APPENDIX A

MATERIAL SUMMARY TABLE

Table 1
Material Quantities

Volume Calculations for Demolition

Building Dimensions

Length (ft)	48.5
Width (ft)	24.25
Height of interior walls (ft)	10
Area (ft^2)	1176.125
Perimeter (ft)	145.5

				Wood		Insulation		Concrete		Aluminum Siding		Asphalt		Items
				ft^3	m^3	ft^3	m^3	ft^3	m^3	ft^3	m^3	ft^3	m^3	each
Item			**Volume calculation**											
CONCRETE														
Footing concrete blocks under floor slab			length x width						1.0					
CONCRETE TOTAL									**1.0**					
WOOD	**area**	**thickness**												
Plywood flooring and ceiling - assume 3/4"	2448	0.0625	area x thickness	153.0										
Interior/exterior plywood wall sheathing - assume 3/4"	1982.8	0.0625	area x thickness	123.9										
Plywood roof decking - assume 3/4"	1281.37	0.0625	area x thickness	80.1										
WOOD TOTAL				**357.0**	**10.1**									
WOOD FRAMING	**count**	**volume**												
Wall studs (2x4") exterior	135	0.55555556	No. studs x vol 1 stud (10ft high)	75.0	2.059									
Floor joists - 2x10" x width of bldg (24.25ft)	78	3.54166667	No. joists x vol 1 stud (24.5ft wide)	276.3										
Ceiling joists - 2x10" x width of bldg (24.25ft)	78	3.54166667	No. joists x vol 1 stud (24.5ft wide)	276.3										
Wooden truss work 2x10" (incl all parts)	78	4.86111111		379.2										
Gable ends (2x4")	20	0.22222222	No. studs x vol 1 stud (4ft high)	4.4										
WOOD FRAMING TOTAL				**1011.1**	**28.6**									
SIDING	**area**	**thickness**												
Aluminum siding incl. tarpaper and particle board	351.2	0.125	area x thickness							43.9	1.2			
SIDING TOTAL										**43.9**	**1.2**			
ROOFING	**area**	**thickness**												
Asphalt shingles	1281.2	0.0625	area x thickness									80.1	2.3	
ROOFING TOTAL												**80.1**	**2.3**	
INSULATION	**area**	**thickness**												
Fiberglass - 4" thick incl. vapor barrier	2919.125	0.33	total area (walls + ceiling - doors) x thickness			963.3	27.3							
INSULATION TOTAL						**963.3**	**27.3**							
MISC.	**count**													
4ft x 2 bulb fluorescent lights	9		counted											**9**
Man doors	2		counted											**2**
9 x 8ft garage doors	4		counted											**4**

APPENDIX B

DEMOLITION WASTE SURVEY FOUR BAY GARAGE
Lot 63, Group 1158, Plan 748
NORMAN WELLS NORTHWEST TERRITORIES,
SENES CONSULTANTS, November 2013

REPORT
TO
PUBLIC WORKS AND
GOVERNMENT SERVICES CANADA

DEMOLITION WASTE SURVEY
FOUR BAY GARAGE

Lot 63, Group 1158, Plan 748,
NORMAN WELLS, NORTHWEST TERRITORIES

Prepared by:

SENES CONSULTANTS
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November 2013

350600-504

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Web Site: http://www.senes.ca

29 November 2013

350600-504

Public Works and Government Services Canada
Western Region – Real Property Services
5th floor, Telus Plaza North
10025 Jasper Avenue
Edmonton, AB
T5J 1S6

Attention: Ms. Liana Smith
Project Officer

Re: **Demolition Waste Survey Four Bay Garage**
Lot 63, Group 1158, Plan 748,
Norman Wells, Northwest Territories

Dear Ms. Smith:

We are pleased to submit our report for the above referenced scope of work. The results of the assessment program identified some paint applications with elevated lead levels and minor amounts of mould. No PCBs or asbestos-containing materials were identified. There are various petroleum based liquids stored at the site that would need to be removed from the site prior to any site demolition works.

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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1.0 INTRODUCTION

SENES Consultants (SENES) was retained by Public Works and Government Services Canada (PWGSC) to conduct a demolition waste survey of the Four Bay Garage located at on the corner of Woodland Drive and Tulita Street within the community of Norman Wells. The legal description of the site is Lot 63, Group 1158, Plan 748, Norman Wells, Northwest Territories (see Figure 1). The Four Bay Garage is bounded to the south by an empty lot, to the east by a two-story residential building, to the west by a NorthwesTel facility, to the north by a NWT Power facility and the northeast by another residential dwelling (see Figure 2). The site is located within an area zoned commercial.

The Garage is a one storey wood frame building on a cribbed foundation. The building is 7.39 m wide by 14.75 m long with an approximate footprint of 109 m^2.

The Norman Wells 4 Bay Garage is currently occupied by PWGSC and AANDC and used for equipment and material storage purposes. Historically, the building has been used as either a parking garage or for material storage since it was constructed in the 1950's. The building is currently heated by an oil fired ceiling mounted furnace. The building is not serviced with either water or sewer. The NWT Power Corporation provides electricity to the building from its Norman Wells generators.

It is our understanding that 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 Four Bay Garage prior to demolition.

The design construction floor plan drawings of the various building components are provided in Appendix A, while photographs of the primary building features and building materials are provided in Appendix B.

