Metal Based Paint Remedial Action Plan

Parks Canada Buildings and Structures at Georgina Point (Active Pass) Lightstation, East Point (Saturna Island) Lightstation; Portlock Point Lightstation and Russell Island

Prepared for:
Parks Canada Agency

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

123220964

August 21, 2018

Table of Contents

LIST OF TABLES

Abbreviations

ACM	asbestos-containing material
LCP	lead-containing paint
Parks Canada	Parks Canada Agency
PPM	parts per million
RAP	remedial action plan
Stantec	Stantec Consulting Ltd.

Executive Summary

Stantec Consulting Ltd. (Stantec) was commissioned by the Parks Canada Agency (Parks Canada) to prepare a remedial action plan (RAP) for metal-based paint at the sites (further referred to as the subject sites) and associated structures (further referred to as the subject structures) listed below, which are located in Gulf Islands National Park Reserve, British Columbia.

Site Name	Structure
Georgina Point (Active Pass) Lightstation	Light Keepers House
	Weather Station (Radio/Engine Room)
	Beacon (Light Tower)
	Garage
	Shed (former Fuel Shed)
	Seasonal Washroom
	Outhouse
	NAV Canada Shed (Solar Panel/Battery Room)
	Gazebo
East Point (Saturna Island) Lightstation	Light Tower and Shed
	Garage
	Bunkhouse
	Fog Horn Building
Portlock Point	Lighthouse (Major Shorelight)
Russell Island	Mahoi House
	Caretakers Shed
	Water Tower
	Generator Shed

Through a review of previous documents related to metal (and other) contamination at the subject sites, as well as the completion of a supplemental site review, the following general conclusions were made:

- Although lead, mercury and other metals may be present in paint, lead is the constituent that Stantec believes poses the most significant risk from both a health (exposure) and an environmental (contamination) standpoint. This is for reasons including, but not limited to, the following:
  - Lead is the constituent in paint that was historically used to the greatest extent
  - Ecological and human health risks associated with other metals such as mercury and arsenic are discussed in previous environmental assessment reports, primarily as they pertain to significant other (non-paint) site-related sources for these metals (e.g., mercury bath lamps; historic waste disposal practices).
  - Contributions to ecological or human health risks from the presence of metals (other than lead) in paint do not appear to have been considered as significant contamination sources in previous environmental assessment reports.
- Paints with lead content less than 600 parts per million (ppm) lead do not appear to pose significant risks for metal exposure for employees and/or users, nor do they appear to pose significant site contamination hazards associated with metals.
- For paints with lead content greater that 600 ppm that are in good condition (i.e., not flaking, bubbling and/or peeling—well adhered to the substrate) on surfaces:
  - These pose limited risks to employees and/or users at the subject structures, with respect to exposure to heavy metals
  - These pose limited risks to be a significant contributor to metal contamination of soil and groundwater at the subject structures
- For paints with lead content greater that 600 ppm that are in poor condition (i.e., flaking, bubbling and/or peeling from the substrate) on surfaces:
  - These can pose risks to employees and/or users at the subject structures, with respect to exposure to heavy metals
  - In limited instances (e.g., where paint chips/debris is present on ground surfaces), these can pose a risk of contributing to metal contamination of soil and groundwater at the subject structures.

Based on the above, the RAP was developed to meet the following objectives:

- Primary Objective: to address paints that, due to their condition and lead content, may be presenting metal-related exposure risks to employees and/or users at the subject structures.
- Secondary Objective: to address paints that, due to their condition and lead content, may be contributing to metal contamination of soil and groundwater at the subject structures.

The RAP was prepared to address lead in paint, with the expectation that appropriately handling painted building materials to control risks associated with lead will also appropriately control the risks associated with mercury and other metals in paint.

The specifics of the RAP as it pertains to each of the subject structures, including where and to what extent lead-containing paints require action (removal, clean-up, re-painting, etc.) are provided in Section 5.0 of this document.

