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for

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APPENDIX A1

Stantec
Pre-Demolition Hazardous Building Materials Assessment
RCMP Mobile Home #4
6665 Christensen Road
Anahim Lake, BC
Sept 16, 2019



**Pre-Demolition Hazardous
Building Materials Assessment**

RCMP Mobile Home #4, 6665 Christensen
Road, Anahim Lake, BC

September 16, 2019

Prepared for:

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PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

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Executive Summary

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) on behalf of the Royal Canadian Mounted Police (RCMP) to conduct a hazardous building materials assessment of RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC (subject building).

The purpose of the assessment was to check for potential hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

The work was carried out in accordance with the requirements of the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR), British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97) and the RCMP Asbestos Management Plan (AMP).

The hazardous building materials considered during this assessment included the following:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)
- Polychlorinated biphenyls (PCBs) in electrical equipment
- Mould and/or moisture-impacted building materials
- Mercury in electrical equipment
- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

Based on Stantec's visual assessment and the laboratory analyses performed on the samples collected, as well as a review of previous reports or sampling records/reports, hazardous building materials were identified to be present.

A summary of our findings is presented in Table ES 1, below. Recommendations pertaining to the handling, removal, transportation and disposal of identified hazardous building materials are provided in the body of this report.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Table ES 1 Summary of Findings

Hazardous Building Material	Summary of Findings
Asbestos	<p>The following ACMs were identified through this assessment:</p> <ul style="list-style-type: none"> • Vinyl sheet flooring (various styles—concealed layers) • Window pane caulking • Roof vent mastic • Exterior cement panel <p>Identified ACMs were observed to be in good condition.</p>
Lead	<p>The following LCPs were identified through previous reports or sampling records, and were visually confirmed to remain within the building during the current assessment:</p> <ul style="list-style-type: none"> • Light yellow on exterior metal, presumed to refer to metal siding <ul style="list-style-type: none"> – Confirmed by the results for a sample collected as part of this assessment • Orange on wood exterior of doors and door frames <p>The following additional LCPs were identified through this assessment:</p> <ul style="list-style-type: none"> • Red coloured paint on metal roofing • Tan coloured paint on metal canopy roofing <p>Identified LCPs were observed to be in good condition</p> <p>The majority of building materials coated with identified LCPs are not anticipated to be disposed of via landfill (e.g., metal). A bulk sample of exterior wood coated with orange coloured LCP was collected in a form presumed to be representative of waste generated during demolition. Analysis of that sample indicated that such waste does NOT contain lead in a dispersible form such that its leachate contains greater than 5.0 milligrams per litre (mg/L) lead.</p> <p>Lead may also be present in the following materials:</p> <ul style="list-style-type: none"> • Older electrical wiring materials and sheathing • Solder used on domestic water lines • Solder used in bell fittings for cast iron pipes and in electrical equipment • Vent and pipe flashings
Polychlorinated biphenyls (PCBs)	No suspected PCB-containing equipment was observed.
Mould	No suspect mould or moisture staining was observed.
Mercury	<p>Mercury vapour is present in the compact fluorescent light bulbs within approximately 10 light fixtures observed throughout.</p> <p>Mercury is present in the switch in one thermostat observed in the living room.</p>
Ozone-depleting substance (ODS)	Building related cooling and refrigeration equipment suspected to be ODS-containing was not observed.
Silica	<p>Silica is expected to be present in the following, which were observed in various locations throughout:</p> <ul style="list-style-type: none"> • Cement products such as: <ul style="list-style-type: none"> – Concrete—foundations, floors – Panels • Gypsum and associated wall/ceiling finish materials



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The statements made in this Executive Summary text are subject to the same limitations included in this report and are to be read in conjunction with the remainder of this report.



Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	asbestos-containing material
AIHA	American Industrial Hygiene Association
AMP	Asbestos Management Plan
BC	British Columbia
CEPA	<i>Canadian Environmental Protection Act</i>
CFC	chlorofluorocarbon
CMHC	Canada Mortgage and Housing Corporation
COHSR	Canada Occupational Health and Safety Regulations
EACO	Environmental Abatement Council of Ontario
ELLAP	Environmental Lead Laboratory Approval Program
EMSL	EMSL Canada Inc.
HCFC	hydrochlorofluorocarbon
HUD	polarized light microscopy
HVAC	heating, ventilation and air conditioning
LCP	lead-containing paint
NVLAP	National Voluntary Laboratory Accreditation Program



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ODS	ozone-depleting substance
OEL	occupational exposure limit
PCB	polychlorinated biphenyl
PLM	polarized light microscopy
PSPC	Public Services and Procurement Canada
RCMP	Royal Canadian Mounted Police
USEPA	United States Environmental Protection Agency



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #4, 6665 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Introduction
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1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) on behalf of the Royal Canadian Mounted Police (RCMP) to conduct a hazardous building materials assessment of RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC (subject building).

The purpose of the assessment was to check for potential hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

The work was carried out in accordance with the requirements of the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR), British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97) and the RCMP Asbestos Management Plan (AMP).

The hazardous building materials considered during this assessment included the following:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)
- Polychlorinated biphenyls (PCBs) in electrical equipment
- Mould and/or moisture-impacted building materials
- Mercury in electrical equipment
- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

The site work was conducted by Mr. Keith Irwin and Mr. Steve Chou on June 25, 2019.

1.1 UNDERSTANDING OF THE PROJECT

The following documentation related to hazardous building materials was reviewed prior to undertaking the assessment:

- Pinchin West Ltd. Report No. 13789S entitled *Hazardous Building Materials Assessment RCMP Residence 6665 Christensen Road, Anahim Lake, BC*, dated July 18, 2016, prepared for BGIS – WSI (Pinchin Report)

This documentation provided Stantec with an understanding of ACMs or hazardous building materials that were anticipated to be present at the subject building. According to the above-noted document, various LCPs, silica-containing materials and mercury-containing items were previously identified.



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Based on the limited and non-destructive nature of the Pinchin Report, and on behalf of the RCMP, PSPC requested this assessment to provide supplemental and current information as a measure of diligence in maintaining compliance with the requirements of the COHSR, BC Reg. 296/97 and the RCMP AMP as they pertain to identifying hazards associated with hazardous building materials for demolition projects.

2.0 SCOPE

The scope of work for this assessment involved the following:

- Review of existing information, including site drawings, previous assessment and/or abatement documentation and discussions with site personnel, where available
- Visual assessment of readily accessible areas for the presence of suspected hazardous building materials
- Collection of representative bulk samples from building materials suspected to contain asbestos fibres
- Collection of paint chip samples for the determination of the lead content in paint finishes
- Collection of bulk samples of painted building materials in forms presumed to be representative of waste generated during demolition, for the determination of whether waste may be considered a toxic leachate (and require special disposal)
- Submission of samples collected for laboratory analysis
- Evaluation and interpretation of field findings along with current and previous sample analytical results to develop conclusions and recommendations pertaining to hazardous building materials identified

2.1 LIMITATIONS

In preparation of this report, Stantec used professional judgment based on experience. The work was conducted in accordance with generally accepted professional standards. Stantec relied on information gathered during the site investigation and laboratory analytical reports.

This report reflects the observations made within accessible and accessed areas of the subject building, and the results of analyses performed on specific materials sampled during the current and/or previous assessments. Analytical results reflect the sampled materials at the specific sample locations.

This report has been prepared for the exclusive use of the Client for the purpose of assessing general conditions in the subject building. Any use that a third party makes of this report, or reliance on, or decisions to be made on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #4, 6665 CHRISTENSEN ROAD, ANAHIM LAKE, BC

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2.1.1 Physical and Sampling Limitations

Sampling was conducted pertaining only to suspected ACMs, suspected LCPs and bulk building materials coated with paint presumed to be destined for landfill disposal. The assessment for the presence of other hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible spaces only. Concealed spaces were inspected via existing access panels, where present. Interior and exterior finishes, solid ceilings, walls, flooring and structural elements were removed and/or penetrated in limited locations to access concealed areas.

Due to limitations on the agreed to scope of work for this project, there are specific limitations to the information that can be provided regarding each hazardous building material considered in this assessment, as outlined below.

- Building materials that may contain asbestos but were not accessible for sampling include, but are not limited to the following:
 - Attic insulation materials in locations more than one metre from the attic access hatch, potentially concealed beneath visible (fiberglass batt) insulation
 - Sub-grade materials (e.g., asbestos cement drainage pipe)
 - Woven tape inside duct connection joints
 - Mechanical (e.g., piping and ducting) insulation within wall cavities
 - Heating, ventilation and air conditioning (HVAC) units mechanical inner linings and/or insulation on the interior side of ducts.
- Samples of paint applications suspected to contain lead were collected from surfaces of major paint applications where visually different paint colours and/or types were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour were presumed to be the same, regardless of differing sub surface paints, if any.
- Sampling for analysis of lead leachate was conducted such that building material samples were collected in a form presumed to be representative of waste generated during demolition. The lead leachate samples are meant to represent the general waste that would be created when painted surfaces are demolished, without having paint removed.
 - Materials such as metal and concrete that are coated with LCPs are typically not tested for leachable lead content for the following reasons:
 - o If removed with paint in-tact, these materials are expected to be recycled, not disposed of via landfill. As such, the leachable lead content will not impact the “disposal” option, as recycling facilities will typically accept metal or concrete with lead-containing paint.
 - o If removal of the paint from the substrate is considered, the waste associated with that process (paint chips and removal substrate—sand, beads, etc.) is typically presumed to be hazardous waste (leachable for lead in excess of 5.0 mg/L) or must be tested in its actual form (once removed, with the removal substrate) to confirm.



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- o In most cases, during an initial assessment, it is not practical to try to remove sufficient paint from the substrate in order to appropriately analyze for lead leachate, as a significant area would have to be “scraped” (50–100 g of sample is required).
- Due to height restrictions and the risk of electrical shock in handling operational light fixtures, the ballasts present in the fixtures observed were inspected for PCB labels or other PCB identifiers in limited locations a detailed herein. Conclusions and recommendations regarding the presence of PCBs are based on limited observations in combination with information provided by building staff regarding lighting renovations (where requested by Stantec, based on visual observations) and are presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, will not be commented on.
 - Although they may also be present in other items in limited amounts (e.g., plastics, molded rubber parts, applied dried paints, coatings or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets), PCBs are not expected to be present in those materials in concentrations that would necessitate the requirement for PCB-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.
- Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) was conducted. The conclusions made in this report provide description(s) of the potential source(s) of moisture that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. The conclusions provided herein will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the impacted area(s).
 - This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.
- The potential presence of mercury or mercury-containing equipment in inaccessible areas or as internal parts of HVAC mechanisms or other equipment was not assessed.
 - Although limited amounts of mercury may be present in paints and adhesives, mercury is not expected to be present in those materials in concentrations that would necessitate the requirement for mercury-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.
- Investigation was limited to a visual review in accessed areas of readily accessible building-related cooling and refrigeration equipment which could contain ODSs. Testing was not conducted. Equipment or materials that were not assessed but that may contain ODSs included, but were not limited to, portable equipment (including domestic-type refrigerators and water coolers, occupant-owned refrigeration equipment), flexible plastic foam or rigid insulation foam, solvents, aerosol spray propellants and portable fire extinguishing equipment.



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- In general, the assessment for the presence of hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible accessed spaces only. Additional hazardous building materials are potentially present in inaccessible areas not assessed including, but not limited to: ceiling spaces, wall cavities and crawlspace areas not accessed, as well as buried materials.

2.1.2 Information from Previous Reports

Stantec reviewed the Pinchin Report for information purposes, and the information provided was considered in developing the current assessment and sampling plan.

Supplemental sampling of previously sampled materials was conducted in those instances where such sampling was required to bring the information into compliance with current regulations as they pertain to minimum sample numbers to appropriately characterize the sampled building material.

Where previous sampling and analytical data indicated the presence of a hazardous building material (e.g., asbestos, lead), additional sampling was not conducted, and the material was considered to be hazardous.

3.0 HAZARDOUS BUILDING MATERIALS ASSESSMENT

Building information and the results of the assessment for each of the considered hazardous building materials are provided in the following sub-sections.

Background information and health effects information, as well as information regarding regulatory framework and relevant legislation with respect to hazardous building materials are provided in Appendix A.

Floor plans showing the locations of samples collected during this assessment as well as identified hazardous building materials (where practical) are provided in Appendix B.

3.1 FACILITY DESCRIPTION

The subject building is located at 6665 Christensen Road in Anahim Lake, BC and consists of a two level modular building (basement and main floor). The reported construction date of the building was 1982. This construction time period is consistent with those dates when hazardous building materials were commonly used.

The typical structural components, mechanical components and building finishes associated with this building consist of the following:

- Foundation—concrete
- Exterior cladding—metal siding



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- Exterior cladding—cement panels
- Structural—wood framing
- Mechanical—un-insulated pipes and systems
- Mechanical—pipes and vessels insulated with fiberglass
- Heating, ventilation and air conditioning (HVAC)—propane forced air furnace with metal ducted supply
- Interior walls—combination of finished gypsum and unfinished gypsum
- Interior ceilings—gypsum finished with texture coat
- Interior flooring—combination of bare concrete, vinyl sheet flooring, laminate flooring and carpeting
- Roofing—Sheet metal panels

3.2 ASBESTOS

A summary list of the bulk samples collected by Stantec, including a description of the material, sampling location and laboratory test results is provided in Appendix C. Copies of the Laboratory Certificates of Analysis for bulk samples analyzed are provided in Appendix D.

Based on our observations of building construction (estimated vintage of interior finishes and uniformity of building material use) and on our interpretations of the analytical results of suspected ACMs collected through this assessment as well as the previous documentation reviewed as outlined herein, the materials presented in the table in Appendix E were identified as ACMs. The following information is included for each identified ACM:

- Type of material that contains asbestos
- Location/approximate extent of the ACM within the building
- Asbestos type and percentage identified
- Friability
- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.

3.2.1 Methodology

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs are materials that by the nature of their manufacturing and/or construction do not readily allow the release of asbestos fibres. Some non-friable materials such as plaster, drywall joint compound and ceiling tiles that are considered to be non-friable in an undisturbed state can more readily release fibres when damaged or disturbed.



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The presence of asbestos in federal workplaces and pertaining to federally regulated workers is governed by the COHSR. According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

The presence of asbestos in the workplace in British Columbia pertaining to provincially regulated workers is governed by BC Reg. 296/97. According to the current version of BC Reg. 296/97, ACM means:

- Any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

As both federally regulated workers and provincially regulated workers (e.g., contractors) are expected to carry out work activities within the subject building, and as the provincial regulations have a more stringent definition of ACM, and generally include the requirements noted in the COHSR, this assessment was conducted to meet the requirements of BC Reg. 296/97.

Based on these criteria, a visual assessment of accessible areas was undertaken to check for the presence of suspected ACMs. Locations to collect discrete bulk samples of suspected ACMs were identified and samples of representative materials were then collected at these locations.

Multiple samples were collected from each “homogenous application” of observed suspected ACMs (materials suspected to contain asbestos that are uniform in material type, colour, texture application and estimated installation date) and submitted to EMSL Canada Inc. (EMSL) in Mississauga, ON for analysis of asbestos content using polarized light microscopy (PLM) with dispersion staining, in accordance with the United States Environmental Protection Agency (USEPA) 600/R-93/116 method.

The number of samples to be collected for each homogenous application of a suspected ACM was based on accepted occupational hygiene standards and protocols, on the recommendations provided in the 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos (Asbestos Guide)*, and on the assessor’s experience and understanding of the consistency of that building material’s application.

EMSL’s analytical laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

3.2.1.1 Potential Asbestos-Containing Vermiculite Insulation

As part of the assessment, Stantec assessed the subject building for areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of and assessing attic spaces, floor cavities and masonry block or brick walls, which are typical areas where vermiculite is found. Where masonry or brick walls were observed, destructive assessment (drilling) was conducted to assess the cavity for the presence of vermiculite, unless penetrations, breaches and/or sufficient other openings were present.



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3.2.1.2 Sample Results Interpretation

When asbestos is detected in concentrations greater than 0.5% percent in one of the samples within a set that was collected to represent a “homogenous application” of a particular material (or detected in any concentration, in a set of samples collected for applications of vermiculite), the entire sample set, and the entire application of that material is then considered to be an ACM.

In addition to the above, a “positive stop” option was used during the laboratory analysis of the building material samples submitted for asbestos analysis. The “positive stop” option is utilized by the laboratory when asbestos is detected at a concentration of greater than half of one percent in one of the samples within a set that was collected to represent a “homogenous application” of that material (or in any concentration, for vermiculite). At this point, further analysis of subsequent samples within the set is deemed to be unnecessary (as the entire set will be considered an ACM, per above), and the remainder of the samples within the set are not analyzed.

3.2.1.3 Asbestos Sampling Quality Assurance/Quality Control

Sampling activities pertaining to asbestos were conducted in accordance with Stantec’s safe work practices, which take into account current provincial and/or territorial regulations pertaining to such work (i.e., sampling procedures, required number of samples and laboratory analytical procedures).

Representative bulk samples were collected of accessible suspect ACMs in sufficient quantities for laboratory analysis. Suspect ACM samples were sealed in polyethylene zip-lock bags labeled with the sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

All sample bags were compiled in order and placed into a single container accompanied with a chain of custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.

3.2.1.4 Assessment of Material Condition

A visual assessment of the condition and accessibility was also completed for each occurrence of suspect ACM. A description of the criteria used in evaluating the condition, accessibility and exposure risk of ACMs is provided below. The criteria are generally based on the June 5, 2017 Public Services and Procurement Canada “Asbestos Management Standard”, and industry standards of practice.

Friable ACMs other than Mechanical Insulation

In evaluating the condition of friable ACMs other than mechanical insulation (e.g., spray-applied as fireproofing, texture, decorative or acoustic finishes), the following criteria apply:



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Good

- Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the Assessor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes un-encapsulated or un-painted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor

- Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the Assessor's assessment form.

Fair condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray-applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes, which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of building with ACM, regardless of the reported condition.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment, etc.) the following criteria are used:

Good

- Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

Fair

- Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.



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Poor

- Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product, and evaluated per the above criteria.

3.2.2 Findings

No ACMs were identified in the Pinchin Report.

Asbestos was detected through laboratory analysis of bulk samples of the following materials that were collected as part of this assessment:

- Vinyl sheet flooring (various styles—concealed layers)
- Window pane caulking
- Roof vent mastic
- Exterior cement panel

The ACMs that were accessible and observed were noted to be in good condition.

3.2.2.1 Non-Asbestos-Containing Materials

The bulk samples collected during this assessment for which no asbestos was detected through laboratory analysis can be seen in the table in Appendix C.

Refer to the documentation in Section 1.1 for materials that have been previously sampled and identified as non-asbestos-containing through sampling and laboratory analysis.



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Materials Not Suspected to Contain Asbestos

Various materials within the subject building were observed and/or presumed to be present, which are not suspected to contain asbestos. Typical materials of this nature that were observed and are not considered suspected ACMs, include but are not limited to the following:

- Materials comprised of glass, such as:
 - Window panes
 - Pre-formed fibreglass insulation on mechanical pipes or vessels (potentially excluding attached wrap layers)
 - Fibreglass batt insulation in wall, floor or ceiling cavities, or used in other applications (potentially excluding attached paper backing)
 - Lights and lighting components
- Materials comprised of metal, such as:
 - Flashings on siding or roofs
 - Electrical wiring (excluding wrap) and conduit
 - Plumbing components
 - Components of doors, windows and associated trim
 - Structural components
 - Ducting
 - Lights and lighting components
 - Roofing and roof vents
- Materials comprised of wood, such as:
 - Wall framing
 - Components of doors, windows and associated trim
 - Structural components
 - Handrails
- Other materials generally not suspected to contain asbestos:
 - Gypsum board/"drywall" (excluding suspected ACM finishing compounds)
 - Poured concrete items such as foundations, floors, pads or structural beams (excluding suspected ACM finishing compounds)
 - Silicone-based clear caulking or sealants

3.2.2.2 Potential for Vermiculite Insulation

As part of the assessment, Stantec assessed the subject building for areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of and assessing attic spaces, floor cavities and masonry block or brick walls, which are typical areas where vermiculite is found. No vermiculite or locations that may potentially contain vermiculite (that could not otherwise be assessed) were observed.



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3.2.3 Recommendations

Based on the visual assessment, results of laboratory analyses and review of previous documentation, Stantec recommends the following with regards to meeting the requirements of the COHSR and BC Reg. 296/97 as they pertain managing asbestos during demolition projects:

- Identified ACMs should be removed by appropriately trained personnel (e.g., asbestos abatement contractor personnel), in accordance with the requirements of the COHSR, BC Reg. 296/97 and the Asbestos Guide, and prior to the initiation of project work that will disturb them.
- Should a material suspected to contain asbestos fibres become uncovered during demolition activities, all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if asbestos fibres are present. Confirmed ACMs should be handled in accordance with applicable guidelines and regulations.
- Suspected ACMs deemed visually similar to the ACMs identified in this report should be considered asbestos-containing and handled as such, unless proven otherwise, through analytical testing.
- Asbestos-containing cement pipe may be present below ground—caution should be used at any time when excavation is required.
- Ensure asbestos containing waste is handled, stored, transported and disposed of in accordance with the requirements of the Federal Transportation of Dangerous Goods Regulation and the British Columbia Hazardous Waste Regulation (BC Reg. 63/88).
- If the building is not demolished:
 - Due to the confirmed presence of asbestos within the subject building, the RCMP AMP should be developed and implemented for the subject building.
 - Identified ACMs in good condition can be managed in place, upon development and implementation of the RCMP AMP

3.3 LEAD

A summary list of the samples collected including a description of the samples, sampling locations and laboratory analytical results is provided in Appendix F. Copies of the Laboratory Certificates of Analysis for paint chip samples analyzed are included in Appendix G.

Based on our observations and interpretations of suspected LCP sample analytical results, as well as the previous documentation reviewed as outlined herein, the paints presented in the table in Appendix H were identified as LCPs.

The following information is included for each identified LCP:

- Paint colour
- Substrate to which paint is applied
- Location/approximate extent of the LCP within the building
- Lead content of paint



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- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.

3.3.1 Methodology

A visual assessment of accessible areas was undertaken in order to check for the presence of materials that may contain lead. These materials included paint applications, wiring and plumbing, batteries, etc.

3.3.1.1 Lead in Paint

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
 - Exposure limit indicated in both the COHSR and BC Reg. 296/97 is 0.05 mg/m³
 - Potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
 - Any risk assessment should include for the presence of high risk individuals within the workplace

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

When reviewing the above, “high risk” individuals are not expected to be present in the workplace associated with this building during building material alteration activities (i.e., demolition) that would create significant disturbance to paint with such individuals present. As such, paints containing 600 ppm lead or more will be considered “lead-containing” for the purpose of this report, such that appropriate risk assessments can be completed for demolition planning. However, information regarding the lead content of all paints tested is provided herein, for reference and risk assessment should the consideration of high risk individuals be necessary, based on the requirements of a particular situation.



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Based on the above, samples of potential LCPs were collected from major paint applications, in sufficient quantity to conduct analysis for total lead content. The sampling of paint applications involved the collection of paint chip samples of paint layers to the substrate, where possible. A minimum volume of 5 cc or a half teaspoon of paint chips was typically collected. Wherever necessary and possible, paint was separated from any backing material such as paper, concrete or wood and placed in a sealed, clearly labelled plastic bag.

Samples collected were submitted to EMSL for analysis of total lead content using EPA Method SW 846 3050B*/7000B. EMSL's analytical laboratory is also accredited by the AIHA Environmental Lead Laboratory Approval Program (ELLAP).

Welding, Burning or Torch Cutting

Although a concentration of 600 ppm lead has been used to define paint coatings as LCPs, it should be noted that this is related to painted surfaces and the determination of appropriate provisions to protect occupants and employees from exposure to elevated concentrations of lead during typical operations and maintenance or simple renovation. This does not include painted metal surfaces that are to be welded, burned or torch-cut.

Using an arc welder or oxyacetylene torch on steel that is coated with lead-containing paint can create hazardous lead fumes and is prohibited by section 12.115 of BC Reg. 296/97.

Regulatory excerpt: **12.115 Coatings on metals**

A coating on metal which could emit harmful contaminants (such as lead, chromium, organic materials, or toxic combustion products) must be removed from the base metal, whenever practicable, before welding or cutting begins.

In addition, the following information is provided in the Lead Guideline:

- Welding or torch cutting of paints or coatings on metal can create very high concentrations of airborne lead fumes. Torch cutting structural steel, coated with paint containing as little as 130 mg/kg (equivalent to ppm) lead, can release airborne levels of lead as high as 0.8 mg/m³ (16 times the exposure limit).

Given this information and that the analytical detection limit for lead paint analysis is approximately 80–90 ppm (not significantly different than 130 ppm, which, per above, may release airborne lead levels 16 times the exposure limit), any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless a project-specific or tasks-specific risk assessment and safe work practices are developed by a qualified person.



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3.3.1.2 Building Materials—Leachable Lead Content

According to BC Reg. 63/88, lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 mg/L lead.

Based on the above, bulk samples of painted building materials that would be expected to be disposed-of via landfill were collected in a form presumed to be representative of waste generated during demolition, each sample containing over 50 g in weight. The samples were submitted to EMSL in Cinnaminson, New Jersey.

Upon receipt and review of paint chip sample analytical results for total lead content, leachate analysis of building materials coated with identified LCPs was requested. Leachate analysis was conducted by EMSL through toxicity characteristic leaching procedure, using US EPA Method SW846, 1311/7420.

3.3.1.3 Assessment of Paint Condition

The criteria for condition evaluation pertaining to LCPs described herein are generally based on the United States Housing and Urban Development (HUD) 2012 *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

When evaluating the condition of LCPs, an attempt should be made to determine whether the deterioration is due to a moisture problem or some other existing building deficiency.

“**Poor**” surfaces are considered to be a hazard and should be corrected. “**Fair**” surfaces should be repaired but are not yet considered to be a hazard; if not repaired, they should be monitored frequently. “**Good/intact**” surfaces should be monitored to ensure that they remain in a nonhazardous condition.

In addition, the presence of paint debris must be considered in evaluating condition. Given the variety of paint uses, there are many applications that can have a tendency for the paint to “wear” from the surface slowly, over an extended period of time. Conditions where paint has worn from a surface are worth noting for maintenance discussions (i.e., related to re-coating the surface should, for example, the coating provide weather protection), however, in the absence of loose paint chip debris/dust, such conditions would not represent a potential exposure situation related to lead.

The condition evaluation criteria for LCPs are summarized in Table 1, below.

Table 1 Lead-Containing Paint Condition Categories

Type of Building Component ¹	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	Fair ²	Poor ³
Exterior components with large surface areas.	Entire surface is intact.	Less than or equal to 10 square feet	More than 10 square feet
Interior components with large surface areas (walls, ceilings, floors, doors.	Entire surface is intact.	Less than or equal to 2 square feet	More than 2 square feet



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Table 1 Lead-Containing Paint Condition Categories

Type of Building Component ¹	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	Fair ²	Poor ³
Interior and exterior components with small surface areas (window sills, baseboards, soffits, trim).	Entire surface is intact.	Less than or equal to 10% of the total surface area of the component.	More than 10% of the total surface area of the component
<p>NOTES:</p> <p>¹ Building component in this table refers to each individual component or side of building, not the combined surface area of all similar components in a room (e.g., a wall with 1 square foot of deteriorated paint is in “fair” condition, even if the other three walls in a room are intact).</p> <p>² Surfaces in “fair” condition should be repaired and/or monitored but are not considered to be “lead-containing paint hazards”.</p> <p>³ Surfaces in “poor” condition are considered to be “lead-containing paint hazards” and should be addressed through abatement or interim controls.</p>			

3.3.2 Findings

Lead is expected to be present in the following within the subject building:

- Older electrical wiring materials and sheathing
- Solder used on domestic water lines
- Solder used in bell fittings for cast iron pipes and in electrical equipment
- Vent and pipe flashings

3.3.2.1 Lead in Paint

A summary of the LCPs that were identified within the subject building as indicated in the Pinchin Report is provided below, complete with notes regarding current observations, where applicable:

- Light yellow on exterior metal, presumed to refer to metal siding (observed by Stantec to remain)
 - Confirmed by the results for a sample collected as part of this assessment
- Orange on wood exterior of doors and door frames (observed by Stantec to remain)

Additional information regarding extent and current condition of identified LCPs, including photographs (where available) is provided in Appendix H.

Greater than 600 ppm lead was detected through laboratory analysis of chip samples of the following additional paints:

- Red coloured paint on metal roofing
- Tan coloured paint on metal canopy roofing

Additional information regarding extent and current condition of identified LCPs, including photographs (where available) is provided in Appendix H.



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Building Materials—Leachable Lead Content

The majority of building materials coated with identified LCPs are not anticipated to be disposed of via landfill (e.g., metal).

A bulk sample of the exterior wood door and door frame material coated with orange LCP, which is expected to be disposed of via landfill was collected in a form presumed to be representative of waste generated during demolition and was submitted to EMSL for analysis of leachable lead content.

Analytical results indicate that waste from this material does NOT contain lead in a dispersible form such that its leachate contains greater than 5.0 mg/L lead.

A copy of the certificate of analysis provided by EMSL for the leachate sample submitted is also included in Appendix I.

3.3.3 Recommendations

When paints or other lead-containing equipment/materials within the subject building are to be disturbed and/or removed, including in instances where paint chip debris is removed (which should be completed during the demolition project), ensure compliance with the following:

- Exposure protection requirements of the COHSR and BC Reg. 296/97, including the provisions of the Lead Guideline
- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

Corrective action or remedial work on paint applications containing any concentration of lead should be undertaken in a manner so as to avoid generating fine particulate matter or dust (i.e., avoid sanding). Airborne lead dust or fumes should not exceed the COHSR and BC Reg. 296/97 eight-hour occupational exposure limit (OEL) of 0.05 mg/m³ during the removal of paints and products containing any concentration of lead. The use of personal protective equipment is recommended to reduce the potential for over-exposure to lead dust. This can be achieved by:

- Providing workers with protective clothing and personal protective equipment or devices as necessary to protect them against the hazards to which the worker may be exposed
- Providing workers with adequate and training in the care and use of clothing, equipment or device before wearing or using such items
- Wetting the surface of the materials to prevent dust emissions
- Providing workers with washing facilities with clean water, soap and individual towels to properly wash prior to exiting the work area



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To avoid the inhalation of lead, it is essential to have the following control methods in place:

- Engineering controls
- Work practices and hygiene practices
- Respirators and personal protective equipment
- Training

The work tasks required and the ways in which lead-containing materials (including paints) will be impacted will determine the appropriate respirators, measures and procedures that should be followed to protect workers from lead exposure.

If demolition does not proceed and the building is to be re-occupied, then lead-containing materials, including paints, can be managed in place, where in good condition.

3.3.3.1 Welding, Burning or Torch Cutting

Any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless project-specific or tasks-specific risk assessments and safe work practices are developed by a qualified person. Development of such risk assessments and work practices will involve consideration of information including, but not limited to, the following:

- Composition of the material to be disturbed
- Lead content of the paint coating
- Methods and tools to be used, including exhaust ventilation
- Duration of the work and/or work shift
- Training of the personnel conducting the task
- Respiratory protection program in effect

3.4 POLYCHLORINATED BIPHENYLS

3.4.1 Methodology

A visual review and/or a review of estimated/reported construction dates to assess the potential presence of PCBs in electrical equipment was completed. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic systems, compressors, switchgear and capacitors.

No sampling of dielectric fluids was undertaken as part of this assessment.

3.4.2 Findings

No suspected PCB-containing equipment was observed.



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3.4.3 Recommendations

Should a material suspected to contain PCBs become uncovered during demolition activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.

PCB-containing items identified for removal and disposal should be handled, transported, stored and disposed of in accordance with the following:

- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation
- Federal PCB Regulations (SOR/2008-273)

If the building is not demolished, fluorescent lamp ballasts that may contain PCBs can be managed in place, where these items are operating and in good condition. No further action is currently required until such time that renovation or demolition activities are to be conducted, or until 2025, when PCB-containing ballasts will require removal and disposal.

3.5 MOULD

3.5.1 Methodology

The presence of suspect visible mould was assessed through visual observations. Material observed with dark-coloured staining and/or a textured and discoloured appearance is described as “suspected mould”. Mould identified visually is defined as “suspected mould” unless it is confirmed as mould by laboratory analysis.

The scope of work and procedures utilized for the visual assessment were based on the recommendations for such provided in the documents listed below:

- Standard Construction Document CCA 82 *Mould Guidelines for the Canadian Construction Industry*, Canadian Construction Association, 2004 (referred to as CCA 82)
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008 (referred to as the NYC Guidelines)
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health, 2004 (referred to as the Health Canada Guide)
- *Indoor Air Quality in Office Buildings: A Technical Guide*, Report of the Federal-Provincial Advisory Committee on Environmental and Occupational Health, 1995 (referred to as the IAQ Guide)
- *Bioaerosols: Assessment and Control*, American Conference of Governmental Industrial Hygienists (ACGIH), 1999 (referred to as the ACGIH Report)
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA, Second Edition 2005



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3.5.2 Findings

Suspect mould or moisture-impacted building materials were not observed at the time of the assessment.

3.5.3 Recommendations

As no mould and/or moisture-impacted building materials were observed within the subject building during the assessment, no recommendations have been provided.

3.6 MERCURY

3.6.1 Methodology

An assessment for equipment that is likely to contain mercury (such as thermostats, thermometers and fluorescent light tubes) was completed visually. Information on the type of equipment (i.e., gauges, switches, batteries, thermometers, etc.), model and serial numbers and quantities was recorded, where such information was available.

3.6.2 Findings

Mercury vapour is present in the compact fluorescent light bulbs within approximately 10 light fixtures observed throughout.

One mercury-containing thermostat was identified in the living room on the wall opposite to the front door, as indicated on the floor plan drawing in Appendix B.

3.6.3 Recommendations

Complete removal of mercury-containing equipment is required prior to demolition activities that may disturb the equipment. When mercury-containing items (e.g., compact fluorescent light bulbs and thermostats) are removed, ensure all mercury waste is handled, stored transported and disposed of in accordance with the requirements the following:

- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that workers exposure levels do not exceed the occupational exposure limit of 0.025 mg/m³ as per the COHSR and BC Reg. 296/97. This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.

If the building is not demolished, identified mercury-containing items can be managed in place, therefore no further action is recommended at this time. Mercury vapour within light fixtures poses no risk to workers or occupants provided the mercury containers remain intact and undisturbed.



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3.7 OZONE DEPLETING SUBSTANCES

3.7.1 Methodology

An assessment for equipment or systems likely to contain ODSs (such as refrigeration/cooling equipment or fire suppression systems) was completed visually. Information on the type of equipment, manufacturer and type and quantity of refrigerants was recorded, where available.

3.7.2 Findings

Building related cooling, refrigeration or fire suppression equipment suspected to be ODS-containing was not observed.

3.7.3 Recommendations

As no suspect ODS-containing equipment was observed within the subject building during the assessment, no recommendations have been provided.

3.8 SILICA

3.8.1 Methodology

An assessment for the presence of silica was conducted visually. The presence of typical silica-containing building materials such as concrete, masonry, stone, terrazzo, refractory brick, gypsum, ceramic tile, ceiling tile and other items, was noted.

3.8.2 Findings

Silica is expected to be present in the following, which were observed in various locations throughout:

- Cement products such as:
 - Concrete—foundations, floors
 - Panels
- Gypsum and associated wall/ceiling finish materials



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3.8.3 Recommendations

When silica-containing materials within the subject building are to be disturbed and/or removed (e.g., coring through concrete slabs, demolition of masonry or concrete units), ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by the COHSR and BC Reg. 296/97 (cristobalite and quartz—each 0.025 mg/m³). This would include, but not be limited to, the following:

- Providing workers with respiratory protection
- Wetting the surface of the materials, and use of water or dust suppressing agents to prevent dust emissions
- Providing workers with facilities to properly wash prior to exiting the work area

If the subject building is not demolished, silica-containing materials can be managed in place; therefore, no further action is recommended at this time.



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4.0 CLOSURE

This report has been prepared for the sole benefit of the PSPC on behalf of the RCMP. Any use which a third party makes of this report, or any reliance on decisions based on it, is the responsibility of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professionals and technical staff in accordance with generally accepted engineering, scientific and occupational health and safety practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgment of Stantec Consulting Ltd. based on the data obtained from the work. The conclusions are based on the site conditions encountered by Stantec Consulting Ltd. at the time the work was performed at the specific assessment and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on building construction and conditions, weather, building usage and other factors. Due to the nature of the investigation and the limited data available, Stantec Consulting Ltd. cannot warrant against undiscovered environmental or health and safety liabilities.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

We trust that the above is satisfactory for your purposes at this time. Should you have any questions or concerns, or require additional information, please do not hesitate to contact the Stantec Project Manager at your convenience.

Regards,

Stantec Consulting Ltd.



APPENDIX A

**Hazardous Building Materials Background Information,
Health Effects Information and Regulatory Framework**

Appendix A HAZARDOUS BUILDING MATERIALS BACKGROUND INFORMATION, HEALTH EFFECTS INFORMATION AND REGULATORY FRAMEWORK

A.1 ASBESTOS

Asbestos is a naturally occurring form of fibrous silicate that is durable and flexible; has high thermal and tensile strength; is resistant to heat, chemical corrosion and friction; does not conduct electricity; and insulates well against condensation, heat and noise. Due to these properties, asbestos was used in over 3,000 commercial products, and it is estimated that approximately 70% of the asbestos that was used in North America was used in building materials.

In buildings, and among many other potential asbestos-containing materials, asbestos is typically found in plaster, mechanical insulation, gaskets, thermal insulation on pipes, refractory material, roofing felts, floor tiles, ceiling tiles and parging, heat resistant panels, incandescent light fixture reflector plates, and any other material requiring a high degree of durability or thermal resistance.

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs or “manufactured products” are materials that by the nature of their manufacturing/construction do not readily allow the release of asbestos fibres. These materials should not be cut or shaped with power tools, since this procedure may allow for the release of the asbestos fibres. Some materials or “manufactured products”, such as plaster, drywall and ceiling tiles that are considered to be non-friable in an undisturbed state can become friable when damaged or disturbed.

The common use of friable (breakable by hand) asbestos-containing materials (ACMs) in construction ceased voluntarily in the mid-1970s; however, the spray application of asbestos-containing fireproofing was not prohibited until 1986. A material known as vermiculite, which was commonly used for insulation within attics, floor spaces or within masonry block wall systems and may be contaminated with asbestos due to its production processes, was used into the mid-1990s. In addition, asbestos cement products and roofing products (e.g., sealants) currently used in the construction of buildings may still contain asbestos.

A.1.1 Health Effects

Undisturbed asbestos within building materials poses no health risks. Asbestos poses a risk when building materials containing asbestos are impacted, or disturbed, thereby releasing the asbestos fibres into the air.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

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Asbestos-related diseases are caused when suspended airborne asbestos fibres are inhaled and the fibres settle into various regions of the lungs and remain for extended periods. Once embedded in the lungs the asbestos fibres cause scarring within the lung tissue, ultimately leading to impaired lung function (asbestosis) and/or various cancers (lung cancer; mesothelioma). These asbestos-related diseases are irreversible and fatal. The risk of lung-related cancers is increased in individuals who smoke.

These asbestos-related diseases most often occur in individuals who have been exposed to high concentrations of airborne asbestos over a long period of time, though mesothelioma has been found in individuals with short-term exposures. Symptoms or the development of these asbestos-related diseases usually occur 10 to 25 years after exposure.

A.1.2 Regulatory Framework

Asbestos is included in the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR) and British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97). Included in both regulatory instruments are provisions for the general duties of employers, requirements for health assessments, training and project notification. There are also sections that will also apply to abatement projects, depending on the work procedures and specific work site hazards.

The COHSR and BC Reg. 296/97 also established an 8-hour occupational exposure limit (OEL) for asbestos (all forms) to be 0.1 fibre/cubic centimetre.

The 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos* (Asbestos Guide) is used by Occupational Health and Safety officers as a guide when reviewing abatement work practices and employer codes of practice, and generally meets the requirements of the COHSR.

The Asbestos Guide also provides significant additional background information pertaining to asbestos, along with details on health effects and other applicable legislation within the province of British Columbia (e.g., the federal *Hazardous Products Act*, the BC Building Code and waste disposal regulations).

According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

According to the current version of BC Reg. 296/97, asbestos-containing material (ACM) means any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

Disposal of asbestos waste is governed by the British Columbia Hazardous Waste Regulation (BC Reg. 63/88). The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of asbestos waste in British Columbia. In general, and for transportation and disposal, the waste must be placed in a double sealed container, properly labeled, free of cuts, tears or punctures and disposed of at a licensed waste station which has been properly notified of the presence of asbestos waste.



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A.2 LEAD

Lead may be used in its pure metallic form or combined chemically with other elements to form lead compounds. Metallic lead is used to make products such as electric storage batteries, ammunition, lead solder, radiation shields, pipes, and sheaths for electric cables. Metallic lead is sometimes combined with other metals such as copper, tin and antimony as lead alloys for use in the manufacture of a variety of metal products.

Organic lead compounds contain a lead atom covalently bonded to carbon. Common examples of organic lead compounds include lead “soaps” such as lead oleates, high pressure lubricants, and anti-knock agents in gasoline.

Inorganic lead compounds (or lead salts) result when lead is combined with an element other than carbon. Examples are lead oxide, lead chromate, lead carbonate and lead nitrate. Inorganic lead compounds may occur as solids or in solutions, and are used in insecticides, pigments, paints, frits, glasses, plastics, and rubber compounds.

Lead is commonly found in buildings in items such as the solder used on copper domestic pipes; the caulking on bell fittings of cast iron drainage pipes; electrical equipment/wiring; batteries (e.g., emergency exit signage batteries); lead sheeting (e.g., x-ray rooms); vent and pipe flashings; and paints and ceramic tile glazes.

A.2.1 Health Effects

Elemental lead and inorganic lead compounds are absorbed through ingestion or inhalation and can incorporate into the bone marrow, nerve tissue, brain, and kidneys. In children, symptoms of lead poisoning can include headaches, irritability, abdominal pain, vomiting, anemia, weight loss, poor attention span, noticeable learning difficulty, slowed speech development, and hyperactivity. In adults, symptoms of lead poisoning can include pain, numbness or tingling of the extremities, muscular weakness, headache, abdominal pain, memory loss, unsteady gait, pale skin, weight loss, vomiting, irritability, and anemia. Although adults are susceptible to the toxic effects of lead, children are at high risk due to the nature of a child's activities that involve the introduction of non-food items into their bodies.

Excessive airborne lead and surface contamination can be transferred to employees' hands and may result in lead ingestion. Therefore, work practices intended to minimize surface lead concentrations, such as frequent cleaning of work surfaces should be included in an overall lead exposure control plan.

A.2.2 Regulatory Framework

In the past, the United States Department of Housing and Urban Development (HUD) set a criteria of lead-based paint as 0.5% lead (by weight) or 5,000 parts per million (ppm) for evaluating whether lead is a hazard in a residential setting.



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In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm (2005) to 90 ppm (2010). However, it is important to note that this regulation does not comment on the potential occupational exposure if the material is disturbed.

Under the COHSR and BC Reg. 296/97, a regulatory limit has been established for occupational exposure to airborne lead that may be present in a workplace. The OEL for airborne lead dust or fumes per both regulatory instruments should not exceed the TWA value of 0.05 milligram per cubic metre of air (mg/m³). The OEL represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
 - This potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
 - Any risk assessment should include for the presence of high risk individuals within the workplace.

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

Work procedures that can be used to assist in protecting workers and adjacent work areas from exposure to lead during disturbance activities can also be found in this document.

According to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88), lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 milligrams per litre (mg/L) lead.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of lead waste in British Columbia.



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A.3 POLYCHLORINATED BIPHENYLS (PCBS)

PCBs are man-made toxic chemicals whose physical and chemical properties produce the following attributes: fire resistance, low electrical conductivity, high resistance to thermal breakdown, high chemical stability and resistance to oxidants and other chemical.

PCBs were used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. In fluorescent fixtures, PCBs were usually found within the small capacitors inside the ballast that controls the lamp. The Federal Chlorobiphenyls Regulation, SOR/91-152, prohibited the use of PCBs in electrical equipment manufactured after July 1, 1980. Stocks of items such as ballasts containing PCBs may have been used into the early or mid-1980s.

A.3.1 Health Effects

PCBs are insoluble in water; however, they readily dissolve in fats and other organic compounds. It is these attributes and fat-solubility that allow PCBs to persist in the environment and bio-accumulate in humans and animals. Exposure to PCBs can affect the immune system, reproductive system, nervous system and endocrine system. In humans, PCBs are potentially cancer-causing.

A.3.2 Regulatory Framework

As of September 5, 2008, under subsection 93(1) of the *Canadian Environmental Protection Act*, (CEPA), Federal PCB regulations were published by the Canada Gazette Part II (SOR/2008-273) that imposed specific deadlines for the elimination of all PCBs in concentrations at or above 50 milligrams/kilogram (mg/kg). This regulation required the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limited the period of time PCB materials could be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well as improved practices for the management of PCBs that remain in use (i.e., those with PCB concentrations less than 50 mg/kg) until their eventual elimination.