1.1 SCOPE OF WORK

The scope of work for our investigation included:

- obtaining representative bulk samples of materials suspected of containing asbestos and samples of paint suspected of containing lead; however no samples

SENES Consultants

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

BUILDING DEMOLITION

NORMAN WELLS 4 BAY GARAGE ,NT

SITE LOCATION PLAN

Drawn By:	P.A.L.	Approved By:	P.E.H.	Project No:	350600-504
Date:	AUGUST 2013	Scale:	N.T.S		FIGURE 1

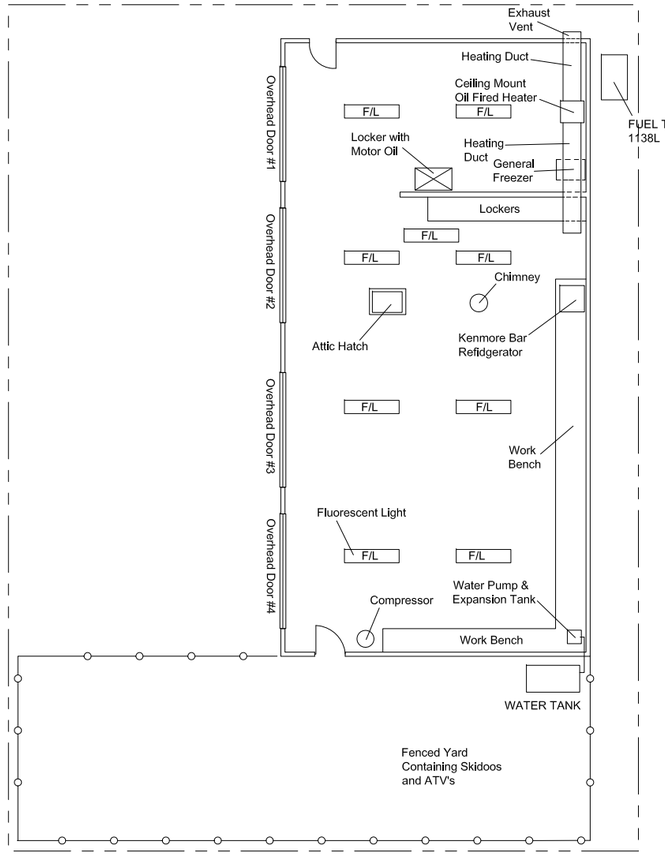
Aug 23, 2013 – 3:16pm – USER izba
Z:\350000 Series\350600-504 Norman Wells\350600-504 Fig 1.dwg

RESIDENTIAL PROPERTIES

TULITA STREET

NORTHWEST TELEPHONE

WOODLAND AVENUE



NEW APARTMENT BUILDING

VACANT LAND

RESIDENTIAL PROPERTIES

FRANKLIN AVENUE

SENES Consultants

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

BUILDING DEMOLITION

NORMAN WELLS 4 BAY

SITE PLAN

Drawn By: P.A.L.	Approved By: P.E.H.	Project No: 350600-504
Date: AUGUST 2013	Scale: 1:75 Approx.	FIGURE 2

Aug 23, 2013 – 3:19pm – USER: izha
Z:\350000 Series\350600-504 Norman Wells\350600-504 Fig 2 and 3.dwg

were collected from the roofing material as SENES did not want to damage the roof and possibly cause an issue with leaking in the future.

- laboratory analyses of bulk samples for asbestos content and analysis of paint chip samples for lead content; and

- 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.

- SENES would expect that all personal belongings, boats, motors, ATVs, motor oil, paint, miscellaneous chemical products and water would be removed prior to demolition of the building.

The Class B Estimate for the abatement and demolition work will be provided under separate cover. The field component of the demolition waste survey was undertaken by our Mr. Patrick Harrison on 28 July 2013 with assistance from Mr. Steve Deschene of AANDC.

2.0 BACKGROUND INFORMATION ON HAZARDOUS MATERIALS

The Government of the Northwest Territories (GNWT) *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 the Northwest Territories 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 the NWT.*

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 13282, Asbestos Abatement (maximum precautions).

The Northwest Territories 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 NWT 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* – GNWT April 2001 states that "Products that contain lead in excess of 600 parts per million (0.06% by weight) are considered hazardous waste and shall be managed in accordance with this guideline".

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 *GNWT 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 *Guideline for the General Management of Hazardous Waste in the NWT.*

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). Amendments to the federal PCB regulations were passed into law on 17 September 2008. The key aspects of the new *PCBs Regulations* (superseding the Chlorobiphenyls Regulations and the Storage of PCB Materials Regulations), enacted under the *Canadian Environmental Protection Act* (CEPA), are the establishment of end of use dates for all equipment containing PCBs and storage/disposal requirements.

The regulations require that:

- all in-service PCB equipment containing PCBs >50 mg/kg at child care facilities, schools (preschool, primary and secondary), hospitals, senior citizens' care facilities, food or feed processing plants and drinking water treatment plants be removed from service by 31 December 2009;

- PCB waste stored on properties occupied by child care facilities, schools (preschool, primary and secondary), hospitals, senior citizens' care facilities, food or feed processing plants and drinking water treatment plants, and/or land within 100 m of the above properties, be removed from the storage facility and disposed of by 31 December 2009;

- all equipment having PCB concentrations >500 mg/kg at all other locations be removed from service by 31 December 2009;

- all equipment having PCB concentrations >50 mg/kg be removed from service by 31 December 2025;

- PCB-containing equipment be placed into suitable storage or disposed of at a suitable facility within 30 days following removal from service; and

- release of PCBs to the environment be limited to new more stringent limits, including 2 mg/kg PCBs for liquids and 50 mg/kg for solids containing PCBs, and a maximum of 1 gram from capacitors, transformers and other equipment containing PCBs.

