
CK-01b	Window caulking	1-043	None Detected	Good
CK-01c	Window caulking	1-044	None Detected	Good
CK-01d	Window caulking	1-045	None Detected	Good
CK-01e	Window caulking	1-047	None Detected	Good
CK-01f	**Window caulking**	**1-045**	**4% Chrysotile Asbestos**	**Good**
CK-01g	Window caulking	Exterior window	Not Analysed	Good
VSF(1)-01a	Vinyl Sheet Flooring	1-001	None Detected	Good
VSF(1)-01b	Vinyl Sheet Flooring	1-001	None Detected	Good
VSF(1)-01c	Vinyl Sheet Flooring	1-023	None Detected	Good
VSF(2)-01a	Vinyl Sheet Flooring	1-002	None Detected	Good
VSF(2)-01b	Vinyl Sheet Flooring	1-005	None Detected	Good
VSF(2)-01c	Vinyl Sheet Flooring	1-008	None Detected	Good
VSF(3)-01a	Vinyl Sheet Flooring	1-004	None Detected	Good

Sample ID	Sample Description	Room Location Number	Asbestos Concentration (%) and Type	Condition
VSF(3)-01b	Vinyl Sheet Flooring	1-005	None Detected	Good
VSF(3)-01c	Vinyl Sheet Flooring	1-005	None Detected	Good
VSF(4)-01a	**Vinyl Sheet Flooring**	**1-020**	**20% Chrysotile Asbestos**	**Good**
VSF(4)-01b	Vinyl Sheet Flooring	1-008	Not Analysed	Good
VSF(4)-01c	Vinyl Sheet Flooring	1-005	Not Analysed	Good
VSF(5)-01a	Vinyl Sheet Flooring	1-026	None Detected	Good
VSF(5)-01b	Vinyl Sheet Flooring	1-038	None Detected	Good
VSF(5)-01c	Vinyl Sheet Flooring	1-041	None Detected	Good
VSF(6)-01a	Vinyl Sheet Flooring	1-031	None Detected	Good
VSF(6)-01b	Vinyl Sheet Flooring	1-031	None Detected	Good
VSF(6)-01c	Vinyl Sheet Flooring	1-031	None Detected	Good
VSF(7)-01a	Vinyl Sheet Flooring	1-035	None Detected	Good
VSF(7)-01b	Vinyl Sheet Flooring	1-035	None Detected	Good
VSF(7)-01c	Vinyl Sheet Flooring	1-035	None Detected	Good
VSF(8)-01a	Vinyl Sheet Flooring	1-048	None Detected	Good
VSF(8)-01b	Vinyl Sheet Flooring	1-048	None Detected	Good
VSF(8)-01c	Vinyl Sheet Flooring	1-048	None Detected	Good
VSF(9)-01a	Vinyl Sheet Flooring	1-039	None Detected	Good
VSF(9)-01b	Vinyl Sheet Flooring	1-039	None Detected	Good
VSF(9)-01c	Vinyl Sheet Flooring	1-050	None Detected	Good
TR-01a	**Cement Transite Panel**	**1-003**	**35% Chrysotile Asbestos**	**Good**
TR-01b	Cement Transite Panel	1-003	Not Analysed	Good

Sample ID	Sample Description	Room Location Number	Asbestos Concentration (%) and Type	Condition
TR-01c	Cement Transite Panel	1-003	Not Analysed	Good

Note: **Bold** indicated results above guidelines

As noted above, asbestos was detected in several materials submitted for analyses. According to O. Reg. 278/05, a material is considered an ACM if a bulk material sample contains 0.5% or more asbestos by dry weight. Under the Department of Environment, Government of Nunavut, *Environmental Guideline for Waste Asbestos (revised 2011)* (Waste Asbestos), asbestos waste is defined as a substance containing asbestos in a concentration greater than 1% by weight that is no longer wanted or is unusable for its intended purpose and is intended for disposal. Based on the review of the analytical results, the difference between the two regulations does not change the ACM designation of the materials documented at the site.

3.2 Lead

FRANZ observed potential lead-based paints in the following areas during the site visit on May 29 and 30, 2012:

- Grey paint along walls and ceilings of east wing;
- White paint along walls and ceilings of older west wing;
- Green and yellow paint along upper ceiling decks and cavity walls of building;
- Blue paint along window sills of east wing; and
- White paint along exterior of building.

FRANZ collected fifteen samples of interior and exterior paint material observed at the Site as potentially containing lead. The 15 paint samples were submitted to IATL in Mount Laurel, New Jersey for analysis of lead using the Atomic Absorption Spectroscopy (AAS) method. Table 2 presents the results of the laboratory lead testing on the paint samples. The laboratory Certificates of Analysis are provided in Appendix C.

Table 2: Lead Sampling Results – CFO Bunkhouse, Iqaluit, Nunavut

Sample ID	Paint Description and Sample Location	Lead Concentration by Weight (%)	Lead Concentration (ppm)
PT-01	1-002	<0.005	<50
PT-02	**1-003**	**11%**	**110,000**
PT-03	**1-007**	**11%**	**110,000**
PT-04	1-008	<0.005	<50
PT-05	1-012	<0.005	<50
PT-06	**1-013**	**2.2**	**22,000**
PT-07	**1-019**	**0.78**	**7,800**

Sample ID	Paint Description and Sample Location	Lead Concentration by Weight (%)	Lead Concentration (ppm)
PT-08	**1-025**	**6.4**	**64,000**
PT-09	**1-026**	**3.8**	**38,000**
PT-10	1-026	0.011	110
PT-11	1-030	<0.005	<50
PT-12	1-036	0.013	130
PT-13	**1-045**	**0.08**	**800**
PT-14	1-046	<0.005	<50
PT-15	Exterior	0.011	110

Note: **Bold** indicated results above guidelines

In 1976, the *Hazardous Products Act* limited the amount of lead in interior paint and in paint accessible to children to 0.5% by dry weight. In April 2005, the federal *Hazardous Products Act Surface Coating Materials Regulation (SOR/2005-109)* limited the allowable concentration of total lead present in a surface coating material (with some exceptions) to 90 mg/kg (or 90 ppm). According to the Department of Environment, Government of Nunavut, *Environmental Guideline for Waste Lead and Lead Paint (revised 2011*), lead paint is defined as a paint or similar structural coating containing 0.06% lead by weight (600 ppm). Using this guideline, those surface coating materials with lead concentrations that exceed 600 ppm are considered to be lead-based.

The laboratory results indicated that seven (7) bulk paint samples collected from the site contained concentrations of lead in excess of the recommended limit of the Government of Nunavut. Samples PT-02 and PT-03 were green/yellow paint collected from the upper older ceiling areas along the east wing of the building and both contained 110,000 ppm of lead. These paint materials were most probably applied when the building was constructed during the 1960's. Samples PT-06 (22,000 ppm), PT-07 (7,800 ppm), PT-08 (64,000 ppm), and PT-09 (38,000 ppm) were older white/yellow/green materials from cavity walls and upper ceiling deck areas along the east wing and corridor of the building. Sample PT-13 (800) was older white window sill paint collected from the west wing of the building.

3.3 Mercury

The following is a summary of potential sources of mercury observed during the site inspection:

- Wall mounted mercury-containing thermostats (with mercury ampoules);
- Fluorescent light bulbs located throughout the on-site building may contain mercury; and
- Electrical components (including, but not limited to circuit breaker panels and heavy duty power switches) located throughout the site are potential sources of mercury.

No other potential sources of mercury were observed during the site inspection.

3.4 Silica

In general, concrete, brick, stone, and mortar used in the construction of any building is assumed to contain silica. The building at the site is constructed of wood framing and does not contain any silica products. No other potential sources of silica were observed during the site inspection.

3.5 Other Designated Substances

During the DSS, FRANZ did not encounter any of the following remaining designated substances in the building in any bulk form. These substances included: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride.

3.6 Ozone Depleting Substances

During the DSS, FRANZ observed several pieces of refrigeration equipment been stored inside the building at the site. The equipment was not in use at the time off the DSS. FRANZ was unable to inspect the equipment to determine whether or not they were labelled as containing any refrigerant which may be considered ODS. There were no portable or window mounted air conditioners located in the building.

3.7 PCBs

Fluorescent as well as single bulk light fixtures are present throughout the entire site. As a component of the DSS survey, FRANZ dissembled approximately a dozen fluorescent light fixtures located throughout the building. Most lamp ballasts inspected were marked as non-PCB; however, one (1) older light fixture located in one of the washrooms (Survey Area 1-045) was marked as a Sola unit and hand stamped with the code E69. FRANZ reviewed the document "*PCB Ballasts*", produced in 2009, by PCB Disposal in order to determine whether or not the ballast may contain PCBs. According to *Table 2 – Identification of Ballasts*, Sola manufactured ballasts are additionally marked with a hand stamped letter and number code in order to identify the year and month of manufacture. The letter E represent the month of the year, or May, and the last two (2) digits represents the year, or in this case 1969. PCBs are present in these ballasts up to and including December 1979 (L79); therefore, this ballast is assumed to contain PCBs. FRANZ estimates that there were approximately a dozen older fluorescent fixtures throughout several rooms of the west side of the building which are assumed to contain PCBs.

Under the new federal PCB Regulations passed on September 5, 2008 and published in the Canada Gazette September 17, 2008, ballasts are exempt from the deadlines that are imposed on in-service askarel transformers and PCB capacitors that must be removed and disposed of by December 31, 2009. All PCB ballasts are to be removed from service by Dec 31, 2025.

3.8 Mould

As a component of this DSS, FRANZ did not inspect the building or building systems for the presence of mould or mould amplification sites.

4.0 DISCUSSION

The results of the DSS and proposed remedial measures are summarized in the sections below.

4.1 Asbestos-Containing Materials

ACMs are present in a limited amount of building materials throughout the building at the site. Confirmed as well as presumed ACM and asbestos that may be potentially concealed at the site are discussed below.

4.1.1 Friable ACM

Vinyl Sheet Flooring (VSF)

During the DSS, FRANZ observed nine (9) distinct types of friable VSF located throughout the east wing and connecting corridor of the building. Representative bulk sample [VSF(4)-01a)] was found to contain 20% Chrysotile asbestos. In many areas, the flooring material was either completely exposed or covered with additional flooring material including carpeting and wood flooring. The VSF was observed to be in good condition. FRANZ estimates that there are approximately 200 m^2 of friable ACM VSF present throughout the building.

Window Caulking (CK)

Friable window caulking was observed along the interior areas of windows along the west side of the building. Windows along the east wing of the building had been replaced with wooden framed units. There was no caulking observed along the interior side of these units. A representative bulk sample [CK(1)-01f] collected from the exterior area of the building was found to contain 4% Chrysotile asbestos. The caulking was observed to be in good condition. FRANZ estimates that there is approximately 1 m^2 of friable ACM caulking present on each window along the west wing as well as along the exterior side of most windows of the entire building.

Roofing Tiles (RF)

Friable asphalt roofing shingles are present across the entire roof of the building. Representative sample [RF-01C)] collected from the roof of the building was found to contain 3% Chrysotile asbestos. FRANZ estimates that there is approximately 750 m^2 of friable asphalt roofing shingles across the roof areas of the building.

4.1.2 Non-Friable ACM

Transite Cement Sheeting (TR)

Non-friable ACM Transite sheeting was observed along the ceiling areas of two (2) rooms in the east wing of the building. The Transite was used to insulate older vent pipes that appeared to previously vent the rooms. The metal vents were cut off at the lower ceiling but remained in place. The flat Transite panels were located along the upper deck of the ceiling surrounding the

piping. Representative sample [TR-01(a)] was found to contain 35% Chrysotile asbestos. The material was in good condition. FRANZ estimates that there is approximately 0.3 to 0.5 m^2 of Transite material in the ceiling area between 2-3 rooms of the east wing of the building.