Subsequent to the completion of the tasks indicated in this RAP, it is recommended that Parks Canada conducts annual review of the condition of identified lead-containing paints at each of the subject structures, such that localized maintenance conducted by Parks Canada staff can address potential risks associated with exposure and site contamination.

Where renovation or demolition work is to be undertaken, impacts to building materials coated with paints containing lead and/or other metals should be conducted in accordance with the following:

- Exposure protection requirements of the BC Reg. 296/97, including the provisions of the WorkSafe BC 2017 publication *Safe Work Practices for Handling Lead*
- Transportation and disposal requirements of the British Columbia Hazardous Waste Regulation (BC Reg. 63/88)
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was commissioned by the Parks Canada Agency (Parks Canada) to prepare a remedial action plan (RAP) for metal-based paint at four sites (further referred to as the subject sites) and associated structures (further referred to as the subject structures) located in Gulf Islands National Park Reserve, British Columbia as follows:

Site Name	Structure	FCSI #
Georgina Point (Active Pass) Lightstation	Light Keepers House	00023457
	Weather Station (Radio/Engine Room)	00023457
	Beacon (Light Tower)	00023457
	Garage	00023457
	Shed (former Fuel Shed)	00023457
	Seasonal Washroom	00023457
	Outhouse	00023457
	NAV Canada Shed (Solar Panel/Battery Room)	00023457
	Gazebo	00023457
East Point (Saturna Island) Lightstation	Light Tower and Shed	00023462
	Garage	00023462
	Bunkhouse	00023462
	Fog Horn Building	00023462
Portlock Point	Lighthouse (Major Shorelight)	00023458
Russell Island	Mahoi House	00024299
	Caretakers Shed	00024299
	Water Tower	00024299
	Generator Shed	00024299

2.0 BACKGROUND AND OBJECTIVES

Lead-containing paints (LCPs) have been identified on various structural (building-related) components (both interior and exterior) at the subject sites and associated with the subject structures. The condition of the LCPs was reviewed recently by Stantec as documented in the following report (further referred to herein as the *Stantec 2017 Assessment Report*):

- Stantec Report No. 123220964 titled *Metal Based Paint and Supplemental Asbestos Assessment—Parks Canada Buildings and Structures at Georgina Point (Active Pass) Lightstation, East Point (Saturna Island) Light Station; Portlock Point Lightstation and Russell Island*, dated January 19, 2018, prepared for the Parks Canada Agency.

Stantec understands that the Parks Canada Remediation and Risk Management Plan (in draft) recommends that contaminated paint is abated and/or remediated as a means of removing the source of lead (and other metals) that may pose health and safety risks to visitors and staff, and that may contribute to potential environmental contamination at the subject sites.

In support of meeting the objectives of the Parks Canada Remediation and Risk Management Plan, Parks Canada commissioned Stantec to prepare this RAP to address the LCPs noted to be in poor or deteriorating condition as documented in the Stantec 2017 Assessment Report.

2.1 PREVIOUS INVESTIGATIONS

In addition to the Stantec 2017 Assessment Report, the following additional documents were provided by Parks Canada for Stantec's review (further referred to herein as the "previous environmental assessment reports"):

- Stantec Report No. 123220330 entitled *Hazardous Building Materials Assessment, 45 Buildings at the Gulf Islands National Park, BC* dated March 22, 2016, prepared for Public Works and Government Services Canada on behalf of Parks Canada (initial assessment)
- Parks Canada Agency March 2016 DRAFT document *Portlock Point Major Shorelight, Prevost Island: Remediation and Risk Management Plan*
- Parks Canada Agency March 2016 document *Active Pass Lightstation Georgina Point, Mayne Island Remediation and Risk Management Plan*
- Parks Canada Agency July 2016 DRAFT document *Saturna Island (East Point) Lightstation: Remediation and Risk Management Plan*
- The Environmental Services Group Royal Military College of Canada August 2014 document *Gulf Islands National Park – 2014 Site Closure Review—Active Pass, East Point, Portlock Point*
- The Environmental Services Group Royal Military College of Canada July 2015 document *Summary Report for Gulf Islands National Park Reserve, British Columbia – Results and Recommendations of the 2014 Sampling Program—Human Health Risk Assessment; Ecological Risk Assessment Review; Site Closure Tool Initiation*
- The Environmental Services Group Royal Military College of Canada March 2015 document *Gulf Islands 2014 Sampling Report, Gulf Islands National Park Reserve, British Columbia—2014 Additional Sampling Program*