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. The maximum end of use date cannot, however, extend beyond 31 December 2014. 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.

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 (416) 346-1971 or the Department of the Environmental and Natural Resources Government of the Northwest Territories at 1-867-920-8130; 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.

The recommended procedures for removal of RCF are more stringent than for mineral wool and glass wool and include construction of temporary enclosures, installation of high efficiency particulate air (HEPA) filtration units, use of disposable coveralls and an Nl00 full-facepiece respirator or a powered air purifying respirator (PAPR) with HEPA filters.

Also, special care is required when removing RCF that have endured prolonged heating of temperatures above 900°C because it may contain crystalline silica in the form of cristobalite.

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 for mould remediation work 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 GNWT Environmental Protection Act. In practice heating oil is considered a resource and is generally recovered and recycled where possible. For the purposes of this program we have assumed that the above ground tank located on the south side of the building will be decommissioned and reused or sold by the remediation contractor.

3.0 PROPERTY DESCRIPTION

The subject property is located on the south side of Tulita St. and the east side of Woodland Ave. in the village of Norman Wells. The property is approximately 28 m by 25 m and is occupied by a single story 109 m^2 area four bay garage structure built in the early 1950's, a fenced in compound, used for the storage of snow machines and ATVs, and a parking area for motor vehicles in front to the garage.

The garage structure is a single storey wood frame building with an asphalt shingled roof founded on shallow cribbing. The building is approximately 7.39 m by 14.75 m in size. The exterior cladding is split between an aluminum composite wall covering on the lower 1.16 m (aluminum siding over asphalt paper and particle board) while the upper 1.84 m is painted 12 mm thick plywood. The roof system comprises wooden trusses covered with plywood sheet and asphalt shingles. The interior walls, ceiling and floor are all of plywood construction. The walls and ceiling are insulated with glass fiber batt insulation. The floor is also constructed of plywood on 50 x 150 mm wood frame, mounted on timbers and concrete blocks. The interior configuration of the existing building elements and various materials are shown in plan on Figure 2.

The building is not serviced with either water or sewer however there is an electrical service sources from a pole located to the south west of the subject site. No transformers were observed on the pole. Water is supplied to the building by an exterior 2,000 litre tank, connected to an interior pump and expansion tank located inside the garage. The building is heated by one ceiling mounted oil-fired furnace located at the north end of the building exhausted through the north wall. There is one aboveground 1,135 L fiberglass oil tank, manufactured in 2011, located outside on the north end of the east side of the building. There is no evidence of leakage on the ground immediately beneath or around the existing above ground fuel tank.

The roof construction is comprised of wooden roof trusses, plywood sheathing with asphalt shingles; there is one roof vent which was likely connected to a furnace at one time. The ceiling is of plywood construction.

4.0 RESULTS AND DISCUSSION

4.1 ASBESTOS

During the course of our hazardous materials survey various building materials which typically may contain asbestos fibres were inspected. Wall cavities were accessed through existing wall openings, light switches and outlet cover plates, and damaged wall sections while the ceiling space was accessed by the attic access hatch. On the basis of our inspection three representative bulk samples of building materials often found to contain asbestos were collected by SENES staff to confirm the presence or absence of asbestos. The samples were forwarded for analysis to EMSL Canada Inc. in Mississauga, Ontario, a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory. Results of bulk sample analysis for asbestos content are provided in Table 4.1. Laboratory reports are provided in Appendix A. The sample locations are presented in plan on Figure 3.