Under SOR/2008-273, the following end-of-use dates were established:

- December 31, 2009
 - Equipment containing PCBs in a concentration of 500 mg/kg or more
 - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in sensitive locations (i.e., drinking-water treatment plant, food or feed processing plant, child care facility, preschool, primary or secondary school, hospital, or senior citizen care facility or the property on which the plant or facility is located, within 100 m of it)
- December 31, 2014
 - Certain specified equipment not replaced by the 2009 deadline due to technical constraints for engineered-to-order equipment or if the facility is scheduled for permanent closure before 2014
- December 31, 2025
 - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in non-sensitive locations



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In addition to the above, a maximum storage period of one year is allowed for PCBs and products that contain PCBs at each of the following non-sensitive locations:

- Owner's PCB storage site
- PCB storage site of an authorized facility for decontamination or of an authorized transfer site
- PCB storage site of an authorized destruction facility

For British Columbia, according to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88):

- PCB wastes are defined as: PCB liquid, PCB solid, and PCB equipment that have been taken out of service for the purpose of treatment, recycling, reuse, or disposal, or for the purpose of storage prior to treatment, recycling, reuse, or disposal
 - "PCB liquid" means any liquid containing more than 50 parts per million (ppm) by weight of PCB
 - "PCB solid" means any material or substance other than PCB liquid that contains or is contaminated with chlorobiphenyls at a concentration greater than 50 ppm by weight of chlorobiphenyls
 - "PCB Equipment" means any manufactured item that contains or is contaminated with a PCB liquid or PCB solid is PCB equipment. While items of PCB equipment are often electrical components such as transformers or capacitors, the definition includes other items such as contaminated drums and containers.
 - o NOTE: An item of equipment from which PCB liquid or PCB solid has been removed is still PCB equipment until it has been decontaminated by an approved protocol. This is because the removal is a treatment process and the equipment, until decontaminated, is a residue from the treatment

In British Columbia, PCB equipment becomes PCB wastes as soon as it is removed from service. This is the case even if the intent is to treat, recycle, or reuse the equipment.

When PCB wastes are stored in British Columbia, the full requirements of BC Reg. 63/88 apply to:

- 1.0 kg or more of pure PCB
- 100 L or more of any liquid containing more than 50 ppm of PCB
- 100 kg or more of any material other than a liquid, contaminated with more than 50 ppm of PCB

These amounts are the total of all amounts at a single location owned or controlled by the same person. They include PCB equipment. BC Reg. 63/88 also provides packaging requirements for storage, labeling requirements, waste destruction requirements, and references SOR/2008-273, indicating

NOTE: The federal PCB Regulations also apply to stored PCBs and have strict maximum allowable storage periods which would prohibit provisions in [BC Reg 63/88] related to storage prior to 1 April 1992. In event of a conflict between [BC Reg 63/88] and [SOR/2008-273], follow [SOR/2008-273].

The Federal Transportation of Dangerous Goods Regulation sets out the requirements for the proper transport of PCB waste across provincial boundaries.



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In British Columbia, a manifest issued by the Ministry of Environment (or equivalent federal document) must be used for hazardous wastes shipped from sites in British Columbia. A manifest must be used to transport:

- 5 kg or more of PCB solids
- 5 L or more of PCB liquids
- An amount of a PCB solid or PCB liquid containing more than 500 g of PCB within BC
- 500 g or more of solids, liquids, or mixtures of these containing 50 mg/kg of PCB outside of BC

A.4 MOULD

Mould can be found everywhere in the outside environment—on plants, in soil and on dead and decaying matter (i.e., dead leaves). Mould requires two main conditions in order to grow—a source of food (a substrate typically comprised of cellulose) and water. Sources of food for mould are plentiful in outdoor and indoor environments; however, it is the presence of water in an indoor environment that will determine mould growth. The source of water can be a result of a water pipe leak or even excess condensation. Thus, the key to controlling mould indoors is to control the presence of water.

The removal of building materials impacted by mould growth may require workers with specific training and experience using work procedures that have been developed to protect workers and work areas from exposure to elevated concentrations of airborne mould.

A.4.1 Health Effects

There are a number of documented cases of health problems related to exposure to indoor fungi. Both high-level, short-term exposures and lower-level, long-term exposures can result in illness. The most common symptoms from exposure to mould in indoor environments are runny nose, eye irritation, cough, congestion, aggravation of asthma, headache, flu-like symptoms, fatigue, and skin rash. People with suppressed immune systems may be susceptible to fungal infections as a result of exposure to indoor moulds.

People who are exposed to mould growth on building materials will not necessarily exhibit adverse health effects. However, the mould must still be removed. Humans are at risk from indoor mould when fungal spores, fragments or metabolites are released into the air and inhaled or physically contacted (dermal exposure).

Not everyone experiences allergic reaction; the susceptibility to exposure varies with the individual's genetic predisposition, age, state of health, and concurrent exposures. For these reasons, and because the measurement of exposure is not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to establish "safe" or "unsafe" levels of exposure. However, federal and provincial policies have been written to minimize mould exposure and the elimination of mould indoors.



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A.4.2 Susceptibility to Mould Exposure

People's reaction to mould exposure is quite varied, and although anyone can be affected, some people may be more susceptible and at greater risk, including:

- Infants and children
- Elderly
- Pregnant women
- Individuals with respiratory conditions or allergies and asthma
- Persons with weakened immune system (e.g., chemotherapy patients, organ or bone marrow transplant recipients, and people with HIV infections or autoimmune diseases)

People with specific health concerns should consult their doctor if concerned about mould exposure. Symptoms that may appear to stem from mould exposure may be due to other causes such as bacterial or viral infections or other allergies.

A.4.3 Regulatory Framework

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).

Although there are currently no regulations in Canada pertaining specifically to mould in buildings, occupational health and safety regulations typically require employers to take every precaution reasonable in the circumstances for the protection of workers. For example, BC Reg. 296/97 indicates the following:

- Section 4.79(1):
 - Employer must ensure that the indoor air quality is investigated when
 - a) complaints are reported
- Section 4.79(2):
 - Air quality investigation must include
 - c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints

The WorkSafeBC Guideline for Part 4 of BC Reg. 296/97 discusses the application of the Regulation to workplaces with mould showing on exposed or hidden surfaces, or where mould may be a factor in complaints regarding indoor air quality. The guideline provides information for investigating indoor air quality complaints with respect to mould contamination, including information on sampling for the



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presence of moulds in buildings. Information is also provided on possible health effects and for cleanup personnel involved in the remediation of buildings damaged by water and mould.

Several additional guidelines and other resources describe procedures for the investigation and remediation of mould. The following documents indicate that mould observed in occupied building should be remediated in accordance with these procedures:

- Environmental Abatement Council of Ontario's (EACO) *Mould Abatement Guidelines*, 2010—Edition 2
- *Mould Guidelines for The Canadian Construction Industry*, Canadian Construction Association—82, 2004
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008
- *Bioaerosols: Assessment and Control*, ACGIH 1999
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health 2004
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA 1996
- *Clean-Up Procedures for Mould in Houses*, Canada Mortgage and Housing Corporation (CMHC) 2004

A.5 MERCURY

Mercury is commonly found in buildings as mercury vapour lighting, thermostats/thermometers with mercury-containing glass ampoules, electrical switches and can also be found in minor amounts in fluorescent lamp tubes and vapour bulbs and may be present in stable forms in adhesives. If mercury is exposed to the air, odourless vapours are formed.

A.5.1 Health Effects

Routes of exposure for mercury and mercury compounds include inhalation, ingestion, skin and/or eye contact. Mercury is hazardous if it is inhaled or absorbed through the skin, therefore exposure controls (including both respiratory protection and skin protection) are important to consider.

Elemental (metallic) mercury most often causes health effects through inhalation of its vapour, which can be absorbed through the lungs. This kind of exposure can result when elemental mercury is spilled (or products that contain elemental mercury break) and the mercury is exposed to the air. Vapour concentrations can vary especially in warm or poorly-ventilated indoor spaces where the airborne concentration can exceed the permissible exposure limit (provincially set).

Chronic mercury “poisoning” can be caused by long-term exposure to low airborne concentrations (or low levels) of mercury. Symptoms or effects of mercury exposure include: tremors, emotional changes (e.g., mood swings, nervousness, irritability, etc.), neuromuscular effects (e.g., muscular weakness, twitching), mental changes/disturbances, digestive disturbances, headaches, insomnia, and changes in nervous response.



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Factors that determine the severity of the health effects from mercury exposure include the following:

- Chemical form of mercury (e.g., elemental, methylmercury, inorganic and organic)
- Dose
- Age of individual exposed
- Duration of exposure
- Route of exposure—as listed above
- Health of individual exposed

A.5.2 Regulatory Framework

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Exposure to mercury is regulated by the COHSR and BC Reg. 296/97. The regulated occupational exposure limit for airborne mercury according to both regulatory instruments is 0.025 mg/m³ (eight-hour TWA).

Mercury disposal should be through a scrap dealer (elemental mercury), recycling firm for mercury vapour and returned to the manufacturer for light tubes and fixtures. Disposal of mercury waste is governed by BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of mercury waste in British Columbia.

A.6 OZONE-DEPLETING SUBSTANCES

Ozone-depleting substances (ODSs) are chemical agents known as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) used in various refrigeration equipment including air-conditioning, heat pump, refrigeration or freezer units. They have also been used in solvents, as aerosol additives in the production of foam insulation and in fire extinguishing equipment.

A.6.1 Health Effects

Health effects are not typically related to exposure to ODSs directly, but to the consequences of ODS release to the atmosphere, subsequent degradation of the earth's ozone layer, and implications associated with increased UVB light exposure.



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A.6.2 Regulatory Framework

ODSs are regulated in British Columbia by the British Columbia *Waste Management Act*—Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 387/99 as amended by BC Reg. 109/2002).

On federal land, aboriginal land and federal works, buildings and undertakings, the Federal Halocarbon Regulation 2003 (SOR/2003-289, including associated amendments) applies. All other buildings and uses of refrigerants and other agents are under the Ozone-Depleting Substances Regulations 1998 (SOR/99-7), under CEPA. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified individual. The regulation also details an owner's record-keeping obligations.

If ODS-containing materials are to be removed and disposed of, all ODSs must be handled, recycled, stored, and/or disposed of in accordance with the requirements of BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of ODS waste in British Columbia.

A.7 SILICA

Silica is a scientific name that refers to a mineral group made up of silicon and oxygen. It is the crystalline form of silica that is of concern when considering health effects. Crystalline silica occurs in several forms including quartz, cristobalite and tridymite. Silica's many uses include sand in golf courses and playgrounds, sandblasting abrasives, glass, ceramics, building materials (concrete, grout, bricks, blocks, asphalt, acoustical tiles, floor tiles, and plaster), electronic components.

Dust containing respirable crystalline silica is produced during construction-related activities such as the following:

- Demolition
- Masonry, bricklaying and/or stone setting
- Rock drilling
- Repair and/or finishing of concrete materials
- Abrasive blasting
- Dry sweeping
- Quarrying and mining



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A.7.1 Health Effects

Crystalline silica dust particles, which are small enough to be inhaled into the lungs (respirable size), can cause a number of health problems. As with asbestos, silica within building materials poses no threat to human health if left undisturbed.

Exposure to crystalline silica airborne dust may cause scarring of the lungs with coughing and shortness of breath—also known as “silicosis”, a form of disabling, progressive, and sometimes fatal pulmonary fibrosis.

A.7.2 Regulatory Framework

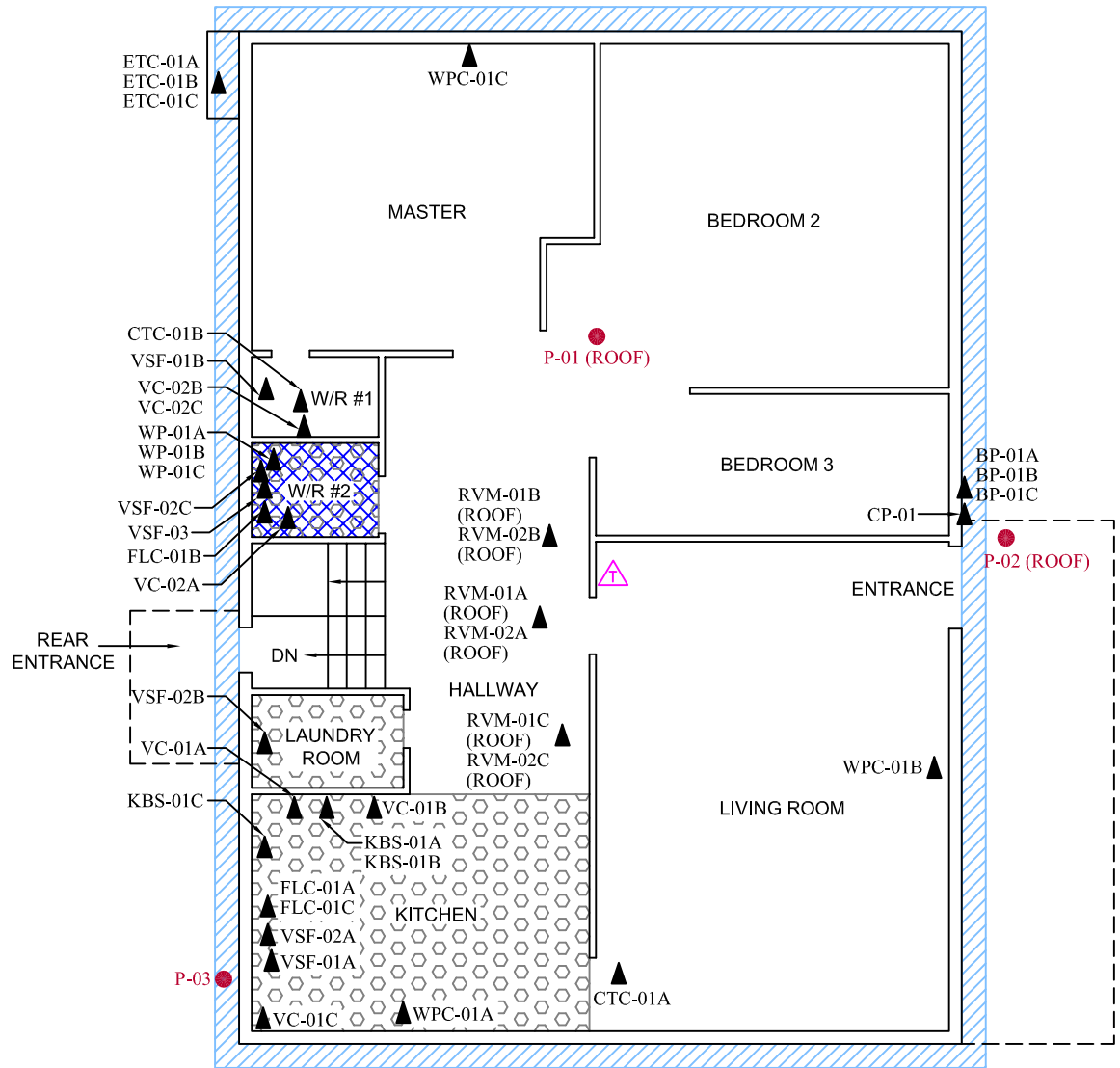
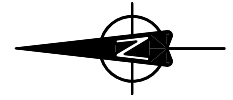
Regulations pertaining to silica are provided in BC Reg. 296/97. Included are general provisions (minimizing release; keeping worksite clear of unnecessary accumulations; ensuring methods for decontamination prevent generation of airborne silica), provisions for “restricted areas” (where there is a reasonable chance that the airborne concentration of silica exceeds or may exceed the occupational exposure limit), provisions for use in abrasive blasting, and provisions for health assessments for workers exposed to silica.

BC Reg. 296/97 and the COHSR also established the eight-hour OEL for silica to be 0.025 mg/m³ for each cristobalite and quartz.



APPENDIX B

Floor Plans



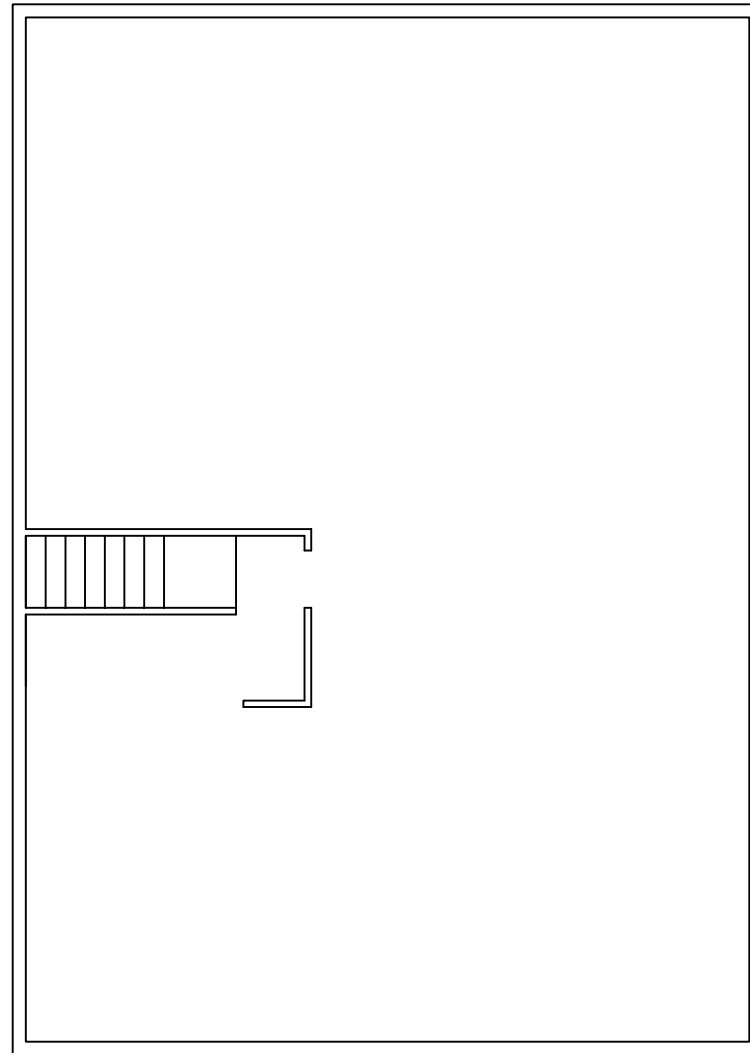
MOBILE HOME #4 - MAIN FLOOR

LEGEND

- ASBESTOS BULK SAMPLE
- PAINT CHIP SAMPLE
- MERCURY-CONTAINING THERMOSTAT
- ASBESTOS-CONTAINING VINYL SHEET FLOORING CONCEALED 2ND LAYER
- ASBESTOS-CONTAINING VINYL SHEET FLOORING CONCEALED 3RD LAYER
- ASBESTOS-CONTAINING CEMENT PANEL

NOTES: 1. BLACK STICKY WINDOW PANE CAULKING APPLIED BETWEEN WINDOW GLASS AND FRAMES ON WINDOWS THROUGHOUT IS ASBESTOS-CONTAINING.
 2. GREY MASTIC APPLIED TO PERIMETER SEAMS OF ROOFTOP VENTS IS ASBESTOS-CONTAINING.
 3. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

<p>FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS</p> <p>RCMP 6665 CHRISTENSEN ROAD, ANAHIM LAKE, BC</p>	Project No.: 123221377	1	
	Scale: N.T.S.		
	Date: 19/07/22		
	Dwn. By: CD <small>SL2019070064</small> VM/DM		
Client: PUBLIC SERVICES AND PROCUREMENT CANADA (PSPC)	App'd By: TW		



MOBILE HOME #4 - BASEMENT

NOTES: 1. BLACK STICKY WINDOW PANE CAULKING APPLIED BETWEEN WINDOW GLASS AND FRAMES ON WINDOWS THROUGHOUT IS ASBESTOS-CONTAINING.
 2. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS RCMP 6665 CHRISTENSEN ROAD, ANAHIM LAKE, BC	Project No.: 123221377	Dwg. No.: 2	
	Scale: N.T.S.		
	Date: 19/07/16		
	Dwn. By: CD <small>CS/VM</small> <small>SL2019070029</small>		
Client: PUBLIC SERVICES AND PROCUREMENT CANADA (PSPC)	App'd By: TW		

APPENDIX C

Summary of Results: Analysis of Bulk Samples for Asbestos

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Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
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Appendix C SUMMARY OF RESULTS: ANALYSIS OF BULK SAMPLES FOR ASBESTOS

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Vinyl sheet flooring, grey marbled 6 "x 6" square pattern throughout washroom #1, washroom #2, stairwell landing, laundry room and kitchen (supplemental)	4-VSF-01A	Main floor, kitchen	None Detected
	4-VSF-01B	Main floor, washroom #1	None Detected
Vinyl sheet flooring, grey, concealed as 2nd layer (under VSF-01) in washroom #2, laundry room and kitchen	4-VSF-02A	Main floor, kitchen	4.2% Chrysotile
	4-VSF-02B	Main floor, laundry room	Positive Stop (Not Analyzed)
	4-VSF-02C	Main floor, washroom #2	Positive Stop (Not Analyzed)
Vinyl sheet flooring, grey, concealed as 3rd layer (under VSF-02) in washroom #2	4-VSF-03	Main floor, washroom #2	13.7% Chrysotile
Floor levelling compound, grey, concealed under vinyl sheet flooring around floor vents observed within kitchen and washroom #2	4-FLC-01A	Main floor, kitchen	None Detected
	4-FLC-01B	Main floor, washroom #2	None Detected
	4-FLC-01C	Main floor, kitchen	None Detected
Wall paper, beige/textured—applied to walls surrounding toilet within washroom #2	4-WP-01A	Main floor, washroom #2	None Detected
	4-WP-01B	Main floor, washroom #2	None Detected
	4-WP-01C	Main floor, washroom #2	None Detected
Ceiling texture coat, white—applied throughout main floor (supplemental)	4-CTC-01A	Main floor, living room	None Detected
	4-CTC-01B	Main floor, washroom #1	None Detected
Window pane caulking, black and sticky—applied between glass and frame throughout exterior perimeter windows	4-WPC-01A	Main floor, kitchen	5.2% Chrysotile
	4-WPC-01B	Main floor, living room	Positive Stop (Not Analyzed)
	4-WPC-01C	Main floor, master bedroom	Positive Stop (Not Analyzed)
Kitchen back splash, 9" x 9" white marbled pattern with brown paper backing applied to walls behind sink and stove	4-KBS-01A	Main floor, kitchen	None Detected
	4-KBS-01B	Main floor, kitchen	None Detected
	4-KBS-01C	Main floor, kitchen	None Detected
Vinyl counter, brown on kitchen counters	4-VC-01A	Main floor, kitchen	None Detected
	4-VC-01B	Main floor, kitchen	None Detected
	4-VC-01C	Main floor, kitchen	None Detected



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
September 16, 2019

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Vinyl counter, beige on washroom #1 and washroom #2 counters	4-VC-02A	Main floor washroom #2	None Detected
	4-VC-02B	Main floor washroom #1	None Detected
	4-VC-02C	Main floor washroom #1	None Detected
Building paper, black—applied under exterior metal siding	4-BP-01A	Exterior, front, by entrance	None Detected
	4-BP-01B	Exterior, front, by entrance	None Detected
	4-BP-01C	Exterior, front, by entrance	None Detected
Exterior texture coat (patch work), white—applied to north east corner lower wall	4-ETC-01A	Exterior, north east corner	None Detected
	4-ETC-01B	Exterior, north east corner	None Detected
	4-ETC-01C	Exterior, north east corner	None Detected
Roof vent mastic, grey—applied to perimeter of vents	4-RVM-01A	Roof, central	6.2% Chrysotile
	4-RVM-01B	Roof, central	Positive Stop (Not Analyzed)
	4-RVM-01C	Roof, central	Positive Stop (Not Analyzed)
Roof vent mastic, black—applied to perimeter of vents	4-RVM-02A	Roof, central	None Detected
	4-RVM-02B	Roof, central	None Detected
	4-RVM-02C	Roof, central	None Detected
Cement panel, grey—applied to exterior lower walls	4-CP-01	Exterior, front, by entrance	15% Chrysotile
<p>NOTES:</p> <p>Bold, highlighted text indicates confirmed ACM</p> <p>Discrepancies between sampled material or location descriptions between this table and the laboratory certificate—this table is to be considered correct</p>			



APPENDIX D

**Laboratory Analytical Report—Asbestos: Polarized Light
Microscopy**



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500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
Fax:
Collected:
Received: 7/04/2019
Analyzed: 7/11/2019

Proj: RCMP Anahim Lake / 123221377

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 4-VSF-01A **Lab Sample ID:** 551908045-0106

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Vinyl sheet flooring, grey marbled 6x6 square pattern throughout washroom #1, washroom #2, stairwell landing, laundry room

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 4-VSF-01B **Lab Sample ID:** 551908045-0107

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #1/Vinyl sheet flooring, grey marbled 6x6 square pattern throughout washroom #1, washroom #2, stairwell landing, laundry

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 4-VSF-02A **Lab Sample ID:** 551908045-0108

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Vinyl sheet flooring, grey, concealed as 2nd layer (under VSF-01) in washroom #2, laundry room and kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown/Beige	0.0%	95.8%	4.2% Chrysotile	

Client Sample ID: 4-VSF-02B **Lab Sample ID:** 551908045-0109

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, laundry room/Vinyl sheet flooring, grey, concealed as 2nd layer (under VSF-01) in washroom #2, laundry room and kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 4-VSF-02C **Lab Sample ID:** 551908045-0110

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/Vinyl sheet flooring, grey, concealed as 2nd layer (under VSF-01) in washroom #2, laundry room and kitchen

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 4-VSF-03 **Lab Sample ID:** 551908045-0111

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/Vinyl sheet flooring, grey, concealed as 3rd layer (under VSF-02) in washroom #2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown/Gray/Beige	0.0%	86.3%	13.7% Chrysotile	



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Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 4-FLC-01A **Lab Sample ID:** 551908045-0112

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Floor levelling compound, grey, concealed under vinyl sheet flooring around floor vents observed within kitchen and washro

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 4-FLC-01B **Lab Sample ID:** 551908045-0113

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/Floor levelling compound, grey, concealed under vinyl sheet flooring around floor vents observed within kitchen and wa

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 4-FLC-01C **Lab Sample ID:** 551908045-0114

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Floor levelling compound, grey, concealed under vinyl sheet flooring around floor vents observed within kitchen and washro

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 4-WP-01A **Lab Sample ID:** 551908045-0115

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/ Wall paper, beige/textured - applied to walls surrounding toilet within washroom #2

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	90.0%	10.0%	None Detected	

Client Sample ID: 4-WP-01B **Lab Sample ID:** 551908045-0116

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/ Wall paper, beige/textured - applied to walls surrounding toilet within washroom #2

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	90.0%	10.0%	None Detected	

Client Sample ID: 4-WP-01C **Lab Sample ID:** 551908045-0117

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/ Wall paper, beige/textured - applied to walls surrounding toilet within washroom #2

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	90.0%	10.0%	None Detected	

Client Sample ID: 4-CTC-01A **Lab Sample ID:** 551908045-0118

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, living room/Ceiling texture coat, white - applied throughout main floor (supplemental)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: 4-CTC-01B **Lab Sample ID:** 551908045-0119

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #1/Ceiling texture coat, white - applied throughout main floor (supplemental)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 4-WPC-01A **Lab Sample ID:** 551908045-0120

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Window pane caulking, black and sticky - applied between glass and frame throughout exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	94.8%	5.2% Chrysotile	

Client Sample ID: 4-WPC-01B **Lab Sample ID:** 551908045-0121

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, living room/Window pane caulking, black and sticky - applied between glass and frame throughout exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 4-WPC-01C **Lab Sample ID:** 551908045-0122

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, master bedroom/Window pane caulking, black and sticky - applied between glass and frame throughout exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 4-KBS-01A **Lab Sample ID:** 551908045-0123

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Kitchen back splash, 9x9 white marbled pattern with brown paper backing applied to walls behind sink and stove

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/White	45.0%	55.0%	None Detected	Layers inseparable

Client Sample ID: 4-KBS-01B **Lab Sample ID:** 551908045-0124

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Kitchen back splash, 9x9 white marbled pattern with brown paper backing applied to walls behind sink and stove

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/White	45.0%	55.0%	None Detected	Layers inseparable

Client Sample ID: 4-KBS-01C **Lab Sample ID:** 551908045-0125

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Kitchen back splash, 9x9 white marbled pattern with brown paper backing applied to walls behind sink and stove

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/White	45.0%	55.0%	None Detected	

Client Sample ID: 4-VC-01A **Lab Sample ID:** 551908045-0126

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/ Vinyl counter, brown on kitchen counters

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	

Client Sample ID: 4-VC-01B **Lab Sample ID:** 551908045-0127

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/ Vinyl counter, brown on kitchen counters

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 4-VC-01C **Lab Sample ID:** 551908045-0128

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, kitchen/Vinyl counter, brown on kitchen counters

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	

Client Sample ID: 4-VC-02A **Lab Sample ID:** 551908045-0129

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/Vinyl counter, beige on washroom #1 and washroom #2 counters

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: 4-VC-02B **Lab Sample ID:** 551908045-0130

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #1/Vinyl counter, beige on washroom #1 and washroom #2 counters

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: 4-VC-02C **Lab Sample ID:** 551908045-0131

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Main Floor, washroom #1/Vinyl counter, beige on washroom #1 and washroom #2 counters

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: 4-BP-01A **Lab Sample ID:** 551908045-0132

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, front, by entrance/Building paper, black - applied under exterior metal siding

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/Black	80.0%	20.0%	None Detected	

Client Sample ID: 4-BP-01B **Lab Sample ID:** 551908045-0133

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, front, by entrance/Building paper, black - applied under exterior metal siding

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/Black	80.0%	20.0%	None Detected	

Client Sample ID: 4-BP-01C **Lab Sample ID:** 551908045-0134

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, front, by entrance/Building paper, black - applied under exterior metal siding

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/Black	80.0%	20.0%	None Detected	

Client Sample ID: 4-ETC-01A **Lab Sample ID:** 551908045-0135

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, north east corner/Exterior texture coat (patch work), white - applied to north east corner lower wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	5.0%	95.0%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 4-ETC-01B **Lab Sample ID:** 551908045-0136

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, north east corner/Exterior texture coat (patch work), white - applied to north east corner lower wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	5.0%	95.0%	None Detected	

Client Sample ID: 4-ETC-01C **Lab Sample ID:** 551908045-0137

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, north east corner/Exterior texture coat (patch work), white - applied to north east corner lower wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 4-RVM-01A **Lab Sample ID:** 551908045-0138

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, grey - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	93.8%	6.2% Chrysotile	

Client Sample ID: 4-RVM-01B **Lab Sample ID:** 551908045-0139

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, grey - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)

Client Sample ID: 4-RVM-01C **Lab Sample ID:** 551908045-0140

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, grey - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)

Client Sample ID: 4-RVM-02A **Lab Sample ID:** 551908045-0141

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, black - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	100%	None Detected	

Client Sample ID: 4-RVM-02B **Lab Sample ID:** 551908045-0142

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, black - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	100%	None Detected	

Client Sample ID: 4-RVM-02C **Lab Sample ID:** 551908045-0143

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, black - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	



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Customer ID: 55JACQ30L
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Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 4-CP-01 **Lab Sample ID:** 551908045-0144

Sample Description: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, front, by entrance/Cement panel, grey - applied to exterior lower walls

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray/White	0.0%	85.0%	15% Chrysotile	

Analyst(s):

- Harman Sohi PLM Grav. Reduction (3)
- Ioana Taina PLM (18)
- Shorthri Kalikutty PLM Grav. Reduction (12)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. 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 or the U.S. Government

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

Report amended: 07/11/2019 16:59:39 Replaces amended report from: 07/11/2019 16:57:15 Reason Code: Client-Change to Appearance

APPENDIX E




Summary of Identified Asbestos-Containing Materials

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix E Summary of Identified Asbestos-Containing Materials
September 16, 2019

Appendix E SUMMARY OF IDENTIFIED ASBESTOS-CONTAINING MATERIALS

**Table E-1 Summary of Identified Asbestos-Containing Materials
RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC**



Identified ACM Description and Condition Information	
Grey vinyl sheet flooring concealed as 2nd layer (under VSF-01) in the kitchen, laundry room and washroom #2	
% Type	4.2% Chrysotile
Friability	Non-friable in situ; potentially friable during demolition
Quantity	Approximately 17 square metres
Condition	Good
	
Grey vinyl sheet flooring concealed as 3rd layer (under VSF-01 and VSF-02) in washroom #2	
% Type	13.7% Chrysotile
Friability	Non-friable in situ; potentially friable during demolition
Quantity	Approximately 4 square metres
Condition	Good
	
Black sticky window pane caulking applied between window glass and frames on windows throughout	
% Type	5.2% Chrysotile
Friability	Non-friable
Quantity	Approximately 20 linear metres
Condition	Good
	



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix E Summary of Identified Asbestos-Containing Materials
September 16, 2019

**Table E-1 Summary of Identified Asbestos-Containing Materials
RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC**

Identified ACM Description and Condition Information	
Grey mastic applied to perimeter seams of rooftop vents	
% Type	6.2% Chrysotile
Friability	Non-friable
Quantity	Approximately 6 linear metres
Condition	Good
	
Grey cement panel applied to lower exterior walls	
% Type	15% Chrysotile
Friability	Non-friable
Quantity	Approximately 50 square metres
Condition	Good
	



APPENDIX F

**Summary of Results: Analysis of Paint Chip Samples for
Lead**

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix F Summary of Results: Analysis of Paint Chip Samples for Lead
September 16, 2019

**Appendix F SUMMARY OF RESULTS: ANALYSIS OF PAINT
CHIP SAMPLES FOR LEAD**

**Table F-1 Suspected Lead-Containing Paint Sample and Analytical Results Summary
RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC**

Sample Number	Paint Colour/Application	Sample Location	Result (ppm)
4-P-01	Red on metal roof	Roof	4,900
4-P-02	Tan on metal canopy roof	Roof	2,200
4-P-03	Beige on metal siding	Exterior, rear	1,900

NOTE:
Bold, highlighted text indicates confirmed LCP



APPENDIX G

Laboratory Analytical Report—Lead: Paint Chip Analysis

**EMSL Canada Inc.**

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 Received: 07/04/19 11:18 AM
 Collected:

Project: **RCMP Anahim Lake / 123221377****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample</i>	<i>Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
4-P-01 551908030-0023			7/8/2019	0.1119 g	180 ppm	4900 ppm
	Site: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof Desc: Red on metal roof					
4-P-02 551908030-0024			7/8/2019	0.0846 g	240 ppm	2200 ppm
	Site: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Roof Desc: Tan on metal canopy roof					
4-P-03 551908030-0025			7/8/2019	0.0759 g	260 ppm	1900 ppm
	Site: Mobile House #4 - 6665 Christensen Road, Anahim Lake, BC - Exterior, rear Desc: Beige on metal siding					

Rowena Fanto, Lead Supervisor
 or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. 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. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Cert #2845.08; AIHA-LAP, LLC - ELLAP #196142

Initial report from 07/11/2019 09:31:42

APPENDIX H

Summary of Identified LCPS

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix H Summary of Identified LCPs
September 16, 2019

Appendix H SUMMARY OF IDENTIFIED LCPS

**Table H-1 Summary of Identified LCPs
RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC**


LCP Description		Photo
Paint colour	Light yellow/beige	
Substrate	Metal	
Location/approx. extent	Exterior siding	
Lead content	1,800 ppm (Pinchin Report) 1,900 ppm (Current Assessment)	
Condition	Good	
Paint colour	Orange	
Substrate	Wood	
Location/approx. extent	Door and door trim	
Lead content	1,200 ppm (Pinchin Report)	
Condition	Good	
Paint colour	Red	
Substrate	Metal	
Location/approx. extent	Roofing	
Lead content	4,900	
Condition	Good	



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix H Summary of Identified LCPs
September 16, 2019

**Table H-1 Summary of Identified LCPs
RCMP Mobile Home #4, 6665 Christensen Road, Anahim Lake, BC**

LCP Description		Photo
Paint colour	Tan	
Substrate	Metal	
Location/approx. extent	Canopy roofing	
Lead content	2,200	
Condition	Good	



APPENDIX I

Laboratory Analytical Report—Lead: Leachate Analysis

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 786-5974

<http://www.EMSL.com>cinnaminsonleadlab@emsl.com

EMSL Order: 201907095

CustomerID: JACQ30L

CustomerPO:

ProjectID:

Attn: **Steve Chou**
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
 Fax:
 Received: 07/15/19 10:10 AM
 Collected:

Project: 123221377 / RCMP Anahim Lake

Test Report: Toxicity Characteristic Leachate Procedure (1311/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
OD-LL-01	201907095-0001		7/17/2019	<0.40 mg/L
Site: RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake, BC - Tan on Wood Column - Exterior, By Front Entrance				
4-LL-06	201907095-0002		7/17/2019	<0.40 mg/L
Site: RCMP Mobile Home #4 - 6665 Christensen Road, Anahim Lake, BC - Orange on Door Frame - Exterior, Rear Exit				

Phillip Worby, Lead Laboratory Manager
 or other approved signatory

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

Initial report from 07/22/2019 11:06:37

APPENDIX A2

Stantec
Pre-Demolition Hazardous Building Materials Assessment
RCMP Mobile Home #5
6652 Christensen Road
Anahim Lake, BC
Sept 16, 2019



**Pre-Demolition Hazardous
Building Materials Assessment**

RCMP Mobile Home #5, 6652 Christensen
Road, Anahim Lake, BC

September 16, 2019

Prepared for:

Public Services and Procurement
Canada, Pacific Region
1230 Government Street
Victoria, BC V8W 3X4

Prepared by:

Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Project No.: 123221337

PSPC Project No.: R.103948.001

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

This document entitled Pre-Demolition Hazardous Building Materials Assessment was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Public Services and Procurement Canada, Pacific Region (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____
(signature)

Steve Chou, B.A., Dipl. Tech.

Reviewed by _____
(signature)

Tiffany Waite, B.Sc.

Approved by _____
(signature)

Sean Brigden, B.Sc., P.B.Dipl., CRSP



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PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

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Executive Summary

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) on behalf of the Royal Canadian Mounted Police (RCMP) to conduct a hazardous building materials assessment of RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC (subject building).

The purpose of the assessment was to check for potential hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

The work was carried out in accordance with the requirements of the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR), British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97) and the RCMP Asbestos Management Plan (AMP).

The hazardous building materials considered during this assessment included the following:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)
- Polychlorinated biphenyls (PCBs) in electrical equipment
- Mould and/or moisture-impacted building materials
- Mercury in electrical equipment
- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

Based on Stantec's visual assessment and the laboratory analyses performed on the samples collected, as well as a review of previous reports or sampling records/reports, hazardous building materials were identified to be present.

A summary of our findings is presented in Table ES 1, below. Recommendations pertaining to the handling, removal, transportation and disposal of identified hazardous building materials are provided in the body of this report.



Table ES 1 Summary of Findings

Hazardous Building Material	Summary of Findings
Asbestos	<p>The following ACMs were identified through this assessment:</p> <ul style="list-style-type: none"> • Sink undercoating • Exterior cement panel • Vinyl floor tile (various styles) <p>Identified ACMs were observed to be in good condition.</p> <p>Although unlikely based on the limited pitch of the roof and the prefabricated nature of the structure (mobile home), vermiculite insulation, a potential ACM, may be present in the attic space (no access point was identified).</p>
Lead	<p>The following LCPs were identified through this assessment:</p> <ul style="list-style-type: none"> • Brown on exterior wood stairs of the rear porch <p>Identified LCPs were observed to be in good condition. Based on the lead content of the identified LCP (760 ppm lead) and the limited amount of material present, it is NOT anticipated that waste from this material (painted wood stairs) would create waste that would contain lead in a dispersible form such that its leachate would contain greater than 5.0 milligrams per litre (mg/L) lead.</p> <p>Lead may also be present in the following materials:</p> <ul style="list-style-type: none"> • Older electrical wiring materials and sheathing • Solder used on domestic water lines • Solder used in bell fittings for cast iron pipes and in electrical equipment • Vent and pipe flashings
Polychlorinated biphenyls (PCBs)	No suspected PCB-containing electrical equipment was observed.
Mould	No suspect mould or moisture staining was observed.
Mercury	Suspected mercury-containing electrical items were not observed.
Ozone-depleting substance (ODS)	Building related cooling and refrigeration equipment suspected to be ODS-containing was not observed.
Silica	<p>Silica is expected to be present in the following, which were observed in various locations throughout:</p> <ul style="list-style-type: none"> • Cement products such as: <ul style="list-style-type: none"> – Concrete—foundations, floors – Panels • Gypsum and associated wall/ceiling finish materials • Ceiling tiles • Asphalt and asphalt products containing rock or stone (e.g., roof shingles)

The statements made in this Executive Summary text are subject to the same limitations included in this report and are to be read in conjunction with the remainder of this report.



Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	asbestos-containing material
AIHA	American Industrial Hygiene Association
AMP	Asbestos Management Plan
BC	British Columbia
CEPA	<i>Canadian Environmental Protection Act</i>
CFC	chlorofluorocarbon
CMHC	Canada Mortgage and Housing Corporation
COHSR	Canada Occupational Health and Safety Regulations
EACO	Environmental Abatement Council of Ontario
ELLAP	Environmental Lead Laboratory Approval Program
EMSL	EMSL Canada Inc.
HCFC	hydrochlorofluorocarbon
HUD	polarized light microscopy
HVAC	heating, ventilation and air conditioning
LCP	lead-containing paint
NVLAP	National Voluntary Laboratory Accreditation Program



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

ODS	ozone-depleting substance
OEL	occupational exposure limit
PCB	polychlorinated biphenyl
PLM	polarized light microscopy
PSPC	Public Services and Procurement Canada
RCMP	Royal Canadian Mounted Police
USEPA	United States Environmental Protection Agency



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Introduction
September 16, 2019

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) on behalf of the Royal Canadian Mounted Police (RCMP) to conduct a hazardous building materials assessment of RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC (subject building).

The purpose of the assessment was to check for potential hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

The work was carried out in accordance with the requirements of the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR), British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97) and the RCMP Asbestos Management Plan (AMP).

The hazardous building materials considered during this assessment included the following:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)
- Polychlorinated biphenyls (PCBs) in electrical equipment
- Mould and/or moisture-impacted building materials
- Mercury in electrical equipment
- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

The site work was conducted by Mr. Keith Irwin and Mr. Steve Chou on June 25, 2019.

1.1 UNDERSTANDING OF THE PROJECT

The following documentation related to hazardous building materials was reviewed prior to undertaking the assessment:

- Pinchin West Ltd. Report No. 13789S entitled *Hazardous Building Materials Assessment RCMP Residence 6652 Christensen Road, Anahim Lake, BC*, dated July 19, 2016, prepared for BGIS – WSI (Pinchin Report)

This documentation provided Stantec with an understanding of ACMs or hazardous building materials that were anticipated to be present at the subject building. According to the above-noted document, various LCPs and silica-containing materials were previously identified.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Scope

September 16, 2019

Based on the limited and non-destructive nature of the Pinchin Report, and on behalf of the RCMP, PSPC requested this assessment to provide supplemental and current information as a measure of diligence in maintaining compliance with the requirements of the COHSR, BC Reg. 296/97 and the RCMP AMP as they pertain to identifying hazards associated with hazardous building materials for demolition projects.

2.0 SCOPE

The scope of work for this assessment involved the following:

- Review of existing information, including site drawings, previous assessment and/or abatement documentation and discussions with site personnel, where available
- Visual assessment of readily accessible areas for the presence of suspected hazardous building materials
- Collection of representative bulk samples from building materials suspected to contain asbestos fibres
- Collection of paint chip samples for the determination of the lead content in paint finishes
- Submission of samples collected for laboratory analysis
- Evaluation and interpretation of field findings along with current and previous sample analytical results to develop conclusions and recommendations pertaining to hazardous building materials identified

2.1 LIMITATIONS

In preparation of this report, Stantec used professional judgment based on experience. The work was conducted in accordance with generally accepted professional standards. Stantec relied on information gathered during the site investigation and laboratory analytical reports.

This report reflects the observations made within accessible and accessed areas of the subject building, and the results of analyses performed on specific materials sampled during the current and/or previous assessments. Analytical results reflect the sampled materials at the specific sample locations.

This report has been prepared for the exclusive use of the Client for the purpose of assessing general conditions in the subject building. Any use that a third party makes of this report, or reliance on, or decisions to be made on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Scope
September 16, 2019

2.1.1 Physical and Sampling Limitations

Sampling was conducted pertaining only to suspected ACMs, suspected LCPs and bulk building materials coated with paint presumed to be destined for landfill disposal. The assessment for the presence of other hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible spaces only. Concealed spaces were inspected via existing access panels, where present. Interior and exterior finishes, solid ceilings, walls, flooring and structural elements were removed and/or penetrated in limited locations to access concealed areas.

Due to limitations on the agreed to scope of work for this project, there are specific limitations to the information that can be provided regarding each hazardous building material considered in this assessment, as outlined below.

- Building materials that may contain asbestos but were not accessible for sampling include, but are not limited to the following:
 - Attic insulation materials (no attic access was identified)
 - Sub-grade materials (e.g., asbestos cement drainage pipe)
 - Woven tape inside duct connection joints
 - Mechanical (e.g., piping and ducting) insulation within wall cavities
 - Insulation materials inside fire-rated doors
 - Heating, ventilation and air conditioning (HVAC) units mechanical inner linings and/or insulation on the interior side of ducts.
- Samples of paint applications suspected to contain lead were collected from surfaces of major paint applications where visually different paint colours and/or types were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour were presumed to be the same, regardless of differing sub surface paints, if any.
- Due to height restrictions and the risk of electrical shock in handling operational light fixtures, the ballasts present in the fixtures observed were not inspected for PCB labels or other PCB identifiers. Conclusions and recommendations regarding the presence of PCBs are based on limited observations in combination with information provided by building staff regarding lighting renovations (where requested by Stantec, based on visual observations) and are presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, will not be commented on.
 - Although they may also be present in other items in limited amounts (e.g., plastics, molded rubber parts, applied dried paints, coatings or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets), PCBs are not expected to be present in those materials in concentrations that would necessitate the requirement for PCB-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Scope

September 16, 2019

- Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) was conducted. The conclusions made in this report provide description(s) of the potential source(s) of moisture that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. The conclusions provided herein will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the impacted area(s).
 - This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.
- The potential presence of mercury or mercury-containing equipment in inaccessible areas or as internal parts of HVAC mechanisms or other equipment was not assessed.
 - Although limited amounts of mercury may be present in paints and adhesives, mercury is not expected to be present in those materials in concentrations that would necessitate the requirement for mercury-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.
- Investigation was limited to a visual review in accessed areas of readily accessible building-related cooling and refrigeration equipment which could contain ODSs. Testing was not conducted. Equipment or materials that were not assessed but that may contain ODSs included, but were not limited to, portable equipment (including domestic-type refrigerators and water coolers, occupant-owned refrigeration equipment), flexible plastic foam or rigid insulation foam, solvents, aerosol spray propellants and portable fire extinguishing equipment.
- In general, the assessment for the presence of hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible accessed spaces only. Additional hazardous building materials are potentially present in inaccessible areas not assessed including, but not limited to: ceiling spaces, wall cavities and crawlspace areas not accessed, as well as buried materials.