- Canadian Coast Guard May 2005 document *Ecological Risk Assessment of Environmental Contamination at Six De-Staffed Lightstations*
- Morrow Environmental June 3, 2005 document *Human Health Risk Assessment of Environmental Contamination at the De-Staffed Active Pass Lightstation Site*
- Morrow Environmental June 3, 2005 document *Human Health Risk Assessment of Environmental Contamination at the De-Staffed East Point Lightstation Site*
- Golder Associates April 11, 2016 document *Supplemental Phase III Environmental Site Assessment and PQRA—Russell Island, BC*
- Franz Environmental Inc. March 2011 document *Remedial Options Evaluation—Russell Island, BC, Gulf Islands National Park Reserve of Canada*

The previous environmental assessment reports provide information regarding items including, but not limited to, the following:

- Site History
- Various actual or potential sources of contamination at the subject sites
- Areas of environmental concern
- Site characterization

3.0 REFERENCE STANDARDS

Although lead, mercury and other metals may be present in paint, lead is the constituent that was historically used to the greatest extent. The lead content of paint will typically significantly exceed that of mercury or other metals in paint.

Based on the above and on our experience in conducting hazardous building materials assessments throughout Canada, lead is the paint constituent that Stantec believes poses the most significant risk from both a health (exposure) and an environmental (contamination) standpoint.

In addition, the ecological and human health risks associated with other metals such as mercury and arsenic are discussed in the previous environmental assessment reports, primarily as they pertain to significant site-related sources for these metals, such as mercury bath lamps (for mercury) and historic waste disposal practices (for arsenic). Contributions to ecological or human health risks from the presence of metals other than lead in paint do not appear to have been considered as significant contamination sources.

As such, this RAP has been prepared to address lead in paint, with the expectation that appropriately handling painted building materials to control risks associated with lead will also appropriately control the risks associated with mercury and other metals in paint.

3.1 LEAD IN PAINT

When discussing exposure risks associated with the lead content of paint that has been applied to building materials (and has dried to form a coating), it is important to understand the various ways in which the lead content of paint is measured and/or considered.

When painted building materials are disturbed, the various processes by which this occurs (e.g., torch-cutting, grinding, manual demolition, etc.) can create airborne, lead-containing particulate. In this respect, applicable regulations present their "allowable" limits for worker exposure in relation to the airborne concentration of lead particles, which is expressed in milligrams per cubic metre (mg/m^3). Both the *Canada Labour Code, Part II* (Canada Labour Code) and British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97) refer to an occupational exposure limit for lead of 0.05 mg/m^3 (airborne particulates).

When assessing how much a particular paint coating may contribute to lead exposure risks upon disturbance, the total lead content of the paint coating is considered. This is measured either in percent weight, or in milligrams per kilogram (mg/kg), which is equivalent to parts per million (ppm). In this respect, 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.

When reviewing the above, although "high risk" individuals may be present at the subject sites periodically as users, such individuals are not expected to be present in situations associated with building material alteration activities (i.e., remediation) that would create significant disturbance to paint and airborne, inhalable particulate matter (i.e., typical exposure risks). As such, and as the risk of ingestion of paint debris can reasonably be deemed low for periodic users, Stantec will reference a value of greater than 600 ppm in defining paints as "lead-containing", such that appropriate risk assessments can be completed when implementing the RAP.