TABLE 4.1

SUMMARY OF RESULTS OF ANALYSIS OF BULK SAMPLES FOR ASBESTOS CONTENT

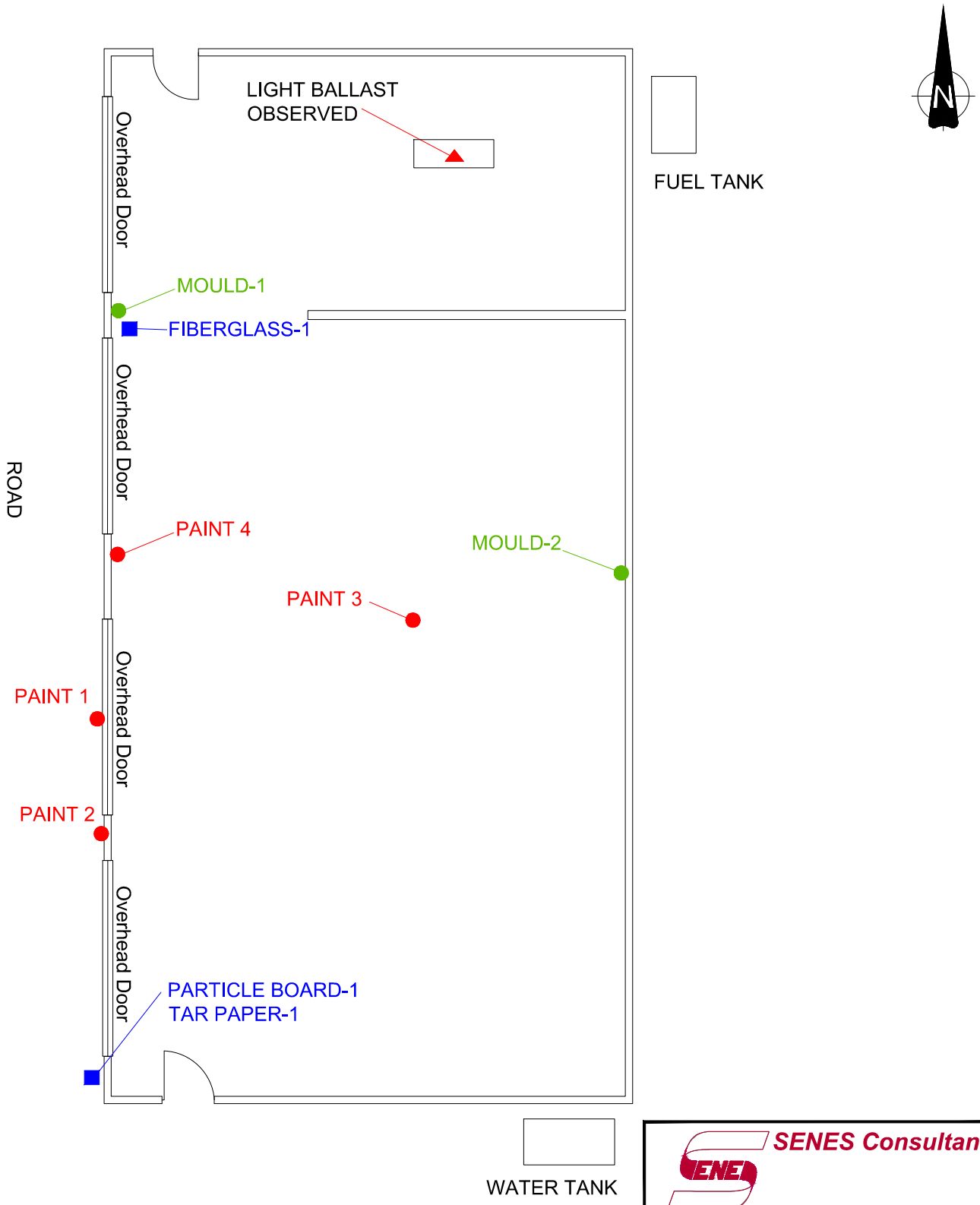
SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	ASBESTOS CONTENT
Particle board 1	exterior from under aluminum siding	Particle board	None detected
Fiberglass 1	Interior from wall space on west wall	Glass fiber insulation	None detected
Tar paper 1	exterior from under aluminum siding	Tar paper	None detected

NOTES:

< = less than.
"Asbestos-containing material" is defined as material that contains 0.5% or more asbestos by dry weight.
Chrysotile = Chrysotile asbestos.
(#3) room number as on drawing.

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 visual observations and results of laboratory analyses of samples collected by SENES, no asbestos-containing materials (GNWT Safety Act, Asbestos Safety Regulations R-016-92, defines materials containing >1% asbestos as asbestos-containing material) were found to be present within the assessed building.



SENES Consultants

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

BUILDING DEMOLITION

NORMAN WELLS 4 BAY

SAMPLE LOCATIONS

Drawn By:	P.A.L.	Approved By:	P.E.H.	Project No:	350600-504
Date:	AUGUST 2013	Scale:	1:75 Approx.		FIGURE 3

Asbestos may also be present in materials which were not sampled during the course of the asbestos survey carried out by SENES, including, but not limited to, roofing materials, and gaskets or internal components of the heater. 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 activities, the work shall not proceed until such time as the required notifications have been made and an appropriate course of action is determined. Roofing materials should be tested for asbestos prior to demolition.

4.2 LEAD

A total of four (4) paint chip samples were collected by SENES during the course of the demolition work survey. Samples were submitted to Maxxam Analytics Inc. in Mississauga a CALA accredited laboratory for analysis of lead content. The results of analysis are presented in Table 4.2. The sample locations are presented in Plan on Figure 3.

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 GNWT Environmental Guideline for Waste Lead and Lead Paint (April 2001) should be followed.

As significant peeling and delamination of paint was noted inside and outside the building at the time of the inspection all loose and flaking paint should be scraped off prior to demolition.

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

SAMPLE Nº	SAMPLE LOCATION	SAMPLE DESCRIPTION	LEAD CONTENT
Paint 1	Exterior	Grey – from garage door	38,000 mg/kg
Paint 2	Exterior	White – from wall	41,000 mg/kg
Paint 3	Interior	Grey – from floor	<50 mg/kg
Paint 4	Interior	White – from wall	1,100 mg/kg

NOTE:
< = less than.

4.3 MERCURY

During the course of our site inspections, nine interior fluorescent light fixtures containing two tubes each were observed. Mercury should be assumed to be present as a gas in all fluorescent light tubes.

The locations of the fixtures that contain mercury are shown in place on Figure 2. Any silent light switches or tilt switches should be checked for mercury at the time of demolition.

4.4 SILICA

Materials observed in the study areas which should be considered to contain silica included concrete blocks in the foundation.