2.1.2 Areas Not Accessed

The following areas were not accessed, for the reasons indicated:

- Attic space (no attic access was identified)

As such, limited comments, if any, will be provided regarding the presence, quantity or condition of hazardous building materials within the above-noted areas.

2.1.3 Information from Previous Reports

Stantec reviewed the Pinchin Report for information purposes, and the information provided was considered in developing the current assessment and sampling plan.



**PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT—
RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC**

Scope

September 16, 2019

Supplemental sampling of previously sampled materials was conducted in those instances where such sampling was required to bring the information into compliance with current regulations as they pertain to minimum sample numbers to appropriately characterize the sampled building material.

Where previous sampling and analytical data indicated the presence of a hazardous building material (e.g., asbestos, lead), additional sampling was not conducted, and the material was considered to be hazardous.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Hazardous Building Materials Assessment
September 16, 2019

3.0 HAZARDOUS BUILDING MATERIALS ASSESSMENT

Building information and the results of the assessment for each of the considered hazardous building materials are provided in the following sub-sections.

Background information and health effects information, as well as information regarding regulatory framework and relevant legislation with respect to hazardous building materials are provided in Appendix A.

Floor plans showing the locations of samples collected during this assessment as well as identified hazardous building materials (where practical) are provided in Appendix B.

3.1 FACILITY DESCRIPTION

The subject building is located at 6652 Christensen Road in Anahim Lake, BC and consists of a two level modular building (basement and main floor). The reported construction date of the building was 1982. This construction time period is consistent with those dates when hazardous building materials were commonly used.

The typical structural components, mechanical components and building finishes associated with this building consist of the following:

- Foundation—concrete
- Exterior cladding—vinyl siding
- Exterior cladding—cement panels
- Structural—wood framing
- Mechanical—un-insulated pipes and systems
- Mechanical—pipes and vessels insulated with fiberglass
- Heating, ventilation and air conditioning (HVAC)—propane forced air furnace with metal ducted supply
- Interior walls—combination of finished gypsum and unfinished gypsum
- Interior ceilings—gypsum finished with texture coat
- Interior flooring—combination of bare concrete, vinyl sheet flooring, vinyl floor tile, laminate flooring and carpeting
- Roofing—asphalt roof shingles

3.2 ASBESTOS

A summary list of the bulk samples collected by Stantec, including a description of the material, sampling location and laboratory test results is provided in Appendix C. Copies of the Laboratory Certificates of Analysis for bulk samples analyzed are provided in Appendix D.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Hazardous Building Materials Assessment
September 16, 2019

Based on our observations of building construction (estimated vintage of interior finishes and uniformity of building material use) and on our interpretations of the analytical results of suspected ACMs collected through this assessment as well as the previous documentation reviewed as outlined herein, the materials presented in the table in Appendix E were identified as ACMs. The following information is included for each identified ACM:

- Type of material that contains asbestos
- Location/approximate extent of the ACM within the building
- Asbestos type and percentage identified
- Friability
- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.

3.2.1 Methodology

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs are materials that by the nature of their manufacturing and/or construction do not readily allow the release of asbestos fibres. Some non-friable materials such as plaster, drywall joint compound and ceiling tiles that are considered to be non-friable in an undisturbed state can more readily release fibres when damaged or disturbed.

The presence of asbestos in federal workplaces and pertaining to federally regulated workers is governed by the COHSR. According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

The presence of asbestos in the workplace in British Columbia pertaining to provincially regulated workers is governed by BC Reg. 296/97. According to the current version of BC Reg. 296/97, ACM means:

- Any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

As both federally regulated workers and provincially regulated workers (e.g., contractors) are expected to carry out work activities within the subject building, and as the provincial regulations have a more stringent definition of ACM, and generally include the requirements noted in the COHSR, this assessment was conducted to meet the requirements of BC Reg. 296/97.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP MOBILE HOME #5, 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC

Hazardous Building Materials Assessment
September 16, 2019

Based on these criteria, a visual assessment of accessible areas was undertaken to check for the presence of suspected ACMs. Locations to collect discrete bulk samples of suspected ACMs were identified and samples of representative materials were then collected at these locations.

Multiple samples were collected from each “homogenous application” of observed suspected ACMs (materials suspected to contain asbestos that are uniform in material type, colour, texture application and estimated installation date) and submitted to EMSL Canada Inc. (EMSL) in Mississauga, Ontario for analysis of asbestos content using polarized light microscopy (PLM) with dispersion staining, in accordance with the United States Environmental Protection Agency (USEPA) 600/R-93/116 method.

The number of samples to be collected for each homogenous application of a suspected ACM was based on accepted occupational hygiene standards and protocols, on the recommendations provided in the 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos (Asbestos Guide)*, and on the assessor’s experience and understanding of the consistency of that building material’s application.

EMSL’s analytical laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

3.2.1.1 Potential Asbestos-Containing Vermiculite Insulation

As part of the assessment, Stantec assessed the subject building for areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of and assessing attic spaces, floor cavities and masonry block or brick walls, which are typical areas where vermiculite is found. Where masonry or brick walls were observed, destructive assessment (drilling) was conducted to assess the cavity for the presence of vermiculite, unless penetrations, breaches and/or sufficient other openings were present.

3.2.1.2 Sample Results Interpretation

When asbestos is detected in concentrations greater than 0.5% percent in one of the samples within a set that was collected to represent a “homogenous application” of a particular material (or detected in any concentration, in a set of samples collected for applications of vermiculite), the entire sample set, and the entire application of that material is then considered to be an ACM.

In addition to the above, a “positive stop” option was used during the laboratory analysis of the building material samples submitted for asbestos analysis. The “positive stop” option is utilized by the laboratory when asbestos is detected at a concentration of greater than half of one percent in one of the samples within a set that was collected to represent a “homogenous application” of that material (or in any concentration, for vermiculite). At this point, further analysis of subsequent samples within the set is deemed to be unnecessary (as the entire set will be considered an ACM, per above), and the remainder of the samples within the set are not analyzed.



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3.2.1.3 Asbestos Sampling Quality Assurance/Quality Control

Sampling activities pertaining to asbestos were conducted in accordance with Stantec's safe work practices, which take into account current provincial and/or territorial regulations pertaining to such work (i.e., sampling procedures, required number of samples and laboratory analytical procedures).

Representative bulk samples were collected of accessible suspect ACMs in sufficient quantities for laboratory analysis. Suspect ACM samples were sealed in polyethylene zip-lock bags labeled with the sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

All sample bags were compiled in order and placed into a single container accompanied with a chain of custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.

3.2.1.4 Assessment of Material Condition

A visual assessment of the condition and accessibility was also completed for each occurrence of suspect ACM. A description of the criteria used in evaluating the condition, accessibility and exposure risk of ACMs is provided below. The criteria are generally based on the June 5, 2017 Public Services and Procurement Canada "Asbestos Management Standard", and industry standards of practice.

Friable ACMs other than Mechanical Insulation

In evaluating the condition of friable ACMs other than mechanical insulation (e.g., spray-applied as fireproofing, texture, decorative or acoustic finishes), the following criteria apply:

Good

- Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the Assessor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes un-encapsulated or un-painted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor

- Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the Assessor's assessment form.



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Fair condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray-applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes, which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of building with ACM, regardless of the reported condition.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment, etc.) the following criteria are used:

Good

- Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

Fair

- Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.

Poor

- Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product, and evaluated per the above criteria.



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3.2.2 Findings

No ACMs were identified in the Pinchin Report.

Asbestos was detected through laboratory analysis of bulk samples of the following additional materials that were collected as part of this assessment:

- Sink undercoating
- Exterior cement panel
- Vinyl floor tile (various styles)

The materials that were accessible and observed were noted to be in good condition.

3.2.2.1 Non-Asbestos-Containing Materials

The bulk samples collected during this assessment for which no asbestos was detected through laboratory analysis can be seen in the table in Appendix C.

Refer to the documentation in Section 1.1 for materials that have been previously sampled and identified as non-asbestos-containing through sampling and laboratory analysis.

Materials Not Suspected to Contain Asbestos

Various materials within the subject building were observed and/or presumed to be present, which are not suspected to contain asbestos. Typical materials of this nature that were observed and are not considered suspected ACMs, include but are not limited to the following:

- Materials comprised of glass, such as:
 - Window panes
 - Pre-formed fibreglass insulation on mechanical pipes or vessels (potentially excluding attached wrap layers)
 - Fibreglass batt insulation in wall, floor or ceiling cavities, or used in other applications (potentially excluding attached paper backing)
 - Lights and lighting components
- Materials comprised of metal, such as:
 - Flashings on siding or roofs
 - Electrical wiring (excluding wrap) and conduit
 - Plumbing components
 - Components of doors, windows and associated trim
 - Structural components
 - Ducting
 - Lights and lighting components
 - Roof vents



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- Materials comprised of wood, such as:
 - Wall framing
 - Components of doors, windows and associated trim
 - Structural components
 - Handrails
- Other materials generally not suspected to contain asbestos:
 - Gypsum board/"drywall" (excluding suspected ACM finishing compounds)
 - Poured concrete items such as foundations, floors, pads or structural beams (excluding suspected ACM finishing compounds)
 - Silicone-based clear caulking or sealants

3.2.2.2 Potential for Vermiculite Insulation

As part of the assessment, Stantec assessed the subject building for areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of attic spaces, floor cavities and masonry block or brick walls, which are typical areas where vermiculite is found. The following observations were made regarding areas where vermiculite is potentially present:

- An attic space was present but was not accessible as no access point was identified. Although unlikely based on the limited pitch of the roof and the prefabricated nature of the structure (mobile home), ACM vermiculite insulation is potentially present in the attic.
- No other locations that may potentially contain vermiculite (that could not otherwise be assessed) were observed by Stantec.

3.2.3 Recommendations

Based on the visual assessment, results of laboratory analyses and review of previous documentation, Stantec recommends the following with regards to meeting the requirements of the COHSR and BC Reg. 296/97 as they pertain managing asbestos during demolition projects:

- Prior to demolition, the attic space of the subject building should be destructively assessed for the presence of potential ACM vermiculite insulation. If vermiculite is found, it should be handled as ACM until such time that analytical testing proves otherwise.
- Identified ACMs should be removed by appropriately trained personnel (e.g., asbestos abatement contractor personnel), in accordance with the requirements of the COHSR, BC Reg. 296/97 and the Asbestos Guide, and prior to the initiation of project work that will disturb them.
- Should a material suspected to contain asbestos fibres become uncovered during demolition activities, all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if asbestos fibres are present. Confirmed ACMs should be handled in accordance with applicable guidelines and regulations.
- Suspected ACMs deemed visually similar to the ACMs identified in this report should be considered asbestos-containing and handled as such, unless proven otherwise, through analytical testing.



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- Asbestos-containing cement pipe may be present below ground—caution should be used at any time when excavation is required.
- Ensure asbestos containing waste is handled, stored, transported and disposed of in accordance with the requirements of the Federal Transportation of Dangerous Goods Regulation and the British Columbia Hazardous Waste Regulation (BC Reg. 63/88).
- If the building is not demolished:
 - Due to the confirmed presence of asbestos within the subject building, the RCMP AMP should be developed and implemented for the subject building.
 - Identified ACMs in good condition can be managed in place, upon development and implementation of the RCMP AMP

3.3 LEAD

A summary list of the samples collected including a description of the samples, sampling locations and laboratory analytical results is provided in Appendix F. Copies of the Laboratory Certificates of Analysis for paint chip samples analyzed are included in Appendix G.

Based on our observations and interpretations of suspected LCP sample analytical results, as well as the previous documentation reviewed as outlined herein, the paints presented in the table in Appendix H were identified as LCPs.

The following information is included for each identified LCP:

- Paint colour
- Substrate to which paint is applied
- Location/approximate extent of the LCP within the building
- Lead content of paint
- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.

3.3.1 Methodology

A visual assessment of accessible areas was undertaken in order to check for the presence of materials that may contain lead. These materials included paint applications, wiring and plumbing, batteries, etc.



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3.3.1.1 Lead in Paint

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
 - Exposure limit indicated in both the COHSR and BC Reg. 296/97 is 0.05 mg/m³
 - Potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
 - Any risk assessment should include for the presence of high risk individuals within the workplace

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

When reviewing the above, “high risk” individuals are not expected to be present in the workplace associated with this building during building material alteration activities (i.e., demolition) that would create significant disturbance to paint with such individuals present. As such, paints containing 600 ppm lead or more will be considered “lead-containing” for the purpose of this report, such that appropriate risk assessments can be completed for demolition planning. However, information regarding the lead content of all paints tested is provided herein, for reference and risk assessment should the consideration of high risk individuals be necessary, based on the requirements of a particular situation.

Based on the above, samples of potential LCPs were collected from major paint applications, in sufficient quantity to conduct analysis for total lead content. The sampling of paint applications involved the collection of paint chip samples of paint layers to the substrate, where possible. A minimum volume of 5 cc or a half teaspoon of paint chips was typically collected. Wherever necessary and possible, paint was separated from any backing material such as paper, concrete or wood and placed in a sealed, clearly labelled plastic bag.

Samples collected were submitted to EMSL for analysis of total lead content using EPA Method SW 846 3050B*/7000B. EMSL’s analytical laboratory is also accredited by the AIHA Environmental Lead Laboratory Approval Program (ELLAP).



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Welding, Burning or Torch Cutting

Although a concentration of 600 ppm lead has been used to define paint coatings as LCPs, it should be noted that this is related to painted surfaces and the determination of appropriate provisions to protect occupants and employees from exposure to elevated concentrations of lead during typical operations and maintenance or simple renovation. This does not include painted metal surfaces that are to be welded, burned or torch-cut.

Using an arc welder or oxyacetylene torch on steel that is coated with lead-containing paint can create hazardous lead fumes and is prohibited by section 12.115 of BC Reg. 296/97.

Regulatory excerpt: **12.115 Coatings on metals**

A coating on metal which could emit harmful contaminants (such as lead, chromium, organic materials, or toxic combustion products) must be removed from the base metal, whenever practicable, before welding or cutting begins.

In addition, the following information is provided in the Lead Guideline:

- Welding or torch cutting of paints or coatings on metal can create very high concentrations of airborne lead fumes. Torch cutting structural steel, coated with paint containing as little as 130 mg/kg (equivalent to ppm) lead, can release airborne levels of lead as high as 0.8 mg/m³ (16 times the exposure limit).

Given this information and that the analytical detection limit for lead paint analysis is approximately 80–90 ppm (not significantly different than 130 ppm, which, per above, may release airborne lead levels 16 times the exposure limit), any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless a project-specific or tasks-specific risk assessment and safe work practices are developed by a qualified person.

3.3.1.2 Building Materials—Leachable Lead Content

According to BC Reg. 63/88, lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 mg/L lead.

For painted building materials that are expected to be disposed of via landfill, and when lead content of paint is found in significant concentrations on significant building components, bulk samples can be collected in a form presumed to be representative of waste generated during demolition, and submitted for analysis through toxicity characteristic leaching procedure. Analytical results can assist in determining disposal options.



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It should be noted that materials such as metal and concrete that are coated with LCPs are typically not tested for leachable lead content for the following reasons:

- If removed with paint in-tact, these materials are expected to be recycled, not disposed of via landfill. As such, the leachable lead content will not impact the “disposal” option, as recycling facilities will typically accept metal or concrete with lead-containing paint.
- If removal of the paint from the substrate is considered, the waste associated with that process (paint chips and removal substrate—sand, beads, etc.) is typically presumed to be hazardous waste (leachable for lead in excess of 5.0 mg/L) or must be tested in its actual form (once removed, with the removal substrate) to confirm.
- In most cases, during an initial assessment, it is not practical to try to remove sufficient paint from the substrate in order to appropriately analyze for lead leachate, as a significant area would have to be “scraped” (50–100 g of sample is required).

3.3.1.3 Assessment of Paint Condition

The criteria for condition evaluation pertaining to LCPs described herein are generally based on the United States Housing and Urban Development (HUD) 2012 *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

When evaluating the condition of LCPs, an attempt should be made to determine whether the deterioration is due to a moisture problem or some other existing building deficiency.

“**Poor**” surfaces are considered to be a hazard and should be corrected. “**Fair**” surfaces should be repaired but are not yet considered to be a hazard; if not repaired, they should be monitored frequently. “**Good/intact**” surfaces should be monitored to ensure that they remain in a nonhazardous condition.

In addition, the presence of paint debris must be considered in evaluating condition. Given the variety of paint uses, there are many applications that can have a tendency for the paint to “wear” from the surface slowly, over an extended period of time. Conditions where paint has worn from a surface are worth noting for maintenance discussions (i.e., related to re-coating the surface should, for example, the coating provide weather protection), however, in the absence of loose paint chip debris/dust, such conditions would not represent a potential exposure situation related to lead.

The condition evaluation criteria for LCPs are summarized in Table 1, below.

Table 1 Lead-Containing Paint Condition Categories

Type of Building Component ¹	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	Fair ²	Poor ³
Exterior components with large surface areas.	Entire surface is intact.	Less than or equal to 10 square feet	More than 10 square feet
Interior components with large surface areas (walls, ceilings, floors, doors).	Entire surface is intact.	Less than or equal to 2 square feet	More than 2 square feet



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Table 1 Lead-Containing Paint Condition Categories

Type of Building Component ¹	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	Fair ²	Poor ³
Interior and exterior components with small surface areas (window sills, baseboards, soffits, trim).	Entire surface is intact.	Less than or equal to 10% of the total surface area of the component.	More than 10% of the total surface area of the component
<p>NOTES:</p> <p>¹ Building component in this table refers to each individual component or side of building, not the combined surface area of all similar components in a room (e.g., a wall with 1 square foot of deteriorated paint is in “fair” condition, even if the other three walls in a room are intact).</p> <p>² Surfaces in “fair” condition should be repaired and/or monitored but are not considered to be “lead-containing paint hazards”.</p> <p>³ Surfaces in “poor” condition are considered to be “lead-containing paint hazards” and should be addressed through abatement or interim controls.</p>			

3.3.2 Findings

Lead is expected to be present in the following within the subject building:

- Older electrical wiring materials and sheathing
- Solder used on domestic water lines
- Solder used in bell fittings for cast iron pipes and in electrical equipment
- Vent and pipe flashings

3.3.2.1 Lead in Paint

The lead-containing coating identified in the Pinchin Report contains 0.010% (equivalent to 100 ppm) lead. For demolition purposes, this paint is not expected to pose an exposure hazard.

Greater than 600 ppm lead was detected through laboratory analysis of chip samples of the following paints:

- Brown on exterior wood stairs of the rear porch

Additional information regarding extent and current condition of identified LCPs, including photographs (where available) is provided in Appendix H.

3.3.2.2 Building Materials—Leachable Lead Content

Based on the lead content of the identified LCP (760 ppm lead) and the limited amount of material present, it is NOT anticipated that waste from this material (painted wood stairs) would create waste that would contain lead in a dispersible form such that its leachate would contain greater than 5.0 milligrams per litre (mg/L) lead.



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3.3.3 Recommendations

When paints or other lead-containing equipment/materials within the subject building are to be disturbed and/or removed, including in instances where paint chip debris is removed (which should be completed during the demolition project), ensure compliance with the following:

- Exposure protection requirements of the COHSR and BC Reg. 296/97, including the provisions of the Lead Guideline
- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

Corrective action or remedial work on paint applications containing any concentration of lead should be undertaken in a manner so as to avoid generating fine particulate matter or dust (i.e., avoid sanding). Airborne lead dust or fumes should not exceed the COHSR and BC Reg. 296/97 eight-hour occupational exposure limit (OEL) of 0.05 mg/m³ during the removal of paints and products containing any concentration of lead. The use of personal protective equipment is recommended to reduce the potential for over-exposure to lead dust. This can be achieved by:

- Providing workers with protective clothing and personal protective equipment or devices as necessary to protect them against the hazards to which the worker may be exposed
- Providing workers with adequate training in the care and use of clothing, equipment or device before wearing or using such items
- Wetting the surface of the materials to prevent dust emissions
- Providing workers with washing facilities with clean water, soap and individual towels to properly wash prior to exiting the work area

To avoid the inhalation of lead, it is essential to have the following control methods in place:

- Engineering controls
- Work practices and hygiene practices
- Respirators and personal protective equipment
- Training

The work tasks required and the ways in which lead-containing materials (including paints) will be impacted will determine the appropriate respirators, measures and procedures that should be followed to protect workers from lead exposure.

If demolition does not proceed and the building is to be re-occupied, then lead-containing materials, including paints, can be managed in place, where in good condition.



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3.3.3.1 Welding, Burning or Torch Cutting

Any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless project-specific or tasks-specific risk assessments and safe work practices are developed by a qualified person. Development of such risk assessments and work practices will involve consideration of information including, but not limited to, the following:

- Composition of the material to be disturbed
- Lead content of the paint coating
- Methods and tools to be used, including exhaust ventilation
- Duration of the work and/or work shift
- Training of the personnel conducting the task
- Respiratory protection program in effect

3.4 POLYCHLORINATED BIPHENYLS

3.4.1 Methodology

A visual review and/or a review of estimated/reported construction dates to assess the potential presence of PCBs in electrical equipment was completed. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic systems, compressors, switchgear and capacitors.

No sampling of dielectric fluids was undertaken as part of this assessment.

3.4.2 Findings

No suspected PCB-containing equipment was observed.

3.4.3 Recommendations

Should a material suspected to contain PCBs become uncovered during demolition activities (i.e., fluorescent light fixtures, dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.

PCB-containing items identified for removal and disposal should be handled, transported, stored and disposed of in accordance with the following:

- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation
- Federal PCB Regulations (SOR/2008-273)



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3.5 MOULD

3.5.1 Methodology

The presence of suspect visible mould was assessed through visual observations. Material observed with dark-coloured staining and/or a textured and discoloured appearance is described as “suspected mould”. Mould identified visually is defined as “suspected mould” unless it is confirmed as mould by laboratory analysis.

The scope of work and procedures utilized for the visual assessment were based on the recommendations for such provided in the documents listed below:

- Standard Construction Document CCA 82 *Mould Guidelines for the Canadian Construction Industry*, Canadian Construction Association, 2004 (referred to as CCA 82)
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008 (referred to as the NYC Guidelines)
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health, 2004 (referred to as the Health Canada Guide)
- *Indoor Air Quality in Office Buildings: A Technical Guide*, Report of the Federal-Provincial Advisory Committee on Environmental and Occupational Health, 1995 (referred to as the IAQ Guide)
- *Bioaerosols: Assessment and Control*, American Conference of Governmental Industrial Hygienists (ACGIH), 1999 (referred to as the ACGIH Report)
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA, Second Edition 2005

3.5.2 Findings

Suspect mould or moisture-impacted building materials were not observed at the time of the assessment.

3.5.3 Recommendations

As no mould and/or moisture-impacted building materials were observed within the subject building during the assessment, no recommendations have been provided.

3.6 MERCURY

3.6.1 Methodology

An assessment for equipment that is likely to contain mercury (such as thermostats, thermometers and fluorescent light tubes) was completed visually. Information on the type of equipment (i.e., gauges, switches, batteries, thermometers, etc.), model and serial numbers and quantities was recorded, where such information was available.



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3.6.2 Findings

Items suspected to contain liquid mercury or mercury vapour were not observed.

3.6.3 Recommendations

As no mercury-containing items were observed within the subject building during the assessment, no recommendations have been provided.

3.7 OZONE DEPLETING SUBSTANCES

3.7.1 Methodology

An assessment for equipment or systems likely to contain ODSs (such as refrigeration/cooling equipment or fire suppression systems) was completed visually. Information on the type of equipment, manufacturer and type and quantity of refrigerants was recorded, where available.

3.7.2 Findings

Building related cooling, refrigeration or fire suppression equipment suspected to be ODS-containing was not observed.

3.7.3 Recommendations

As no suspect ODS-containing equipment was observed within the subject building during the assessment, no recommendations have been provided.

3.8 SILICA

3.8.1 Methodology

An assessment for the presence of silica was conducted visually. The presence of typical silica-containing building materials such as concrete, masonry, stone, terrazzo, refractory brick, gypsum, ceramic tile, ceiling tile and other items, was noted.

3.8.2 Findings

Silica is expected to be present in the following, which were observed in various locations throughout:

- Cement products such as:
 - Concrete—foundations, floors
 - Panels
- Gypsum and associated wall/ceiling finish materials
- Ceiling tiles
- Asphalt and asphalt products containing rock or stone (e.g., roof shingles)



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3.8.3 Recommendations

When silica-containing materials within the subject building are to be disturbed and/or removed (e.g., coring through concrete slabs, demolition of masonry or concrete units), ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by the COHSR and BC Reg. 296/97 (cristobalite and quartz—each 0.025 mg/m³). This would include, but not be limited to, the following:

- Providing workers with respiratory protection
- Wetting the surface of the materials, and use of water or dust suppressing agents to prevent dust emissions
- Providing workers with facilities to properly wash prior to exiting the work area

If the subject building is not demolished, silica-containing materials can be managed in place; therefore, no further action is recommended at this time.



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4.0 CLOSURE

This report has been prepared for the sole benefit of the PSPC on behalf of the RCMP. Any use which a third party makes of this report, or any reliance on decisions based on it, is the responsibility of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professionals and technical staff in accordance with generally accepted engineering, scientific and occupational health and safety practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgment of Stantec Consulting Ltd. based on the data obtained from the work. The conclusions are based on the site conditions encountered by Stantec Consulting Ltd. at the time the work was performed at the specific assessment and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on building construction and conditions, weather, building usage and other factors. Due to the nature of the investigation and the limited data available, Stantec Consulting Ltd. cannot warrant against undiscovered environmental or health and safety liabilities.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

We trust that the above is satisfactory for your purposes at this time. Should you have any questions or concerns, or require additional information, please do not hesitate to contact the Stantec Project Manager at your convenience.

Regards,

Stantec Consulting Ltd.



APPENDIX A

**Hazardous Building Materials Background Information,
Health Effects Information and Regulatory Framework**

Appendix A HAZARDOUS BUILDING MATERIALS BACKGROUND INFORMATION, HEALTH EFFECTS INFORMATION AND REGULATORY FRAMEWORK

A.1 ASBESTOS

Asbestos is a naturally occurring form of fibrous silicate that is durable and flexible; has high thermal and tensile strength; is resistant to heat, chemical corrosion and friction; does not conduct electricity; and insulates well against condensation, heat and noise. Due to these properties, asbestos was used in over 3,000 commercial products, and it is estimated that approximately 70% of the asbestos that was used in North America was used in building materials.

In buildings, and among many other potential asbestos-containing materials, asbestos is typically found in plaster, mechanical insulation, gaskets, thermal insulation on pipes, refractory material, roofing felts, floor tiles, ceiling tiles and parging, heat resistant panels, incandescent light fixture reflector plates, and any other material requiring a high degree of durability or thermal resistance.

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs or “manufactured products” are materials that by the nature of their manufacturing/construction do not readily allow the release of asbestos fibres. These materials should not be cut or shaped with power tools, since this procedure may allow for the release of the asbestos fibres. Some materials or “manufactured products”, such as plaster, drywall and ceiling tiles that are considered to be non-friable in an undisturbed state can become friable when damaged or disturbed.

The common use of friable (breakable by hand) asbestos-containing materials (ACMs) in construction ceased voluntarily in the mid-1970s; however, the spray application of asbestos-containing fireproofing was not prohibited until 1986. A material known as vermiculite, which was commonly used for insulation within attics, floor spaces or within masonry block wall systems and may be contaminated with asbestos due to its production processes, was used into the mid-1990s. In addition, asbestos cement products and roofing products (e.g., sealants) currently used in the construction of buildings may still contain asbestos.

A.1.1 Health Effects

Undisturbed asbestos within building materials poses no health risks. Asbestos poses a risk when building materials containing asbestos are impacted, or disturbed, thereby releasing the asbestos fibres into the air.



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Asbestos-related diseases are caused when suspended airborne asbestos fibres are inhaled and the fibres settle into various regions of the lungs and remain for extended periods. Once embedded in the lungs the asbestos fibres cause scarring within the lung tissue, ultimately leading to impaired lung function (asbestosis) and/or various cancers (lung cancer; mesothelioma). These asbestos-related diseases are irreversible and fatal. The risk of lung-related cancers is increased in individuals who smoke.

These asbestos-related diseases most often occur in individuals who have been exposed to high concentrations of airborne asbestos over a long period of time, though mesothelioma has been found in individuals with short-term exposures. Symptoms or the development of these asbestos-related diseases usually occur 10 to 25 years after exposure.

A.1.2 Regulatory Framework

Asbestos is included in the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR) and British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97). Included in both regulatory instruments are provisions for the general duties of employers, requirements for health assessments, training and project notification. There are also sections that will also apply to abatement projects, depending on the work procedures and specific work site hazards.

The COHSR and BC Reg. 296/97 also established an 8-hour occupational exposure limit (OEL) for asbestos (all forms) to be 0.1 fibre/cubic centimetre.

The 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos* (Asbestos Guide) is used by Occupational Health and Safety officers as a guide when reviewing abatement work practices and employer codes of practice, and generally meets the requirements of the COHSR.

The Asbestos Guide also provides significant additional background information pertaining to asbestos, along with details on health effects and other applicable legislation within the province of British Columbia (e.g., the federal *Hazardous Products Act*, the BC Building Code and waste disposal regulations).

According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

According to the current version of BC Reg. 296/97, asbestos-containing material (ACM) means any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.



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Disposal of asbestos waste is governed by the British Columbia Hazardous Waste Regulation (BC Reg. 63/88). The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of asbestos waste in British Columbia. In general, and for transportation and disposal, the waste must be placed in a double sealed container, properly labeled, free of cuts, tears or punctures and disposed of at a licensed waste station which has been properly notified of the presence of asbestos waste.

A.2 LEAD

Lead may be used in its pure metallic form or combined chemically with other elements to form lead compounds. Metallic lead is used to make products such as electric storage batteries, ammunition, lead solder, radiation shields, pipes, and sheaths for electric cables. Metallic lead is sometimes combined with other metals such as copper, tin and antimony as lead alloys for use in the manufacture of a variety of metal products.

Organic lead compounds contain a lead atom covalently bonded to carbon. Common examples of organic lead compounds include lead “soaps” such as lead oleates, high pressure lubricants, and anti-knock agents in gasoline.

Inorganic lead compounds (or lead salts) result when lead is combined with an element other than carbon. Examples are lead oxide, lead chromate, lead carbonate and lead nitrate. Inorganic lead compounds may occur as solids or in solutions, and are used in insecticides, pigments, paints, frits, glasses, plastics, and rubber compounds.

Lead is commonly found in buildings in items such as the solder used on copper domestic pipes; the caulking on bell fittings of cast iron drainage pipes; electrical equipment/wiring; batteries (e.g., emergency exit signage batteries); lead sheeting (e.g., x-ray rooms); vent and pipe flashings; and paints and ceramic tile glazes.

A.2.1 Health Effects

Elemental lead and inorganic lead compounds are absorbed through ingestion or inhalation and can incorporate into the bone marrow, nerve tissue, brain, and kidneys. In children, symptoms of lead poisoning can include headaches, irritability, abdominal pain, vomiting, anemia, weight loss, poor attention span, noticeable learning difficulty, slowed speech development, and hyperactivity. In adults, symptoms of lead poisoning can include pain, numbness or tingling of the extremities, muscular weakness, headache, abdominal pain, memory loss, unsteady gait, pale skin, weight loss, vomiting, irritability, and anemia. Although adults are susceptible to the toxic effects of lead, children are at high risk due to the nature of a child's activities that involve the introduction of non-food items into their bodies.

Excessive airborne lead and surface contamination can be transferred to employees' hands and may result in lead ingestion. Therefore, work practices intended to minimize surface lead concentrations, such as frequent cleaning of work surfaces should be included in an overall lead exposure control plan.



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A.2.2 Regulatory Framework

In the past, the United States Department of Housing and Urban Development (HUD) set a criteria of lead-based paint as 0.5% lead (by weight) or 5,000 parts per million (ppm) for evaluating whether lead is a hazard in a residential setting.

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm (2005) to 90 ppm (2010). However, it is important to note that this regulation does not comment on the potential occupational exposure if the material is disturbed.

Under the COHSR and BC Reg. 296/97, a regulatory limit has been established for occupational exposure to airborne lead that may be present in a workplace. The OEL for airborne lead dust or fumes per both regulatory instruments should not exceed the TWA value of 0.05 milligram per cubic metre of air (mg/m^3). The OEL represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
 - This potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
 - Any risk assessment should include for the presence of high risk individuals within the workplace

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

Work procedures that can be used to assist in protecting workers and adjacent work areas from exposure to lead during disturbance activities can also be found in this document.



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According to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88), lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 milligrams per litre (mg/L) lead.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of lead waste in British Columbia.

A.3 POLYCHLORINATED BIPHENYLS (PCBS)

PCBs are man-made toxic chemicals whose physical and chemical properties produce the following attributes: fire resistance, low electrical conductivity, high resistance to thermal breakdown, high chemical stability and resistance to oxidants and other chemical.

PCBs were used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. In fluorescent fixtures, PCBs were usually found within the small capacitors inside the ballast that controls the lamp. The Federal Chlorobiphenyls Regulation, SOR/91-152, prohibited the use of PCBs in electrical equipment manufactured after July 1, 1980. Stocks of items such as ballasts containing PCBs may have been used into the early or mid-1980s.

A.3.1 Health Effects

PCBs are insoluble in water; however, they readily dissolve in fats and other organic compounds. It is these attributes and fat-solubility that allow PCBs to persist in the environment and bio-accumulate in humans and animals. Exposure to PCBs can affect the immune system, reproductive system, nervous system and endocrine system. In humans, PCBs are potentially cancer-causing.

A.3.2 Regulatory Framework

As of September 5, 2008, under subsection 93(1) of the *Canadian Environmental Protection Act*, (CEPA), Federal PCB regulations were published by the Canada Gazette Part II (SOR/2008-273) that imposed specific deadlines for the elimination of all PCBs in concentrations at or above 50 milligrams/kilogram (mg/kg). This regulation required the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limited the period of time PCB materials could be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well as improved practices for the management of PCBs that remain in use (i.e., those with PCB concentrations less than 50 mg/kg) until their eventual elimination.

Under SOR/2008-273, the following end-of-use dates were established:

- December 31, 2009
 - Equipment containing PCBs in a concentration of 500 mg/kg or more
 - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in sensitive locations (i.e., drinking-water treatment plant, food or feed processing plant, child care facility, preschool, primary or secondary school, hospital, or senior citizen care facility or the property on which the plant or facility is located, within 100 m of it)



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- December 31, 2014
 - Certain specified equipment not replaced by the 2009 deadline due to technical constraints for engineered-to-order equipment or if the facility is scheduled for permanent closure before 2014
- December 31, 2025
 - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in non-sensitive locations

In addition to the above, a maximum storage period of one year is allowed for PCBs and products that contain PCBs at each of the following non-sensitive locations:

- Owner's PCB storage site
- PCB storage site of an authorized facility for decontamination or of an authorized transfer site
- PCB storage site of an authorized destruction facility

For British Columbia, according to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88):

- PCB wastes are defined as: PCB liquid, PCB solid, and PCB equipment that have been taken out of service for the purpose of treatment, recycling, reuse, or disposal, or for the purpose of storage prior to treatment, recycling, reuse, or disposal
 - "PCB liquid" means any liquid containing more than 50 parts per million (ppm) by weight of PCB
 - "PCB solid" means any material or substance other than PCB liquid that contains or is contaminated with chlorobiphenyls at a concentration greater than 50 ppm by weight of chlorobiphenyls
 - "PCB Equipment" means any manufactured item that contains or is contaminated with a PCB liquid or PCB solid is PCB equipment. While items of PCB equipment are often electrical components such as transformers or capacitors, the definition includes other items such as contaminated drums and containers.
 - o NOTE: An item of equipment from which PCB liquid or PCB solid has been removed is still PCB equipment until it has been decontaminated by an approved protocol. This is because the removal is a treatment process and the equipment, until decontaminated, is a residue from the treatment

In British Columbia, PCB equipment becomes PCB wastes as soon as it is removed from service. This is the case even if the intent is to treat, recycle, or reuse the equipment.

When PCB wastes are stored in British Columbia, the full requirements of BC Reg. 63/88 apply to:

- 1.0 kg or more of pure PCB
- 100 L or more of any liquid containing more than 50 ppm of PCB
- 100 kg or more of any material other than a liquid, contaminated with more than 50 ppm of PCB



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These amounts are the total of all amounts at a single location owned or controlled by the same person. They include PCB equipment. BC Reg. 63/88 also provides packaging requirements for storage, labeling requirements, waste destruction requirements, and references SOR/2008-273, indicating:

NOTE: The federal PCB Regulations also apply to stored PCBs and have strict maximum allowable storage periods which would prohibit provisions in [BC Reg 63/88] related to storage prior to 1 April 1992. In event of a conflict between [BC Reg 63/88] and [SOR/2008-273], follow [SOR/2008-273].

The Federal Transportation of Dangerous Goods Regulation sets out the requirements for the proper transport of PCB waste across provincial boundaries.

In British Columbia, a manifest issued by the Ministry of Environment (or equivalent federal document) must be used for hazardous wastes shipped from sites in British Columbia. A manifest must be used to transport:

- 5 kg or more of PCB solids
- 5 L or more of PCB liquids
- An amount of a PCB solid or PCB liquid containing more than 500 g of PCB within BC
- 500 g or more of solids, liquids, or mixtures of these containing 50 mg/kg of PCB outside of BC

A.4 MOULD

Mould can be found everywhere in the outside environment—on plants, in soil and on dead and decaying matter (i.e., dead leaves). Mould requires two main conditions in order to grow—a source of food (a substrate typically comprised of cellulose) and water. Sources of food for mould are plentiful in outdoor and indoor environments; however, it is the presence of water in an indoor environment that will determine mould growth. The source of water can be a result of a water pipe leak or even excess condensation. Thus, the key to controlling mould indoors is to control the presence of water.

The removal of building materials impacted by mould growth may require workers with specific training and experience using work procedures that have been developed to protect workers and work areas from exposure to elevated concentrations of airborne mould.

A.4.1 Health Effects

There are a number of documented cases of health problems related to exposure to indoor fungi. Both high-level, short-term exposures and lower-level, long-term exposures can result in illness. The most common symptoms from exposure to mould in indoor environments are runny nose, eye irritation, cough, congestion, aggravation of asthma, headache, flu-like symptoms, fatigue, and skin rash. People with suppressed immune systems may be susceptible to fungal infections as a result of exposure to indoor moulds.



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People who are exposed to mould growth on building materials will not necessarily exhibit adverse health effects. However, the mould must still be removed. Humans are at risk from indoor mould when fungal spores, fragments or metabolites are released into the air and inhaled or physically contacted (dermal exposure).

Not everyone experiences allergic reaction; the susceptibility to exposure varies with the individual's genetic predisposition, age, state of health, and concurrent exposures. For these reasons, and because the measurement of exposure is not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to establish "safe" or "unsafe" levels of exposure. However, federal and provincial policies have been written to minimize mould exposure and the elimination of mould indoors.

A.4.2 Susceptibility to Mould Exposure

People's reaction to mould exposure is quite varied, and although anyone can be affected, some people may be more susceptible and at greater risk, including:

- Infants and children
- Elderly
- Pregnant women
- Individuals with respiratory conditions or allergies and asthma
- Persons with weakened immune system (e.g., chemotherapy patients, organ or bone marrow transplant recipients, and people with HIV infections or autoimmune diseases)

People with specific health concerns should consult their doctor if concerned about mould exposure. Symptoms that may appear to stem from mould exposure may be due to other causes such as bacterial or viral infections or other allergies.

A.4.3 Regulatory Framework

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).



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Although there are currently no regulations in Canada pertaining specifically to mould in buildings, occupational health and safety regulations typically require employers to take every precaution reasonable in the circumstances for the protection of workers. For example, BC Reg. 296/97 indicates the following:

- Section 4.79(1):
 - Employer must ensure that the indoor air quality is investigated when
 - a) complaints are reported
- Section 4.79(2):
 - Air quality investigation must include
 - c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints

The WorkSafeBC Guideline for Part 4 of BC Reg. 296/97 discusses the application of the Regulation to workplaces with mould showing on exposed or hidden surfaces, or where mould may be a factor in complaints regarding indoor air quality. The guideline provides information for investigating indoor air quality complaints with respect to mould contamination, including information on sampling for the presence of moulds in buildings. Information is also provided on possible health effects and for cleanup personnel involved in the remediation of buildings damaged by water and mould.

Several additional guidelines and other resources describe procedures for the investigation and remediation of mould. The following documents indicate that mould observed in occupied building should be remediated in accordance with these procedures:

- Environmental Abatement Council of Ontario's (EACO) *Mould Abatement Guidelines*, 2010—Edition 2
- *Mould Guidelines for The Canadian Construction Industry*, Canadian Construction Association—82, 2004
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008
- *Bioaerosols: Assessment and Control*, ACGIH 1999
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health 2004
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA 1996
- *Clean-Up Procedures for Mould in Houses*, Canada Mortgage and Housing Corporation (CMHC) 2004

A.5 MERCURY

Mercury is commonly found in buildings as mercury vapour lighting, thermostats/thermometers with mercury-containing glass ampoules, electrical switches and can also be found in minor amounts in fluorescent lamp tubes and vapour bulbs and may be present in stable forms in adhesives. If mercury is exposed to the air, odourless vapours are formed.



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A.5.1 Health Effects

Routes of exposure for mercury and mercury compounds include inhalation, ingestion, skin and/or eye contact. Mercury is hazardous if it is inhaled or absorbed through the skin, therefore exposure controls (including both respiratory protection and skin protection) are important to consider.

Elemental (metallic) mercury most often causes health effects through inhalation of its vapour, which can be absorbed through the lungs. This kind of exposure can result when elemental mercury is spilled (or products that contain elemental mercury break) and the mercury is exposed to the air. Vapour concentrations can vary especially in warm or poorly-ventilated indoor spaces where the airborne concentration can exceed the permissible exposure limit (provincially set).

Chronic mercury “poisoning” can be caused by long-term exposure to low airborne concentrations (or low levels) of mercury. Symptoms or effects of mercury exposure include: tremors, emotional changes (e.g., mood swings, nervousness, irritability, etc.), neuromuscular effects (e.g., muscular weakness, twitching), mental changes/disturbances, digestive disturbances, headaches, insomnia, and changes in nervous response.

Factors that determine the severity of the health effects from mercury exposure include the following:

- Chemical form of mercury (e.g., elemental, methylmercury, inorganic and organic)
- Dose
- Age of individual exposed
- Duration of exposure
- Route of exposure—as listed above
- Health of individual exposed

A.5.2 Regulatory Framework

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Exposure to mercury is regulated by the COHSR and BC Reg. 296/97. The regulated occupational exposure limit for airborne mercury according to both regulatory instruments is 0.025 mg/m³ (eight-hour TWA).

Mercury disposal should be through a scrap dealer (elemental mercury), recycling firm for mercury vapour and returned to the manufacturer for light tubes and fixtures. Disposal of mercury waste is governed by BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of mercury waste in British Columbia.



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A.6 OZONE-DEPLETING SUBSTANCES

Ozone-depleting substances (ODSs) are chemical agents known as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) used in various refrigeration equipment including air-conditioning, heat pump, refrigeration or freezer units. They have also been used in solvents, as aerosol additives in the production of foam insulation and in fire extinguishing equipment.

A.6.1 Health Effects

Health effects are not typically related to exposure to ODSs directly, but to the consequences of ODS release to the atmosphere, subsequent degradation of the earth's ozone layer, and implications associated with increased UVB light exposure.

A.6.2 Regulatory Framework

ODSs are regulated in British Columbia by the British Columbia *Waste Management Act*—Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 387/99 as amended by BC Reg. 109/2002).

On federal land, aboriginal land and federal works, buildings and undertakings, the Federal Halocarbon Regulation 2003 (SOR/2003-289, including associated amendments) applies. All other buildings and uses of refrigerants and other agents are under the Ozone-Depleting Substances Regulations 1998 (SOR/99-7), under CEPA. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified individual. The regulation also details an owner's record-keeping obligations.

If ODS-containing materials are to be removed and disposed of, all ODSs must be handled, recycled, stored, and/or disposed of in accordance with the requirements of BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of ODS waste in British Columbia.

A.7 SILICA

Silica is a scientific name that refers to a mineral group made up of silicon and oxygen. It is the crystalline form of silica that is of concern when considering health effects. Crystalline silica occurs in several forms including quartz, cristobalite and tridymite. Silica's many uses include sand in golf courses and playgrounds, sandblasting abrasives, glass, ceramics, building materials (concrete, grout, bricks, blocks, asphalt, acoustical tiles, floor tiles, and plaster), electronic components.



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Dust containing respirable crystalline silica is produced during construction-related activities such as the following:

- Demolition
- Masonry, bricklaying and/or stone setting
- Rock drilling
- Repair and/or finishing of concrete materials
- Abrasive blasting
- Dry sweeping
- Quarrying and mining

A.7.1 Health Effects

Crystalline silica dust particles, which are small enough to be inhaled into the lungs (respirable size), can cause a number of health problems. As with asbestos, silica within building materials poses no threat to human health if left undisturbed.

Exposure to crystalline silica airborne dust may cause scarring of the lungs with coughing and shortness of breath—also known as “silicosis”, a form of disabling, progressive, and sometimes fatal pulmonary fibrosis.