3.1.1 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 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/m^3 (16 times the exposure limit).

Given this information and that the analytical detection limit for lead paint analysis is 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. 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/work shift
- Training of the personnel conducting the task
- Respiratory protection program in effect

3.1.2 Building Materials—Leachable Lead Content

Once the exposure risks associated with generating airborne particulate when disturbing building materials coated with LCPs have been addressed, and the painted building materials become waste, we must also consider disposal options.

According to the British Columbia Hazardous Waste Regulation (BC Reg. 63/88), lead waste (including building material waste coated with LCPs) 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/litre (mg/L) lead.

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.

4.0 REMEDIATION OPTIONS AND OBJECTIVES

Through a review of the previous environmental assessment reports, as well as the supplemental site review conducted as part of the Stantec 2017 Assessment Report, the following general conclusions were made:

- Paints with lead content less than 600 parts per million (ppm) lead do not appear to pose significant risks for metal exposure for employees and/or users, nor do they appear to pose significant site contamination hazards associated with metals.
- For paints with lead content greater that 600 ppm that are in good condition (i.e., not flaking, bubbling and/or peeling—well adhered to the substrate) on surfaces:
  - These pose limited risks to employees and/or users at the subject structures, with respect to exposure to heavy metals
  - These pose limited risks to be a significant contributor to metal contamination of soil and groundwater at the subject structures
- For paints with lead content greater that 600 ppm that are in poor condition (i.e., flaking, bubbling and/or peeling from the substrate) on surfaces:
  - These can pose risks to employees and/or users at the subject structures, with respect to exposure to heavy metals
  - In limited instances (e.g. where paint chips/debris is present on ground surfaces), these can pose a risk of contributing to metal contamination of soil and groundwater at the subject structures.

Based on the above, the RAP was developed to meet the following objectives:

- Primary Objective: to address paints that, due to their condition and lead content, may be presenting metal-related exposure risks to employees and/or users at the subject structures.
- Secondary Objective: to address paints that, due to their condition and lead content, may be contributing to metal contamination of soil and groundwater at the subject structures.

The RAP was prepared to address lead in paint, with the expectation that appropriately handling painted building materials to control risks associated with lead will also appropriately control the risks associated with mercury and other metals in paint.

It should be noted that this RAP is not intended to provide guidance regarding overall remediation of soil or groundwater at the subject sites. Per the previous environmental assessment reports, various contaminants exist to varying degrees at the subject sites—and this contamination will remain subsequent to the implementation of this RAP. From an environmental contamination standpoint, this RAP is intended to address the risks that poor condition lead and other metal containing paints pose to contributing (adding) to the existing contamination at each site.

4.1 REGULATORY CRITERIA

The mere presence of lead and/or other metal-containing paint on buildings or structures does not necessarily require action by regulation. However, when such materials become "damaged" (i.e., delaminated from the surface to which they were applied, creating loose debris), they may pose risks for human or environmental exposure/contamination.

Occupational health and safety regulations, which are applicable to the workplace, are typically consulted when assessing and/or addressing the health risks that lead and/or other metal containing paints pose, when they are in poor condition. Such regulations set criteria for "allowable exposures" in the workplace, and often provide guidance regarding procedures to mitigate exposures during work involving lead/other metal containing paint. Occupational Health and Safety Regulations (BC Reg. 296/97 and the Canada Labour Code) and regulatory guidance documents (the Lead Guideline) were utilized as the appropriate standard for addressing health risks from damaged lead or other metal-containing paints in this RAP.

Although various regulations exist regarding soil or groundwater contamination, as stated, the intention of this RAP is not to remediate soil or groundwater at the subject sites to a particular standard. From an environmental protection standpoint, this RAP has been using provincial environmental protection standards (BC Reg. 63/88) to govern the disposal of waste created through the implementation of the RAP.