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

Fluorescent lights were observed throughout the facility during the course of our site inspection. A total of nine T12 type two tube fluorescent light fixtures were observed. The ballast from one fixture was inspected and the information on the face plate recorded. From the information on the face plate the ballast was label as being non-PCB containing. A summary of the information recorded from the one exposed light ballast is presented in Table 4.3. The remaining ballasts will have to be examined by a licensed electrician prior to disposal to confirm the presence of PCBs.

TABLE 4.3
SUMMARY OF RESULTS OF FLUORESCENT LIGHT BALLASTS

NUMBER OF	BALLAST MANUFACTURE	MODEL NUMBER	PCB-CONTAINING
1	Philips	RQM-2S40-TPC	NON-PCB

No transformers or other PCB-containing materials were identified during the waste survey.

4.6 OZONE-DEPLETING SUBSTANCES

Two refrigerators (refrigerant type and quantity unknown) and one freezer (198 g of R12 refrigerant) were observed during the inspection. As this equipment appears to be in good condition and portable it is likely to be moved to a new location, however if any ODS-containing equipment is to be removed and designated for disposal as scrap it must be drained of its contents by a licensed technician and equipped with a label indicating that the equipment no longer contains any refrigerant (see Section 2.6 of this report).

4.7 MAN-MADE MINERAL FIBRE

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

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

4.8 MOULD

Mould was observed in several locations throughout the building on interior surfaces and in wall cavities. The exterior walls and the floor have had some severe water damage over the years and exhibit the signs of wood rot and mould.

TABLE 4.4
SUMMARY OF RESULTS OF MOULD SAMPLES

SAMPLE NUMBER	SAMPLE LOCATION	SAMPLE DESCRIPTION	LABORATORY RESULTS
Mould 1	Floor level between the overhead doors 1 & 2	wood	Positive for mould growth
Mould 2	From east wall above the work bench	Tape pull	Positive for mould growth

See Appendix A – Laboratory Analysis, for laboratory results and species identification.

Mould should be assumed to be present on surfaces inside wall cavities, based on sample results (Mould 1 was a sample of the interior plywood wall taken from floor level). 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

For the purposes of this program we have assumed that the heating oil will be either recovered or transferred, by PWGSC, to one of their other facilities within Norman Wells or the demolition contractor will recover the fuel for their own use. The tank would be managed in a similar manner.

5.0 ASSESSMENT OF NON-HAZARDOUS MATERIAL

Non-hazardous material observed in the building consisted of wood in the form of 50 x 100 mm wood studs and joists, floor and roof decking and wall sheathing in the form of plywood, steel exterior man doors, wood and vinyl overhead rollup doors.

A summary of the various material areas and volumes is tabulated in Table 5.1. Given that the bulk of the construction materials were sized in imperial units, both imperial and metric units for volume are provided.

TABLE 5.1
MATERIAL QUANTITIES

Volume Calculations for Demolition

Building Dimensions

Length (ft)	48.5
Width (ft)	24.25
Height of interior walls (ft)	10
Area (ft^2)	1176.125
Perimeter (ft)	145.5

				Wood		Insulation		Concrete		Aluminum Siding		Asphalt		Items
				ft^3	m^3	ft^3	m^3	ft^3	m^3	ft^3	m^3	ft^3	m^3	each
Item			**Volume calculation**											
CONCRETE														
Footing concrete blocks under floor slab			length x width						1.0					
CONCRETE TOTAL									**1.0**					
WOOD	**area**	**thickness**												
Plywood flooring and ceiling - assume 3/4"	2448	0.0625	area x thickness	153.0										
Interior/exterior plywood wall sheathing - assume 3/4"	1982.8	0.0625	area x thickness	123.9										
Plywood roof decking - assume 3/4"	1281.37	0.0625	area x thickness	80.1										
WOOD TOTAL				**357.0**	**10.1**									
WOOD FRAMING	**count**	**volume**												
Wall studs (2x4") exterior	135	0.55555556	No. studs x vol 1 stud (10ft high)	75.0	2.059									
Floor joists - 2x10" x width of bldg (24.25ft)	78	3.54166667	No. joists x vol 1 stud (24.5ft wide)	276.3										
Ceiling joists - 2x10" x width of bldg (24.25ft)	78	3.54166667	No. joists x vol 1 stud (24.5ft wide)	276.3										
Wooden truss work 2x10" (incl all parts)	78	4.86111111		379.2										
Gable ends (2x4")	20	0.22222222	No. studs x vol 1 stud (4ft high)	4.4										
WOOD FRAMING TOTAL				**1011.1**	**28.6**									
SIDING	**area**	**thickness**												
Aluminum siding incl. tarpaper and particle board	351.2	0.125	area x thickness							43.9	1.2			
SIDING TOTAL										**43.9**	**1.2**			
ROOFING	**area**	**thickness**												
Asphalt shingles	1281.2	0.0625	area x thickness									80.1	2.3	
ROOFING TOTAL												**80.1**	**2.3**	
INSULATION	**area**	**thickness**												
Fiberglass - 4" thick incl. vapor barrier	2919.125	0.33	total area (walls + ceiling - doors) x thickness			963.3	27.3							
INSULATION TOTAL						**963.3**	**27.3**							
MISC.	**count**													
4ft x 2 bulb fluorescent lights	9		counted											**9**
Man doors	2		counted											**2**
9 x 8ft garage doors	4		counted											**4**

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 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 and laboratory analysis of a limited number of building material samples for mould. The survey did not include for identification of asbestos in equipment (including electrical equipment and wiring), furniture (e.g. chairs, table tops, etc.), nor material outside of the building.