Vinyl Floor Tiles (VFTs)

During the DSS, FRANZ documented (4) visually distinct homogenous patterns of VFTs in the building. The VFTs were primarily located along the west wing of the building. Representative bulk samples were collected but were not submitted for analysis. Under current Ontario regulations (O. Reg. 278/05) and a review of Waste Asbestos guidelines as published by the Government of Nunavut, these materials are assumed to contain asbestos. FRANZ estimates that there is approximately 350 m^2 of assumed asbestos-containing VFTs along the west area of the building.

Prior to the demolition of the building, all documented and assumed friable and non-friable ACMs should be removed from the building in accordance with both O.Reg. 278/05 and the Waste Asbestos document published by the Department of Environment, Government of Nunavut. Ontario Regulation 278/05 applies a strict assessment and abatement protocol whereas the Nunavut Waste Asbestos document focuses on handling and disposal of waste asbestos locally, where local landfills permit it. FRANZ recommends that asbestos abatement specifications, merging the above mentioned documents, be prepared for use by the abatement/demolition contractor during the demolition/abatement project scheduled for the site.

4.2 Lead

Based on the analytical results and on visual review, lead is found at the site in:

- Samples PT-02 and PT-03 were green/yellow paint collected from the upper older ceiling areas along the east wing of the building and both contained 110,000 ppm of lead. These paint materials were most probably applied when the building was constructed during the 1960's.
- Samples PT-06 (22,000 ppm), PT-07 (7,800 ppm), PT-08 (64,000 ppm), and PT-09 (38,000 ppm) were older white/yellow/green materials from cavity walls and upper ceiling deck areas along the east wing and corridor of the building.
- Sample PT-13 (800 ppm) was older white window sill paint collected from the west wing of the building.

Under the Department of Environment, Government of Nunavut, *Environmental Guideline for Waste Lead and Lead Paint* (Waste Lead), disposal options for waste lead and lead paint in Nunavut are limited. Disposal of lead waste in a local landfill is not an option. The disposal of waste lead paint may require physical stripping of the paint from the surface prior to disposal. Collected waste paint will most probably need to be shipped off site to a designated receiver as hazardous waste. In Ontario, the Ontario Ministry of Labour has published a document:

Guideline for Lead on Construction Projects (revised 2011) (Lead Guideline). This document lays out waste lead paint remediation and disposal options for construction/demolition projects.

FRANZ recommends that a waste lead paint abatement document be prepared to guide the demolition/abatement contractor utilizing O. Reg. 490/09, Waste Lead and Lead Guideline documents for use during the demolition/abatement project scheduled for the site.

4.3 Mercury

Based on the results of the DSS the following potential and confirmed sources of mercury observed during the site inspection included:

- **Confirmed**: Approximately one half dozen wall mounted mercury-containing thermostats (with mercury ampoules);
- **Potential**: Fluorescent light bulbs located throughout the on-site building may contain mercury; and electrical components (including, but not limited to circuit breaker panels and heavy duty power switches) located throughout the site are potential sources of mercury.

No other potential sources of mercury were observed during the site inspection.

The Department of Environment, Government of Nunavut, *Environmental Guideline for Mercury-containing Products and Waste Mercury* (Waste Mercury), establishes mercury waste identification, assessment, disposal and transportation options for projects involving the handling of waste mercury. Recycling and disposal options for unwanted mercury-containing products and waste mercury in Nunavut are limited. Most waste will have to be separated and shipped to a registered receiver as hazardous waste.

FRANZ, therefore recommends that a waste mercury abatement document be prepared to guide the demolition/abatement contractor utilizing O. Reg. 490/09 and the Waste Mercury document for use during the demolition/abatement project scheduled for the site.

4.4 PCBs

Fluorescent as well as single bulk light fixtures are present throughout the entire site. FRANZ estimates that there were approximately a dozen older fluorescent fixtures throughout several rooms of the west side of the building which most probably contain PCBs.

Under the new federal PCB Regulations passed on September 5, 2008 and published in the Canada Gazette September 17, 2008, all PCB ballasts are to be removed from service by Dec 31, 2025. The Department of Environment, Government of Nunavut, did not publish any documents specifically addressing the assessment, handling, and disposal of PCBs. However,

the Environmental Protection Act, RSNWT (Nu) 1988 (NUEPA) addresses environmental issues such as waste and protection of the environment.

FRANZ recommends that a PCB abatement document be prepared to guide the abatement/demolition contractor utilizing NUEPA, Ontario Regulation 362, R.R.O. 1990 of the Ontario Environmental Protection Act (PCBs), and Ontario Regulation 347 of the Ontario Environmental Protection Act (Waste Management) for use during the demolition/abatement project scheduled for the site.

4.5 Ozone Depleting Substances

During the DSS, FRANZ observed several pieces of refrigeration equipment been stored inside the building at the site. The equipment was not in use at the time off the DSS. FRANZ was unable to inspect the equipment to determine whether or not they were labelled as containing any refrigerant which may be considered ODS. There were no portable or window mounted air conditioners located in the building.

The Department of Environment, Government of Nunavut, *Environmental Guideline for Ozone Depleting Substances* (ODS Guideline) establishes updated ODS information on common ozone depleting substances, replacements, impacts of ozone depletion, and disposal of substances. Unwanted refrigeration and air conditioning equipment must be completely emptied of refrigerant. Household refrigeration and air conditioning equipment is exempt from this requirement as long as it is disposed of in a separate area of the landfill specifically set aside for the disposal of “white goods”: In Ontario, ODS are managed through Ontario Regulation 463/10 of the Ontario Environmental Protection Act (O. Reg. 463/10).

FRANZ, therefore recommends that a ODS abatement document be prepared to guide the abatement/demolition contractor utilizing the ODS Guidelines, Waste Management regulation, and O. Reg. 463/10 for use during the demolition/abatement project scheduled for the site.

5.0 SUMMARY AND RECOMMENDATIONS

Based on the findings of the DSS conducted at the vacated CFO Bunkhouse Building located in Iqaluit, Nunavut, the following designated substances have been identified:

- The results of the DSS survey confirmed the presence of both friable and non-friable asbestos-containing materials present at the site. These materials included friable roofing materials, vinyl sheet flooring and window caulking. Non-friable material included Transite cement boards and four (4) visually distinct homogenous patterns of VFTs. These materials are located throughout the entire building in varying amounts. Prior to the demolition of the building, all documented and assumed friable and non-friable ACMs should be removed from the building in accordance with both O. Reg. 278/05 and the Waste Asbestos document published by Department of Environment,

Government of Nunavut. FRANZ recommends that asbestos abatement specifications detailing asbestos waste removal and disposal options be prepared for use by the abatement/demolition contractor during the demolition/abatement project scheduled for the site.

- During the DSS survey, painted surfaces inside the building were sampled and found to contain lead. According to the Department of Environment Waste Lead document, lead paint is defined as a paint or similar structural coating containing 0.06% lead by weight (600 ppm). The laboratory results indicated that seven (7) bulk paint samples collected from the site contained concentrations of lead in excess of the recommended limit of 600 ppm. The lead paint was generally found on older painted wooden building materials located both above and behind newer drywall materials in the building as well as from window sills along the west wing of the building. FRANZ recommends that a waste lead paint abatement document detailing waste lead removal and disposal options be prepared to guide the demolition/abatement contractor for use during the demolition/abatement project scheduled for the site.
- The following potential and confirmed sources of mercury observed during the site inspection included approximately a half dozen wall mounted mercury-containing thermostats (with mercury ampoules). Additional potential sources included fluorescent light bulbs located throughout the on-site and electrical components (including, but not limited to circuit breaker panels and heavy duty power switches). FRANZ recommends that a waste mercury abatement document detailing waste mercury removal and disposal options be prepared to guide the demolition/abatement during the demolition/abatement project scheduled for the site.
- Fluorescent as well as single bulk light fixtures are present throughout the entire site. FRANZ estimates that there were approximately a dozen older fluorescent fixtures throughout several rooms of the west side of the building which most probably contain PCBs. FRANZ recommends that a PCB abatement document detailing waste PCB removal and disposal options be prepared to guide the abatement/demolition during the demolition/abatement project scheduled for the site.
- During the DSS, FRANZ observed several pieces of refrigeration equipment being stored inside the building at the site. There were no portable or window mounted air conditioners located in the building. FRANZ recommends that a ODS abatement document be prepared detailing waste ODS material handling and disposal options to guide the abatement/demolition contractor utilizing the ODS Guidelines during the demolition/abatement project scheduled for the site.

6.0 LIMITATIONS

This report has been prepared exclusively for Public Works and Government Services Canada and no other person or entity may rely upon the report without the express written consent of Franz Environmental Inc. Any use, which a third party makes of this report, or any reliance on

decisions made based on it, is the responsibility of such third parties. Franz Environmental Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Due to the nature of building construction, some limitations exist as to the scope of a Designated Substances Survey. The field observations, measurements and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings and conclusions presented in this report. The findings and conclusions drawn by Franz Environmental Inc. are limited to the specific scope of work for which Franz Environmental Inc. was retained and are based solely on information generated as a result of the specific scope of work authorized by Public Works and Government Services Canada. The results of the survey are limited to visual assessment of areas made accessible to Franz Environmental Inc. personnel and information obtained from facility personnel.

The conclusions presented herein represent the best judgment of the assessor based on current environmental standards and on the site conditions observed during the site visit on May 29 and 30, 2012. Due to the nature of the investigation and the limited data available, the assessor cannot warrant against undiscovered environmental liabilities or conditions existing in inaccessible areas of the building at the site.

Should additional information become available, Franz Environmental Inc. requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

7.0 CLOSURE

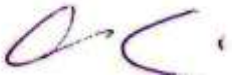
We trust that this report meets your current requirements. If you have any questions regarding this report, please contact the undersigned.

Yours truly,

FRANZ Environmental Inc.

Brian Ryell, B.A.A.
Site Assessor

Catherine LeBlanc, B.Eng.
Project Manager



Chris Ludwig, M.Eng., P.Eng., PMP
Project Principal

Z:\Projects\2012\2419-1201 DSS Iqaluit\Final Report\FINAL DSS Bunkhouse Iqaluit Nunavut.doc