4.2 REMEDIATION OPTIONS

In order to meet the objectives of the RAP, various options for remediation of lead-containing paints (those with lead content in excess of 600 ppm) that were in poor condition at the subject sites were provided to Parks Canada in the Stantec 2017 Assessment Report. These options included the following:

- Removal of poor condition paint from substrate – with or without re-painting
- Removal and replacement of substrate where lead-containing paints are in poor condition

Based on their review of the above-noted options and associated cost estimates for each, as well as Stantec's recommendations, the detailed plan within this document was developed.

5.0 REMEDIAL ACTION PLAN

Table 5-1 below summarizes the RAP for LCPs in poor condition at the subject sites.

It should be noted that tender specifications will be prepared that will outline the applicable containment methods, personal protective equipment, and work procedures to be utilized during the implementation of the RAP in order to protect workers and the environment from exposure to lead and/or other heavy metals during the work. Those specifications will be prepared to instruct the contractor to meet or exceed the requirements of the following, at a minimum:

- Canada Labour Code and BC Reg. 296/97
- Lead Guideline
- BC Reg. 63/88

With respect to the leachable lead concentration column in Table 3-1, the data has been highlighted as follows:

Green highlighting represents that:	• Material tested and found to have leachable lead content <5 mg/L; or, • Lead content of the paint coating is less than 5,000 ppm. Waste generated through removal of paint from substrate (paint chips and removal substrate—sand, beads, etc.) is unlikely to leach in excess of 5 mg/L (in these cases where sampling has not been conducted, the text in this column indicates "Assumed <5"). Contractor may need to conduct supplemental testing of actual waste to confirm.
Red highlighting represents that:	• Material tested and found to have leachable lead content >5 mg/L; or, • Lead content of the paint coating is greater than 5,000 ppm. Waste generated through removal of paint from substrate (paint chips and removal substrate—sand, beads, etc.) is likely to leach in excess of 5 mg/L (in these cases where sampling has not been conducted, the text in this column indicates "Assumed >5")

It should also be noted that where no LCPs were identified in a particular structure or where the Remedial Action Options Table provided in the Stantec 2017 Assessment Report indicated an option of "manage in place" as accepted by Parks Canada, those paints/line items have been removed, as there is no action as part of this RAP.

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Georgina Point Light Keeper's House	Grey on concrete basement floor is in poor condition, flaking and peeling throughout—approximately 33 m^2	41,000	Assumed >5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 33 m^2 of paint from the concrete floor. It is assumed the leachable lead concentration of the waste will exceed 5 mg/L and thus disposal to landfill will **not** be an option. Repaint grey as required by Parks Canada.	
Georgina Point Light Keeper's House	White on wood exterior siding is in good condition except for localized flaking on the rear basement door—approximately 1.5 m^2 in poor condition	1,800	<0.40	Localized LCP removal from substrate	Remove and dispose of approximately 1.5 m^2 of paint from the exterior of the wood door. Repaint white as required by Parks Canada.	
Georgina Point Light Keeper's House	Red on concrete exterior foundation wall under porch is in poor condition, flaking and peeling throughout—Approximately 14.5 m^2 Note that some flaking paint was observed to be present on the surface of the soil below	6,700	Assumed >5	Comprehensive removal of LCP from substrate • Remove the top two inches of soil along the wall where flaking paint is present	Remove and dispose of approximately 14.5 m^2 of paint from the concrete exterior foundation. Remove and dispose of the top two inches of soil (approximately 0.15 m^3 or 300 Kg) along the wall where flaking paint is present. Repaint grey as required by Parks Canada.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Georgina Point Light Keeper's House	White on concrete edge of deck under porch is in poor condition, flaking and peeling throughout—Approximately 1 m^2	37,000	Assumed >5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 1 m^2 of paint from the concrete edge of the deck under the porch. Repaint grey as required by Parks Canada.	
Georgina Point Light Keeper's House	Red paint on concrete base of detached flagpole is in poor condition throughout—Approximately 3 m^2	Presumed LCP; Presumed >5,000 ppm lead	Assumed >5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 3 m^2 of paint from the concrete base of the detached flagpole. Repaint red as required by Parks Canada.	
Georgina Point Weather Station	Grey on concrete floor in the electrical room is in poor condition, flaking and peeling throughout—Approximately 37 m^2	2,200	Assumed <5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 37 m^2 of paint from the concrete floor in the electrical room. Leave unpainted.	