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 28 July 2013.

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

LABORATORY REPORTS

SENES

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 551305502
Customer ID: 55DCSL97
Customer PO: 350600-504
Project ID:

Attn: Wayne Cormack
Decommissioning Consulting Services Ltd.
121 Granton Drive
Unit 11
Richmond Hill, ON L4B 3N4

Phone: (905) 882-5984
Fax: (905) 882-8962
Collected:
Received: 8/13/2013
Analyzed: 8/16/2013

Proj: 4 BAY GARAGE (NORMAN WELLS) 350600-504

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

Client Sample ID: PARTICLE BOARD 1 ***Lab Sample ID:*** **551305502-0001**
Sample Description: PARTICLE BOARD

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/16/2013	Tan/White/Black	80%	20%	None Detected	

Client Sample ID: FIBERGLASS 1 ***Lab Sample ID:*** **551305502-0002**
Sample Description: FIBERGLASS

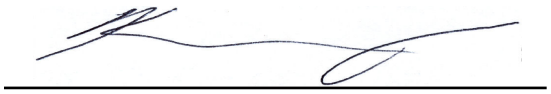
TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/16/2013	Pink	90%	10%	None Detected	

Client Sample ID: TAR PAPER 1 ***Lab Sample ID:*** **551305502-0003**
Sample Description: TAR PAPER - Tar paper

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	8/16/2013	Black	0.0%	100%	None Detected	
TEM Grav. Reduction	8/16/2013	Black	0.0%	100%	None Detected	

Analyst(s)

Matthew Davis	PLM	(2)
	PLM Grav. Reduction	(1)
	TEM Grav. Reduction	(1)



Kevin Pang
or other Approved Signatory

Any questions please contact Kevin Pang.

Initial report from: 08/16/201322:17:56

Your Project #: 350600-504
Site Location: 4 BAY GARAGE (NORMAN WELLS)
Your C.O.C. #: NA

Attention: Charles Gravelle

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

Report Date: 2013/08/19

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3D3220
Received: 2013/08/13, 18:30

Sample Matrix: Paint
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Metals in Paint	2	2013/08/16	2013/08/16	CAM SOP-00408	SW-846 6010C
Metals in Paint	2	2013/08/16	2013/08/19	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 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.

Your Project #: 350600-504
Site Location: 4 BAY GARAGE (NORMAN WELLS)
Your C.O.C. #: NA

Attention: Charles Gravelle

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

Report Date: 2013/08/19

CERTIFICATE OF ANALYSIS

-2-

Encryption Key

Keshani Vijh

19 Aug 2013 16:31:10 -04:00

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.

Total cover pages: 2

Maxxam Job #: B3D3220
Report Date: 2013/08/19

Decommissioning Consulting Services Limited
Client Project #: 350600-504
Site Location: 4 BAY GARAGE (NORMAN WELLS)

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		SQ0407	SQ0408		SQ0409	SQ0410		
Sampling Date		2013/07/28	2013/07/28		2013/07/28	2013/07/28		
COC Number		NA	NA		NA	NA		
	Units	**PAINT 1**	**PAINT 2**	**RDL**	**PAINT 3**	**PAINT 4**	**RDL**	**QC Batch**
Metals								
Lead (Pb)	mg/kg	38000	41000	500	<50	1100	50	3317074

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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 #: B3D3220
Report Date: 2013/08/19

Decommissioning Consulting Services Limited
Client Project #: 350600-504
Site Location: 4 BAY GARAGE (NORMAN WELLS)

Test Summary

Maxxam ID SQ0407 **Collected** 2013/07/28
Sample ID PAINT 1 **Shipped**
Matrix Paint **Received** 2013/08/13

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	3317074	2013/08/16	2013/08/19	Archana Patel

Maxxam ID SQ0408 **Collected** 2013/07/28
Sample ID PAINT 2 **Shipped**
Matrix Paint **Received** 2013/08/13

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	3317074	2013/08/16	2013/08/19	Archana Patel

Maxxam ID SQ0409 **Collected** 2013/07/28
Sample ID PAINT 3 **Shipped**
Matrix Paint **Received** 2013/08/13

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	3317074	2013/08/16	2013/08/16	Archana Patel

Maxxam ID SQ0410 **Collected** 2013/07/28
Sample ID PAINT 4 **Shipped**
Matrix Paint **Received** 2013/08/13

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Metals in Paint	ICP	3317074	2013/08/16	2013/08/16	Archana Patel

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 #: B3D3220
Report Date: 2013/08/19

Decommissioning Consulting Services Limited
Client Project #: 350600-504
Site Location: 4 BAY GARAGE (NORMAN WELLS)

Package 1	22.0°C

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

GENERAL COMMENTS

Results relate only to the items tested.