APPENDIX A

Figures

Legend

Reference: Google Earth 2011

Title: Site Location

FRANZ ENVIRONMENTAL INC.
♦ CONSULTING ♦ ENGINEERING ♦ TECHNOLOGIES ♦

Project: Designated Substance Survey, Bunkhouse Building, Iqaluit, Nunavut

Date: June 2012

Client: PWGSC

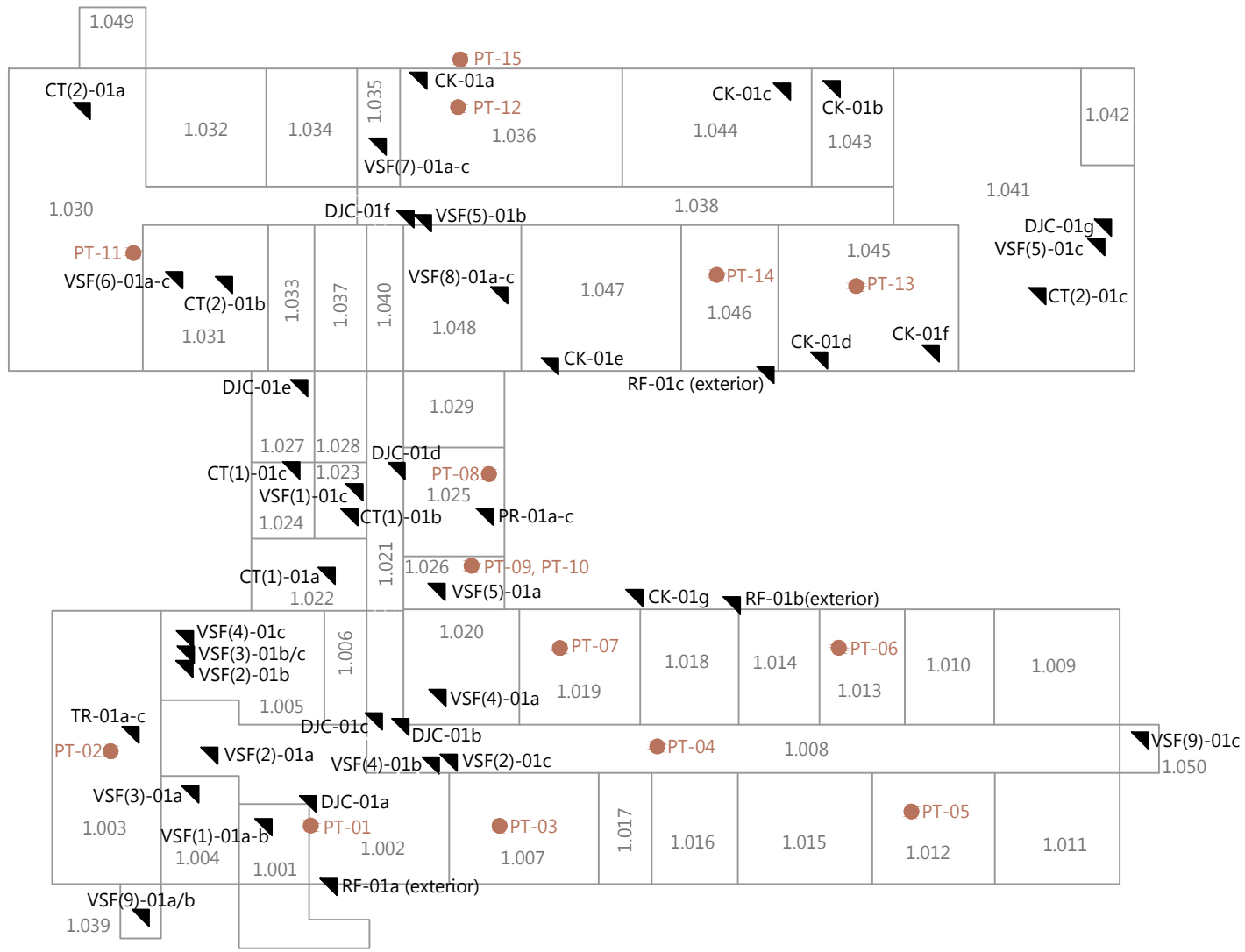
Scale 1:3000

40 30 20 10 0 metres 50 100

Figure 1

updated on:19-Jun-12 by cfernandes

Z:\Projects\2012\2419-1201 DSS Iqaluit\Figures\1-CAD\Drawing1.dwg (layout)



Legend

- Asbestos Sample Location
- Paint Sample Location
- 1.039 Room Location Number

Title: Sample Locations

FRANZ ENVIRONMENTAL INC.
CONSULTING ENGINEERING TECHNOLOGIES

Project: Designated Substance Survey, Bunkhouse Building, Iqaluit, Nunavut

Date: June 2012

Client: PWGSC

Scale 1:250

5 4 3 2 1 0 2.5 5 7.5 metres

Figure 2

updated on:19-Jun-12 by caio

\2419-1201 Iqaluit\Figures\1-CAD\Drawing1.dwg(layout)

APPENDIX B

Site Photographs

Photograph 1: View of vacant CFO Bunkhouse building, Iqaluit, Nunavut.

Photograph 2: View of asbestos-containing asphalt roof shingles on building. Sample (RF-01c) contained 3% Chrysotile asbestos.

Photograph 3: View of asbestos-containing caulking along window sill of older window in west wing of building. Sample of caulking contained 4% Chrysotile asbestos.

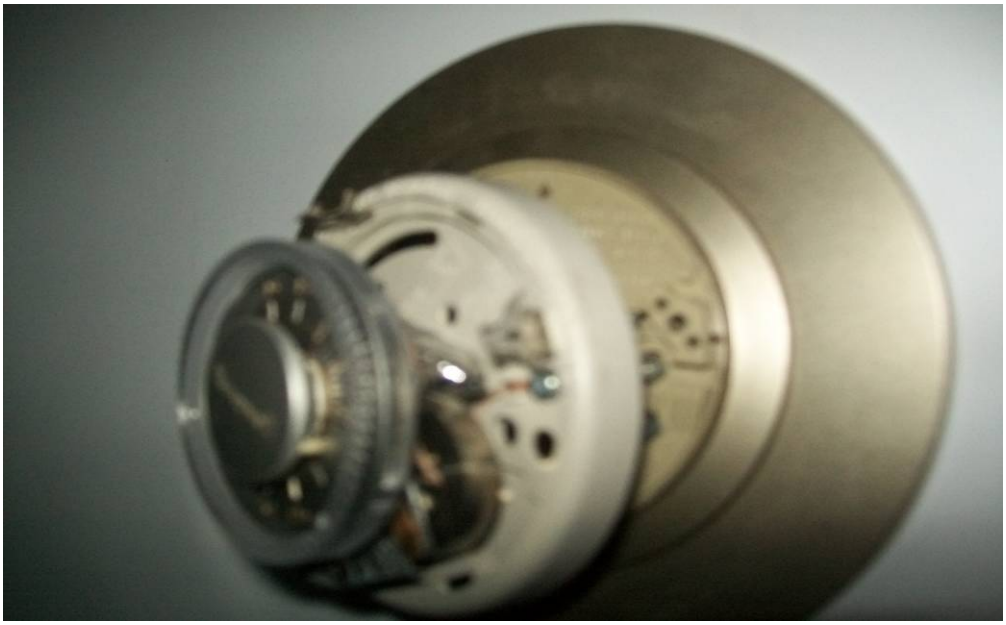
Photograph 4: View of asbestos-containing vinyl sheet flooring (VSF4) (white speckled) along floor of east wing of building. Sample (VSF4-01a) contained 20% Chrysotile asbestos.

Photograph 5: View of asbestos-containing cement Transite panel along upper ceiling of in east wing of building. Sample of Transite contained 35% Chrysotile asbestos.

Photograph 6: View of older upper ceiling area of east wing of building. Paint samples collected from green paint of older ceiling contained 110,000 parts per million (ppm) of lead.

Photograph 7: View of older upper ceiling area of east wing of building. Paint samples collected from yellow paint of older ceiling contained between 7,800 – 64,000 ppm of lead.

Photograph 8: View of white paint along the exterior window sill along the west side of the building. Paint sample collected contained 800 ppm of lead. .



Photograph 9: View of wall mounted thermostat with mercury-containing ampoules along east wing.

Photograph 10: View of assumed PCB-containing fluorescent lamp ballast along upper wall of washroom along west wing of building.

Photograph 11: View of typical assumed asbestos-containing vinyl floor tiles (“VFTs”) under carpeting along floor of west wing of building.

Photograph 12: View of additional typical assumed asbestos-containing VFTs under wood and other flooring material of building.

APPENDIX C

Laboratory Certificates of Analysis

FRANZ ENVIRONMENTAL

CHAIN OF CUSTODY – ASBESTOS ANALYSIS REQUEST FORM

Franz Environmental Inc., 4005 Hickory Drive, Mississauga, ON L4W 1L1, PH: 905 614 1978

17:00

Project #:	DFO Iqaluit Bunkhouse	Received by:	MadgeR B	Date:	12-05-31
Inspector:	Brian Ryell	Sample Log-in:		Date:	
Relinquished by:	Brian Ryell	Sample Prep:		Date:	
Report Results to:	Brian Ryell (bryell@cogeco.ca) and Chris Ludwig (cludwig@franzenvironmental.com).	Analyzed by:		Date:	
			temp: 21, 21, 21		
		QA/QC Review:		Date:	

INSTRUCTIONS Proceed to next lettered sample (i.e. A, B, C, etc.), of each numbered sample set (i.e. 01, 02, 03, etc.), **only if previous sample is less than 0.5% asbestos content**

Please email results to bryell@cogeco.ca and cludwig@franzenvironmental.com

PLEASE SEND LAB RESULTS AS A SEPARATE (STAND ALONE) REPORT.

Franz Sample No.	Lab Sample Number	Date Sampled	Sample Location	Sample Description	Analysis Required			Turnaround Time				
					PCM	PLM	TEM	5 Day	3 Day	2 Day	1 Day	Same Day
RF·01a		MAY 30	EXT. ROOF	tile		X		X				
RF·01b		"	"	"		X		X				
RF·01c		"	"	"		X		X				
DJC·01a		MAY 29	1002	DRYWALL COM.		X		X				
DJC·01b		"	1008			X		X				
DJC·01c		"	1008			X		X				
DJC·01d		"	1021			X		X				
DJC·01e		MAY 30	1027			X		X				
DJC·01f		"	1038			X		X				
DJC·01g		"	1041			X		X				
PR01a		MAY 29	1025	INSUL PAPER		X		X				

31-May-12 17:00
MARIJANE CRUZ
B280076
MBI OTT-002

PLEASE ATTACH A COPY OF THIS REPORT TO EVERY LABORATORY ANALYSIS REPORT AND EVERY INVOICE.

FRANZ ENVIRONMENTAL

CHAIN OF CUSTODY – ASBESTOS ANALYSIS REQUEST FORM

Franz Environmental Inc., 4005 Hickory Drive, Mississauga, ON L4W 1L1, PH: 905 614 1978

Project #:	DFO Iqaluit Bunkhouse	Received by:	[illegible]	Date:	12-05-31 17:00
Inspector:	Brian Ryell	Sample Log-in:		Date:	
Relinquished by:	Brian Ryell	Sample Prep:		Date:	
Report Results to:	Brian Ryell (bryell@cogeco.ca) and Chris Ludwig (cludwig@franzenvironmental.com).	Analyzed by:	temp. 21, 21, 21	Date:	
		QA/QC Review:		Date:	

INSTRUCTIONS Proceed to next lettered sample (i.e. A, B, C, etc.), of each numbered sample set (i.e. 01, 02, 03, etc.), **only if previous sample is less than 0.5% asbestos content**

Please email results to bryell@cogeco.ca and cludwig@franzenvironmental.com

PLEASE SEND LAB RESULTS AS A SEPARATE (STAND ALONE) REPORT.

Franz Sample No.	Lab Sample Number	Date Sampled	Sample Location	Sample Description	Analysis Required			Turnaround Time				
					PCM	PLM	TEM	5 Day	3 Day	2 Day	1 Day	Same Day
PR01b		MAY 29	1025	INSUL PAPER		X		X				
PR01c		"	1025	"		X		X				
CT(1)01a		MAY 29	1022	CEIL. TILE		X		X				
CT(1)01b		"	1023	"		X		X				
CT(1)·01c		"	1024	"		X		X				
CT(2)·01a		MAY 29	1030	CEIL. TILE		X		X				
CT(2)·01b		MAY 30	1031	"		X		X				
CT(2)·01c		"	1041	"		X		X				
CK·01a			1036	window caulk		X		X				
CK·01b			1043	"		X		X				
CK01c			1044	"		X		X				

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FRANZ ENVIRONMENTAL

CHAIN OF CUSTODY – ASBESTOS ANALYSIS REQUEST FORM

Franz Environmental Inc., 4005 Hickory Drive, Mississauga, ON L4W 1L1, PH: 905 614 1978

17:00

Project #:	DFO Iqaluit Bunkhouse	Received by:	Madison B	Date:	12.05.31
Inspector:	Brian Ryell	Sample Log-in:		Date:	
Relinquished by:	Brian Ryell	Sample Prep:		Date:	
Report Results to:	Brian Ryell (bryell@cogeco.ca) and Chris Ludwig (cludwig@franzenvironmental.com).	Analyzed by:		Date:	
			temp: 21,21,21		
		QA/QC Review:		Date:	

INSTRUCTIONS Proceed to next lettered sample (i.e. A, B, C, etc.), of each numbered sample set (i.e. 01, 02, 03, etc.), **only if previous sample is less than 0.5% asbestos content**

Please email results to bryell@cogeco.ca and cludwig@franzenvironmental.com

PLEASE SEND LAB RESULTS AS A SEPARATE (STAND ALONE) REPORT.