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Georgina Point Weather Station	Red on concrete exterior trim is in poor condition, flaking and peeling throughout—Approximately 5.5 m^2	56,000	Assumed >5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 5.5 m^2 of paint from the concrete exterior trim. Repaint red, as required by Parks Canada.	 
Georgina Point Weather Station	Red and white on metal antenna is in poor condition, flaking and peeling throughout—Approximately 11 m^2	Presumed LCP; Presumed >5,000 ppm lead	Assumed >5	Comprehensive removal of LCP from substrate (assuming paint is LCP)	Undertake sampling to confirm lead content of paint. Assuming paint is lead-containing, remove and dispose of approximately 11 m^2 of paint from the metal antenna assuming paint is LCP. Assess surrounding soil for the presence of flaking paint when access is provided. Repaint as required by Transport Canada.	 
Georgina Point Beacon	White on metal interior of upper level walls and ceiling is in poor condition, flaking and peeling throughout—Approximately 5 m^2	7,500	Assumed >5	Comprehensive removal of LCP from substrate • If ACM window caulking will be disturbed it should be removed prior to LCP remediation	Remove and dispose of approximately 5 m^2 of paint from the metal walls and ceiling. Undertake removal work such that ACM window caulking is not disturbed in the process. Repaint white as required by Parks Canada.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

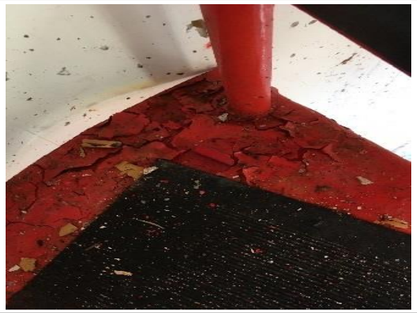
Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Georgina Point Beacon	Red on metal upper level floor and staircase is in poor condition, flaking and peeling throughout—Approximately 10 m^2	67,000	Assumed >5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 10 m^2 of paint from the metal floor and staircase. Repaint red as required by Parks Canada.	 
Georgina Point Beacon	Red on metal upper level exterior and railing is in poor condition, flaking and peeling throughout—Approximately 10 m^2	100,000	Assumed >5	Comprehensive removal of LCP from substrate • If ACM window caulking will be disturbed it should be removed prior to LCP remediation	Remove and dispose of approximately 10 m^2 of paint from the metal exterior and railing. Undertake removal work such that ACM window caulking is not disturbed in the process. Repaint red as required by Parks Canada.	 
Georgina Point Beacon	Grey on concrete exterior foundation and steps is mostly worn from the surface of the concrete (reportedly previously abated)—Approximately 7.5 m^2	1,300	Assumed <5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 7.5 m^2 of paint from the concrete exterior foundation. Repaint grey as required by Parks Canada.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Georgina Point Beacon	Cream on the interior side of the metal door and frame is in poor condition, flaking and peeling throughout—Approximately 2.5 m^2	2,300	Assumed <5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 2.5 m^2 of paint from the metal door and frame. Leave unpainted.	 
Georgina Point Beacon	Grey on interior concrete floor base is in poor condition, flaking and peeling throughout—Approximately 2.5 m^2	2,400	Assumed <5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 2.5 m^2 of paint from the concrete floor base. Leave unpainted.	 
Georgina Point Garage	Grey on concrete floor is in poor condition, flaking and peeling throughout—Approximately 23.5 m^2	1,200	Assumed <5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 23.5 m^2 of paint from the concrete floor. Repaint grey as required by Parks Canada.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Georgina Point Garage	White on wood exterior fascia is in poor condition, flaking and peeling throughout—Approximately 4 m^2	1,100	Assumed <5	Comprehensive substrate removal	Remove and dispose of approximately 4 m^2 or 55.8 Kg of exterior fascia. Replace fascia and paint as required by Parks Canada.	 
Georgina Point Shed	White on wood exterior siding is in good condition except for localized flaking on the door—Approximately 3 m^2 in poor condition	190,000	Assumed >5	Localized removal of LCP from substrate	Remove and dispose of approximately 3 m^2 of paint from the wood exterior of the door. Repaint white as required by Parks Canada.	 
Georgina Point Shed	Grey on concrete front step is in poor condition, flaking and peeling throughout—Approximately 1 m^2	4,400	Assumed <5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 1 m^2 of paint from the concrete front step. Repaint grey as required by Parks Canada.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
East Point Light Tower and Shed	Red on the steel tower structure is in poor condition, flaking and peeling throughout—Approximately 120 m^2	39,000	0.89 (paint chips alone without substrate)	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 120 m^2 of paint from the steel tower structure. Repaint as required by Parks Canada.	 
East Point Light Tower and Shed	White on concrete tower footings is in poor condition, flaking and peeling throughout—Approximately 18 m^2	1,100	Assumed <5	Comprehensive removal of LCP from substrate	Remove and dispose of approximately 18 m^2 of paint from the concrete tower footings. Repaint white as required by Parks Canada.	 
East Point Bunkhouse	White on wood exterior siding is in poor condition flaking and peeling over a significant portion of the building—Approximately 70 m^2 in poor condition	2,000	<0.40	Comprehensive substrate removal	Remove and dispose of approximately 200 m^2 or 2.79 tonnes of wood exterior siding. Replace with wood exterior siding and paint as required by Parks Canada.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
East Point Fog Horn Building	White on wood exterior siding is generally in good condition with minor flaking and peeling in some locations - Approximately 5 m^2 Note that some flaking paint was observed to be present on the surface of the soil below	3,300	<0.40	Localized LCP removal from substrate • Remove the top two inches of soil along the wall where flaking paint is present	Remove and dispose of approximately 5 m^2 of paint from the wood exterior siding. Remove the top two inches of soil (approximately 0.4 m^3 or 800 Kg) along the wall where flaking paint is present. Repaint to match existing.	 
Portlock Point Lighthouse	White on wood exterior trim is flaking and peeling in some locations (window trim and door)—Approximately 4.5 m^2 Note that some of the wood window trim is deteriorating due to moisture	72,000	0.58	Comprehensive removal of LCP from substrate • If ACM building tar and/or window caulking will be disturbed it should be removed prior to LCP remediation	Remove and dispose of approximately 4.5 m^2 of paint from the wood exterior trim. Undertake removal work such that ACM building tar and/or window caulking is not disturbed in the process. Repaint to match existing.	 
Portlock Point Lighthouse	Grey on metal and wood interior trim and stairs is generally in good condition with minor flaking and peeling around the base of the metal light post)—Approximately 1 m^2	5,400	<0.40	Localized removal of LCP from substrate	Remove and dispose of approximately 1 m^2 of paint from the base of the metal light post. Repaint to match existing.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Portlock Point Lighthouse	White on interior metal walls and ceiling on the upper level is flaking and peeling throughout—Approximately 15 m^2	2,900	Assumed <5	Comprehensive removal of LCP from substrate • If ACM window caulking will be disturbed it should be removed prior to LCP remediation	Remove and dispose of approximately 15 m^2 of paint from the metal walls and ceiling. Undertake removal work such that ACM window caulking is not disturbed in the process. Repaint as required by Parks Canada.	 
Portlock Point Lighthouse	Red on exterior metal walls and roof on the upper level is flaking and peeling throughout—Approximately 30 m^2 Note that wood trim is present directly below the windows and that the window trim is deteriorating due to moisture	110,000	Wood trim: 2.9 Metal walls: Assumed >5	Comprehensive removal of LCP from substrate • Remove and replace wood trim • If ACM window caulking will be disturbed it should be removed prior to LCP remediation	Remove and dispose of approximately 30 m^2 of paint from the exterior metal walls and roof. Remove and dispose of approximately 0.4 m^2 or 5 Kg exterior wood window trim. Undertake removal work such that ACM window caulking is not disturbed in the process. Repaint red as required by Parks Canada. Reinstate window trim using fir trim for exterior applications and paint white.	 
Mahoi House	White on wood exterior siding is generally in good condition with minor flaking and peeling in some locations—Approximately 40 m^2 in poor condition	56,000	6.8	Localized LCP removal from substrate	Remove and dispose of approximately 40 m^2 of paint from the wood exterior siding. Repaint to match existing.	 