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

Decommissioning Consulting Services Limited
Attention: Charles Gravelle
Client Project #: 350600-504
P.O. #:
Site Location: 4 BAY GARAGE (NORMAN WELLS)

Quality Assurance Report

Maxxam Job Number: MB3D3220

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3317074	APT	Matrix Spike	Lead (Pb)	2013/08/19		95	%	80 - 120
		QC Standard	Lead (Pb)	2013/08/16		98	%	75 - 125
		Method Blank	Lead (Pb)	2013/08/19	<50		mg/kg	
		RPD	Lead (Pb)	2013/08/19	55.8 (1)		%	35

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.
(1) Duplicate results exceeded RPD acceptance criteria. This may be due to sample heterogeneity.

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

Validation Signature Page

Maxxam Job #: B3D3220

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.

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

13-Aug-13 18:30
Keshani Vijh
B3D3220

121 Granton Drive, Unit 11, Richmond Hill, ON
Tel: (905) 882-5984 Fax: (905) 882-8962
Email: engineers@dcsltd.ca Website: www.dcsltd.ca

Chain of Cu

FW ENV-139

Shipper

Project No.: 350600-504 Site: 4 Bay Garage (Norman Wells)
Project Manager: C.Gravelle / W.Cormack
Field Engineer/Techician: P.Harrison
Date: 13-Aug-13 Route: Courier
Lab:: MAXXAM Location Mississauga
Required Date: 23 Aug 13 Turnaround: 5 Day(s)
Quotation No.: Normal TAT
MDL's To Meet:

Analyses Requested

Groundwater Analyses Required for Compliance with Ontario Drinking Water Guidelines.

___Yes/No___

Location/ Hole No.	Sample No.	Depth (m)	Description	Label No.	Grab/ Comp.	Date Collected	Lead	Field Procedures: pH	Electrical Conductivity	Preservatives
Paint 1			Paint Chips			28-Jul-13	X			
Paint 2			Paint Chips			28-Jul-13	X			
Paint 3			Paint Chips			28-Jul-13	X			
Paint 4			Paint Chips			28-Jul-13	X			

Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:
Relinquished By: Jean Daly	Date: 2013/08/13	Time: 18:24	Received By: Ashitha Sukumar 2013/08/13 18:30

Laboratory

Remarks:
ALL RESULTS ARE TO BE SENT TO THE PROJECT MANAGER.

22/22/22°C

Project No. and Date

(Revision 1 - 17 May 2012)

Sporometrics Inc.
219 Dufferin Street, Suite 20C, Toronto, ON M6K 1Y9 - t.416-516-1660 - f.416-516-1670 - www.sporometrics.com

RESULTS OF LABORATORY ANALYSES: JOB NO. 21473.00

To:	W. Cormack / C. Gravollo	**Date of report:**	2013/08/17
Company:	Decommissioning Consulting Services Ltd.	**Date of sampling:**	2013/07/28
Client Project:	350600-504	**Analyst:**	Yaima Arocha-Rosete
Client Address:	121 Granton Drive, Unit 11, Richmond Hill, ON L4B 3N4	**Date Received:**	2013/08/14

BULK / TAPELIFT / BIOTAPE SAMPLE NO.:		**Mould 1**	**Mould Tape Pull**	**-**	**-**	**-**	**-**
	Location:	-	-				
	Serial #:	N/A	N/A				
	Expiry date:	N/A	N/A				
FUNGAL IDENTIFICATION:[a]	**ELEMENTS:**	**MICROSCOPIC OBSERVATIONS**[b] **(RATING**[c]**):**					
Chaetomium NOS	mycelia	-	-				
	spores	tr	tr				
Cladosporium NOS	mycelia	2+	tr				
	spores	2+	1+				
Epicoccum NOS	mycelia	-	-				
	spores	-	tr				
Stachybotrys NOS	mycelia	1+	-				
	spores	1+	-				
Taeniolella-like NOS	mycelia	1+	-				
	spores	1+	-				
Ulocladium NOS	mycelia	-	-				
	spores	tr	-				
ascospores NOS		-	tr				
OTHER OBSERVATIONS:							
background rating		3+	3+				
pollen NOS		-	tr				
FUNGAL GROWTH INDICATED?[d]**:**		**Y**	**Y**				

AIHA LAP, LLC LAB NO: 171117

Samples were received in satisfactory condition and tested in accordance with SOP 2.1.2.2-3. These results relate only to the samples tested.

[a] **NOS** = not otherwise specified.

[b] Mounted in lactofuchsin / lactic acid, or other medium as required, with 50-100 fields examined in bright field microscopy at 400x magnification.

[c] **-** = not detected; **tr** = 10^0 - 10^1 elements in total; **1+** = 10^0 - 10^1 elements in each of ~25% fields; **2+** = 10^1 - 10^2 elements in each of ~50% fields; **3+** = 10^2 - 10^3 elements in each of ~75 fields; **4+** => 75% fields obscured.

[d] Possibility of fungal growth *in situ* based on microscopic observations; **Y** = yes; **N** = no; **?** = ambiguous. For explanation please refer to the final page of this report.