A.7.2 Regulatory Framework

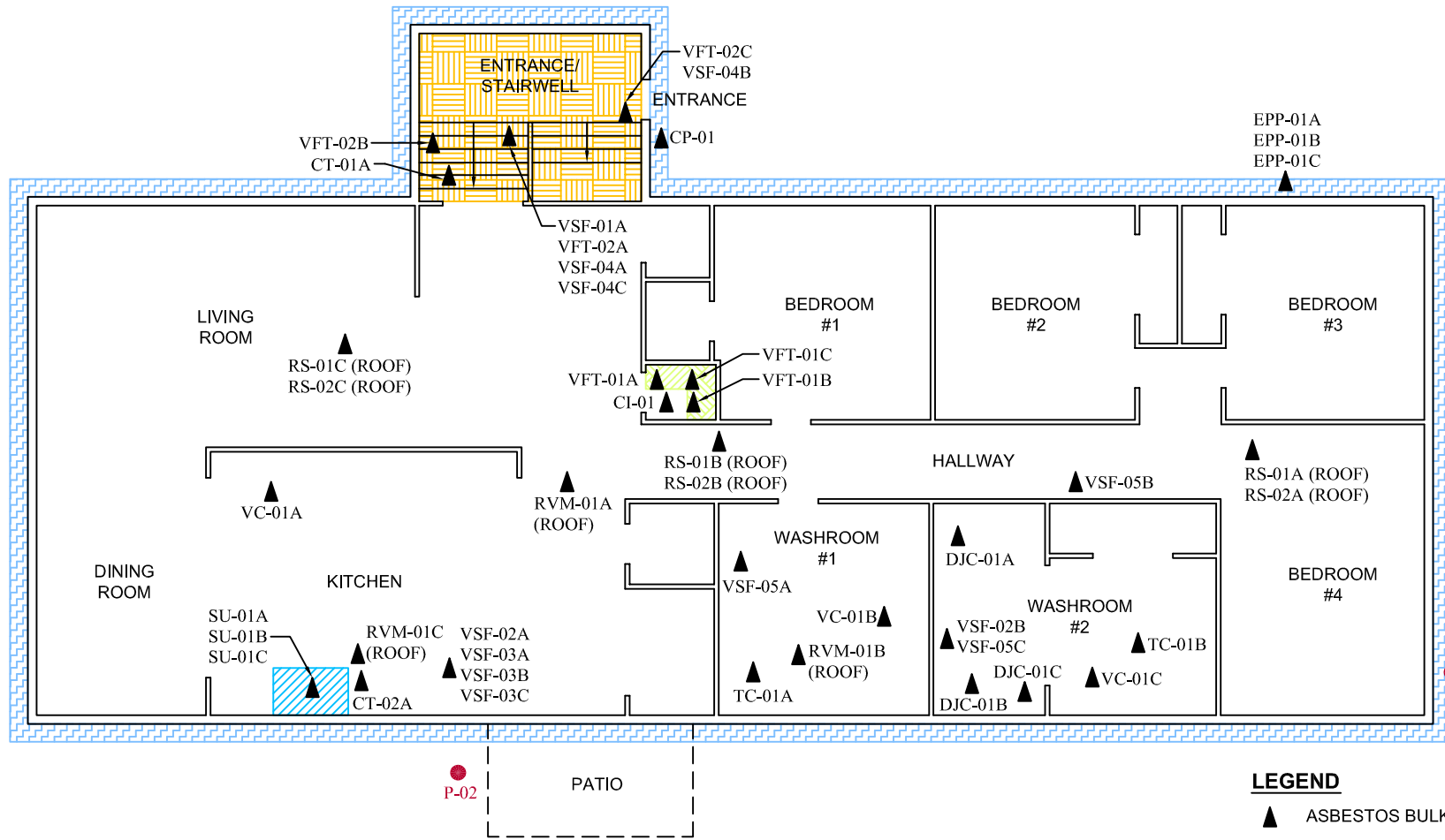
Regulations pertaining to silica are provided in BC Reg. 296/97. Included are general provisions (minimizing release; keeping worksite clear of unnecessary accumulations; ensuring methods for decontamination prevent generation of airborne silica), provisions for “restricted areas” (where there is a reasonable chance that the airborne concentration of silica exceeds or may exceed the occupational exposure limit), provisions for use in abrasive blasting, and provisions for health assessments for workers exposed to silica.

BC Reg. 296/97 and the COHSR also established the eight-hour OEL for silica to be 0.025 mg/m³ for each cristobalite and quartz.



APPENDIX B

Floor Plans



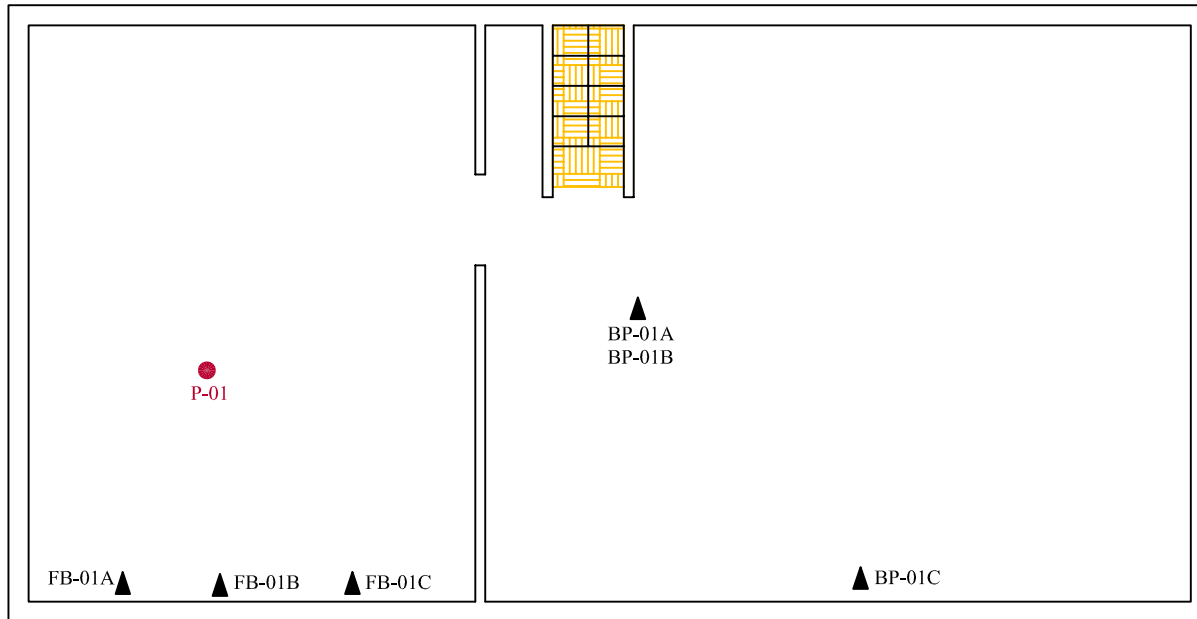
MOBILE HOME #5 - MAIN FLOOR

LEGEND

- ▲ ASBESTOS BULK SAMPLE
- PAINT CHIP SAMPLE
- ASBESTOS-CONTAINING SINK UNDERCOATING
- ASBESTOS-CONTAINING CEMENT PANEL
- ASBESTOS-CONTAINING VINYL FLOOR TILE (EXPOSED)
- ASBESTOS-CONTAINING VINYL FLOOR TILE (CONCEALED)

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

<p>FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS</p> <p>RCMP 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC</p>	Project No.: 123221377	<p>Dwg. No.: 1</p>	
	Scale: N.T.S.		
	Date: 19/07/18		
	Dwn. By: CD <small>SL2019070034</small> CS/DM		
Client: PUBLIC SERVICES AND PROCUREMENT CANADA (PSPC)	App'd By: TW		



MOBILE HOME #5 - BASEMENT

LEGEND

- ASBESTOS BULK SAMPLE
- PAINT CHIP SAMPLE
- ASBESTOS-CONTAINING VINYL FLOOR TILE (CONCEALED)

NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

<p>FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS</p> <p>RCMP 6652 CHRISTENSEN ROAD, ANAHIM LAKE, BC</p>	Project No.: 123221377	2	
	Scale: N.T.S.		
	Date: 19/07/18		
	Dwn. By: CD <small>SL2019070035</small> CS/DM		
Client: PUBLIC SERVICES AND PROCUREMENT CANADA (PSPC)	App'd By: TW		

APPENDIX C

Summary of Results: Analysis of Bulk Samples for Asbestos

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Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
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Appendix C SUMMARY OF RESULTS: ANALYSIS OF BULK SAMPLES FOR ASBESTOS

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Drywall joint compound applied to walls and ceiling throughout west section of washroom #2	5-DJC-01A	Main floor, washroom #2, ceiling	None Detected
	5-DJC-01B	Main floor, washroom #2, ceiling	None Detected
	5-DJC-01C	Main floor, washroom #2, wall	None Detected
Glued-on ceiling tile, 1' x 1' white/textured throughout entrance/stairwell (supplemental)	5-CT-01A	Entrance, stairwell	None Detected
Glued-on ceiling tile, rectangular, white/textured throughout interior, excluding entrance/stairwell (supplemental)	5-CT-02A	Main floor, kitchen	None Detected
Ceiling texture coat, white applied to glued-on ceiling tile (CT-02) within interior (supplemental)	5-TC-01A	Main floor, washroom #1	None Detected
	5-TC-01B	Main floor, washroom #2	None Detected
Vinyl counter, grey within kitchen, washroom #1 and washroom #2	5-VC-01A	Main floor, kitchen	None Detected
	5-VC-01B	Main floor, washroom #1	None Detected
	5-VC-01C	Main floor, washroom #2	None Detected
Sink undercoating, silver applied to kitchen sink	5-SU-01A	Main floor, kitchen	1% Chrysotile
	5-SU-01B	Main floor, kitchen	Positive Stop (Not Analyzed)
	5-SU-01C	Main floor, kitchen	Positive Stop (Not Analyzed)
Cement panel, grey—applied to exterior lower walls	5-CP-01	Exterior, entrance/stairwell	15% Chrysotile



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
September 16, 2019

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Fibreboard, brown with black paper backing—applied to basement ceiling	5-FB-01A-Tar Paper	Basement, north end	None Detected
	5-FB-01A-Fibre Board	Basement, north end	None Detected
	5-FB-01B-Tar Paper	Basement, north end	None Detected
	5-FB-01B-Fibre Board	Basement, north end	None Detected
	5-FB-01C-Tar Paper	Basement, north end	None Detected
	5-FB-01C-Fibre Board	Basement, north end	None Detected
Building paper, black—applied to basement ceiling	5-BP-01A	Basement, central	None Detected
	5-BP-01B	Basement, central	None Detected
	5-BP-01C	Basement, central	None Detected
Electrical penetration putty, grey—applied to perimeter of electrical conduit	5-EPP-01A	Exterior, bedroom #3	None Detected
	5-EPP-01A	Exterior, bedroom #3	None Detected
	5-EPP-01A	Exterior, bedroom #3	None Detected
Roof shingle, black with grey specks/asphalt—applied to roof (top layer)	5-RS-01A	Roof, west	None Detected
	5-RS-01B	Roof, central	None Detected
	5-RS-01C	Roof, east	None Detected
Roof shingle, black with black specks/asphalt—applied to roof (bottom layer)	5-RS-02A	Roof, west	None Detected
	5-RS-02B	Roof, central	None Detected
	5-RS-02C	Roof, east	None Detected
Chimney insulation, grey, associated with furnace chimney	5-CI-01	Main floor, furnace room	None Detected
Roof vent mastic, clear—applied to perimeter of vents	5-RVM-01A	Roof, central	None Detected
	5-RVM-01B	Roof, central	None Detected
	5-RVM-01C	Roof, central	None Detected
Vinyl sheet flooring, beige marbled tile, top layer (supplemental) in the entrance/stairwell	5-VSF-01A	Entrance/stairwell	None Detected



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
September 16, 2019

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Vinyl sheet flooring, beige blue design, top layer (supplemental) throughout the following locations on the main floor: <ul style="list-style-type: none"> • Kitchen • Dining room • Washroom #1 • Washroom #2 	5-VSF-02A	Main floor, kitchen	None Detected
	5-VSF-02B	Main floor, washroom #2	None Detected
Vinyl sheet flooring, red/brown, 2 nd layer under subfloor in the kitchen	5-VSF-03A	Main floor, kitchen	None Detected
	5-VSF-03B	Main floor, kitchen	None Detected
	5-VSF-03C	Main floor, kitchen	None Detected
Vinyl sheet flooring, orange, 2 nd layer in the entrance/stairwell	5-VSF-04A	Entrance/stairwell	None Detected
	5-VSF-04B	Entrance/stairwell	None Detected
	5-VSF-04C	Entrance/stairwell	None Detected
Vinyl sheet flooring, beige and brown antique square pattern, top layer in the water tank closet, under laminate in the hallway and under subfloor in washroom #2	5-VSF-05A	Main floor, washroom #1, water tank closet	None Detected
	5-VSF-05B	Main floor, hallway	None Detected
	5-VSF-05C	Main floor, washroom #2	None Detected
Vinyl floor tile, 12" x 12" cream stone pattern in the main floor furnace room	5-VFT-01A	Main floor, furnace	0.96% Chrysotile
	5-VFT-01B	Main floor, furnace	Positive Stop (Not Analyzed)
	5-VFT-01C-Floor Tile	Main floor, furnace	Positive Stop (Not Analyzed)
	5-VFT-01C-Mastic	Main floor, furnace	None Detected
Vinyl floor tile, 12" x 12" white under two layers of sheet flooring in the entrance stairwell	5-VFT-02A-Floor Tile	Entrance/stairwell	0.60% Chrysotile
	5-VFT-02A-Mastic	Entrance/stairwell	None Detected
	5-VFT-02B	Entrance/stairwell	Positive Stop (Not Analyzed)
	5-VFT-02C	Entrance/stairwell	Positive Stop (Not Analyzed)
<p>NOTES:</p> <p>Bold, highlighted text indicates confirmed ACM</p> <p>Discrepancies between sampled material or location descriptions between this table and the laboratory certificate—this table is to be considered correct</p>			



APPENDIX D

**Laboratory Analytical Report—Asbestos: Polarized Light
Microscopy**



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Phone: (604) 412-3004
Fax:
Collected:
Received: 7/04/2019
Analyzed: 7/11/2019

Proj: RCMP Anahim Lake / 123221377

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-DJC-01A **Lab Sample ID:** 551908045-0214

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #2, ceiling/Drywall joint compound applied to walls and ceiling throughout west section of washroom #2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: 5-DJC-01B **Lab Sample ID:** 551908045-0215

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #2, ceiling/Drywall joint compound applied to walls and ceiling throughout west section of washroom #2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: 5-DJC-01C **Lab Sample ID:** 551908045-0216

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #2, wall/Drywall joint compound applied to walls and ceiling throughout west section of washroom #2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: 5-CT-01A **Lab Sample ID:** 551908045-0217

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance, stairwell/Glued-on ceiling tile, 1x1 white/textured throughout entrance/stairwell (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/White	90.0%	10.0%	None Detected	

Client Sample ID: 5-CT-02A **Lab Sample ID:** 551908045-0218

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Glued-on ceiling tile, rectangular, white/textured throughout interior, excluding entrance/stairwell (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/White	90.0%	10.0%	None Detected	

Client Sample ID: 5-TC-01A **Lab Sample ID:** 551908045-0219

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #1/Ceiling texture coat, white applied to glued-on ceiling tile (CT-02) within interior (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White/Beige	90.0%	10.0%	None Detected	

Client Sample ID: 5-TC-01B **Lab Sample ID:** 551908045-0220

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #2/Ceiling texture coat, white applied to glued-on ceiling tile (CT-02) within interior (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/White	90.0%	10.0%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-VC-01A **Lab Sample ID:** 551908045-0221

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Vinyl counter, grey within kitchen, washroom #1 and washroom #2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-VC-01B **Lab Sample ID:** 551908045-0222

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #1/Vinyl counter, grey within kitchen, washroom #1 and washroom #2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-VC-01C **Lab Sample ID:** 551908045-0223

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #2/Vinyl counter, grey within kitchen, washroom #1 and washroom #2

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-SU-01A **Lab Sample ID:** 551908045-0224

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Sink undercoating, silver applied to kitchen sink

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/Silver	0.0%	99.0%	1% Chrysotile	

Client Sample ID: 5-SU-01B **Lab Sample ID:** 551908045-0225

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Sink undercoating, silver applied to kitchen sink

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 5-SU-01C **Lab Sample ID:** 551908045-0226

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Sink undercoating, silver applied to kitchen sink

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: 5-CP-01 **Lab Sample ID:** 551908045-0227

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Exterior, entrance/stairwell/Cement panel, grey - applied to exterior lower walls

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	0.0%	85.0%	15% Chrysotile	

Client Sample ID: 5-FB-01A-Tar Paper **Lab Sample ID:** 551908045-0228

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, north end/Fibreboard, brown with black paper backing - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Black	70.0%	30.0%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-FB-01A-Fibre Board **Lab Sample ID:** 551908045-0228A

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, north end/Fibreboard, brown with black paper backing - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	85.0%	15.0%	None Detected	

Client Sample ID: 5-FB-01B-Tar Paper **Lab Sample ID:** 551908045-0229

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, north end/Fibreboard, brown with black paper backing - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Black	70.0%	30.0%	None Detected	

Client Sample ID: 5-FB-01B-Fibre Board **Lab Sample ID:** 551908045-0229A

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, north end/Fibreboard, brown with black paper backing - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	85.0%	15.0%	None Detected	

Client Sample ID: 5-FB-01C-Tar Paper **Lab Sample ID:** 551908045-0230

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, north end/Fibreboard, brown with black paper backing - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Black	70.0%	30.0%	None Detected	

Client Sample ID: 5-FB-01C-Fibre Board **Lab Sample ID:** 551908045-0230A

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, north end/Fibreboard, brown with black paper backing - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	85.0%	15.0%	None Detected	

Client Sample ID: 5-BP-01A **Lab Sample ID:** 551908045-0231

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, central/Building paper, black - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	90.0%	10.0%	None Detected	

Client Sample ID: 5-BP-01B **Lab Sample ID:** 551908045-0232

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, central/Building paper, black - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	90.0%	10.0%	None Detected	

Client Sample ID: 5-BP-01C **Lab Sample ID:** 551908045-0233

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement, central/Building paper, black - applied to basement ceiling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown	90.0%	10.0%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-EPP-01A **Lab Sample ID:** 551908045-0234

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Exterior, bedroom #3/Electrical penetration putty, grey - applied to perimeter of electrical conduit

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-EPP-01B **Lab Sample ID:** 551908045-0235

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Exterior, bedroom #3/Electrical penetration putty, grey - applied to perimeter of electrical conduit

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-EPP-01C **Lab Sample ID:** 551908045-0236

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Exterior, bedroom #3/Electrical penetration putty, grey - applied to perimeter of electrical conduit

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-RS-01A **Lab Sample ID:** 551908045-0237

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, west/Roof shingle, black with grey specks/aphalt - applied to roof (top layer)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-RS-01B **Lab Sample ID:** 551908045-0238

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, central/Roof shingle, black with grey specks/aphalt - applied to roof (top layer)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-RS-01C **Lab Sample ID:** 551908045-0239

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, east/Roof shingle, black with grey specks/aphalt - applied to roof (top layer)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: 5-RS-02A **Lab Sample ID:** 551908045-0240

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, west/Roof shingle, black with black specks/asphalt - applied to roof (bottom layer)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	100%	None Detected	

Client Sample ID: 5-RS-02B **Lab Sample ID:** 551908045-0241

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, central/Roof shingle, black with black specks/asphalt - applied to roof (bottom layer)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	100%	None Detected	



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Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-RS-02C **Lab Sample ID:** 551908045-0242

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, east/Roof shingle, black with black specks/asphalt - applied to roof (bottom layer)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	100%	None Detected	

Client Sample ID: 5-CI-01 **Lab Sample ID:** 551908045-0243

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, furnace room/Chimney insulation, grey, associated with furnace chimney

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray	25.0%	75.0%	None Detected	

Client Sample ID: 5-RVM-01A **Lab Sample ID:** 551908045-0244

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, clear - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Clear	0.0%	100%	None Detected	

Client Sample ID: 5-RVM-01B **Lab Sample ID:** 551908045-0245

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, clear - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Clear	0.0%	100%	None Detected	

Client Sample ID: 5-RVM-01C **Lab Sample ID:** 551908045-0246

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Roof, central/Roof vent mastic, clear - applied to perimeter of vents

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Clear	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-01A **Lab Sample ID:** 551908045-0247

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/stairwell/ Vinyl sheet flooring, beige marbled tile, top layer (supplemental) in the entrance/stairwell

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-02A **Lab Sample ID:** 551908045-0248

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/ Vinyl sheet flooring, beige blue design, top layer (supplemental) throughout the following locations on the main floor: ki

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-02B **Lab Sample ID:** 551908045-0249

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, washroom #2/ Vinyl sheet flooring, beige blue design, top layer (supplemental) throughout the following locations on the main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	



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Customer ID: 55JACQ30L
Customer PO: 123221377
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-VSF-03A **Lab Sample ID:** 551908045-0250

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Vinyl sheet flooring, red/brown, 2nd layer under subfloor in the kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-03B **Lab Sample ID:** 551908045-0251

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Vinyl sheet flooring, red/brown, 2nd layer under subfloor in the kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-03C **Lab Sample ID:** 551908045-0252

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main floor, kitchen/Vinyl sheet flooring, red/brown, 2nd layer under subfloor in the kitchen

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-04A **Lab Sample ID:** 551908045-0253

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/Stairwell/Vinyl sheet flooring, orange, 2nd layer in the entrance/stairwell

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Tan	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-04B **Lab Sample ID:** 551908045-0254

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/Stairwell/Vinyl sheet flooring, orange, 2nd layer in the entrance/stairwell

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Tan	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-04C **Lab Sample ID:** 551908045-0255

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/Stairwell/Vinyl sheet flooring, orange, 2nd layer in the entrance/stairwell

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Tan	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-05A **Lab Sample ID:** 551908045-0256

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main Floor, washroom #1, water tank closet/Vinyl sheet flooring, beige and brown antique square pattern, top layer in the water tank closet, u

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	

Client Sample ID: 5-VSF-05B **Lab Sample ID:** 551908045-0257

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main Floor, hallway/Vinyl sheet flooring, beige and brown antique square pattern, top layer in the water tank closet, under laminate in the ha

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	



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

EMSL Canada Order 551908045
Customer ID: 55JACQ30L
Customer PO: 123221377
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-VSF-05C **Lab Sample ID:** 551908045-0258

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main Floor, washroom #2/ Vinyl sheet flooring, beige and brown antique square pattern, top layer in the water tank closet, under laminate in th

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	100%	None Detected	

Client Sample ID: 5-VFT-01A **Lab Sample ID:** 551908045-0259

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main Floor, furnace/ Vinyl floor tile, 12x12 cream stone pattern in the main floor furnace room

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	99.0%	0.96% Chrysotile	

Client Sample ID: 5-VFT-01B **Lab Sample ID:** 551908045-0260

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main Floor, furnace/ Vinyl floor tile, 12x12 cream stone pattern in the main floor furnace room

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)

Client Sample ID: 5-VFT-01C-Floor Tile **Lab Sample ID:** 551908045-0261

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main Floor, furnace/ Vinyl floor tile, 12x12 cream stone pattern in the main floor furnace room

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)

Client Sample ID: 5-VFT-01C-Mastic **Lab Sample ID:** 551908045-0261A

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Main Floor, furnace/ Vinyl floor tile, 12x12 cream stone pattern in the main floor furnace room

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 5-VFT-02A-Floor Tile **Lab Sample ID:** 551908045-0262

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/stairwell/ Vinyl floor tile, 12x12 white under two layers of sheet flooring in the entrance stairwell

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	99.4%	0.60% Chrysotile	

Client Sample ID: 5-VFT-02A-Mastic **Lab Sample ID:** 551908045-0262A

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/stairwell/ Vinyl floor tile, 12x12 white under two layers of sheet flooring in the entrance stairwell

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Tan	0.0%	100.0%	None Detected	

Client Sample ID: 5-VFT-02B **Lab Sample ID:** 551908045-0263

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/stairwell/ Vinyl floor tile, 12x12 white under two layers of sheet flooring in the entrance stairwell

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)



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EMSL Canada Order 551908045
Customer ID: 55JACQ30L
Customer PO: 123221377
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: 5-VFT-02C **Lab Sample ID:** 551908045-0264

Sample Description: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Entrance/stairwell/Vinyl floor tile, 12x12 white under two layers of sheet flooring in the entrance stairwell

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)

Analyst(s): _____

- Harman Sohi PLM Grav. Reduction (8)
- Ioana Taina PLM (19)
- Shorthri Kalikutty PLM (2)
- PLM Grav. Reduction (21)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. 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 or the U.S. Government

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

Report amended: 07/11/2019 17:05:43 Replaces amended report from: 07/11/2019 17:03:01 Reason Code: Client-Change to Appearance

APPENDIX E




Summary of Identified Asbestos-Containing Materials

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix E Summary of Identified Asbestos-Containing Materials
September 16, 2019

Appendix E SUMMARY OF IDENTIFIED ASBESTOS-CONTAINING MATERIALS

**Table E-1 Summary of Identified Asbestos-Containing Materials
RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC**

Identified ACM Description and Condition Information	
Silver sink undercoating applied to the underside of the kitchen sink	
% Type	1% Chrysotile
Friability	Non-friable
Quantity	Approximately 1 square metre
Condition	Good
	
Grey cement panel applied to lower exterior walls	
% Type	15% Chrysotile
Friability	Non-friable
Quantity	Approximately 55 square metres
Condition	Good
	
12" x 12" cream stone patter vinyl floor tile in the main floor furnace room	
% Type	0.96% Chrysotile
Friability	Non-friable
Quantity	Approximately 1 square metre
Condition	Good
	




PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix E Summary of Identified Asbestos-Containing Materials
September 16, 2019

**Table E-1 Summary of Identified Asbestos-Containing Materials
RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC**

Identified ACM Description and Condition Information	
12" x 12" white vinyl floor tile concealed under two layers of sheet flooring in the entrance stairwell.	
% Type	0.60% Chrysotile
Friability	Non-friable
Quantity	Approximately 15 square metres
Condition	Good

A photograph showing a cross-section of a floor structure. A white arrow points to a layer of material, likely the identified asbestos-containing material, which is situated between two layers of sheet flooring. The structure includes wooden joists and a metal edge.

APPENDIX F

**Summary of Results: Analysis of Paint Chip Samples for
Lead**

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix F Summary of Results: Analysis of Paint Chip Samples for Lead
September 16, 2019

Appendix F SUMMARY OF RESULTS: ANALYSIS OF PAINT CHIP SAMPLES FOR LEAD

**Table F-1 Suspected Lead-Containing Paint Sample and Analytical Results Summary
RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC**

Sample Number	Paint Colour/Application	Sample Location	Result (ppm)
5-P-01	Red on structural steel	Basement	120
5-P-02	Brown on wood stairs	Exterior, front	710
5-P-03	Beige on vinyl siding	Exterior, rear	<80
NOTE: Bold , highlighted text indicates confirmed LCP			



APPENDIX G

Laboratory Analytical Report—Lead: Paint Chip Analysis

**EMSL Canada Inc.**

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CustomerID: 55JACQ30L

CustomerPO: 123221377

ProjectID:

Attn: **Steve Chou**
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
 Fax:
 Received: 07/04/19 11:18 AM
 Collected:

Project: **RCMP Anahim Lake / 123221377****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample</i>	<i>Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
5-P-01 551908030-0026			7/8/2019	0.2456 g	81 ppm	120 ppm
	Site: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Basement Desc: Red on structural steel					
5-P-02 551908030-0027			7/8/2019	0.2460 g	81 ppm	710 ppm
	Site: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Exterior, front Desc: Brown on wood stairs					
5-P-03 551908030-0028			7/8/2019	0.2486 g	80 ppm	<80 ppm
	Site: Mobile House #5 - 6652 Christensen Road, Anahim Lake, BC - Exterior, rear Desc: Beige on vinyl siding					

Rowena Fanto, Lead Supervisor
 or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. 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. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Cert #2845.08; AIHA-LAP, LLC - ELLAP #196142

Initial report from 07/11/2019 09:32:26

APPENDIX H


Summary of Identified LCPS

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix H Summary of Identified LCPs
September 16, 2019

Appendix H SUMMARY OF IDENTIFIED LCPS

**Table H-1 Summary of Identified LCPs
RCMP Mobile Home #5, 6652 Christensen Road, Anahim Lake, BC**

LCP Description		Photo
Paint colour	Brown	
Substrate	Wood	
Location/approx. extent	Exterior wood stairs of the rear porch	
Lead content	710	
Condition	Good (partially worn from the surface in some locations)	



APPENDIX A3

Stantec
Pre-Demolition Hazardous Building Materials Assessment
RCMP Old Detachment #1
6661 Christensen Road
Anahim Lake, BC
Sept 16, 2019



**Pre-Demolition Hazardous
Building Materials Assessment**

RCMP Old Detachment #1, 6661
Christensen Road, Anahim Lake BC

September 16, 2019

Prepared for:

Public Services and Procurement
Canada, Pacific Region
1230 Government Street
Victoria, BC V8W 3X4

Prepared by:

Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Project No.: 123221377

PSPC Project No.: R.103948.001

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

This document entitled Pre-Demolition Hazardous Building Materials Assessment was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Public Services and Procurement Canada, Pacific Region (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____
(signature)

Steve Chou, B.A., Dipl. Tech.

Reviewed by _____
(signature)

Tiffany Waite, B.Sc.

Approved by _____
(signature)

Sean Brigden, B.Sc., P.B.Dipl., CRSP



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Executive Summary

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) on behalf of the Royal Canadian Mounted Police (RCMP) to conduct a hazardous building materials assessment of RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC (subject building).

The purpose of the assessment was to check for potential hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

The work was carried out in accordance with the requirements of the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR), British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97) and the RCMP Asbestos Management Plan (AMP).

The hazardous building materials considered during this assessment included the following:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)
- Polychlorinated biphenyls (PCBs) in electrical equipment
- Mould and/or moisture-impacted building materials
- Mercury in electrical equipment
- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

Based on Stantec's visual assessment and the laboratory analyses performed on the samples collected, as well as a review of previous reports or sampling records/reports, hazardous building materials were identified to be present.

A summary of our findings is presented in Table 1, below. Recommendations pertaining to the handling, removal, transportation and disposal of identified hazardous building materials are provided in the body of this report.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Table ES 1 Summary of Findings

Hazardous Building Material	Summary of Findings
Asbestos	<p>The following ACMs were identified through this assessment:</p> <ul style="list-style-type: none"> • Sink/toilet under coating • Vent mastic • Windowpane caulking • Cement panel <p>Identified ACMs were observed to be in good condition.</p>
Lead	<p>The following LCPs were identified through previous reports or sampling records, and were visually confirmed to remain within the building during the current assessment:</p> <ul style="list-style-type: none"> • Grey paint on front/rear metal entrance door and frame • Light tan paint on metal doors and frames throughout • Off-white paint on drywall throughout <p>The following additional LCP was identified through this assessment:</p> <ul style="list-style-type: none"> • Brown paint on exterior metal gutter and downspout <p>Identified LCPs were observed to be in good condition</p> <p>The building materials coated with identified LCPs are not anticipated to be disposed of via landfill (e.g. metal) and/or did not contain lead in concentrations that would be anticipated to create lead-leachable waste (e.g. drywall coated with paint that contains 760 ppm lead). As a measure of diligence and confirmation, a bulk sample of exterior wood coated with tan coloured paint was collected in a form presumed to be representative of waste generated during demolition. Analysis of that sample indicated that such waste does NOT contain lead in a dispersible form such that its leachate contains greater than 5.0 milligrams per litre (mg/L) lead.</p> <p>Lead may also be present in the following materials:</p> <ul style="list-style-type: none"> • Lead-acid batteries used in emergency lighting • Older electrical wiring materials and sheathing • Solder used on domestic water lines • Solder used in bell fittings for cast iron pipes and in electrical equipment • Vent and pipe flashings
Polychlorinated biphenyls (PCBs)	<p>Ballasts within two light fixtures were visually inspected and found to be non-PCB containing. Based on these observations, it is unlikely that PCB-containing ballasts are present within the approximately 70 light fixtures observed. However, this must be verified at the time of demolition.</p>
Mould	<p>Moisture-impacted materials were observed as follows:</p> <ul style="list-style-type: none"> • Moisture-stained ceiling tiles in various locations
Mercury	<p>Mercury vapour is present in the light tubes within the approximately 70 fluorescent light fixtures observed throughout.</p> <p>One mercury-containing thermostat was identified on the main floor, general office, on the wall adjacent to the male washroom.</p>
Ozone-depleting substance (ODS)	<p>The following equipment was identified by labels to be ODS-containing:</p> <ul style="list-style-type: none"> • One Climette wall mounted A/C unit (R-22/18oz)



Table ES 1 Summary of Findings

Hazardous Building Material	Summary of Findings
Silica	<p>Silica is expected to be present in the following, which were observed in various locations throughout:</p> <ul style="list-style-type: none"> • Cement products such as: <ul style="list-style-type: none"> – Concrete—foundations, floors, walls, blocks – Masonry units and associated mortar – Cement panels • Gypsum and associated wall/ceiling finish materials • Suspended ceiling tiles • Asphalt and asphalt products containing rock or stone (e.g., roof shingles)

The statements made in this Executive Summary text are subject to the same limitations included in this report and are to be read in conjunction with the remainder of this report.



Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	asbestos-containing material
AIHA	American Industrial Hygiene Association
AMP	Asbestos Management Plan
BC	British Columbia
CEPA	<i>Canadian Environmental Protection Act</i>
CFC	chlorofluorocarbon
CMHC	Canada Mortgage and Housing Corporation
COHSR	Canada Occupational Health and Safety Regulations
EACO	Environmental Abatement Council of Ontario
ELLAP	Environmental Lead Laboratory Approval Program
EMSL	EMSL Canada Inc.
HCFC	hydrochlorofluorocarbon
HUD	polarized light microscopy
HVAC	heating, ventilation and air conditioning
LCP	lead-containing paint
NVLAP	National Voluntary Laboratory Accreditation Program



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

ODS	ozone-depleting substance
OEL	occupational exposure limit
PCB	polychlorinated biphenyl
PLM	polarized light microscopy
PSPC	Public Services and Procurement Canada
RCMP	Royal Canadian Mounted Police
USEPA	United States Environmental Protection Agency



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT— RCMP OLD DETACHMENT #1, 6661 CHRISTENSEN ROAD, ANAHIM LAKE BC

Introduction
September 16, 2019

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was commissioned by Public Services and Procurement Canada (PSPC) on behalf of the Royal Canadian Mounted Police (RCMP) to conduct a hazardous building materials assessment of RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC (subject building).

The purpose of the assessment was to check for potential hazardous building materials that may require special attention in accordance with applicable federal and provincial regulations, prior to planned demolition activities.

The work was carried out in accordance with the requirements of the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR), British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97) and the RCMP Asbestos Management Plan (AMP).

The hazardous building materials considered during this assessment included the following:

- Asbestos-containing materials (ACMs)
- Lead, including lead-containing paints (LCPs)
- Polychlorinated biphenyls (PCBs) in electrical equipment
- Mould and/or moisture-impacted building materials
- Mercury in electrical equipment
- Ozone-depleting substances (ODSs) in heating, ventilation and air conditioning (HVAC) equipment or fire suppression systems
- Silica in building materials

The site work was conducted by Mr. Steve Chou and Mr. Keith Irwin on June 24 and June 27, 2019.

1.1 UNDERSTANDING OF THE PROJECT

The following documentation related to hazardous building materials was reviewed prior to undertaking the assessment:

- Pinchin West Report No. 13789S entitled *Hazardous Building Materials Assessment; RCMP Detachment 6661 Christensen Road, Anahim Lake, BC*, dated July 18, 2016, prepared for BGIS-WSI (Pinchin Report)

This documentation provided Stantec with an understanding of ACMs or hazardous building materials that were anticipated to be present at the subject building. According to the above-noted document, various LCPs, silica-containing materials, mercury-containing items, PCBs and mould were previously identified.



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Based on the limited and non-destructive nature of the Pinchin Report, and on behalf of the RCMP, PSPC requested this assessment to provide supplemental and current information as a measure of diligence in maintaining compliance with the requirements of the COHSR, BC Reg. 296/97 and the RCMP AMP as they pertain to identifying hazards associated with hazardous building materials for demolition projects.

2.0 SCOPE

The scope of work for this assessment involved the following:

- Review of existing information, including site drawings, previous assessment and/or abatement documentation and discussions with site personnel, where available
- Visual assessment of readily accessible areas for the presence of suspected hazardous building materials
- Collection of representative bulk samples from building materials suspected to contain asbestos fibres
- Collection of paint chip samples for the determination of the lead content in paint finishes
- Collection of bulk samples of painted building materials in forms presumed to be representative of waste generated during demolition, for the determination of whether waste may be considered a toxic leachate (and require special disposal)
- Submission of samples collected for laboratory analysis
- Evaluation and interpretation of field findings along with current and previous sample analytical results to develop conclusions and recommendations pertaining to hazardous building materials identified

2.1 LIMITATIONS

In preparation of this report, Stantec used professional judgment based on experience. The work was conducted in accordance with generally accepted professional standards. Stantec relied on information gathered during the site investigation and laboratory analytical reports.

This report reflects the observations made within accessible and accessed areas of the subject building, and the results of analyses performed on specific materials sampled during the current and previous assessments. Analytical results reflect the sampled materials at the specific sample locations.

This report has been prepared for the exclusive use of the Client for the purpose of assessing general conditions in the subject building. Any use that a third party makes of this report, or reliance on, or decisions to be made on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



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2.1.1 Physical and Sampling Limitations

Sampling was conducted pertaining only to suspected ACMs, suspected LCPs and bulk building materials coated with paint presumed to be destined for landfill disposal. The assessment for the presence of other hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible spaces only. Concealed spaces were inspected via existing access panels, where present. Interior and exterior finishes, solid ceilings, walls, flooring and structural elements were removed and/or penetrated in limited locations to access concealed areas.

Due to limitations on the agreed to scope of work for this project, there are specific limitations to the information that can be provided regarding each hazardous building material considered in this assessment, as outlined below.

- Building materials that may contain asbestos but were not accessible for sampling include, but are not limited to the following:
 - Attic insulation materials in locations more than one metre from the attic access hatch, potentially concealed beneath visible (fiberglass batt) insulation
 - Sub-grade materials (e.g., asbestos cement drainage pipe)
 - Woven tape inside duct connection joints
 - Mechanical (e.g., piping and ducting) insulation within wall cavities
 - Heating, ventilation and air conditioning (HVAC) units mechanical inner linings and/or insulation on the interior side of ducts.
- Samples of paint applications suspected to contain lead were collected from surfaces of major paint applications where visually different paint colours and/or types were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour were presumed to be the same, regardless of differing sub surface paints, if any.
- Sampling for analysis of lead leachate was conducted such that building material samples were collected in a form presumed to be representative of waste generated during demolition. The lead leachate samples are meant to represent the general waste that would be created when painted surfaces are demolished, without having paint removed.
 - Materials such as metal and concrete that are coated with LCPs are typically not tested for leachable lead content for the following reasons:
 - o If removed with paint in-tact, these materials are expected to be recycled, not disposed of via landfill. As such, the leachable lead content will not impact the “disposal” option, as recycling facilities will typically accept metal or concrete with lead-containing paint.
 - o If removal of the paint from the substrate is considered, the waste associated with that process (paint chips and removal substrate—sand, beads, etc.) is typically presumed to be hazardous waste (leachable for lead in excess of 5.0 mg/L) or must be tested in its actual form (once removed, with the removal substrate) to confirm.



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- o In most cases, during an initial assessment, it is not practical to try to remove sufficient paint from the substrate in order to appropriately analyze for lead leachate, as a significant area would have to be “scraped” (50–100 g of sample is required).
- Due to height restrictions and the risk of electrical shock in handling operational light fixtures, the ballasts present in only a limited number of fixtures observed were inspected for PCB labels or other PCB identifiers. Conclusions and recommendations regarding the presence of PCBs are based on limited observations in combination with information provided by building staff regarding lighting renovations (where requested by Stantec, based on visual observations) and are presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, will not be commented on.
 - Although they may also be present in other items in limited amounts (e.g., plastics, molded rubber parts, applied dried paints, coatings or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets), PCBs are not expected to be present in those materials in concentrations that would necessitate the requirement for PCB-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.
- Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) was conducted. The conclusions made in this report provide description(s) of the potential source(s) of moisture that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. The conclusions provided herein will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the impacted area(s).
 - This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.
- The potential presence of mercury or mercury-containing equipment in inaccessible areas or as internal parts of HVAC mechanisms or other equipment was not assessed:
 - Although limited amounts of mercury may be present in paints and adhesives, mercury is not expected to be present in those materials in concentrations that would necessitate the requirement for mercury-specific handling procedures, separate removal and/or disposal considerations for demolition. As such, these items were not considered in our assessment.
- Investigation was limited to a visual review in accessed areas of readily accessible building-related cooling and refrigeration equipment which could contain ODSs. Testing was not conducted. Equipment or materials that were not assessed but that may contain ODSs included, but were not limited to, portable equipment (including domestic-type refrigerators and water coolers, occupant-owned refrigeration equipment), flexible plastic foam or rigid insulation foam, solvents, aerosol spray propellants and portable fire extinguishing equipment.



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- In general, the assessment for the presence of hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible accessed spaces only. Additional hazardous building materials are potentially present in inaccessible areas not assessed including, but not limited to: ceiling spaces, wall cavities and crawlspace areas not accessed, as well as buried materials.

2.1.2 Areas Not Accessed

The following areas were not accessed, for the reasons indicated:

- Attic areas located greater than 1 m from the attic access hatch. Although the attic was accessed at the access hatch, for safety reasons, Stantec did not enter the attic space to assess conditions throughout.

As such, limited comments, if any, will be provided regarding the presence, quantity or condition of hazardous building materials within the above-noted areas.

2.1.3 Information from Previous Reports

Stantec reviewed the Pinchin Report for information purposes, and the information provided was considered in developing the current assessment and sampling plan.

Supplemental sampling of previously sampled materials was conducted in those instances where such sampling was required to bring the information into compliance with current regulations as they pertain to minimum sample numbers to appropriately characterize the sampled building material.

Where previous sampling and analytical data indicated the presence of a hazardous building material (e.g., asbestos, lead), additional sampling was not conducted, and the material was considered to be hazardous.

3.0 HAZARDOUS BUILDING MATERIALS ASSESSMENT

Building information and the results of the assessment for each of the considered hazardous building materials are provided in the following sub-sections.

Background information and health effects information, as well as information regarding regulatory framework and relevant legislation with respect to hazardous building materials are provided in Appendix A.

Floor plans showing the locations of samples collected during this assessment as well as identified hazardous building materials (where practical) are provided in Appendix B.



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3.1 FACILITY DESCRIPTION

The subject building is located at 6661 Christensen Road, Anahim Lake BC and consists of a main floor and crawl space. The reported construction date of the building was in the 1970s. This construction time period is consistent with those dates when hazardous building materials were commonly used.

The typical structural components, mechanical components and building finishes associated with this building consist of the following:

- Foundation—slab on grade and concrete
- Exterior cladding—metal and cement panel
- Structural—wood framing, concrete walls, floors and beams
- Mechanical—pipes and vessels insulated with fiberglass
- Heating, ventilation and air conditioning (HVAC)—forced air heating system, wall-mounted air conditioner, and hot water boiler
- Interior walls—combination of finished gypsum, unfinished gypsum and wood panel
- Interior ceilings—combination of t-bar with acoustic ceiling tiles, finished gypsum and bare concrete
- Interior flooring—combination of bare concrete, vinyl floor tiles and vinyl sheet flooring
- Roofing—asphalt roof membrane

3.2 ASBESTOS

A summary list of the bulk samples collected by Stantec, including a description of the material, sampling location and laboratory test results is provided in Appendix C. Copies of the Laboratory Certificates of Analysis for bulk samples analyzed are provided in Appendix D.

Based on our observations of building construction (estimated vintage of interior finishes and uniformity of building material use) and on our interpretations of the analytical results of suspected ACMs collected through this assessment as well as the previous documentation reviewed as outlined herein, the materials presented in the table in Appendix E were identified as ACMs. The following information is included for each identified ACM:

- Type of material that contains asbestos
- Location/approximate extent of the ACM within the building
- Asbestos type and percentage identified
- Friability
- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.



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3.2.1 Methodology

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs are materials that by the nature of their manufacturing and/or construction do not readily allow the release of asbestos fibres. Some non-friable materials such as plaster, drywall joint compound and ceiling tiles that are considered to be non-friable in an undisturbed state can more readily release fibres when damaged or disturbed.

The presence of asbestos in federal workplaces and pertaining to federally regulated workers is governed by the COHSR. According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

The presence of asbestos in the workplace in British Columbia pertaining to provincially regulated workers is governed by BC Reg. 296/97. According to the current version of BC Reg. 296/97, ACM means:

- Any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

As both federally regulated workers and provincially regulated workers (e.g., contractors) are expected to carry out work activities within the subject building, and as the provincial regulations have a more stringent definition of ACM, and generally include the requirements noted in the COHSR, this assessment was conducted to meet the requirements of BC Reg. 296/97.

Based on these criteria, a visual assessment of accessible areas was undertaken to check for the presence of suspected ACMs. Locations to collect discrete bulk samples of suspected ACMs were identified and samples of representative materials were then collected at these locations.

Multiple samples were collected from each “homogenous application” of observed suspected ACMs (materials suspected to contain asbestos that are uniform in material type, colour, texture application and estimated installation date) and submitted to EMSL Canada Inc. (EMSL) in Burnaby, BC for analysis of asbestos content using polarized light microscopy (PLM) with dispersion staining, in accordance with the United States Environmental Protection Agency (USEPA) 600/R-93/116 method.

The number of samples to be collected for each homogenous application of a suspected ACM was based on accepted occupational hygiene standards and protocols, on the recommendations provided in the 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos (Asbestos Guide)*, and on the assessor’s experience and understanding of the consistency of that building material’s application.

EMSL’s analytical laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).