Franz Sample No.	Lab Sample Number	Date Sampled	Sample Location	Sample Description	Analysis Required			Turnaround Time				
					PCM	PLM	TEM	5 Day	3 Day	2 Day	1 Day	Same Day
VSF(7)		MAY 30	1035	vinyl sheet flooring		X		X				
VSF(7)		"	"	"		X		X				
VSF(7)		"	"	"		X		X				
VSF(8)		"	1048	"		X		X				
VSF(8)		"	"	"		X		X				
VSF(8)		"	"	"		X		X				
VSF(9)		"	1039	"		X		X				
VSF(9)		"	1039	"		X		X				
VSF(9)		"	1050	"		X		X				
TR·01a		MAY 29	1003	TRANSITE		X		X				
TR·01b		"	1003	"		X		X				
TR·01c		"	1003	"		X		X				

PLEASE ATTACH A COPY OF THIS REPORT TO EVERY LABORATORY ANALYSIS REPORT AND EVERY INVOICE.

EMSL Canada Inc.
10 Falconer Drive, Unit #3 Mississauga, ON L5N 3L8
Phone/Fax: 289-997-4602 / (289) 997-4607
http://www.emsl.com / torontolab@emsl.com

EMSL Canada Order 551202349
Customer ID: 55PAS80C
Customer PO: 280076
Project ID:

Attn: Marijane Cruz
Maxxam Analytics, Inc.
32 Colonnade Road
Unit 1000
Nepean, ON K2E 7J6

Proj: JOB# B280076

Phone: (613) 274-3549
Fax: (613) 274-0574
Collected:
Received: 6/02/2012
Analyzed: 6/06/2012

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: NQ7640-01R\RF.01A ***Lab Sample ID:*** **551202349-0001**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Black/Silver	0%	100%	None Detected	

Client Sample ID: NQ7641-01R\RF.01B ***Lab Sample ID:*** **551202349-0002**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Black/Silver	0%	100%	None Detected	

Client Sample ID: NQ7642-01R\RF.01C ***Lab Sample ID:*** **551202349-0003**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	rown/Various/Blac	0%	97%	**3% Chrysotile**	

Client Sample ID: NQ7643-01R\DJC.01A ***Lab Sample ID:*** **551202349-0004**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

Client Sample ID: NQ7644-01R\DJC.01B ***Lab Sample ID:*** **551202349-0005**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

Client Sample ID: NQ7645-01R\DJC.01C ***Lab Sample ID:*** **551202349-0006**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

Client Sample ID: NQ7646-01R\DJC.01D ***Lab Sample ID:*** **551202349-0007**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

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Customer ID: 55PAS80C
Customer PO: 280076
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: NQ7647-01R\DJC.01E ***Lab Sample ID:*** **551202349-0008**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

Client Sample ID: NQ7648-01R\DJC.01F ***Lab Sample ID:*** **551202349-0009**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

Client Sample ID: NQ7649-01R\DJC.01G ***Lab Sample ID:*** **551202349-0010**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

Client Sample ID: NQ7650-01R\PR.01A ***Lab Sample ID:*** **551202349-0011**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Black	0%	100%	None Detected	

Client Sample ID: NQ7651-01R\PR.01B ***Lab Sample ID:*** **551202349-0012**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Black	0%	100%	None Detected	

Client Sample ID: NQ7652-01R\PR.01C ***Lab Sample ID:*** **551202349-0013**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Black	50%	50%	None Detected	

Client Sample ID: NQ7653-01R\CT(1).01A ***Lab Sample ID:*** **551202349-0014**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Tan/White	80%	20%	None Detected	

Client Sample ID: NQ7654-01R\CT(1).01B ***Lab Sample ID:*** **551202349-0015**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Tan/White	80%	20%	None Detected	

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Customer ID: 55PAS80C
Customer PO: 280076
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: NQ7655-01R\CT(1).01C ***Lab Sample ID:*** **551202349-0016**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	75%	25%	None Detected	

Client Sample ID: NQ7656-01R\CT(2).01A ***Lab Sample ID:*** **551202349-0017**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Tan/White	80%	20%	None Detected	

Client Sample ID: NQ7657-01R\CT(2).01B ***Lab Sample ID:*** **551202349-0018**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Tan/White	80%	20%	None Detected	

Client Sample ID: NQ7658-01R\CT(2).01C ***Lab Sample ID:*** **551202349-0019**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	30%	70%	None Detected	

Client Sample ID: NQ7659-01R\CK.01A ***Lab Sample ID:*** **551202349-0020**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/White	0%	100%	None Detected	

Client Sample ID: NQ7660-01R\CK.01B ***Lab Sample ID:*** **551202349-0021**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/White	0%	100%	None Detected	

Client Sample ID: NQ7661-01R\CK.01C ***Lab Sample ID:*** **551202349-0022**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/White	0%	100%	None Detected	

Client Sample ID: NQ7662-01R\CK.01D ***Lab Sample ID:*** **551202349-0023**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/White	0%	100%	None Detected	

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Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: NQ7663-01R\CK.01E ***Lab Sample ID:*** **551202349-0024**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	White	0%	100%	None Detected	

Client Sample ID: NQ7664-01R\CK.01F ***Lab Sample ID:*** **551202349-0025**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Brown	0%	96%	**4% Chrysotile**	

Client Sample ID: NQ7665-01R\CK.01G ***Lab Sample ID:*** **551202349-0026**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012				Stop Positive (Not Analyzed)	

Client Sample ID: NQ7666-01R\VSF(1).01A ***Lab Sample ID:*** **551202349-0027**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Tan/Blue	0%	100%	None Detected	

Client Sample ID: NQ7667-01R\VSF(1).01B ***Lab Sample ID:*** **551202349-0028**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Tan/Blue	0%	100%	None Detected	

Client Sample ID: NQ7668-01R\VSF(1).01C ***Lab Sample ID:*** **551202349-0029**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	30%	70%	None Detected	

Client Sample ID: NQ7669-01R\VSF(2).01A ***Lab Sample ID:*** **551202349-0030**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	0%	100%	None Detected	

Client Sample ID: NQ7670-01R\VSF(2).01B ***Lab Sample ID:*** **551202349-0031**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	0%	100%	None Detected	

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Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: NQ7671-01R\VSF(2).01C ***Lab Sample ID:*** **551202349-0032**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Brown/Gray	50%	50%	None Detected	

Client Sample ID: NQ7672-01R\VSF(3).01A ***Lab Sample ID:*** **551202349-0033**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Various	0%	100%	None Detected	

Client Sample ID: NQ7673-01R\VSF(3).01B ***Lab Sample ID:*** **551202349-0034**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Various	0%	100%	None Detected	

Client Sample ID: NQ7674-01R\VSF(3).01C ***Lab Sample ID:*** **551202349-0035**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	30%	70%	None Detected	

Client Sample ID: NQ7675-01R\VSF(4).01A ***Lab Sample ID:*** **551202349-0036**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Tan/Various	0%	80%	**20% Chrysotile**	

Client Sample ID: NQ7676-01R\VSF(4).01B ***Lab Sample ID:*** **551202349-0037**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012				Stop Positive (Not Analyzed)	

Client Sample ID: NQ7677-01R\VSF(4).01C ***Lab Sample ID:*** **551202349-0038**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012				Stop Positive (Not Analyzed)	

Client Sample ID: NQ7678-01R\VSF(5).01A ***Lab Sample ID:*** **551202349-0039**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Various	35%	65%	None Detected	

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Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: NQ7679-01R\VSF(5).01B ***Lab Sample ID:*** **551202349-0040**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Various	35%	65%	None Detected	

Client Sample ID: NQ7680-01R\VSF(5).01C ***Lab Sample ID:*** **551202349-0041**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	40%	60%	None Detected	

Client Sample ID: NQ7681-01R\VSF(6).01A ***Lab Sample ID:*** **551202349-0042**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Beige	35%	65%	None Detected	

Client Sample ID: NQ7682-01R\VSF(6).01B ***Lab Sample ID:*** **551202349-0043**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Beige	35%	65%	None Detected	

Client Sample ID: NQ7683-01R\VSF(6).01C ***Lab Sample ID:*** **551202349-0044**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	40%	60%	None Detected	

Client Sample ID: NQ7684-01R\VSF(7).01A ***Lab Sample ID:*** **551202349-0045**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Brown/White/Beige	35%	65%	None Detected	

Client Sample ID: NQ7685-01R\VSF(7).01B ***Lab Sample ID:*** **551202349-0046**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Brown/White/Beige	35%	65%	None Detected	

Client Sample ID: NQ7686-01R\VSF(7).01C ***Lab Sample ID:*** **551202349-0047**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	20%	80%	None Detected	

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Client Sample ID: NQ7687-01R\VSF(8).01A ***Lab Sample ID:*** **551202349-0048**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Beige	35%	65%	None Detected	

Client Sample ID: NQ7688-01R\VSF(8).01B ***Lab Sample ID:*** **551202349-0049**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Beige	35%	65%	None Detected	

Client Sample ID: NQ7689-01R\VSF(8).01C ***Lab Sample ID:*** **551202349-0050**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray	0%	100%	None Detected	

Client Sample ID: NQ7690-01R\VSF(9).01A ***Lab Sample ID:*** **551202349-0051**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Blue	0%	100%	None Detected	

Client Sample ID: NQ7691-01R\VSF(9).01B ***Lab Sample ID:*** **551202349-0052**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Blue	0%	100%	None Detected	

Client Sample ID: NQ7692-01R\VSF(9).01C ***Lab Sample ID:*** **551202349-0053**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Gray/Various	20%	80%	None Detected	

Client Sample ID: NQ7693-01R\TR.01A ***Lab Sample ID:*** **551202349-0054**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012	Beige	0%	65%	**35% Amosite**	

Client Sample ID: NQ7694-01R\TR.01B ***Lab Sample ID:*** **551202349-0055**
Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	6/06/2012				Stop Positive (Not Analyzed)	

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Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: NQ7695-01R\TR.01C ***Lab Sample ID:*** **551202349-0056**

Sample Description:

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	6/06/2012			Stop Positive (Not Analyzed)		

Analyst(s)

Matthew Davis	PLM	(34)
Merriam Haffar	PLM	(17)

Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

Initial report from: 06/06/201215:48:46

Your Project #: DFO IQALUIT BUNKHOUSE

Attention: Chris Ludwig
Franz Environmental Inc
4005 Hickory Dr
Mississauga, ON
L4W 1L1

Report Date: 2012/06/07

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B279973
Received: 2012/05/31, 17:00

Sample Matrix: Paint
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Metals in Paint (1)	10	2012/06/06	2012/06/06	CAM SOP-00408	SW-846 6010C
Metals in Paint (1)	5	2012/06/06	2012/06/07	CAM SOP-00408	SW-846 6010C

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited by SCC (Lab ID 97) for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