Sporometrics Inc.
219 Dufferin Street, Suite 20C, Toronto, ON M6K 1Y9 - t.416-516-1660 - f.416-516-1670 - www.sporometrics.com

RESULTS OF LABORATORY ANALYSES: JOB NO. 21473.00

To:	W. Cormack / C. Gravollo	**Date of report:**	2013/08/17
Company:	Decommissioning Consulting Services Ltd.	**Date of sampling:**	2013/07/28
Client Project:	350600-504	**Analyst:**	Yaima Arocha-Rosete
Client Address:	121 Granton Drive, Unit 11, Richmond Hill, ON L4B 3N4	**Date Received:**	2013/08/14

END OF REPORT

Examined By

Released By

Yaima Arocha-Rosete, PhD

Analyst

Mike Saleh, MHSc

Analyst

PAN AMERICAN AEROBIOLOGY CERTIFICATION BOARD
PAACB
Certified Analysts on Staff

ilac-MRA

AIHA LAP, LLC
ACCREDITED LABORATORY
ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #171117

Sporometrics Inc.
219 Dufferin Street, Suite 20C, Toronto, ON M6K 1Y9 - t.416-516-1660 - f.416-516-1670 - www.sporometrics.com

RESULTS OF LABORATORY ANALYSES: JOB NO. 21473.00

To:	W. Cormack / C. Gravollo	**Date of report:**	2013/08/17
Company:	Decommissioning Consulting Services Ltd.	**Date of sampling:**	2013/07/28
Client Project:	350600-504	**Analyst:**	Yaima Arocha-Rosete
Client Address:	121 Granton Drive, Unit 11, Richmond Hill, ON L4B 3N4	**Date Received:**	2013/08/14

Guidance on the interpretation of microscopic findings Samples of bulk materials as well as tape lift samples from potentially contaminated surfaces may be examined microscopically to assess the potential of these materials to be supporting fungal growth and serving as indoor fungal amplification sites. Guidelines on indoor microbial contamination proposed by Health Canada (HC. 1995. Indoor air quality in office buildings: A technical guide. Federal-Provincial Advisory Committee on Environmental and Occupational Health. Ottawa: Environmental Health Directorate 93-EHD-166 rev.) state unambiguously that indoor, active fungal growth sites are unacceptable regardless of the extent to which these amplifiers impact on the indoor airborne spore-load. Fungal spores are commonly borne on air currents and settle on flat surfaces as a matter of course. Thus, the observation of fungal spores alone is insufficient to characterize a specimen as a growth site. This judgment primarily requires the microscopic visualization of fungal filaments ("hyphae", or *en masse*, "mycelia"). Additionally, the identification of different kinds of fungi usually requires the observation of spores (e.g. conidia, ascospores, etc.) along with the organs responsible for their production (e.g. conidiophores, ascomata, etc.). However, the latter rarely persist long after the spores have been produced, making definitive identification difficult or impossible in aged specimens. The rating system used by Sporometrics to score the frequency of structures observed microscopically is based on a 5-point assessment of 50-100 microscopic fields, usually taken at 400 x magnification. This system uses the following rating criteria:

Descriptor	Criteria (based on 50-100 fields)	Interpretation of growth *in situ* according to observations:	
		Spores alone	Spores and spore-bearing structures or mycelia
tr	10^0-10^1 elements in total	growth **not** indicated	growth **not** indicated
1+	10^0-10^1 elements per ~25% fields	unclear	growth indicated
2+	10^1-10^2 elements per ~50% fields	growth indicated	growth indicated
3+	10^2-10^3 elements per ~75% fields	growth indicated	growth indicated
4+	> 75% fields obscured by elements	growth indicated	growth indicated

APPENDIX B

PHOTOGRAPHS

SENES

Photo 1: North side of the garage, note the oil fired heater exhaust.

Photo 2: East side of the garage, note the above ground fuel storage tank and the chimney.

Photo 3: South side of the garage, note the 2000*l* water tank.

Photo 4: West side of the garage.

Photo 5: Inside of garage bay 1 facing east, note the ceiling mounted heater and associated ductwork, also the exposed light ballast and the freezer in the back corner.

Photo 6: Lockers loaded with spray paint and paint thinner and shelving loaded with motor oil (for trucks, boats and ATVs).

Photo 7: View south from bay 1 across the garage. Note the car batteries on the shelf below the work bench and the expansion tank for the water tank in the far corner.

Photo 8: View east from garage door at bay 2.

Photo 9: Attic space, looking east from access hatch. Note the wood frame construction, glass fiber batt insulation and the abandoned oil stove pipe/chimney.

Photo 10: The above ground fuel storage tank located on the north side of the garage.

Photo 11: The oil fired ceiling mounted heater.

Photo 12: The water storage tank on the south side of the garage.

Photo 13: A typical T12 florescent light fixture, note that the ballast cover was removed prior to the inspection and that the ballast is a “NON-PCB” type.

Photo 14: View south through the attic.

Photo 15: Footing of building.

APPENDIX C

LIST OF ACRONYMS

APPENDIX C
ACRONYMS

ACM	asbestos containing material
CEPA	Canadian Environmental Protection Act
CFCs	chiorofluorocarbons
CGE	Canadian General Electric
CSAO	Construction Safety Association of Ontario
GNWT	Government of the Northwest Territories
HCFCs	hydrochlorofluorocarbons
HEPA	high efficiency particulate air
HFCs	hydrofluorocarbons
HID	high intensity discharge
MMMF	man-made mineral fibres
NIOSH	United States National Institute for Occupational Safety and Health
NVLAP	National Voluntary Laboratory Accreditation Program
PAPR	powered air purifying respirator
RCF r	efractory ceramic fibres
SVF	synthetic vitreous fibres
TWAEV	time-weighted average exposure value
UFFI u	rea formaldehyde foam insulation