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3.2.1.1 Potential Asbestos-Containing Vermiculite Insulation

As part of the assessment, Stantec assessed the subject building for areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of and assessing attic spaces, floor cavities and masonry block or brick walls, which are typical areas where vermiculite is found. Where masonry or brick walls were observed, destructive assessment (drilling) was conducted to assess the cavity for the presence of vermiculite, unless penetrations, breaches and/or sufficient other openings were present.

3.2.1.2 Sample Results Interpretation

When asbestos is detected in concentrations greater than 0.5% percent in one of the samples within a set that was collected to represent a “homogenous application” of a particular material (or detected in any concentration, in a set of samples collected for applications of vermiculite), the entire sample set, and the entire application of that material is then considered to be an ACM.

In addition to the above, a “positive stop” option was used during the laboratory analysis of the building material samples submitted for asbestos analysis. The “positive stop” option is utilized by the laboratory when asbestos is detected at a concentration of greater than half of one percent in one of the samples within a set that was collected to represent a “homogenous application” of that material (or in any concentration, for vermiculite). At this point, further analysis of subsequent samples within the set is deemed to be unnecessary (as the entire set will be considered an ACM, per above), and the remainder of the samples within the set are not analyzed.

3.2.1.3 Asbestos Sampling Quality Assurance/Quality Control

Sampling activities pertaining to asbestos were conducted in accordance with Stantec’s safe work practices, which take into account current provincial and/or territorial regulations pertaining to such work (i.e., sampling procedures, required number of samples and laboratory analytical procedures).

Representative bulk samples were collected of accessible suspect ACMs in sufficient quantities for laboratory analysis. Suspect ACM samples were sealed in polyethylene zip-lock bags labeled with the sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

All sample bags were compiled in order and placed into a single container accompanied with a chain of custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.



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3.2.1.4 Assessment of Material Condition

A visual assessment of the condition and accessibility was also completed for each occurrence of suspect ACM. A description of the criteria used in evaluating the condition, accessibility and exposure risk of ACMs is provided below. The criteria are generally based on the June 5, 2017 Public Services and Procurement Canada “Asbestos Management Standard”, and industry standards of practice.

Friable ACMs other than Mechanical Insulation

In evaluating the condition of friable ACMs other than mechanical insulation (e.g., spray-applied as fireproofing, texture, decorative or acoustic finishes), the following criteria apply:

Good

- Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the Assessor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes un-encapsulated or un-painted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor

- Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the Assessor’s assessment form.

Fair condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray-applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes, which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of building with ACM, regardless of the reported condition.



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Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment, etc.) the following criteria are used:

Good

- Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

Fair

- Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.

Poor

- Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product, and evaluated per the above criteria.

3.2.2 Findings

No ACMs were identified in the Pinchin Report.

Asbestos was detected through laboratory analysis of bulk samples of the following materials that were collected as part of this assessment:

- Sink/toilet under coating
- Vent mastic
- Windowpane caulking
- Cement panel

The ACMs that were accessible and observed were noted to be in good condition.



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3.2.2.1 Non-Asbestos-Containing Materials

The bulk samples collected during this assessment for which no asbestos was detected through laboratory analysis can be seen in the table in Appendix C.

Refer to the documentation in Section 1.1 for materials that have been previously sampled and identified as non-asbestos-containing through sampling and laboratory analysis.

Non-Friable Materials Containing Less Than 0.5% Asbestos

One supplemental sample of 9" x 9" beige square pattern vinyl sheet flooring was collected within the main floor, general office. The analytical result of that sample indicated the asbestos content to be less than 0.25% chrysotile asbestos. The total number of samples collected for this material (two samples per the Pinchin Report—no asbestos detected; one sample per the current assessment) would be adequate to appropriately characterize its asbestos content based on its extent and published standards for sampling of homogenous applications of suspected ACMs (e.g., the Asbestos Guide). Given the analytical results and the non-friable nature of this material, it would not be considered an ACM.

Materials Not Suspected to Contain Asbestos

Various materials within the subject building were observed and/or presumed to be present, which are not suspected to contain asbestos. Typical materials of this nature that were observed and are not considered suspected ACMs, include but are not limited to the following:

- Materials comprised of glass, such as:
 - Window panes
 - Pre-formed fibreglass insulation on mechanical pipes or vessels (potentially excluding attached wrap layers)
 - Fibreglass batt insulation in wall, floor or ceiling cavities, or used in other applications (potentially excluding attached paper backing)
 - Lights and lighting components
- Materials comprised of metal, such as:
 - Wall framing
 - Flashings on siding or roofs
 - Electrical wiring (excluding wrap) and conduit
 - Plumbing components
 - Components of doors, windows and associated trim
 - Structural components
 - Handrails
 - Siding
 - Vents



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- Materials comprised of wood, such as:
 - Wall framing
 - Components of doors, windows and associated trim
 - Structural components
 - Handrails
 - Siding
- Other materials generally not suspected to contain asbestos:
 - Gypsum board/"drywall" (excluding suspected ACM finishing compounds)
 - Poured concrete items such as foundations, floors and pads (excluding suspected ACM finishing compounds)
 - Masonry units such as bricks or blocks (excluding mortar or potential loose-fill insulation)
 - Silicone-based clear caulking or sealants

3.2.2.2 Potential for Vermiculite Insulation

Destructive testing was conducted by Stantec at the time of this assessment to assess wall cavities (and other potential locations of vermiculite) as indicated on the drawings in Appendix B. No vermiculite insulation was observed within the subject building through observations or destructive testing.

3.2.3 Recommendations

Based on the visual assessment and results of laboratory analyses and review of previous documentation, Stantec recommends the following with regards to meeting the requirements of the COHSR and BC Reg. 296/97 as they pertain managing asbestos during demolition projects:

- Identified ACMs should be removed by appropriately trained personnel (e.g., asbestos abatement contractor personnel), in accordance with the requirements of the COHSR, BC Reg. 296/97 and the Asbestos Guide, and prior to the initiation of project work that will disturb them.
- Should a material suspected to contain asbestos fibres become uncovered during demolition activities, all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if asbestos fibres are present. Confirmed ACMs should be handled in accordance with applicable guidelines and regulations.
- Suspected ACMs deemed visually similar to the ACMs identified in this report should be considered asbestos-containing and handled as such, unless proven otherwise, through analytical testing.
- Asbestos-containing cement pipe may be present below ground—caution should be used at any time when excavation is required.
- Ensure asbestos containing waste is handled, stored, transported and disposed of in accordance with the requirements of the Federal Transportation of Dangerous Goods Regulation and the British Columbia Hazardous Waste Regulation (BC Reg. 63/88).



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- If the building is not demolished:
 - Due to the confirmed presence of asbestos within the subject building, the RCMP AMP should be developed and implemented for the subject building.
 - Identified ACMs in good condition can be managed in place, upon development and implementation of the RCMP AMP.

3.3 LEAD

A summary list of the samples collected including a description of the samples, sampling locations and laboratory analytical results is provided in Appendix F. Copies of the Laboratory Certificates of Analysis for paint chip samples analyzed are included in Appendix G.

Based on our observations and interpretations of suspected LCP sample analytical results, as well as the previous documentation reviewed as outlined herein, the paints presented in the table in Appendix H were identified as LCPs.

The following information is included for each identified LCP:

- Paint colour
- Substrate to which paint is applied
- Location/approximate extent of the LCP within the building
- Lead content of paint
- Condition
- Representative photographs, where available

Our assessment methodologies and findings are further summarized in the following sub-sections.

3.3.1 Methodology

A visual assessment of accessible areas was undertaken in order to check for the presence of materials that may contain lead. These materials included paint applications, wiring and plumbing, batteries, etc.

3.3.1.1 Lead in Paint

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
 - Exposure limit indicated in both the COHSR and BC Reg. 296/97 is 0.05 mg/m³.
 - Potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.



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- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
 - Any risk assessment should include for the presence of high risk individuals within the workplace

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

When reviewing the above, “high risk” individuals are not expected to be present in the workplace associated with this building during building material alteration activities (i.e., demolition) that would create significant disturbance to paint with such individuals present. As such, paints containing 600 ppm lead or more will be considered “lead-containing” for the purpose of this report, such that appropriate risk assessments can be completed for demolition planning. However, information regarding the lead content of all paints tested is provided herein, for reference and risk assessment should the consideration of high risk individuals be necessary, based on the requirements of a particular situation.

Based on the above, samples of potential LCPs were collected from major paint applications, in sufficient quantity to conduct analysis for total lead content. The sampling of paint applications involved the collection of paint chip samples of paint layers to the substrate, where possible. A minimum volume of 5 cc or a half teaspoon of paint chips was typically collected. Wherever necessary and possible, paint was separated from any backing material such as paper, concrete or wood and placed in a sealed, clearly labelled plastic bag.

Samples collected were submitted to EMSL for analysis of total lead content using EPA Method SW 846 3050B*/7000B. EMSL’s analytical laboratory is also accredited by the AIHA Environmental Lead Laboratory Approval Program (ELLAP).

Welding, Burning or Torch Cutting

Although a concentration of 600 ppm lead has been used to define paint coatings as LCPs, it should be noted that this is related to painted surfaces and the determination of appropriate provisions to protect occupants and employees from exposure to elevated concentrations of lead during typical operations and maintenance or simple renovation. This does not include painted metal surfaces that are to be welded, burned or torch-cut.



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Using an arc welder or oxyacetylene torch on steel that is coated with lead-containing paint can create hazardous lead fumes and is prohibited by section 12.115 of BC Reg. 296/97.

Regulatory excerpt: 12.115 Coatings on metals

A coating on metal which could emit harmful contaminants (such as lead, chromium, organic materials, or toxic combustion products) must be removed from the base metal, whenever practicable, before welding or cutting begins.

In addition, the following information is provided in the Lead Guideline:

- Welding or torch cutting of paints or coatings on metal can create very high concentrations of airborne lead fumes. Torch cutting structural steel, coated with paint containing as little as 130 mg/kg (equivalent to ppm) lead, can release airborne levels of lead as high as 0.8 mg/m³ (16 times the exposure limit).

Given this information and that the analytical detection limit for lead paint analysis is approximately 80–90 ppm (not significantly different than 130 ppm, which, per above, may release airborne lead levels 16 times the exposure limit), any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless a project-specific or tasks-specific risk assessment and safe work practices are developed by a qualified person.

3.3.1.2 Building Materials—Leachable Lead Content

According to BC Reg. 63/88, lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 mg/L lead.

Based on the above, bulk samples of painted building materials that would be expected to be disposed-of via landfill were collected in a form presumed to be representative of waste generated during demolition, each sample containing over 50 g in weight. The samples were submitted to EMSL in Cinnaminson, New Jersey.

Upon receipt and review of paint chip sample analytical results for total lead content, leachate analysis of building materials coated with identified LCPs was requested. Leachate analysis was conducted by EMSL through toxicity characteristic leaching procedure, using US EPA Method SW846, 1311/7420.

3.3.1.3 Assessment of Paint Condition

The criteria for condition evaluation pertaining to LCPs described herein are generally based on the United States Housing and Urban Development (HUD) 2012 *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

When evaluating the condition of LCPs, an attempt should be made to determine whether the deterioration is due to a moisture problem or some other existing building deficiency.



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“**Poor**” surfaces are considered to be a hazard and should be corrected. “**Fair**” surfaces should be repaired but are not yet considered to be a hazard; if not repaired, they should be monitored frequently. “**Good/intact**” surfaces should be monitored to ensure that they remain in a nonhazardous condition.

In addition, the presence of paint debris must be considered in evaluating condition. Given the variety of paint uses, there are many applications that can have a tendency for the paint to “wear” from the surface slowly, over an extended period of time. Conditions where paint has worn from a surface are worth noting for maintenance discussions (i.e., related to re-coating the surface should, for example, the coating provide weather protection), however, in the absence of loose paint chip debris/dust, such conditions would not represent a potential exposure situation related to lead.

The condition evaluation criteria for LCPs are summarized in Table 1, below.

Table 1 Lead-Containing Paint Condition Categories

Type of Building Component ¹	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	Fair ²	Poor ³
Exterior components with large surface areas.	Entire surface is intact.	Less than or equal to 10 square feet	More than 10 square feet
Interior components with large surface areas (walls, ceilings, floors, doors).	Entire surface is intact.	Less than or equal to 2 square feet	More than 2 square feet
Interior and exterior components with small surface areas (window sills, baseboards, soffits, trim).	Entire surface is intact.	Less than or equal to 10% of the total surface area of the component.	More than 10% of the total surface area of the component
<p>NOTES:</p> <p>¹ Building component in this table refers to each individual component or side of building, not the combined surface area of all similar components in a room (e.g., a wall with 1 square foot of deteriorated paint is in “fair” condition, even if the other three walls in a room are intact).</p> <p>² Surfaces in “fair” condition should be repaired and/or monitored but are not considered to be “lead-containing paint hazards”.</p> <p>³ Surfaces in “poor” condition are considered to be “lead-containing paint hazards” and should be addressed through abatement or interim controls.</p>			

3.3.2 Findings

Lead is expected to be present in the following within the subject building:

- Lead-acid batteries used in emergency lighting
- Older electrical wiring materials and sheathing
- Solder used on domestic water lines
- Solder used in bell fittings for cast iron pipes and in electrical equipment
- Vent and pipe flashings



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3.3.2.1 Lead in Paint

A summary of the LCPs that were identified within the subject building as indicated in the Pinchin Report is provided below, complete with notes regarding current observations, where applicable:

- Grey paint on metal found in reception and vestibule (observed by Stantec to remain)
- Light tan paint on metal throughout (observed by Stantec to remain)
- Off-white paint on drywall throughout (observed by Stantec to remain)

Greater than 600 ppm lead was detected through laboratory analysis of chip samples of the following additional paints:

- Brown coloured paint on exterior metal gutter and downspout

Additional information regarding extent and current condition of identified LCPs, including photographs (where available) is provided in Appendix H.

Building Materials—Leachable Lead Content

The building materials coated with identified LCPs are not anticipated to be disposed of via landfill (e.g., metal) and/or did not contain lead in concentrations that would be anticipated to create lead-leachable waste (e.g. drywall coated with paint that contains 760 ppm lead).

As a measure of diligence and confirmation, a bulk sample of the exterior wood column material coated with tan-coloured paint, which is expected to be disposed of via landfill was collected in a form presumed to be representative of waste generated during demolition and was submitted to EMSL for analysis of leachable lead content.

Analytical results indicate that waste from this material does NOT contain lead in a dispersible form such that its leachate contains greater than 5.0 mg/L lead.

A copy of the certificate of analysis provided by EMSL for the leachate sample submitted is also included in Appendix I.

3.3.3 Recommendations

When paints or other lead-containing equipment/materials within the subject building are to be disturbed and/or removed, including in instances where paint chip debris is removed (which should be completed during the demolition project), ensure compliance with the following:

- Exposure protection requirements of the COHSR and BC Reg. 296/97, including the provisions of the Lead Guideline
- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation



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Corrective action or remedial work on paint applications containing any concentration of lead should be undertaken in a manner so as to avoid generating fine particulate matter or dust (i.e., avoid sanding). Airborne lead dust or fumes should not exceed the COHSR and BC Reg. 296/97 eight-hour occupational exposure limit (OEL) of 0.05 mg/m³ during the removal of paints and products containing any concentration of lead. The use of personal protective equipment is recommended to reduce the potential for over-exposure to lead dust. This can be achieved by:

- Providing workers with protective clothing and personal protective equipment or devices as necessary to protect them against the hazards to which the worker may be exposed
- Providing workers with adequate training in the care and use of clothing, equipment or device before wearing or using such items
- Wetting the surface of the materials to prevent dust emissions
- Providing workers with washing facilities with clean water, soap and individual towels to properly wash prior to exiting the work area

To avoid the inhalation of lead, it is essential to have the following control methods in place:

- Engineering controls
- Work practices and hygiene practices
- Respirators and personal protective equipment
- Training

The work tasks required and the ways in which lead-containing materials (including paints) will be impacted will determine the appropriate respirators, measures and procedures that should be followed to protect workers from lead exposure.

If demolition does not proceed and the building is to be re-occupied, then lead-containing materials, including paints, can be managed in place, where in good condition.

3.3.3.1 Welding, Burning or Torch Cutting

Any paint coating on a metal surface to be welded, burned or torch-cut must be removed prior to that action being undertaken, unless project-specific or tasks-specific risk assessments and safe work practices are developed by a qualified person. Development of such risk assessments and work practices will involve consideration of information including, but not limited to, the following:

- Composition of the material to be disturbed
- Lead content of the paint coating
- Methods and tools to be used, including exhaust ventilation
- Duration of the work and/or work shift
- Training of the personnel conducting the task
- Respiratory protection program in effect



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3.4 POLYCHLORINATED BIPHENYLS

3.4.1 Methodology

A visual review and/or a review of estimated/reported construction dates to assess the potential presence of PCBs in electrical equipment was completed. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic systems, compressors, switchgear and capacitors.

No sampling of dielectric fluids was undertaken as part of this assessment.

3.4.2 Findings

Ballasts within two light fixtures were visually inspected and found to be non-PCB containing. Based on these observations, it is unlikely that PCB-containing ballasts are present within the approximately 70 light fixtures observed. However, this must be verified at the time of demolition.

3.4.3 Recommendations

When decommissioned, verify the PCB content of fluorescent lamp ballasts as per the Environment Canada publication *Identification of Lamp Ballasts Containing PCBs*, 1991.

Should a material suspected to contain PCBs become uncovered during demolition activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.

PCB-containing items identified for removal and disposal should be handled, transported, stored and disposed of in accordance with the following:

- Transportation and disposal requirements BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation
- Federal PCB Regulations (SOR/2008-273)

If the building is not demolished, fluorescent lamp ballasts that may contain PCBs can be managed in place, where these items are operating and in good condition. No further action is currently required until such time that renovation or demolition activities are to be conducted, or until 2025, when PCB-containing ballasts will require removal and disposal.



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3.5 MOULD

3.5.1 Methodology

The presence of suspect visible mould was assessed through visual observations. Material observed with dark-coloured staining and/or a textured and discoloured appearance is described as “suspected mould”. Mould identified visually is defined as “suspected mould” unless it is confirmed as mould by laboratory analysis.

The scope of work and procedures utilized for the visual assessment were based on the recommendations for such provided in the documents listed below:

- Standard Construction Document CCA 82 *Mould Guidelines for the Canadian Construction Industry*, Canadian Construction Association, 2004 (referred to as CCA 82)
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008 (referred to as the NYC Guidelines)
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health, 2004 (referred to as the Health Canada Guide)
- *Indoor Air Quality in Office Buildings: A Technical Guide*, Report of the Federal-Provincial Advisory Committee on Environmental and Occupational Health, 1995 (referred to as the IAQ Guide)
- *Bioaerosols: Assessment and Control*, American Conference of Governmental Industrial Hygienists (ACGIH), 1999 (referred to as the ACGIH Report)
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA, Second Edition 2005

3.5.2 Findings

Visible mould growth was not observed in the location referenced in the Pinchin Report. The moisture staining observed to remain in that location (staining on metal ducting and efflorescence on concrete block) would not be expected to have implications for building demolition.


The observations pertaining to mould and/or moisture that were made during this assessment are summarized in Table 2, below.



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**Table 2 Mould/Moisture Observations Summary
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Building Area	Observation	Suspected Source of Moisture	Photo
Throughout	Moisture-stained ceiling tiles in various locations	Pipe leaks or roof leaks	

3.5.3 Recommendations

When demolition work within the subject building proceeds, it is expected that mould and/or moisture-impacted building materials, will be removed and disposed of during that process. Due to the actual or potential presence of mould on building materials in the building, and if those impacted materials are to be removed by hand, demolition workers should be notified of the potential presence of mould and be provided with respiratory protection and/or other personal protective equipment as deemed necessary for the work that they will be conducting.

If significant mould contamination is identified in concealed locations, an experienced mould abatement contractor may be required to assist with removal in accordance with applicable guidelines and standards for such work.

If the building is not demolished, Stantec recommends the following course of action within the subject building:

- Remove and replace moisture-stained ceiling tiles with new tiles. If staining re-appears on the new tiles, the source of moisture should be identified and corrected.
 - This work can be conducted by regular facility maintenance staff, if conducted prior to the onset of mould growth

3.6 MERCURY

3.6.1 Methodology

An assessment for equipment that is likely to contain mercury (such as thermostats, thermometers and fluorescent light tubes) was completed visually. Information on the type of equipment (i.e., gauges, switches, batteries, thermometers, etc.), model and serial numbers and quantities was recorded, where such information was available.



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3.6.2 Findings

Mercury vapour is present in the light tubes within the approximately 70 fluorescent light fixtures observed throughout.

One mercury-containing thermostat was identified on the main floor, general office, on the wall adjacent to the male washroom, as indicated on the floor plan drawing in Appendix B.

3.6.3 Recommendations

Complete removal of mercury-containing equipment is required prior to demolition activities that may disturb the equipment. When mercury-containing items (e.g., fluorescent light bulbs/tubes, thermostats) are removed, ensure all mercury waste is handled, stored transported and disposed of in accordance with the requirements the following:

- Transportation and disposal requirements of BC Reg. 63/88
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that workers exposure levels do not exceed the occupational exposure limit of 0.025 mg/m³ as per the COHSR and BC Reg. 296/97. This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.

If the building is not demolished, identified mercury-containing items can be managed in place, therefore no further action is recommended at this time. Mercury vapour within light fixtures poses no risk to workers or occupants provided the mercury containers remain intact and undisturbed.

3.7 OZONE DEPLETING SUBSTANCES

3.7.1 Methodology

An assessment for equipment or systems likely to contain ODSs (such as refrigeration/cooling equipment or fire suppression systems) was completed visually. Information on the type of equipment, manufacturer and type and quantity of refrigerants was recorded, where available.

3.7.2 Findings

The following equipment was identified by labels to be ODS-containing:

- Climette wall mounted A/C unit (R-22/18 oz) located on the main floor, general office on the exterior perimeter wall



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3.7.3 Recommendations

When refrigeration equipment that is confirmed to be ODS-containing is decommissioned, it should be emptied and inspected by licensed refrigeration technicians, as defined in the Federal Halocarbon Regulations (SOR/2003-289 and associated amendments).

If ODS-containing equipment is to be removed during demolition activities, ODSs must be handled, recycled, stored, transported and/or disposed of in accordance with the requirements of the following:

- British Columbia *Waste Management Act—Ozone Depleting Substances and Other Halocarbons Regulation* (BC Reg. 387/99)
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation
- SOR/2003-289 and associated amendments

If the subject building is not demolished, ODS-containing equipment can be managed in place and must be serviced by licensed refrigeration technicians (as defined in SOR/2003-289 and associated amendments).

3.8 SILICA

3.8.1 Methodology

An assessment for the presence of silica was conducted visually. The presence of typical silica-containing building materials such as concrete, masonry, stone, terrazzo, refractory brick, gypsum, ceramic tile, ceiling tile and other items, was noted.

3.8.2 Findings

Silica is expected to be present in the following, which were observed in various locations throughout:

- Cement products such as:
 - Concrete—foundations, floors, walls, blocks
 - Masonry units and associated mortar
 - Cement panels
- Gypsum and associated wall/ceiling finish materials
- Suspended ceiling tiles
- Asphalt and asphalt products containing rock or stone (e.g., roof membrane).



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3.8.3 Recommendations

When silica-containing materials within the subject building are to be disturbed and/or removed (e.g., coring through concrete slabs, demolition of masonry or concrete units), ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by the COHSR and BC Reg. 296/97 (cristobalite and quartz—each 0.025 mg/m³). This would include, but not be limited to, the following:

- Providing workers with respiratory protection
- Wetting the surface of the materials, and use of water or dust suppressing agents to prevent dust emissions
- Providing workers with facilities to properly wash prior to exiting the work area

If the subject building is not demolished, silica-containing materials can be managed in place; therefore, no further action is recommended at this time.



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4.0 CLOSURE

This report has been prepared for the sole benefit of the PSPC on behalf of the RCMP. Any use which a third party makes of this report, or any reliance on decisions based on it, is the responsibility of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professionals and technical staff in accordance with generally accepted engineering, scientific and occupational health and safety practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgment of Stantec Consulting Ltd. based on the data obtained from the work. The conclusions are based on the site conditions encountered by Stantec Consulting Ltd. at the time the work was performed at the specific assessment and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on building construction and conditions, weather, building usage and other factors. Due to the nature of the investigation and the limited data available, Stantec Consulting Ltd. cannot warrant against undiscovered environmental or health and safety liabilities.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

We trust that the above is satisfactory for your purposes at this time. Should you have any questions or concerns, or require additional information, please do not hesitate to contact the Stantec Project Manager at your convenience.

Regards,

Stantec Consulting Ltd.



APPENDIX A

**Hazardous Building Materials Background Information,
Health Effects Information and Regulatory Framework**

Appendix A HAZARDOUS BUILDING MATERIALS BACKGROUND INFORMATION, HEALTH EFFECTS INFORMATION AND REGULATORY FRAMEWORK

A.1 ASBESTOS

Asbestos is a naturally occurring form of fibrous silicate that is durable and flexible; has high thermal and tensile strength; is resistant to heat, chemical corrosion and friction; does not conduct electricity; and insulates well against condensation, heat and noise. Due to these properties, asbestos was used in over 3,000 commercial products, and it is estimated that approximately 70% of the asbestos that was used in North America was used in building materials.

In buildings, and among many other potential asbestos-containing materials, asbestos is typically found in plaster, mechanical insulation, gaskets, thermal insulation on pipes, refractory material, roofing felts, floor tiles, ceiling tiles and parging, heat resistant panels, incandescent light fixture reflector plates, and any other material requiring a high degree of durability or thermal resistance.

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs or “manufactured products” are materials that by the nature of their manufacturing/construction do not readily allow the release of asbestos fibres. These materials should not be cut or shaped with power tools, since this procedure may allow for the release of the asbestos fibres. Some materials or “manufactured products”, such as plaster, drywall and ceiling tiles that are considered to be non-friable in an undisturbed state can become friable when damaged or disturbed.

The common use of friable (breakable by hand) asbestos-containing materials (ACMs) in construction ceased voluntarily in the mid-1970s; however, the spray application of asbestos-containing fireproofing was not prohibited until 1986. A material known as vermiculite, which was commonly used for insulation within attics, floor spaces or within masonry block wall systems and may be contaminated with asbestos due to its production processes, was used into the mid-1990s. In addition, asbestos cement products and roofing products (e.g., sealants) currently used in the construction of buildings may still contain asbestos.

A.1.1 Health Effects

Undisturbed asbestos within building materials poses no health risks. Asbestos poses a risk when building materials containing asbestos are impacted, or disturbed, thereby releasing the asbestos fibres into the air.



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Asbestos-related diseases are caused when suspended airborne asbestos fibres are inhaled and the fibres settle into various regions of the lungs and remain for extended periods. Once embedded in the lungs the asbestos fibres cause scarring within the lung tissue, ultimately leading to impaired lung function (asbestosis) and/or various cancers (lung cancer; mesothelioma). These asbestos-related diseases are irreversible and fatal. The risk of lung-related cancers is increased in individuals who smoke.

These asbestos-related diseases most often occur in individuals who have been exposed to high concentrations of airborne asbestos over a long period of time, though mesothelioma has been found in individuals with short-term exposures. Symptoms or the development of these asbestos-related diseases usually occur 10 to 25 years after exposure.

A.1.2 Regulatory Framework

Asbestos is included in the Canada Labour Code, Part II Canada Occupational Health and Safety Regulations (COHSR) and British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97). Included in both regulatory instruments are provisions for the general duties of employers, requirements for health assessments, training and project notification. There are also sections that will also apply to abatement projects, depending on the work procedures and specific work site hazards.

The COHSR and BC Reg. 296/97 also established an 8-hour occupational exposure limit (OEL) for asbestos (all forms) to be 0.1 fibre/cubic centimetre.

The 2017 WorkSafeBC publication *Safe Work Practices for Handling Asbestos* (Asbestos Guide) is used by Occupational Health and Safety officers as a guide when reviewing abatement work practices and employer codes of practice, and generally meets the requirements of the COHSR.

The Asbestos Guide also provides significant additional background information pertaining to asbestos, along with details on health effects and other applicable legislation within the province of British Columbia (e.g., the federal *Hazardous Products Act*, the BC Building Code and waste disposal regulations).

According to the COHSR, ACM means:

- Any article that is manufactured and contains 1% or more asbestos (by weight) at the time of manufacture, or any material that contains 1% or more asbestos when tested in accordance with accepted methods.

According to the current version of BC Reg. 296/97, asbestos-containing material (ACM) means any material containing at least 0.5% asbestos, or vermiculite insulation with any asbestos.

Disposal of asbestos waste is governed by the British Columbia Hazardous Waste Regulation (BC Reg. 63/88). The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of asbestos waste in British Columbia. In general, and for transportation and disposal, the waste must be placed in a double sealed container, properly labeled, free of cuts, tears or punctures and disposed of at a licensed waste station which has been properly notified of the presence of asbestos waste.



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A.2 LEAD

Lead may be used in its pure metallic form or combined chemically with other elements to form lead compounds. Metallic lead is used to make products such as electric storage batteries, ammunition, lead solder, radiation shields, pipes, and sheaths for electric cables. Metallic lead is sometimes combined with other metals such as copper, tin and antimony as lead alloys for use in the manufacture of a variety of metal products.

Organic lead compounds contain a lead atom covalently bonded to carbon. Common examples of organic lead compounds include lead “soaps” such as lead oleates, high pressure lubricants, and anti-knock agents in gasoline.

Inorganic lead compounds (or lead salts) result when lead is combined with an element other than carbon. Examples are lead oxide, lead chromate, lead carbonate and lead nitrate. Inorganic lead compounds may occur as solids or in solutions, and are used in insecticides, pigments, paints, frits, glasses, plastics, and rubber compounds.

Lead is commonly found in buildings in items such as the solder used on copper domestic pipes; the caulking on bell fittings of cast iron drainage pipes; electrical equipment/wiring; batteries (e.g., emergency exit signage batteries); lead sheeting (e.g., x-ray rooms); vent and pipe flashings; and paints and ceramic tile glazes.

A.2.1 Health Effects

Elemental lead and inorganic lead compounds are absorbed through ingestion or inhalation and can incorporate into the bone marrow, nerve tissue, brain, and kidneys. In children, symptoms of lead poisoning can include headaches, irritability, abdominal pain, vomiting, anemia, weight loss, poor attention span, noticeable learning difficulty, slowed speech development, and hyperactivity. In adults, symptoms of lead poisoning can include pain, numbness or tingling of the extremities, muscular weakness, headache, abdominal pain, memory loss, unsteady gait, pale skin, weight loss, vomiting, irritability, and anemia. Although adults are susceptible to the toxic effects of lead, children are at high risk due to the nature of a child's activities that involve the introduction of non-food items into their bodies.

Excessive airborne lead and surface contamination can be transferred to employees' hands and may result in lead ingestion. Therefore, work practices intended to minimize surface lead concentrations, such as frequent cleaning of work surfaces should be included in an overall lead exposure control plan.

A.2.2 Regulatory Framework

In the past, the United States Department of Housing and Urban Development (HUD) set a criteria of lead-based paint as 0.5% lead (by weight) or 5,000 parts per million (ppm) for evaluating whether lead is a hazard in a residential setting.



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In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm (2005) to 90 ppm (2010). However, it is important to note that this regulation does not comment on the potential occupational exposure if the material is disturbed.

Under the COHSR and BC Reg. 296/97, a regulatory limit has been established for occupational exposure to airborne lead that may be present in a workplace. The OEL for airborne lead dust or fumes per both regulatory instruments should not exceed the TWA value of 0.05 milligram per cubic metre of air (mg/m³). The OEL represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, the 2011 WorkSafeBC manual titled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, indicates the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit
 - This potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
 - Any risk assessment should include for the presence of high risk individuals within the workplace

In addition to the above, the 2017 WorkSafeBC publication *Safe Work Practices for Handling Lead* (Lead Guideline) indicates the following:

Unlike for asbestos-containing material, WorkSafeBC does not numerically define what would be considered a lead-containing paint or coating. All suspected paints or coatings should be tested for lead because, depending on the nature of the work, even a small amount could pose a risk to workers. In order to determine which controls and personal protective equipment would be required for a particular job, a qualified person must consider this information as part of the risk assessment.

Work procedures that can be used to assist in protecting workers and adjacent work areas from exposure to lead during disturbance activities can also be found in this document.

According to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88), lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 milligrams per litre (mg/L) lead.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of lead waste in British Columbia.



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A.3 POLYCHLORINATED BIPHENYLS (PCBS)

PCBs are man-made toxic chemicals whose physical and chemical properties produce the following attributes: fire resistance, low electrical conductivity, high resistance to thermal breakdown, high chemical stability and resistance to oxidants and other chemical.

PCBs were used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. In fluorescent fixtures, PCBs were usually found within the small capacitors inside the ballast that controls the lamp. The Federal Chlorobiphenyls Regulation, SOR/91-152, prohibited the use of PCBs in electrical equipment manufactured after July 1, 1980. Stocks of items such as ballasts containing PCBs may have been used into the early or mid-1980s.

A.3.1 Health Effects

PCBs are insoluble in water; however, they readily dissolve in fats and other organic compounds. It is these attributes and fat-solubility that allow PCBs to persist in the environment and bio-accumulate in humans and animals. Exposure to PCBs can affect the immune system, reproductive system, nervous system and endocrine system. In humans, PCBs are potentially cancer-causing.

A.3.2 Regulatory Framework

As of September 5, 2008, under subsection 93(1) of the *Canadian Environmental Protection Act*, (CEPA), Federal PCB regulations were published by the Canada Gazette Part II (SOR/2008-273) that imposed specific deadlines for the elimination of all PCBs in concentrations at or above 50 milligrams/kilogram (mg/kg). This regulation required the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limited the period of time PCB materials could be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well as improved practices for the management of PCBs that remain in use (i.e., those with PCB concentrations less than 50 mg/kg) until their eventual elimination.

Under SOR/2008-273, the following end-of-use dates were established:

- December 31, 2009
 - Equipment containing PCBs in a concentration of 500 mg/kg or more
 - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in sensitive locations (i.e., drinking-water treatment plant, food or feed processing plant, child care facility, preschool, primary or secondary school, hospital, or senior citizen care facility or the property on which the plant or facility is located, within 100 m of it)
- December 31, 2014
 - Certain specified equipment not replaced by the 2009 deadline due to technical constraints for engineered-to-order equipment or if the facility is scheduled for permanent closure before 2014
- December 31, 2025
 - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in non-sensitive locations



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In addition to the above, a maximum storage period of one year is allowed for PCBs and products that contain PCBs at each of the following non-sensitive locations:

- Owner's PCB storage site
- PCB storage site of an authorized facility for decontamination or of an authorized transfer site
- PCB storage site of an authorized destruction facility

For British Columbia, according to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88):

- PCB wastes are defined as: PCB liquid, PCB solid, and PCB equipment that have been taken out of service for the purpose of treatment, recycling, reuse, or disposal, or for the purpose of storage prior to treatment, recycling, reuse, or disposal
 - "PCB liquid" means any liquid containing more than 50 parts per million (ppm) by weight of PCB
 - "PCB solid" means any material or substance other than PCB liquid that contains or is contaminated with chlorobiphenyls at a concentration greater than 50 ppm by weight of chlorobiphenyls
 - "PCB Equipment" means any manufactured item that contains or is contaminated with a PCB liquid or PCB solid is PCB equipment. While items of PCB equipment are often electrical components such as transformers or capacitors, the definition includes other items such as contaminated drums and containers.
 - o NOTE: An item of equipment from which PCB liquid or PCB solid has been removed is still PCB equipment until it has been decontaminated by an approved protocol. This is because the removal is a treatment process and the equipment, until decontaminated, is a residue from the treatment

In British Columbia, PCB equipment becomes PCB wastes as soon as it is removed from service. This is the case even if the intent is to treat, recycle, or reuse the equipment.

When PCB wastes are stored in British Columbia, the full requirements of BC Reg. 63/88 apply to:

- 1.0 kg or more of pure PCB
- 100 L or more of any liquid containing more than 50 ppm of PCB
- 100 kg or more of any material other than a liquid, contaminated with more than 50 ppm of PCB

These amounts are the total of all amounts at a single location owned or controlled by the same person. They include PCB equipment. BC Reg. 63/88 also provides packaging requirements for storage, labeling requirements, waste destruction requirements, and references SOR/2008-273, indicating

NOTE: The federal PCB Regulations also apply to stored PCBs and have strict maximum allowable storage periods which would prohibit provisions in [BC Reg 63/88] related to storage prior to 1 April 1992. In event of a conflict between [BC Reg 63/88] and [SOR/2008-273], follow [SOR/2008-273].

The Federal Transportation of Dangerous Goods Regulation sets out the requirements for the proper transport of PCB waste across provincial boundaries.



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In British Columbia, a manifest issued by the Ministry of Environment (or equivalent federal document) must be used for hazardous wastes shipped from sites in British Columbia. A manifest must be used to transport:

- 5 kg or more of PCB solids
- 5 L or more of PCB liquids
- An amount of a PCB solid or PCB liquid containing more than 500 g of PCB within BC
- 500 g or more of solids, liquids, or mixtures of these containing 50 mg/kg of PCB outside of BC

A.4 MOULD

Mould can be found everywhere in the outside environment—on plants, in soil and on dead and decaying matter (i.e., dead leaves). Mould requires two main conditions in order to grow—a source of food (a substrate typically comprised of cellulose) and water. Sources of food for mould are plentiful in outdoor and indoor environments; however, it is the presence of water in an indoor environment that will determine mould growth. The source of water can be a result of a water pipe leak or even excess condensation. Thus, the key to controlling mould indoors is to control the presence of water.

The removal of building materials impacted by mould growth may require workers with specific training and experience using work procedures that have been developed to protect workers and work areas from exposure to elevated concentrations of airborne mould.

A.4.1 Health Effects

There are a number of documented cases of health problems related to exposure to indoor fungi. Both high-level, short-term exposures and lower-level, long-term exposures can result in illness. The most common symptoms from exposure to mould in indoor environments are runny nose, eye irritation, cough, congestion, aggravation of asthma, headache, flu-like symptoms, fatigue, and skin rash. People with suppressed immune systems may be susceptible to fungal infections as a result of exposure to indoor moulds.

People who are exposed to mould growth on building materials will not necessarily exhibit adverse health effects. However, the mould must still be removed. Humans are at risk from indoor mould when fungal spores, fragments or metabolites are released into the air and inhaled or physically contacted (dermal exposure).

Not everyone experiences allergic reaction; the susceptibility to exposure varies with the individual's genetic predisposition, age, state of health, and concurrent exposures. For these reasons, and because the measurement of exposure is not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to establish "safe" or "unsafe" levels of exposure. However, federal and provincial policies have been written to minimize mould exposure and the elimination of mould indoors.



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A.4.2 Susceptibility to Mould Exposure

People's reaction to mould exposure is quite varied, and although anyone can be affected, some people may be more susceptible and at greater risk, including:

- Infants and children
- Elderly
- Pregnant women
- Individuals with respiratory conditions or allergies and asthma
- Persons with weakened immune system (e.g., chemotherapy patients, organ or bone marrow transplant recipients, and people with HIV infections or autoimmune diseases)

People with specific health concerns should consult their doctor if concerned about mould exposure. Symptoms that may appear to stem from mould exposure may be due to other causes such as bacterial or viral infections or other allergies.

A.4.3 Regulatory Framework

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).

Although there are currently no regulations in Canada pertaining specifically to mould in buildings, occupational health and safety regulations typically require employers to take every precaution reasonable in the circumstances for the protection of workers. For example, BC Reg. 296/97 indicates the following:

- Section 4.79(1):
 - Employer must ensure that the indoor air quality is investigated when
 - a) complaints are reported
- Section 4.79(2):
 - Air quality investigation must include
 - c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints

The WorkSafeBC Guideline for Part 4 of BC Reg. 296/97 discusses the application of the Regulation to workplaces with mould showing on exposed or hidden surfaces, or where mould may be a factor in complaints regarding indoor air quality. The guideline provides information for investigating indoor air quality complaints with respect to mould contamination, including information on sampling for the



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presence of moulds in buildings. Information is also provided on possible health effects and for cleanup personnel involved in the remediation of buildings damaged by water and mould.

Several additional guidelines and other resources describe procedures for the investigation and remediation of mould. The following documents indicate that mould observed in occupied building should be remediated in accordance with these procedures:

- Environmental Abatement Council of Ontario's (EACO) *Mould Abatement Guidelines*, 2010—Edition 2
- *Mould Guidelines for The Canadian Construction Industry*, Canadian Construction Association—82, 2004
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environment*, New York City Department of Health and Mental Hygiene, November 2008
- *Bioaerosols: Assessment and Control*, ACGIH 1999
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health 2004
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA 1996
- *Clean-Up Procedures for Mould in Houses*, Canada Mortgage and Housing Corporation (CMHC) 2004

A.5 MERCURY

Mercury is commonly found in buildings as mercury vapour lighting, thermostats/thermometers with mercury-containing glass ampoules, electrical switches and can also be found in minor amounts in fluorescent lamp tubes and vapour bulbs and may be present in stable forms in adhesives. If mercury is exposed to the air, odourless vapours are formed.

A.5.1 Health Effects

Routes of exposure for mercury and mercury compounds include inhalation, ingestion, skin and/or eye contact. Mercury is hazardous if it is inhaled or absorbed through the skin, therefore exposure controls (including both respiratory protection and skin protection) are important to consider.

Elemental (metallic) mercury most often causes health effects through inhalation of its vapour, which can be absorbed through the lungs. This kind of exposure can result when elemental mercury is spilled (or products that contain elemental mercury break) and the mercury is exposed to the air. Vapour concentrations can vary especially in warm or poorly-ventilated indoor spaces where the airborne concentration can exceed the permissible exposure limit (provincially set).

Chronic mercury “poisoning” can be caused by long-term exposure to low airborne concentrations (or low levels) of mercury. Symptoms or effects of mercury exposure include: tremors, emotional changes (e.g., mood swings, nervousness, irritability, etc.), neuromuscular effects (e.g., muscular weakness, twitching), mental changes/disturbances, digestive disturbances, headaches, insomnia, and changes in nervous response.



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Factors that determine the severity of the health effects from mercury exposure include the following:

- Chemical form of mercury (e.g., elemental, methylmercury, inorganic and organic)
- Dose
- Age of individual exposed
- Duration of exposure
- Route of exposure—as listed above
- Health of individual exposed

A.5.2 Regulatory Framework

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Exposure to mercury is regulated by the COHSR and BC Reg. 296/97. The regulated occupational exposure limit for airborne mercury according to both regulatory instruments is 0.025 mg/m³ (eight-hour TWA).

Mercury disposal should be through a scrap dealer (elemental mercury), recycling firm for mercury vapour and returned to the manufacturer for light tubes and fixtures. Disposal of mercury waste is governed by BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of mercury waste in British Columbia.

A.6 OZONE-DEPLETING SUBSTANCES

Ozone-depleting substances (ODSs) are chemical agents known as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) used in various refrigeration equipment including air-conditioning, heat pump, refrigeration or freezer units. They have also been used in solvents, as aerosol additives in the production of foam insulation and in fire extinguishing equipment.

A.6.1 Health Effects

Health effects are not typically related to exposure to ODSs directly, but to the consequences of ODS release to the atmosphere, subsequent degradation of the earth's ozone layer, and implications associated with increased UVB light exposure.



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

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A.6.2 Regulatory Framework

ODSs are regulated in British Columbia by the British Columbia *Waste Management Act*—Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 387/99 as amended by BC Reg. 109/2002).

On federal land, aboriginal land and federal works, buildings and undertakings, the Federal Halocarbon Regulation 2003 (SOR/2003-289, including associated amendments) applies. All other buildings and uses of refrigerants and other agents are under the Ozone-Depleting Substances Regulations 1998 (SOR/99-7), under CEPA. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified individual. The regulation also details an owner's record-keeping obligations.

If ODS-containing materials are to be removed and disposed of, all ODSs must be handled, recycled, stored, and/or disposed of in accordance with the requirements of BC Reg. 63/88.

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of ODS waste in British Columbia.

A.7 SILICA

Silica is a scientific name that refers to a mineral group made up of silicon and oxygen. It is the crystalline form of silica that is of concern when considering health effects. Crystalline silica occurs in several forms including quartz, cristobalite and tridymite. Silica's many uses include sand in golf courses and playgrounds, sandblasting abrasives, glass, ceramics, building materials (concrete, grout, bricks, blocks, asphalt, acoustical tiles, floor tiles, and plaster), electronic components.

Dust containing respirable crystalline silica is produced during construction-related activities such as the following:

- Demolition
- Masonry, bricklaying and/or stone setting
- Rock drilling
- Repair and/or finishing of concrete materials
- Abrasive blasting
- Dry sweeping
- Quarrying and mining



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Appendix A Hazardous Building Materials Background Information, Health Effects Information and Regulatory Framework
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A.7.1 Health Effects

Crystalline silica dust particles, which are small enough to be inhaled into the lungs (respirable size), can cause a number of health problems. As with asbestos, silica within building materials poses no threat to human health if left undisturbed.

Exposure to crystalline silica airborne dust may cause scarring of the lungs with coughing and shortness of breath—also known as “silicosis”, a form of disabling, progressive, and sometimes fatal pulmonary fibrosis.