MARIJANE CRUZ, Project Manager
Email: MCruz@maxxam.ca
Phone# (905) 817-5756

==========

Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

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Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		NQ7236		NQ7237	NQ7238		NQ7239	NQ7240		NQ7241		NQ7242		
Sampling Date		2012/05/29		2012/05/29	2012/05/29		2012/05/29	2012/05/29		2012/05/29		2012/05/29		
	Units	**PT.01**	**RDL**	**PT.02**	**PT.03**	**RDL**	**PT.04**	**PT.05**	**RDL**	**PT.06**	**RDL**	**PT.07**	**RDL**	**QC Batch**
Metals														
Lead (Pb)	mg/kg	<50	50	110000	110000	500	<50	<50	50	22000	500	7800	50	2872419

Maxxam ID		NQ7243	NQ7244		NQ7245	NQ7245	NQ7246	NQ7247	NQ7248	NQ7249	NQ7250		
Sampling Date		2012/05/29	2012/05/29		2012/05/29	2012/05/29	2012/05/30	2012/05/30	2012/05/30	2012/05/30	2012/05/30		
	Units	**PT.08**	**PT.09**	**RDL**	**PT.10**	**PT.10 Lab-Dup**	**PT.11**	**PT.12**	**PT.13**	**PT.14**	**PT.15**	**RDL**	**QC Batch**
Metals													
Lead (Pb)	mg/kg	64000	38000	500	110	110	<50	130	800	<50	110	50	2872419

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

Test Summary

Maxxam ID NQ7236 **Collected** 2012/05/29
Sample ID PT.01 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7237 **Collected** 2012/05/29
Sample ID PT.02 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/07	ARCHANA PATEL

Maxxam ID NQ7238 **Collected** 2012/05/29
Sample ID PT.03 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/07	ARCHANA PATEL

Maxxam ID NQ7239 **Collected** 2012/05/29
Sample ID PT.04 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxamanalytics.com

Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

Test Summary

Maxxam ID NQ7240 **Collected** 2012/05/29
Sample ID PT.05 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7241 **Collected** 2012/05/29
Sample ID PT.06 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/07	ARCHANA PATEL

Maxxam ID NQ7242 **Collected** 2012/05/29
Sample ID PT.07 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7243 **Collected** 2012/05/29
Sample ID PT.08 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/07	ARCHANA PATEL

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxamanalytics.com

Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

Test Summary

Maxxam ID NQ7244 **Collected** 2012/05/29
Sample ID PT.09 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/07	ARCHANA PATEL

Maxxam ID NQ7245 **Collected** 2012/05/29
Sample ID PT.10 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7245 Dup **Collected** 2012/05/29
Sample ID PT.10 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7246 **Collected** 2012/05/30
Sample ID PT.11 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxamanalytics.com

Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

Test Summary

Maxxam ID NQ7247 **Collected** 2012/05/30
Sample ID PT.12 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7248 **Collected** 2012/05/30
Sample ID PT.13 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7249 **Collected** 2012/05/30
Sample ID PT.14 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam ID NQ7250 **Collected** 2012/05/30
Sample ID PT.15 **Shipped**
Matrix Paint **Received** 2012/05/31

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	2872419	2012/06/06	2012/06/06	ARCHANA PATEL

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxamanalytics.com

Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

Package 1	21.0°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxamanalytics.com

Maxxam Job #: B279973
Report Date: 2012/06/07

Franz Environmental Inc
Client Project #: DFO IQALUIT BUNKHOUSE

Sampler Initials: BR

QUALITY ASSURANCE REPORT

			Matrix Spike		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2872419	Lead (Pb)	2012/06/06	90	75 - 125	<50	mg/kg	NC	35	101	75 - 125

N/A = Not Applicable
RPD = Relative Percent Difference
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

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Validation Signature Page

Maxxam Job #: B279973

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

CRISTINA CARRIERE, Scientific Services

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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FRANZ ENVIRONM ENTAL

PAINT SAMPLE CHAIN OF CUSTODY/ANALYSIS REQUEST FORM

4005 Hickory Drive, Mississauga, Ontario, L4W 1L1, PH: 905 614 1978

Project #:	DFO Iqaluit Bunkhouse	Received by:	Mad	Date:	12.05.31 17:00
Inspector:	Brian Ryell	Sample Log-in:		Date:	
Relinquished by:	Brian Ryell	Sample Prep:		Date:	
Report Results to:	Brian Ryell (bryell@cogeco.ca) and Chris Ludwig (cludwig@franzenvironmental.com)	Analyzed by:		Date:	
			temp 21, 21, 21		
		QA/QC Review:		Date:	

INSTRUCTIONS Please email all results to bryell@cogeco.ca and Chris Ludwig (cludwig@franzenvironmental.com)
PLEASE SEND LAB RESULTS AS A SEPARATE (STAND ALONE) REPORT.

Franz Sample No.	Lab Sample Number	Date Sampled	Sample Location	Sample Description	Analysis Required			Turnaround Time				
					Lead			5 Day	3 Day	2 Day	1 Day	Same Day
PT-01		MAY 29/2012	1002		X			X				
PT-02			1003		X			X				
PT-03			1007		X			X				
PT-04			1008		X			X				
PT-05			1012		X			X				
PT-06			1013		X			X				
PT-07			1019		X			X				
PT-08			1025		X			X				
PT-09			1026		X			X				
PT-10		"	1026		X			X				
PT-11		MAY 30	1030		X			X				
PT-12		MAY 30	1036		X			X				

31-May-12 17:00
MARIJANE CRUZ
B279973
MBI OTT-002

PLEASE ATTACH A COPY OF THIS REPORT TO EVERY LABORATORY ANALYSIS REPORT AND EVERY INVOICE.

REC'D IN OTTAWA

Page 1 of 2

FRANZ ENVIRONMENTAL

PAINT SAMPLE CHAIN OF CUSTODY/ANALYSIS REQUEST FORM

4005 Hickory Drive, Mississauga, Ontario, L4W 1L1, PH: 905 614 1978

Project #:	DFO Iqaluit Bunkhouse	Received by:	MadgeB	Date:	120531
Inspector:	Brian Ryell	Sample Log-in:		Date:	
Relinquished by:	Brian Ryell	Sample Prep:		Date:	
Report Results to:	Brian Ryell (bryell@xcoeco.ca) and Chris Ludwig (cludwig@franzenvironmental.com)	Analyzed by:		Date:	temp: 21, 21, 21
		QA/QC Review:		Date:	

INSTRUCTIONS Please email all results to bryell@xcoeco.ca and Chris Ludwig (cludwig@franzenvironmental.com)
PLEASE SEND LAB RESULTS AS A SEPARATE (STAND ALONE) REPORT.

			LEAD	Turnaround
Pt. 013	MAY 30	1045	X	5 DAY
Pt. 014	"	1046	X	1
Pt 015	"	EXTERIOR	X	

PLEASE ATTACH A COPY OF THIS REPORT TO EVERY LABORATORY ANALYSIS REPORT AND EVERY INVOICE. **Page 2 of 2**

DECOMMISSIONING CONSULTING SERVICES
121 Granton Drive, Unit 11
Richmond Hill, Ontario L4B 3N4
Canada

Tel 905 882 5984
Fax 905 882 8962
Email engineers@dcsltd.ca
www.dcsltd.ca

350600-519

21 January 2015

Public Works and Government Services Canada
ATB Place, North Tower
5th Floor - 10025 Jasper Avenue
Edmonton, AB T5J 1S6

Attention: Ms. Liana Smith
Senior Environmental Specialist

RE: Investigation and Supplementary Testing for Designated Substances
DFO Bunkhouse Building 1074, Iqaluit, NU
PWGSC Project Number: R.065695.006

Dear Ms. Smith:

Decommissioning Consulting Services (DCS – an ARCADIS Company) was retained by PWGSC to complete further investigation and supplementary testing of designated substances in the former DFO bunkhouse Building 1074 located in Iqaluit, Nunavut. The site review and investigative work was completed to provide additional information regarding the presence of designated substances and hazardous materials prior to the abatement of said materials and subsequent demolition of the structure.

The former DFO Bunkhouse (Building 1074) is located in Iqaluit, Nunavut, and is composed of two (2) single-story structures connected by a central corridor. The structure was originally constructed circa 1962 for the Canadian Coast Guard (CCG) as a seasonal bunkhouse building. There have been several renovations completed since that time to suit the needs of the users. The entire building is vacant and was originally scheduled for complete demolition. The building is constructed of wood framing with wood fibre exterior siding.

1.0 SCOPE OF WORK

The scope of work for our investigation included:

- obtaining additional representative and confirmatory bulk samples of materials suspected of containing asbestos and samples of paint suspected of containing lead;
- laboratory analyses of bulk samples for asbestos content and analysis of paint chip samples for lead content; and
- preparation of a letter report with supplementary testing, inspection information, and results.

2.0 INTRODUCTION

The Government of Nunavut *Occupational Health & Safety Regulations* requires that an employer provide any information, instruction, training and supervision that are necessary to protect the health and safety of workers. "Hazardous materials" which require special handling during construction or demolition activities include asbestos, lead, silica, mercury, polychlorinated biphenyls (PCBs), ozone-depleting substances (ODS), man-made mineral fibres (MMMF), mould and urea formaldehyde foam insulation (UFFI).

Other regulatory requirements (and guidelines) which apply to control of exposure to hazardous materials are referenced in the sections below.

2.1 ASBESTOS

Asbestos has been widely used in buildings, both in friable applications (materials which can be crumbled, pulverized or powdered by hand pressure, when dry) such as pipe and tank insulation, sprayed-on fireproofing and acoustic texture material and in non-friable manufactured products such as floor tile, gaskets, cement board and so on. The use of asbestos in friable applications was curtailed around the mid-1970s and, as such, most buildings constructed prior to about 1975 contain some form of friable construction material with an asbestos content. The use of asbestos in certain non-friable materials continued beyond the mid-1970s.

Control of exposure to asbestos is governed in Nunavut by the *Guideline for the Management of Waste Asbestos.* Disposal of asbestos waste (friable and non-friable materials) is governed by the *Guideline for the General Management of Hazardous Waste in Nunavut.*

Public Works and Government Services Canada (PWGSC) Departmental Policy 057 – *Asbestos Management* provides requirements for asbestos management in federal buildings. This document states:

- *"Public Works and Government Services Canada shall comply with all federal, provincial, territorial and municipal regulations, statutes and requirements with regard to asbestos containing materials (ACM) in government owned or leased buildings and facilities."*

PWGSC DP 057 – *Asbestos Management* - defines asbestos-containing material and classifies asbestos work operations into three types (Type 1,2 and 3) and specifies procedures to be followed in conducting Type 1 and 2 asbestos work. Type 3 procedures are not included in the standard procedures provided in DP 057.

DP 057 states that procedures for Type 3 work are developed for the particular work to be undertaken, and the specific circumstances and worksite. These procedures are to be developed in compliance with the National Master Specification, Section 02 82 00, Asbestos Abatement (maximum precautions).

The Nunavut Occupational Health and Safety Regulations (Draft – September 1, 2010) contains requirements for asbestos management and abatement in Part 24. Sections of this draft regulation state the following with respect to asbestos abatement and demolition:

"Asbestos process" means any activity that may release asbestos dust, and includes

(a) the sawing, cutting or sanding of asbestos-containing materials,
(b) the repair, maintenance, replacement or removal of asbestos surfaces,
(c) the cleaning or disposal of asbestos materials,
(d) the mixing or application of asbestos shorts, cements, grouts, putties or similar compounds,
(e) the storing or conveyance of materials containing asbestos, and

(f) the demolition of structures containing asbestos.

Where an asbestos process is undertaken, an employer shall ensure that

(a) the area is effectively isolated or otherwise enclosed to prevent the escape of asbestos dust to any other part of the work site;
(b) a warning notice is conspicuously displayed indicating that asbestos work is in progress;
(c) all asbestos-containing materials removed are placed in appropriate receptacles that are impervious to asbestos and that are clearly labelled "Asbestos"; and
(d) the receptacles referred to in paragraph (c) are handled and transported in a manner that will protect them from physical damage.

DP 057 and the Nunavut Draft Regulation classify removal of more than a minor amount of friable asbestos-containing material as "Type 3" and "High Risk" work, respectively.

DCS reviewed the report entitled "*Final - Designated Substance Survey, Bunkhouse Building – Department of Fisheries and Oceans, Iqaluit, Nunavut*" prepared by Franz Environmental Inc., dated 2012. Information and bulk sample analysis results obtained from this report were utilized by DCS during the course of our investigation and supplementary testing to identify potential issues of concern and in the preparation of this report.

During the course of our investigation and supplementary testing, additional representative and confirmatory bulk samples of materials were collected by DCS staff. The samples were forwarded to EMSL Canada Inc., a commercial laboratory in Mississauga, Ontario for asbestos analysis. Results of bulk sample analysis for asbestos content are provided in Table 1.1. The laboratory report is provided in Attachment A.

TABLE 1.1

SUMMARY OF RESULTS OF ANALYSES OF BULK SAMPLES FOR ASBESTOS CONTENT DCS – December 2014

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	ASBESTOS CONTENT
FT-1	1.022	Vinyl Floor Tile 12” x 12” - White	None detected (PLM) None detected (TEM)
FT-1	1.022	Mastic under Vinyl Floor Tile 12” x 12” - White	None detected (PLM) None detected (TEM)
PA-1	1.022	Paper backing under floor tile (FT-1)	None detected
FT-2A	West Wing	Vinyl Floor Tile under plywood - Orange	None detected (PLM) None detected (TEM)
FT-2A	West Wing	Mastic under Vinyl Floor Tile under plywood - Orange	None detected (PLM) None detected (TEM)
FT-2B	West Wing	Vinyl Floor Tile under plywood - Orange	None detected
FT-2B	West Wing	Mastic under Vinyl Floor Tile under plywood - Orange	None detected
FT-2C	West Wing	Vinyl Floor Tile under plywood - Orange	None detected
FT-2C	West Wing	Mastic Vinyl Floor Tile under plywood - Orange	None detected
FT-3A	West Wing	Vinyl Floor Tile 12” x 12” – Beige	None detected (PLM) None detected (TEM)
FT-3A	West Wing	Mastic Vinyl Floor Tile 12” x 12” – Beige	None detected (PLM) None detected (TEM)
FT-3B	West Wing	Vinyl Floor Tile 12” x 12” – Beige	None detected
FT-3B	West Wing	Mastic under Vinyl Floor Tile 12” x 12” – Beige	None detected
FT-3C	West Wing	Vinyl Floor Tile 12” x 12” – Beige	None detected
FT-3C	West Wing	Mastic under Vinyl Floor Tile 12” x 12” – Beige	None detected
VFS-1	1.020	Vinyl Floor Sheeting – Diamond Pattern (Orange)	**21.3% Chrysotile**
VFS-1	1.020	Mastic under Vinyl Floor Sheeting – Diamond Pattern (Orange)	**1.9% Chrysotile**
VFS-2	1.005	Vinyl Floor Sheeting – Grey/Blue Mottled	None detected (PLM) None detected (TEM)
CT-1	East Wing	Suspended Ceiling Tile	None detected
CT-2	West Wing	Acoustic Ceiling Tile	None detected

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	ASBESTOS CONTENT
EXT-1	Exterior	Fibreboard under exterior sheathing	None detected

NOTES:

Bulk samples were analyzed by Polarized Light Microscopy (PLM) analysis, except where "TEM" is noted, in which case Transmission Electron Microscopy analysis was also performed.

Confirmation of the locations of asbestos-containing material was made based on the results of the bulk sample analysis, visual observations and physical characteristics of the applications as well as our knowledge of the uses of asbestos in building materials.

Based on review of existing information, visual observations and results of laboratory analyses of samples collected by DCS and others, the following asbestos-containing materials were found to be present at the site:

- vinyl sheet floor flooring with asbestos-containing paper backing located under existing non-asbestos sheet flooring and plywood throughout the east building and connecting corridor;
- asphaltic roof membrane applied to the entire roof structure;
- sections of cement sheet panels present in the ceiling areas of two rooms in the west portion of the building;
- asbestos-containing gasket on forced-air furnace electrical junction box;
- window caulking applied to interior of all windows in the west portion of the building; and
- window caulking applied to exterior of all windows in the west and east portion of the building.

Asbestos-containing materials are to be handled, removed and disposed in accordance with Section 02 82 00 – Asbestos Abatement – Maximum Precautions in the project specifications, and the measures and procedures outlined in the Nunavut *Guideline for the Management of Waste Asbestos* and the *Guideline for the General Management of Hazardous Waste in Nunavut.*

2.2 LEAD

Lead is a heavy metal that can be found in construction materials such as paints, coatings, mortar, concrete, solder, packings (gaskets, etc.), sheet metal, caulking, glazed ceramic products and cable splices. Lead has been used historically in exterior and interior paints.

The *Environmental Guideline for Waste Lead and Lead Paint* – Department of the Environment, Government of Nunavut revised April 2014 states that "Products that contain lead in excess of 100 mg/kg (0.01% by weight) are considered hazardous waste and shall be managed in accordance with this guideline". Paint having a leachate value for lead of 5.0 milligrams per liter (mg/l) or more is a hazardous waste and must be managed in accordance with this Guideline and the Environmental Guideline for the General Management of Hazardous Waste. Alternatively, a TCLP can be performed on the material. If the resulting leachate value is less than or equal to 5 mg/l, the waste is considered non- hazardous.

Twenty-two samples of paint were collected from the site by DCS during the course of the investigation and supplementary testing. The samples were submitted to Maxxam Analytics in Mississauga, Ontario for analysis of lead content. The results of analyses are presented in Table 1.2. The laboratory report is provided in Attachment A.

TABLE 1.2
SUMMARY OF RESULTS OF ANALYSES OF BULK SAMPLES FOR LEAD CONTENT
DCS – December 2014

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	LEAD CONTENT MG/KG (PPM)
PT-1	Exterior Wood Paneling	Wall Paint – White	95
PT-2	Exterior Wood Paneling	Wall Paint – White	**270**
PT-3	Exterior Wood Paneling	Wall Paint – White	**1140**
PT-4	Exterior Wood Paneling	Wall Paint – White	120
PT-5	Exterior Wood Paneling	Wall Paint – White	8.6
PT-6	Exterior Wood Paneling	Wall Paint – White	6.9

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	LEAD CONTENT MG/KG (PPM)
PT-7	Exterior Wood Paneling	Wall Paint – White	11
PT-8	Exterior Wood Paneling	Wall Paint – White	8.1
PT-9	Exterior Wood Paneling	Wall Paint – White	**180**
PT-10	Exterior Wood Paneling	Wall Paint – White	**230**
PT-11	Exterior Metal Window Frame	Trim Paint – White	Not Analyzed
PT-12	Exterior Metal Window Frame	Trim Paint – White	Not Analyzed
PT-13	Exterior Wood Window Frame	Trim Paint – White	**430**
PT-14	Exterior Wood Window Frame	Trim Paint – White	**400**
PT-15	Interior Wood Paneling	Wall Paint – White	4.6
PT-16	Interior Wood Paneling	Wall Paint – White	15
PT-17	Interior Wood Paneling	Wall Paint – White	5.4
PT-18	Interior Wood Sheathing	Ceiling Paint - Green	**80000**
PT-19	Interior Wood Sheathing	Wall Paint - Green	**91000**
PT-20	Interior Wood Sheathing	Wall Paint - Green	**71000**
TCLP-1	Exterior Paint	Wall Paint – White	55
TCLP-2	Exterior Paint	Wall Paint – White	**120**

Lead was detected at levels in excess of 100 mg/kg in the exterior white wall paint applied to the wall paneling, window frames, fascia and soffits, and in the interior green paint applied to underside of the roof sheeting and applied to the inside face of the exterior wood sheeting and studs throughout the building (including under neutral painted surfaces). The variation in the laboratory results is likely the result of the thickness of the paint applications due to weathering and delamination.

Due to the composition of the paint, the laboratory was unable to perform a TCLP extraction. According to the laboratory, the submitted paint samples varied in weight from 0.011g to 0.509g. Approximately 0.03g of paint was utilized in the bulk paint samples analysis. The total combined weight of all samples received was slightly above 7g. The minimum volume required for TCLP lead

as per the laboratory method is 110g. The laboratory advised DCS that the paint alone is extremely light and would be very challenging to obtain the volume of sample required to complete the test.

Lead may also be present in the solder on the sweated-on joints between copper pipe and fittings.

All lead-based paint is to be handled, removed and disposed in accordance with Section 02 83 11 – Lead-Based Paint Abatement – Intermediate Precautions in the project specifications, and the measures and procedures outlined in the Nunavut *Environmental Guideline for Waste Lead and Lead Paint* (April 2014).

2.3 MERCURY

Mercury has been used in electrical equipment such as alkaline batteries, fluorescent light bulbs (lamps), high intensity discharge (HID) lights (mercury vapour, high pressure sodium and metal halide), "silent switches" and in instruments such as thermometers, manometers and barometers, pressure gauges, float and level switches and flow meters. Mercury-containing lamps, the bulk of which are 1.22 m (four foot) fluorescent lamps contain between 7 and 40 mg of mercury each. Mercury compounds have also been used by many manufacturers historically as additives in latex paint to protect the paint from mildew and bacteria during production and storage.

The intentional addition of mercury to Canadian-produced consumer paints for interior use was prohibited in 1991. Mercury may have remained in paints after 1991, however, as a result of impurities in the paint ingredients or cross-contamination due to other manufacturing processes. The Nunavut *Occupational Health and Safety Regulations (Draft) September 2010* sets a contamination limit of 0.025mg/m^3(for inorganic forms, including metallic mercury).

Mercury-containing thermostats and silent light switches are mercury tilt switches which are small tubes with electrical contacts at one end of the tube. A mercury tilt switch is usually present when no switch is visible. Mercury switches often have the word "TOP" stamped on the upper end of the switch, which is visible after removing the cover plate. If mercury switches are to be removed, the entire switch should be removed and placed into a suitable container for storage and disposal.

Waste light tubes generated during renovations or building demolition and waste mercury from equipment must either be recycled or disposed of in accordance with the requirements of The

Environmental Guideline for Mercury-Containing Products and Waste Mercury – Department of the Environment, Government of Nunavut November 2010.

Waste mercury from mercury switches or gauges should, however, be properly collected and shipped to a recycling facility or disposed of as a hazardous waste. Removal of mercury-containing equipment (e.g., switches, gauges, controls, etc.) should be carried out in a manner which prevents spillage and exposure to workers.

During the course of our site inspections, fluorescent lights were observed throughout the site. Mercury should be assumed to be present as a gas in all fluorescent light tubes. Six mercury thermostats were observed in the building. Mercury should also be assumed to be present in paint applications (albeit likely in low concentrations). Any silent light switches or tilt switches should be checked for mercury at the time of demolition.

Waste light tubes generated during renovations or building demolition and waste mercury from equipment must either be recycled or disposed of in accordance with Section 02 81 01 – Hazardous Materials in the project specifications, and the measures and procedures outlined in *Environmental Guideline for Mercury-Containing Products and Waste Mercury* – Department of the Environment, Government of Nunavut November 2010.

2.4 SILICA

Silica exists in several forms of which crystalline silica is of most concern with respect to potential worker exposures. Quartz is the most abundant type of crystalline silica. Some commonly used construction materials containing silica include brick, refractory brick, concrete, concrete block, cement, mortar, rock and stone, sand, fill dirt, topsoil and asphalt containing rock or stone.

Materials observed in the designated study areas which should be considered to contain silica included gypsum board, drywall joint compound, ceiling tiles and concrete.