Table 5-1 Remedial Action Plan
Gulf Islands National Park Reserve, BC

Building	Paint Description/ Condition/Quantity	Paint Lead Concentration (ppm)	Leachable Lead Concentration for Waste (mg/L)	Remedial Action Option Chosen	Scope Details	Photograph
Russel Island Caretaker's Shed	White on wood exterior siding is flaking and peeling over a significant portion of the building—Approximately 20 m^2 in poor condition	1,700	<0.40	Comprehensive substrate removal	Remove and dispose of approximately 130 m^2 or 1.8 tonnes of wood exterior siding. Replace exterior siding with wood siding and paint white.	
Russel Island Water Tower	Beige on wood exterior trim is flaking and peeling throughout—Approximately 2 m^2	1,800	Assumed <5	Comprehensive substrate removal	Remove and dispose of approximately 3 m^2 or 42 Kg of wood exterior trim. Replace exterior trim with like material and repaint same colour.	 

6.0 POST-REMEDIATION ACTIVITIES

Subsequent to the completion of the tasks indicated in this RAP, it is recommended that Parks Canada conducts annual review of the condition of identified lead-containing paints at each of the subject structures, such that localized maintenance conducted by Parks Canada staff can address potential risks associated with exposure and site contamination.

Where renovation or demolition work is to be undertaken, impacts to building materials coated with paints containing lead and/or other metals should be conducted in accordance with the following:

- Exposure protection requirements of the BC Reg. 296/97, including the provisions of the WorkSafe BC 2017 publication "Safe Work Practices for Handling Lead"
- Transportation and disposal requirements of the British Columbia Hazardous Waste Regulation (BC Reg. 63/88)
- Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

7.0 CLOSURE

This RAP has been prepared for the sole benefit of the Parks Canada Agency. 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 RAP.

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. Recommendations presented in this report should not be construed as legal advice.

The recommendations presented in this RAP represent the best technical judgment of Stantec Consulting Ltd. based on the data obtained from the work, as well as input provided by Parks Canada Agency. The recommendations are based on the site conditions encountered by Stantec Consulting Ltd. at the time the work was performed (per the Stantec 2017 Assessment Report) at the specific assessment and/or sampling locations noted in that report 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.

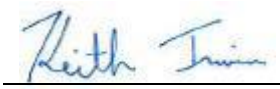
If any conditions become apparent that differ significantly from our understanding of conditions as presented in this RAP, we request that we be notified immediately to reassess the conclusions provided herein.

Closure
August 21, 2018

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.



Keith Irwin, Dipl.Tech.
Technologist
Phone: (604) 412-3016
Keith.Irwin@stantec.com

Tiffany Waite, B.Sc.
Associate
Phone: (250) 470-4498
Tiffany.Waite@stantec.com

This report was approved for transmittal by:

Sean Brigden, B.Sc., P.B.Dipl, CRSP
Senior Associate
Phone: (250) 655-6062
Sean.Brigden@stantec.com