A.7.2 Regulatory Framework

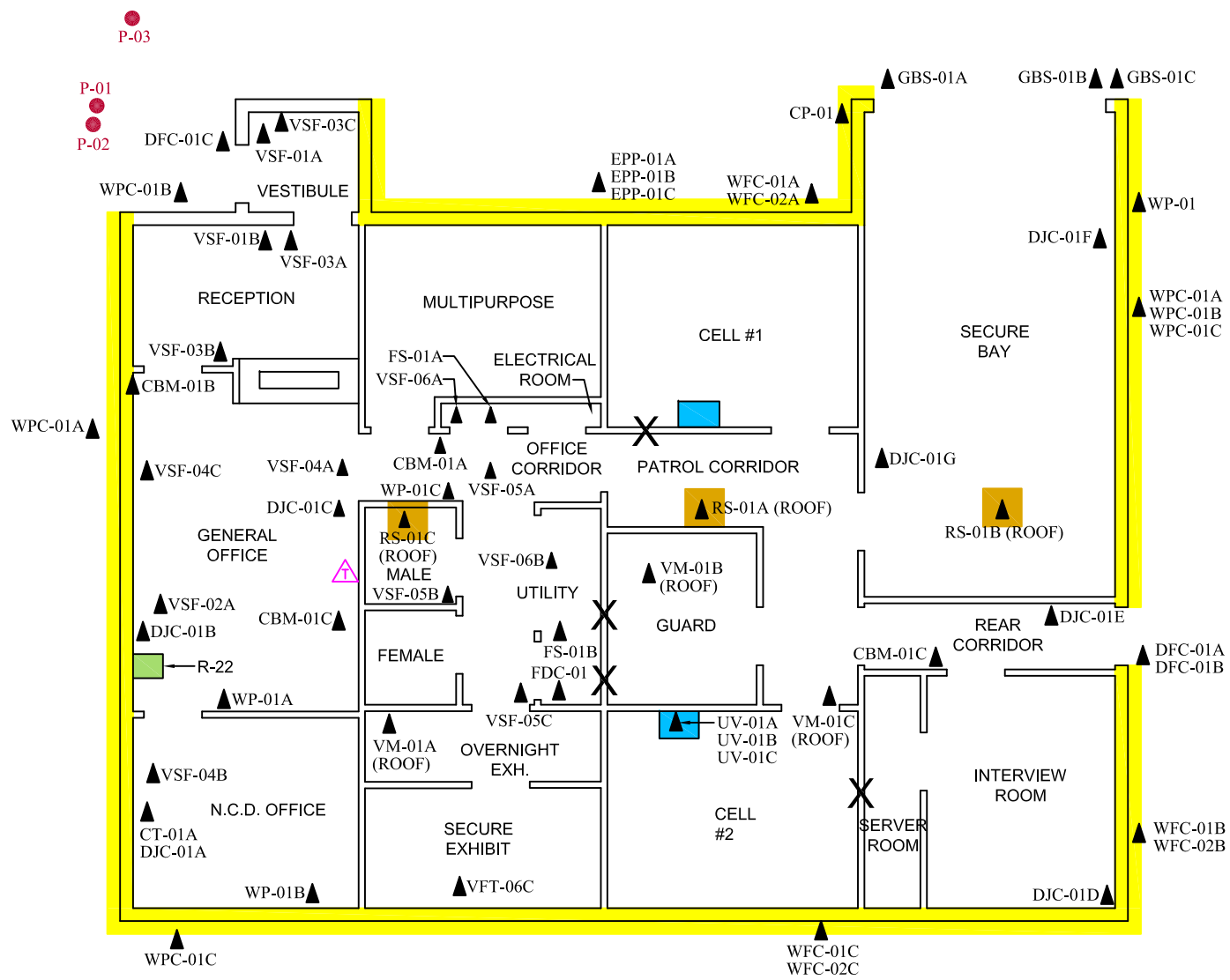
Regulations pertaining to silica are provided in BC Reg. 296/97. Included are general provisions (minimizing release; keeping worksite clear of unnecessary accumulations; ensuring methods for decontamination prevent generation of airborne silica), provisions for “restricted areas” (where there is a reasonable chance that the airborne concentration of silica exceeds or may exceed the occupational exposure limit), provisions for use in abrasive blasting, and provisions for health assessments for workers exposed to silica.

BC Reg. 296/97 and the COHSR also established the eight-hour OEL for silica to be 0.025 mg/m³ for each cristobalite and quartz.



APPENDIX B

Floor Plans



- LEGEND**
- ▲ ASBESTOS BULK SAMPLE
 - PAINT CHIP SAMPLE
 - ASBESTOS-CONTAINING GOLD SINK/TOILET UNDERCOATING
 - ASBESTOS-CONTAINING BROWN VENT MASTIC (ROOF)
 - ASBESTOS-CONTAINING GREY CEMENT PANEL ON LOWER EXTERIOR WALL
 - X INTRUSIVE INVESTIGATION FOR VERMICULITE
 - ODS-CONTAINING A/C EQUIPMENT
 - ▲ MERCURY-CONTAINING THERMOSTAT

OLD DETACHMENT #1 - MAIN FLOOR

NOTES: 1. BLACK WINDOW PANE CAULKING APPLIED BETWEEN GLASS AND FRAME THROUGHOUT EXTERIOR WINDOWS IS ASBESTOS-CONTAINING.
 2. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

<h2 style="margin: 0;">FLOOR PLAN SHOWING HAZARDOUS BUILDING MATERIALS AND BULK SAMPLE LOCATIONS</h2> <p style="margin: 0;">RCMP 6661 CHRISTENSEN ROAD, ANAHIM LAKE, BC</p>		<p>Project No.: 123221377</p> <p>Scale: N.T.S.</p> <p>Date: 19/07/22</p> <p>Dwn. By: CD <small>SL2019070065</small> CS/DM</p> <p>App'd By: TW</p>	<p>Dwg. No.:</p> <h1 style="font-size: 2em; margin: 0;">1</h1>	
<p>Client: PUBLIC SERVICES AND PROCUREMENT CANADA (PSPC)</p>				

APPENDIX C

Summary of Results: Analysis of Bulk Samples for Asbestos

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
September 16, 2019

Appendix C SUMMARY OF RESULTS: ANALYSIS OF BULK SAMPLES FOR ASBESTOS

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Vinyl sheet flooring, pink marbled pattern throughout vestibule and reception (supplemental)	OD-VSF-01A	Main floor, vestibule	None Detected
	OD-VSF-01B	Main floor, reception	None Detected
Vinyl sheet flooring, 9" x 9" beige pattern throughout the following locations on the main floor (supplemental): <ul style="list-style-type: none"> • General office • N.C.O. office • Lunch room • Office corridor • Male washroom • Female washroom • Rear corridor • Interview room • Server room 	OD-VSF-02A	Main floor, general office	<0.25% Chrysotile
Vinyl sheet flooring, beige, concealed (under VSF-01), throughout vestibule and reception	OD-VSF-03A	Main floor, reception	None Detected
	OD-VSF-03B	Main floor, reception	None Detected
	OD-VSF-03C	Main floor, vestibule	None Detected
Vinyl sheet flooring, dark grey, concealed (under VSF-02), throughout general office and N.C.O. office	OD-VSF-04A	Main floor, general office	None Detected
	OD-VSF-04B	Main floor, N.C.O. office	None Detected
	OD-VSF-04C	Main floor, general office	None Detected
Vinyl sheet flooring, beige, concealed (under VSF-02), throughout the following locations on the main floor: <ul style="list-style-type: none"> • Office corridor • Male washroom • Female washroom • Overnight exhibit 	OD-VSF-05A	Main floor, office corridor	None Detected
	OD-VSF-05B	Main floor, male washroom	None Detected
	OD-VSF-05C	Main floor, office corridor	None Detected
Vinyl sheet flooring, beige streaked, throughout electrical, utility and secure exhibit	OD-VSF-06A	Main floor, electrical	None Detected
	OD-VSF-06B	Main floor, utility	None Detected
	OD-VSF-06C	Main floor, secure exhibit	None Detected



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Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
September 16, 2019

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Wall paper, beige/textured—applied to walls within the following locations on the main floor: <ul style="list-style-type: none"> • General office • N.C.O. office • Lunch room (partial walls) • Office corridor 	OD-WP-01A	Main floor, general office	None Detected
	OD-WP-01B	Main floor, N.C.O. office	None Detected
	OD-WP-01C	Main floor, office corridor	None Detected
Suspended ceiling tile, 2" x 4", deep fissure (supplemental)	OD-CT-01A	Main floor, N.C.O. office	None Detected
Fire stop, red—applied to floor around electrical conduit (supplemental)	OD-FS-01A	Main floor, electrical	None Detected
	OD-FS-01B	Main floor, utility	None Detected
Sink/toilet under coating, gold	OD-UV-01A	Main floor, cell #2	1% Chrysotile
	OD-UV-01B	Main floor, cell #2	Positive Stop (Not Analyzed)
	OD-UV-01C	Main floor, cell #2	Positive Stop (Not Analyzed)
Drywall joint compound—applied to walls, ceilings, bulkheads, columns throughout main floor	OD-DJC-01A	Main floor, N.C.O office, perimeter wall	None Detected
	OD-DJC-01B	Main floor, general office, perimeter wall	None Detected
	OD-DJC-01C	Main floor, general office, partition wall	None Detected
	OD-DJC-01D	Main floor, interview room, perimeter wall	None Detected
	OD-DJC-01E	Main floor, rear corridor, partition wall	None Detected
	OD-DJC-01F	Main floor, secure bay, perimeter wall	None Detected
	OD-DJC-01G	Main floor, secure bay, partition wall	None Detected
Cove base mastic, tan—applied between cove base and lower wall	OD-CBM-01A	Main floor, office corridor	None Detected
	OD-CBM-01B	Main floor, general office	None Detected
	OD-CBM-01C	Main floor, general office	None Detected
Flex duct connector, black—applied to ducting	OD-FDC-01	Main floor, utility	None Detected
Door frame caulking, brown (painted silver in some locations)—applied between wall and frame	OD-DFC-01A	Exterior, rear exit	None Detected
	OD-DFC-01B	Exterior, rear exit	None Detected
	OD-DFC-01C	Exterior, front entrance	None Detected



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix C Summary of Results: Analysis of Bulk Samples for Asbestos
September 16, 2019

**Table C-1 Suspected ACM Bulk Sample and Analytical Results Summary
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Garage door frame caulking, brown (painted white)—applied between wall and frame	OD-GBS-01A	Exterior, secure bay	None Detected
	OD-GBS-01B	Exterior, secure bay	None Detected
	OD-GBS-01C	Exterior, secure bay	None Detected
Window frame caulking, clear—applied between frame and wall on exterior perimeter windows	OD-WFC-01A	Exterior, cell #1	None Detected
	OD-WFC-01B	Exterior, interview room	None Detected
	OD-WFC-01C	Exterior, cell #2	None Detected
Window frame caulking, brown—applied between frame and wall on exterior perimeter windows	OD-WFC-02A	Exterior, cell #1	None Detected
	OD-WFC-02B	Exterior, interview room	None Detected
	OD-WFC-02C	Exterior, cell #2	None Detected
Roofing shingle, red/asphalt—applied to roof	OD-RS-01A	Roof, central	None Detected
	OD-RS-01B	Roof, central	None Detected
	OD-RS-01C	Roof, central	None Detected
Vent mastic, brown—applied to perimeter of roof vents	OD-VM-01A	Roof, central	0.69% Chrysotile
	OD-VM-01B	Roof, central	Positive Stop (Not Analyzed)
	OD-VM-01C	Roof, central	Positive Stop (Not Analyzed)
Electrical penetration putty, grey—applied to perimeter of electrical cord	OD-EPP-01A	Exterior, front	None Detected
	OD-EPP-01B	Exterior, front	None Detected
	OD-EPP-01C	Exterior, front	None Detected
Window pane caulking, black—applied between glass and frame	OD-WPC-01A	Exterior, general office	1.5% Chrysotile
	OD-WPC-01B	Exterior, reception	Positive Stop (Not Analyzed)
	OD-WPC-01C	Exterior, N.C.O. office	Positive Stop (Not Analyzed)
Cement panel, grey—applied to exterior lower walls	OD-CP-01	Exterior, secure bay, front	20% Chrysotile
<p>NOTES:</p> <p>Bold, highlighted text indicates confirmed ACM</p> <p>Discrepancies between sampled material or location descriptions between this table and the laboratory certificate—this table is to be considered correct</p>			



APPENDIX D

**Laboratory Analytical Report—Asbestos: Polarized Light
Microscopy**



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EMSL Canada Order 551908045
Customer ID: 55JACQ30L
Customer PO: 123221377
Project ID:

Attn: Steve Chou
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6
Phone: (604) 412-3004
Fax:
Collected:
Received: 7/04/2019
Analyzed: 7/11/2019
Proj: RCMP Anahim Lake / 123221377

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: OD-VSF-01A **Lab Sample ID:** 551908045-0145

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, vestibule/Vinyl sheet flooring, pink marbled pattern throughout vestibule and reception (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Tan	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-01B **Lab Sample ID:** 551908045-0146

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, reception/Vinyl sheet flooring, pink marbled pattern throughout vestibule and reception (supplemental)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Tan	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-02A **Lab Sample ID:** 551908045-0147

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general office/Vinyl sheet flooring, 9x9 beige pattern throughout the following locations on the main floor: general office, N.C.O.

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	<0.25% Chrysotile	

Client Sample ID: OD-VSF-03A **Lab Sample ID:** 551908045-0148

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, reception/Vinyl sheet flooring, beige, concealed (under VSF-01), throughout vestibule and reception

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-03B **Lab Sample ID:** 551908045-0149

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, reception/Vinyl sheet flooring, beige, concealed (under VSF-01), throughout vestibule and reception

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-03C **Lab Sample ID:** 551908045-0150

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, vestibule/Vinyl sheet flooring, beige, concealed (under VSF-01), throughout vestibule and reception

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-04A **Lab Sample ID:** 551908045-0151

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general office/Vinyl sheet flooring, dark grey, concealed (under VSF-02), throughout general office and N.C.O. office

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	



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EMSL Canada Order 551908045
Customer ID: 55JACQ30L
Customer PO: 123221377
Project ID:

Test Report: Asbestos Analysis in Bulk Material for Occupational Health and Safety British Columbia Regulation 188/2011 via EPA 600/R-93/116 Method

Client Sample ID: OD-VSF-04B **Lab Sample ID:** 551908045-0152

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, N.C.O. office/Vinyl sheet flooring, dark grey, concealed (under VSF-02), throughout general office and N.C.O. office

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-04C **Lab Sample ID:** 551908045-0153

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general office/Vinyl sheet flooring, dark grey, concealed (under VSF-02), throughout general office and N.C.O. office

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-05A **Lab Sample ID:** 551908045-0154

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, office corridor/Vinyl sheet flooring, beige, concealed (under VSF-02), throughout the following locations on the main floor: office

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-05B **Lab Sample ID:** 551908045-0155

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, male washroom/Vinyl sheet flooring, beige, concealed (under VSF-02), throughout the following locations on the main floor: office c

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-05C **Lab Sample ID:** 551908045-0156

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, office corridor/Vinyl sheet flooring, beige, concealed (under VSF-02), throughout the following locations on the main floor: office

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-06A **Lab Sample ID:** 551908045-0157

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, electrical/Vinyl sheet flooring, beige streaked, throughout electrical, utility and secure exhibit

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-06B **Lab Sample ID:** 551908045-0158

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, utility/Vinyl sheet flooring, beige streaked, throughout electrical, utility and secure exhibit

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-VSF-06C **Lab Sample ID:** 551908045-0159

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, secure exhibit/Vinyl sheet flooring, beige streaked, throughout electrical, utility and secure exhibit

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	



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Project ID:

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Client Sample ID: OD-WP-01A **Lab Sample ID:** 551908045-0160

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general corridor/ Wall paper, beige/textured - applied to walls within the following locations on the main floor: general office, N.

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	White/Beige	20.0%	80.0%	None Detected	

Client Sample ID: OD-WP-01B **Lab Sample ID:** 551908045-0161

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, N.C.O. office/Wall paper, beige/textured - applied to walls within the following locations on the main floor: general office, N.C.O

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	White/Beige	20.0%	80.0%	None Detected	

Client Sample ID: OD-WP-01C **Lab Sample ID:** 551908045-0162

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, office corridor/Wall paper, beige/textured - applied to walls within the following locations on the main floor: general office, N.C

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	White/Beige	20.0%	80.0%	None Detected	

Client Sample ID: OD-CT-01A **Lab Sample ID:** 551908045-0163

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, N.C.O. office/Suspended ceiling tile, 2x4 deep fissure (supplemental)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray/White	80.0%	20.0%	None Detected	

Client Sample ID: OD-FS-01A **Lab Sample ID:** 551908045-0164

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, electrical/Fire stop, red - applied to floor around electrical conduit (supplemental)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Red	0.0%	100%	None Detected	

Client Sample ID: OD-FS-01B **Lab Sample ID:** 551908045-0165

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, utility/Fire stop, red - applied to floor around electrical conduit (supplemental)

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Red	0.0%	100%	None Detected	

Client Sample ID: OD-UV-01A **Lab Sample ID:** 551908045-0166

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, cell #2/Sink/toilet under coating, gold

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019	Brown/Gold	0.0%	99.0%	1% Chrysotile	

Client Sample ID: OD-UV-01B **Lab Sample ID:** 551908045-0167

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, cell #2/Sink/toilet under coating, gold

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM	7/11/2019					Positive Stop (Not Analyzed)



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Client Sample ID: OD-UV-01C **Lab Sample ID:** 551908045-0168

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, cell #2/Sink/toilet under coating, gold

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019					Positive Stop (Not Analyzed)

Client Sample ID: OD-DJC-01A **Lab Sample ID:** 551908045-0169

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, N.C.O. office, perimeter wall/Drywall joint compound - applied to walls, ceilings, bulkheads, columns throughout main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: OD-DJC-01B **Lab Sample ID:** 551908045-0170

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general office, perimeter wall/Drywall joint compound - applied to walls, ceilings, bulkheads, columns throughout main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: OD-DJC-01C **Lab Sample ID:** 551908045-0171

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general office, partition wall/Drywall joint compound - applied to walls, ceilings, bulkheads, columns throughout main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: OD-DJC-01D **Lab Sample ID:** 551908045-0172

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, interview room, perimeter wall/Drywall joint compound - applied to walls, ceilings, bulkheads, columns throughout main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: OD-DJC-01E **Lab Sample ID:** 551908045-0173

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, rear corridor, partition wall/Drywall joint compound - applied to walls, ceilings, bulkheads, columns throughout main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: OD-DJC-01F **Lab Sample ID:** 551908045-0174

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, secure bay, perimeter wall/Drywall joint compound - applied to walls, ceilings, bulkheads, columns throughout main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	

Client Sample ID: OD-DJC-01G **Lab Sample ID:** 551908045-0175

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, secure bay, partition wall/Drywall joint compound - applied to walls, ceilings, bulkheads, columns throughout main floor

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White	0.0%	100.0%	None Detected	



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Client Sample ID: OD-CBM-01A **Lab Sample ID:** 551908045-0176

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, office corridor/Cove base mastic, tan - applied between cove base and lower wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-CBM-01B **Lab Sample ID:** 551908045-0177

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general office/Cove base mastic, tan - applied between cove base and lower wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-CBM-01C **Lab Sample ID:** 551908045-0178

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, general office/Cove base mastic, tan - applied between cove base and lower wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Beige	0.0%	100%	None Detected	

Client Sample ID: OD-FDC-01 **Lab Sample ID:** 551908045-0179

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Main floor, utility/Flex duct connector, black - applied to ducting

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	White/Black	30.0%	70.0%	None Detected	

Client Sample ID: OD-DFC-01A **Lab Sample ID:** 551908045-0180

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, rear exit/Door frame caulking, brown (painted silver in some locations) - applied between wall and frame

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Silver	0.0%	100%	None Detected	

Client Sample ID: OD-DFC-01B **Lab Sample ID:** 551908045-0181

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, rear exit/Door frame caulking, brown (painted silver in some locations) - applied between wall and frame

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Silver	0.0%	100%	None Detected	

Client Sample ID: OD-DFC-01C **Lab Sample ID:** 551908045-0182

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, front entrance/Door frame caulking, brown (painted silver in some locations) - applied between wall and frame

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	100%	None Detected	

Client Sample ID: OD-GBS-01A **Lab Sample ID:** 551908045-0183

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, secure bay/Garage door frame caulking, brown (painted white) - applied between wall and frame

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	White/Black	0.0%	100%	None Detected	



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Client Sample ID: OD-GBS-01B **Lab Sample ID:** 551908045-0184

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, secure bay/Garage door frame caulking, brown (painted white) - applied between wall and frame

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	White/Black	0.0%	100%	None Detected	

Client Sample ID: OD-GBS-01C **Lab Sample ID:** 551908045-0185

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, secure bay/Garage door frame caulking, brown (painted white) - applied between wall and frame

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	White	0.0%	100%	None Detected	

Client Sample ID: OD-WFC-01A **Lab Sample ID:** 551908045-0186

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, cell #1/Window frame caulking, clear - applied between frame and wall on exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Clear	0.0%	100%	None Detected	

Client Sample ID: OD-WFC-01B **Lab Sample ID:** 551908045-0187

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, interview room/Window frame caulking, clear - applied between frame and wall on exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Clear	0.0%	100%	None Detected	

Client Sample ID: OD-WFC-01C **Lab Sample ID:** 551908045-0188

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, cell #2/Window frame caulking, clear - applied between frame and wall on exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Clear	0.0%	100%	None Detected	

Client Sample ID: OD-WFC-02A **Lab Sample ID:** 551908045-0189

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, cell #1/Window frame caulking, brown - applied between frame and wall on exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: OD-WFC-02B **Lab Sample ID:** 551908045-0190

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, interview room/Window frame caulking, brown - applied between frame and wall on exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: OD-WFC-02C **Lab Sample ID:** 551908045-0191

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, cell #2/Window frame caulking, brown - applied between frame and wall on exterior perimeter windows

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	



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Client Sample ID: OD-RS-01A **Lab Sample ID:** 551908045-0192

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Roof, central/Roofing shingle, red/asphalt - applied to roof

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Red	0.0%	100%	None Detected	

Client Sample ID: OD-RS-01B **Lab Sample ID:** 551908045-0193

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Roof, central/Roofing shingle, red/asphalt - applied to roof

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Red	0.0%	100%	None Detected	

Client Sample ID: OD-RS-01C **Lab Sample ID:** 551908045-0194

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Roof, central/Roofing shingle, red/asphalt - applied to roof

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Red	0.0%	100%	None Detected	

Client Sample ID: OD-VM-01A **Lab Sample ID:** 551908045-0195

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Roof, central/Vent mastic, brown - applied to perimeter of roof vents

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Brown	0.0%	99.3%	0.69% Chrysotile	

Client Sample ID: OD-VM-01B **Lab Sample ID:** 551908045-0196

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Roof, central/Vent mastic, brown - applied to perimeter of roof vents

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)

Client Sample ID: OD-VM-01C **Lab Sample ID:** 551908045-0197

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Roof, central/Vent mastic, brown - applied to perimeter of roof vents

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019					Positive Stop (Not Analyzed)

Client Sample ID: OD-EPP-01A **Lab Sample ID:** 551908045-0198

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, front/Electrical penetration putty, grey - applied to perimeter of electrical cord

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: OD-EPP-01B **Lab Sample ID:** 551908045-0199

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, front/Electrical penetration putty, grey - applied to perimeter of electrical cord

TEST	Analyzed		Non-Asbestos		Asbestos	Comment
	Date	Color	Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	



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Client Sample ID: OD-EPP-01C **Lab Sample ID:** 551908045-0200

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, front/Electrical penetration putty, grey - applied to perimeter of electrical cord

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Gray	0.0%	100%	None Detected	

Client Sample ID: OD-WPC-01A **Lab Sample ID:** 551908045-0201

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, general office/Window pane caulking, black - applied between glass and frame

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019	Black	0.0%	98.5%	1.5% Chrysotile	

Client Sample ID: OD-WPC-01B **Lab Sample ID:** 551908045-0202

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, reception/Window pane caulking, black - applied between glass and frame

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: OD-WPC-01C **Lab Sample ID:** 551908045-0203

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, N.C.O. office/Window pane caulking, black - applied between glass and frame

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM Grav. Reduction	7/11/2019				Positive Stop (Not Analyzed)	

Client Sample ID: OD-CP-01 **Lab Sample ID:** 551908045-0204

Sample Description: Old Detachment - 6661 Christensen Road, Anahim Lake, BC - Exterior, secure bay, front/Cement panel, grey - applied to exterior lower walls

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	7/11/2019	Gray/White	0.0%	80.0%	20% Chrysotile	

Analyst(s):

- Harman Sohi PLM Grav. Reduction (11)
- Ioana Taina PLM (14)
- Shorthri Kalikutty PLM Grav. Reduction (29)

Reviewed and approved by:

Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. 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 or the U.S. Government

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

Report amended: 07/12/2019 09:14:43 Replaces amended report from: 07/11/2019 17:05:43 Reason Code: Client-Change to Appearance

APPENDIX E




Summary of Identified Asbestos-Containing Materials

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix E Summary of Identified Asbestos-Containing Materials
September 16, 2019

Appendix E SUMMARY OF IDENTIFIED ASBESTOS-CONTAINING MATERIALS

**Table E-1 Summary of Identified Asbestos-Containing Materials
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**

Identified ACM Description and Condition Information		
Gold sink/toilet under coating within cell #1 and cell #2		
% Type	1% Chrysotile	
Friability	Non-friable	
Quantity	Approximately 3 square metres	
Condition	Good	
Brown vent mastic applied to various roof vents		
% Type	0.69% Chrysotile	
Friability	Non-friable in situ; potentially friable during demolition	
Quantity	Approximately 3 linear metres	
Condition	Good	
Black window pane caulking applied between glass and frame throughout exterior windows		
% Type	1.5% Chrysotile	
Friability	Non-friable	
Quantity	Approximately 60 linear metres	
Condition	Good	




PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix E Summary of Identified Asbestos-Containing Materials
September 16, 2019

**Table E-1 Summary of Identified Asbestos-Containing Materials
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**

Identified ACM Description and Condition Information	
Grey cement panel applied to lower exterior walls	
% Type	20% Chrysotile
Friability	Non-friable
Quantity	Approximately 65 square metres
Condition	Good in general, with areas of localized damage

A photograph showing the corner of a building's exterior wall. The wall is covered in a grey cement panel. There is a localized area of damage at the corner, where the cement has chipped away, revealing a darker material underneath. A white arrow points to this damaged area. The ground in front of the wall is covered with green grass and some orange mulch.

APPENDIX F

**Summary of Results: Analysis of Paint Chip Samples for
Lead**

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix F Summary of Results: Analysis of Paint Chip Samples for Lead
September 16, 2019

**Appendix F SUMMARY OF RESULTS: ANALYSIS OF PAINT
CHIP SAMPLES FOR LEAD**

**Table F-1 Suspected Lead-Containing Paint Sample and Analytical Results Summary
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**

Sample Number	Paint Colour/Application	Sample Location	Result (ppm)
OD-P-01	Tan on wood column	Exterior, by front entrance	200
OD-P-02	Brown on metal gutters	Exterior, front	1,100
OD-P-03	Tan on metal railings	Exterior, front	110

NOTE:
Bold, highlighted text indicates confirmed LCP



APPENDIX G

Laboratory Analytical Report—Lead: Paint Chip Analysis

**EMSL Canada Inc.**

2756 Slough Street, Mississauga, ON L4T 1G3

Phone/Fax: (289) 997-4602 / (289) 997-4607

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

EMSL Canada Or	551908030
CustomerID:	55JACQ30L
CustomerPO:	123221377
ProjectID:	

Attn: **Steve Chou**
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
 Fax:
 Received: 07/04/19 11:18 AM
 Collected:

Project: **RCMP Anahim Lake / 123221377****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample</i>	<i>Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
OD-P-01 551908030-0030	Site: Old Detachment (OD) - Exterior, by front entrance Desc: Tan on wood column		7/8/2019	0.2419 g	83 ppm	200 ppm
OD-P-02 551908030-0031	Site: Old Detachment (OD) - Exterior, front Desc: Brown on metal gutters		7/8/2019	0.0763 g	260 ppm	1100 ppm
OD-P-03 551908030-0032	Site: Old Detachment (OD) - Exterior, front Desc: Tan on metal railings		7/8/2019	0.2440 g	82 ppm	110 ppm

Rowena Fanto, Lead Supervisor
 or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. 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. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Cert #2845.08; AIHA-LAP, LLC - ELLAP #196142

Initial report from 07/11/2019 09:33:01

APPENDIX H


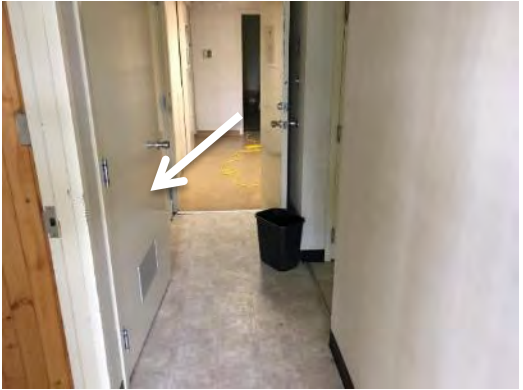

Summary of Identified LCPS

PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix H Summary of Identified LCPs
September 16, 2019

Appendix H SUMMARY OF IDENTIFIED LCPS

**Table H-1 Summary of Identified LCPs
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**


LCP Description		Photo
Paint colour	Grey	
Substrate	Metal	
Location/approx. extent	Front/rear entrance door and frame	
Lead content	120,000 ppm (Pinchin Report)	
Condition	Good	
Paint colour	Light tan	
Substrate	Metal	
Location/approx. extent	Door and frame throughout	
Lead content	7,300 ppm (Pinchin Report)	
Condition	Good	
Paint colour	Off-white	
Substrate	Drywall	
Location/approx. extent	Drywall throughout	
Lead content	730 ppm (Pinchin Report)	
Condition	Good	



PRE-DEMOLITION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Appendix H Summary of Identified LCPs
September 16, 2019

**Table H-1 Summary of Identified LCPs
RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake BC**

LCP Description		Photo
Paint colour	Brown	
Substrate	Metal	
Location/approx. extent	Gutter and downspout throughout	
Lead content	1,110 ppm	
Condition	Good	



APPENDIX I

Laboratory Analytical Report—Lead: Leachate Analysis



EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 786-5974

<http://www.EMSL.com>

cinnaminsonleadlab@emsl.com

EMSL Order:	201907095
CustomerID:	JACQ30L
CustomerPO:	
ProjectID:	

Attn: **Steve Chou**
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
 Fax:
 Received: 07/15/19 10:10 AM
 Collected:

Project: 123221377 / RCMP Anahim Lake

Test Report: Toxicity Characteristic Leachate Procedure (1311/7000B)

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
OD-LL-01	201907095-0001		7/17/2019	<0.40 mg/L
Site: RCMP Old Detachment #1, 6661 Christensen Road, Anahim Lake, BC - Tan on Wood Column - Exterior, By Front Entrance				
4-LL-06	201907095-0002		7/17/2019	<0.40 mg/L
Site: RCMP Mobile Home #4 - 6665 Christensen Road, Anahim Lake, BC - Orange on Door Frame - Exterior, Rear Exit				

Phillip Worby, Lead Laboratory Manager
or other approved signatory

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

Initial report from 07/22/2019 11:06:37

APPENDIX B

WSP

Civil Water and Utility Report
Sept 13, 2019



2019-09-13

Confidential

Barry Cosgrave
Number Ten Architectural Group
200-1619 Store Street
Victoria BC
V8W 3K3

Subject: Anahim Lake RCMP Renovation - Civil Water and Utility Report

Dear Sir:

WSP is completing an assessment of the existing civil services for the above project including water, sewer and storm. This report summarizes our review of the site's water supply and distribution system.

Existing Conditions

Water Distribution System:

The ex-detachment and two mobile homes are supplied with water from a well located on the property. Water is pumped from the well to the pumphouse where it is treated before being distributed. The pumphouse also supplies water to the four RCMP homes to the west (6655, 6653, 6651, and 6649 Christensen Rd).

Historic drawings indicate that the pumphouse was built in 2002. There are two treated water lines to distribution from the existing pumphouse. The first line supplies Lot 6665 (yellow mobile home to the north), as well as Lots 6652, 6661 and 6655 (White mobile home, Old detachment, and RCMP home across from yellow trailer). The second line runs west to supply Lots 6649, 6651 and 6653 (RCMP homes along the road).

For existing water distribution system, see C-001 attached.

Water Well and Treatment System:

There is a 6" well in the middle of the property, on the east side of the access road, opposite 6655. This water well has tag number #18709. The Well has a ¾ hp pump that pumps the water from the well via a raw water line to a 1100 US gallon (4,000L) holding tank in the pumphouse. From the holding tank the water is treated via filtration and water softener. A jet pump with a pressure tank supplies the treated water to the residences via treated water distribution lines.

As part of WSP assessment the well was inspected and water quality was tested by Big Country Pumps in August 2019 (report attached). Big Country conducted a supply test on the well by continuous pumping until the water level stabilized. On the day of testing the (approximately) 222ft deep well, had a static water level of 14ft below grade. During the well test the water level stabilized at 47ft below grade and with a flowrate of 10gpm.



Big Country's well inspection noted that the well is at ground level and should be raised 450mm above grade. It appears that the well casing has been cut off and cement barrel is broken. This could lead to surface water entering the well from above. It is our recommendation that casing and barrel be repaired.

Big Country took two samples during their well inspection. One of raw water and one of treated water. These samples were tested for E. Coli and Total Coliform Bacteria. Both results showed no sign of either parameter. Sample results have been attached.

WSP has learned that BGIS Property Solutions (BGIS) assess water quality through monthly sampling on behalf of Vancouver Coastal Health Authority. Bacteriological Test are completed monthly. Hardness and total metals are tested periodically. Summary report for 2018 bacteriological results has been attached as well as June 2019 Analytical Report when hardness and total metals were tested. BGIS are not aware of any health hazard associated with the sites' water supply based on their review of the test results. Based on discussions with BGIS, there are no significant known deficiencies associated with the treatment system.

Proposed Servicing

The ex-detachment will be renovated and upgraded to provide a new residence for the RCMP staff. The existing potable water servicing will need to be reconfigured to supply the new residence. Currently, water is supplied to the existing building (ex-detachment) from the pumphouse via Lot 6665. The mobile home on Lot 6665 will be demolished and waterlines will be abandoned. Two new connections will therefore be required to maintain water service to Lot 6655 and new residence at 6661.

For proposed water distribution system, see C002 attached.

Demands

The proposed system will consist of the following 5 residences; 6655, 6653, 6651, 6649, and 6661. Since the residences are typically occupied by families, we have assumed an occupancy of 4 residents per household for a total of 20 persons. We have assumed the following demands for evaluation purposes:

Average Day Demand (ADD): 450 liters per capita per day (lpcd)

Maximum Day Demand (MDD): 900lpcd

Peak Hour Demand (PHD): 1,350lpcd

These values are based on unmetered residential demands in according to Master Municipal Construction Documents (MMCD) Design Guidelines.

The MDD for all residences (20 persons) is estimated at 18,000L/day, or 12.5L/min. The equalisation storage required based on MMCD Design Guidelines is 3,000L, so the storage provided by the pumphouse holding tank (4,000L) is adequate.

The yield of the well is at least 10gpm (38.8L/min) based on Big Country's well test, so the water supply system appears to be suitable for meeting the systems demands.



Summary / Recommendations

- New residence to be connected to the existing pumphouse treated water discharge line.
- Lot 6655 to be connected to the existing pumphouse treated water discharge line.
- Well casing and concrete barrel to be restored.

Yours sincerely,

Katarina Konicek, P.Eng.
Project Engineer

Simon Kras, P.Eng.
Senior Engineer

WSP ref.: 191-10513-00

Enclosed:

- Photo Sheet
- Big Country Well Report 20190906
- Raw water Result 20190827
- Treated Water Results 20190827
- BGIS – 2018 Annual Water Report
- BGIS – June 2019 Analytical Report
- Civil 50% Design Drawings – C001
- Civil 50% Design Drawings – C002

WATER UTILITY REPORT - PHOTO SHEET



Water Well



Water Well



Pumphouse



Pumphouse

WATER UTILITY REPORT - PHOTO SHEET



Inside pumphouse



Holding tank, 1100 Us gal (4000L)



Jet pump



Filtration units



Filtration unit details



Water Softener

Konicek, Katarina

From: Big Country Pumps <rgrey@telus.net>
Sent: September 6, 2019 11:46 AM
To: Konicek, Katarina
Subject: Well report

Anahim Lake pump house at RCMP compound

6" well in the middle of the compound yard. Approximately depth of the well is 222' with a 3/4Hp pump. Well tag #18709. There is a vermon proof cap on the well. Static level is at 14'. Ran pump in well at 10gpm and water stabilized at 47' and at this point the well was still producing 10gpm. There is a holding tank in the pump house which well pumps into. There is a jet pump that pulls water from holding tank and delivers it to the houses. Flow test was taken from raw water tap on the side of the building. Two samples were taken 1 from raw water and 1 from treated water. That pump house feeds 4 houses and 2 mobiles and old office as of right now. Well is at ground level and should be raised 18" above grade. There is cement basin around well now and the top is broken, surface water could run down around well and contaminate water. Raw water is approximately 15 grains hard and iron was 1.5gr ppm.


Rob Grey
Big Country Pumps Inc.
Sent from [Mail](#) for Windows 10



Date: 29-AUG-19
 PO No.: 23223
 WO No.: L2337416
 LSD: Anahim Lake
 Project Ref: RCMP
 Sample ID: RCMP RAW WATER
 Sampled By:
 Date Collected: 27-AUG-19
 Lab Sample ID: L2337416-1
 Matrix: Water

HIGHLANDS IRRIGATION LTD. (THE WATER PEOPLE)
 1105 South Lakeside Drive
 Williams Lake BC V2G 3A7
 ATTN: Darlene Wiebe

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Bacteriological Tests						
E. Coli	<1		MPN/100mL	0		28-AUG-19
Coliform Bacteria - Total	<1		MPN/100mL	0		28-AUG-19
<p>CDWQG = Health Canada Guideline Limits updated JUNE 2019</p> <p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p>						

Approved by 
 Amanda Lampreau
 Account Manager

Guidelines & Objectives

Health Canada MAC Health Related Criteria Limits

Nitrate/Nitrite-N*	Criteria limit is 10 mg/L (1.0 mg/L if present as all Nitrite-N). High concentrations may contribute to blue baby syndrome in infants.
Lead*	A cumulative body poison, uncommon in naturally occurring hard waters.
Fluoride*	Present in fluoridated water supplies at 0.8 mg/L to reduce dental caries. Elevated levels causes fluorosis (mottling of teeth).
Total Coliforms*	Criteria is 0 CFU/100mL. Adverse health effects.
E. Coli*	Criteria is 0 CFU/100 mL. Certain E. Coli bacteria can be life threatening.
Manganese*	Elevated levels may cause staining of laundry and porcelain.

*Health Canada Canadian Drinking Water Quality Guidelines (MAC limit)

Aesthetic Objective Concentration Levels

Alkalinity	Acid neutralizing capacity. Usually a measure of carbonate and bicarbonates and calculated and reported as calcium carbonate.
Balance	Quality control parameter ratioing cations to anions
Bicarbonate	See Alkalinity. Report as the anion HCO ₃ -1
Carbonate	See Alkalinity. Reported at the anion CO ₃ -2
Calcium	See Hardness. Common major cation of water chemistry.
Chloride	Common major anion of water chemistry.
Conductance	Physical test measuring water salinity (dissolved ions or solids)
Hardness	Classical measure or capacity of water to precipitate soap (chiefly calcium and magnesium ions). Causes scaling tendency in water if carbonates/bicarbonates are present (if >200 mg/L). For drinking water purposes waters with results <200 mg/L are considered acceptable, results >200 mg/L are considered poor but can be tolerated. Results >500 mg/L are unacceptable.
Hydroxide	See alkalinity
Magnesium	See hardness. Common major cation of water chemistry. Elevated levels (>125 mg/L) may exert a cathartic or diuretic action.
pH	Measure of water acidity/alkalinity. Normal range is 7.0-8.5.
Potassium	Common major cation of water chemistry.
Sodium	Common major cation of water chemistry. Measure of salinity (saltiness).
Sulphate	Common major anion of water chemistry. Elevated levels may exert a cathartic or diuretic action.
Total Dissolved Solids	A measure of water salinity.
Iron	Causes staining to laundry and porcelain and astringent taste. Oxidizes to red-brown precipitate on exposure to air.
Heterotrophic Plate Count	Criteria is 500 cfu/mL. Measure of heterotrophic bacteria present.

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.


UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Date: 29-AUG-19
 PO No.: 23222
 WO No.: L2337410
 LSD: Anahim Lake
 Project Ref: RCMP
 Sample ID: RCMP TREATED WATER
 Sampled By:
 Date Collected: 27-AUG-19
 Lab Sample ID: L2337410-1
 Matrix: Water

HIGHLANDS IRRIGATION LTD. (THE WATER PEOPLE)
 1105 South Lakeside Drive
 Williams Lake BC V2G 3A7
 ATTN: Darlene Wiebe

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Bacteriological Tests						
E. coli	<1		MPN/100mL	0		28-AUG-19
Coliform Bacteria - Total	<1		MPN/100mL	0		28-AUG-19
CDWQG = Health Canada Guideline Limits updated JUNE 2019						
<p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p>						
Approved by 						
Amanda Lampreau Account Manager						

ADDRESS: 1445 McGill Rd, Unit 2B, Kamloops BC, V2C 0K7 | Phone: +1 250 372 3588 | Fax: +1 250 372 3670
 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

Guidelines & Objectives

Health Canada MAC Health Related Criteria Limits

Nitrate/Nitrite-N*	Criteria limit is 10 mg/L (1.0 mg/L if present as all Nitrite-N). High concentrations may contribute to blue baby syndrome in infants.
Lead*	A cumulative body poison, uncommon in naturally occurring hard waters.
Fluoride*	Present in fluoridated water supplies at 0.8 mg/L to reduce dental caries. Elevated levels causes fluorosis (mottling of teeth).
Total Coliforms*	Criteria is 0 CFU/100mL. Adverse health effects.
E. Coli*	Criteria is 0 CFU/100 mL. Certain E. Coli bacteria can be life threatening.
Manganese*	Elevated levels may cause staining of laundry and porcelain.

*Health Canada Canadian Drinking Water Quality Guidelines (MAC limit)

Aesthetic Objective Concentration Levels

Alkalinity	Acid neutralizing capacity. Usually a measure of carbonate and bicarbonates and calculated and reported as calcium carbonate.
Balance	Quality control parameter ratioing cations to anions
Bicarbonate	See Alkalinity. Report as the anion HCO ₃ -1
Carbonate	See Alkalinity. Reported at the anion CO ₃ -2
Calcium	See Hardness. Common major cation of water chemistry.
Chloride	Common major anion of water chemistry.
Conductance	Physical test measuring water salinity (dissolved ions or solids)
Hardness	Classical measure or capacity of water to precipitate soap (chiefly calcium and magnesium ions). Causes scaling tendency in water if carbonates/bicarbonates are present (if >200 mg/L). For drinking water purposes waters with results <200 mg/L are considered acceptable, results >200 mg/L are considered poor but can be tolerated. Results >500 mg/L are unacceptable.
Hydroxide	See alkalinity
Magnesium	See hardness. Common major cation of water chemistry. Elevated levels (>125 mg/L) may exert a cathartic or diuretic action.
pH	Measure of water acidity/alkalinity. Normal range is 7.0-8.5.
Potassium	Common major cation of water chemistry.
Sodium	Common major cation of water chemistry. Measure of salinity (saltiness).
Sulphate	Common major anion of water chemistry. Elevated levels may exert a cathartic or diuretic action.
Total Dissolved Solids	A measure of water salinity.
Iron	Causes staining to laundry and porcelain and astringent taste. Oxidizes to red-brown precipitate on exposure to air.
Heterotrophic Plate Count	Criteria is 500 cfu/mL Measure of heterotrophic bacteria present.

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Anahim Lk RCMP Annual Water Sample Report

BC92045 Samples tested by ALS Environmental

Tested by Wade Lambe at WSI. Site tested monthly.