The Nunavut *Occupational Health and Safety Regulations (Draft) September 2012* includes measures and procedures recommended for demolition activities, including dismantling and break up of concrete, masonry, etc. as follows:

- workers exposed to silica should wear a half-mask particulate respirator with N, R-, or P-series filters and 95, 99 or 100% efficiency;

- clean up after each operation should be done to prevent dust containing silica from spreading;

- compressed air should not be used for removing dust from clothing;

- workers exposed to silica should be provided with or have access to washing facilities equipped with clean water, soap, and individual towels;

- silica dust on personal protective clothing and equipment should be removed by damp wiping or HEPA vacuuming;

- contaminated personal protective clothing and equipment should be handled with care to prevent disturbing the silica dust and the generation of airborne silica dust;

- washing facilities and laundering procedures must be suitable for handling silica-contaminated laundry; and

- warning signs should be posted in sufficient numbers to warn of the silica hazard. There should be a sign, at least, at each entrance to the work area. The signs should display the following information in large, clearly visible letters:

    - there is a silica dust hazard;

    - access to the work area is restricted to authorized persons;

    - respirators must be worn in the work area.

2.5 OTHER DESIGNATED SUBSTANCES

No other designated substances (vinyl chloride, acrylonitrile, benzene, isocyanates, arsenic, ethylene oxide and coke oven emissions) were observed to be present in the designated study areas, and none

would be expected to be encountered in any building materials in a form that would represent an exposure concern. Arsenic may be present at low levels in paint applications.

2.6 PCBs

Any equipment containing PCBs such as transformers, switchgear, light ballasts and capacitors, which is removed from service due to age, failure or as a result of decommissioning, is considered to constitute a PCB waste. Although current federal legislation (effective 1 July 1980) has prohibited the manufacture and sale of new equipment containing PCBs since that time, continued operation of equipment supplied prior to this date and containing PCBs is still permitted. Handling, storage and disposition of such equipment is, however, tightly regulated and must be managed in accordance with provincial and federal government requirements as soon as it is taken out of service or becomes unserviceable.

In most institutional, commercial facilities and in smaller industrial facilities, the primary source of equipment potentially containing PCBs is fluorescent and HID light ballasts. Small transformers may also be present. In larger industrial facilities, larger transformers and switch gear containing, or potentially containing, PCBs may also be present.

PCB wastes are prohibited from shipment to disposal facilities in the United States. Out-of-Territory facilities that will accept PCB waste solids and liquids for destruction include the Alberta Special Waste Management facility operated by Earth Tech (Canada) Inc. in Swan Hills, Alberta, and the Bennett Environmental facility in Quebec.

Removal of in-service equipment containing PCBs, such as fluorescent light ballasts, capacitors and transformers, is subject to the requirements of the federal *PCBs Regulations* (discussed below). The federal PCB regulations outline the end of use dates for all equipment containing PCBs and storage/disposal requirements.

Exceptions are provided for fluorescent light ballasts and pole-mounted transformers where an end of use date of 31 December 2025 has been specified. The regulations also limit the storage of PCB material to a maximum of one year from the date the regulations came into effect or one year following removal of the equipment from service, whichever is the later date.

The regulations also allow for the filing of applications for exemption from the applicable end of use dates specified above. There are a number of circumstances under which an application may be filed. In addition to the above, there are several other requirements, including filing of annual reports, notification for changes in inventories for stored PCBs, and so forth.

PCBs may be present in caulking used in windows, door frames and masonry columns in buildings built or renovated between 1950 and 1979.

PCBs were also commonly added to industrial paints from the 1940s to the late 1970s. PCBs were added directly to the paint mixture to act as a fungicide, to increase durability and flexibility, to improve resistance to fires and to increase moisture resistance. The use of PCBs in new products was banned in Canada in the 1970s. PCB amended paints were used in specialty industrial/institutional applications prior to the 1970s including government buildings and equipment such as industrial plants, radar sites, ships as well as non-government rail cars, ships, grain bins, automobiles and appliances.

Sixty four fluorescent light ballasts were observed in the subject building. The ballasts will have to be examined by a licensed electrician prior to disposal to confirm the presence of PCBs. Light ballasts, such as those associated with the type of fluorescent lights (T12s) identified at the site, are typically a magnetic type which may contain PCBs. Inspection of product codes and date codes on the ballasts can be used to determine the likely presence or absence of PCBs.

The electric power comes to the building from a pole located in the south east corner of the subject site. One pole mounted transformer was observed on the pole; however it is not associated with this building. No other PCB-containing equipment or materials were identified during the waste survey.

All PCB-containing equipment is to be handled, removed and disposed in accordance with Section 02 84 00 – Polychlorinated Biphenyl Remediation in the project specifications.

2.7 OZONE-DEPLETING SUBSTANCES

The Federal Halocarbon Regulations, 2003 (FHR 2003) were published in August 2003 under the authority of the Canadian Environmental Protection Act, 1999. The purpose of the FHR 2003 is to reduce and prevent emissions of ozone-depleting substances and of their halocarbon alternatives to the environment from air-conditioning, refrigeration, fire-extinguishing and solvent systems that are:

- located on federal or aboriginal lands; or
- owned by federal departments, boards and agencies, Crown corporations, or federal works and undertakings.

Contractor responsibilities under the FHR 2003 include the following:

- only a certified and licensed technician may install, service, leak test or charge halocarbon containing equipment;
- if a leak test is conducted on a piece of air conditioning or refrigeration equipment, the contractor is to affix a notice containing all of the information as required in Schedule 2, item 2 of the FHR 2003, including: a) name and address of owner of the system, b) name of operator of the system, c) specific location of the system, d) description of the system, e) name of certified person, f) certificate number, g) name of employer of certified person, h) type of halocarbon in the system, i) charging capacity of the system, and j) date of last two leak tests;
- no halocarbons are to be knowingly released from a refrigeration or air conditioning system, or from a fire extinguishing system (unless to fight a fire). If any work is done on an air conditioning, refrigeration, or fire extinguishing system that may result in a release of a halocarbon, the halocarbon shall first be recovered into a container designed for that purpose;

- in the event that a halocarbon-containing system must be charged, a leak test is to first be performed. If a leak is detected for a halocarbon-containing system, the owner of the equipment (and contract authority) must be informed of the leak as soon as possible. In the case of a leak resulting in a release of greater than 100 kg, or of unknown weight from a unit with a capacity equal to or greater than 100 kg, the contractor must report the release within 24 hrs to Environment Canada at (867) 920-8130 via the Northwest Territories Department of Environment and Natural Resources emergency spill line for the Northwest Territories and Nunavut; and

- upon servicing a halocarbon-containing system, the service log book for the unit is to be completed by the contractor. Before dismantling, decommissioning or destroying any halocarbon-containing system; the halocarbon(s) will be recovered and a notice shall be affixed to the system. The notice shall meet the requirements listed in Schedule 2, Item 3 of the FHR 2003.

No equipment potentially containing ODS was identified on site during the course of the investigation and supplementary testing.

2.8 MAN-MADE MINERAL FIBRES

Man-made mineral fibres (MMMF), also known as Synthetic Vitreous Fibres (SVF), include mineral wool (rock wool and slag wool), glass wool (fibre glass) and refractory ceramic fibres (RCF). MMMFs have been produced and widely used in Canada for the past 60 years and are commonly used in the construction industry as insulation and fire protection material.

Man-made mineral fibres were observed throughout the site in the form of glass fibre batts.

Recommendations for the removal, maintenance and demolition of materials which contain MMMF are as follows:

- Where practicable, the insulation should be lightly misted with water before and during removal.

- The work area should be isolated by safety tape and warning signs.

- In most situations, a United States National Institute for Occupational Safety and Health (NIOSH) approved N95 air-purifying respirator, dust-resistant safety goggles, and disposable coveralls will provide adequate protection. However, if the activity generates substantial amounts of dust, a more protective respirator may be necessary. For example, major demolition may require a full-face piece respirator or a supplied-air respirator instead of a half-face piece air-purifying respirator.

- All waste material should be placed in covered, sealed waste disposal containers as it is removed. If the material is wet, it should be placed in waterproof containers.

- Material to be removed should be handled carefully and not thrown about. Rough handling will release dust and fibres into the air.

- Before maintenance or removal, ventilation duct openings and other openings that could permit the spread of fibres should be temporarily sealed.

- Work areas should be kept clean and scrap material removed as often as necessary to keep the area clean.

2.9 MOULD

Moulds are forms of fungi that are found everywhere both indoors and outdoors all year round. Outdoors, moulds live in the soil, on plants and on dead and decaying matter. More than 1000 different kinds of indoor moulds have been found in buildings. Moulds spread and reproduce by making spores, which are all small and light-weight, able to travel through air, capable of resisting dry, adverse environmental conditions, and hence capable of surviving a long time. Moulds need moisture and nutrients to grow and their growth is stimulated by warm, damp and humid conditions.

Suspect mould was observed in the building, and should be assumed to be present on surfaces inside wall cavities (e.g. on gypsum board, etc.), and possibly in other “hidden” areas. During demolition, any mould-impacted materials should be misted or wetted with water to reduce airborne dust. The materials should then be placed into a disposal bin and sealed. Workers involved in the demolition of mould-impacted materials should wear appropriate protective clothing and equipment and follow decontamination practices as outlined in the Canadian Construction Association Standard Construction Document CCA-82 2004 – Mould guidelines for the Canadian Construction Industry.

2.10 UFFI

Urea formaldehyde foam insulation (UFFI) is a polymer manufactured at point-of-use by blending urea formaldehyde resin with a phosphoric acid catalyst and compressed air at a nozzle tip. This nozzle was used to inject the freshly mixed foam product into enclosed wall cavities. UFFI was introduced in Canada in the l970s. In response to concerns about the health effects of formaldehyde gas, the installation of UFFI was banned in Canada in 1980.

No UFFI was observed at the site.

2.11 RADIOACTIVE MATERIALS

Aside from nuclear and biomedical industries, radioactive materials may be present in very small amounts within glow-in-the-dark compasses and watch faces, gas lamp mantles and in smoke detectors. Smoke detectors typically contain 1 micro curie of Americium-241. Standard smoke detectors do not require a radioactive license and are accepted as segregated items at the Iqaluit landfill.

3.0 USE AND LIMITATIONS OF THIS INVESTIGATION AND SUPPLEMENTARY TESTNG REPORT

This report, prepared for Public Work Government Services Canada, does not provide certification or warranty, expressed or implied, that the investigation conducted by DCS identified all designated substances (as defined in the *Ontario Occupational Health and Safety Act*) and hazardous materials at the subject facility. The work undertaken by DCS was directed to provide supplementary information on the presence of designated substances and hazardous materials in building construction materials based on existing information, visual inspection of readily accessible areas, and on the results of laboratory analysis of a limited number of bulk samples of material for asbestos content and laboratory analysis of a limited number of paint samples for lead content. The survey did not include for identification of asbestos in process materials, equipment (including electrical equipment and wiring), nor material outside of the building (e.g. asphaltic pavement).

The material in this report reflects DCS' best judgment in light of the information available at the time of the investigation, which was performed on 22 and 23 December 2014.

This report was prepared by DCS for Public Work Government Services Canada. Any use which any other party makes of the report, or reliance on, or decisions to be based on it, is the responsibility of such parties.

4.0 CLOSURE

We trust that the above meets with your requirements. If you have any questions or require additional information or assistance, please feel free to contact our office.

Yours very truly,

DECOMMISSIONING CONSULTING SERVICES LIMITED

Kelly Smith, B.Sc.
Senior Project Manager

Charles Gravelle, P.Eng. (ON, NT/NU)
Senior Project Manager

Att.

ATTACHMENT A

LABORATORY REPORTS

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http://www.EMSL.com / torontolab@emsl.com

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Customer ID: 55DCSL97
Customer PO: 350600-519
Project ID:

Attn: Kelly Smith
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Richmond Hill, ON L4B 3N4

Phone: (905) 882-5984
Fax: (905) 882-8962
Collected:
Received: 12/30/2014
Analyzed: 1/05/2015

Proj: DFO 1074 BLDG, IQALUIT, NU/350600-519

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: FT-1 TILE ***Lab Sample ID:*** **551409965-0001**

Sample Description: 1.022/VINYL FLOOR TILE 12"X12"-WHITE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Gray/White	0.0%	100%	None Detected	
TEM Grav. Reduction	1/05/2015	Gray/White	0.0%	100%	None Detected	

Client Sample ID: FT-1 MASTIC ***Lab Sample ID:*** **551409965-0001A**

Sample Description: 1.022/VINYL FLOOR TILE 12"X12"-WHITE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Yellow	0.0%	100%	None Detected	
TEM Grav. Reduction	1/05/2015	Yellow	0.0%	100%	None Detected	

Client Sample ID: PA-1 ***Lab Sample ID:*** **551409965-0002**

Sample Description: 1.022/PAPER BACKING UNDER FLOOR TILE(FT-1)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	1/02/2015	White	80%	20%	None Detected	

Client Sample ID: FT-2A TILE ***Lab Sample ID:*** **551409965-0003**

Sample Description: WEST WING/VINYL FLOOR TILE UNDER PLYWOOD-ORANGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	
TEM Grav. Reduction	1/05/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-2A MASTIC ***Lab Sample ID:*** **551409965-0003A**

Sample Description: WEST WING/VINYL FLOOR TILE UNDER PLYWOOD-ORANGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	
TEM Grav. Reduction	1/05/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-2B TILE ***Lab Sample ID:*** **551409965-0004**

Sample Description: WEST WING/VINYL FLOOR TILE UNDER PLYWOOD-ORANGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

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EMSL Canada Order 551409965
Customer ID: 55DCSL97
Customer PO: 350600-519
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: FT-2B MASTIC ***Lab Sample ID:*** **551409965-0004A**
Sample Description: WEST WING/VINYL FLOOR TILE UNDER PLYWOOD-ORANGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-2C TILE ***Lab Sample ID:*** **551409965-0005**
Sample Description: WEST WING/VINYL FLOOR TILE UNDER PLYWOOD-ORANGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-2C MASTIC ***Lab Sample ID:*** **551409965-0005A**
Sample Description: WEST WING/VINYL FLOOR TILE UNDER PLYWOOD-ORANGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-3A TILE ***Lab Sample ID:*** **551409965-0006**
Sample Description: WEST WING/VINYL FLOOR TILE 12"X12"-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	
TEM Grav. Reduction	1/05/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-3A MASTIC ***Lab Sample ID:*** **551409965-0006A**
Sample Description: WEST WING/VINYL FLOOR TILE 12"X12"-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	
TEM Grav. Reduction	1/05/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-3B TILE ***Lab Sample ID:*** **551409965-0007**
Sample Description: WEST WING/VINYL FLOOR TILE 12"X12"-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-3B MASTIC ***Lab Sample ID:*** **551409965-0007A**
Sample Description: WEST WING/VINYL FLOOR TILE 12"X12"-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: FT-3C TILE ***Lab Sample ID:*** **551409965-0008**
Sample Description: WEST WING/VINYL FLOOR TILE 12"X12"-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

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EMSL Canada Order 551409965
Customer ID: 55DCSL97
Customer PO: 350600-519
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: FT-3C MASTIC **Lab Sample ID:** **551409965-0008A**
Sample Description: WEST WING/VINYL FLOOR TILE 12"X12"-BEIGE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Brown	0.0%	100%	None Detected	

Client Sample ID: VFS-1 **Lab Sample ID:** **551409965-0009**
Sample Description: 1.020/VINYL FLOOR SHEETING-DIAMOND PATTERN(ORANGE)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Tan/Beige/Orange	0.0%	78.7%	**21.3% Chrysotile**	

Client Sample ID: VFS-1-Mastic **Lab Sample ID:** **551409965-0009A**
Sample Description: 1.020/VINYL FLOOR SHEETING-DIAMOND PATTERN(ORANGE)

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/05/2015	Brown	0.0%	98.1%	**1.9% Chrysotile**	

Client Sample ID: VFS-2 **Lab Sample ID:** **551409965-0010**
Sample Description: 1.005/VINYL FLOOR SHEETING-GREY/BLUE MOTTLED

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	1/03/2015	Gray/Various/Beige	0.0%	100%	None Detected	
TEM Grav. Reduction	1/05/2015	Gray/Various/Beige	0.0%	100%	None Detected	

Client Sample ID: CT-1 **Lab Sample ID:** **551409965-0011**
Sample Description: EAST WING/SUSPENDED CEILING TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	1/02/2015	Gray/White	80%	20%	None Detected	

Client Sample ID: CT-2 **Lab Sample ID:** **551409965-0012**
Sample Description: WEST WING/ACOUSTIC CEILING TILE

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	1/02/2015	Gray/White	80%	20%	None Detected	

Client Sample ID: EXT-1 **Lab Sample ID:** **551409965-0013**
Sample Description: EXTERIOR/FIBREBOARD UNDER EXTERIOR SHEATHING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	1/02/2015	Tan/Black	90%	10%	None Detected	

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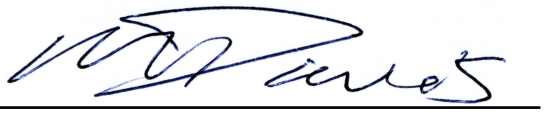
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Analyst(s):

Jon Delos Santos	PLM Grav. Reduction (4)
Matthew Davis	TEM Grav. Reduction (7)
Nicole Yeo	PLM (4) PLM Grav. Reduction (13)

Reviewed and approved by:



Matthew Davis
or Other Approved Signatory

None Detected = <0.5%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 01/05/201516:25:18

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EMSL Canada Order 551408265
Customer ID: 55DCSL97
Customer PO: 350600-519
Project ID:

Attn: Charles Gravelle
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Phone: (905) 882-5984
Fax: (905) 882-8962
Collected:
Received: 11/05/2014
Analyzed: 11/06/2014

Proj: BUILDING 1074 IQALUIT/350600-519

Test Report: Asbestos Analysis of Bulk Materials via EPA600/R-93/116 Method

Client Sample ID: 1-A ***Lab Sample ID:*** **551408265-0001**
Sample Description: FIBREBOARD SHEATHING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	11/05/2014	Brown/Gray	90%	10%	None Detected	

Client Sample ID: 1-B ***Lab Sample ID:*** **551408265-0002**
Sample Description: FIBREBOARD SHEATHING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	11/05/2014	Brown/Gray	90%	10%	None Detected	

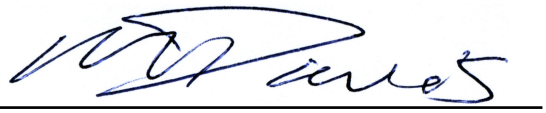
Client Sample ID: 1-C ***Lab Sample ID:*** **551408265-0003**
Sample Description: FIBREBOARD SHEATHING

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	11/06/2014	Brown/Gray	90%	10%	None Detected	

Analyst(s):

Jon Delos Santos PLM (2)
Nicole Yeo PLM (1)

Reviewed and approved by:



Matthew Davis
or Other Approved Signatory

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Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 11/06/201409:42:19

Your Project #: 350600-519
Site Location: DFO 1074 BLDG. IQALUIT, NU
Your C.O.C. #: na

Attention:Kelly Smith

Decommissioning Consulting Services Limited
121 Granton Dr
Unit 11
Richmond Hill, ON
L4B 3N4

Report Date: 2015/01/02
Report #: R3276325
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4O4983
Received: 2014/12/30, 13:40

Sample Matrix: Paint
Samples Received: 20

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals in Paint	20	2015/01/02	2015/01/02	CAM SOP-00408	EPA 6010C m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Keshani Vijh, Project Manager
Email: KVijh@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4O4983
Report Date: 2015/01/02

Decommissioning Consulting Services Limited
Client Project #: 350600-519
Site Location: DFO 1074 BLDG. IQALUIT, NU

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		ZA0306	ZA0307	ZA0308		ZA0309	ZA0310		ZA0311		
Sampling Date		2014/12/23	2014/12/23	2014/12/23		2014/12/23	2014/12/23		2014/12/23		
COC Number		na	na	na		na	na		na		
	Units	PT-1	PT-2	PT-3	RDL	PT-4	PT-5	RDL	PT-6	RDL	QC Batch
Metals											
Lead (Pb)	mg/kg	95	270	140	5.0	120	8.6	2.0	6.9	1.0	3875055

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		ZA0312		ZA0313		ZA0314		ZA0315		
Sampling Date		2014/12/23		2014/12/23		2014/12/23		2014/12/23		
COC Number		na		na		na		na		
	Units	PT-7	QC Batch	PT-8	RDL	PT-9	QC Batch	PT-10	RDL	QC Batch
Metals										
Lead (Pb)	mg/kg	11	3875057	8.1	2.0	180	3875055	230	1.0	3875057

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		ZA0318	ZA0319	ZA0320	ZA0321	ZA0322		ZA0323		
Sampling Date		2014/12/23	2014/12/23	2014/12/23	2014/12/23	2014/12/23		2014/12/23		
COC Number		na	na	na	na	na		na		
	Units	PT-13	PT-14	PT-15	PT-16	PT-17	RDL	PT-18	RDL	QC Batch
Metals										
Lead (Pb)	mg/kg	430	300	4.6	1.5	5.4	1.0	80000	200	3875055

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		ZA0324		ZA0325		ZA0326	ZA0327		
Sampling Date		2014/12/23		2014/12/23		2014/12/23	2014/12/23		
COC Number		na		na		na	na		
	Units	PT-19	RDL	PT-20	RDL	TCLP-1	TCLP-2	RDL	QC Batch
Metals									
Lead (Pb)	mg/kg	91000	500	71000	200	55	120	1.0	3875055

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B4O4983
Report Date: 2015/01/02

Decommissioning Consulting Services Limited
Client Project #: 350600-519
Site Location: DFO 1074 BLDG. IQALUIT, NU

GENERAL COMMENTS

Sample ZA0306-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0307-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0308-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0309-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0310-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0312-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0313-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0323-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0324-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Sample ZA0325-01 : Metals: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

Decommissioning Consulting Services Li...
Client Project #: 350600-519
Site Location: DFO 1074 BLDG. IQALUIT, NU

			Matrix Spike		Method Blank		RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**Value**	**Units**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
3875055	Lead (Pb)	2015/01/02	91	75 - 125	<1.0	mg/kg	NC	35	100	75 - 125
3875057	Lead (Pb)	2015/01/02	NC	75 - 125	<1.0	mg/kg	10	35	107	75 - 125

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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APPENDIX B

PHOTOGRAPHS

Photograph No. 1: View south along the east wing. Lead-containing paint (white) applied to the wall paneling, window frames, fascia and soffits.

Photograph No. 2: View of the hydro-pole near the south east corner of the building. Note the pole mounted transformer.

Photograph No. 3: View looking south between the east and west wings. The area on the right is where the former fuel tank was reported to have been.

Photograph No. 4: View south along the west wing. Lead-containing paint (white) applied to the wall paneling, window frames, fascia and soffits.

Photograph No. 5: Vinyl sheet floor flooring with asbestos-containing paper backing located under existing non-asbestos sheet flooring and plywood.

Photograph No. 6: Asbestos-containing gasket on forced-air furnace electrical junction box.

Photograph No. 7: Lead-containing paint (green) applied to underside of the roof sheeting.

Photograph No. 8: Lead-containing paint (green) applied to the inside face of the exterior wood sheeting.