Vancouver Coastal Health

Jan 2018

Fecal, total coliform and e-coli <1

Feb 2018

Fecal, total coliform and e-coli <1

March 2018

Fecal, total coliform and e-coli <1

April 2018

Fecal, total coliform and e-coli <1

May 2018

Fecal, total coliform and e-coli <1

June 2018

Fecal, total coliform and e-coli <1

July 2018

Fecal, total coliform and e-coli <1

Aug 2018

Fecal, total coliform and e-coli <1

Sept 2018

Fecal, total coliform and e-coli <1

Oct 2018

Fecal, total coliform and e-coli <1

Nov 2018

Fecal, total coliform and e-coli <1

Dec 2018

Fecal, total coliform and e-coli <1



Brookfield GIS Workplace Solutions
ATTN: Wade Lambe
23 - 3318 Oak Street
Williams Lake BC V8X 1R1

Date Received: 05- JUN- 19
Report Date: 12- JUN- 19 09:47 (MT)
Version: FINAL

Client Phone: 250- 267- 1722

Certificate of Analysis

Lab Work Order #: L2285388
Project P.O. #: BCB32110273
Job Reference: BCB170- BCB- VA
C of C Numbers:
Legal Site Desc:

Carla Fuginski
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALSCANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	Sample ID	Description	Sampled Date	Sampled Time	Client ID
		L2285388-1	Water	04-JUN-19	08:30	BC92045 ANAHIM LK RCMP
WATER						
Physical Tests	Hardness (as CaCO ₃) (mg/L)			1.14 ^{HTC}		
Bacteriological Tests	E. coli (MPN/100mL)			<1		
	Coliform Bacteria - Fecal (CFU/100mL)			<1		
	Coliform Bacteria - Total (MPN/100mL)			<1		
Total Metals	Aluminum (Al)-Total (mg/L)			<0.010		
	Antimony (Sb)-Total (mg/L)			<0.00050		
	Arsenic (As)-Total (mg/L)			0.00025		
	Barium (Ba)-Total (mg/L)			<0.020		
	Boron (B)-Total (mg/L)			<0.10		
	Cadmium (Cd)-Total (mg/L)			<0.00020		
	Calcium (Ca)-Total (mg/L)			0.22		
	Chromium (Cr)-Total (mg/L)			<0.0020		
	Copper (Cu)-Total (mg/L)			0.0075		
	Iron (Fe)-Total (mg/L)			<0.030		
	Lead (Pb)-Total (mg/L)			<0.00050		
	Magnesium (Mg)-Total (mg/L)			0.14		
	Manganese (Mn)-Total (mg/L)			<0.0020		
	Mercury (Hg)-Total (mg/L)			<0.00020		
	Potassium (K)-Total (mg/L)			3.19		
	Selenium (Se)-Total (mg/L)			<0.0010		
	Sodium (Na)-Total (mg/L)			202		
	Uranium (U)-Total (mg/L)			0.00091		
	Zinc (Zn)-Total (mg/L)			<0.050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L2285388-1	BC92045 ANAHIM LK RCMP	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ECOLI-COLI-BCDW-VA	Water	E.coli by Colilert	APHA METHOD 9223
This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is obtained by comparing the positive responses to a probability table.			
FCOLI-MF-BCDW-VA	Water	Fecal coliform by membrane filtration	APHA METHOD 9222
This analysis is carried out using procedures adapted from APHA Method 9222 "Membrane Filter Technique for Members of the Coliform Group". Coliform bacteria is enumerated by culturing and colony counting. A known sample volume is filtered through a 0.45 micron membrane filter. The test involves an initial 24 hour incubation of the filter with the appropriate growth medium, positive results require further testing (up to an additional 48 hours) to confirm and quantify the total coliform. This method is used for non-turbid water with a low background bacteria level.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-TOT-CVAFS-VA	Water	Total Hg in Water by CVAFS LOR=50ppt	EPA 1631E (mod)
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
TCOLI-COLI-BCDW-VA	Water	Total coliform by Colilert	APHA METHOD 9223
This analysis is carried out using procedures adapted from APHA Method 9223 "Enzyme Substrate Coliform Test". E. coli and Total Coliform are determined simultaneously. The sample is mixed with a mixture hydrolyzable substrates and then sealed in a multi-well packet. The packet is incubated for 18 or 24 hours and then the number of wells exhibiting a positive response are counted. The final result is quantified by a statistical estimation of bacteria density (most probable number).			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



L2285388-COFC



Enviro

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page _____ of _____

Report To		Report Format / Distribution			Service Requested (Rush for routine analysis subject to availability)																																																																																																										
Company: <u>WSI</u>		<input type="checkbox"/> Standard <input type="checkbox"/> Other			<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)																																																																																																										
Contact: <u>Wade Lambe</u>		<input type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax			<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT																																																																																																										
Address: <u>204 540 Barcland St</u>		Email 1: _____			<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT																																																																																																										
<u>Williams Lk BC</u>		Email 2: _____			<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT																																																																																																										
Phone: <u>250 267 1722</u> Fax: <u>250 305 2585</u>		Email 3: _____			Analysis Request																																																																																																										
Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Client / Project Information			Please indicate below Filtered, Preserved or both (F, P, F/P)																																																																																																										
Hardcopy of Invoice with Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Job #:			<table border="1" style="width: 100%; height: 100%;"> <tr> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td rowspan="5" style="writing-mode: vertical-rl; transform: rotate(180deg);">Number of Containers</td> </tr> <tr> <td colspan="4" style="text-align: center;">Total California</td> <td colspan="4" style="text-align: center;">Fecal California</td> <td colspan="4" style="text-align: center;">E-Coli</td> <td colspan="4" style="text-align: center;">Chemical</td> <td colspan="4" style="text-align: center;">Total Metals</td> </tr> <tr> <td style="text-align: center;">X</td><td style="text-align: center;">X</td><td style="text-align: center;">X</td><td style="text-align: center;">X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>																										Number of Containers	Total California				Fecal California				E-Coli				Chemical				Total Metals				X	X	X	X																																																								
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	<u>BC92045 Anahim Lk RCMP</u>	<u>4/6/19</u>	<u>8:30</u>		X	X	X	X																																																																																																							

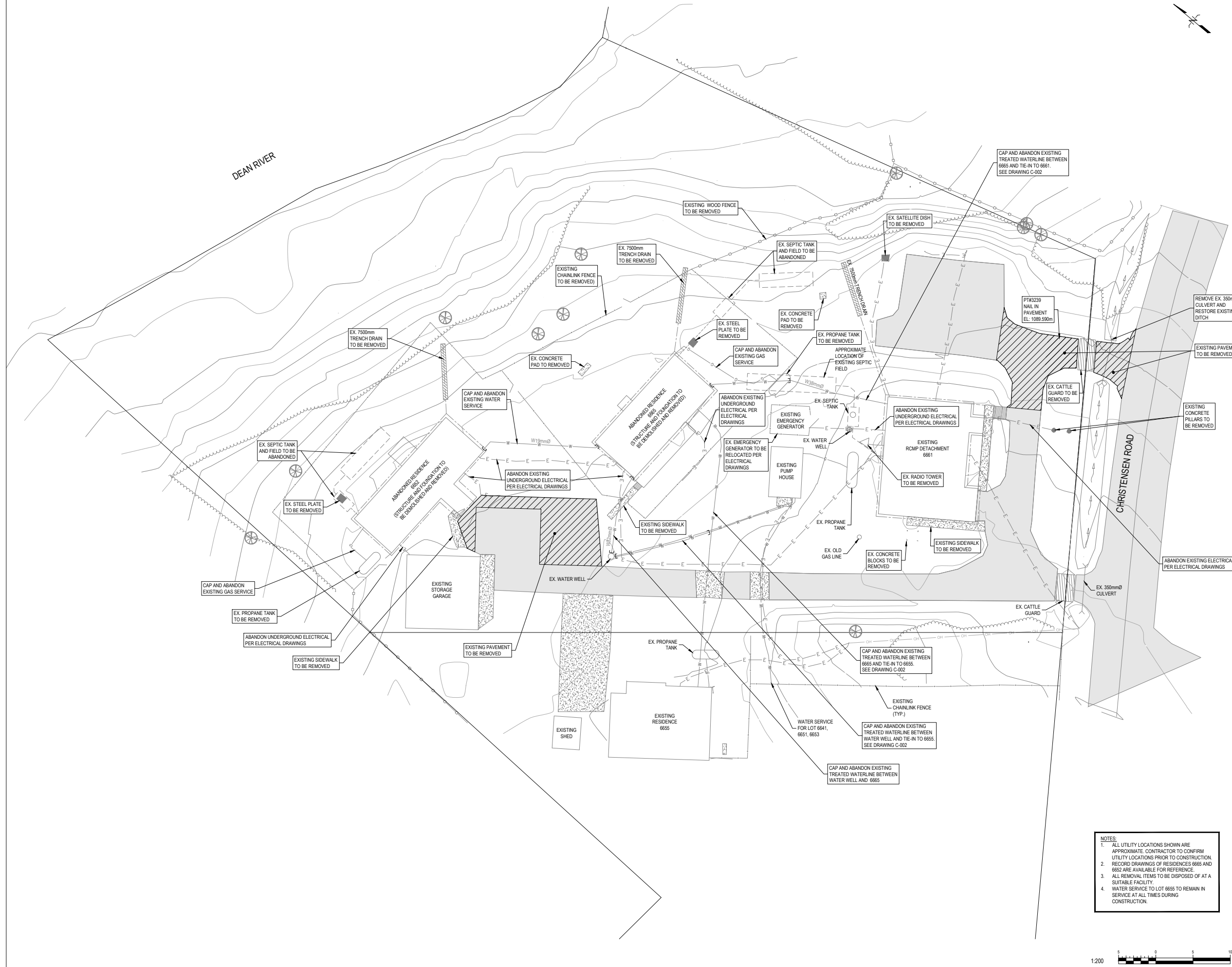
Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)				SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mm-yy)	Time (hh:mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:	
<u>WADE LAMBE</u>	<u>4/6/19</u>	<u>2pm</u>	<u>[Signature]</u>	<u>June 5</u>	<u>8:40am</u>	<u>12°C</u>				Yes / No ? If Yes add SIF	



NOTES:
 1. ALL UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTRACTOR TO CONFIRM UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
 2. RECORD DRAWINGS OF RESIDENCES 6665 AND 6662 ARE AVAILABLE FOR REFERENCE.
 3. ALL REMOVAL ITEMS TO BE DISPOSED OF AT A SUITABLE FACILITY.
 4. WATER SERVICE TO LOT 6655 TO REMAIN IN SERVICE AT ALL TIMES DURING CONSTRUCTION.

Revision/Revisions	Description/Description	Date/Date
0		
0		
0		
0		
0		
A	ISSUED FOR 90% REVIEW SUBMISSION	2019.09.13

RCMP
 14200 Green Timbers Way
 Surrey, B.C.

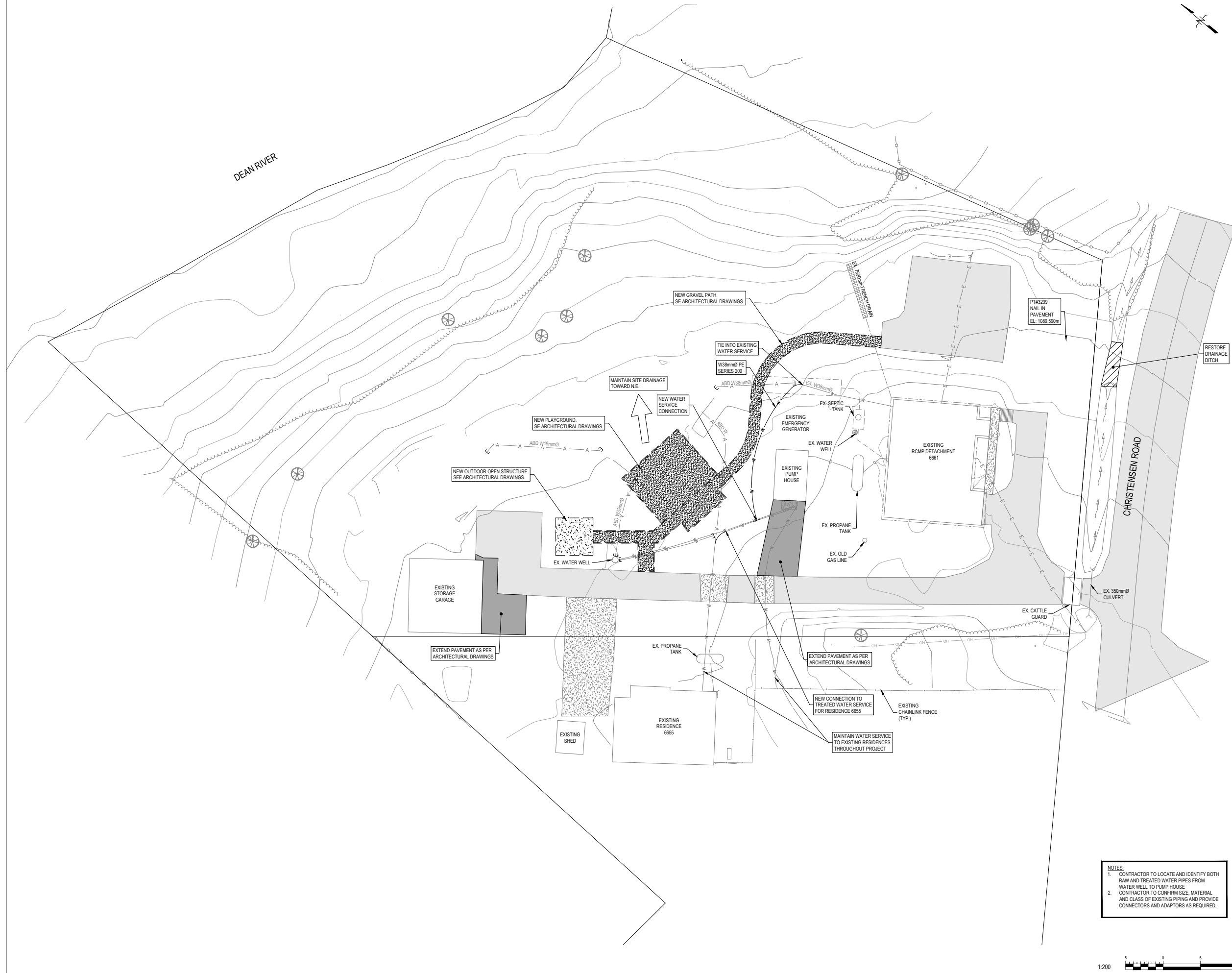
Project title/Titre du projet
RCMP ANAHIM LAKE RENOVATION

Consultant Signature Box Only
 Designed by/Concept par
KLK
 Drawn by/Dessiné par
SG
 PWGSC Project Manager/Administrateur de Projets TPSGC
Dianne Dy
 PWGSC Regional Manager, Architectural and Engineering Services/
 Gérant Régional, Services d'architecture et de gén. TPSGC
Philip Fung
 Drawing title/Titre du dessin

EXISTING CONDITIONS AND DEMOLITION PLAN

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.103948.001	C-001	0





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A	ISSUED FOR 90% REVIEW SUBMISSION	2019.09.13
Revision/Revisión	Description/Description	Date/Date

Client/Client
RCMP
 14200 Green Timbers Way
 Surrey, B.C.

Project title/Titre du projet
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Consultant Signature Box Only
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 PWGSC Project Manager/Administrateur de Projets TPSGC
Dianne Dy
 PWGSC Regional Manager, Architectural and Engineering Services/
 Gestionnaire Régionale, Services d'architecture et de génie, TPSGC
Philip Fung

Drawing title/Titre du dessin
PROPOSED SITE SERVICING PLAN

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.103948.001	C-002	1

NOTES:
 1. CONTRACTOR TO LOCATE AND IDENTIFY BOTH RAW AND TREATED WATER PIPES FROM WATER WELL TO PUMP HOUSE
 2. CONTRACTOR TO CONFIRM SIZE, MATERIAL AND CLASS OF EXISTING PIPING AND PROVIDE CONNECTORS AND ADAPTORS AS REQUIRED.



APPENDIX C

WSP

Civil Septic Utility Report
October 19, 2019



2019-10-22

Confidential

Barry Cosgrave
Number Ten Architectural Group
200-1619 Store Street
Victoria BC
V8W 3K3

Subject: Anahim Lake RCMP Renovation - Civil Septic Utility Report

Dear Sir:

WSP is completing an assessment of the existing civil services for the above project including water, sewer and storm. This report summarizes our review of the site's septic system.

Existing Conditions

Septic System:

The ex-detachment and two mobile homes have individual septic systems consisting of septic tanks and fields. The two systems servicing the mobile homes were not inspected as these will be decommissioned when mobile homes are removed. The ex-detachment has a septic tank and field located to the north of the building. Approximate locations shown on C-001 are based on as-built information from 1983.01.15 As-Built Drawing (see Figure 2 attached at the end of this report). The approximate septic tank locations are supported by visual findings of tank covers. There were no above ground indications of septic disposal fields, therefore as-built drawings were assumed correct for design purposes. There is a white PVC cleanout pipe located north of the building between the building and septic tank.



Figure 1: Septic Tank Lid and Cleanout

Suite 301
3600 Uptown Boulevard
Victoria, BC, Canada V8Z 0B9

T: +1 250 384-5510
F: +1 250 386-2844
wsp.com



Based on the inspection results the single compartment concrete septic tank has an approximate capacity of 1,000 US gallons (3,785 L). This tank appears to be connected to a trickle gravity system and septic drain field. Historic drawings indicate that septic system was installed in 1983. BGIS's 2016 Annual Building Inspection (attached) shows that the tank was last pumped in June 2015.

For existing septic system, see C-001 attached.

System Inspection Results:

As part of WSP assessment the septic system was inspected by Registered Onsite Wastewater Practitioners (ROWP), Keray Camille on September 12, 2019 (report attached). The inspection consisted of a visual inspection of the tank and a flow test. The visual inspection noted that the tank appears in good condition. The inlet and outlet baffles were intact. The concrete risers and lid also appear to be in good condition. The flow test consisted of 1300 liters of water run through tank in a 2-hour period. The tank level did not rise and no water was present in the general area of the tank. The inspection summary states that “the septic tank and drain field appear to be adequate to support 3-bedroom residents with approximate flow of 1300 liters per day”.

Proposed Servicing

The ex-detachment will be renovated and upgraded to provide a new residence for the RCMP staff. There will be all new plumbing installed in the residence. This new plumbing system will be connected to the existing septic tank through the existing sanitary drain from the building to the tank. No upgrades or alterations are required for the septic tank or field.

Cleanout located north of the new residence should remain in place.

For proposed septic system, see C-002 attached.

Vancouver Coastal Health (VCH), John Pickles – Public Health Inspector, was contacted on October 1, 2019. Because no changes are proposed to the existing septic system a permit to construct is not required by VCH for the proposed work being done at 6661 Christensen Road.

Proposed Decommissioning

The decommissioning of the two septic systems connected to the two mobile homes shall be completed in situ and in accordance with the BC Sewerage System Standard Practice Manual, Version 3. Contractor shall therefore follow the following guidelines:

- Avoid any substantial retention of groundwater in the tank by creating holes in the bottom, or breaking away at least one side of the tank.
- Backfill the tank in a manner that provides uniform and complete soil fill of the tank, with minimal risk of settling later. This may involve completely removing the lid. Alternatively, the lid can be cut or broken, and placed within the tank in such a way that large voids are prevented.
- Fill material should be selected to minimize potential settling. Well-drained native soil, such as sand or loamy sand, may be considered.
- Avoid cohesive or organic soils.

Demands

The proposed septic system will service the new 3-bedroom residence. We have assumed the following flows for evaluation purposes:

Daily Design Flow (DDF) for 3-bedroom residence: 1,300 L/day

This flow is based on the BC Sewerage System Standard Practice Manual, Version 3.

Based on the septic system inspection completed in September 2019, the system has adequate capacity to handle the new demand flows.

Summary / Recommendations

- New residence to be connected to the existing septic tank and field. Cleanout located north of the new residence should remain in place.
- Two septic systems connected to mobile homes to be abandoned in situ.

Yours sincerely,



Katarina Konicek, P.Eng.
Project Engineer



Simon Kras, P.Eng.
Senior Engineer

WSP ref.: 191-10513-00

Enclosed:

- Figure 2: 1983.01.15 As-Built Drawings
- ROWP Inspection Report 20190912
- BGIS's 2016 Annual Building Inspection
- Civil 99% Design Drawings – C001
- Civil 99% Design Drawings – C002

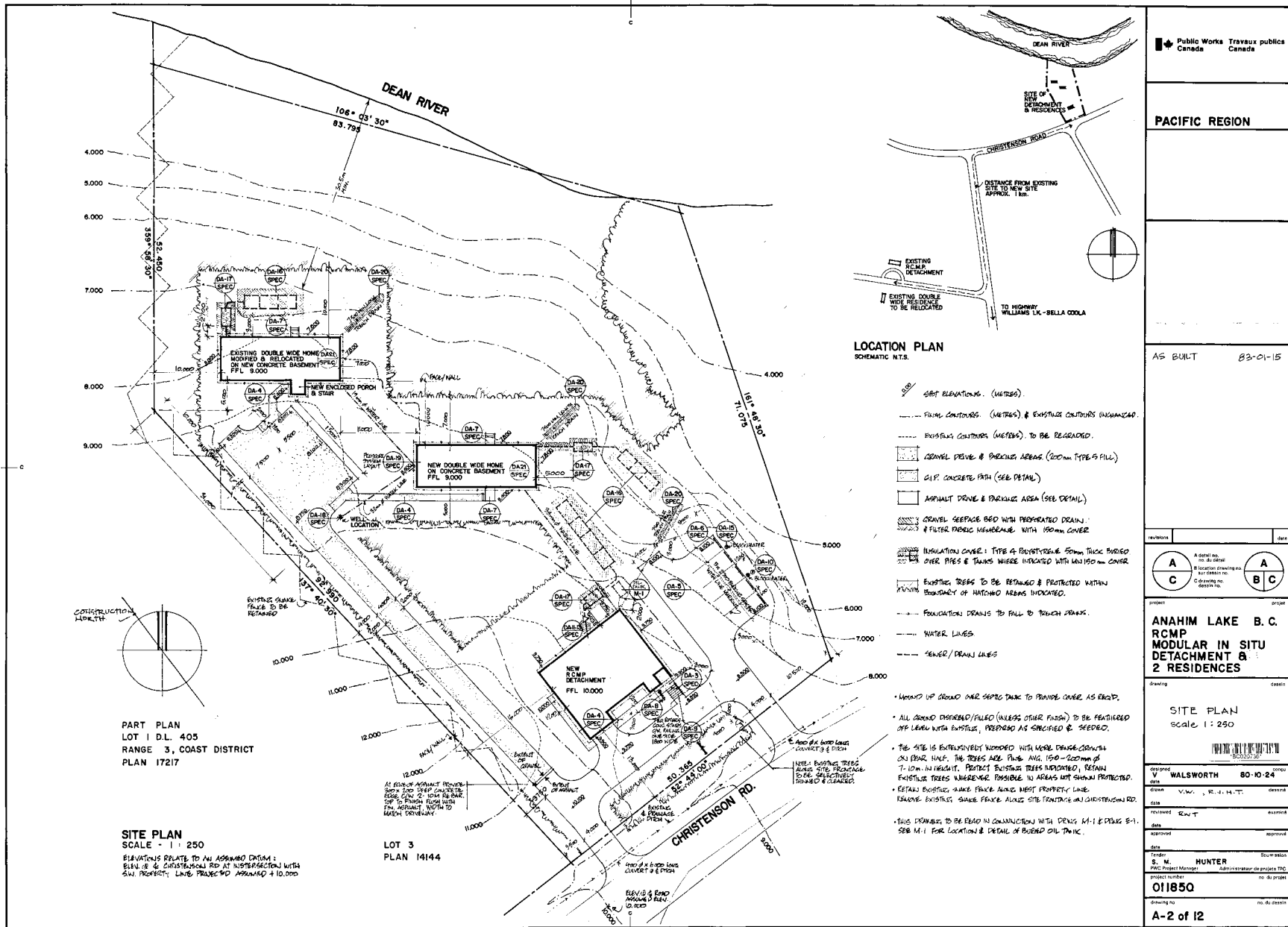


Figure 2: As-builts 1983.01.15

Keray Camille ROWP
3058 Dog Creek Road
Williams Lake BC
V2G 4X2

On September 12/19 I performed an septic system inspection at 6661 Christensen Road Anahim Lake.

The septic tank is located to the west of the building and appears to be a trickle gravity system.

The +- 1000 gal single compartment concrete septic tank appears to be i good condition with inlet and outlet baffles intact. The tank appears to be water tight.

The 2 foot concrete riser and lid appear to be water tight and in good condition.

1300 litres of water was ran through it in a 2 hour period and the tank level didn't rise and no surface water was present in the general area of the tank.

The exact location of the drain field was unknown but no surface water appeared in the area.


The tank was them pumped by Gordon's septic.

In summary the septic tank and drain field appears to be adequate to support a 3 bedroom residents with approximate flow of 1300 litres per day of residential strength effluent.

Feel free to call me with any questions.

Keray Camille 250-303-1029



Building Number: 91270 Building Name: E0801 - R.C.M.P. DETACHMENT 50801 Building Address: 6661 CHRISTENSEN RD. 6661 CHRISTENSEN RD. ANAHIM LAKE BC VOL 1C0 Region: BC 02 FMZ: 202 Facility Manager: BRENDA FINCH Leased/Owned: Owned Building Rentable Area(SQM): 165.40 Usable Area (SQM): 165.40 BEPI Calculation Area (SQM): Lot Size (SQM): Occupancy Type: OCCUPIED Asset Type: Recycling Availability: 153 Composting Availability: North Preventative Maintenance:	
Prime Tenant: Local Building Rep: Local Building Rep Phone #: M Real Estate Regional Manager:	Est. Construction Year: Act. Construction Year: Comments: No. of Floors:
Parking Stalls: Interior Exterior Handicap Parking: Interior Exterior Total 0	Wheelchair Access: Building Counter Workplace Washroom
Heritage Information	
Architect: Historical Building: N Heritage Designation Information:	Architectural Style: Heritage Designation Date:
Lease Information	
Lease Expiry Date:	Lease Renewal Options: Lease Renewal Date:
Energy Management Information	
System Type: Recommendations:	Comments:

Portfolio: BC 02
Building: 91270 - E0801 - R.C.M.P. DETACHMENT 50801
Building Address: 6661 CHRISTENSEN RD.

Building Analysis

Inspection 2016

Inspection Date: 23-JUN-2016

Total Score: 106

Total Corrective Cost:

Total Project Cost:

01 - General Requirements

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
---------------	----------	--------	----------	----------	---------------------------	--------------	--------------	----------------	--------------

70 - Security / CCTV

628 - Cell Area RCMP

Cell Area 91270-70-628-000001 3 - Satisfactory condition-reliable N Cell walls and benches painted August 2012, doors a MEDIUM



Photo Description:

cell door

Uploaded On: 9/12/2016 12:07:39 PM



Photo Description:

cell area corridor

Uploaded On:

9/12/2016 12:06:40 PM



Photo Description:

some staining on toilets

Uploaded On:

9/12/2016 12:10:04 PM

72 - Environmental

623 - ABI Janitorial and Recycling			
Janitorial and Recycling 91270-72-623-000001	3 - Satisfactory condition-reliable N	Janitorial work meets the expected standard. RCMP ha	LOW

99 - Others tools and equipment

625 - March In Requirements RCMP			
March In Requirements 91270-99-625-000001	0 - Unknown	This is a Detachment and not part of the "March In or March	NA

626 - March out Requirements RCMP			
March out Requirements 91270-99-626-000001	0 - Unknown	This is a Detachment and not part of the "March In or March	NA

02 - Site Conditions


Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
72 - Environmental									
624 - Pest Management for Exterior-Interior									
Pest Management 91270-72-624-000001		3 - Satisfactory condition-reliable N	The last year saw 1 work order to address pavement an	MEDIUM					
80 - Architectural / Structural									
849 - Retaining Walls									
Retaining Walls 91270-80-849-000001		0 - Building component or equip	No retaining walls at this property.	NA					
85 - Grounds									
835 - Barriers and Fences									
Barriers & Fences 91270-85-835-000001		3 - Satisfactory condition-reliable N	Fence is in good condition along front of building. The cat	MEDIUM					
840 - Flag Pole									
Flag Pole 91270-85-840-000001		3 - Satisfactory condition-reliable N	Good no issues.	LOW					
				<p>Photo Description:</p> <p>Uploaded On: 9/12/2016 12:33:36 PM</p>					
846 - Lawns									
Lawns 91270-85-846-000001		3 - Satisfactory condition-reliable N	The lawn or green ground cover was healthy during our	MEDIUM					



Photo Description:

some stumps in the front of the compound

Uploaded On: 9/12/2016 12:24:14 PM



Photo Description:

Uploaded On: 9/12/2016 12:22:47 PM

847 - Landscaping

Landscaping 91270-85-847-000001

3 - Satisfactory condition-reliable N Primarily lawn on grounds with a few small indigenous tr LOW



Photo Description:

Uploaded On: 9/12/2016 12:15:40 PM



Photo Description:

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Photo Description:

Uploaded On: 9/12/2016 12:17:21 PM



Photo Description:

Uploaded On: 9/12/2016 12:14:53 PM

850 - Grounds and Approaches

Grounds & Approaches
91270-85-850-000001

3 - Satisfactory
condition-reliable N Grounds are primarily green
ground cover described above LOW



Photo Description:

public entrance

Uploaded On: 9/12/2016 12:45:32 PM



Photo Description:

minor asphalt cracking and undersized cattle guard

Uploaded On: 9/12/2016 12:44:30 PM



Photo Description:

large puddle at foot of small deck

Uploaded On: 9/12/2016 12:46:08 PM



Photo Description:

Uploaded On: 9/12/2016 12:44:58 PM

851 - Parking Area

Parking Area 91270-85-851-000001

3 - Satisfactory condition-reliable N The main public parking area is asphalt which is in acceptab MEDIUM



Photo Description:

Uploaded On: 9/12/2016 12:50:00 PM



Photo Description:

staff parking area

Uploaded On: 9/12/2016 12:55:40 PM

03 - Concrete

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
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80 - Architectural / Structural

830 - Foundations, Footings and Supports

Foundation & Footings 91270-80-830-000001		3 - Satisfactory condition-reliable N	The continuous concrete foundation is covered with rigi	MEDIUM					
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Photo Description:

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Photo Description:

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07 - Thermal and Moisture Protection

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
---------------	----------	--------	----------	----------	---------------------------	--------------	--------------	----------------	--------------

80 - Architectural / Structural

870 - Roof

Roof 91270-80-870-000001		3 - Satisfactory condition-reliable N	The main building roof is torch down membrane which is relat	LOW					
--------------------------	--	---------------------------------------	--	-----	--	--	--	--	--



Photo Description:

Uploaded On: 9/12/2016 1:20:16 PM



Photo Description:

attached trailer roof

Uploaded On: 9/12/2016 1:25:32 PM

08 - Doors & Windows

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
---------------	----------	--------	----------	----------	---------------------------	--------------	--------------	----------------	--------------

80 - Architectural / Structural

815 - Doors - Exterior

Doors Exterior 91270-80-815-000001		3 - Satisfactory condition-reliable N	Three exterior doors, all are metal with metal jambs, equip	MEDIUM					
------------------------------------	--	---------------------------------------	---	--------	--	--	--	--	--



Photo Description:

Uploaded On: 9/12/2016 1:49:05 PM



Photo Description:

Uploaded On: 9/12/2016 1:33:45 PM



Photo Description:

inside of public entrance

Uploaded On: 9/12/2016 1:38:19 PM



Photo Description:

staff entrance

Uploaded On: 9/12/2016 1:33:21 PM

855 - Overhead Door

Overhead Door 91270-80-855-000001	Prisoner Unload	3 - Satisfactory condition-reliable N	Overhead door good working order, next annual service sch	MEDIUM
-----------------------------------	-----------------	---------------------------------------	---	--------



Photo Description:

Uploaded On: 9/12/2016 1:28:25 PM

895 - Windows - Exterior

Windows Exterior 91270-80-895-000001

3 - Satisfactory condition-reliable N The main buildings windows are anodized aluminum in wor MEDIUM



Photo Description:

outside view

Uploaded On: 9/12/2016 1:44:01 PM



Photo Description:

trailer windows

Uploaded On: 9/12/2016 1:44:24 PM



Photo Description:

inside view

Uploaded On: 9/12/2016 1:43:32 PM

09 - Finishes

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
---------------	----------	--------	----------	----------	---------------------------	--------------	--------------	----------------	--------------

80 - Architectural / Structural

800 - Building Interior - general

Building Exterior 91270-80-800-000001		3 - Satisfactory condition-reliable N	Varies types of siding exist here- the main building utilize	MEDIUM					
---------------------------------------	--	---------------------------------------	--	--------	--	--	--	--	--



Photo Description:

vinyl siding shown

Uploaded On: 9/12/2016 1:57:52 PM



Photo Description:

anodized metal on the main building

Uploaded On: 9/12/2016 1:59:09 PM



Photo Description:
screw on metal siding used on mobile
Uploaded On: 9/12/2016 1:58:37 PM

99 - Others tools and equipment

860 - Painting										
Painting Interior-Exterior 91270-99-860-000001		4 - Frequent breakdown-unreliab	Main entry- minor wear and tear but looks ok. Reception a		HIGH					

15 - Mechanical

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
---------------	----------	--------	----------	----------	---------------------------	--------------	--------------	----------------	--------------

20 - Heating

340 - Furnace - Forced Air (Gas or Oil)										
Furnace - Forced Air- PROPANE #1 (MAIN 2) 9127	OFFICE	3 - Satisfactory condition-reliable N	Annually serviced in October. High efficiency forced air prop	MEDIUM						



Photo Description:
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Furnace - Forced Air- PROPANE #2 91270-20-340-	CELLS	3 - Satisfactory condition-reliable N	Annually serviced in October. High efficiency forced air prop	MEDIUM						
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Photo Description:

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25 - Refrigeration

054 - AIR CONDITION-PKGD < 5.4T FEDERAL SITES ONLY

AIR CONDITION-PKGD < 5.4T Fed 91270-25-054-0000	reception	0 - Unknown	NA
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059 - AIR CONDITION-SPLIT < 5.4T FEDERAL SITES ONLY

AIR CONDITION-SPLIT < 5.4T Fed 91270-25-059-0000	Trailer addition	3 - Satisfactory condition-reliable N	A/C unit located outside of attached trailer. This piece of	MEDIUM
--	------------------	---------------------------------------	---	--------



Photo Description:

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621 - Halocarbon equipment compliant with Fed Regs RCMP

Halocarbon equipment compliant with Federal Regs	0 - Yes	Federal Halocarbon book located in mechanical room b	MEDIUM
--	---------	--	--------

50 - Water Supply

337 - Tank-Domestic Hot Water

Tank-Domestic Hot Water 91270-50-337-000001	3 - Satisfactory condition-reliable N	The electric water heater is approximately 10 years old.	MEDIUM
---	---------------------------------------	--	--------

55 - Plumbing / Drainage

235 - Drains

Drains 91270-55-235-000001 3 - Satisfactory condition-reliable N The detachment's sewage flows into the onsite septic tan MEDIUM



Photo Description:

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72 - Environmental

482 - Tank Septic

Tank, Under Ground - Septic 91270-72-482-000001 Anahim Lake RCMP 3 - Satisfactory condition-reliable N This was last pumped in June 2015. MEDIUM



Photo Description:

septic tank riser

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498 - Fuel Storage System - Above Ground - Under 2500L

Fuel Storage System - AST - <2500L 91270-72-498-00000 inside fenced compound 3 - Satisfactory condition-reliable N Generator diesel fuel tank is an above ground "Tidy Tank" MEDIUM

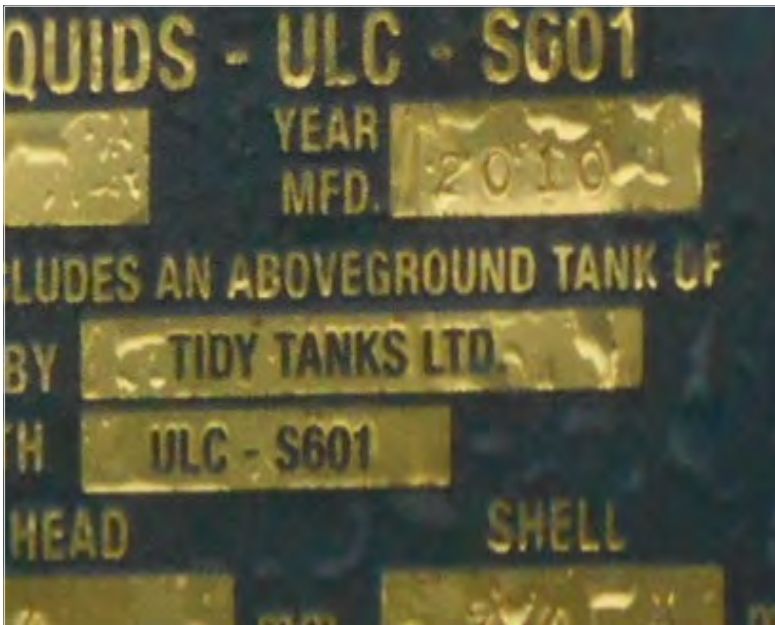


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Photo Description:

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622 - Size of Fuel Tank. Is Spill Kit on site?

Size of Fuel Tank. Is Spill kit on site 91270-72-622-00001	3 - Satisfactory condition-reliable N	Propane fuel tank 1000G. Spill kits (3) on site located on	MEDIUM
--	---------------------------------------	--	--------

73 - Propane

497 - Fuel Storage Tank - Propane-Natural Gas

Fuel Storage Tank - Propane-Natural Gas 91270-73-497-00	North of Building	3 - Satisfactory condition-reliable N	Propane tank 1000G remains the property and responsibility	MEDIUM
---	-------------------	---------------------------------------	--	--------



Photo Description:

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80 - Architectural / Structural

810 - Chimneys and Stacks

Chimneys and Stacks [F1] Furnace Closet 3 - Satisfactory PVC venting off of high eff. MEDIUM
91270-80-810-000001 condition-reliable N furnaces exits up through old



Photo Description:

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Photo Description:

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Chimneys and Stacks [F2] 91270-80-810-000002 Furnace Closet 3 - Satisfactory condition-reliable N LOW

99 - Others tools and equipment

989 - Washrooms

Washrooms 91270-99-989-000001 3 - Satisfactory condition-reliable N Mechanically washroom are in good working order no issues MEDIUM



Photo Description:

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Photo Description:

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16 - Electrical

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
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05 - Electrical Service and Distribution Low Voltage (31-750 V)

205 - Disconnect - Main

Disconnect - Main #1 (MAIN 3) 91270-05-205-00001	Hall Electric Closet	3 - Satisfactory condition-reliable N	Sylvania 400 amp service. Disconnect Cat#A5022N. No s	MEDIUM					
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Photo Description:

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Disconnect - Main #2 91270-05-205-00002	Hall Electrical Closet	3 - Satisfactory condition-reliable N	Panel A-Sylvania 200amp. Cat#40200.	MEDIUM					
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Photo Description:

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Disconnect - Main #3 91270-05-205-000003 Hall Electrical Closet 3 - Satisfactory condition-reliable N Pannel E-Sylvania 100amp Cat#B121100 No spares for e MEDIUM

379 - Lighting - Interior(including Ballast)Type T8orT12

Lighting - Interior (including Ballast) (30) 91270-05-379-0 3 - Satisfactory condition-reliable N No issues with the T-12 fluorescent lighting, light tubes MEDIUM

380 - Lighting Exterior

Lighting Exterior 91270-05-380-000001 3 - Satisfactory condition-reliable N Exterior lighting checked and working @ time of inspection MEDIUM



Photo Description:

Uploaded On: 9/12/2016 6:46:20 PM

18 - Fire & Safety

Building Item	Location	Rating	Comments	Priority	Estimated Corrective Cost	Project Name	Project Type	Estimated Cost	Start Within
---------------	----------	--------	----------	----------	---------------------------	--------------	--------------	----------------	--------------

10 - Electrical Auxiliary and Standby Power

251 - Standby Generator none FL&S

Standby Generator none FL&S 91270-10-251-000001 Inside fenced compound 3 - Satisfactory condition-reliable N Generator located behind detachment in a small area se MEDIUM



Photo Description:

Uploaded On: 9/12/2016 6:37:56 PM

60 - Life Safety Systems

290 - Alarm-Fire System - general

Alarm-Fire System - general Guard Room 3 - Satisfactory Annual service to be MEDIUM
91270-60-290-000001 condition-reliable N completed August 2016 by Pa

Conclusions and Recommendations

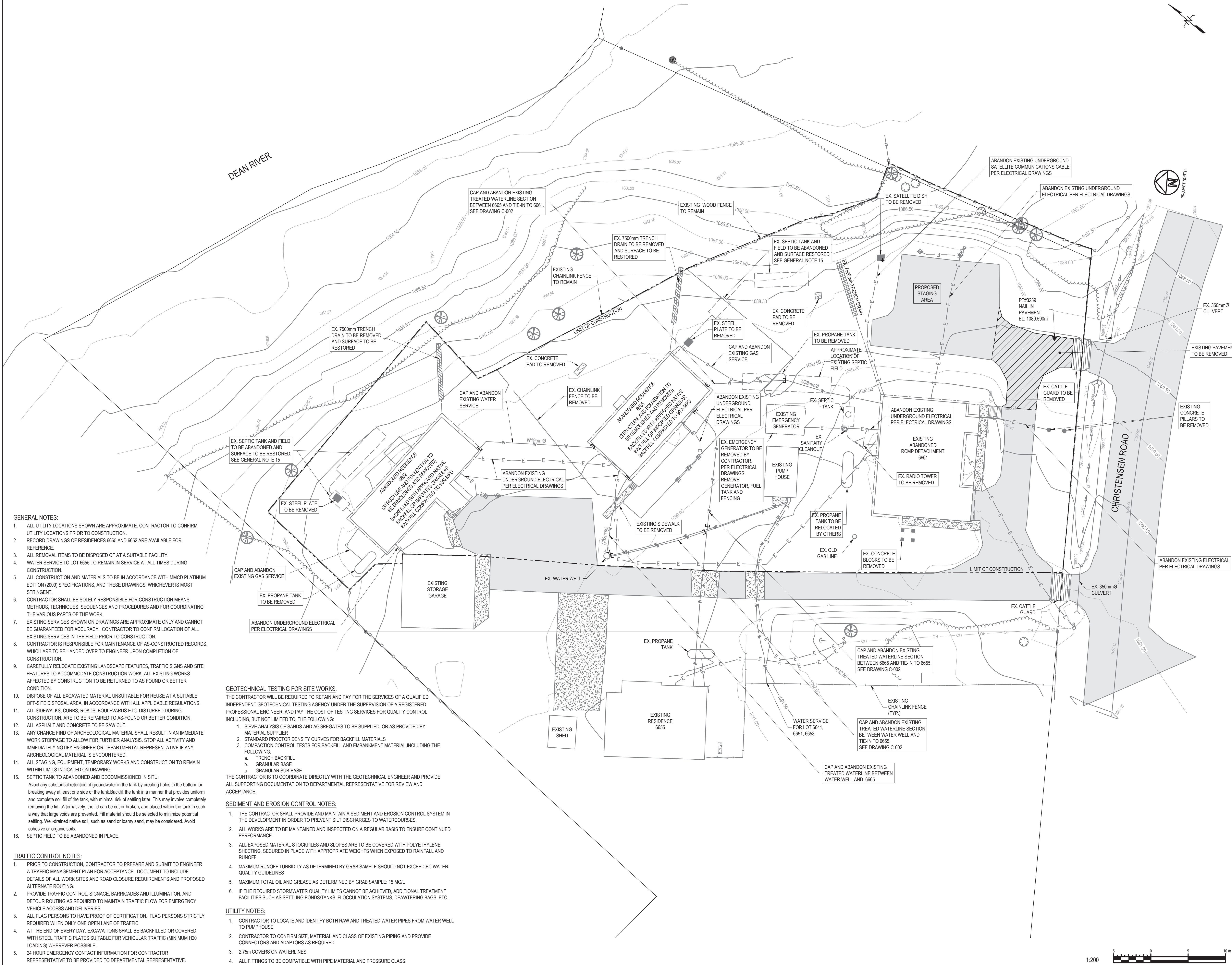
New detachment opening in October 2016

BRENDA FINCH

Facility Manager

Signature

Date



- GENERAL NOTES:**
1. ALL UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTRACTOR TO CONFIRM UTILITY LOCATIONS PRIOR TO CONSTRUCTION. RECORD DRAWINGS OF RESIDENCES 6655 AND 6652 ARE AVAILABLE FOR REFERENCE.
 2. ALL REMOVAL ITEMS TO BE DISPOSED OF AT A SUITABLE FACILITY.
 3. WATER SERVICE TO LOT 6655 TO REMAIN IN SERVICE AT ALL TIMES DURING CONSTRUCTION.
 4. ALL CONSTRUCTION AND MATERIALS TO BE IN ACCORDANCE WITH MMCD PLATINUM EDITION (2009) SPECIFICATIONS, AND THESE DRAWINGS, WHICHEVER IS MOST STRINGENT.
 5. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING THE VARIOUS PARTS OF THE WORK.
 6. EXISTING SERVICES SHOWN ON DRAWINGS ARE APPROXIMATE ONLY AND CANNOT BE GUARANTEED FOR ACCURACY. CONTRACTOR TO CONFIRM LOCATION OF ALL EXISTING SERVICES IN THE FIELD PRIOR TO CONSTRUCTION.
 7. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF AS-CONSTRUCTED RECORDS, WHICH ARE TO BE HANDED OVER TO ENGINEER UPON COMPLETION OF CONSTRUCTION.
 8. CAREFULLY RELOCATE EXISTING LANDSCAPE FEATURES, TRAFFIC SIGNS AND SITE FEATURES TO ACCOMMODATE CONSTRUCTION WORK. ALL EXISTING WORKS AFFECTED BY CONSTRUCTION TO BE RETURNED TO AS FOUND OR BETTER CONDITION.
 9. DISPOSE OF ALL EXCAVATED MATERIAL UNSUITABLE FOR REUSE AT A SUITABLE OFF-SITE DISPOSAL AREA, IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
 10. ALL SIDEWALKS, CURBS, ROADS, BOULEVARDS ETC. DISTURBED DURING CONSTRUCTION, ARE TO BE REPAIRED TO AS-FOUND OR BETTER CONDITION.
 11. ALL ASPHALT AND CONCRETE TO BE SAW CUT.
 12. ANY CHANCE FIND OF ARCHEOLOGICAL MATERIAL SHALL RESULT IN AN IMMEDIATE WORK STOPPAGE TO ALLOW FOR FURTHER ANALYSIS. STOP ALL ACTIVITY AND IMMEDIATELY NOTIFY ENGINEER OR DEPARTMENTAL REPRESENTATIVE IF ANY ARCHEOLOGICAL MATERIAL IS ENCOUNTERED.
 13. ALL STAGING, EQUIPMENT, TEMPORARY WORKS AND CONSTRUCTION TO REMAIN WITHIN LIMITS INDICATED ON DRAWING.
 14. SEPTIC TANK TO BE ABANDONED AND DECOMMISSIONED IN SITU:
Avoid any substantial retention of groundwater in the tank by creating holes in the bottom, or breaking away at least one side of the tank. Backfill the tank in a manner that provides uniform and complete soil fill of the tank, with minimal risk of settling later. This may involve completely removing the lid. Alternatively, the lid can be cut or broken, and placed within the tank in such a way that large voids are prevented. Fill material should be selected to minimize potential settling. Well-drained native soil, such as sand or loamy sand, may be considered. Avoid cohesive or organic soils.
 15. SEPTIC FIELD TO BE ABANDONED IN PLACE.

- GEOTECHNICAL TESTING FOR SITE WORKS:**
THE CONTRACTOR WILL BE REQUIRED TO RETAIN AND PAY FOR THE SERVICES OF A QUALIFIED INDEPENDENT GEOTECHNICAL TESTING AGENCY UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL ENGINEER, AND PAY THE COST OF TESTING SERVICES FOR QUALITY CONTROL INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
1. SIEVE ANALYSIS OF SANDS AND AGGREGATES TO BE SUPPLIED, OR AS PROVIDED BY MATERIAL SUPPLIER
 2. STANDARD PROCTOR DENSITY CURVES FOR BACKFILL MATERIALS
 3. COMPACTION CONTROL TESTS FOR BACKFILL AND EMBANKMENT MATERIAL INCLUDING THE FOLLOWING:
 - a. TRENCH BACKFILL
 - b. GRANULAR BASE
 - c. GRANULAR SUB-BASE
- THE CONTRACTOR IS TO COORDINATE DIRECTLY WITH THE GEOTECHNICAL ENGINEER AND PROVIDE ALL SUPPORTING DOCUMENTATION TO DEPARTMENTAL REPRESENTATIVE FOR REVIEW AND ACCEPTANCE.

- SEDIMENT AND EROSION CONTROL NOTES:**
1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN A SEDIMENT AND EROSION CONTROL SYSTEM IN THE DEVELOPMENT IN ORDER TO PREVENT SILT DISCHARGES TO WATERCOURSES.
 2. ALL WORKS ARE TO BE MAINTAINED AND INSPECTED ON A REGULAR BASIS TO ENSURE CONTINUED PERFORMANCE.
 3. ALL EXPOSED MATERIAL STOCKPILES AND SLOPES ARE TO BE COVERED WITH POLYETHYLENE SHEETING, SECURED IN PLACE WITH APPROPRIATE WEIGHTS WHEN EXPOSED TO RAINFALL AND RUNOFF.
 4. MAXIMUM RUNOFF TURBIDITY AS DETERMINED BY GRAB SAMPLE SHOULD NOT EXCEED BC WATER QUALITY GUIDELINES
 5. MAXIMUM TOTAL OIL AND GREASE AS DETERMINED BY GRAB SAMPLE: 15 MGL
 6. IF THE REQUIRED STORMWATER QUALITY LIMITS CANNOT BE ACHIEVED, ADDITIONAL TREATMENT FACILITIES SUCH AS SETTLING PONDS/TANKS, FLOCCULATION SYSTEMS, DEWATERING BAGS, ETC.,

- UTILITY NOTES:**
1. CONTRACTOR TO LOCATE AND IDENTIFY BOTH RAW AND TREATED WATER PIPES FROM WATER WELL TO PUMPHOUSE
 2. CONTRACTOR TO CONFIRM SIZE, MATERIAL AND CLASS OF EXISTING PIPING AND PROVIDE CONNECTORS AND ADAPTORS AS REQUIRED.
 3. 2.75m COVERS ON WATERLINES.
 4. ALL FITTINGS TO BE COMPATIBLE WITH PIPE MATERIAL AND PRESSURE CLASS.

- TRAFFIC CONTROL NOTES:**
1. PRIOR TO CONSTRUCTION, CONTRACTOR TO PREPARE AND SUBMIT TO ENGINEER A TRAFFIC MANAGEMENT PLAN FOR ACCEPTANCE. DOCUMENT TO INCLUDE DETAILS OF ALL WORK SITES AND ROAD CLOSURE REQUIREMENTS AND PROPOSED ALTERNATE ROUTING.
 2. PROVIDE TRAFFIC CONTROL, SIGNAGE, BARRICADES AND ILLUMINATION, AND DETOUR ROUTING AS REQUIRED TO MAINTAIN TRAFFIC FLOW FOR EMERGENCY VEHICLE ACCESS AND DELIVERIES.
 3. ALL FLAG PERSONS TO HAVE PROOF OF CERTIFICATION. FLAG PERSONS STRICTLY REQUIRED WHEN ONLY ONE OPEN LANE OF TRAFFIC.
 4. AT THE END OF EVERY DAY, EXCAVATIONS SHALL BE BACKFILLED OR COVERED WITH STEEL TRAFFIC PLATES SUITABLE FOR VEHICULAR TRAFFIC (MINIMUM H20 LOADING) WHEREVER POSSIBLE.
 5. 24 HOUR EMERGENCY CONTACT INFORMATION FOR CONTRACTOR REPRESENTATIVE TO BE PROVIDED TO DEPARTMENTAL REPRESENTATIVE.

0		
0		
0		
0		
B	95% REVIEW SUBMISSION	2019.10.25
A	50% REVIEW SUBMISSION	2019.08.13
Revision/	Description/Description	Date/Date
Client/client		

RCMP
14200 Green Timbers Way
Surrey, B.C.

RCMP ANAHIM LAKE RENOVATION

Consultant Signature Box Only

Designed by/Concept par
KLK

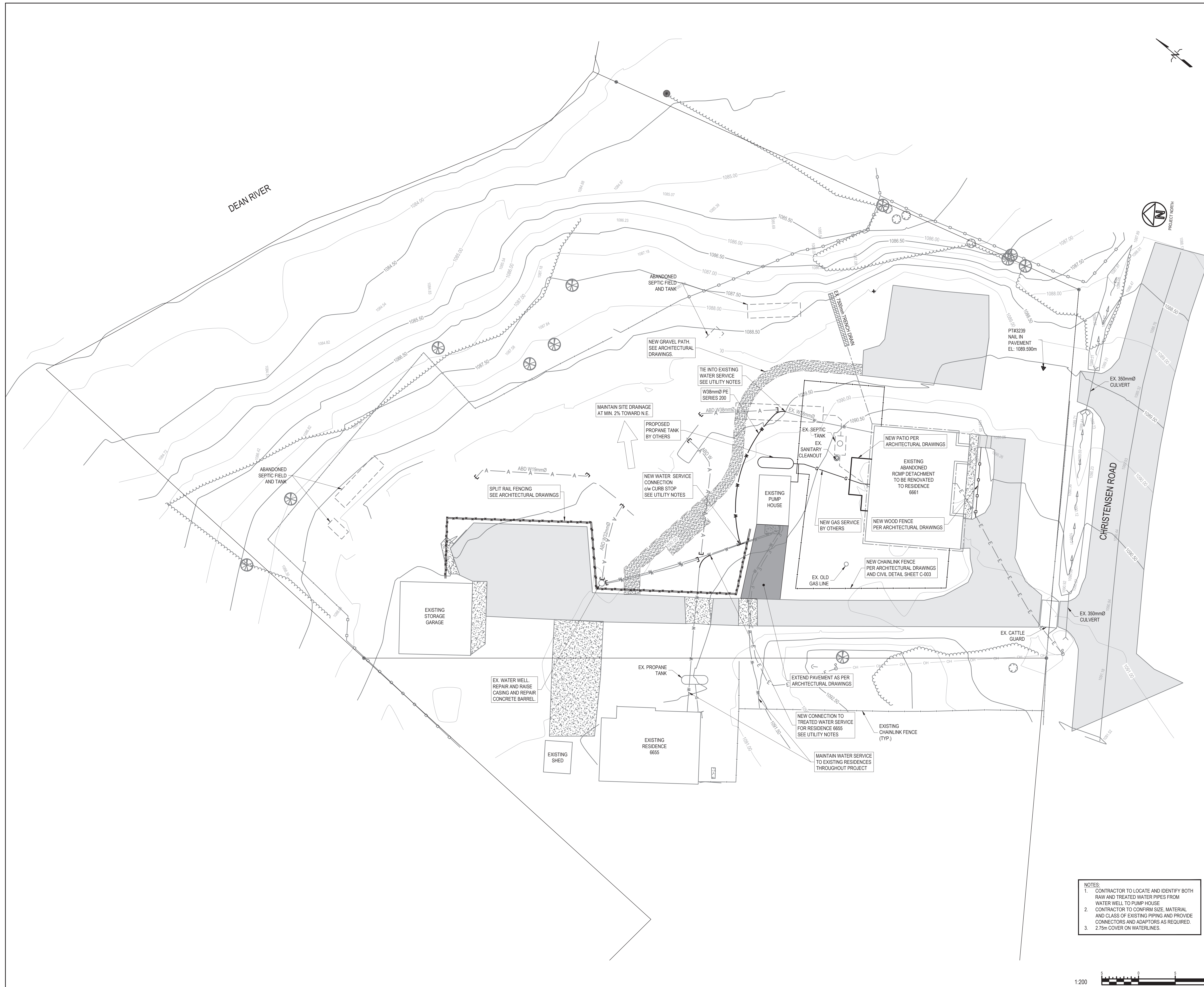
Drawn by/Dessiné par
SG

PWGSC Project Manager/Administrateur de Projets TPSGC
Dianne Dy

PWGSC, Regional Manager, Architectural and Engineering Services
Gestionnaire Régionale, Services d'architecture et de génie, TPSGC
Philip Fung

Drawing title/Titre du dessin
GENERAL NOTES, EXISTING CONDITIONS AND DEMOLITION PLAN

Project No./No. du projet R.103948.001	Sheet/ Feuille C-001	Revision no./ La Revision no. B
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NOTES:
1. CONTRACTOR TO LOCATE AND IDENTIFY BOTH RAW AND TREATED WATER PIPES FROM WATER WELL TO PUMP HOUSE
2. CONTRACTOR TO CONFIRM SIZE, MATERIAL AND CLASS OF EXISTING PIPING AND PROVIDE CONNECTORS AND ADAPTORS AS REQUIRED.
3. 2.75m COVER ON WATERLINES.

Revision	Description	Date/Date
0		
0		
0		
0		
B	99% REVIEW SUBMISSION	2019.10.25
A	50% REVIEW SUBMISSION	2019.08.13

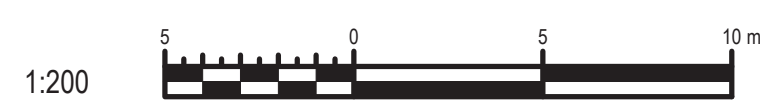
Client/Client
RCMP
14200 Green Timbers Way
Surrey, B.C.

Project title/Titre du projet
RCMP ANAHIM LAKE RENOVATION

Consultant Signature Box Only
Designed by/Concept par
KLK
Drawn by/Dessiné par
SG
PWGSC Project Manager/Administrateur de Projets TPSGC
Dianne Dy
PWGSC, Regional Manager, Architectural and Engineering Services
Gestionnaire régionale, Services d'architecture et de génie, TPSGC
Philip Fung

Drawing title/Titre du dessin
PROPOSED SITE SERVICING PLAN

Project No./No. du projet R.103948.001	Sheet/ Feuille C-002	Revision no./ La Révision no. B
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APPENDIX D

MMCD- Master Municipal Specifications

AGGREGATES AND GRANULAR MATERIALS

- 1.0 GENERAL**
- .1 Section 31.05.17 refers to those portions of the work that are unique to the supply and processing of aggregates. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- 1.1 Related Work**
- .1 Section 31.05.17 includes specifications for aggregates and granular materials referred to in the following sections:
- .1 Shrub and Tree Preservation Section 31.11.41
 - .2 Excavating, Trenching and Backfilling Section 31.23.01
 - .3 Roadway Excavation, Embankment And Compaction Section 31.24.13
 - .4 Granular Base Section 32.11.23
 - .5 Granular Subbase Section 32.11.16.1
 - .6 Unit Paving Section 32.14.01
 - .7 Portland Cement Concrete Pavement Section 32.13.13
 - .8 Waterworks Section 33.11.01
 - .9 Storm Sewers Section 33.40.01
 - .10 Pipe Culverts Section 33.42.13
 - .11 Sanitary Sewers Section 33.30.01
 - .12 Sewage Forcemains Section 33.34.01
- .2 Section 31.05.17 does not include specifications for aggregates to be incorporated into controlled density fill, hot-mix asphalt concrete paving, pavement crack filling, ready-mixed concrete or granular materials for landscaping purposes. These specifications are specified as follows:
- .1 Controlled Density Fill Section 31.23.23
 - .2 Hot-Mix Asphalt Concrete Paving Section 32.12.16
 - .3 Pavement Crack Cleaning and Filling Prior to Overlay Section 32.01.17.7
 - .4 Cast-in-Place Concrete Section 03.30.53
 - .5 Topsoil and Finish Grading Section 32.91.21
 - .6 Seeding Section 32.92.20
 - .7 Hydraulic Seeding Section 32.92.19
 - .8 Sodding Section 32.92.23
 - .9 Planting of Trees, Shrubs and Ground Covers Section 32.93.01

- 1.2 References**
- .1 The abbreviated standard specifications for testing, materials, fabrication and supply, referred to herein, are fully described in Section 01 42 00 – Reference Specifications – Site and Infrastructure.
- 1.3 Approvals**
- .1 Inform Contract Administrator of proposed source and provide samples or access for sampling at least 2 weeks prior to commencing production.
- .2 If materials from proposed source do not meet specified requirements, locate alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
- .3 Should a change of material source be proposed during work, advise Contract Administrator 2 weeks in advance of proposed change to allow sampling and testing.
- .4 Acceptance of material does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified.
- 1.4 Measurement and Payment**
- .1 Payment for all work performed under in this Section will be included under payment for work requiring aggregates and granular materials in other Sections unless specifically shown otherwise as separate pay items.
- 1.5 Inspection and Testing**
- .1 Refer to General Conditions, Clause 4.12. Inspections.
- 2.0 PRODUCTS**
- 2.1 Materials - General**
- .1 Gravel to be composed of inert, durable material, reasonably uniform in quality and free from soft or disintegrated particles. In absence of satisfactory performance records over a five year period for particular source of material, soundness to be tested according to ASTM C88 or latest revised issue. Maximum weight average losses for coarse and fine aggregates to be 30% when magnesium sulphate is used after five cycles.
- .2 All crushed gravel when tested according to ASTM C136 and ASTM C117, or latest revised issue, to have a generally uniform gradation and conform to following gradation limits and 60% of the material passing each sieve must have one or more fractured faces. Determination of the amount of fractured material shall be in accordance with the Ministry of Transportation and Highways' Specification I-11, Fracture Count for Coarse Aggregate, Method "A", which determines fractured faces by count. The Plasticity Index for crushed gravel to not exceed 6.0.
- 2.2 Native Material**
- .1 To be any workable soil free of organic or foreign matter; any material obtained within limits of Contract may be deemed native material for purposes of payment if it is approved by the Contract Administrator. Native material is not acceptable if it is impracticable to control its water content or compact to specified density.

2.3 Pit Run Gravel

- .1 To be well graded granular material, substantially free from clay lumps, organic matter and other extraneous material, screened to remove all stones in excess of maximum diameter specified in material description (300 mm Pit Run Gravel, 200 mm Pit Run Gravel, 100 mm Pit Run Gravel). Material to compact to specified density and conform to following gradations:

Sieve Designation	Percent Passing		
(300 mm dia)			(100)
(200 mm dia)	---		(100)
(100 mm dia)	---		(100)
75 mm	---		100
50 mm	70	-	100
25 mm	50	-	100
4.75 mm	22	-	100
2.36 mm	10	-	85
0.075 mm	2	-	8

- .2 Recycled concrete free from contaminated and other extraneous material, conforming to the specified gradations may be used as pit run gravel.

2.4 Pit Run Sand

- .1 To be well graded pit run sand, free from organic materials and conform to following gradations:

Sieve Designation	Percent Passing		
12.5 mm			100
4.75 mm	35	-	100
2.36 mm	20	-	70
1.18 mm	13	-	50
0.600 mm	8	-	35
0.300 mm	5	-	25
0.150 mm	2	-	15
0.075 mm	0	-	6

2.5 River Sand

- .1 River sand to be free of organic material and conform to the following gradation:

Sieve Designation	Percent Passing
19mm	100
4.76mm	80 - 100
0.60mm	20 - 100
0.42mm	10 - 100
0.25mm	0 - 80
0.15mm	0 - 50
0.074mm	0 - 4

2.6 Drain Rock

- .1 To consist of clean round stone or crushed rock conforming to following gradations:

Sieve Designation	Percent Passing	
	Coarse	Fine (Torpedo Gravel)
25.0mm	100	
19.0mm	0 - 100	
9.5mm	0 - 5	100
4.75mm	0	50 - 100
2.36mm		10 - 35
1.18mm		5 - 15
0.600mm		0 - 8
0.300mm		0 - 5
0.150mm		0 - 2
0.075mm		0

- .2 Drain rock to be used only where specified on Standard Detail Drawings or Contract Drawings. Use of drain rock other than as specified requires approval of Contract Administrator after examination of soils against which drain rock will be placed.

- 2.7 **Granular Pipe Bedding and Surround Material** .1 Crushed or graded gravels: to conform to following gradations:

Sieve Designation	Percent Passing	
	Type 1*	Type 2*
25.0 mm	100	100
19.0 mm	90 - 100	90 - 100
12.5 mm	65 - 85	70 - 100
9.5 mm	50 - 75	
4.75 mm	25 - 50	40 - 70
2.36 mm	10 - 35	25 - 52
1.18 mm	6 - 26	15 - 38
0.600 mm	3 - 17	6 - 27
0.300 mm		3 - 20
0.075 mm	0 - 5	0 - 8

*Type 1: *standard gradation*

*Type 2: *to be used only in dry trench conditions and with Contract Administrator's prior approval*

Recycled concrete free from contaminated and other extraneous material, conforming to the Type 1 gradations, may be used as pipe bedding and surround material.

- .2 Other permissible materials: only where shown on Contract Drawings or directed by Contract Administrator shall drain rock, pit run sand, river sand or approved native material be used for bedding and pipe surround.

- 2.8 **Select Granular Sub-base** .1 To be well graded granular material, substantially free from lumps and organic matter, screened if required to conform to following gradations:

Sieve Designation	Percent Passing	
75 mm		100
25 mm	50	85
0.150 mm	0	15
0.075 mm	0	8

- 2.9 **Crushed Granular Sub-base** .1 To be 75 mm crushed gravel conforming to following gradations:

Sieve Designation	Percent Passing	
80 mm		100
75 mm		100
38 mm	60 -	100
25 mm	-	
19 mm	35 -	80
12.5 mm	-	
9.5 mm	26 -	60
4.75 mm	20 -	40
2.36 mm	15 -	30
1.18 mm	10 -	20
0.6 um	5 -	15
0.3 um	3 -	10
0.18 um	-	
0.15 um	-	
0.075 um	0 -	5

- 2.10 **Granular Base** .1 To be 19 mm crushed gravel conforming to following gradations:

Sieve Designation	Percent Passing	
19 mm		100
12.5 mm	75 -	100
9.5 mm	60 -	90
4.75 mm	40 -	70
2.36 mm	27 -	55
1.18 mm	16 -	42
0.600 mm	8 -	30
0.300 mm	5 -	20
0.075 mm	2 -	8

- .2 Where shown on the contract drawings or directed by the Contract Administrator, Type 2_19 mm crushed gravel conforming to following gradations is permissible:

Sieve Designation	Type 2 Percent Passing		
25mm			100
19mm	80	-	100
9.5mm	50	-	85
4.75mm	35	-	70
2.36mm	25	-	50
1.18mm	15	-	35
0.300mm	5	-	20
0.075mm	0	-	5

2.11 Recycled Aggregate Material

- .1 Aggregates containing recycled material may be utilized if approved by the Contract Administrator. In addition to meeting all other conditions of this specification, recycled material should not reduce the quality of construction achievable with quarried materials. Recycled material should consist only of crushed portland cement concrete; other construction and demolition materials such as asphaltic pavements, bricks, plaster, etc. are not acceptable.

2.12 Pit Fines, Overburden and Cyclone sand

- .1 **Pit Fines:** Fine aggregate which is a by-product of gravel washing and screening, conforming to the following:

Sieve Designation	Percent Passing		
4.76mm			100
0.42mm	80	-	100
0.074mm	0	-	4

- .2 **Cyclone Sand** Inorganic fine sand produced as a by-product of gravel processing and conforming to the following:

Sieve Designation	Percent Passing		
4.76mm			100
0.42mm	80	-	100
0.25mm	50	-	100
0.15mm	0	-	70
0.074mm	0	-	20

- .3 **Overburden** Inorganic, silty, native material as a by-product of gravel mining and conforming to the following:

Sieve Designation	Percent Passing		
150 .mm	100		
76.00 mm	85	-	100
4.76 mm	45	-	100
0.42 mm	25	-	100
0.074 mm	20	-	60

3.0 EXECUTION

3.1 Handling

- .1 Handle and transport aggregates to avoid segregation, contamination and degradation
- .2 Do not use intermixed or contaminated materials. Remove and dispose rejected materials within 48 h of rejection.

END OF SECTION 31 05 17

- 1.0 GENERAL**
- .1 Section 32 12 16 refers to those portions of the work that are unique to the supply and placement of hot-mix asphalt concrete paving. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
- 1.1 Related Work**
- .1 Traffic Control, Vehicle Access and Parking Section 01 55 00
- .2 Aggregates and Granular Material Section 31 05 17
- .3 Reshaping Granular Roadbed Section 31 22 16
- .4 Asphalt Prime Section 32 12 13.2
- .5 Asphalt Tack Coat Section 32 12 13.1
- .6 Full Depth Reclamation Section 32 01 16.8
- .7 Excavating, Trenching and Backfilling Section 31 23 01
- 1.2 References**
- .1 The abbreviated standard specifications for testing, materials, fabrication and supply, referred to herein, are fully described in Section 01 42 00. Reference Specifications – Site and Infrastructure.
- 1.3 Material Certification**
- .1 Upon request, submit manufacturer's test data and certification that asphalt cement meets requirements of this section.
- 1.4 Submission of Mix Design**
- .1 Submit asphalt concrete mix design and trial mix test results to Contract Administrator for review at least one week prior to commencing work.
- 1.5 Measurement and Payment**
- .1 Payment for asphaltic concrete paving includes all construction joint preparation, supply and placing of the asphaltic concrete, compaction, adjusting and cleaning frames, covers and lids of all castings affected and taped temporary pavement markings.
Measurement for asphaltic concrete paving for the specified design mixes for lower and upper courses will be for asphalt concrete actually incorporated into work based on weigh tickets provided to Contract Administrator as loads are delivered.
- .2 For measurement and payment purpose, Contract Administrator may order cores to be taken from finished paving to determine finished paving thickness. Three cores will be taken from paving areas up to 1,500m² each. Cores for each area will be averaged to determine overall thickness for that area. If average thickness of cores indicates that pavement thickness varies from the thickness specified, Contract Administrator may do one of following:
- .1 if thickness is less than that specified, Contract Administrator may require an overlay to be placed in deficient areas with no additional payment for the overlay and any other work necessary to place such overlay.
- .2 if thickness is greater than specified, Contract Administrator may accept the work, if the excess thickness is acceptable; and calculate the amount of excess paving and, for payment purpose, reduce the quantity of asphaltic concrete paving placed accordingly.

- .3 Payment for asphaltic concrete sidewalks, driveways, in-fill strips and specified permanent patching paving includes all construction joint preparation, supply and placing of the asphaltic concrete, compaction and adjusting and cleaning frames, covers and lids of all castings affected.
Measurement for asphaltic concrete sidewalks, driveways, in-fill strips and specified permanent patching will be made separately for each of specified thicknesses which may be checked by Contract Administrator as given in 1.5.2 of this Section.
- .1 if thickness is less than that specified, Contract Administrator may require an overlay to be placed in deficient areas with no additional payment for the overlay and any other work necessary to place such overlay.
- .2 if thickness is less than specified, Contract Administrator may calculate amount of asphaltic concrete deficiency and, for payment purpose, reduce the item amount in pro-rata accordingly.
- .3 if thickness is greater than specified, Contract Administrator may accept the work, if the excess thickness is acceptable; or may require the work to be removed and replaced with appropriate thickness, all without additional payment.
- .4 Payment for extruded asphalt concrete curb will be made separately for each type of curb specified and will include the asphaltic concrete, all preparatory work and placing by extrusion.
- .5 No additional payment will be made for work described in this Section for surface restoration if payment is already included under work described in other Sections.
- .6 Payment for all the above-described asphaltic concrete work placed by hand will only be made for such work specifically ordered by Contract Administrator.
- .7 Payment for saw cutting asphaltic concrete or Portland cement concrete pavement will only be made for permanent reinstatement and other specific work shown on Contract Drawings or as directed by Contract Administrator and will not include saw cutting prior to trench excavation for pipe laying work.
- .8 Payment for permanent reinstatement of pavement includes all work under Section 31 23 01 - Excavating, Trenching and Backfilling - 3.6.7, but not saw cutting edges of pavements.

1.6 Inspection and Testing

- .1 Refer to General Conditions, Clause 4.12, Inspections.
- .2 Testing laboratory to be approved by Contract Administration.

2.0 PRODUCTS

2.1 Materials

- .1 Asphalt cement: to CGSB-16.3-M90, Grade 80 - 100.
- .2 Reclaimed asphalt pavement (RAP): Crush and screen so that 100% of reclaimed asphalt pavement material passes 37.5 mm screen before mixing.
- .3 Aggregates: to Section 31 05 17 - Aggregates and Granular Materials and following requirements:

- .1 Crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
- .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117.

Sieve Designation		Percent Passing				
		*Lower Course #1	*Lower Course #2	*Upper Course #1	*Upper Course #2	*Fine Mix
25.0	mm	100	--	--	--	--
19.0	mm	--	100	100	--	--
12.5	mm	70 - 85	84 - 99	84 - 99	100	--
9.5	mm	--	73 - 88	73 - 88	--	100
4.75	mm	40 - 65	50 - 68	50 - 68	55 - 75	80 - 100
2.36	mm	32 - 53	35 - 55	35 - 55	38 - 58	64 - 89
1.18	mm	26 - 44	27 - 46	27 - 46	28 - 47	48 - 76
0.600	mm	18 - 36	18 - 36	18 - 36	20 - 36	32 - 60
0.300	mm	10 - 26	10 - 26	10 - 26	10 - 26	16 - 42
0.150	mm	4 - 17	4 - 17	4 - 17	4 - 17	6 - 23
0.075	mm	3 - 8	3 - 8	3 - 8	3 - 8	4 - 10

***Footnote to asphalt mix-type selection:**

Lower Course #1: Arterial and collector, lower course only.

Lower Course #2: Local, lower course only.

Upper Course #1: Arterial and collector, upper course only.

Upper Course #2: Local, surface course only.

Fine Mix: Skim patch on existing asphalt surface.

- .3 Coarse aggregate is aggregate retained on 4.75 mm sieve and fine aggregate is aggregate passing 4.75 mm sieve when tested to ASTM C136.
- .4 When dryer drum plant or plant without hot screening is used, process fine aggregate through 4.75 mm sieve and stockpile separately from coarse aggregate.
- .5 Do not use aggregates having known polishing characteristics in mixes for upper courses.
- .6 Sand equivalent: to ASTM D2419. Min: 40
- .7 Magnesium Sulphate soundness: to ASTM C88.
Max % loss by mass after five cycles:
 - .1 Coarse aggregate: 15
 - .2 Fine aggregate: 18
- .8 Los Angeles abrasion: Grading B, to ASTM C131.
Max % loss by mass:
 - .1 Coarse aggregate, upper course: 25

- .2 Coarse aggregate, lower course: 35
- .9 Absorption: to ASTM C127.
Max % by mass:
 - .1 Coarse aggregate, upper course: 1.75
 - .2 Coarse aggregate, lower course: 2.00
- .10 Loss by washing: to ASTM C117.
Max % passing 0.075 mm sieve:
 - .1 Coarse aggregate, upper course: 1.5
 - .2 Coarse aggregate, lower course: 2.0
- .11 Flat and elongated particles: (with length to thickness ratio greater than 3):
Max % by mass:
 - .1 Coarse aggregate, upper course: 10
 - .2 Coarse aggregate, lower course: 10
- .12 Crushed fragments: at least 60% of particles by mass within each of following sieve designation ranges, to have at least 2 freshly fractured faces. Material to be tested according to ASTM C136 and ASTM C117.

Determination of amount of fractured material will be in accordance with Ministry of Transportation and Highways' Specification I-11, Fracture Count for Coarse Aggregate, Method "B", which determines fractured faces by mass.

Passing		Retained On	
25mm	to	12.5mm	
12.5mm	to	4.75mm	

- .13 Regardless of compliance with specified physical requirements, fine aggregates may be accepted or rejected on basis of past field performance.
- .4 Mineral filler:
 - .1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps.
 - .2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed to improve mix properties.
 - .3 Mineral filler to be dry and free flowing when added to aggregate.

2.2 Mix Design

- .1 Submit job mix formula to Contract Administrator for review and approval.
- .2 Mix may contain up to a maximum 20% by mass of RAP without a special mix design. Contract Administrator may approve higher proportion of RAP if Contractor demonstrates ability to produce mix meeting requirements of specification.
- .3 Design of mix: by Marshall method to requirements below.
 - .1 Compaction blows on each face of test specimens: 75
 - .2 Mix physical requirements:

Property	Pavement Course
Marshall Stability at 60°C	kN min. 6.4 lower course
	5.5 upper course
	5.5 fine
Flow Value	mm 2 – 4
Air Voids in Mixture	% 3 - 6 lower course
	3 - 5 upper course
	3 - 5 fine
Voids in Mineral Aggregate	% min. 13 lower course 1
	14 lower course 2
	14 upper course 1
	15 upper course 2
	15 fine
Index of Retained Stability	% min. 75

- .3 Measure physical requirements as follows:
 - .1 Marshall load and flow value: to ASTM D1559.
 - .2 Air voids: to ASTM D3203.
 - .3 Index of Retained Stability: measure in accordance with Marshall Immersion Test (ASTM D1559).
 - .4 Do not change job-mix without prior approval of Contract Administrator. Should change in material source be proposed, new job-mix formula to be submitted to Contract Administrator for review and approval.

3.0 EXECUTION

3.1 Plant and Mixing Requirements

- .1 Batch and continuous mixing plants:
 - .1 To ASTM D995.
 - .2 Heat asphalt cement and aggregate to mixing temperature. Do not heat asphalt cement above 160°C.
 - .3 Before mixing, dry aggregates to a moisture content not greater than 0.5% by mass or to a lesser moisture content if required to meet mix design requirements.
 - .4 Contract Administrator will monitor temperature of completed mix at plant and at paver after considering hauling and placing conditions.
 - .5 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders.
 - .6 Feed cold aggregates to plant in proportions that will ensure continuous operations.
 - .7 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job- mix requirements.
 - .8 Store hot screened aggregates in a manner to minimize segregation and temperature loss.
 - .9 Where RAP is to be incorporated into mix:
 - .1 Feed from separate cold feed bin specially designed to minimize consolidation of material. Provide 37.5 mm scalping screen on cold feed to remove oversized pieces of RAP.
 - .2 Ensure positive and accurate control of RAP cold feed by use of hydraulic motor or electric clutch and equip with anti-rollback device to prevent material from sliding backward on feed belt.
 - .3 Combine RAP and new aggregates in proportions as specified. Dry mix thoroughly, until uniform temperature within plus or minus 5°C of mix temperature is achieved prior to adding new asphalt cement. Do not add new asphalt cement where temperature of dry mix material is above 160°C.
 - .10 Maintain temperature of materials within plus or minus 5°C of specified mix temperature during mixing.
 - .11 Mixing time:
 - .1 In batch plants, dry mix for not less than 10 s. Continue wet mixing as long as necessary to obtain a thoroughly blended mix but not less than 30 s or more than 75 s.
 - .2 In continuous mixing plants, mixing time as required but not less than 45 s.

- .2 Dryer drum mixing plant:
 - .1 Where RAP to be incorporated into mix, dryer drum mixer to be designed to prevent direct contact of RAP with burner flame or with exhaust gases hotter than 180°C.
 - .2 Feed aggregates to burner end of dryer drum by means of a multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.
 - .3 Feed RAP from separate cold feed bin designed to minimize reconsolidation of material.
 - .4 Meter total flow of aggregate and RAP by electronic weigh belt system with an indicator that can be monitored by plant operator and which is interlocked with asphalt pump so that proportions of aggregate and RAP and asphalt entering mixer remain constant.
 - .5 Provide for easy calibration of weighing systems for aggregates and RAP without having material enter mixer.
 - .6 Make provision for conveniently sampling full flow of materials from the cold feed.
 - .7 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate and RAP from cold feed prior to entering drum.
 - .8 Provide a system interlock which will stop all feed components if either asphalt or aggregate from any bin stops flowing.
 - .9 Accomplish heating and mixing of asphalt mix in a drum dryer-mixer. Control heating to prevent fracture of aggregate or excessive oxidation of asphalt. Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with a printing recorder that can be monitored by plant operator. Submit printed record of mix temperatures at end of each week, if required.
 - .10 Mixing period and temperature to produce a uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer to be less than 0.5%.
- .3 Temporary storage of hot mix:
 - .1 Provide mix storage of sufficient capacity to permit continuous operation, maintained at specified temperatures and designed to prevent segregation.
 - .2 Do not store asphalt mix in storage bins in excess of 12 h.

- .4 Mixing tolerances:
 - .1 Permissible variation in aggregate gradation from job mix (percent of total mass):
 - .1 4.75 mm sieve and larger 5.5
 - .2 2.36 mm sieve 4.5
 - .3 0.600 mm sieve 3.5
 - .4 0.150 mm sieve 2.5
 - .5 0.075 mm sieve 1.5
 - .2 Permissible variation of asphalt cement from job mix, 0.3%.
 - .3 Permissible variation of mix temperature at discharge from plant, 5°C.

3.2 Equipment

- .1 Pavers: mechanical grade-controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown as shown on Contract Drawings.
- .2 Rollers: sufficient number of rollers of type and weight to obtain specified density of compacted mix.
- .3 Vibratory rollers:
 - .1 Minimum drum diameter: 1200 mm.
 - .2 Maximum amplitude of vibration (machine setting): 0.5 mm for lifts less than 40 mm thick.
- .4 Haul trucks: of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
 - .1 Boxes with tight metal bottoms.
 - .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
 - .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
 - .4 Trucks which cannot be weighed in a single operation on scales supplied will not be accepted.
- .5 Hand tools:
 - .1 Lutes or rakes with covered teeth for spreading and finishing operations.
 - .2 Tamping irons having mass not less than 12 kg and a bearing area not exceeding 310cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Contract Administrator, may be used instead of tamping irons.
 - .3 Straight edges, 3.0 m in length, to test finished surface.

3.3 Preparation

- .1 Reshape granular roadbed in accordance with Section 31.22.16 - Reshaping Granular Roadbed, Section 32.13.16.1 - Roller Compacted Concrete Paving and Section 32.01.16.8 - Full Depth Reclamation, if required.

- .2 When paving over existing asphalt surface, clean pavement surface in accordance with Section 32 01 11 - Pavement Surface Cleaning and Removal of Pavement Markings. When levelling course is not required, patch and correct depressions and other irregularities to approval of Contract Administrator before beginning paving operations.
- .3 Adjust existing castings to new elevations and protect from asphaltic mix.
- .4 When matching new pavement with existing pavement make vertical cut between existing pavement and new pavement as shown on Contract Drawings.
- .5 Apply prime coat and/or tack coat in accordance with Section 32 12 13.2 - Asphalt Prime and/or Section 32 12 13.1 - Asphalt Tack Coat prior to paving.
- .6 Prior to laying mix, clean surfaces of loose and foreign material.

3.4 Transportation of Mix

- .1 Transport mix to job site in vehicles cleaned of foreign material.
- .2 Paint or spray truck beds with light oil, limewater, soap or detergent solution, at least once a day or as required. Elevate truck bed and thoroughly drain. No excess solution will be permitted.
- .3 Schedule delivery of material for placing in daylight, unless Contract Administrator approves artificial light.
- .4 Deliver material to paver at a uniform rate and in an amount within capacity of paving and compacting equipment.
- .5 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within specified range. Temperature of mix upon placement shall not be less than 125°C.

3.5 Placing

- .1 Obtain Contract Administrator's approval of base, existing surface, tack coat, or prime coat prior to placing asphalt.
- .2 Place asphalt concrete to thicknesses, grades and lines as shown on Contract Drawings.
- .3 Placing conditions:
 - .1 Place asphalt mixtures only when air temperature is above 5°C. Place overlay pavement only when air temperature is above 10° C.
 - .2 When temperature of surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.
 - .3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
- .4 Place asphalt concrete in compacted lifts of thickness as shown on Contract Drawings:
 - .1 Levelling course(s) to thicknesses required but not exceeding 100 mm each.
 - .2 Lower course in layers not to exceed 100 mm each.
 - .3 Surface course in layers of maximum 60 mm each.

- .5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.
- .6 Spread and strike off mixture with self propelled mechanical finisher.
 - .1 Construct longitudinal joints and edges true to line markings. Position and operate paver to follow established line closely.
 - .2 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver. Work pavers as close together as possible and in no case permit them to be more than 30 m apart.
 - .3 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
 - .4 Correct irregularities in alignment left by paver by trimming directly behind machine.
 - .5 Correct irregularities in surface of pavement course directly behind paver. Remove by shovel or lute excess material forming high spots. Fill and smooth indented areas with hot mix. Do not broadcast material over such areas.
 - .6 Do not throw surplus material on freshly screeded surfaces.
- .7 When hand spreading is used:
 - .1 Approved wood or steel forms, rigidly supported to assure correct grade and cross section, may be used. Use measuring blocks and intermediate strips to aid in obtaining required cross-section.
 - .2 Distribute material uniformly. Do not broadcast material.
 - .3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.
 - .4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.
 - .5 Provide heating equipment to keep hand tools free from asphalt. Avoid high temperatures which may burn material. Do not use tools at a higher temperature than temperature of mix being placed.

3.6 Compaction

- .1 Roll asphalt continuously to average density not less than 97% of 75 blow Marshall density in accordance with ASTM D1559 with no individual test less than 95%.
- .2 General:
 - .1 Provide at least two rollers and as many additional rollers as necessary to achieve specified pavement density. When more than two rollers are required, one roller to be pneumatic tired type.
 - .2 Start rolling operations as soon as placed mix can bear weight of roller without undue displacement of material or cracking of surface.
 - .3 Operate roller slowly initially to avoid displacement of material. For subsequent rolling do not exceed 5 km/h for static steel- wheeled rollers and 8 km/h for pneumatic- tired rollers.

- .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 20 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing should not exceed compacted lift thickness.
 - .5 Overlap successive passes of roller by at least one half width of roller and vary pass lengths.
 - .6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
 - .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
 - .8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
 - .9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.
 - .10 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.
 - .11 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.
- .3 Breakdown rolling:
- .1 Commence breakdown rolling immediately following rolling of transverse and longitudinal joint and edges.
 - .2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.
 - .3 Operate breakdown roller with drive roll or wheel nearest finishing machine. Exceptions may be made when working on steep slopes or super-elevated sections.
 - .4 Use only experienced roller operators for this work.
- .4 Second rolling:
- .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.
 - .2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.
- .5 Finish rolling:
- .1 Accomplish finish rolling with steel wheel rollers while material is still warm enough for removal of roller marks.
 - .2 Conduct rolling operations in close sequence.

3.7 Joints

- .1 General:
 - .1 Remove surplus material from surface of previously laid strip. Do not dispose on surface of freshly laid strip.
 - .2 Construct joints between asphalt concrete pavement and portland cement concrete pavement as specified.
 - .3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.
- .2 Transverse joints:
 - .1 Offset transverse joint in succeeding lifts by at least 600 mm.
 - .2 Cut back to full depth vertical face and tack face with thin coat of asphalt prior to continuing paving.
 - .3 Compact transverse joints to provide a smooth riding surface.
- .3 Longitudinal joints:
 - .1 Offset longitudinal joints in succeeding lifts by at least 150 mm.
 - .2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100°C prior to paving of adjacent lane. If cold joint can not be avoided, tack face of adjacent lane with thin coat of asphalt prior to continuing paving.
 - .3 Overlap previously laid strip with spreader by 100 mm.
 - .4 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with a lute or rake.
 - .5 Roll longitudinal joints directly behind paving operation.
 - .6 When rolling with static roller, shift roller over onto previously placed lane in order that 100 to 150 mm of drum width rides on newly laid lane, then operate roller to pinch and press fines gradually across joint. Continue rolling until thoroughly compacted neat joint is obtained.
 - .7 When rolling with vibratory roller, have most of drum width ride on newly placed lane with remaining 100 to 150 mm extending onto previously placed and compacted lane.
- .4 Construct feather joints so that thinner portion of joint contains fine graded material obtained by changed mix design or by raking out coarse aggregate in mix. Place and compact joint so that joint is smooth and without visible breaks in grade. Location of feather joint as specified.
- .5 Construct butt joints at locations and to details as shown on Contract Drawings.
- .6 Wherever practical, locate joints under future traffic markings (paint lines).

3.8 Pavement Patching

- .1 Ensure temporary and permanent pavement patching done by handwork conforms to all standards specified for machine placed asphaltic concrete.
- .2 Subbase and base preparation as specified in Section 32.11.16.1 - Granular Subbase and Section 32.11.23 - Granular Base respectively, unless shown otherwise on Contract Drawings.

- | | |
|---|---|
| 3.9 Sidewalks, Driveways and Curbs | <ul style="list-style-type: none">.1 Hot-mix asphalt concrete sidewalks, driveways and curbs as shown on Contract Drawings..2 Machine place where practical..3 Ensure placement by handwork conforms to all standards specified for machine placed asphaltic concrete..4 Other than requirements relating specifically to Portland cement concrete, ensure hot-mix asphalt concrete sidewalks and curbs comply with all requirements of <u>Section 03 30 20 - Concrete Walks, Curbs and Gutters</u>..5 Ensure hot-mix asphalt concrete driveways comply with all requirements of <u>Section 32 12 16 - Hot-Mix Asphalt Concrete Paving</u>. |
| 3.10 Finished Tolerances | <ul style="list-style-type: none">.1 Ensure finished asphalt surface within 6 mm of design elevation but not uniformly high or low..2 Ensure finished asphalt surface does not have irregularities exceeding 6 mm when checked with a 3 m straight edge placed in any direction..3 Water ponding not permitted..4 Against concrete gutter, finished asphalt surface to be higher than the gutter by not more than 6mm. |
| 3.11 Defective Work | <ul style="list-style-type: none">.1 Correct irregularities which develop before completion of rolling by loosening upper mix and removing or adding material as required..2 If irregularities or defects remain after final compaction, remove upper course promptly and lay new material to form a true and even surface and compact immediately to specified density. |
| 3.12 Clean-Up | <ul style="list-style-type: none">.1 Remove lids or covers from all castings and clean any prime, tack coat or hot-mix asphaltic concrete from frames, lids and covers of all castings. |

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END OF SECTION 32 12 16

APPENDIX E

Pre Construction Hazardous Materials Assessment Form
Oct 31 2019



ANAHIM LAKE - PRELIMINARY HAZARD ASSESSMENT FORM – APPENDIX P

Project Number:	R.103948.001
Location:	Anahim Lake, B.C.
Date:	October 31, 2019
Name of Departmental Representative:	Kai Mark
Name of Client Department:	R.C.M.P.
Name of Client or Sr. Project Manager	Kai Mark PH: (604) - 365-0089

Site Specific Orientation Provided at Project Location Yes

Notice of Project Required Yes

NOTE:

PWGSC REQUIRES A Notice of Project FOR ALL CONSTRUCTION WORK RELATED ACTIVITIES

NOTE:

OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

Important Notice: This hazard assessment has been prepared by PSPC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PSPC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
	PWGSC, OGD's, or tenants		General Public or other contractors		
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	Yes	No	Yes	No	Note: When thinking about this pre-construction hazard assessment, remember a hazard is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)	yes				
Slip Hazards or Unsound Footing	yes				
Working at Heights	yes				
Working Over or Around Water	yes				
Heavy overhead lifting operations, mobile cranes etc.	TBD				



Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.)	yes				
Fire and Explosion Hazards	yes				
High Noise Levels	yes				
Excavations	yes				
Blasting		no			
Construction Equipment	yes				
Pedestrian Traffic (site personnel, tenants, visitors, public)	yes				
Multiple Employer Worksite	yes				Federal employees on or around site

Electrical Hazards					Comments
Contact With Overhead Wires	TBD				
Live Electrical Systems or Equipment	yes				
Other:					
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions	yes				
Earthquake	yes				
Tsunami		no			
Avalanche	yes				
Forest Fires	yes				
Fire and Explosion Hazards	yes				
Working in Isolation	yes				
Working Alone	yes				
Violence in the Workplace	yes				
High Noise Levels	yes				
Inclement weather	yes				
High Pressure Systems	yes				
Other:					
Hazardous Work Environments					
Confined Spaces / Restricted Spaces PSPC employees do not enter confined space.	yes				If available, provide the contractor with the existing confined space assessment(s) for information only. Contractor must perform their own confined space assessment as per provincial regulations.
Suspended / Mobile Work Platforms	TBD				
Other:					
Biological Hazards					
Mould Proliferations	TBD				Ceiling tiles are stained
Accumulation of Bird or Bat Guano		no			
Bacteria / Legionella in Cooling Towers / Process Water					Water identified in Stantec Reports included in Appendix A1.A2, and A3
Rodent / Insect Infestation		no			
Poisonous Plants		no			
Sharp or Potentially Infectious Objects in Wastes	yes				
Wildlife	yes				



Chemical Hazards					
Asbestos Materials on Site	yes				Asbestos identified in Stantec Reports included in Appendix A1.A2, and A3
Designated Substance Present		no			
Chemicals Used in work	TBD				
Lead in paint	yes				Lead identified in Stantec Reports included in Appendix A1.A2, and A3
Mercury in Thermostats or Switches	yes	TBD			Mercury identified in Stantec Reports included in Appendix A1.A2, and A3
Application of Chemicals or Pesticides		no			
PCB Liquids in Electrical Equipment		no			Identified in Stantec Reports included in Appendix A1.A2, and A3
Radioactive Materials in Equipment		no			
Other:					
Contaminated Sites Hazards					
Hazardous Waste		no			
Hydrocarbons		no			
Metals		no			
Other:					

Security Hazards					Comments
Risk of Assault	yes				
Other:					
Other Hazards					
Silica and particulate matter from the demolition process.	yes				Silica and dust exposure control plan will be required.

Other Compliance and Permit Requirements¹	YES	NO	Notes / Comments²
Is a Building Permit required?			
Is an Electrical permit required?			
Is a Plumbing Permit required?			
Is a Sewage Permit required?			
Is a Dumping Permit required?			
Is a Hot Work Permit required?			
Is a Permit to Work required?			Mandatory for ALL AFD managed work sites.
Is a Confined Space Entry Permit required?			Mandatory
Is a Confined Space Entry Log required			Mandatory for all Confined Spaces
Discharge Approval for treated water required			

Notes:

- (1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.
- (2) TBD means To Be Determined by Service Provider.



Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.

Service Provider Name			
Signatory for Service Provider		Date Signed	
RETURN EXECUTED DOCUMENT TO PSPC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING			