Public Works and Government Services Canada

Requisition No. E2899-14-2200

MERX I.D. No. _____

SPECIFICATIONS
for

Rock Bay Remediation Project

Victoria, BC

Project No. R.002674.006 July 2012

APPROVED BY:

_____ 2014/01/10
Regional Manager ES Date

_____ 2014/01/10
Construction Safety Coordinator Date

TENDER:

_____ 2014 Jan 10
Project Manager Date

Real Property Services Branch, Professional and Technical Services, Pacific Region
#641 – 800 Burrard Street, Vancouver, B.C. V6Z 2V8

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1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. Pre-mobilization Submittals will be paid in accordance with lump sum price established for all Preconstruction Meetings, final design, planning, health and safety, and other Submittals in accordance with the Contract or required and accepted by the Departmental Representative as in accordance with the Contract prior to mobilization to Site.

1.1.2. Mobilization will be paid in accordance with lump sum price established for mobilizing all necessary equipment, materials, supplies, facilities, and personnel associated with the Works to the Site. Includes initial insurance, bonding, and permits. Additional insurance, bonding, and permits due to changes in scope, cost, and schedule as accepted by the Departmental Representative will be included in Contract amendments.

1.1.3. Site Preparation will be paid in accordance with lump sum price established to prepare the Site for planned construction works. Includes clearing and grubbing, utility location, rerouting, and protection, and construction of temporary onsite access roads. Also includes removal of any incidental or generated material.

1.1.4. Paving will be paid in accordance with lump sum price established to pave the Uplands Stage 2 area in accordance with the Contract.

1.1.5. Site Facilities Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect all infrastructure in accordance with the Contract. Includes temporary structures and facilities, temporary hoarding, security fencing, federal signage, sanitary facilities, stormwater management infrastructure, noise and air monitoring station, meteorological station and utility installation.

1.1.6. Site Facilities Operation will be paid in accordance with unit rate price established for time to operate and maintain all infrastructure between mobilization and demobilization. Includes temporary structures and facilities including temporary hoarding, security fencing, federal signage, sanitary facilities, stormwater management infrastructure, noise and air monitoring station, meteorological station and utility installation Also includes ongoing services including project management, security, surveying, noise monitoring, vibration monitoring, utilities, project meetings, inspections, progress Submittals, traffic control, health and safety, Environmental Protection and cleaning. Also, includes living out allowances, travel and room and board. Rate must not vary even if hours of work and/or days of work vary. Time will only be paid for duration in accordance with the Contract and changes in schedule as accepted by the Departmental Representative and included in Extension of Time on Contracts.

1.1.7. Standby Time will be paid in accordance with unit rate price established, for time when construction Work is unable to proceed, and that is directly attributable to any neglect or delay that occurs after the date of the Contract on

the part of the Departmental Representative in providing any information or in doing any act that the Contract expressly requires the Departmental Representative. Includes machinery and labour standby costs. Does not include items covered by Site Facilities Operation. Standby Time may be pro-rated based on hours of work. Make all efforts to minimize impacts due to delays caused by the Departmental Representative, including re-sequencing Work. Provide documentation of a sufficient description of the facts and circumstances of the occurrence to enable the Departmental Representative to determine whether or not the Standby Time is justified. Reviews, sampling, or other work conducted by the Departmental Representative with time allowances in accordance with the Contract will result in no increase to the Contract Amount nor Extension of Time for completion of the Work.

1.1.8. Contaminated Wastewater Treatment Plant Provision will be paid in accordance with lump sum price established to design, temporarily provide for duration of Work, and erect Contaminated Wastewater Treatment Plant. Includes all ancillary tanks, storage containers, equipment and piping to collect, store, treat, sample, and discharge contaminated or potentially Contaminated Wastewater.

1.1.9. Contaminated Wastewater Treatment Plant Operation will be paid in accordance with the lump sum price established for time duration to operate and maintain Contaminated Wastewater Treatment Plant. Includes all ancillary tanks, storage containers, equipment and piping to collect, store, treat, sample, and discharge contaminated or potentially Contaminated Wastewater. Includes sampling and analysis, and consumables for water treatment.

1.1.10. Cofferdam:

1.1.10.1. Cofferdam Provision will be paid in accordance with lump sum price established to design and temporarily provide for duration of Work the Cofferdam. Includes all materials required for shoring and bracing for excavation in the marine environment. Also includes all materials for marine environment dewatering and pumping systems.

1.1.10.2. Cofferdam Installation will be paid in accordance with lump sum price established to erect Cofferdam. Includes installation and maintenance for the duration of the Work of shoring and bracing required for excavation in the marine environment. Also includes all installation and maintenance of marine environment dewatering and pumping systems. Also includes initial dewatering behind Cofferdam.

1.1.10.3. Cofferdam Removal will be paid in accordance with lump sum price established to remove Cofferdam. Includes refilling of Rock Bay behind Cofferdam and removal of the Cofferdam at Completion of Work. Also includes removal of marine environment dewatering and pumping systems

1.1.11. Temporary Support Walls:

1.1.11.1. Temporary Support Provision for uplands boundaries will be paid in accordance with lump sum price established to design and temporarily provide for duration of Work the Temporary Support Walls. Includes all

materials required for shoring and bracing for excavation in the uplands. Also includes all materials for uplands dewatering and pumping systems.

1.1.11.2. Temporary Support Installation for uplands boundaries will be paid in accordance with lump sum price established to erect Temporary Support Walls. Includes installation and maintenance for the duration of the Work of shoring and bracing required for excavation in the uplands. Also includes all installation and maintenance of uplands dewatering and pumping systems.

1.1.11.3. Temporary Support Removal for uplands boundaries will be paid in accordance with lump sum price established to remove Temporary Support Walls. Includes removal of shoring and bracing required for excavation in the uplands. Also includes removal of uplands dewatering and pumping systems.

1.1.12. Excavation and Loading for Direct Offsite Transport ("hot loading") will be paid in accordance with unit rate price established for ex-situ weight of material removed. Measurement will be as recorded on Contractor supplied onsite weigh-scale certified by Measurement Canada and results provided to Departmental Representative for material as instructed by the Departmental Representative or in accordance with the Contract for direct offsite transport. Includes stockpiling onsite and loading for offsite transportation if Contractor elects to not load for direct offsite transport. Does not include offsite transportation.

1.1.13. Geoduck Hole Excavation will be paid in accordance with unit rate price established for ex-situ weight of material removed. Measurement will be as recorded on Contractor supplied onsite weigh-scale certified by Measurement Canada and results provided to Departmental Representative for material as instructed by the Departmental Representative for direct offsite transport. Includes stockpiling onsite and loading for offsite transportation if Contractor elects to not load for direct offsite transport. Does not include offsite transportation.

1.1.14. Excavation and Loading for Onsite Stockpiling will be paid in accordance with unit rate price established for ex-situ weight of material removed as recorded on Contractor supplied onsite weigh-scale certified by Measurement Canada and results provided to Departmental Representative for material as instructed by the Departmental Representative or in accordance with the Contract for onsite stockpile for ex-situ characterization. Includes, onsite transport and stockpiling for ex-situ characterization.

1.1.15. Outfalls will be paid in accordance with lump sum price established for removal and replacement of stormwater pipes and outfalls 626 and 627 in accordance with the Contract and includes diversion of flows during construction.

1.1.16. Sand Seam Seal will be paid in accordance with lump sum price established for provision and installation of a sand seam seal in accordance with the Contract.

1.1.17. Waste Oversize Debris Removal will be paid in accordance with unit rate price established for time to remove oversize material from excavation.

1.1.18. Backfill will be paid in accordance with unit rate price established per tonne for imported backfill material as recorded on Contractor supplied weigh scale

certified by Measurement Canada receipts and results provided to Departmental Representative. Includes provision, transport to Site, onsite transport, placing, grading and compacting.

1.1.19. Contaminated Waste Transport will be paid in accordance with unit rate price established for weight identified by weigh scale receipts from an offsite receiving facility. Includes loading, barging, hauling, interim storage, and handling for all material transported from Site. If material is taken to a Treatment Facility before a Disposal Facility, payment includes transport and handling to both Treatment Facility and Disposal Facility.

1.1.20. Non-Contaminated Waste (CL) Transport will be paid in accordance with unit rate price established for weight identified by weigh scale receipts from an offsite receiving facility. Includes loading, barging, hauling, interim storage, and handling for all material transported from Site.

1.1.21. Contaminated Waste Treatment will be paid in accordance with unit rate price established for weight identified on Certificates of Treatment.

1.1.22. Contaminated Waste Disposal will be paid in accordance with unit rate price established for weight identified on Certificates of Disposal.

1.1.23. Non-Contaminated Waste (CL) Disposal will be paid in accordance with unit rate price established for weight identified at receiving offsite Landfill facility.

1.1.24. Shoreline Remediation will be paid in accordance with the lump sum price established to supply, place, compact and construct shoreline remediation features in accordance with the Contract, including all Work, equipment and materials.

1.1.25. Site Restoration will be paid in accordance with the lump sum price established to restore the Site to make suitable for post-Work use as instructed by the Departmental Representative. Includes deconstructing all temporary facilities including Contaminated Wastewater Treatment Plant, removal of pavement installed in Stage 2 area, and removal of any incidental or generated material.

1.1.26. Installation of Permanent Fencing will be paid in accordance with the unit price established for the supply and installation of permanent fencing in accordance with the Contract.

1.1.27. Demobilization will be paid in accordance with lump sum price established for demobilizing all equipment and personnel associated with the Works from the Site. Includes decontaminating all equipment prior to removal from Site.

1.1.28. Closeout Submittals will be paid in accordance with lump sum price established for Final Site Inspection (for Certificate of Completion purposes), Closeout Meetings, provision of final as-built documents and completion documents as instructed by the Departmental Representative.

1.2. Definitions

1.2.1. Change Order: PWGSC form issued by the Departmental Representative to the Contractor as per the relevant Contemplated Change Notice.

1.2.2. Commercial Land Use: the use of land for the primary purpose of buying, selling or trading of merchandise or services including, without limitation, shopping

malls, office complexes, restaurants, hotels, motels, grocery stores, automobile service stations, petroleum distribution operations, dry cleaning operations, municipal yards, warehouses, law courts, museums, churches, golf courses, government offices, air and sea terminals, bus and railway stations, and storage associated with these uses. When referenced in the standards for levels of contamination, Commercial Land Use shall be defined as:

1.2.2.1. CL for material which does not exceed the applicable standard or guideline for Commercial Land Use.

1.2.2.2. CL+ for material which does exceed the applicable standard or guideline for Commercial Land Use but is not Hazardous Waste.

1.2.3. Confirmation Samples: soil and sediment samples collected from the base and walls of the excavation by the Departmental Representative to confirm that the remedial objectives for the Work have been met.

1.2.4. Contaminated Waste: soil and sediment where substances occur at concentrations that: (i) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (ii) exceed the levels specified in policies and regulations. All Contaminated Waste is assumed to be salt impacted, except for materials situated above 1.89 m geodetic elevation. Includes Hazardous Waste (HW) and Non-Hazardous Contaminated Waste (CL+); does not include Non-Contaminated Waste. Relevant regulations, unless otherwise in accordance with the Contract or as instructed by the Departmental Representative, include:

1.2.4.1. For all sites: Canadian Council of Ministers of the Environment (CCME) *Canadian Environmental Quality Guidelines* and CCME *Canada-Wide Standards*.

1.2.4.2. For sites in BC: BC *Hazardous Waste Regulations*, BC *Approved Water Quality Guidelines*, BC *Contaminated Sites Regulation*.

1.2.5. Contaminated Wastewater: liquid material where substances occur at concentrations that: (i) are above background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment, or (ii) meet or exceed the levels specified in policies and regulations. Includes Hazardous Wastewater (HW) and Non-Hazardous Contaminated Wastewater (CL+); does not include Non-Contaminated Wastewater or Sewage Wastewater. Relevant regulations, unless otherwise in accordance with the Contract or as instructed by the Departmental Representative, include:

1.2.5.1. For all sites: Canadian Council of Ministers of the Environment (CCME) *Canadian Environmental Quality Guideline*s and CCME *Canada-Wide Standards*.

1.2.5.2. For sites in BC: BC *Hazardous Waste Regulations*, BC *Approved Water Quality Guidelines*.

1.2.6. Contaminated Wastewater Treatment Plant: a temporary onsite or existing offsite facility located in Canada that is designed, constructed and operated for the handling or processing of Contaminated Wastewater in such a manner as to change the physical, chemical or biological character or composition of the

water to lower than the site-specific remedial objective, Discharge Approval, and in compliance with all regulations.

1.2.7. Contemplated Change Notice: PWGSC form issued by the Departmental Representative to the Contractor requesting Contractor to provide a quote, which may result in a Change Order.

1.2.8. Contract: see General Conditions.

1.2.9. Contract Amount: see General Conditions.

1.2.10. Contractor: see General Conditions.

1.2.11. Departmental Representative: see General Conditions.

1.2.12. Discharge Approval: permit, certificate, approval, or any other form of authorization issued by appropriate federal agency, province, territory, or municipality having jurisdiction and authorizing offsite discharge.

1.2.13. Disposal Facility: a facility specifically used to introduce waste into the environment for the purpose of final burial.

1.2.14. Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

1.2.15. Environmental Protection: prevention, control, mitigation, and restoration of pollution and habitat or environmental disruption during construction. Control of Environmental Pollution and Damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; vibrations; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.16. Environmental Protection Plan: plan developed by the Contractor to ensure Environmental Protection and prevent Environmental Pollution and Damage identifying all environmental risks and mitigation measures, including: personnel requirements, emergency contacts, Environmental Protection methods, procedures, and equipment, and emergency response including a Spill Control Plan.

1.2.17. Extension of Time: see General Conditions.

1.2.18. Extension of Time on Contracts: PWGSC form requesting an Extension of Time.

1.2.19. Final Completion: see General Conditions.

1.2.20. Hazardous Waste (HW): Contaminated Waste which meets the regulatory definition of Hazardous Waste. Includes:

1.2.20.1. Hazardous Waste – Treatable (HW Hydrocarbons): Hazardous Waste which contains only contaminants which are amenable to treatment.

1.2.20.2. Hazardous Waste – Comingled (HW Hydrocarbons and CL+ Metals): Hazardous Waste which contains some contaminants which are amenable to treatment and some that are not.

1.2.21. Land Surveyor: a person working for the Contractor who is a qualified, registered land surveyor licensed to practice in relevant jurisdiction.

1.2.22. Landfill: an existing offsite facility located in Canada that is designed, constructed and operated to prevent any pollution from being caused by the facility outside the area of the facility from waste placed in or on land within the facility.
1.2.23. Materials Source Separation Program: consists of a series of ongoing activities to separate reusable and recyclable waste into categories from other types of waste at point of generation.
1.2.24. Neighbourhood Air Quality Management Plan: air quality plan to protect the general public in the vicinity of the Site due to the Work. Does not include air quality to protect on Site workers, which is the concern of the Prime Contractor.
1.2.25. Non-Contaminated Waste (CL): soil and sediment which is not Contaminated Waste. Includes cleared and grubbed vegetation, litter, rubbish, debris, cobbles, boulders, excess construction material, lumber, steel, plastic, concrete, and asphalt. Includes surplus or unsuitable material such as Topsoil or excavated Overburden. All Non-Contaminated Waste (CL) is assumed to be salt impacted, except for materials situated above 1.89 m geodetic elevation.
1.2.26. Non-Contaminated Wastewater: liquids which are suitable for direct discharge to the environment after removal of sediment, and which is not Contaminated Wastewater or Sewage Wastewater. Includes surface runoff, stormwater, and groundwater which has not come into contact with Contaminated Waste.
1.2.27. Non-Hazardous Contaminated Waste (CL+): Contaminated Waste which does not meet the regulatory definition of Hazardous Waste. Includes:
1.2.27.1. Non-Hazardous Contaminated Waste – Treatable (CL+ Hydrocarbons): Non-Hazardous Contaminated Waste which contains only contaminants which are amenable to treatment.
1.2.27.2. Non-Hazardous Contaminated Waste – Non-treatable (CL+ Metals): Non-Hazardous Contaminated Waste which contains only contaminants which are not amenable to treatment.
1.2.27.3. Non-Hazardous Contaminated Waste – Comingled (CL+ Metals and CL+ Hydrocarbons): Non-Hazardous Contaminated Waste which contains some contaminants which are amenable to treatment and some that are not.
1.2.28. Non-Hazardous Contaminated Wastewater (CL+): Contaminated Wastewater which does not meet the regulatory definition of Hazardous Waste.
1.2.29. On Site Instruction: instructions or other communications issued by the Departmental Representative to the Contractor.
1.2.30. On Site Notice: notice or other communication issued by the Contractor to the Departmental Representative.
1.2.31. Overburden: non-contaminated soil or sediment excavated incidentally that is not Topsoil.
1.2.32. Progress Payment: see General Conditions.
1.2.33. Qualified Professional: a person working for the Contractor who is registered in relevant jurisdiction with his or her appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association, and through suitable education,

experience, accreditation and knowledge can be reasonably relied on to provide advice within his or her area of expertise.

1.2.34. Quote: Contractor's cost estimate issued to the Departmental Representative as per the relevant Contemplated Change Notice via an On Site Notice.

1.2.35. Remediation by Excavation: full excavation of Contaminated Waste and Non-Contaminated Waste (CL) to the Site boundaries for the purpose of remediating the Site. Includes full treatment and disposal. Does not include risk assessment or risk management of material onsite. Does not include encapsulation or solidification in place.

1.2.36. Sewage Wastewater: liquid waste which is not suitable for direct discharge to the environment, and which must be either treated offsite or discharged to a sanitary sewer. Includes water from hand basin, shower, personal hygiene facilities, or other liquid waste from sanitary facilities.

1.2.37. Site: area shown on Drawings.

1.2.38. Subcontractor: see General Conditions.

1.2.39. Submit/Submittals: documents from the Contractor to the Departmental Representative as: required by Contract; stipulated in permit, certificate, approval, or any other form of authorization; by convention or industry practice. Submittals are final only after review and accepted in writing by Departmental Representative.

1.2.40. Substantial Performance: see General Conditions.

1.2.41. Superintendent: see General Conditions

1.2.42. Supplier: see General Conditions.

1.2.43. Topsoil: non-contaminated soil excavated incidentally that is a surface organic layer to facilitate vegetation growth.

1.2.44. Treatment Facility: a facility specifically used to treat Contaminated Waste.

1.2.45. Waste Oversize Debris: Waste that is required to be excavated and is: larger than 1 cubic metre or larger than 2 metres in one dimension, cannot be removed with a typical excavator, and requires the use of special equipment (e.g., saws, hydraulic cutters, excavator hammers, vibratory pile extractors).

1.2.46. Waste Quality: soil or other material that is not suitable for industrial, commercial, urban park, residential, agricultural, wildlands or any other land use specified in the BC *Contaminated Sites Regulation.*

1.2.47. Waste Reduction Plan: a written report which addresses opportunities for reduction, reuse or recycling of materials.

1.2.48. Work: see General Conditions.

1.2.49. Working Day: see General Conditions.

1.3. Action and Informational Submittals

1.3.1. After hours work: at least 5 Working Days prior to commencing after hours work Submit a schedule showing requested dates, times, and reasons for after hours work. Approval will only be granted for reasons valid in the opinion of the Departmental Representative and if request can be reasonably accommodated by other contracts.

1.4. Work Covered by Contract

1.4.1. Work under the Contract covers remediation of contaminated material by excavation and offsite treatment and disposal at the Rock Bay Site, Victoria, BC.

1.4.2. Work to be performed under the Contract includes, but is not limited to, the following items covered further in the Contract:

1.4.2.1. Prime Contractor for health and safety and environmental protection at Site.
1.4.2.2. All required design activities to complete Work.
1.4.2.3. Pre-mobilization Submittals.
1.4.2.4. Progress Submittals, including cash flow and forecasting.
1.4.2.5. Prepare Site for Work, including onsite temporary office facilities for Departmental Representative and consultants.
1.4.2.6. Plan excavation, including geotechnical design as required.
1.4.2.7. Design and operate Contaminated Wastewater Treatment Plant.
1.4.2.8. Design and install Cofferdam to allow excavation of sediments in the dry.
1.4.2.9. Dewater Rock Bay behind Cofferdam.
1.4.2.10. Design and install temporary shoring support to allow excavation of uplands soil to property line.
1.4.2.11. Remove and replace existing stormwater pipes and outfalls and manage outfall flows during construction.
1.4.2.12. Excavate Non-Contaminated Waste (CL material) as determined by the Departmental Representative.
1.4.2.13. Excavate Contaminated Waste (HW and CL+ material) as determined by the Departmental Representative.
1.4.2.14. Excavation of Contaminated Waste to extend to project Site boundary with zero percent residual contamination at Final Completion.
1.4.2.15. Backfill excavations with clean imported fill material.
1.4.2.16. Load and transport Contaminated Waste and Non-Contaminated Waste to a Disposal Facility or Treatment Facility for final disposal.
1.4.2.17. Construct shoreline remediation.
1.4.2.18. Refill Rock Bay behind Cofferdam.
1.4.2.19. Remove Cofferdam and temporary shoring.
1.4.2.20. Restore Site suitable for use as a gravel parking lot.
1.4.2.21. As-built and closure Submittals.
1.4.2.22. All ancillary activities required to complete Work.

1.4.3. Green Requirements:

1.4.3.1. Use only environmentally responsible green materials/products with no Volatile Organic Compounds (VOC) emissions or minimum VOC emissions of indoor off-gassing contaminants for improved indoor air quality – subject of acceptance of Submittal of Materials Safety Data Sheet (MSDS) Product Data.

1.4.3.2. Use materials/products containing highest percentage of recycled and recovered materials practicable – consistent with maintaining cost effective satisfactory levels of competition.

1.4.3.3. Adhere to waste reduction requirement for reuse or recycling of waste materials, thus diverting materials from Landfill.
1.4.4. Work not included in the Contract comprises such work and services specifically listed as:
1.4.4.1. Not Used.

1.5. Location
1.5.1. The Site is located adjacent to Rock Bay southeast of Barclay Point in Victoria, BC, as shown on Drawings.
1.5.2. The approximate geodetic coordinates for the centre of the Stage 3 area are:
1.5.2.1. Latitude: 48°26'1.9"N.
1.5.2.2. Longitude: 123°22'7.5"W.
1.5.3. The approximate UTM coordinates for the centre for the Stage 3 area are:
1.5.3.1. Coordinate System: NAD 83, Zone 10, Hemisphere North.
1.5.3.2. UTM X Coordinate: 472723.7.
1.5.3.3. UTM Y Coordinate: 5364589.1.
1.5.4. There is no civic street address or PIN for Rock Bay Site.
1.5.5. The Transport Canada property at Rock Bay is described in the Six Harbours Agreement (1924).

1.6. Project/Site Conditions
1.6.1. Work at Site will involve contact with contaminated materials including:
1.6.1.1. Hydrocarbons (Light Extract Petroleum Hydrocarbons (LEPHs) and Heavy Extract Petroleum Hydrocarbons (HEPHs)).
1.6.1.2. Polyaromatic Hydrocarbons (PAHs).
1.6.1.3. Metals.
1.6.1.4. Cyanide in groundwater.
1.6.1.5. Sodium and Chloride.
1.6.2. Complete list of anticipated contaminants and concentration levels on the Site available separately in assessment reports.
1.6.3. Existing conditions on the Site may vary; however, the following conditions currently exist:
1.6.3.1. Outfall 626 enters the Site from the east near the southeast corner of the uplands and drains into Rock Bay. The outfall includes a headwall. The existing tidegate will be removed by others prior to the Work.
1.6.3.2. Outfall 627 enters the Site from the east at the northeast corner of the uplands and extends east then bends to the southwest and drains into Rock Bay. Outfall 627 does not currently have a headwall or tidegate attached.
1.6.3.3. The Stage 2 area as shown on Drawings is currently bare and the surface is a compacted 75 mm open-graded rock which slopes from south to north at approximately 0-4%.
1.6.3.4. The Stage 1 area as shown on Drawings was previously backfilled with clean backfill materials.

1.6.3.5. The excavation in the uplands area is anticipated to encounter buried piles, former foundations, concrete, bricks and other debris.
1.6.3.6. The uplands section of Stage 3 area has been fenced along the southern project Site boundary.
1.6.3.7. Gas and electrical lines are known to be present in the Stage 3 area.
1.6.3.8. The Stage 2 area which is being made available for storage and construction activities, is fully enclosed with a 2.4 m high chain-link fence except along the south-western corner north of the end of Store Street.

1.7. Other Contracts

1.7.1. Other contracts are currently in progress at Site.
1.7.2. Other contracts are:
1.7.2.1. Environmental and other consultants.
1.7.3. Further contracts may be awarded while the Contract is in progress.
1.7.4. Cooperate with other contractors in carrying out their respective works and carry out instructions from Departmental Representative.
1.7.5. Coordinate Work with that of other contractors. If any part of Work under the Contract depends for its proper execution or result upon Work of another contractor, report promptly to Departmental Representative, in writing, any defects which can interfere with proper execution of this Work.

1.8. Products Supplied by the Departmental Representative

1.8.1. Not Used.

1.9. Contractor's Use of Site

1.9.1. Use of Site:
1.9.1.1. For the sole benefit of Canada.
1.9.1.2. Exclusive and only for completion of the execution of Work.
1.9.1.3. Assume responsibility for assigned premises for performance of this Work.
1.9.1.4. Be responsible for coordination of all Work activities onsite, including the Work of other contractors engaged by the Departmental Representative.
1.9.2. There are no pre-existing arrangements for encroachment on the neighbouring properties. Shoring designs accommodating no offsite encroachment, or arrangements for offsite encroachment, are the responsibility of the Contractor.
1.9.3. Perform Work in accordance with Contract. Ensure Work is carried out in accordance with schedule accepted by Departmental Representative.
1.9.4. Do not unreasonably encumber Site with material or equipment.

1.10. Existing Permits

1.10.1. Existing permits are:
1.10.1.1. Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish No. 99-HPAC-PA3-000-000747.

1.11. Schedule Requirements

1.11.1. Work to be initiated: within 10 days of Contract Award.
1.11.2. Pre-Mobilization Submittals: no earlier than: 2014Apr01.
1.11.3. Mobilization: no earlier than: 2014Apr01.
1.11.4. Cofferdam Installation: no earlier than: 2014Jul01.
1.11.5. In-water Work: must occur as per schedule requirements of the Fisheries Permit.
1.11.6. Site Works: Final Completion no later than 2015Nov30.
1.11.7. Treatment Works: Final Completion no later than 2016Jan30.
1.11.8. Completion of the Work: no later than 2016Feb15. This includes all final Submittals including as-built documents, the Certificate of Completion, and the Statutory Declaration at Final Completion.

1.12. Hours of Work
1.12.1. Restrictive as follows:
1.12.1.1. Working Day work hours are 07:00 to 19:00.
1.12.2. Obtain consent from Departmental Representative for all after hours Work, including weekends and holidays.
1.12.2.1. Proceed only as instructed by the Departmental Representative.

1.13. Security Clearances
1.13.1. Not Used.

2. PART 2 - PRODUCTS

2.1. Not Used
2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used
3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Schedule: within 10 Working Days after Contract award, Submit a baseline Gantt chart. Include:

1.3.1.1. Dates of commencement and completion of Work for each Description of Work identified on the Unit Price Table.

1.3.1.2. Dates of Submittals including shop drawings, product data, MSDS sheets and samples.

1.3.1.3. Dates of inspection and testing.

1.3.1.4. Final Completion date within the time period in accordance with the Contract, including Amendments.

1.3.2. Schedule of Interruption of Services: at least 5 Working Days prior to any shutdown or closure of active utilities or facilities Submit a schedule identifying type of service and dates of shutdown or closure.

1.3.3. Utility Locations: at least 5 Working Days prior to commencing any subsurface disturbance, Submit drawings identifying all utilities on the Site. Update drawings as instructed by the Departmental Representative.

1.3.4. Breakdown of Lump Sum Prices: at least 5 Working Days prior to submitting the first Progress Payment, Submit a breakdown of the Contract lump sum prices including labour, material and time, in detail as instructed by the Departmental Representative and aggregating Contract Amount.

1.3.5. Daily Work Records: at the end of each shift Submit daily Work records, during onsite Work. Include:

1.3.5.1. Quantities for each Description of Work identified in the Unit Price Table and Change Orders.

1.3.5.2. Description of Work performed.

1.3.5.3. Current Site conditions.

1.3.5.4. General information including: date, time shift started and ended, Subcontractor(s) onsite, Health and Safety items, and Environmental Protection items.

1.3.5.5. Signature of Superintendent and Departmental Representative.

1.3.6. Cash Flow: with each Progress Payment, Submit a cash flow forecast. Include:

1.3.6.1. Calculation of planned cost versus actual cost and schedule forecasting and cash flow projections on a monthly basis, indicating anticipated value of future Progress Payments, for each Description of Work identified in the Unit Price Table.

1.3.6.2. Progress Payments will not be processed until cash flow has been accepted by the Departmental Representative.
1.3.7. Coordination Meeting Minutes and Drawings: at least 5 Working Days prior to relevant Work commencing, Submit final meeting minutes and drawings from coordination with Subcontractors.
1.3.8. Quality Management Plan: within 40 Working Days after Contract award, Submit a quality management plan. Include:
1.3.8.1. Details on planned review, inspection and testing to provide Quality Assurance and Quality Control for the Work.
1.3.8.2. Subcontractors responsible for review, inspection and testing.
1.3.8.3. Schedule of submittals of review, inspection and testing results.
1.3.9. Review, Inspection, and Testing Results: within 5 Working Days of receipt, Submit all results of reviews, inspection, and testing performed as part of the Work, including laboratory reports.

1.4. Division of Specifications

1.4.1. This specification is subdivided into Divisions and Sections in accordance with the six digit National Master Specifications System.
1.4.2. A Division or Section may consist of the Work of more than one Subcontractor. Responsibility for determining which Subcontractor provides the labour, material, equipment and services required to complete the Work rests solely with the Contractor.

1.5. Work Schedule

1.5.1. Carry out Work in accordance with the Contract and as follows:
1.5.1.1. Do not change Schedule accepted by the Departmental Representative without approval from Departmental Representative.
1.5.1.2. Interim reviews of Work progress based on Work schedule must be conducted at Progress Meetings or as instructed by the Departmental Representative and schedule updated by Contractor as instructed by the Departmental Representative.

1.6. Documents Required

1.6.1. Maintain 1 copy each of the following posted at the job Site:
1.6.1.1. General Conditions.
1.6.1.2. Drawings.
1.6.1.3. Specifications.
1.6.1.4. Addenda or other modifications to Contract.
1.6.1.5. Change orders.
1.6.1.6. Copy of current Work schedule.
1.6.1.7. Reviewed and final shop drawings Submittals.
1.6.1.8. One set of record drawings and Specifications for “as-built” purposes.
1.6.1.9. Field and laboratory test reports.
1.6.1.10. Reviewed and accepted Submittals.

1.6.1.11. Manufacturers' installation and application instructions (as appropriate).
1.6.1.12. National Building Code of Canada (as appropriate).
1.6.1.13. Current construction standards of workmanship listed in technical Sections (as appropriate).
1.6.1.14. Health and Safety documents, including all daily toolbox meetings, Notice of Project, and utility clearances.
1.6.1.15. Environmental Protection Plan.
1.6.1.16. Quality Management Plan.
1.6.1.17. Final Meeting Minutes, Agendas and associated attachments.
1.6.1.18. Permits and other approvals.

1.7. Setting out of Work

1.7.1. Assume full responsibility for and execute complete layout of Work to locations, lines and elevations in accordance with the Contract.
1.7.2. Provide devices needed to layout and construct Work.
1.7.3. Supply such services and devices in accordance with the Contract to facilitate Departmental Representative's inspection of Work.

1.8. Acceptance of Substrates

1.8.1. Each trade must examine surfaces prepared by others and job conditions which can affect his work, and must report defects to the Departmental Representative. Commencement of Work will imply acceptance of prepared Work or substrate surfaces.

1.9. Works Coordination

1.9.1. Coordinate Work of Subcontractors.
1.9.1.1. Designate one person to be responsible for review of Contract and shop drawings and managing coordination of Work.
1.9.2. Convene meetings between Subcontractors whose Work interfaces and ensure awareness of areas and extent of interface required.
1.9.2.1. Provide each Subcontractor with complete Drawings and Specifications for Contract, to assist them in planning and carrying out their respective work.
1.9.2.2. Develop coordination drawings when required, illustrating potential interference between Work of various trades and distribute to affected parties.
1.9.2.3. Facilitate meeting and review coordination drawings. Ensure Subcontractors agree and sign off on coordination drawings.
1.9.2.4. Publish minutes of each meeting.
1.9.2.5. Submit a copy of coordination drawings and meeting minutes as instructed by the Departmental Representative.
1.9.3. Submit shop drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.
1.9.4. Work coordination:
1.9.4.1. Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.

1.9.4.2. Ensure that each trade provides all other trades reasonable opportunity for Final Completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed Work.
1.9.4.3. Ensure disputes between Subcontractors are resolved.
1.9.5. Failure to coordinate Work is responsibility of Contractor.

1.10. Approvals of Shop Drawings, Product Data and Samples
1.10.1. The term "shop drawings" means drawings, figures, diagrams, illustrations, schedules, performance charts, brochures and other data which are Submittals by Contractor to illustrate details of a portion of Work.
1.10.2. Submit as instructed by the Departmental Representative the requested shop drawings, product data, MSDS sheets and samples in accordance with the Contract.
1.10.3. Allow sufficient time for the following:
1.10.3.1. Review of product data.
1.10.3.2. Acceptance of shop drawings.
1.10.3.3. Review of re-submission.
1.10.3.4. Ordering of accepted material and/or products.

1.11. Relics and Antiquities
1.11.1. See General Conditions.

1.12. Quality of Work
1.12.1. Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman, or Qualified Professional.
1.12.2. Meet or exceed standards set out in the National Building Code of Canada as applicable for workmanship, erection methods and procedures.
1.12.3. In cases of dispute, perform Work to standard or quality in accordance with any decisions by the Departmental Representative.
1.12.4. Follow Departmental Representative’s instructions to meet the Quality of Work in accordance with the Contract at no increase to the Contract Amount and no increase to Extension of Time for completion of the Work. Quality of Work includes addressing comments on Submittals, modifying environmental procedures, and preventing or remediating contaminated material spills.

1.13. Quality Management
1.13.1. Be responsible for all Quality Assurance and Quality Control during the performance of the Work.
1.13.2. Quality Assurance and Quality Control includes monitoring, inspecting, testing, documenting and reporting the means, methods, materials, workmanship, processes, and products of all aspects of the Work, including design, construction, and management as necessary to ensure conformance with the Contract.

1.13.3. Assist Departmental Representative in quality audit inspections and submit all indicated information within 5 Working Days of collection or as instructed.

1.14. Inspection and Testing

1.14.1. Appoint and pay for the services of testing agency or testing laboratory where required for the following:

1.14.1.1. Inspection and testing in accordance with the Contract.

1.14.1.2. Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

1.14.1.3. Inspection and testing performed exclusively for Contractor's convenience.

1.14.2. Where tests or inspections by designated testing laboratory reveal Work is not in accordance with the Contract, perform additional inspections or tests as instructed by the Departmental Representative to verify acceptance of corrected Work.

1.14.3. Notify and obtain approval in advance of planned testing.

1.14.4. Where materials in accordance with the Contract to be tested, deliver representative samples in required quantity to testing laboratory.

1.14.5. Uncover and make good Work that is covered before specified inspection or testing in accordance with the Contract is completed and reviewed for acceptance.

1.14.6. Test results must be signed by Qualified Professional.

1.14.7. The Departmental Representative may require, and pay for, additional inspection and testing services not included above.

1.15. Additional Drawings

1.15.1. The Departmental Representative may furnish additional Drawings for clarification. These additional Drawings have the same meaning and intent as if they were included with Drawings referred to in the Contract.

1.15.2. Upon request, Departmental Representative may furnish up to a maximum of 2 sets of Drawings for use by the Contractor at no additional cost. Should more than 2 sets of documents be required the Departmental Representative will provide them at additional cost.

1.16. Record Keeping

1.16.1. On Site Notifications: All correspondence from Contractor to the Departmental Representative, including Submittals, Quotes, and Extension Of Time On Contracts, must be as a sequentially numbered On Site Notifications. Include cross references to applicable On Site Instructions. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Notifications.

1.16.2. On Site Instructions: All correspondence from the Departmental Representative to the Contractor, including Contemplated Change Notices, Change Orders, and Extension of Time on Contracts, will be as sequentially numbered On Site Instructions. Include cross references to applicable On Site Notifications. The

status of the Contractor, including the function of Prime Contractor, must not change by reason of any On Site Instructions.

1.16.3. Maintain adequate records to support information provided to Departmental Representative.

1.16.4. Maintain asbestos waste shipment records or other Hazardous Waste Manifests for minimum of 3 years from date of shipment or longer period required by applicable law or regulation.

1.16.5. Maintain bills of ladings for minimum of 300 days from date of shipment or longer period required by applicable law or regulation.

1.17. Change Documents

1.17.1. Change Documents do not relieve Contractor of any obligation.

1.17.2. Change Documents do not change the Contractor's responsibility for sequencing, methods and means.

1.17.3. Change Documents do not change by any reason the status of the Contractor, including the function of Prime Contractor or as supervisor.

1.17.4. Change Documents include:

1.17.4.1. Change Order: There may be an increase to the Contract Amount by reason of any Change Order. No Extension of Time for completion of the Work by reason of any Change Order.

1.17.4.2. Contemplated Change Notice: No increase to the Contract Amount by reason of any Contemplated Change Notice. No Extension of Time for completion of the Work by reason of any Contemplated Change Notice.

1.17.4.3. Extension of Time on Contracts: No increase to the Contract Amount by reason of any Extension of Time on Contracts. There may be an Extension of Time for completion of the Work by reason of an Extension of Time on Contracts.

1.17.4.4. Quote: No increase to the Contract Amount by reason of any Quote. No Extension of Time for completion of the Work by reason of any Quote. The status of the Contractor, including the function of Prime Contractor, must not change by reason of any Quote.

1.18. System of Measurement

1.18.1. The metric system of measurement (SI) will be employed on the Contract.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Preconstruction Meeting Minutes: within 2 Working Days of the Preconstruction Meeting, Submit meeting minutes.

1.3.2. Progress Meeting Minutes: within 2 Working Days of a Progress Meeting, Submit meeting minutes.

1.3.3. Information for Progress Meetings: at least 2 Working Days prior to scheduled Progress Meetings, Submit all information in accordance with the Contract for Progress Meetings. Include:

1.3.3.1. Agenda for the proposed Progress Meeting.

1.3.3.2. Updated progress schedule with commencement and Final Completion of Work for each Description of Work identified on the Unit Price Table. Include review of progress with respect to previously established dates for starting and stopping various stages of Work, major problems and action taken, Contract compliance, injury reports, equipment breakdown, and material removal.

1.3.3.3. Copies of transport manifests and disposal receipts for all materials removed from Site.

1.3.3.4. Other information as instructed by the Departmental Representative or relevant to agenda for upcoming progress meeting.

1.3.4. Final Site Inspection: within 2 Working Days of the Final Site Inspection, Submit meeting minutes.

1.3.5. Closeout Meetings: within 2 Working Days of the Closeout Meeting, Submit meeting minutes.

1.4. Administrative

1.4.1. Schedule and administer project meetings throughout the progress of the Work weekly and at the call of the Departmental Representative.

1.4.2. Prepare agenda for meetings.

1.4.3. Submit written notice with agenda of each meeting 2 Working Days in advance of meeting date as instructed by the Departmental Representative.

1.4.4. Provide physical space and make arrangements for meetings.

1.4.5. Preside at meetings.

1.4.6. Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

1.4.7. Maintain records of meeting minutes for a minimum of 2 years after Work is completed.
1.4.8. Representative of Contractor, Subcontractor(s) and Supplier(s) attending meetings must be qualified and authorized to act on behalf of party each represents.

1.5. Preconstruction Meeting

1.5.1. Within 5 Working Days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
1.5.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
1.5.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
1.5.4. Agenda to include:
1.5.4.1. Appointment of official representative of participants in the Work, including Contractor's Superintendent and PWGSC Departmental Representative.
1.5.4.2. Schedule of Work.
1.5.4.3. Schedule of Submittals.
1.5.4.4. Requirements for temporary facilities.
1.5.4.5. Site security.
1.5.4.6. Change orders, procedures, approvals required, administrative requirements.
1.5.4.7. Monthly Progress Payments, administrative procedures, hold backs.
1.5.4.8. Appointment of inspection and testing agencies or firms.
1.5.4.9. List of Subcontractor(s).

1.6. Progress Meetings

1.6.1. During course of Work schedule progress meetings weekly subject to approval by Departmental Representative.
1.6.2. Contractor, Superintendent, major Subcontractor(s) involved in Work, and Departmental Representative are to be in attendance.
1.6.3. Agenda to include:
1.6.3.1. Review and acceptance of minutes of previous meeting.
1.6.3.2. Review health and safety, including incidents, near misses, and corrective measures.
1.6.3.3. Review Environmental Protection, including incidents, near misses, and corrective measures.
1.6.3.4. Review contractual compliance.
1.6.3.5. Review regulatory compliance.
1.6.3.6. Review communications, problems or concerns with community.
1.6.3.7. Review of Work progress since previous meeting.
1.6.3.8. Field observations, problems, conflicts.
1.6.3.9. Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various

stages of Work.
1.6.3.10. Problems which impede construction schedule.
1.6.3.11. Corrective measures and procedures to regain projected schedule.
1.6.3.12. Revision to construction schedule.
1.6.3.13. Progress schedule, during succeeding Work period.
1.6.3.14. Review submittal schedules: expedite as required.
1.6.3.15. Maintenance of quality standards.
1.6.3.16. Quantities of material transported, treated, and disposed.
1.6.3.17. Review proposed changes for affect on construction schedule and on Final Completion date.
1.6.3.18. Other business.

1.7. Toolbox Meetings

1.7.1. During the course of the Work, schedule daily toolbox meetings at the start of each Work shift. Multiple meetings are required if the Contractor works multiple shifts within a 24-hour period.
1.7.2. All on Site workers to attend, including Contractor, Superintendent, major Subcontractor(s), and environmental consultants. Departmental Representative may attend.
1.7.3. Agenda to include:
1.7.3.1. Planned Work activities and environmental considerations for that shift.
1.7.3.2. Coordination activities required between Contractor, Subcontractor(s), Departmental Representative, and other contractor(s) including environmental consultant.
1.7.3.3. Health and Safety items.
1.7.3.4. Environmental Protection items.

1.8. Final Site Inspection

1.8.1. Within 5 Working Days of completion of Site Works and Demobilization, request a meeting on Site to review the Site.
1.8.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.
1.8.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.
1.8.4. Agenda to include:
1.8.4.1. Inspect removal of all temporary equipment, materials, supplies, and facilities.
1.8.4.2. Inspect final surface grades.
1.8.4.3. Inspect final vegetation.
1.8.4.4. Inspect permanent facilities for performance and damage.
1.8.4.5. Document all damage, deficiencies, missing items, and non-conformance.

1.8.5. If required, and in the opinion of the Departmental Representative, perform another Final Site Inspection after resolving all documented damage, deficiencies, missing items, and non-conformance.

1.9. Closeout Meeting

1.9.1. Within 10 Working Days of completion of the Work, request a meeting to review the project.

1.9.2. Departmental Representative, Contractor, Superintendent, major Subcontractor(s), field inspectors and supervisors must be in attendance.

1.9.3. Establish time and location of meeting subject to approval by Departmental Representative and notify parties concerned at least 3 Working Days before meeting.

1.9.4. Agenda to include:

1.9.4.1. Review Certificate of Completion.

1.9.4.2. Review final payment.

1.9.4.3. Identify lessons learned.

1.9.4.4. Perform Contractor Performance Evaluation Report Form.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Shop Drawings: at least 5 Working Days prior to commencing applicable Work, Submit Shop Drawings signed by a Qualified Professional.

1.4. General

1.4.1. This section specifies general requirements and procedures for the Contractor's Submittals of design drawings, shop drawings, product data, samples and other submittals in accordance with the Contract to Departmental Representative. Additional specific requirements for Submittals are identified in individual technical sections.

1.4.2. Present shop drawings, product data and samples in SI Metric units.

1.4.3. Where items or information is not produced in SI Metric units, converted values are acceptable.

1.4.4. Contractor's responsibility for errors and omissions in Submittals is not relieved by the Departmental Representative's review of Submittals.

1.4.5. Notify Departmental Representative in writing at time of Submittals, identifying deviations from requirements of Contract and stating reasons for deviations.

1.4.6. Contractor's responsibility for deviations in Submittals from requirements of Contract is not relieved by the Departmental Representative's review of Submittals unless Departmental Representative gives written acceptance of specific deviations.

1.4.7. Make any changes in Submittals which Departmental Representative requires to be in accordance with the Contract and resubmit as instructed by the Departmental Representative.

1.4.8. Notify Departmental Representative in writing, when resubmitting, of any revisions other than those instructed by the Departmental Representative.

1.4.9. Do not proceed with Work until relevant Submittals are finalized and have been accepted.

1.4.10. Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to Submit in ample time is responsibility of Contractor.

1.4.11. Review Submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each Submittal has been checked and coordinated with requirements of Work and Contract. Submittals not stamped, signed, dated

and identified as to specific project will be returned without being examined and considered rejected.

1.4.12. Verify field measurements and affected adjacent Work are coordinated.

1.4.13. Adjustments made on Submittals by the Departmental Representative will not result in an increase the Contract Amount nor an Extension of Time for completion of the Work. If adjustments result in an increase to the Contract Amount or an Extension of Time for completion of the Work, notify Departmental Representative and receive approval prior to proceeding with Work.

1.4.14. Keep one final copy of each Submittal onsite.

1.5. Submission Requirements

1.5.1. Coordinate each Submittal with the requirements of the Work and the Contract. Individual Submittals will not be reviewed until:

1.5.1.1. Submittals are complete.

1.5.1.2. All related information is available.

1.5.2. Allow 10 Working Days for Departmental Representative's review of each Submittal, unless otherwise specified.

1.5.3. All Submittals are to be sent to Departmental Representative in duplicate as a hardcopy and in electronic format compatible with Departmental Representative's software.

1.5.4. Accompany Submittals with On Site Notification:

1.5.4.1. Date.

1.5.4.2. Project title and number.

1.5.4.3. Contractor's name and address.

1.5.4.4. Identification and quantity of each shop drawing, product data and sample.

1.5.4.5. Other pertinent data.

1.5.5. Submittals must include:

1.5.5.1. Date and revision dates.

1.5.5.2. Project title and number.

1.5.5.3. Name and address of:

1.5.5.3.1. Subcontractor.

1.5.5.3.2. Supplier.

1.5.5.3.3. Manufacturer.

1.5.5.4. Signature of Superintendent, certifying approval of Submittals, verification of field measurements and in accordance with the Contract.

1.5.5.5. Qualified Professional to sign and seal Submittals in accordance with the Contract. Submittals to include at a minimum 1 hard copy of original ink sealed document.

1.5.5.6. Details of appropriate portions of Work as applicable.

1.6. Shop Drawings

1.6.1. Shop drawings are drawings, figures, diagrams, illustrations, schedules, performance charts, brochures and other data intended to illustrate details of a portion of the Work which are provided by the Qualified Professional of record.
1.6.2. Maximum sheet size: ANSI E (864 x 1118 mm).
1.6.3. Submit, as instructed by the Departmental Representative, 2 copies of shop drawings for each requirement requested in the specification sections and/or as instructed by the Departmental Representative.
1.6.4. Cross-reference shop drawing information to applicable portions of the Contract.
1.6.5. Qualified Professional to sign and seal each individual shop drawing.
1.6.6. Qualified Professional to sign and seal final design drawings and submit as instructed by the Departmental Representative upon Final Completion of the construction project. Final design drawings are prepared by a Qualified Professional to reflect design changes made during the construction of the Remediation by Excavation project. Final design drawings are intended to incorporate addenda, change orders and other significant design changes, but not necessarily Site instructions.
1.6.7. Shop drawings must include:
1.6.7.1. The original date of issue.
1.6.7.2. The dates of all applicable revisions.
1.6.7.3. The project title.
1.6.7.4. The project address.
1.6.7.5. The project number.
1.6.7.6. Wherever applicable, the name(s) of the: Contractor, Subcontractor(s), Supplier(s), manufacturers, and separate detailers.
1.6.7.7. The sequence number for each shop drawing.
1.6.7.8. Identifications of all products and materials.
1.6.7.9. Relation to adjacent structures or materials.
1.6.7.10. Clearly identified field dimensions.
1.6.7.11. Applicable standards.

1.7. Shop Drawings Review

1.7.1. Departmental Representative's review of shop drawings is to determine if shop drawings are consistent with the general intent of the Contract and are in accordance with the Contract.
1.7.2. This review will not mean that Departmental Representative approves the detail design inherent in the shop drawings, responsibility for which will remain with Contractor submitting same.
1.7.3. This review will not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract.
1.7.4. Without restricting the generality of the foregoing, be responsible for:
1.7.4.1. Dimensions to be confirmed and correlated at the Site.
1.7.4.2. Information that pertains solely to fabrication processes or to techniques of construction and installation.

1.7.4.3. Coordination of the Work of all sub-trades.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. List of Signs and Devices: within 40 Working Days after Contract award and prior to mobilization to Site Submit a list of signs and other devices required for the project.

1.4. Protection of Public Traffic

1.4.1. Comply with requirements of acts, regulations and bylaws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

1.4.2. Comply with current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways*.

1.4.3. Provide and maintain road access and egress to property fronting Site and in other areas in accordance with the Contract, except where other means of road access exist that are accepted.

1.5. Informational and Warning Devices

1.5.1. Provide and maintain signs, flashing warning lights, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Work which requires road user response.

1.5.2. Supply and erect signs, delineators, barricades and miscellaneous warning devices to comply with current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways*.

1.5.3. Place signs and other devices in locations recommended in current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways*.

1.5.4. Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation onsite changes, revise list for approval.

1.5.5. Continually maintain traffic control devices in use:

1.5.5.1. Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

1.5.5.2. Remove or cover signs which do not apply to conditions existing from day to day.

1.6. Control of Public Traffic

1.6.1. Provide competent flag personnel, trained in accordance with, and properly equipped to, current version of BC Ministry of Transportation and Infrastructure *Traffic Control Manual for Work on Roadways* for situations as follows:

1.6.1.1. When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

1.6.1.2. In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

1.7. Operational Requirements

1.7.1. Maintain existing conditions for traffic throughout period of Contract except that, when required for construction in accordance with the Contract and when measures have been taken in accordance with the Contract and accepted by Departmental Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:

1.7.1.1. Maintain existing conditions for traffic crossing right-of-way.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Contaminated Waste and Non-Contaminated Waste (CL) Management Plan: within 40 Working Days after Contract award and prior to mobilization to Site, Submit plan detailing management of Contaminated Waste and Non-Contaminated Waste. Include:

1.3.1.1. Sequence, methods and means to ensure different categories of waste are segregated.

1.3.1.2. Sequence, methods and means to handle, transport, and store Contaminated Waste and Non-Contaminated Waste (CL) onsite.

1.3.1.3. Sequence, methods and means to transport Contaminated Waste and Non-Contaminated Waste (CL) offsite. Include name, vehicle type, and licenses of transporters. Include name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of all transfer stations and interim storage facilities.

1.3.1.4. Sequence, methods and means to treat Contaminated Waste offsite. Include proposed treatment method, schedule for treatment, and name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of Treatment Facilities.

1.3.1.5. Sequence, methods and means to dispose Contaminated Waste and Non-Contaminated Waste (CL) offsite. Include name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of Disposal Facilities.

1.3.2. Contaminated Wastewater Treatment Plant Provision Plan: within 40 Working Days after Contract award and prior to mobilization to Site, Submit design, operation procedures, manufacturers' instructions, and monitoring and sampling plan of onsite Contaminated Wastewater Treatment Plant.

1.3.3. Contaminated Wastewater Treatment Plant Initial Testing: within 5 Working Days of conducting initial operations testing, and prior to operating or discharge, Submit results of initial operations test.

1.3.4. Contaminated Wastewater Treatment Plant Operational Testing: within 5 Working Days of sampling Submit sampling results of operational (recurrent) testing.

1.3.5. Certificate of Seaworthiness: Prior to barge shipments, Submit a Certificate of Seaworthiness by an independent licensed Marine Surveyor for all marine vessels transporting Contaminated Material.

1.3.6. Transport Manifests: within 5 Working Days of offsite transport, Submit documentation verifying that material has been transported appropriately. Include:
1.3.6.1. Method of transport.
1.3.6.2. Name of transport company.
1.3.6.3. Weigh scale receipt including location, date, and weight of loading.
1.3.6.4. Weigh scale receipt including location, date, and weight of unloading.
1.3.7. Certificate of Treatment: within 30 Working Days of treatment at Treatment Facility, Submit documentation verifying that materials have been treated by Contractor. Include:
1.3.7.1. Issued by the Treatment Facility.
1.3.7.2. On company letterhead.
1.3.7.3. Name and location of facility where the material is being treated.
1.3.7.4. Date and weight for each shipment received and total weight received at the offsite facility.
1.3.7.5. Date and weight for each treatment event and total weight treated at the offsite facility.
1.3.7.6. Treatment methodology.
1.3.7.7. Laboratory certificates demonstrating treatment objectives were met.
1.3.7.8. Disposition of treated material.
1.3.7.9. Signed by identified authorized treatment company representative.
1.3.8. Certificate of Disposal: within 30 Working Days of disposal at Disposal Facility, Submit documentation verifying that materials have been disposed by Contractor. Include:
1.3.8.1. Issued by the Disposal Facility.
1.3.8.2. On company letterhead.
1.3.8.3. Name and location of facility where the material is being disposed.
1.3.8.4. Date and weight for each shipment received and total weight received at the Disposal Facility.
1.3.8.5. Identification of final ownership of material.
1.3.8.6. Signed by identified authorized disposal company representative.

1.4. Sequencing and Scheduling

1.4.1. Commence Work involving contact with Contaminated or potentially Contaminated Waste or Wastewater after all applicable Environmental Protection procedures (including those identified in Contaminated Waste and Non-Contaminated Waste (CL) Management Plan and Environmental Protection Plan) and facilities (including those identified in Site Layout) are operational and accepted by Departmental Representative.
1.4.2. Plan work sequencing and traffic patterns to prevent contamination of clean areas due to traffic or debris.

1.5. Equipment Decontamination Facility

1.5.1. Prior to commencing Work involving equipment contact with potentially Contaminated Waste, construct equipment decontamination facilities to accommodate the largest potentially contaminated equipment onsite.

1.5.2. Collect and contain equipment decontamination wastewater and sediment. Transfer collected wastewater and sediment to treatment facilities accepted by Departmental Representative.

1.6. Personnel Decontamination Facility

1.6.1. Provide an area or areas close to the workers' changing facilities to enable workers and other personnel leaving areas such as exclusion area to remove deleterious and contaminated materials from boots, clothing and skin surfaces.

1.6.2. Be responsible for ensuring that all materials, chemicals, protective clothing, wash water and deleterious materials are collected, treated and disposed of in accordance with applicable environmental standards and regulations.

1.6.3. Personnel Decontamination Facility to be available for use by persons other than the Contractor's workers and Subcontractors, including federal employees, other contractor(s), and environmental agencies. Provide use of facilities to other persons.

1.7. Drum Staging Pad

1.7.1. Provide, maintain, and operate drum staging pad as required.

1.7.2. Construct drum staging pad with sump capable of collecting leachate and rain runoff. Place impermeable liner that contours over top of berm, and collects leachate and runoff from staging pad which is conducted solely to sump on staging pad. Leachate is Contaminated Wastewater.

1.8. Contaminated Wastewater Treatment Plant

1.8.1. Design Requirements:

1.8.1.1. Design and Operating Criteria: design Contaminated Wastewater Treatment Plant capable of treating Contaminated Wastewater generated from dewatering excavations and Work areas to meet Discharge Approval requirements, capable of removing oil, suspended solids, particulates, and asbestos fibers, and filter water through 5-micron particulate filter prior to discharge.

1.8.1.2. Ensure that discharges from Site are in compliance with applicable permit requirements and limitations.

1.8.1.3. Design piping to transfer liquid/solid mixtures generated by dewatering operations which require treatment to Contaminated Wastewater Treatment Plant.

1.8.1.4. Design Contaminated Wastewater Treatment Plant capable of receiving liquid/solid mixtures and not causing delay to dewatering operations.

1.8.1.5. Design Contaminated Wastewater Treatment Plant for a minimum treatment capacity of 500,000 litres per day.

1.8.1.6. Contaminated Wastewater treatment will require the treatment of cyanide in groundwater which is not amenable to traditional treatment methods and it must be the Contractor’s responsibility to determine the method of treatment suitable.

1.8.1.7. Piping: suitable material type, of sufficient diameter and structural thickness for purpose intended; satisfactorily tested for leaks with potable water in presence of Departmental Representative before handling Contaminated Wastewater.

1.8.2. Installation:

1.8.2.1. Prepare Site for Contaminated Wastewater Treatment Plant.

1.8.2.2. Install component systems in accordance with installation procedures and as required.

1.8.2.3. Following installation of system, implement initial operation test in accordance with procedures developed by Contractor and submit results as instructed by the Departmental Representative.

1.8.2.4. Install piping in accordance with manufacturer's instructions and test for leakage using potable water prior to commencing dewatering and treatment operations.

1.8.3. Initial Testing: determine performance of Contaminated Wastewater Treatment Plant provided by Contractor as follows prior to commencing excavation:

1.8.3.1. Test run with potable water to ensure it is operating currently and no leaks are occurring.

1.8.3.2. Performance verification (contaminant removal) of Contaminated Wastewater treated, stored, tested, assessed, and accepted by Departmental Representative prior to discharge.

1.8.3.3. Provide access for independent collection of treated stored water samples by the Departmental Representative.

1.8.4. Operational Testing:

1.8.4.1. Operate Contaminated Wastewater Treatment Plant using experienced, qualified personnel and in accordance with manufacturer's instructions and procedures as Submittals by Contractor.

1.8.4.2. Collect, analyze, and assess samples as recommended by a Qualified Professional.

1.8.4.3. Provide access for independent collection of samples by the Departmental Representative.

1.8.4.4. On basis of analytical results by Contractor or Departmental Representative obtained from samples collected at the discharge point, make system modifications required for effluent to satisfy effluent criteria, or continue with normal dewatering operations as instructed by the Departmental Representative.

1.8.5. Decommissioning/Dismantling:

1.8.5.1. Decontaminate and remove salvageable components of Contaminated Wastewater Treatment Plant including treatment system, pumps, piping, and electrical equipment.

1.8.5.2. Dispose of non-salvageable equipment and materials at Disposal Facility accepted by the Departmental Representative. Decontaminate salvageable equipment as required prior to demobilization from Site.

1.9. Soil and Sediment Stockpiling

1.9.1. Provide, maintain, and operate storage/stockpiling facilities as per Contractor's Site Layout.

1.9.2. Segregate Contaminated Waste from Non-Contaminated Waste (CL) into separate stockpiles to prevent cross-contamination.

1.9.3. Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable cover during periods of Work stoppage including at end of each Working Day and as instructed by the Departmental Representative.

1.9.4. Securely fasten covers over stockpiled material until material is loaded for offsite transport.

1.9.5. Store excavated Non-Contaminated Waste (CL) only on non-contaminated surface areas. Ensure no contact between excavated Non-Contaminated Waste (CL) and drainage of Contaminated Wastewater or Contaminated Waste.

1.9.6. Store excavated Contaminated Waste in temporary stockpiles.

1.9.6.1. Install impermeable liner (e.g. asphalt) below proposed stockpile locations to prevent contact between stockpile material and ground.

1.9.6.2. Cover stockpiled material when not being worked or sampled to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.

1.9.6.3. Prevent Non-Contaminated Wastewater, such as surface water, from coming into contact with Contaminated Waste stockpiles.

1.9.7. Segregate Contaminated Waste into:

1.9.7.1. Hazardous Waste – Treatable (HW Hydrocarbons).

1.9.7.2. Hazardous Waste – Comingled (HW Hydrocarbons and CL+ Metals).

1.9.7.3. Non-Hazardous Contaminated Waste – Treatable (CL+ Hydrocarbons).

1.9.7.4. Non-Hazardous Contaminated Waste – Non-treatable (CL+ Metals).

1.9.7.5. Non-Hazardous Contaminated Waste – Comingled (CL+ Metals and CL+ Hydrocarbons).

1.9.8. Segregate different suspect material in discrete stockpiles to facilitate ex-situ characterization as instructed by the Departmental Representative.

1.9.9. Assist Departmental Representative in collection of stockpile samples for exsitu characterization. Ex-situ characterization may take up to 5 Working Days, not counting the day the sample is collected. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Sample results provided within 5 Working Days, not counting the day the sample is collected.

1.9.10. Do not remove Contaminated Waste from stockpiles until exsitu characterization completed and as instructed by Departmental Representative.

1.10. Equipment Decontamination

1.10.1. At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated.

1.10.2. If required, as instructed by the Departmental Representative, use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in clean area before removing from Site or travelling on clean areas. Perform assessment as instructed by the Departmental Representative to determine effectiveness of decontamination.

1.10.2.1. Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.

1.10.2.2. Collect decontamination wastewater and sediment which accumulate in decontamination location. Treat collected wastewater as Contaminated Wastewater. Manage decontamination sediment as Hazardous Waste (HW).

1.10.3. In the opinion of the Departmental Representative, each piece of equipment must be inspected by the Departmental Representative after decontamination and prior to travel on clean areas or demobilization from Site. Perform additional decontamination as required in the opinion of the Departmental Representative.

1.10.4. Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

1.11. Progress Decontamination

1.11.1. Decontaminate equipment after working in potentially contaminated Work areas and prior to subsequent Work or travel on clean areas.

1.12. Final Decontamination

1.12.1. Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially Contaminated Waste prior to demobilization from Site.

1.13. Drums

1.13.1. Storage of liquid waste: 200 L steel drums meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

1.13.2. Storage of solid waste: 200 L steel drums meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

1.14. Contaminated Wastewater

1.14.1. Assume ownership of, and be responsible for Contaminated Wastewater once it is loaded on a vehicle, barge, or other vessel for transport offsite or once it enters the Contaminated Wastewater Treatment Plant.

1.14.2. Collect Contaminated Wastewater that has, or potentially has, come into contact with Contaminated Waste including excavation and stockpile areas, or is otherwise potentially contaminated from Work activities.

1.14.3. Transport and treat collected Contaminated Wastewater at Contaminated Wastewater Treatment Plant.

1.14.4. Discharge to environment: obtain Discharge Approval from authority having jurisdiction. Comply with Waterway Impact Requirements.

1.15. Neighbourhood Air Quality Management Plan

1.15.1. The Contractor must maintain air quality to protect on Site workers and the general public and in accordance with the Contract.

1.15.2. To protect the general public working and living in the vicinity of the Site from potential vapours, odours and particulate matter that may be generated during the Work, Work Activities Levels will be implemented.

1.15.3. Work Activities Levels will be in accordance with any decision of the Departmental Representative. Considerations for Work Level Activities include:

1.15.3.1. Exceedences of fence line reference values.

1.15.3.2. Reasonable potential to exceed fence line reference values.

1.15.3.3. Public concerns or complaints.

1.15.3.4. Reasonable potential for public concerns or complaints.

1.15.4. The Departmental Representative will collect real-time (1 to 15 minute collection period) and time-integrated (24 hour collection period) samples for comparison to fence line reference values for protection of residential or commercial receptors.

1.15.5. For the Neighbourhood Air Quality Management Plan, Potential Contaminants of Concern and real-time measurement fence line reference values are:

1.15.5.1. Benzene: 400 $\mu g/m^3$.

1.15.5.2. H_2S: 18 $\mu g/m^3$.

1.15.5.3. HCN: 20 $\mu g/m^3$.

1.15.5.4. PM_{10}: 150 $\mu g/m^3$.

1.15.5.5. $PM_{2.5}$: 79 $\mu g/m^3$.

1.15.6. For the Neighbourhood Air Quality Management Plan, Potential Contaminants of Concern and time-integrated measurement fence line reference values are:

1.15.6.1. Benzene: 66 $\mu g/m^3$.

1.15.6.2. Ethylbenzene: 3,000 $\mu g/m^3$.
1.15.6.3. Toluene: 1,200 $\mu g/m^3$.
1.15.6.4. Xylenes: 540 $\mu g/m^3$.
1.15.6.5. Volatile Petroleum Hydrocarbons: 2,700 $\mu g/m^3$.
1.15.6.6. Light Extractable Petroleum Hydrocarbons: 1,700 $\mu g/m^3$.
1.15.6.7. Napthalene: 9 $\mu g/m^3$.
1.15.6.8. Styrene: 270 $\mu g/m^3$.
1.15.6.9. Benzo(a)anthracene: 10 $\mu g/m^3$.
1.15.6.10. Benzo(a)pyrene: 1 $\mu g/m^3$.
1.15.6.11. Benzo(b)fluoranthene: 18.3 $\mu g/m^3$.
1.15.6.12. Benzo(k)fluoranthene: 26.5 $\mu g/m^3$.
1.15.6.13. Phenanthrene: 48 $\mu g/m^3$.
1.15.6.14. Pyrene: 379 $\mu g/m^3$.
1.15.6.15. Hydrogen Cyanide: 2 $\mu g/m^3$.
1.15.6.16. Hydrogen Sulphide: 5 $\mu g/m^3$.
1.15.6.17. PM_{10}: 150 $\mu g/m^3$.
1.15.6.18. $PM_{2.5}$: 79 $\mu g/m^3$.
1.15.7. Implement Level 1 Work Activities at all times during the Work.
1.15.8. Implement Level 2 Work Activities if real-time or time-integrated fence line reference values are exceeded, or as instructed by Departmental Representative.
1.15.8.1. Modify sequencing, methods and means as acceptable to the Departmental Representative.
1.15.8.2. Recommence Level 1 Work Activities only as instructed by Departmental Representative.
1.15.9. Implement Level 3 Work Activities if real-time or time-integrated fence line reference values are exceeded, or as instructed by Departmental Representative.
1.15.9.1. Modify sequencing, methods and means as acceptable to the Departmental Representative.
1.15.9.2. Recommence Level 2 Work Activities only as acceptable to the Departmental Representative.
1.15.10. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for implementing Level 1, 2, or 3 Work Activities.

1.16. Neighbourhood Air Quality Management Plan Level 1 Work Activities

1.16.1. Apply fresh water to all excavation areas to suppress dust.
1.16.2. Apply fresh water to haul roads, parking and staging areas to suppress dust. Clean paved areas to remove potentially dust generating material.
1.16.3. Fully cover with tarps or a Foam Suppressant all inactive areas of stockpiles.
1.16.4. Fully cover with tarps or a Foam Suppressant all inactive areas of local barge stockpiles.

1.17. Neighbourhood Air Quality Management Plan Level 2 Work Activities

1.17.1. All Level 1 Work Activities.
1.17.2. Continuously apply Foam Suppressant to active areas of excavation. Fully cover with tarps or a Foam Suppressant all inactive areas of excavation.
1.17.3. Increase the frequency of fresh water application to haul roads, parking and staging areas to suppress all dust.
1.17.4. Continuously apply Foam Suppressant to active areas of stockpiles.
1.17.5. Continuously apply Foam Suppressant to active areas of local barge stockpiles. Do not load contaminated material onto local barges when average hourly wind speeds exceed 20 km/h.

1.18. Neighbourhood Air Quality Management Plan Level 3 Work Activities
1.18.1. All Level 2 Work Activities.
1.18.2. Stop all construction Work on Site.

1.19. Foam Suppressant
1.19.1. Foam Suppressant is a foam specifically designed for the control of volatile organic compounds, dust, and odours.
1.19.2. Foam Suppressant properties include:
1.19.2.1. Odourless, viscous and persistent.
1.19.2.2. Non-hazardous and non-polluting.
1.19.2.3. Compatible with Treatment and Disposal Facilities requirements.
1.19.2.4. Apply Foam Suppressant as per manufacturer's instructions.

1.20. Fence-line Air Quality Monitoring Stations
1.20.1. Construct and maintain three fence-line air quality monitoring stations around the perimeter of the remediation Site in accordance with the Contract.
1.20.2. Sampling equipment will be supplied by the Departmental Representative.
1.20.3. Each station must have the capacity to securely store and enable continuous unattended air sampling equipment listed below.
1.20.3.1. Three 6 litre stainless steel evacuated canisters (10 kg each).
1.20.3.2. Two Poly Urethane Foam samplers (30 kg each). The motor exhaust must be directed well away from the sampler to prevent exhaust air from re-entering the system.
1.20.3.3. Two high volume suspended particulate samplers (60 kg each).
1.20.3.4. One windsock.
1.20.4. Provide continuous 110 V, 1 phase, 60 Hz electrical power.
1.20.5. Ensure safe access to all stations by the Departmental Representative at all times.

1.21. Meteorological Station
1.21.1. Construct and maintain meteorological station at the Site in accordance with the Contract.
1.21.2. Meteorological equipment will be supplied by the Departmental Representative.
1.21.3. Provide continuous 110 V, 1 phase, 60 Hz electrical power.

1.21.4. Ensure safe access by the Departmental Representative with 1 Working Days notice.

1.22. Contaminated Waste Management

1.22.1. Remove all Contaminated Waste (HW and CL+) within Work areas in accordance with the Contract and as instructed by the Departmental Representative.

1.22.2. Minimize generation of Contaminated Waste to greatest extent practicable. Take necessary precautions to avoid mixing during excavation, handling, loading, stockpiling, and transport of Non-Contaminated Waste (CL) with Contaminated Waste, and Non-Hazardous Contaminated Waste (CL+) with Hazardous Waste (HW).

1.22.3. Segregate, excavate, handle, stockpile, load, transport, treat, and dispose Contaminated Waste separately into the following classifications in accordance with the Contract or as instructed by the Departmental Representative based on insitu results, field observations, field measurements, and/or ex-situ characterization:

1.22.3.1. Hazardous Waste – Treatable (HW Hydrocarbons).

1.22.3.2. Hazardous Waste – Comingled (HW Hydrocarbons and CL+ Metals).

1.22.3.3. Non-Hazardous Contaminated Waste – Treatable (CL+ Hydrocarbons).

1.22.3.4. Non-Hazardous Contaminated Waste – Non-treatable (CL+ Metals).

1.22.3.5. Non-Hazardous Contaminated Waste – Comingled (CL+ Metals and CL+ Hydrocarbons).

1.22.4. Handle, stockpile, load, and transport Contaminated Waste from the Site separately from material from other sites.

1.22.5. Treat and dispose Contaminated Waste from the Site separately from material from other sites to the extent practicable as acceptable to the Departmental Representative.

1.22.6. Material characterization additional to information provided in Contract required by transport, Treatment Facility or Disposal Facility responsibility of Contractor.

1.23. Contaminated Waste Transport

1.23.1. Assume ownership of, and be responsible for, Contaminated Waste once it is loaded on a vehicle, barge, or other vessel for transport offsite.

1.23.2. Transport material offsite as soon as practical. Do not unreasonably stockpile material onsite.

1.23.3. Cover material while being transported to prevent release of airborne dust, vapours, or odours, and to prevent saturation and leachate generation from material.

1.23.4. Excess water in soil or sediment must not be allowed to flow out of vehicle or vessel during transport.

1.23.5. Stabilize soil and sediment as necessary.

1.23.6. All vehicles, vessels and operators must be appropriately licensed and equipped to transport Hazardous Waste (HW) soil and sediment.

1.23.7. Barges must be inspected by an independent Marine Surveyor and Submit a copy of the Certificate of Seaworthiness to Departmental Representative.
1.23.8. Manifest and correlate weights of all material transported from Site documenting weight at removal from Site, movement, transfer stations, interim storage and treatment, and weight of material at final Disposal Facility. Submit all manifests, as instructed by the Departmental Representative.
1.23.9. Material transported with discrepancies in manifests must be resolved as required by regulations and as acceptable to the Departmental Representative. Discrepancies include:
1.23.9.1. No manifest or an incomplete manifest.
1.23.9.2. The material transported does not match the description in the manifest.
1.23.9.3. The amount transported differs by more than 5% in the manifest.
1.23.9.4. The material transported is in a hazardous condition.

1.24. Contaminated Waste Disposition

1.24.1. Treat and dispose of Contaminated Waste as follows, otherwise in accordance with the Contract, or as instructed by the Departmental Representative:
1.24.1.1. Hazardous Waste – Treatable (HW Hydrocarbons): This material must be treated at a Treatment Facility prior to disposal at a Disposal Facility.
1.24.1.2. Hazardous Waste – Comingled (HW Hydrocarbons and CL+ Metals): This material must be treated at a Treatment Facility prior to disposal at a Disposal Facility.
1.24.1.3. Non-Hazardous Contaminated Waste – Treatable (CL+ Hydrocarbons): This material must be treated at a Treatment Facility prior to disposal at a Disposal Facility.
1.24.1.4. Non-Hazardous Contaminated Waste – Non-treatable (CL+ Metals): This material must be disposed at a Disposal Facility.
1.24.1.5. Non-Hazardous Contaminated Waste – Comingled (CL+ Metals and CL+ Hydrocarbons): This material must be treated at a Treatment Facility prior to disposal at a Disposal Facility.

1.25. Contaminated Waste Treatment

1.25.1. Contaminated Waste Treatment: treat at Treatment Facility identified by Contractor and accepted by the Departmental Representative.
1.25.2. Treatment Facility must:
1.25.2.1. Be an existing offsite facility located in Canada.
1.25.2.2. Be designed, constructed and operated for the handling or processing of waste in such a manner as to change the physical, chemical or biological character or composition of waste amenable to treatment to lower than the BC *Contaminated Sites Regulation* Schedule 7 Column II.
1.25.2.3. Hold a valid and subsisting permit, certificate, approval, or any other form of authorization issued by a province or territory for the treatment of soil or other material that is Waste Quality
1.25.2.4. Comply with applicable municipal zoning, bylaws, and requirements.

1.25.3. Treat material as soon as practical and within 100 Working Days of leaving Site unless otherwise accepted by Departmental Representative.
1.25.4. Material treated must subsequently be disposed of at a Disposal Facility after treatment.
1.25.5. Treatment includes bioremediation, thermal desorption, and incineration. Treatment does not include blending, mixing, or dilution.
1.25.6. If proposed Treatment Facility is not acceptable to Departmental Representative, identify an alternate Treatment Facility that is acceptable.
1.25.7. Submit Certificates of Treatment for all material treated offsite.

1.26. Contaminated Waste Disposal

1.26.1. Contaminated Waste Disposal: dispose Contaminated Waste at Disposal Facility identified by Contractor and accepted by the Departmental Representative.
1.26.2. Disposal Facility must:
1.26.2.1. Be an existing offsite facility located in Canada.
1.26.2.2. Be designed, constructed and operated to prevent any pollution from being caused by the facility outside the area of the facility from waste placed in or on land within the facility.
1.26.2.3. Hold a valid and subsisting permit, certificate, approval, or any other form of authorization issued by a province or territory for the disposal of soil or other material that is Waste Quality.
1.26.2.4. Comply with applicable municipal zoning, bylaws, and requirements.
1.26.3. Dispose material as soon as practical and within 100 Working Days of leaving Site unless otherwise accepted by Departmental Representative.
1.26.4. Material sent to a Disposal Facility must be permanently stored at that facility.
1.26.5. If proposed Disposal Facility is not acceptable to Departmental Representative, identify an alternate Disposal Facility that is acceptable.
1.26.6. Submit Certificates of Disposal for all material disposed offsite.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Submit to Departmental Representative Submittals listed for review.
1.3.2. Work affected by Submittal must not proceed until review is complete.
1.3.3. Submit the following:
1.3.3.1. Health and Safety Plan.
1.3.3.2. Copies of reports or directions issued by federal and provincial health and safety inspectors.
1.3.3.3. Copies of incident and accident reports.
1.3.3.4. Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
1.3.3.5. Emergency Procedures.
1.3.3.6. Notice of Project.
1.3.4. The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 Working Days after receipt of the plan.
1.3.5. If changes are required, revise the plan as appropriate and resubmit to Departmental Representative within 5 Working Days.
1.3.6. Submittal of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It will not:
1.3.6.1. Be construed to imply approval by the Departmental Representative.
1.3.6.2. Be interpreted as a warranty of being complete, accurate and legislatively compliant.
1.3.6.3. Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.4. References

1.4.1. Government of Canada:
1.4.1.1. Canada Labour Code - Part II.
1.4.1.2. Canada Occupational Health and Safety Regulations.
1.4.2. National Building Code of Canada (NBC):
1.4.2.1. Part 8, Safety Measures at Construction and Demolition Sites.
1.4.3. Canadian Standards Association (CSA) as amended:
1.4.3.1. CSA Z797-2009 Code of Practice for Access Scaffold.

1.4.3.2. CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
1.4.3.3. CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
1.4.4. Fire Protection Engineering Services, HRSDC:
1.4.4.1. FCC No. 301, Standard for Construction Operations.
1.4.4.2. FCC No. 302, Standard for Welding and Cutting.
1.4.5. American National Standards Institute (ANSI):
1.4.5.1. ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
1.4.6. Province of British Columbia:
1.4.6.1. Workers Compensation Act Part 3-Occupational Health and Safety.
1.4.6.2. Occupational Health and Safety Regulation.

1.5. Regulatory Requirements

1.5.1. Comply with codes, acts, bylaws, standards and regulations applicable to the performance of the Work in accordance with the Contract to ensure safe operations at Site.
1.5.2. In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will instruct on the course of action to be followed.

1.6. Worker’s Compensation Board Coverage

1.6.1. Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the Final Completion of the Work.
1.6.2. Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.7. Compliance with Regulations

1.7.1. PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
1.7.2. It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the Work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.8. Responsibility

1.8.1. Assume responsibility as the Prime Contractor for Work under this Contract.
1.8.1.1. Be responsible for health and safety of persons onsite, safety of property onsite and for protection of persons adjacent to Site and environment to extent that they may be affected by conduct of Work.

1.8.1.2. Comply with and enforce compliance by employees with safety requirements of Contract, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9. Health and Safety Coordinator

1.9.1. The Health and Safety Coordinator must:

1.9.1.1. Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the Site to perform Work.

1.9.1.2. Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.

1.9.1.3. Be on Site during execution of Work.

1.10. General Conditions

1.10.1. Provide safety barricades and lights around Site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

1.10.2. Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the Site:

1.10.2.1. Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

1.11. Project/Site Conditions

1.11.1. Work at Site will involve contact with contaminants identified in Specifications and environmental reports.

1.12. Work Permits

1.12.1. Obtain specialty permits related to project before start of Work.

1.13. Filing of Notice

1.13.1. The Prime Contractor is to complete and submit a Notice of Project as required by Provincial or Territorial authorities.

1.13.2. Provide copies of all notices to the Departmental Representative.

1.14. Health and Safety Plan

1.14.1. Conduct a site-specific hazard assessment based on review of Contract, required Work, and project Site. Identify any known and potential health risks and safety hazards.

1.14.2. Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

1.14.2.1. Primary requirements:

1.14.2.1.1. Contractor's safety policy.

1.14.2.1.2. Identification of applicable compliance obligations.

1.14.2.1.3. Definition of responsibilities for project safety/organization chart for project.
1.14.2.1.4. General safety rules for project.
1.14.2.1.5. Job-specific safe work, procedures.
1.14.2.1.6. Inspection policy and procedures.
1.14.2.1.7. Incident reporting and investigation policy and procedures.
1.14.2.1.8. Occupational Health and Safety Committee/Representative procedures.
1.14.2.1.9. Occupational Health and Safety meetings.
1.14.2.1.10. Occupational Health and Safety communications and record keeping procedures.
1.14.2.2. Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the Work.
1.14.2.3. List hazardous materials to be brought onsite as required by Work.
1.14.2.4. Indicate engineering and administrative control measures to be implemented at the Site for managing identified risks and hazards.
1.14.2.5. Identify personal protective equipment (PPE) to be used by workers.
1.14.2.6. Identify personnel and alternates responsible for site safety and health.
1.14.2.7. Identify personnel training requirements and training plan, including site orientation for new workers.
1.14.3. Develop the plan in collaboration with all Subcontractors. Ensure that work/activities of Subcontractors are included in the hazard assessment and are reflected in the plan.
1.14.4. Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.
1.14.5. Departmental Representative's review: the review of Health and Safety Plan by Public Works and Government Services Canada (PWGSC) will not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract.

1.15. Emergency Procedures

1.15.1. List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (ie names/telephone numbers) of:
1.15.1.1. Designated personnel from own company.
1.15.1.2. Regulatory agencies applicable to Work and as per legislated regulations.
1.15.1.3. Local emergency resources.
1.15.1.4. Departmental Representative and site staff.
1.15.2. Include the following provisions in the emergency procedures:
1.15.2.1. Notify workers and the first-aid attendant, of the nature and location of the emergency.
1.15.2.2. Evacuate all workers safely.
1.15.2.3. Check and confirm the safe evacuation of all workers.

1.15.2.4. Notify the fire department or other emergency responders.
1.15.2.5. Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
1.15.2.6. Notify Departmental Representative and Site staff.
1.15.3. Provide written rescue/evacuation procedures as required for, but not limited to:
1.15.3.1. Work at high angles.
1.15.3.2. Work in confined spaces or where there is a risk of entrapment.
1.15.3.3. Work with hazardous substances.
1.15.3.4. Underground work.
1.15.3.5. Work on, over, under and adjacent to water.
1.15.3.6. Workplaces where there are persons who require physical assistance to be moved.
1.15.4. Design and mark emergency exit routes to provide quick and unimpeded exit.
1.15.5. Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.16. Hazardous Products

1.16.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
1.16.2. Where use of hazardous and toxic products cannot be avoided:
1.16.2.1. Notify Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as required.
1.16.2.2. In conjunction with Departmental Representative, schedule to carry out Work during "off hours" when tenants have left the building.
1.16.2.3. Provide adequate means of ventilation as required.

1.17. Unforeseen Hazards

1.17.1. Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the Work, immediately stop Work and notify the Departmental Representative verbally and in writing.

1.18. Posted Documents

1.18.1. Post legible versions of the following documents onsite:
1.18.1.1. Health and Safety Plan.
1.18.1.2. Sequence of Work.
1.18.1.3. Emergency procedures.
1.18.1.4. Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
1.18.1.5. Notice of Project.
1.18.1.6. Floor plans or Site plans.

1.18.1.7. Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the Site for review by employees and workers.
1.18.1.8. Workplace Hazardous Materials Information System (WHMIS) documents.
1.18.1.9. Material Safety Data Sheets (MSDS).
1.18.1.10. List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
1.18.2. Post all Material Safety Data Sheets (MSDS) onsite, in a common area, visible to all workers and in locations accessible to tenants when Work of this Contract includes construction activities adjacent to occupied areas.
1.18.3. Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as accepted by the Departmental Representative.

1.19. Meetings

1.19.1. Attend health and safety preconstruction meeting and all subsequent meetings called by the Departmental Representative.
1.19.2. Ensure all site personnel attend a health and safety toolbox meeting at the beginning of each shift, which must include:
1.19.2.1. Sign-in of all attendees.
1.19.2.2. Planned Work activities and environmental considerations for that shift.
1.19.2.3. Hazards associated with these Work activities, including environmental hazards (eg potential for hypothermia, heat exhaustion, heat stroke).
1.19.2.4. Appropriate job-specific safe work procedures.
1.19.2.5. Required personal protective equipment (PPE).
1.19.2.6. Appropriate emergency procedures.
1.19.2.7. Review recent accidents on Site, including near misses.
1.19.3. Retain records of all health and safety meetings onsite during Work, and retain as corporate records for a minimum of 7 years after Work is completed.

1.20. Correction of Non-Compliance

1.20.1. Immediately address health and safety non-compliance issues identified by the Departmental Representative.
1.20.2. Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
1.20.3. The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time.
1.20.4. Correct non-compliance.

1.21. Critical Incident Reporting

1.21.1. Critical Incident includes:
1.21.1.1. An event resulting in death or serious injury to employees, client department personnel, contractors or the general public entering or occupying PWGSC facilities. This can include physically or psychologically traumatic events

such as natural disasters, hostage takings, terrorism, rape, acts or threats of violence, accidents, suicides or homicides.

1.21.1.2. A fire or explosion causing equipment or property damage or threat to another property.

1.21.1.3. Damage to a boiler or other pressure vessel resulting in fire or rupture of equipment.

1.21.1.4. The free fall of or damage to an elevating device rendering it unserviceable.

1.21.1.5. The uncontrolled release or spill of hazardous wastes or materials.

1.21.1.6. The implementation of rescue, revival or other similar emergency procedures.

1.21.1.7. A structural failure or collapse of a building, tower, crane, hoist, temporary construction support system or excavation.

1.21.1.8. An electric shock, toxic or oxygen deficient atmosphere causing an employee to lose consciousness.

1.21.2. In the event of a Critical Incident, immediate actions include:

1.21.2.1. Contacting emergency services as required (ambulance, fire department, police, environment).

1.21.2.2. Initiating urgently required corrective action appropriate to the incident (protect life, first-aid treatment, minimize property damage, etc.).

1.21.2.3. Contacting the Regional Manager responsible for Safety and Health.

1.21.2.4. Ensuring that evidence on the site is not disturbed until investigations have been completed.

1.21.2.5. Cooperating with officials authorized to investigate the incident.

1.22. Utility Clearance

1.22.1. The Contractor is solely responsible for utility clearance.

1.22.2. The Contractor will not rely upon Drawings or other information provided with utility locations.

1.23. Personal Protective Equipment Program

1.23.1. Submit Personal Protective Equipment (PPE) program to the Departmental Representative addressing:

1.23.1.1. Donning and doffing procedures.

1.23.1.2. PPE selection based upon Site hazards.

1.23.1.3. PPE use and limitations of equipment.

1.23.1.4. Work mission duration, PPE maintenance and storage.

1.23.1.5. PPE decontamination and disposal.

1.23.1.6. PPE inspection procedures prior to, during, and after use.

1.23.1.7. Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.

1.23.1.8. Medical surveillance requirements for personnel assigned to work at Site.

1.23.1.9. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.

1.23.1.10. Site control measures employed at Site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.
1.23.1.11. Decontamination procedures for both personnel and equipment.
1.23.1.12. Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.
1.23.1.13. Written respiratory protection program for project activities.
1.23.1.14. Procedures dealing with heat and/or cold stress.
1.23.1.15. Spill containment program if waste material is generated, excavated, stored, or managed onsite.

1.24. Offsite Contingency and Emergency Response Plan

1.24.1. Prior to commencing Work involving handling of hazardous materials, develop offsite Contingency and Emergency Response Plan.
1.24.2. Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from Site.

1.25. Personnel Health, Safety, and Hygiene

1.25.1. Training: ensure personnel entering Site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.
1.25.2. Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity.
1.25.3. Personal Protective Equipment:
1.25.3.1. Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.
1.25.4. Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:
1.25.4.1. Ensure prescription eyeglasses worn are safety glasses and do not permit contact lenses onsite within work zones.
1.25.4.2. Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.
1.25.4.3. Dispose of or decontaminate PPE worn onsite at end of each workday.
1.25.4.4. Decontaminate reusable PPE before reissuing.

1.25.4.5. Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.
1.25.4.6. Ensure facial hair does not interfere with proper respirator fit.
1.25.5. Respiratory Protection:
1.25.5.1. Provide site personnel with extensive training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.
1.25.5.2. Develop, implement, and maintain respirator program.
1.25.5.3. Monitor, evaluate, and provide respiratory protection for site personnel.
1.25.5.4. Ensure levels of protection as listed have been chosen consistent with site-specific potential airborne hazards associated with major contaminants identified onsite.
1.25.5.5. In absence of additional air monitoring information or substance identification, retain an industrial hygiene specialist to determine minimum levels of respiratory protection required.
1.25.5.6. Immediately notify Departmental Representative when level of respiratory protection required increases.
1.25.5.7. Ensure appropriate respiratory protection during Work activities. As minimum requirement, ensure that persons entering potentially contaminated work areas are supplied with and use appropriate respiratory protection.
1.25.6. Heat Stress/Cold Stress: implement heat stress or cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.
1.25.7. Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:
1.25.7.1. Suitable containers for storage and disposal of used disposable PPE.
1.25.7.2. Potable water and suitable sanitation facility.
1.25.8. Emergency and First-Aid Equipment:
1.25.8.1. Locate and maintain emergency and first-aid equipment in appropriate location onsite including first-aid kit to accommodate number of site personnel; portable emergency eye wash; two 9 kg ABC type dry chemical fire extinguishers.
1.25.9. Site Communications:
1.25.9.1. Post emergency numbers near site telephones.
1.25.9.2. Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.
1.25.9.3. Provide employee alarm system to notify employees of site emergency situations or to stop Work activities if necessary.
1.25.9.4. Furnish selected personnel with 2-way radios.
1.25.9.5. Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or Work-related conditions; include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Environmental Protection Plan: within 40 Working Days after Contract award and prior to mobilization to Site, Submit a plan detailing protection of the environment. Include:

1.3.1.1. Comprehensive overview of known or potential environmental issues to be addressed during Work.

1.3.1.2. Identify requirements that plan complies with. Includes: permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.

1.3.1.3. Names and qualifications of persons responsible for ensuring adherence to Environmental Protection Plan.

1.3.1.4. Names and qualifications of persons responsible for manifesting material to be removed from Site.

1.3.1.5. Names and qualifications of persons responsible for training Site personnel.

1.3.1.6. Description of Environmental Protection personnel training program.

1.3.1.7. Work Area Plan showing proposed activity in each portion of areas, such as exclusion zone(s), decontamination zone(s) and clean zone(s), and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized Work areas.

1.3.1.8. Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials onsite.

1.3.1.9. Historical, Archaeological, Cultural Resources, Biological Resources and Wetlands Plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands. Include procedures if previously unknown historical, archaeological, cultural, and biological resources are discovered during Work.

1.3.1.10. Noise Control Plan identifying methods and procedures for preventing, monitoring, and controlling noise for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.

Include thresholds and procedures if: noise does not comply with appropriate levels, or if there are public complaints.

1.3.1.11. Vibration Control Plan identifying methods and procedures for preventing, monitoring, and controlling vibration for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract. Include thresholds and procedures if: vibration does not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs

1.3.1.12. Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to prevent mud transported onto public roads by vehicles or runoff, and mitigation measures if mud is transported onto public roads by vehicles or runoff. Vehicles and vehicle traffic must comply with all federal, provincial, and municipal laws and regulations.

1.3.1.13. Contamination Prevention Plan identifying hazardous, deleterious or regulated substances to be used onsite; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with federal, provincial, and municipal laws and regulations for storage and handling of these materials.

1.3.1.14. Spill Control Plan including procedures, instructions, and reports to be used in event of spill of hazardous, deleterious or regulated substances. Identify locations and contents of spill kits.

1.3.1.15. Communications Plan identifying emergency contact list and conditions for implementing emergency contact. Emergency contact to include: Contractor emergency response team including Superintendent; Departmental Representative and alternate, and other contractor(s) and individuals as instructed by the Departmental Representative; and federal, provincial, and municipal emergency contacts.

1.3.1.16. Air Pollution Control Plan detailing provisions to assure that contaminants, dust, debris, materials, and trash, are contained onsite. Include procedures, in accordance with the Contract, if air pollution does not comply with appropriate levels, there are public complaints, or if onsite or offsite damage occurs.

1.3.1.17. Non-Contaminated Waste (CL) Disposal Plan identifying methods and locations for solid waste disposal including clearing waste. Include name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of Landfill.

1.3.1.18. Wastewater Management Plan identifying methods and procedures for management and discharge of Contaminated and Non-Contaminated Wastewater including surface waters and wastewater which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of groundwater, disinfection water, hydrostatic test water, and water used in flushing of lines. Include method of treatment and disposal.

1.3.1.19. Wastewater Disposal Plan identifying methods and locations for solid waste disposal including clearing waste. Include name, location, provincial or territorial authorizations, and evidence of compliance with Municipal zoning and bylaws of Disposal Facility and/or copy of municipal permit to discharge to sewer system

1.3.1.20. Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, federal, provincial, and municipal laws and regulations.

1.3.2. Pollution Control Procedures Modification: immediately when pollution control procedures are inadequate, as instructed by the Departmental Representative, Submit modified procedures to resolve problem.

1.3.3. Pollution Control Remediation: immediately when soil, sediment or water contaminated by Contractor's activities are inadequate as instructed by the Departmental Representative, Submit remediation procedures.

1.3.4. Dust and Particulate Control Procedures Modification: immediately when dust and particulate control measures are inadequate as instructed by the Departmental Representative, Submit modified procedures to resolve problem.

1.4. Fires

1.4.1. Fires and burning of rubbish onsite not permitted.

1.5. Cleaning

1.5.1. Maintain cleanliness of Work and surrounding Site to comply with federal, provincial, and municipal fire and safety laws, ordinances, codes, and regulations applicable to the performance of the Work.

1.5.2. Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.5.3. Ensure cleanup of the Work areas each day after Final Completion of Work.

1.6. Site Clearing and Plant Protection

1.6.1. Minimize stripping of Topsoil and vegetation.

1.6.2. Restrict tree and plant removal to areas in accordance with the Contract or as instructed by the Departmental Representative. Protect all other trees and plants onsite and offsite.

1.6.3. Salvage all trees and plants to be removed in accordance with the Contract or as instructed by the Departmental Representative.

1.6.4. Wrap in burlap, trees and shrubs adjacent to construction Work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.

1.6.5. Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

1.7. Vibration

1.7.1. Maintain acceptable vibration levels as to not damage structures adjacent to the Site as a result of the Work.

1.8. Maintenance of Public Roads

1.8.1. Prevent tracking or spilling of debris or material onto public roads.
1.8.2. Immediately sweep or scrape up debris or material on public roads.
1.8.3. Clean public roads within a 200 m radius of the Site entrance at least once per shift.

1.9. Pollution Control

1.9.1. Pollution includes spills or other releases from Contractor's activities that could potentially contaminate soil, sediment, water, and atmosphere from discharge of hazardous, deleterious or regulated substances, including from equipment and material handling.
1.9.2. Provide sequence, methods and means, and facilities to prevent spills or releases.
1.9.2.1. Maintain temporary erosion and pollution control features.
1.9.2.2. Do not store fuel onsite other than tanks forming part of the equipment.
1.9.2.3. Control emissions from equipment and plant to meet applicable authorities' emission requirements.
1.9.2.4. Contractor to regularly inspect all machinery on the Site to ensure it is in good repair and free of leaks.
1.9.3. Inadequate procedures:
1.9.3.1. Stop relevant Work if procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated or levels in accordance with the Contract.
1.9.3.2. Submit procedures proposed to resolve problem.
1.9.3.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause spills or other releases.
1.9.3.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent spills or other releases, or when monitoring indicates that release equals or exceeds regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.
1.9.4. Be prepared to intercept, cleanup, and dispose of spills or other releases that can occur whether on land or water.
1.9.5. Spill kits and containment are to be maintained onsite and ready for deployment in the event of spills or other releases.
1.9.5.1. Spill kits are to include sufficient quantities of absorbent material, containers, booms, shovels and other tools, and personal protective equipment.
1.9.5.2. Spill response materials must be compatible with type of equipment being used or type of material being handled.
1.9.5.3. Spill kits are to be in close proximity to machinery.

1.9.5.4. During the Work there are to be trained and qualified personnel available that are ready to deploy spill kits when necessary.
1.9.6. Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
1.9.7. Promptly report spills and releases potentially causing damage to environment to:
1.9.7.1. Authority having jurisdiction or interest in spill or other release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
1.9.7.2. Contractor emergency response team including Superintendent
1.9.7.3. Departmental Representative and other contractor(s) and individuals as instructed by the Departmental Representative.
1.9.8. Departmental Representative can collect samples for chemical analyses prior to, during, and upon Final Completion of Work to monitor potential pollution caused by Contractor's activities. Assist Departmental Representative in collection of samples.
1.9.9. Remediation of soil, sediment or water contaminated by Contractor's activities.
1.9.9.1. Remediate all soil, sediment or water contaminated by Contractor's activities associated with the Work onsite and offsite.
1.9.9.2. Remediation includes excavation, pumping, testing, transport, treatment and disposal as appropriate for the type of contamination incurred, and at a minimum in accordance with the Contract.
1.9.9.3. Submit procedures for remediating soil, sediment or water contaminated by Contractor's activities.
1.9.9.4. Remediate as instructed by the Departmental Representative.
1.9.9.5. Contractor is responsible for any additional investigation, testing, and assessments required as acceptable to the Departmental Representative.

1.10. Dust and Particulate Control

1.10.1. Execute Work by methods to minimize raising dust from construction operations.
1.10.2. Prevent fugitive dust from the Site from interfering with onsite and offsite uses.
1.10.3. Prevent dust from spreading to neighbouring properties.
1.10.4. Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads, excavations, and stockpiles.
1.10.5. Implement and maintain dust and particulate control measures immediately as instructed by the Departmental Representative during Work and in accordance with regulations and in accordance with the Contract.
1.10.6. Provide positive means to prevent airborne dust from dispersing into atmosphere. Use fresh (non-saline) water for dust and particulate control.
1.10.7. As minimum, use appropriate covers on vehicles, including trucks, barges, and trains, hauling fine or dusty material. Use watertight vehicles to haul wet materials.
1.10.8. Inadequate procedures:

1.10.8.1. Stop relevant Work if dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, or when monitoring indicates that dust or particulate levels equal or exceed regulated or levels in accordance with the Contract.
1.10.8.2. Submit procedures proposed to resolve problem.
1.10.8.3. Make necessary changes to operations prior to resuming excavation, handling, processing, or other Work that can cause release of dusts or particulates.
1.10.8.4. Departmental Representative can stop relevant Work at any time when Contractor's Work procedures are inadequate to prevent release of dusts or particulates, or when monitoring indicates that dust or particulate levels equal or exceed regulated or levels in accordance with the Contract. Do not proceed with stopped Work until corrections accepted by Departmental Representative.

1.11. Non-Contaminated Waste (CL) Removal

1.11.1. Remove all Non-Contaminated Waste (CL) within Work areas in accordance with the Contract and as instructed by the Departmental Representative.
1.11.2. Assume ownership of, and be responsible for, Non-Contaminated Waste (CL) once it is loaded on a vehicle, barge, or other vessel for transport offsite.
1.11.3. Remove surplus materials and temporary facilities from Site.
1.11.4. Dispose waste offsite.
1.11.5. Do not burn or bury any waste onsite.
1.11.6. Do not discharge wastes into streams or waterways.
1.11.7. Do not dispose of volatile or hazardous materials such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
1.11.8. Dispose of following materials at appropriate Landfill identified by Contractor and accepted by Departmental Representative:
1.11.8.1. Non-Contaminated Waste (CL).
1.11.8.2. Disposable PPE.

1.12. Sewage Wastewater

1.12.1. Store Sewage Wastewater from toilet facilities with wastewater from handbasins, and/or showers, for ultimate disposal.
1.12.2. Provide, operate, and maintain Sewage Wastewater storage tanks to store Sewage Wastewater.
1.12.3. Transport and dispose of Sewage Wastewater at a Disposal Facility, or discharge to municipal sanitary sewer system in compliance with Municipal requirements, as accepted by Departmental Representative.
1.12.4. Discharges: comply with applicable discharge limitations and requirements; do not discharge Sewage Wastewater to Site sewer systems that do not conform to or are in violation of such limitations or requirements; and obtain approval prior to discharge of Sewage Wastewater.

1.13. Wastewater Control

1.13.1. Dewater various parts of Work including, without limitation, excavations, structures, foundations, and Work areas.

1.13.2. Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.

1.13.3. Direct surface waters that have not contacted potentially Contaminated Wastes to surface drainage systems.

1.13.4. Control surface drainage including ensuring that gutters are kept open, wastewater is not allowed across or over pavements or sidewalks except through accepted pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

1.14. Non-Contaminated Wastewater Disposal

1.14.1. Dispose of Non-Contaminated Wastewater in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

1.14.2. Control disposal or runoff of Non-Contaminated Wastewater containing suspended materials or other harmful substances in accordance with local authority requirements.

1.14.3. Ensure pumped Non-Contaminated Wastewater into waterways, sewer or drainage systems is free of suspended materials. Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas

1.14.4. Obtain permits to discharge Non-Contaminated Wastewater to environment or Municipal sewers.

1.14.5. Do not discharge water which may have come in contact with potentially Contaminated Waste or otherwise be Contaminated directly offsite to the environment or to municipal sewers.

1.15. Erosion and Sediment Control

1.15.1. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other Work areas. Prevent erosion and sedimentation.

1.15.2. Minimize amount of bare soil or sediment exposed at one time. Stabilize disturbed soil or sediment as quickly as practical. Strip vegetation, regrade, or otherwise develop to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as instructed by the Departmental Representative.

1.15.3. Provide and maintain temporary erosion and sediment control measures.

1.15.3.1. Temporary erosion and sediment control measures are required to prevent erosion and migration of silt, mud, sediment, and other debris offsite or to other areas of Site where damage might result, or that might otherwise be required by laws and regulations.

1.15.3.2. Temporary erosion and sediment control measures include: silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, vegetative cover, dikes, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition.

1.15.3.3. Temporary improvements must remain in place and in operation as necessary or until otherwise instructed by the Departmental Representative

1.15.3.4. Place silt fences and/or hay or straw bales in ditches to prevent sediment from escaping from ditch terminations.

1.15.3.5. Do not construct bale barriers and silt fence in flowing streams or in swales.

1.15.3.6. Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.

1.15.3.7. Bales and/or silt fence can be removed at beginning of Working Day, replace at end of Working Day.

1.15.3.8. Repair damaged bales, end runs, and undercutting beneath bales.

1.15.3.9. Unless instructed by the Departmental Representative, remove temporary erosion and sediment control devices upon Final Completion of Work. Temporary erosion and sediment control devices once removed become property of Contractor.

1.15.4. Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.

1.15.5. Construct fill areas to prevent erosion.

1.15.6. Do not disturb existing embankments or embankment protection in accordance with the Contract.

1.15.7. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.15.8. If soil, sediment and debris from Site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where it is undesirable, remove accumulation and restore area to original condition, as instructed by the Departmental Representative.

1.16. Work In or Adjacent to Waterways

1.16.1. Guidelines and Practices:

1.16.1.1. Follow practices described in Fisheries and Oceans Canada (September 1993) Land Development Guidelines for the Protection of Aquatic Habitat.

1.16.1.2. Follow practices described in BC Ministry of Environment (March 2004) Standards and Best Practices for Instream Works.

1.16.1.3. Comply with Fisheries Act Authorization and other relevant authorizations and in accordance with the Contract.

1.16.2. General:

1.16.2.1. Construction equipment to be operated on land only unless equipment is specifically designed and permitted to operate in water.

1.16.2.2. Do not use waterway beds for borrow material.
1.16.2.3. Waterways to be free of excavated fill, waste material and debris.
1.16.2.4. Design and construct temporary crossings to minimize erosion to waterways.
1.16.2.5. Do not skid logs or construction materials across waterways.
1.16.2.6. Avoid spawning beds when constructing temporary crossings of waterways.
1.16.3. Machinery:
1.16.3.1. Ensure all hydraulic machinery to be used in or adjacent to waterways use environmentally sensitive hydraulic fluids which are non-toxic to aquatic life, and which are readily or inherently bio-degradable.
1.16.3.2. Place oil drip trays or absorbent materials (e.g. pads) under any heavy equipment working within the Fisheries Sensitive Zone adjacent to the watercourse to ensure there is no potential for contamination of the streambanks or watercourse resulting from leaks or drip off machinery. Ensure that there is no potential for oil, grease or other deleterious substances to enter any watercourse, ravine or storm sewer system.
1.16.3.3. All equipment and machinery working within 15 meters of any watercourse must be in good working condition (power washed) and free of leaks or excess oil and grease. No fuels, lubricants, construction wastes or other deleterious substances can enter any watercourse at any time.
1.16.4. Watercourse Maintenance:
1.16.4.1. Do not disturb streamside or riparian vegetation in accordance with the Contract. Important native in-water aquatic vegetation, such as cattails, must not be disturbed.
1.16.4.2. Do not disturb the watercourse bank or the root systems of vegetation growing on the watercourse banks in accordance with the Contract.
1.16.5. Sediment Control and Deleterious Substances:
1.16.5.1. All Work must be undertaken and completed in such a manner to prevent the release of silt, sediment or sediment laden water, raw concrete or concrete leachate, or any other deleterious substances to any ditch, watercourse, ravine or storm sewer system.
1.16.5.2. Construction and excavation wastes, Overburden, soil, sediment, concrete, concrete leachate, grout, oil, grease or any other substance deleterious to aquatic life must be disposed of or placed in a manner that must prevent their entry into any watercourse, ravine or storm sewer system.
1.16.5.3. All excavated material must be removed from the Site or placed in a stable area above the high water mark of the watercourse, as far as possible from the channel, and protected from erosion by mitigating measures including temporary covering exposed soil or sediment with: polyethylene covers, geotextile fabric, hydro-seed or planting vegetation. Material that is moved offsite must be disposed of in such a manner as to prevent its entry into any ditch, watercourse, wetland, floodplain, ravine or storm sewer system.
1.16.5.4. Fill must be inert material in accordance with the Contract, free from contaminants and must be placed so that it cannot gain entry into any ditch, watercourse, wetland, floodplain, ravine or storm sewer system.

1.16.5.5. No fill is to be stockpiled on marsh or marsh fringe areas.
1.16.6. Restoration of waterways impacted by Contractor's activities.
1.16.6.1. Restore all waterways impacted by Contractor's activities associated with the Work onsite and offsite.
1.16.6.2. Restoration includes removal of material, regrading, and revegetation to restore to original pre-impacted state.
1.16.6.3. Submit procedures for restoration.
1.16.6.4. Restore as instructed by the Departmental Representative.

1.17. Waterway Impact Requirements
1.17.1. All impacts to a waterway, including runoff, discharge, or work in or adjacent to waterways, must meet Waterway Impact Requirements.
1.17.2. Other than site-specific criteria or authorizations, Waterway Impact Requirements must meet the more stringent of:
1.17.2.1. Laws, regulations, and permits applicable to the performance of the Work.
1.17.2.2. BC *Approved Water Quality Guidelines* for Marine and Estuarine Aquatic Life water use.
1.17.2.3. CCME *Canadian Environmental Quality Guidelines* for the Protection of Aquatic Life.
1.17.3. Site-specific criteria for Waterway Impact Requirements are:
1.17.3.1. Naphthalene concentrations must not exceed 38 µg/L.
1.17.4. Site-specific authorization for Waterway Impact Requirements are:
1.17.4.1. Discharge Approval to be obtained by Contractor from Transport Canada pursuant to the *Canada Marine Act*.

1.18. Noncompliance
1.18.1. Departmental Representative will inform Contractor in writing of observed noncompliance with federal, provincial or municipal environmental laws, regulations, permits, or other environmental procedure violations.
1.18.2. After receipt of notice, inform the Departmental Representative of the proposed corrective action. Corrective action will be subject to acceptance of Departmental Representative.
1.18.2.1. Do not take action until after receipt of written acceptance.
1.18.3. Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.

2. PART 2 - PRODUCTS

2.1. Not Used
2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Not Used.

1.4. Laws, Regulations, Permits

1.4.1. Generally, provincial and municipal laws, regulations and requirements do not apply on federal lands, activities or undertakings. Soil and other materials that are removed from federal lands may become subject to provincial or municipal laws and regulations.

1.4.2. Provincial or municipal standards may be used in relation to federal lands only as guidelines for the purpose of establishing remediation goals and objectives. The term "standards" is used in this part in order to maintain consistency in terminology throughout this document, and does not imply that standards contained in provincial or municipal laws and regulations apply on Federal lands, activities or undertakings.

1.4.3. Comply with certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial or municipal authorities to complete the Work that have already been obtained.

1.4.4. Obtain and pay for certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial or municipal authorities to complete the Work that have not already been obtained or that are required to be amended.

1.4.5. Provide applicable authorities with plans and information required for issue of acceptance certificates.

1.4.6. Furnish inspection certificates in evidence that the Work installed conforms with the requirements of the authority having jurisdiction.

1.5. Codes, Bylaws, Standards

1.5.1. Meet or exceed requirements of Contract, standards, and codes applicable to the performance of the Work and referenced documents.

1.5.2. In any case of conflict or discrepancy, the most stringent requirements will apply.

1.5.3. Perform Work in accordance with the National Building Code of Canada (NBC), and other requirements or codes in accordance with the Contract, construction standards and/or any other code or bylaw applicable to the performance of the Work.

1.5.4. Certificates, licenses and other permits enforced at the location concerned required by regulatory federal, provincial or municipal authorities to complete the Work include:

1.5.4.1. Harmful Alteration Destruction or Distraction (HADD) authorization.

1.5.4.2. Canadian Environmental Assessment Agency (CEAA) authorization.

1.5.4.3. *Canada Marine Act*, including authorizations from Transport Canada Harbour Master such as water Discharge Approval.

1.5.5. Comply with all attachments, references, and reports relevant to Work, including environmental protection.

1.6. Smoking Environment

1.6.1. Smoking on the Site is not permitted.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Site Layout: within 40 Working Days after Contract award and prior to mobilization to Site, Submit Site Layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor. Include:

1.3.1.1. Equipment and personnel decontamination areas.

1.3.1.2. Means of ingress, egress and temporary traffic control.

1.3.1.3. Equipment and material staging areas.

1.3.1.4. Stockpile areas and construction details, including base preparation and water control features.

1.3.1.5. Exclusion areas, contaminant handling areas, and other areas identified in Contractor's site-specific Health and Safety Plan and Environmental Protection Plan.

1.3.1.6. Grading, including contours, required to construct temporary facilities.

1.3.1.7. Location of all temporary facilities including: Contaminated Wastewater Treatment Plant, truck wash and decontamination units, truck weigh scale facility, office trailers, parking, storage, environmental monitoring stations, above ground and underground utilities, and temporary facilities and roads.

1.3.2. Signs: at least 5 Working Days prior to posting, Submit any signs viewable by public.

1.4. Utilities

1.4.1. Power is not available at existing Site and must be supplied at the Contractor’s expense.

1.4.2. Water supply is not available at existing Site and must be supplied at the Contractor’s expense.

1.5. Fire Protection

1.5.1. Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

1.6. Access and Delivery

1.6.1. Only the designated entrance in accordance with the Contract can be used for access to Site.

1.6.1.1. Maintain for duration of Contract.

1.6.1.2. Make good damage resulting from Contractor's use.
1.6.2. Use of the Site will be granted to the Contractor through the Departmental Representative.

1.7. Installation and Removal
1.7.1. Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
1.7.2. Identify areas which have to be gravelled to prevent tracking of mud.
1.7.3. Indicate use of supplemental or other staging area.
1.7.4. Provide construction facilities in order to execute work expeditiously.
1.7.5. Provide temporary utilities in order to execute Work expeditiously.
1.7.6. Remove from Site all such Work after use.

1.8. Site Storage/Loading
1.8.1. Confine work and operations of employees in accordance with the Contract. Do not unreasonably encumber premises with products.
1.8.2. Storage space must be limited to the Site.
1.8.3. Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.9. Construction Parking
1.9.1. Parking of private vehicles will not be permitted on Site.
1.9.2. Provide and maintain adequate access to project site.

1.10. Security
1.10.1. Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.
1.10.2. Control access to Site and maintain a log of all personnel onsite. No non-Work visitors allowed without prior written consent of Departmental Representative

1.11. Departmental Representative and Consultant Offices
1.11.1. Provide two separated office facilities for the exclusive use of the Departmental Representative and their consultants with the following:
1.11.1.1. Factory fabricated modular double wide units in accordance with the Contract.
1.11.1.2. The offices must be new or refurbished, and not older than 10 years. Refurbished product must not contain moisture damaged finishes, wood structure in floor, roof or wall system. Mold must not be present.
1.11.1.3. Ensure total absence of condensation on interior surfaces under following minimum condition.
1.11.1.3.1. Interior: 22 degrees C 55% RH, still air.
1.11.1.3.2. Exterior: 15 degrees C 50 km/h wind.
1.11.1.4. Building envelope: watertight construction.

1.11.1.4.1. In addition to uniform live load, design for full live load on leeward half of building frame and zero live load on windward half.
1.11.1.5. Design members to withstand, within acceptable deflection limitations:
1.11.1.5.1. Snow load: 1.6 kN/m2 (33 psf).
1.11.1.5.2. Floor live load: 4.8 kN/m2 (100 psf).
1.11.1.6. Design building enclosure elements to accommodate, by means of expansion joints, movement in wall and structural movements without permanent distortion, damage to infills, racking of joints, breakage of seals, water penetration or glass breakage.
1.11.1.7. Completed building: exterior to interior minimum sound attenuation of STC 30.
1.11.1.8. Conceal, piping, conduit and related components within ceilings and wall assemblies.
1.11.1.9. Building interior environment: heated and cooled to maintain temperature of 20 degrees C minimum to 25 degrees C maximum with relative humidity of 35% to 60%.
1.11.1.10. Provide ventilation and outdoor air as per ASHRAE 62.1 – 2010 Standard.
1.11.1.11. Building lighting: maintain measured lighting level of 200 lx at 1500 mm above finished floor, after building finishes and painting complete.
1.11.1.12. Thermal performance of window units: Maximum heat transfer rate (U-value) not to exceed 2.0 W/m2K.
1.11.1.13. Regularly collect refuse and recyclables and keep the office clean and properly maintained with heat and light.
1.11.1.14. Provide private washroom facilities in offices in accordance with the Contract, complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
1.11.1.15. Furnish offices in accordance with the Contract.
1.11.1.16. Work stations must include; 1 desk (minimum size 120 cm x 50 cm, minimum height 70 cm), 1 swivel desk chair (minimum load requirement 100 kg), 1 bookshelf (minimum 3 shelves with a minimum shelf height of 32 cm), 1 locking filing cabinet (minimum dimensions 50 cm x 39 cm x 60 cm), 1 garbage can, and 1 recycling bin.
1.11.1.17. Meeting room must include; 1 white board (minimum dimensions 100 cm x 100 cm) and 1 speaker phone.
1.11.1.18. The offices and contents must be for the sole use of the Departmental Representative and their consultant(s) for the duration of the Work and may, if necessary, be used concurrently with other inspection agencies.
1.11.1.19. Provide a private telephone line for the sole use of the Departmental Representative and Consultants. Long distance phone calls will be paid for by the Departmental Representative.
1.11.1.20. Provide internet access for all work stations (Departmental Representative and Consultant office facilities).
1.11.2. Installation:
1.11.2.1. Install stable timber foundation as shown on Contractor’s Site Layout.

1.11.2.2. Install level and plumb.
1.11.2.3. Install skirting and stairs.
1.11.2.4. Adjust doors and windows for smooth operation.
1.11.2.5. Install personnel decontamination facility immediately adjacent to stairs.
1.11.3. Provide a minimum of four parking spaces for Departmental Representatives and their consultants adjacent to offices.

1.12. Equipment, Tools and Materials Storage
1.12.1. Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
1.12.2. Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.13. Sanitary Facilities
1.13.1. Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
1.13.2. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.14. Construction Signage
1.14.1. Provide and erect project signs within 10 Working Days of mobilization in a location designated by Departmental Representative.
1.14.2. Provide project identification site sign comprising foundation, framing, and one 1200 x 2400 mm signboard as detailed and as described below.
1.14.2.1. Foundations: 15 MPa concrete to CSA-A23.1 minimum 200 mm x 900 mm deep.
1.14.2.2. Framework and battens: SPF, pressure treated minimum 89 x 89 mm.
1.14.2.3. Signboard: 19 mm Medium Density Overlaid Douglas Fir Plywood to CSA O121.
1.14.2.4. Paint: alkyd enamel to CAN/CGSB-1.59 over exterior alkyd primer to CAN/CGSB 1.189.
1.14.2.5. Fasteners: hot-dip galvanized steel nails and carriage bolts.
1.14.2.6. Vinyl sign face: printed project identification, self adhesive, vinyl film overlay, supplied by Departmental Representative.
1.14.3. Locate project identification sign as directed by Departmental Representative and construct as follows:
1.14.3.1. Build concrete foundation, erect framework, and attach signboard to framing.
1.14.3.2. Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
1.14.3.3. Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.
1.14.4. Direct requests for approval to erect Contractor signboard to Departmental Representative. For consideration general appearance of Contractor signboard

must conform to project identification site sign. Wording in both official languages.

1.14.5. Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

1.14.6. Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.15. Protection and Maintenance of Traffic

1.15.1. Provide access and temporary relocated roads as necessary to maintain traffic.

1.15.2. Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

1.15.3. Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.

1.15.4. Protect travelling public from damage to person and property.

1.15.5. Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

1.15.6. Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

1.15.7. Construct access and haul roads necessary.

1.15.8. Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

1.15.9. Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

1.15.10. Dust control: adequate to ensure safe operation at all times.

1.15.11. Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.

1.15.12. Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

1.15.13. Provide snow removal during period of Work.

1.15.14. Remove, upon completion of work, haul roads designated by Departmental Representative.

1.16. Truck Wash and Decontamination Units

1.16.1. Supply, install and operate the truck wash, including the installation of a water supply.

1.16.1.1. No vehicles which have come in contact with Contaminated Waste must leave the Site without passing through the truck wash.

1.16.1.2. The truck wash must provide, at a minimum, the ability to wash truck tires and load boxes to a minimum height of 1.7 m.

1.16.1.3. Truck wash must have a solid separation tank and all solids collected must be classified as Contaminated Waste and disposed of at a Disposal Facility.
1.16.1.4. Recycle or treated as Contaminated Wastewater water used in the truck wash.
1.16.2. Supply personnel decontamination units (minimum of 2) for use by hazardous material, testing and inspection personnel working in areas of hazardous materials and for general clean-up of personal protective equipment to remove Contaminated Waste.
1.16.2.1. At least one personnel decontamination unit must have overhead shower capability.
1.16.2.2. The personnel decontamination units to be available to Departmental Representative and their consultants.
1.16.2.3. The personnel decontamination units are subject to acceptance of Departmental Representative.
1.16.3. The truck wash and personnel decontamination units must be maintained in good working order during onsite Work.
1.16.4. The truck wash and personnel decontamination units must be removed from the Site during Site Decommissioning.

1.17. Truck Weigh Scale Facility

1.17.1. Supply, install, maintain, license and operate an electronic weigh scale or platform type with remote balancing beam as accepted by Departmental Representative. The scale must be of sufficient size and capacity to weigh, at a single pass, the largest, rigid-framed haulage vehicle to be used on the Site and in any case, must have a minimum capacity of 40,000 kg. The scale must be capable of weighing all loads to within 50 kg of the true mass. The scale must comply with an acceptable current standard for industrial truck scales as instructed by the Departmental Representative.
1.17.2. The scale must be situated adjacent to the Work on the Site at a location accepted by the Departmental Representative. Provide and maintain suitable level roadways and clearance for truck access and exit from the scale and control speeds and braking of vehicles to prevent damage to and calibration of the scale. Provide and maintain a suitable building enclosure for a scale operator and recording equipment.
1.17.3. At the start of the Work, and as frequently as the Departmental Representative may deem necessary in order to ensure the accuracy, the scale must be calibrated and checked by an Inspector of Weights and Measures.
1.17.4. Scaleperson to attend the scale at all times weighing is required for the Work. Sufficient copies of weigh scale receipts must be printed to satisfy the requirements of the Contractor and third parties supplying or receiving weighed materials and as instructed by the Departmental Representative.
1.17.5. The weigh scale receipts must bear the signature, initials or other marking of the Departmental Representative, scaleperson, and receiving checker.
1.17.6. Accuracy of the scale must be verified by Measurement Canada as required under the *Weights and Measures Act* and *Regulations.*

1.18. Clean-Up

1.18.1. Remove construction debris, waste materials, packaging material from work site daily.
1.18.2. Clean dirt or mud tracked onto paved or surfaced roadways.
1.18.3. Store materials resulting from demolition activities that are salvageable.
1.18.4. Stack stored new or salvaged material not in construction facilities.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Product Data: at least 5 Working Days prior to use, Submit data on products to be used in Work. Include:

1.3.1.1. Manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products or any other information in accordance with the Contract.

1.3.1.2. Delete information not applicable to project.

1.3.1.3. Supplement standard information to provide details applicable to project.

1.3.1.4. Cross-reference product data information to applicable portions of Contract.

1.3.2. Substitution: at least 5 Working Days prior to use and after Contract award, Submit proposals for substituting products, if required. Include statements of respective costs of items originally in accordance with the Contract and the proposed substitution.

1.3.3. Quality of Work: at least 5 Working Days prior to Work, Submit alternate means to meet or correct quality of work, if required.

1.4. Products, Material and Equipment

1.4.1. Use new products, material and equipment in accordance with the Contract. The term "products" is referred to throughout the specifications.

1.4.2. Use products of one manufacturer for material and equipment of the same type or classification in accordance with the Contract.

1.4.3. Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation method in accordance with the Contract s.

1.4.4. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document is to be followed.

1.4.5. Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

1.4.6. Prevent damage, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from Site.

1.4.7. Store products in accordance with Suppliers' instructions.

1.5. Quality of Products

1.5.1. Products, materials and equipment (referred to as products) incorporated into Work must be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. As instructed by the Departmental Representative, furnish evidence as to type, source, and quality of the products provided.
1.5.2. Defective products will be rejected regardless of previous inspections.
1.5.2.1. Inspection does not relieve responsibility, but is precaution against oversight or error.
1.5.2.2. Remove and replace defective products.
1.5.3. Retain purchase orders, invoices and other documents to prove that all products utilized in the Work meet the requirements of the Contract. Produce documents as instructed by the Departmental Representative.
1.5.4. Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative in accordance with the Contract.
1.5.5. Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.6. Availability of Products

1.6.1. Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items.
1.6.2. If delays in supply of products are foreseeable, Notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the Work.
1.6.3. In event of failure to Notify Departmental Representative at the start of Work and should it subsequently appear that the Work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character.

1.7. Manufacturer's Instructions

1.7.1. Install or erect products in accordance with the manufacturer's instructions in accordance with the Contract.
1.7.1.1. Do not rely on labels or enclosures provided with products.
1.7.1.2. Obtain written instructions directly from the manufacturer.
1.7.2. Notify Departmental Representative in writing of any conflict between Contract and manufacturer's instructions. Departmental Representative will instruct which document is to be followed.
1.7.3. Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to instruct the removal and re-installation.

1.8. Contractor's Options for Selection of Products for Tendering

1.8.1. Products specified by "Prescriptive" specifications: select any product meeting or exceeding requirements in accordance with the Contract.

1.8.2. Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.
1.8.3. Products specified to meet particular design requirements or to match existing materials: use only material in accordance with the Contract.
1.8.4. When products are specified by a referenced standard or by performance specifications, as instructed by the Departmental Representative obtain from manufacturer and independent laboratory report showing that the product meets or exceeds the requirements in accordance with the Contract.

1.9. Storage, Handling and Protection

1.9.1. Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
1.9.2. Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in Work.
1.9.3. Store products subject to damage from weather in weatherproof enclosures.
1.9.4. Remove and replace damaged products as instructed by the Departmental Representative.

1.10. Transportation

1.10.1. Pay costs of transportation of products required in performance of Work.
1.10.2. Transport products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
1.10.3. Transport products subject to damage from weather in weatherproof enclosures.
1.10.4. Transport in an efficient manner that does not cause delays to the Work schedule.

1.11. Quality of Work

1.11.1. Ensure quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately Notify Departmental Representative if required Work is such as to make it impractical to produce results in accordance with the Contract. Provide alternate means to meet or correct quality of work, as accepted by the Departmental Representative.
1.11.2. Do not employ anyone unskilled in their required duties.
1.11.3. Perform Work to standard of fitness of Quality of Work in accordance with any decision by the Departmental Representative.

1.12. Coordination

1.12.1. Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

1.13. Remedial Work

1.13.1. Perform remedial Work required to repair or replace parts or portions of Work as instructed by the Departmental Representative as defective or unacceptable. Coordinate adjacent affected Work as required.
1.13.2. Perform remedial Work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

2. PART 2 - PRODUCTS

2.1. Not Used
2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used
3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Preconstruction Condition Survey: within 10 Working Days prior to mobilization to Site, Submit Preconstruction Condition Survey of existing structures, utilities and surface features.

1.3.2. Preconstruction As-Built Documents: at least 5 Working Days prior to mobilization to Site, Submit preconstruction as-built documents prepared by a Land Surveyor.

1.4. Qualifications of Surveyor

1.4.1. A Land Surveyor, acceptable to Departmental Representative.

1.5. Survey Reference Points

1.5.1. Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

1.5.2. Make no changes or relocations without prior written notice to Departmental Representative.

1.5.3. Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

1.5.4. Require surveyor to replace control points in accordance with original survey control.

1.6. Survey Requirements

1.6.1. Establish permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

1.6.2. Establish lines and levels, locate and lay out, by instrumentation.

1.6.3. Stake for grading, fill.

1.7. Existing Services

1.7.1. Size, depth and location of existing utilities and structures as specified are for guidance only. Completeness and accuracy are not guaranteed.

1.7.2. Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative. All utilities entering Site must be confirmed prior to subsurface disturbance (ie do not rely on as-built

documents). As appropriate, confirm locations of buried utilities by independent utility locator and using hand test excavations or hydrovac methods

1.7.3. Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.7.4. Maintain and protect from damage all utilities and structures encountered, unless Work involves temporarily breaking, rerouting, or connecting into existing utilities.

1.7.5. Where Work involves temporarily breaking, rerouting, or connecting into existing utilities, obtain permission from utility companies of intended interruption of services, and carry out Work at times determined by the authorities having jurisdiction.

1.7.6. Submit schedule to and obtain approval for any shutdown or closure of active service. Adhere to schedule accepted by Departmental Representative and provide notice to affected parties.

1.7.7. Provide temporary services as required to maintain critical building and tenant systems.

1.7.8. Where unknown utilities are encountered, immediately verbally notify Departmental Representative and confirm findings in writing.

1.8. Examination

1.8.1. Examine Site and Contract and be familiar and conversant with existing conditions likely to affect Work, including Contaminated Waste.

1.9. Records

1.9.1. Land Surveyor to prepare preconstruction as-built drawings of all utilities.

1.9.2. Land Surveyor to prepare postconstruction as-built drawings of all utilities, including existing, reinstated, rerouted, and abandoned.

1.9.3. Maintain a complete, accurate log of control and survey work as it progresses.

1.9.4. Preconstruction Condition Survey:

1.9.4.1. Conduct Preconstruction Condition Survey of existing structures and other features which can be affected by Work, both onsite and offsite. Includes: buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, roads, survey bench marks, monuments and other features.

1.9.4.2. Survey to include detailed photographic documentation of any preconstruction damage, and measurements where appropriate, including crack width and length, angles out of true. Record written notices to owners of features that have existing damage.

1.9.4.3. Record written notices of offsite owners which refused entry to conduct Preconstruction Condition Survey.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Waste Reduction Plan: within 40 Working Days after Contract award and prior to mobilization to Site, Submit a plan detailing material separation. Include:

1.3.1.1. List of materials to be reused or recycled.

1.3.1.2. Sequence, methods and means to dispose Non-Contaminated Waste offsite. Include name, location, provincial or territorial authorizations, and evidence of compliance with municipal zoning and bylaws of Disposal Facilities.

1.3.2. Landfill Receipts: within 5 Working Days of transport offsite, Submit receiving facility receipts indicating quantity and type of material delivered to Landfill.

1.3.3. Recycling Receipts: within 5 Working Days of transport offsite, Submit receiving facility receipts indicating quantity and type of materials sent for recycling.

1.4. Non-Contaminated Waste Disposal

1.4.1. Non-Contaminated Waste Disposal:

1.4.1.1. Divert materials which can be practically reused or recycled from Landfill.

1.4.1.2. Dispose all other Non-Contaminated Waste in

1.4.2. Landfill must:

3.1.1.1. Be an existing offsite facility located in Canada.

3.1.1.2. Conform with the BC Ministry of Environment *Landfill Criteria For Municipal Solid Waste*.

1.4.2.1. Hold a valid and subsisting permit, certificate, approval, or any other form of authorization issued by a province or territory for the disposal of Non-Contaminated Waste.

1.4.3. Dispose material as soon as practical and within 100 Working Days of leaving Site unless otherwise accepted by Departmental Representative.

1.4.4. Material sent to a Landfill must be permanently stored at that facility.

1.4.5. If proposed Landfill is not acceptable to Departmental Representative, identify an alternate Landfill that is acceptable.

1.4.6. Submit recycling receipts or landfill receipts for all material disposed offsite.

1.5. Materials Source Separation

1.5.1. Provide separate containers for reusable and/or recyclable materials of the following:

1.5.1.1. Metals.

1.5.1.2. Wood.
1.5.1.3. Plastics.
1.5.1.4. Paper.
1.5.1.5. Glass.
1.5.1.6. Other materials in accordance with the Contract.
1.5.2. Implement Materials Source Separation Program for waste generated on project in compliance with methods accepted by the Departmental Representative.
1.5.3. Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
1.5.4. Locate separated materials in areas which minimize material damage.

1.6. Diversion of Materials

1.6.1. Create a list of materials to be separated from the general waste stream and stockpiled in separate containers, as accepted by the Departmental Representative and consistent with applicable fire regulations.
1.6.1.1. Mark containers.
1.6.1.2. Provide instruction on disposal practices.

1.7. Storage, Handling and Application

1.7.1. Do Work in compliance with Waste Reduction Plan.
1.7.2. Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes, and dispose at Landfill weekly.
1.7.3. Materials in separated condition: collect, handle, store onsite, and transport offsite to an authorized recycling facility accepted by the Departmental Representative, and remove from Site weekly.
1.7.4. Materials must be immediately separated into specified categories for reuse or recycling.
1.7.5. Unless otherwise in accordance with the Contract, materials for removal become the Contractor’s property.
1.7.6. Onsite sale of salvaged/recyclable material is not permitted.
1.7.7. Submit as instructed by the Departmental Representative receiving facility weigh scale receipts indicating quantity of material delivered to Landfill.
1.7.8. Submit as instructed by the Departmental Representative receiving facility weigh scale receipts indicating quantity and type of materials sent for recycling.

2. PART 2 - PRODUCTS

2.1. Not Used

2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used

3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Product Instructions: at least 10 Working Days before Substantial Performance of the Work is completed, Submit instructions and data by personnel experienced in maintenance and operation of products and equipment constructed and remaining onsite, if required.

1.3.2. Closeout Documents: within 30 Working Days of Final Completion of Site Restoration, Submit completion documents and as-built documents.

1.4. As-Built Documents

1.4.1. The Departmental Representative will provide 2 sets of Drawings, 2 sets of Specifications, and 2 copies of the original AutoCAD files for “as-built” purposes.

1.4.2. As Work progresses, maintain accurate records to show all deviations from the Contract. Note changes as they occur on as-built Specifications, Drawings and shop drawings.

1.4.3. Drawings and shop drawings: legibly mark each item to record actual construction, including:

1.4.3.1. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

1.4.3.2. Field changes of dimension and detail.

1.4.3.3. Changes made by change orders.

1.4.3.4. Details not on original Drawings.

1.4.3.5. References to related shop drawings and modifications.

1.4.4. Contract Specifications: legibly mark each item to record actual workmanship of construction, including:

1.4.4.1. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

1.4.4.2. Changes made by addenda and change orders.

1.4.5. As-built information:

1.4.5.1. Record changes in red ink.

1.4.5.2. Mark on 1 set of Drawings, Specifications and shop drawings at Final Completion of project and, before final inspection, neatly transfer notations to second set.

1.4.5.3. Submit 1 set in editable AutoCAD 14 file format with all as-built information.

1.4.5.4. Submit all sets as instructed by the Departmental Representative.
1.4.6. As required, surveying to be completed by a Land Surveyor for as-built documents.

1.5. Completion Documents
1.5.1. Submit as instructed by the Departmental Representative, a written certificate that the following have been performed:
1.5.1.1. Work has been completed and inspected by the Departmental Representative in accordance with the Contract.
1.5.1.2. Treatment and disposal of treatable soils have been completed and disposal of all other soils has been completed.
1.5.1.3. Damage has been repaired, deficiencies have been completed, missing items have been provided, and non-conformance has been corrected, in the opinion of the Departmental Representative.
1.5.1.4. Equipment and systems have been tested, adjusted and balanced, and are fully operational.
1.5.1.5. Certificates required by the Fire Commissioner of Canada, and utility companies have been submitted.
1.5.1.6. Operation of systems has been demonstrated to the personnel as instructed by the Departmental Representative.
1.5.1.7. Work is complete and ready for Final Site Inspection.
1.5.2. Defective products will be rejected, regardless of previous inspections. Replace defective products.
1.5.3. Prepare all documentation required as part of any permits or other authorizations obtained or otherwise the responsibility of the Contractor.

2. PART 2 - PRODUCTS

2.1. Not Used
2.1.1. Not Used.

3. PART 3 - EXECUTION

3.1. Not Used
3.1.1. Not Used.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Permits: at least 10 Working Days prior to mobilization to Site, Submit copies of all permits, certificates, approvals, or any other form of authorizations and all reporting required.

1.3.2. Work Sequencing: within 40 Working Days of Contract award and prior to mobilization to Site, Submit Work sequencing description and schedule. Includes:

1.3.2.1. Work Sequencing description must describe sequence, methods and means to perform each major task.

1.3.2.2. Work Sequencing schedule must show on a Gantt chart, start, end and dependencies of each major task and also indicates Work to be performed in sequence and in parallel.

1.3.2.3. Major tasks include: pre-mobilization Work, Mobilization, Site Preparation, installation of temporary facilities, temporary support walls, excavation in each area, Cofferdam, dewatering, outfall construction, backfilling, Shoreline Restoration, offsite transportation, offsite treatment, offsite disposal, Site Restoration and Demobilization.

1.3.3. Import Fill Material Quality: at least 5 Working Days prior to bringing material onsite, Submit documentation signed and sealed by a Qualified Professional verifying that material is acceptable for import and intended use. Include:

1.3.3.1. Grain-size distribution information.

1.3.3.2. Chemical analyses for Potential Contaminants of Concern, including metals.

1.3.3.3. Testing to be performed by a Qualified Professional at sufficient frequency to characterize all material imported to Site. Test using appropriate guidelines and practices.

1.3.4. Import Fill Material Samples: at least 5 Working Days prior to bringing material to Site, Submit samples of imported fill.

1.3.4.1. Submit samples representative of all material to be imported. Sample frequency subject to acceptance by Departmental Representative.

1.3.4.2. Submit sufficient sample size to allow geotechnical and environmental quality testing.

1.4. Sequencing for Free Phase Products

1.4.1. When floating free phase substance is present, remove free phase from saturated soil or sediment without further contaminating soil, sediment or groundwater prior to commencing other construction Work.
1.4.2. Collect free phase product, load, and transport to a Treatment Facility.

1.5. Onsite Access Roads

1.5.1. Maintain onsite access roads as follows:
1.5.1.1. Obtain permission to use existing onsite access roads.
1.5.1.2. Maintain and clean roads for duration of Work.
1.5.1.3. Control mud and dust from road.
1.5.1.4. Repair damage incurred from use of roads.
1.5.1.5. Provide photographic documentation of roads used by construction vehicles before, during and after Work.
1.5.1.6. The Departmental Representative can instruct cleaning of the onsite access roads.

2. PART 2 - PRODUCTS

2.1. Materials

2.1.1. Erosion and sediment control materials to meet the following minimum requirements:
2.1.1.1. Hay or Straw Bale: wire bound or string tied; securely anchored by at least 2 stakes or rebars driven through bale 300 mm to 450 mm into ground; chinked (filled by wedging) with hay or straw to prevent water from escaping between bales; and entrenched minimum of 100 mm into ground.
2.1.1.2. Silt Fence: assembled, ready to install unit consisting of geotextile attached to driveable posts. Geotextile: uniform in texture and appearance, having no defects, flaws, or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 2-year service life from outdoor exposure.
2.1.1.3. Net Backing: industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.
2.1.1.4. Posts: sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.
2.1.2. Gradations to be within limits specified when tested to ASTM C117-13 (*Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing*) and ASTM C136-06 (*Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates*). Sieve sizes to SCC CAN/CGSB-8.1-88 (*Sieves, Testing, Woven Wire, Inch Series*) and CAN/CGSB-8.2-M88 (*Sieves, Testing, Woven Wire, Metric Series*).

2.1.3. Import fill materials to meet the following minimum requirements

2.1.3.1. Import fill materials must be granular aggregate composed of inert, clean, tough, durable particles of crushed rock, gravel and sand capable of withstanding the deleterious effects of exposure to water, freeze-thaw, handling, spreading and compacting. The aggregate particles must be uniform in quality and free from clay lumps, wood and free from an excess of flat or elongated pieces.

2.1.3.2. Import fill materials must originate from a clean source, and be the lesser of the Canadian Council of Ministers of the Environment *Soil Quality Guidelines for Commercial and Industrial Land Uses*, and the British Columbia *Contaminated Sites Regulation Schedule 7- Standards Triggering Contaminated Soil Relocation Agreements, Soil Relocation to Non-agricultural Land*.

2.1.3.3. Import fill material brought onsite must be tested by the Contractor for Acid Rock Drainage (ARD) and Metals Leaching (ML) potential using acid base accounting (ABA) for assessment of ARD potential and more specifically using the Modified Sobek Test Method. The potential for metals leaching must use Shake Flask Extraction (SFE) Method for analysis of metals leaching. See guidance document Price 2009, *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials* MEND Report 1.20.1, Natural Resources Canada.

2.1.3.4. Any import fill material which has a discrete sample exceeding the standards or guidelines specified must be removed from the Site and replaced, including relevant placed material, as instructed by the Departmental Representative, and an alternate source of backfill must be provided, with no increases to Contract Amount or Extension of Time for completion of the Work.

2.1.4. Import fill material additional testing:

2.1.4.1. Perform additional testing as instructed by the Departmental Representative.

2.1.4.2. Facilitate testing by the Departmental Representative.

3. PART 3 - EXECUTION

3.1. Examination

3.1.1. Site Verification of Conditions:

3.1.1.1. Contractor to determine condition of existing Site and requirements to make the Site suitable for Work.

3.2. Mobilization Requirements

3.2.1. Do not mobilize until instructed by Departmental Representative.

3.2.2. Mobilize all necessary equipment, materials and personnel to the Site in an orderly and efficient manner.

3.3. Site Preparation and Operation

3.3.1. Site Preparation and operation includes construction, operation and maintenance for the duration of the Work,
3.3.2. Remove and dispose all surficial Non-Contaminated Waste (CL) at a Landfill to allow access for Work.
3.3.3. Clearing and grubbing of the Site to allow access for Work.
3.3.3.1. Clearing consists of removing Non-Contaminated Waste (CL) vegetation above existing ground surface to facilitate Work. Includes: cutting off trees and brush vegetative growth, felled trees, previously uprooted trees and stumps. Dispose of Non-Contaminated Waste (CL) at a Landfill.
3.3.3.2. Grubbing consists of excavation of Non-Contaminated Waste (CL) below existing ground surface to facilitate Work. Includes: stumps, roots, boulders and rock fragments. Dispose of Non-Contaminated Waste (CL) at a Landfill.
3.3.4. Remove obstructions, ice and snow, from surfaces to be worked.
3.3.5. Protection:
3.3.5.1. Protect existing features with temporary barriers and enclosures as required by applicable local regulations.
3.3.5.2. Keep excavations clean, free of standing water, and loose soil or sediment.
3.3.5.3. Protect natural and man-made features required to remain undisturbed. Unless otherwise required or located in an area to be occupied by new construction, protect existing trees from damage.
3.3.5.4. Protect buried utilities that are required to remain undisturbed.
3.3.5.5. Provide temporary structures to divert flow of surface water from excavation.
3.3.6. Security and Safety:
3.3.6.1. Provide safety measures to ensure worker and public safety.
3.3.6.2. Ensure Site is secure during onsite Work, provide, install, and remove fencing, temporary hoarding, and other security measures as required and specified.
3.3.7. Site including all restoration and excavation areas should be secured with locked fencing, temporary hoarding and security personnel.

3.4. Import Fill Material

3.4.1. Do not import fill material until Departmental Representative has completed and analysed testing. Testing and analysis will depend on parameters. Testing will be performed at industry regular (standard) turnaround times (i.e. not priority, emergency, same day or other rush turnaround times).
3.4.2. Departmental Representative will inspect import fill material, and will not allow import of fill material that varies from Submittal samples.

3.5. Site Restoration

3.5.1. Final site grades must be within 5 cm of pre-existing grades before Work commenced, unless otherwise specified.
3.5.2. Clean permanent access roads of contamination resulting from project activity as required or as instructed of Departmental Representative, with no increases to Contract Amount or Extension of Time for completion of the Work.

3.5.3. Decontaminate equipment used in construction processes and remove from Site at end of construction activities.
3.5.4. Remove all temporary structures including subsurface structures for shoring support.
3.5.5. Upon Final Completion of Work, remove Non-Contaminated Waste (CL) materials and debris, trim slopes, and correct defects as instructed by the Departmental Representative.
3.5.6. Protect newly graded areas from traffic and erosion and maintain free of trash or debris until demobilization is completed and accepted by the Departmental Representative.

3.6. Demobilization

3.6.1. Do not demobilize until instructed by Departmental Representative.
3.6.2. Demobilize all necessary equipment, materials, and personnel from Site in an orderly and efficient manner.

END OF SECTION

1. PART 1 - GENERAL

1.1. Measurement Procedures

1.1.1. See 01 11 00.

1.2. Definitions

1.2.1. See 01 11 00.

1.3. Action and Informational Submittals

1.3.1. Temporary Hoarding: at least 5 Working Days prior to installation, Submit a description of temporary hoarding.

1.3.2. Excavation and Backfilling Plan: within 40 Working Days after Contract award and prior to mobilization to Site, Submit documentation describing excavation Work. Include:

1.3.2.1. Cofferdam design.

1.3.2.2. Sequence, methods and means for dewatering and replacement of water behind the Cofferdam.

1.3.2.3. Excavation slopes design.

1.3.2.4. Temporary support walls design.

1.3.2.5. Support of structures design.

1.3.2.6. Sequence, methods and means for excavation dewatering and heave protection.

1.3.2.7. Backfilling requirements. Meet or exceed requirements in accordance with the Contract and any other codes, bylaws, rules and regulations applicable to the performance of the Work.

1.3.2.8. Procedures for excavations adjacent to utilities or other structures if the excavation has the potential to impact utilities or other structures.

1.3.2.9. Monitoring and inspection requirements, including frequency or milestones when a Qualified Professional must inspect Works.

1.3.2.10. Excavation and Backfilling Plan must be signed and sealed by a Qualified Professional, as required by ground conditions, excavation depth, shoring type, or support type.

1.3.3. Monitoring and Testing Results: within 5 Working Days of sampling, Submit all monitoring and testing results. Include procedures, frequency of sampling, Quality Assurance and Quality Control testing and documentation to be provided. Provide monitoring and testing results, including any assessments performed by a Qualified Professional. Include:

1.3.3.1. Noise monitoring.

1.3.3.2. Vibration monitoring.

1.3.3.3. Imported fill material, including geotechnical and environmental quality.

1.3.3.4. Compaction testing results.

1.3.3.5. Contaminated Wastewater Treatment Plant water testing.

1.3.3.6. Environmental analytical results for spill or other environmental testing.

1.3.4. Weigh Scale Certification: at least 5 Working Days prior to use, Submit a copy of the Measurement Canada, Weigh Scale Certification for any onsite or offsite weigh scale used during transportation, treatment or disposal.

1.3.5. Weigh Scale Slips: within 10 days of measurement, Submit all onsite and offsite weigh scale slips for material.

2. PART 2 - PRODUCTS

2.1. Backfill Material

2.1.1. 75 mm Coarse granular backfill: free of shale, clay, friable material and debris. This material must meet the specification for Sub-Base Aggregates - Intermediate Graded Sub-Base (IGSB), Table 202-C - Aggregate Gradations; of the BC Ministry of Transportation and Infrastructure, 2012 Standard Specifications for Highway Construction (Nov. 1, 2011), Volume 1. All material passing the 2 mm screen size must be screened off and removed from the final product

2.2. Shoreline Restoration Materials

2.2.1. 25 mm minus well-graded fine granular fill: free of clay, shale and organic matter. This material must meet the specification for Crushed Base Course Aggregate – Well Graded Base (WGB) – 25mm, Table 202-C - Aggregate Gradations; of the BC Ministry of Transportation and Infrastructure, 2012 *Standard Specifications for Highway Construction (Nov. 1, 2011), Volume 1*.

2.2.2. Sand/Silt Substrate Material: The sand/silt substrate must be well graded silty sand with all material passing 2 mm screen and with maximum 5% passing the 0.075 mm (No. 200) sieve. Material must be clean, hard, durable uncoated particles free from clay lumps, cementation, organic or other objectionable material.

2.2.3. Beach Material: The imported beach material must be 25 mm minus granular material, graded in accordance with the Contract and the following specified gradations:

Sieve Size (mm)	Percent Passing by Weight
25	100
9.5	60-90
4.75	40-70
2.38	30-60
1.19	20-45
0.297	8-20
0.075	0

2.2.4. Granular Filter Material: The granular filter material must comprise either natural screened gravel, or manufactured clear crushed gravel. The granular filter material must be a well graded, clean gravel, meeting the following specified gradations:

Sieve Size (mm)	Percent Passing by Weight
150	100
75	40-80
25	10-17
10	5-10
2	0-2

2.2.5. Cobble: 150 mm minus free of silt, clay, loam, friable and soluble materials, and organic matter. To consist of clean round stone or crush rock. This material must meet the following specified gradations:

Sieve Size (mm)	Percent Passing by Weight
150	100
75	30-50
25	10-20
4.75	0-5

2.2.6. Class II Riprap

2.2.6.1. Riprap rock: for channel bank protection must be durable, angular quarry rock, and must be well-graded within the following specified gradations:

2.2.6.1.1. Nominal 500 mm diameter or 200 kg class.

2.2.6.1.2. Gradation specifications:

Percent	Sizing Requirement
100	Smaller than 800 mm or 700 kg
At least 20%	Larger than 600 mm or 300 kg
At least 50%	Larger than 500 mm or 200 kg
At least 80%	Larger than 300 mm or 30 kg

2.2.6.1.3. Blending and grading of the riprap must be completed by the Contractor during the loading process at the quarry and during placing.

2.2.6.2. Riprap must have the following properties:

2.2.6.2.1. Igneous rock (i.e. granite preferred) or other rock type accepted by Departmental Representative.

2.2.6.2.2. Specific gravity greater than 2.6.

2.2.6.2.3. Dense, unweathered, without cracks or fissures.

2.2.6.2.4. The breadth and/or the thickness of individual riprap must be a minimum one-third of the length dimension; thin, flat pieces or rock are unacceptable.
2.2.6.2.5. Only clean riprap can be placed. Clean any deleterious material from the riprap before placement.
2.2.6.2.6. Riprap rock must be tested for ARD and ML.
2.2.7. Non-woven Geofabric: Non-woven geofabric for buried application must be non woven, needle punched polyester meeting the following specifications:
2.2.7.1. Mullen bursting strength – 5167 kPa.
2.2.7.2. Elongation – 50% min.
2.2.7.3. Apparent opening size – 0.15 mm.
2.2.7.4. Permittivity – 0.7 sec-1.

2.3. Pavement
2.3.1. Asphalt must, at minimum, meet the specifications for: Upper Course #1 mix-type as specified in Section 32 12 16, Hot Mix Asphalt Concrete Paving; of the *BC Master Municipal Construction Document (2009) Platinum Edition.*

2.4. Outfalls
2.4.1. Material requirements in accordance with the Contract.
2.4.2. The materials must conform to the design requirements from the City of Victoria.

3. PART 3 - EXECUTION

3.1. Site Review
3.1.1. Ensure that all Works comply with the final sealed design documents as prepared by a Qualified Professional.
3.1.2. Qualified Professional to visit Site regularly.

3.2. Barge Ramp Performance Requirements
3.2.1. Be responsible for any fees or costs associated with the use of the barge ramp during the term of the Contract.
3.2.2. Be responsible for completing upgrades or repairs if required, to make the barge ramp safe and suitable for the intended operations.

3.3. Install Temporary Hoarding
3.3.1. Place temporary hoarding along all of the upland project Site boundaries in accordance with the Contract so as to provide a visual, environmental, and safety barrier between the Site and neighbouring properties.
3.3.2. Temporary hoarding to be a minimum of 2.4 m in height.
3.3.3. Temporary hoarding not to extend beyond the project Site boundary in accordance with the Contract.

3.3.4. Remove and replace temporary hoarding during excavation activities where excavation along the project Site boundary cannot be accomplished while the temporary hoarding is in place.
3.3.5. The type of temporary hoarding used will be as selected by the Contractor, but will be subject to approval. The temporary hoarding must not have visible holes and must be a neutral color subject to acceptance by Departmental Representative. Only signage accepted by the Departmental Representative will be allowed. No advertising, company identifications, or other markings permitted.
3.3.6. Remove temporary hoarding from the Site during the Site Restoration.

3.4. Paving

3.4.1. Pave the Stage 2 area in accordance with the Contract.
3.4.2. Paving of the Stage 2 area to make ready for use as holding/sorting area for excavated soil and sediment, offices and temporary facilities, surface water control for Stage 2 area and for other purposes as designated by the Contractor.
3.4.3. Purpose of paving the Stage 2 area is to prevent re-contamination of Stage 2 area during Stage 3 activities.
3.4.4. Curbing to direct surface water flows will be required.
3.4.5. Prior to the construction of the asphalt paving, install all piping, wiring or conduits required for the operation of the construction facilities.
3.4.6. Be responsible for the asphalt mix, Quality Assurance and Quality Control of the supplied product and acceptance of the final product. Finished asphalt thickness to be a minimum of 75 mm.
3.4.7. Complete repairs of cracked or damaged pavement and any associated impacts or damages as required or as instructed by the Departmental Representative.

3.5. Design, Construction and Operation of Onsite Access Road(s)

3.5.1. Construct, operate and maintain the onsite access road(s) to the Stage 3 area.
3.5.2. Design of temporary onsite access roads to be signed and sealed by a Qualified Professional.
3.5.3. Qualified Professional to confirm that the temporary onsite access roads allow for the safe transport of materials and equipment.
3.5.4. Construction of the onsite access road(s) may require the removal of historic piles or dock facilities along the proposed access alignment, as well as abandoned drainage pipes.
3.5.5. Any temporary access, detour and haul roads associated with the project must be constructed to accommodate all required uses and be maintained throughout the course of construction operations in a safe, environmentally sound manner.
3.5.6. Location, alignment, design and construction of all detour, access and haul road(s) subject to the acceptance of the Departmental Representative.
3.5.7. Employ suitable measures to maintain quality, visibility, and safe conditions in the use of access, detour and haul road(s) associated with the Work.

3.6. Cofferdam

3.6.1. Design Requirements:

3.6.1.1. Act as support structures to maintain a dry condition within the Stage 3 remediation area during the excavation of Contaminated Waste, and construction of new facilities (i.e. outfalls or shoreline restoration).

3.6.1.2. Allow excavation of all Contaminated Waste laterally and vertically on the Rock Bay Site up to the project Site boundary in accordance with the Contract in order to result in no residual contamination at the Rock Bay Site.

3.6.1.3. Provide a safe working environment for personnel and equipment within the dewatered excavation area.

3.6.1.4. Additional support may be required and are considered part of the Cofferdam design.

3.6.1.5. The Cofferdam cannot have any tiebacks or supports which extend beyond the project Site boundary. Support(s) which are to be constructed on Transport Canada property must be included in the support/cut-off wall design.

3.6.1.6. The Cofferdam must not flex or bend when exposed while excavations are occurring on the Transport Canada side of the wall during the construction/remediation of the uplands portion of the Site.

3.6.1.7. Seismic Resistance of Cofferdam:

3.6.1.7.1. Cofferdam is a temporary structure only. Resistance to seismic loads will be at the discretion of the Qualified Professional.

3.6.1.7.2. Be responsible for any failures and resultant costs should the Cofferdam fail due to a seismic event during the construction period.

3.6.1.8. Accommodate the maximum high tide conditions, with a sufficient freeboard to prevent potential overtopping from waves, within Rock Bay.

3.6.1.9. Accommodate impacts from marine traffic to the extents identified by the Contractor.

3.6.1.10. Location of Cofferdam constrained by:

3.6.1.10.1. Surface area to be dewatered behind Cofferdam must approximate surface area shown in DFO Authorization No. 99-HPAC-PA3-000-000747.

3.6.1.10.2. Accommodate potential additional unknown contamination by locating Cofferdam a minimum of 10 m beyond the limits of contamination shown on Drawings.

3.6.1.11. All drawings to be signed and sealed by a Qualified Professional.

3.6.1.12. Cofferdam designs to be completed in accordance with methods in current version of *Canadian Foundation Engineering Manual*.

3.6.2. Installation:

3.6.2.1. Installation method will be at the discretion of the Contractor, but subject to the acceptance of the Departmental Representative prior to the start of installation.

3.6.2.2. Shock waves in water from Cofferdam installation cannot exceed 30 kilopascals.

3.6.3. Decommissioning/Dismantling:

3.6.3.1. Remove Cofferdam and associated structures after bay refilling is complete.
3.6.3.2. Structural elements of the Cofferdam cannot be left in place above or below the mud line.
3.6.4. Marine Traffic:
3.6.4.1. Obtain an approval from the Harbour Master for the installation and operation of the Cofferdam as per the *Canada Marine Act*.
3.6.4.2. Provide lighting and other markers to prevent Cofferdam from becoming a navigational hazard.
3.6.4.3. Ensure Cofferdam does not become an entry point by allowing sufficient freeboard or installing fencing.

3.7. Removal and Replacement of Water Behind Cofferdam

3.7.1. Be responsible for controlled dewatering of water retained behind the Cofferdam in Rock Bay.
3.7.2. During the removal of water retained behind the Cofferdam, pump out the water directly into Rock Bay without treatment as long as it meets applicable water quality regulations and guidelines and Discharge Approval.
3.7.3. If water quality exceeds applicable water quality regulations and guidelines or Discharge Approval, the removed water must be sent and treated at the Contaminated Wastewater Treatment Plant, prior to disposal.
3.7.4. Water may be removed and discharged directly to Rock Bay, in compliance with applicable water quality regulations and guidelines and Discharge Approval, until approximately 1 m depth of water or as instructed by the Departmental Representative, is left behind the Cofferdam, at then it must be sent and treated at the Contaminated Wastewater Treatment Plant.
3.7.5. Fish and marine life salvage required for impounded water when instructed by the Departmental Representative.
3.7.6. Replacement of water behind the Cofferdam must be conducted in a safe manner as accepted by the Departmental Representative using water directly pumped from Rock Bay, outside of the Cofferdam.
3.7.7. Replacement of water behind the Cofferdam must not result in scour or damage of the substrate or other materials placed as part of the shoreline remediation.

3.8. Temporary Support Walls

3.8.1. Design Requirements:
3.8.1.1. Act as support structures for excavations as well as for stability of nearby buildings during remediation/construction excavation procedures.
3.8.1.2. Allow excavation of all Contaminated Waste laterally and vertically on the Rock Bay Site up to the project Site boundary in accordance with the Contract in order to result in no residual contamination at the Rock Bay Site.
3.8.1.3. Provide a safe working environment for personnel and equipment within the dewatered excavation area.
3.8.1.4. Additional support may be required and are considered part of the Temporary Support Walls design.

3.8.1.5. Temporary Support Walls cannot have any tiebacks or supports which extend beyond the project Site boundary. Support(s) which are to be constructed on Transport Canada property must be included in the support/cut-off wall design.
3.8.1.6. Temporary Support Walls must not flex or bend when exposed while excavations are occurring on the Transport Canada side of the wall during the construction/remediation of the uplands portion of the Site.
3.8.1.7. Seismic Resistance of Temporary Support Walls:
3.8.1.7.1. Support structures are temporary structures only. Resistance to seismic loads will be at the discretion of the Qualified Professional.
3.8.1.7.2. Be responsible for any failures and resultant costs should the Temporary Support Walls fail due to a seismic event during the construction period.
3.8.1.8. All drawings to be signed and sealed by a Qualified Professional.
3.8.1.9. Temporary Support Walls designs to be completed in accordance with methods in current version of *Canadian Foundation Engineering Manual*.
3.8.2. Installation:
3.8.2.1. All installation activities must take place on the Rock Bay Site. No staging or construction activities are to take place on adjacent properties.
3.8.2.2. Installation must be regularly inspected by a Qualified Professional.
3.8.3. Maintain side slopes of excavations in safe condition by appropriate methods and in accordance with relevant regulations.
3.8.4. Construct temporary Works to depths, heights and locations to meet project requirements.
3.8.5. During backfill operation:
3.8.5.1. Unless otherwise indicated or as instructed by the Departmental Representative, remove Temporary Support Walls from excavations.
3.8.5.2. Do not remove support until backfilling has reached respective levels of such bracing.
3.8.5.3. Remove support in increments that ensure compacted backfill is maintained at elevation at least 500 mm above toe of support.

3.9. **Dewatering and Heave Protection**
3.9.1. Keep excavations free of water while Work is in progress.
3.9.2. Provide to Departmental Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
3.9.3. Plan for excavation below groundwater table to avoid quick conditions or heave.
3.9.4. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
3.9.5. Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
3.9.6. Keep excavations, staging pads, and other Work areas free from water including standby equipment necessary to ensure continuous operation of dewatering system.

3.9.7. Dewatering Methods: includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.
3.9.8. Separate Contaminated Wastewater from Non-Contaminated Wastewater and collect and divert to Contaminated Wastewater Treatment Plant as required.

3.10. Excavation

3.10.1. Notify Departmental Representative at least 5 Working Days in advance of excavation operations.
3.10.2. Excavate to lines, grades, elevations and dimensions in accordance with the Contract or as instructed by Departmental Representative.
3.10.3. Excavation of Contaminated Waste to extend to project Site boundary with zero percent residual contamination at Final Completion.
3.10.4. Elevations shown on Drawings, are approximate and final excavation elevations to be determined based on field conditions as instructed by the Departmental Representative.
3.10.5. Excavation must not interfere with bearing capacity of adjacent foundations.
3.10.6. Machine cut banks and slopes.
3.10.7. Protect bottom of excavations from excessive traffic.
3.10.8. Grade excavation top perimeter to prevent surface water run-off into excavation.
3.10.9. Keep excavated and stockpiled materials safe distance away from edge of excavation.
3.10.10. Restrict vehicle operations directly adjacent to open excavations.
3.10.11. Segregate and handle to minimize the amount of Hazardous Waste (HW) materials wherever possible, while complying with Hazardous Waste disposal regulations. Segregation of Hazardous Waste during excavation will be by visual and olfactory characteristics and available in-situ characterization.
3.10.12. Contaminated Waste onsite classification will be based on available in-situ characterization.
3.10.13. Non-Contaminated Waste (CL) onsite classification will be based on ex-situ characterization.
3.10.14. Remove Waste Oversize Debris. Break or cut oversize debris into manageable size.
3.10.14.1. Piles encountered during excavation must be cut off at base of excavation. Piles are not to be extracted.
3.10.15. Remove Non-Contaminated Waste (CL) to Landfill.
3.10.16. Earth bottoms of excavations to be undisturbed soil or sediment, level, free from loose, soft or organic material.
3.10.17. Notify Departmental Representative when bottom of excavation is reached.
3.10.18. Provide assistance for collection of Confirmation Samples as instructed to the Departmental Representative.
3.10.19. Obtain acceptance by Departmental Representative of completed excavation.

3.11. Geoduck Hole Excavation

3.11.1. Where geoduck holes are identified at the base of the excavation limits, and as instructed by the Departmental Representative, excavate soil or sediment within 50 mm of the outer edge of the geoduck hole and to a minimum depth of 150 mm below the bottom of the geoduck hole.

3.11.2. Excavation diameter will be limited to a maximum of 200 mm or as instructed by Departmental Representative.

3.11.3. The sequence, method and means of excavation must be accepted by the Departmental Representative.

3.12. **Outfall Remediation and Construction**

3.12.1. Design Requirements:

3.12.1.1. Stormwater pipes, headwalls, check valve attachments, and backfill material to be in accordance with requirements provided by the City of Victoria in accordance with the Contract.

3.12.1.2. The Contractor's Excavation Plan and design must determine the methods required to address excavation, bypass and/or excavation support option for the remediation of the Contaminated Waste in and around the existing stormwater pipes and outfalls.

3.12.1.3. The design must incorporate option(s) regarding managing storm water flows during the construction period and while excavation is in progress.

3.12.1.4. The design may require the temporary by-pass or relocation of one or both of the existing stormwater pipes and outfalls 626 and 627.

3.12.2. Construction Performance Requirements: Be responsible for all works associated with the removal and/or replacement of stormwater pipes and outfalls 626 and 627, including but not limited to:

3.12.2.1. Diversion of flows during construction.

3.12.2.2. Purchase and supply of pipe if required.

3.12.2.3. Excavation and disposal of fill and, removal and disposal/re-use of existing pipes.

3.12.2.4. Backfilling of stormwater pipes and outfalls areas.

3.12.2.5. Laying of new stormwater pipes.

3.12.2.6. Headwall construction for outfalls.

3.12.3. Replacement of Fill around Stormwater Pipes for Outfalls 626 and 627:

3.12.3.1. Backfilling with clean fill in accordance with requirements provided by the City of Victoria in accordance with the Contract. Backfill stormwater pipes in accordance with Drawings.

3.12.3.2. Any lift, or portion thereof, that has suffered a reduction in density after compaction due to frost action, rain or for any other reason, must be re-compacted or removed and replaced before any material is placed for the succeeding lift.

3.12.3.3. Do not compact directly over crown of stormwater pipes.

3.12.4. Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.

3.12.5. Procedures for pipe installation must be in accordance with manufacturer's and the City of Victoria's requirements.

3.13. Headwall Installation

3.13.1. See Drawings for outfall 626 and 627 requirements.
3.13.2. The Contractor is responsible for contacting the City of Victoria to determine design requirements to accommodate check valves (tidegates) on outfall 626 and 627.
3.13.3. Supply and install all materials, labour and mechanical parts required to complete the Work.
3.13.4. Supply or installation of the check valve to be performed by others.

3.14. Backfill Types and Compaction

3.14.1. Use only imported backfill material in accordance with the Contract, which has been recommended by a Qualified Professional, and has previously accepted as a Submittal.
3.14.2. Compact material in accordance with the Contract to ensure no long term settlement and is suitable for planned post-remediation use:
3.14.2.1. Compact each layer of material to the more stringent of Excavation Plan or Drawings.
3.14.2.2. Machine compact all fill materials unless otherwise shown on Drawings.

3.15. Backfilling

3.15.1. Do not proceed with backfilling operations until completion of following:
3.15.1.1. Confirmation Sampling, analysis, and assessment has been completed by the Departmental Representative. Confirmation Sampling, analysis, and assessment may take up to 5 Working Days. No Standby Time charges or increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Sampling results provided within 5 Working Days, not including day of sample collection.
3.15.1.2. Surveying has been completed by a Land Surveyor for as-built documents
3.15.1.3. Departmental Representative has inspected and excavation limits accepted by the Departmental Representative based on survey data and Confirmation Samples results.
3.15.1.4. Departmental Representative has inspected and accepted backfill material.
3.15.1.5. Proposed backfill material can be sampled and tested for geotechnical and environmental quality. Backfill material testing may take up to 5 Working Days not including day of sample collection.
3.15.1.6. Departmental Representative has inspected and accepted compaction results for previous lift.
3.15.1.7. Removal of shoring and bracing; backfilling of voids with satisfactory backfill material.
3.15.2. Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

3.15.3. Do not use backfill material which is frozen or contains ice, snow or debris.
3.15.4. Place backfill material in uniform layers not exceeding 300 mm compacted thickness, or in accordance with the Contract. Compact each layer to the satisfaction of the Qualified Professional and in accordance with the Contract before placing succeeding layer.
3.15.5. Backfill compaction to be tested by a Qualified Professional in accordance with Excavation Plan.
3.15.6. Notify Departmental Representative when final backfill grade is reached.
3.15.7. Do not begin subsequent Work until surveying has been completed by the Departmental Representative for documentation.

3.16. Sand Seam Seal

3.16.1. A sand seam seal must be placed along the southern project Site boundary in the area of the sand seam excavation in accordance with the Contract. The sand seam seal must block or significantly reduce the potential for contaminated groundwater within the excavated sand seam to enter into the Site.
3.16.2. Seal material must have a maximum hydraulic conductivity of $1x10^{-8}$ m/sec.
3.16.3. Seal material must be as per the design requirements established by the Contractor.
3.16.4. The design for the sand seam seal must be signed and sealed by a Qualified Professional.
3.16.5. The sand seam seal materials must be placed and constructed as instructed by the Qualified Professional.

3.17. Shoreline Remediation

3.17.1. Shoreline Remediation must include the placement of substrate materials, cobble, riprap, granular filter, geotextile materials, and natural features (e.g. logs) in accordance with the Contract.
3.17.2. Materials to be supplied for Shoreline Remediation in accordance with the Contract.
3.17.3. Shoreline Remediation will not include planting or placement of vegetation.
3.17.4. Shoreline Remediation must include the construction or placement of a headwall around the downstream end of outfalls 626 and 627 and must be constructed in accordance with the Contract.
3.17.5. Sand/silt Substrate Placement:
3.17.5.1. Finish all areas covered by sand/silt substrate to final lines and grades shown on Drawings.
3.17.5.2. Sand/silt substrate layer to be placed in 600 mm total thickness over geofabric placed on top of coarse granular backfill.
3.17.5.3. Uniformly compact finished surface and complete smooth and free from any irregular surface changes.
3.17.5.4. Ensure that all areas drain.
3.17.6. Riprap Placement:

3.17.6.1. Riprap must be off-loaded from trucks and installed such that the gradation in accordance with the Contract is achieved along the bank and toe.
3.17.6.2. Riprap must be well graded and must be placed directly over the filter layer (where applicable) without pockets of small stones or clusters of large boulders. Incorporate natural features during placement of riprap. The finished areas must form a firm, stable, uniform mass of interlocking stone with a minimum of voids.
3.17.6.3. Dumping or rolling of rock down the bank face is not an acceptable method of placement. Rock must be carefully placed and "keyed" into position, commencing with the largest rocks, then filling voids with the smaller pieces.
3.17.6.4. Riprap must be placed with the use of an excavator equipped with a hydraulic thumb. The operator of the excavator must be experienced in the placement of riprap using a hydraulic thumb.
3.17.6.5. Rock placed at toe of slope to be larger end of gradation in accordance with the Contract. Oversize riprap up to 800 mm allowable in toe section.
3.17.7. Granular Filter Placement:
3.17.7.1. The granular filter must be placed in a uniform 200 mm layer where shown on Drawings or as instructed by the Departmental Representative.
3.17.8. Geofabric Placement:
3.17.8.1. Geofabric is to be placed as per manufacturer's instructions where shown on Drawings or as instructed by the Departmental Representative. In particular, care should be taken to ensure placement with appropriate overlap between pieces to manufacturer's instructions.

3.18. Transportation

3.18.1. Obtain an approval from the Harbour Master for barge operations as per the *Canada Marine Act*.
3.18.2. Transport all Contaminated Waste to Treatment Facility and Disposal Facility based on Contaminated Waste type as instructed by the Departmental Representative.
3.18.3. Material must be weighed at departure by the onsite scale certified by Measurement Canada. Submit Certification and all weigh scale receipts.
3.18.3.1. Departmental Representative can require testing of weigh scale, or require a different weigh scale be used.

3.19. Treatment

3.19.1. Treat appropriate Contaminated Waste at Treatment Facility based on Contaminated Waste type as instructed by the Departmental Representative.
3.19.2. Material must be weighed at arrival and at departure by a scale certified by Measurement Canada. Submit Certification and all weigh scale receipts.
3.19.2.1. Test weigh scale, or use a different weigh scale, as instructed by the Departmental Representative.

3.20. Disposal

3.20.1. Dispose of all Contaminated Waste at Disposal Facility based on Contaminated Waste type as instructed by the Departmental Representative.
3.20.2. Material must be weighed at arrival by a scale at the Disposal Facility certified by Measurement Canada. Submit Certification and all weigh scale receipts.
3.20.2.1. Test weigh scale, or use a different weigh scale, as instructed by the Departmental Representative.

3.21. Permanent Fencing
3.22. Install permanent fencing in accordance with the Contract.
3.23. Fencing must be 2.4m high, chain-link fencing consistent with existing onsite fencing, in accordance with the Contract.
3.24. Fencing must be connected to existing fencing wherever possible.

END OF SECTION

APPENDIX A

Site Photographs

APPENDIX A
Site Photographs

Photo 1: Looking west across the Stage 2 Area.

Note: Photograph taken on October 14, 2013.

APPENDIX A
Site Photographs

Photo 2: Looking southeast across Stage 2 Area towards PLAN 2108-R.

Note: Photograph taken on June 25, 2013.

APPENDIX A
Site Photographs

Photo 3: Looking southeast across Stage 1 Area, at upland area southeast of Rock Bay (part of South Excavation Area).

Note: Photograph taken on Jan 6, 2014.

APPENDIX A
Site Photographs

Photo 4: Looking east towards C PLAN 48591, at upland area east of Rock Bay (part of South Excavation Area).

Note: Photograph taken on Jan 6, 2014.

APPENDIX A
Site Photographs

Photo 5: Looking north towards 1 PLAN 48025, at the upland area east of Rock Bay (part of South Excavation Area).

Note: Photograph taken on Jan 6, 2014.

APPENDIX A
Site Photographs

Photo 6: Looking north towards 1 PLAN 48025, along the upland area northeast of Rock Bay (part of South Excavation Area).

Note: Photograph taken on Jan 6, 2014, during a 2.5 m tide.

APPENDIX A
Site Photographs

Photo 7: Looking west along the upland area north of Rock Bay (part of South Excavation Area).

Note: Photograph taken on Jan 6, 2014, during a 2.5 m tide.

APPENDIX A
Site Photographs

Photo 8: Looking north upland area north of Rock Bay (part of North Excavation Area).

Note: Photograph taken on Jan 6, 2014, during a 2.5 m tide.

Photo 9: Looking at the shoreline on the northeast side of Rock Bay, note outfall 627.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide, piles and dolphins have been cut at the mud line.

Photo 10: Looking at the shoreline on the northeast side of Rock Bay, note outfall 627.

Note: Photograph taken on Jan 6, 2014, during a 2.5 m tide.

APPENDIX A
Site Photographs

Photo 11: Looking at the shoreline on the east side of Rock Bay.

Note: Photograph taken on October 14, 2013, during a 2.1 m tide.

Photo 12: Looking east, along the south shoreline of Rock Bay. Outfall 626 with tidegate shown in centre of photo.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 13: Looking east along the south shoreline of Rock Bay (West Excavation Area).

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 14: Old timber pilings and concrete dock on south shoreline of Rock Bay.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 15: Old timber pilings and concrete dock on south shoreline of Rock Bay.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 16: Typical debris found along the south shoreline of Rock Bay.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 17: View looking west along the south shoreline of Rock Bay.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 18: Close up of outfall 626 with headwall structure and check valve (tidegate).

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 19: Looking north along the east shoreline of Rock Bay.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 20: Looking south along the east shoreline of Rock Bay.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide.

Photo 21: Looking northwest at outfall 627.

Note: Photograph taken on June 25, 2013, during a 0.0 m tide, note debris above high water mark has been removed.

APPENDIX A
Site Photographs

Photo 22: Looking west along the shoreline on the north side of Rock Bay.

Note: Photograph taken on Jan 6, 2014, during a 2.5 m tide.

APPENDIX B

DFO Authorization and Amendment

S. 35(2) of the *Fisheries Act*

Authorization No.
99-HPAC-PA3-000-000747

AUTHORIZATION FOR WORKS OR UNDERTAKINGS AFFECTING FISH HABITAT AND DESTRUCTION OF FISH

Authorization issued to:

Name: Transport Canada; Robert MacDonald, Project Director and BC Hydro and Power Authority; Walter Udell, Project Manager

Address: TC: Suite 620 – 800 Burrard Street, Vancouver, BC, V6Z 2K5 and
BCH: 6911 Southpoint Drive (E04), Burnaby, BC, V3N 4X8

Telephone: TC: Tel: (604) 666-5381 Fax: (604) 666-2961 Cell: (604) 202-7131 and
BCH: Tel: (604) 528-3139 Fax: (604) 528-2111 Cell: (604) 312-6651

Location of Project

Rock Bay, Victoria Harbour, BC

Valid Authorization Period

The valid authorization period is January 15, 2004 to December 31 2007.

Description of Works or Undertakings

Coffer dams will be installed in two locations (Southeastern and Southwestern sections) of Rock Bay. Contaminated soils will be excavated and replaced with clean sediment, gravel and rock. Portions of a hard substrate bank will be removed and replaced with intertidal saltmarsh and native backshore vegetation. The coffer dams will be removed and tidal circulation will be returned to the bay after all contaminated soils in the designated restoration zone are removed. Boulder/cobble blankets will be placed at the outlets of culverts #626 and 627 to stabilize the foreshore at these locations and provide attachment surfaces for marine animals.

The harmful alteration, disruption and destruction of fish habitat hereby authorized is:

1/ Approximately **4,500m²** of intertidal and shallow subtidal substrate at the Southeastern end of Rock Bay.

2/ Approximately **1,300m²** of intertidal and shallow subtidal substrate along the Southwestern foreshore of Rock Bay.

Conditions of Authorization

Transport Canada (TC) and BC Hydro (BCH) confirm that all plans and specifications relating to this Authorization have been duly prepared and reviewed by appropriate professionals working on behalf of TC & BCH. TC & BCH acknowledge they are solely responsible for all design, safety and workmanship aspects of all of the works associated with this Authorization.

Conditions that relate to the installation of the coffer dams and removal of contaminated sediments:

1. All construction activities must conform to mitigative conditions outlined by Hemmera Envirochem Inc. in the report dated October, 2003 ;

2. A qualified marine biological consultant acting as an environmental monitor must be on-site during the critical phases of coffer dam installation and dredging of the contaminated sediments in order to ensure that fish and invertebrates are salvaged properly and returned safely to the marine environment.

3. A qualified marine biological consultant must be on-site during the critical phases of bolder/cobble blanket placement and coffer dam removal to ensure that appropriate mitigation is carried out and to initiate fish habitat monitoring of replacement fish habitats.

Conditions that relate to the replacement/restoration of damaged fish habitat:

1. A qualified specialist in native backshore vegetation and saltmarsh transplanting techniques must be retained by TC & BCH to ensure that this phase of the mitigation and fish habitat compensation is carried out in a professional manner. A list of appropriate plant species for revegetation of the Rock Bay area is included on page 41 of the Hemmera Envirochem Inc. report dated October, 2003.

2. The excavated marine sediments will be replaced with clean, uncontaminated sediments in the following fashion: a) the majority of the area affected by removal of contaminated sediments (**2,775m²**) will be replaced with fine textured materials emulating the former silt substrates. b) a boulder layer will be placed at the outlet of culverts #626 and #627 (areas of approximately **510m²** and **300m²** respectively) c) The boulder field would then be surrounded by a mix of cobble and boulder in the transition to the finer sediments (areas of approximately **615m²** at culvert #626 and **300m²** at culvert #627).

Monitoring Program

1. TC & BCH shall carry out a monitoring program (the "Monitoring Program"), which includes the following:

   a) A SCUBA/intertidal site assessment of the restored/compensatory boulder/cobble and fine sediment habitats will be conducted annually between June 1 and August 31 for a period of 5 years post-construction. The assessment will be conducted by a qualified marine biological consultant who will submit a report to the Chief, Habitat Management, South Coast Area, or designate, on or before September 30 in each year that the monitoring assessment is conducted.

The assessment will compare remediation of the restored/compensatory habitats with both pre-restoration conditions for similar habitats in Rock Bay and with similar habitats ("controls") within Victoria Harbour. DFO recognizes that duplicate habitats in Victoria Harbour may not be exactly the same and the Harbour habitats will be subject to environmental influences of their own, however, an effort must be made to find similar habitats to the restored/compensatory habitats for the sake of comparison. DFO also recognizes that City of Victoria storm sewer outfalls #626 and 627 may also influence restoration/recovery of newly created habitats in Rock Bay.

b) The monitoring assessment will include, but will not be limited to, defining the species and areal coverage by transplanted and volunteer vegetation (backshore and intertidal and subtidal vegetation will be documented in the survey). In addition, a species list of observed marine invertebrates and fish will be compiled and an estimate of numbers of individuals will be recorded. Based on the results of the assessment, a statement with respect to the productive capacity of the restored/created fish habitat should be included in the annual monitoring report.

c) If the SCUBA/intertidal assessment of the restored/compensatory habitat at Rock Bay determines that the backshore, intertidal and subtidal fish habitats are being successfully restored, DFO will be satisfied that the goal of No Net Loss has been achieved. If vegetation and invertebrate/fish numbers within Rock Bay have not reached the coverage and density levels found in adjacent similar habitats in Victoria Harbour within five years of the remedial work, TC & BCH may need to provide additional compensation to replace the productive capacity of lost habitats within the bay. It is expected that appropriate additional replacement habitat will be negotiated by TC & BCH (with the assistance of a qualified marine biological consultant) and the DFO Chief, Habitat Management, South Coast Area or designate.

2. The restored/compensatory habitat will be deemed to be functioning as intended if, in the opinion of DFO, the habitat is physically stable and the backshore, intertidal saltmarsh, subtidal alga, marine invertebrates and fish appear to be expanding and undergoing normal reproductive processes. It is anticipated that the restored/compensatory backshore vegetation and saltmarsh habitats will have the same density and shoot height/vigour as natural vegetation in the vicinity of Victoria Harbour. The restored/compensatory intertidal and subtidal bedrock/boulder and fine sediments will support healthy marine invertebrates and fish at density levels similar to adjacent natural habitats in Victoria Harbour. Determination of the success of the restoration/compensation will be made jointly by TC & BCH (with assistance from a qualified biological consultant doing the assessment) and DFO (the Chief of Habitat Management, South Coast or designate). It is understood that restoration/compensation success may be influenced by conditions in Victoria Harbour, and more specifically, by Victoria sewer outfalls 626 and 627.

Following the initial monitoring period, and any extensions thereof, DFO will assess the success of the restored/compensatory habitat and determine whether or not it is functioning as intended, and choose the appropriate course of action as outlined below:

a) If the restored/compensatory habitat is functioning as intended and will be self-sustaining without further remedial work, the Monitoring Program will be terminated; or

b) If the restored/compensatory habitat is not functioning as intended, TC & BCH shall extend the Monitoring Program, including any remedial work required, for an additional two years to allow more time for the habitat to become adequately established.

c) If the restored/compensatory habitat is not functioning as intended and further remedial work is not likely to rectify the situation, TC & BCH shall then carry out alternative compensatory works mutually agreed upon by TC & BCH, their qualified marine biological consultant and DFO (Chief, Habitat Management or designate).

3. TC & BCH shall ensure that the restored/compensatory habitat is functioning as intended as long as the Rock Bay site is under their jurisdiction. If at any time TC & BCH becomes aware that the compensatory habitat is not functioning as intended, for example by reason of natural erosion or being covered by large amounts of wood debris, TC & BCH shall carry out any works which are necessary to enable the compensatory habitat to function as designed. If TC & BCH transfers their interest in the project site, and the transferee assumes the obligations noted above in a form satisfactory to DFO, TC & BCH shall thereafter be relieved of these obligations.

4. TC & BCH confirm they shall leave the restored/compensatory habitat undisturbed. After the restored/compensatory habitat is functioning as intended, TC & BCH shall not carry on any work or undertaking that will adversely disturb or impact the restored/compensatory habitat, and will take all reasonable steps to ensure that the restored/compensatory habitat is not disturbed by others, so long as TC & BCH are associated with the remediation site at Rock Bay. If any disturbance of the restored/compensatory habitat is anticipated as a result of another authorized Federal activity, additional offsetting compensatory habitat must be provided by TC & BCH, subject to negotiation with DFO (Chief, Habitat Management or designate).

5. TC & BCH shall not be required to deliver to DFO a letter of credit or surety from a Canadian bank. Initiation of construction of the project will not occur until all parties, TC & BCH and DFO, have signed this authorization. **All correspondence regarding fish habitat compensation monitoring will be directed to the Chief, Habitat Management, South Coast Area, or designate, Fisheries and Oceans Canada, 3225 Stephenson Point Road, Nanaimo, BC V9T 1K3.**

The holder of this authorization is hereby authorized under the authority of section 35(2) of the Fisheries Act, R.S.C., 1985, c. F. 14, to carry out the work or undertaking described herein.

This authorization is valid only with respect to fish habitat and for no other purposes. It does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

Failure to comply with any condition of this authorization may result in charges under the Fisheries Act.

This authorization form should be held on site and work crews should be made familiar with the conditions attached.

Date of issuance: April 22, 2004.

Approved by: L A Russell A/Snr Habitat Biologist

Title: Chief, South Coast Habitat Unit
Habitat and Enhancement Branch

Transport Canada and BC Hydro acknowledge that DFO has consulted with them regarding the terms of this Authorization, and confirm that they have reviewed and understand the terms of this Authorization, and it will comply with them.

Executed by an authorized signatory of Transport Canada on the 16th day of April, 2004 in the presence of:

Scott Tomlinson
Witness (signature)

SCOTT TOMLINSON
(print name)

Transport Canada

Per: Robert MacDonald
Authorized signatory

ROBERT MACDONALD
Name

PROJECT DIRECTOR, VICTORIA AND ESQUIMALT HARBOURS ENVIRONMENTAL PROGRAM.
Title

Executed by an authorized signatory of BC Hydro on the 21ST day of APRIL, 2004 in the presence of:

G. R. Haddow
Witness (signature)

GEORGIE R. HADDOW
(print name)

BC Hydro

Per: G W Udell
Authorized signatory

GORDON WALTER UDELL
Name

PROJECT MANAGER
Title

FISHERIES ACT S. 35(2) AUTHORIZATION
99-HPAC-PA3-000-000747

AMENDMENT "B"

Date of Amendment: March 28, 2012

Authorization issued to:

Name: Ian Chatwell, Transport Canada
Regional Manager Environmental Services

Address: Suite 620 – 800 Burrard Street, Vancouver, BC, V6Z 2J8

Telephone: (604) 666-5370 Fax: (604) 666-2961

Location of Project:

Rock Bay, Victoria Harbour, BC

Authorization Amendment:

All conditions of the original Authorization (99-HPAC-PA3-000-000747) remain applicable. The Amended changes are as follows:

1. The name and address of the person and company responsible for the Authorization (noted above); and,
2. The Valid Authorization Period.

The Amended Valid Authorization Period is as follows:

> **All works that may result in the harmful alteration, disruption or destruction (HADD) of fish habitat associated with the Rock Bay site remediation project (Stage 3) must occur during the period July 1, 2014 through February 15, 2015 and July 1, 2015 through February 15, 2016, with amendments as necessary as a result of monitoring information and in consultation with Fisheries and Oceans Canada.**

Canada

Fisheries and Oceans Canada

Per: _____

Nick Leone, Area Manager
Habitat Management Unit
Ecosystems Management Branch
South Coast Area

Transport Canada

Per: _____
Authorized signatory

Ian Chatwell
Print Name

Regional Manager, Environmental Services
Title

APPENDIX C

Navigable Waters Permit

Transport Canada
Pacific Region
Suite 200 – 401 Burrard Street
Vancouver, BC V6C 3S4
Tel 604-775-8896
Fax: 604-775-8828

NAVIGABLE WATERS PROTECTION ACT

WORK ASSESSMENT

APPLICANT INFORMATION	
APPLICANT'S FILE #:	NWP # 8200-04-8251.1
OWNER: Transport Canada	OWNER'S REP. : British Columbia Hydro International Ltd.
ADDRESS: Box 220 800 Burrard Street, Suite 620 Vancouver BC V6Z 2J8 Attn: Robert MacDonald	ADDRESS: 6911 Southpoint Drive (A03) Burnaby BC V3N 4X8 Attn: G. (Walter) Udell, P. Eng.

WORK/SITE DESCRIPTION	
TYPE OF WORK: Dredging – removal of contaiminated soil and sediment	
WORK IS: P	(Legend: P=Proposed E=Existing EP=Existing/Proposed)
WATERWAY: Rock Bay	
APPROX. COORDINATES: Latitude 48° 26' 2" N Longitude 123° 21' 59" W	
SITE DESCRIPTION:	encompassing the bed of Rock Bay, an extension of Upper Harbour, Victoria, Vancouver Island, British Columbia.

It has been determined, pusuant to ss. 5(2) of the Navigable Waters Protection Act, that the proposed work as shown in these plans will not substantially interfere with navigation if it is built or placed, and maintained in accordance with these plans, site description and schedule provided by the proponent. Since conditions may change it would be advisable, in the case of a proposed work, to obtain a reassessment if the work has not commenced within two years from the date hereon.

J Schellenberg
(SIGNATURE)

Navigable Waters Protection Officer
(TITLE)

Jim Schellenberg
(PRINT NAME)

Sept 11/04.
(DATE)

Canada

SUGGESTIONS

This application has been received in this office for comment.

It is your responsibility to obtain all other forms of authorization from federal or provincial agencies that may have jurisdiction in this matter prior to construction of any works.

Transport Canada officials have reviewed this proposal and advise that at this time, we foresee no conflict between the placement of this work and the public right of navigation.

It is your responsibility to build and maintain the facility in accordance with the submitted plans and contact the area officer should changes be contemplated.

Should this proposal require habitat compensation by the Department of Fisheries and Oceans – Habitat and Enhancement Branch, a separate application of the compensatory works will be necessary for our review.

The following suggestions are made in the interest of boating safety:

Any materials or equipment used in dredging should be marked in accordance with the *Collision Regulations* of the *Canada Shipping Act* if located in or on the waterway.

Ensure that equipment used in dredging does not interfere with navigation and that all materials, equipment, cables, anchors, chains, temporary structures and debris are removed from the waterway upon completion of the work.

Any piles to be removed should be cut at or below the natural bed of the waterway. Failure to do so will require a separate review.

The banks of the waterway should be restored to an even contour and protected from erosion as necessary.

Debris control and removal will be the responsibility of the proponent.

Notice to Shipping action may be taken by contacting the agency below at least 10 days in advance of your intended date of commencement.

Canadian Coast Guard
Vessel Traffic Services
Room 2308
555 West Hastings Street
Vancouver, BC
V6B 5G3

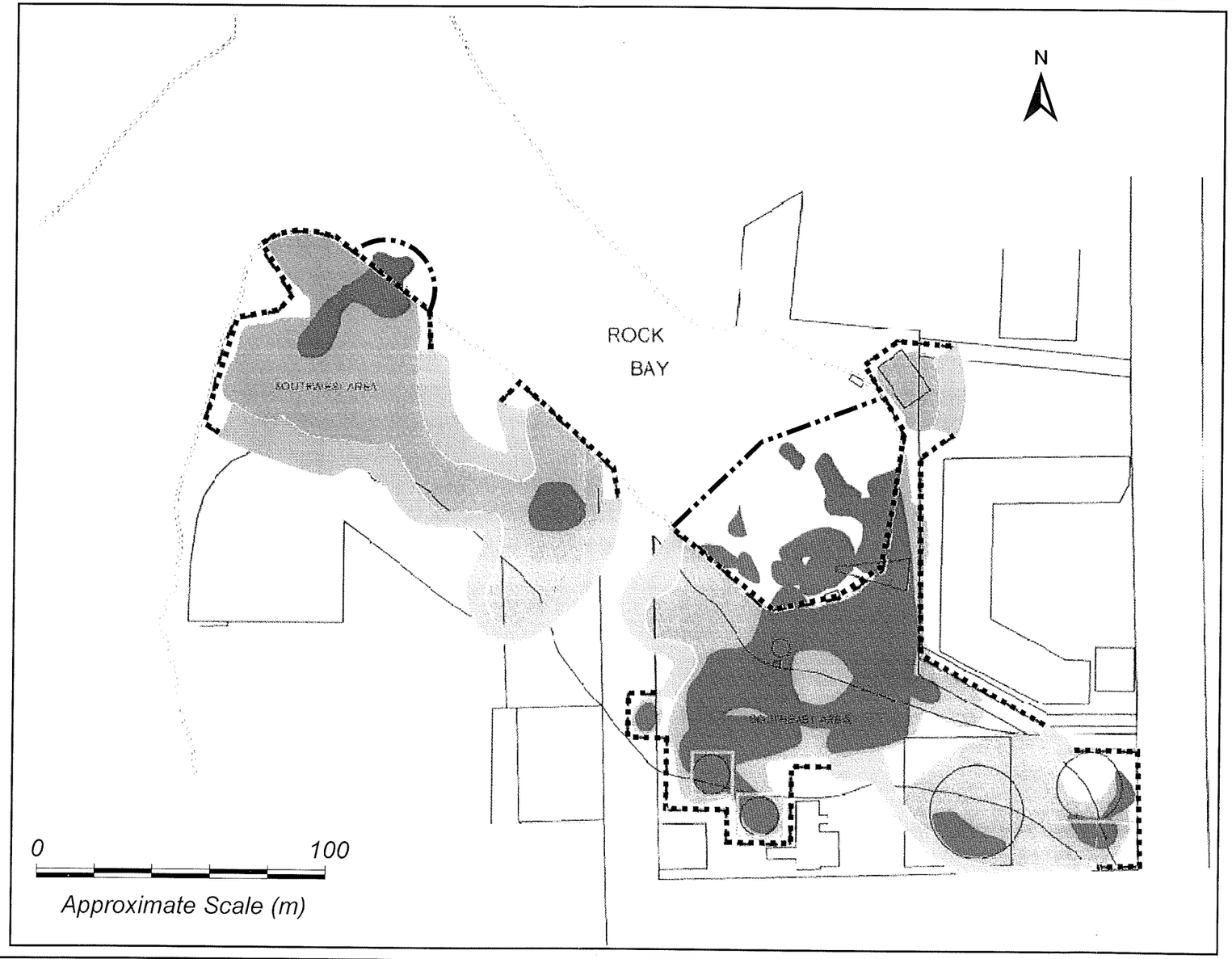
Tel (604) 666-6011
Fax (604) 666-8453

On completion of installation of the work, please contact the Database Information Officer of the Canadian Hydrographic Service at (250) 363 – 6360. This will ensure the correction of marine charts and publications.

cc: **Fisheries and Oceans, Institute of Ocean Sciences**, Box 6000, 9860 W. Saanich Road, Sidney, BC V8L 4B2 **Attn: Hydrographic Data Centre**

Department of Fisheries & Oceans, Habitat Management Unit, 3225 Stephenson Point Road, Nanaimo, BC, V9T 1K3. **Attn: Rob Russell**

Canada



LEGEND

- Approximate lateral extent of soil and sediment exceeding Special Waste standards.
- Approximate lateral extent of soil with PAH concentrations exceeding CSR/CL standards.

CSR - Contaminated Sites Regulation
CL - Commercial Standard
SW - Special Waste

- Temporary Sheetpile Barrier
- Batterslope 1:2 (V:H)
- Sheetpile for structural support
- Sheetpile for foreshore support

REVIEWED BY
NWP Officer
Marine Safety
Pacific Region
8200-04-8251
SEP 13 2004
9
J. Schellenberg
Ref.No.: 5 OF 11

NOTE: This figure is a variant on Figure 12 from the Golder Report dated July 22, 2003.

Transport Canada Transports Canada

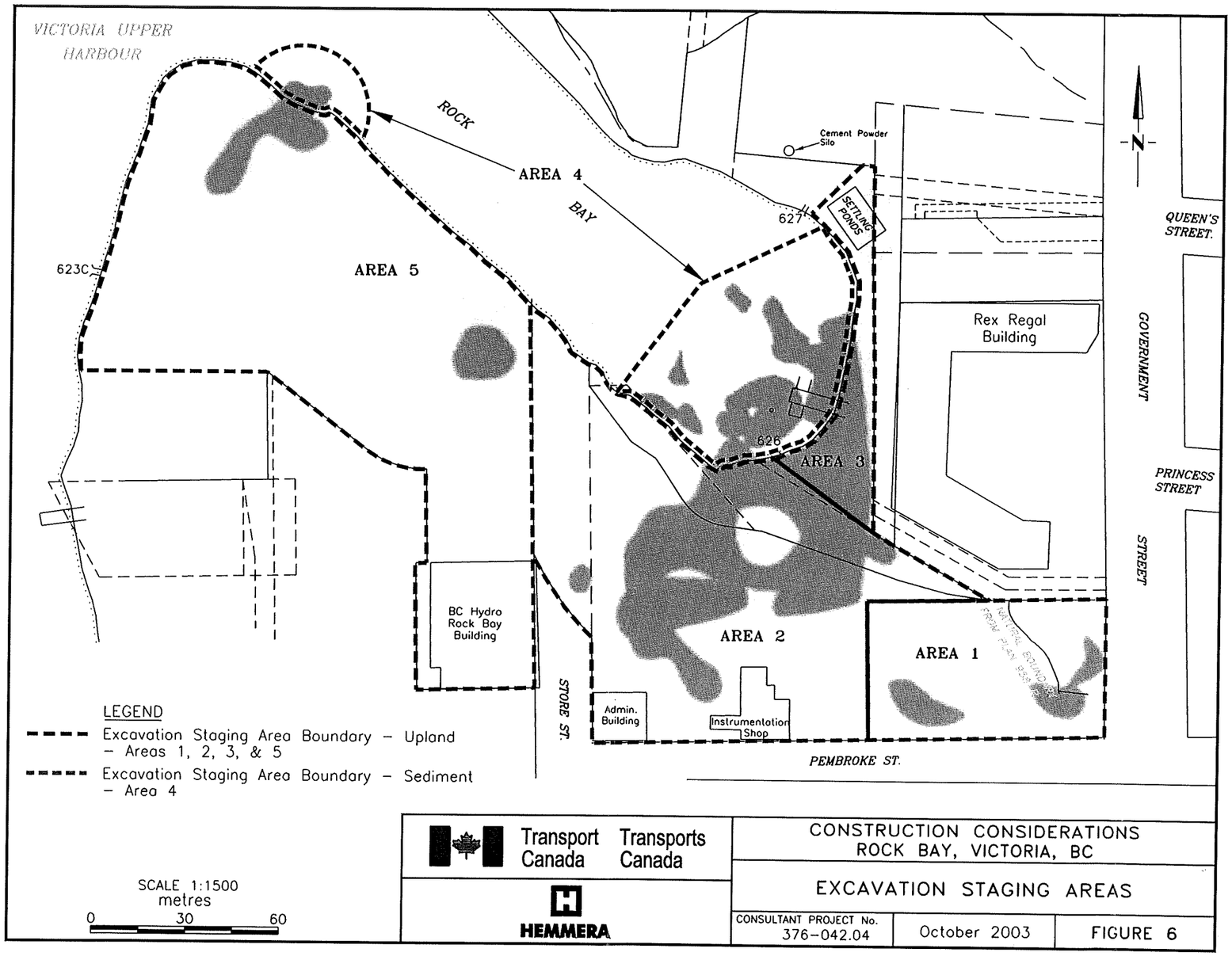
HEMMERA

CONSTRUCTION CONSIDERATIONS
ROCK BAY, VICTORIA, BC

REMOVAL OF SEDIMENT GREATER THAN SW & ALL SOIL GREATER THAN CSR CL/IL STANDARD

376-042.04	October 2003	Figure 5

CONSTRUCTION-CONSIDS



Transport Canada Transports Canada

HEMMERA

CONSTRUCTION CONSIDERATIONS
ROCK BAY, VICTORIA, BC

EXCAVATION STAGING AREAS

CONSULTANT PROJECT No.		
376-042.04	October 2003	FIGURE 6

APPENDIX D

CEAA

OGD.

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

Real Property Services | Services immobiliers

CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA) CHECKLIST

LOI CANADIENNE SUR L'ÉVALUATION ENVIRONNEMENTALE (LCEE) LISTE DE CONTRÔLE

The following checklist must be completed for every PWGSC project.

La présente liste doit être remplie pour chaque projet de TPSGC.

TO BE COMPLETED BY PROJECT PROPONENT | **À ÊTRE REMPLIE PAR LE PROPOSANT DU PROJET**

EOTP - WBSE	Project Title - Titre du projet	Project manager - Gestionnaire de projet
R.002674	Rock Bay Stage 3 Remediation	Scott Tomlinson
Telephone No.- N° de téléphone	**Fax No. N° de télécopieur**	**Email - Courriel**
604-666-3513	- -	scott.tomlinson@pwgsc.gc.ca
Address - Adresse	**Project Location - Lieu du Projet**	**Project Start Date - Date de début du projet**
641 - 800 Burrard St Vancouver BC	Rock Bay, Victoria, BC	2009-04-01
		Project End Date - Date de fin du projet
		2014-03-31

Description of Project Activities and Scope (serviced lot, new construction, building expansion, building/structure footprint (m2), distance from bodies of water, interior/exterior of building)

Description des activités et portée du projet (terrain viabilisé, nouvelle construction, agrandissement d'un édifice, incidence de l'édifice/de la structure (m2), distance face à un ou des cours d'eau, construction à l'intérieur ou à l'extérieur de l'édifice)

Transport Canada project.
Remediation of PAH and metal contaminated soil and sediment and associated contaminated groundwater.
Approximately 30,000 tonne of contaminated soil and 28,000 tonned of contaminated sediment.
Remediation technique will be to install shoring and coffer dam and excavate for offsite destruction, treatment, and disposal at permitted facilities.

☑ Checking this box is equivalent to an electronic signature confirming and validating the above project description Cette case cochée signifie une signature électronique confirmant et validant la description du projet ci-haut.	**Date** 2011-03-07

▶ **Send checklist to Environmental Services for sign-off, then file.**
Envoyer la liste de contrôle aux Services environnementaux pour approbation, puis la classer.

TO BE COMPLETED BY ENVIRONMENTAL SERVICES | **À ÊTRE REMPLIE PAR LES SERVICES ENVIRONNEMENTAUX**

1. Is the proposed activity considered a "project" as defined by *Canadian Environmental Assessment Act* (CEAA)?
Les travaux entrepris correspondent-ils à la description d'un « projet », suivant la définition présentée dans la *Loi canadienne sur l'évaluation environnementale* (LCEE) ?

☑ YES / OUI — Proceed with Checklist / Poursuivre la liste de contrôle

☐ NO / NON — EA not required / Aucune évaluation environnementale n'est requise

2. Is this project described in the *CEAA Exclusion List Regulations 2007* ?
Est-ce que le projet est visé par le *Règlement sur la liste d'exclusion de la LCEE 2007* ?

Excluded by Schedule
Exempté en vertu de l'annexe NO - on Inclusion List - Remediation of Federal lands.

☐ YES / OUI — Part - Partie _____ Item - Article _____

EA not required
Aucune évaluation environnementale n'est requise

☑ NO / NON — Proceed with Checklist / Poursuivre la liste de contrôle

3. Is there a Federal Authority (FA) who is responsible for carrying out the Environment Assessment?
Est-ce qu'une autorité fédérale est chargée d'effectuer l'évaluation environnementale ?

☑ YES / OUI — Proceed with Checklist / Poursuivre la liste de contrôle

☐ NO / NON — EA not required / Aucune évaluation environnementale n'est requise

4. Is there a CEAA (s. 5) Trigger?
Est-ce qu'il y a un déclencheur en vertu de l'article 5 de la LCEE ?

☑ YES / OUI — Environmental Assessment is required / Une évaluation environnementale est requise
Trigger / Déclencheur Funds/Lands

☐ NO / NON — EA not required / Aucune évaluation environnementale n'est requise

Approval - Approbation

Approved by (print Environmental Services name)	Signature	Date
KATRINA JOHNSTON		Mar. 7/11
Address - Adresse	**Telephone No.- N° de téléphone**	**Fax No. N° de télécopieur**
401 - 1230 Govn 4 St. Victoria BC	250-363-8623	2503633577
	Email - Courriel	
	Katrina.johnston@pwgsc.gc.ca	

Transport Canada / Transports Canada

March 22, 2004

To (Distribution):

Subject:
Canadian Environmental Assessment (CEAA) Environmental Assessment Referral – Victoria Harbour – Rock Bay Remediation Project

Rock Bay is the location of a historic coal gasification facility that resulted in the contamination of soil, groundwater and sediment on the site, on neighbouring properties and within the adjacent harbour floor. The former facility was located on both properties currently owed by the BC Hydro and Power Authority, (BC Hydro) a BC Crown Corporation and successor company to the original operators, and property leased to these entities by Transport Canada. Transport Canada is proposing to remediate contaminated soils, groundwater and sediment located on Transport Canada's property in Rock Bay, Victoria, BC.

Transport Canada is proposing to excavate approximately 85, 536 m^3 of soil (both contaminated and non-contaminated soil and sediments). Groundwater remediation will involve the removal of soils that are a source of impacts, the pumping, treatment and disposal of waters from the excavation and post remediation groundwater monitoring. Details on methods proposed to undertake this remedial project can be found in the attachment, *Construction Considerations for Recommended Remedial Strategy*. I have also included the *Permit Application to Alter or Disturb Fish Habitat, Rock Bay, Victoria, B.C* for your information.

Transport Canada has been working in cooperation with other federal departments in the development of the recommended remedial strategy. The following individuals have either been directly involved in the development of the strategy or have had the opportunity to review and comment on the strategy.

Richard Glue	Environment Canada	604-666-5566
Atahana Mentzelopoulos	Environment Canada	604-666-0064
Mike Nassichuk	Environment Canada	604-666-2799
Lisa Walls	Environment Canada	604-666-3055
Rob Russell	Fisheries and Oceans Canada	250-756-7284
March Klaver	Fisheries and Oceans Canada	250-723-9637

Rob Russell and March Klaver of Fisheries and Oceans Canada have also worked with Transport Canada in developing a draft S. 35 (2) and S. 32 of the Fisheries Act.

Transport Canada is the proponent of this project and has declared itself a responsible authority (RA) for the project, as defined in section 5 of CEAA, and has determined the proposed project will require a screening level review.

The purpose of this letter is to:

a) seek your input with regards to your potential CEAA role (i.e. could your Department be triggered under the Act).
b) seek your expert advice as a potential Federal Authority under the Act.

Transports Canada Transport Canada

CEAA ENVIRONMENTAL SCREENING REPORT

SCREENING SUMMARY

A. PROJECT IDENTIFICATION

Project Title/Type	Victoria Harbour, Rock Bay – Rock Bay Remediation Project		
Project Location:	Rock Bay, Victoria Harbour, BC	Estimated Cost:	Approx. $32 M
CEAA Trigger:	Proponent	EA Start Date:	2004-03-17
CEAR No.:	04-01-1829	NOC Posting Date:	2004-03-18
TC File No.:	T 7075 795-1 RDIMS#748800		

B. CONTACTS

Transport Canada:	Name: Robert Sisler	Telephone No.:	604-666-5370
		Fax No.:	604-666-2961
FEAC:	Name: Karen Hall	Telephone No.:	604-666-5368
		Fax No.:	604-666-2961
Other RAs:	Name: Rob Russell Fisheries & Oceans Canada	Telephone No.:	250-756-7284
		Fax No.:	
Proponent:	Name: Robert MacDonald Transport Canada	Telephone No.:	604-666-5381
		Fax No.:	604-666-5545

1.0 PROJECT DESCRIPTION

1.1 PROJECT DESCRIPTION

Introduction

Rock Bay is the location of a historic coal gasification facility that resulted in the contamination of soil, groundwater and sediment on the site, on neighbouring properties and within the adjacent harbour floor. The former facility was located on both properties currently owed by the BC Hydro and Power Authority, (BC Hydro) a BC Crown Corporation and successor company to the original operators, and property leased to these entities by Transport Canada. Transport Canada is proposing to remediate contaminated soils, groundwater and sediment located on Transport Canada's property in Rock Bay, Victoria, BC.

The Rock Bay area has been used by several industries in the past, including a coal gasification plant, a tannery, and sawmills. Rock Bay has also been subject to the impacts of significant infilling since the 1860's and also the discharge of stormwater for approximately one third of the City of Victoria.

The historical operations in the Rock Bay area have resulted in the contamination of soil and groundwater beneath the uplands portion of the site as well as the adjacent sediments within Rock Bay. The principle contaminants of concern (COCs) in soil in the upland areas of the Rock Bay site include coal tar and coal-tar components (e.g. PAHs), as well as other chemicals associated with materials used at the site including ammonia liquors, cyanide, hydrocarbon fuels, and oxide box wastes. Many of the groundwater contaminants at the subject site are associated with soil contamination. The principal COC in sediments is PAHs, from both historical industrial activities and the City of Victoria stormwater discharges into the bay.

Site Description

Rock Bay is a narrow bay, ranging from 60 to 100 m wide and approximately 250 m long, and forms a small appendage of Upper Victoria Harbour (Appendix A). The average depth of Rock Bay is approximately 3 m. Rip rap embankments comprise approximately 50% of the upper intertidal shoreline along Rock Bay. This rip rap extends into the lower intertidal zone along the majority of the south side of Rock Bay (South Western and South Eastern Zones).

The intertidal and backshore ecosystem value for Rock Bay was rated "Very Low" during the 1997 Victoria and Esquimalt Harbours Ecological Inventory and Rating project. During the 1998 marine biophysical inventory of Rock Bay by Archipelago Marine Research Ltd., only three fish species, the starry flounder, perch, and sculpin (unidentified species) and limited invertebrate species, were observed. Based on previous biological assessments, degradation of the marine environment has occurred both in Rock Bay and in the associated riparian zone. As a result, fish habitat within the bay is limited.

For ease of discussion, the upland portion of the Site has been divided into the South Western Zone, the South Eastern Zone and the Northern Zone (See map in Appendix B). The area of the

Site owned by Transport Canada and BC Hydro in each of the zones is summarised in the table below.

Summary of the Area of Zones and Land Ownership within the Site

Zone	BC Hydro Area (hectares)	Transport Canada Area (hectares)	Total Area (hectares)
South Western	0.5630	1.1315	1.6945
South Eastern	1.0106	0.2389	1.2495
Northern	Not Applicable	0.3650	0.3650
Sub-total uplands	1.5736	1.7354	3.3090
Rock Bay (head of bay to Barclay Point)	Not Applicable	2.0244	2.0244

Proposed Works

The Rock Bay Revised Recommended Remedial Strategy involves the remediation of soil and groundwater in the upland areas around Rock Bay and the remediation of marine sediment in Rock Bay. Upland contaminated soils above the *CSR* Commercial/Industrial (CL/IL) and Special Waste (SW) standards are to be removed to a maximum depth of eight meters and replaced with clean fill. Groundwater remediation involves the removal of the source soils, the pumping, treatment and disposal of excavation waters, and post remediation groundwater monitoring. Sediment remediation in Rock Bay involves the construction of temporary coffer dams in Rock Bay to isolate sediments that exceed the SW standard. The water within the area impounded by the coffer dams would then be removed (pumped), the contaminated sediments removed, the sediment in the excavated areas restored, and the temporary coffer dam removed. The remaining sediment with residual contamination will be risk managed.

1.1.1 Project Scheduling:

- Estimated Work Start Date: June 2004
- Estimated Work Completion Date: March 2006

1.2 ALTERNATIVES TO THE PROJECT

Four different scenarios were evaluated prior to choosing the current project. The following table outlines and provides evaluation of the alternatives, as well as discussion on how this project was chosen.

Summary of Remediation Scenarios

Scenario No.	Name	Summary of Components	Cost Estimate
Scenario 1	In situ management of all contamination	• Pump and treat system • NAPL collection wells • Sediment ecological risk assessment • Upland human health risk assessment	$3,515,000
Scenario 2	In situ sediment management and removal of upland soil greater than CSR CL/IL standards to 1 m depth	• Pump and treat system • NAPL collection wells • Excavation and disposal of soil greater than CSR CL/IL standards to 1 m depth • Sediment ecological risk assessment • Upland human health risk assessment	$8,630,000
Scenario 3	Removal of soil and sediment greater than Special Waste standard	• Excavation and disposal of soil greater than Special Waste standard • Excavation and disposal of sediment greater than Special Waste standard • Sediment ecological risk assessment • Upland human health risk assessment	$26,715,000
Scenario 4	Remediation of uplands to CSR CL/IL standards and removal of sediment greater than Special Waste standard	• Excavation and disposal of all soil greater than CSR CL/IL standards • Excavation and disposal of sediment greater than Special Waste standard • Sediment ecological risk assessment	$30,485,000

EVALUATION OF REMEDIATION SCENARIOS

A qualitative evaluation of the four revised remediation scenarios has been conducted to provide a basis for selection of the recommended remedial strategy. The following eight criteria have been evaluated:

- liability reduction;
- long term management responsibility reduction;
- social benefit;
- environmental benefit;
- technical feasibility;
- third party acceptability;
- approval duration; and
- implementation duration.

The rating system for these criteria has been structured so that a "high" rating in a category is more favourable than a "low" rating. The results of this evaluation are summarized in the following table.

Evaluation of Remediation Scenarios

REMEDIATION SCENARIOS	Liability Reduction [1]	Long Term Management. Responsibility Reduction [2]	Social Benefit [3]	Environmental Benefit [4]	Technical Feasibility [5]	Third Party Acceptability [6]	Approval Duration [7]	Implementation Duration [8]	Cost Estimates
1. In situ management of all contamination	Low	Low	Low	Low	Low	Low	Long	Long	$3.5M
2. In situ sediment management and removal of upland soil greater than CSR CL/IL standards to 1m depth	Low / Mod.	Low / Mod.	Mod*.	Low / Mod*.	Low / Mod.	Low / Mod.	Long	Long	$8.6M
3. Removal of soil and sediment greater than Special Waste standard	Mod. / High	Mod. / High	Mod*. / High*.	Mod*.	High	Mod. / High	Med.	Short / Med.	$26.7M
4. Remediation of uplands to CSR CL/IL standards and removal of sediment greater than Special Waste standard	High	High	High*	High*	Mod. / High	High	Short / Med.	Short / Med.	$30.5M

Notes: [1] High = Liability virtually eliminated; Mod = Some ongoing liability may exist; Low = High ongoing liability will exist.

[2] High = No long-term management; Mod = Some long-term management; Low = Intensive ongoing management required.

[3] High = Large social benefit; Mod = Some social benefit ; Low = Little or no social benefit. * assumes that stormwater management actions are implemented.

[4] High = Large environmental benefit; Mod = Some environmental benefit ; Low = Little or no environmental benefit. * assumes that stormwater management actions are implemented.

[5] High = Routine / proven; Mod = Requires management; Low = Difficult/Uncertain.

[6] High = Acceptable / anticipate cooperation; Mod = Requires management; Low = Opposition.

[7] Long = If approved >2yr; Med = If approved 6mos - 2yrs; Short = If approved <6mos

[8] Long = >4yrs; Med = 2 yrs - 4yrs; Short = <2 yrs

RECOMMENDED REMEDIAL STRATEGY FOR ROCK BAY

Following a technical and financial review of the four alternative remedial strategies, numerous discussions with the environmental agencies, and consideration of the qualitative evaluation, BC Hydro and Transport Canada have selected Scenario 4 as the recommended remedial strategy.

The Scenario 4 includes the excavation, disposal and replacement of all soil with contaminant concentrations greater than the provincial CSR CL/IL standards and the excavation of sediment with contaminant concentrations greater than the provincial Special Waste standards. The remaining coal tar affected sediment with contaminant concentrations greater than the federal (CSeQGs+PEL)/2 guideline would be subject to risk assessment and if necessary ongoing risk management measures would be considered.

For the South Western Zone, it is estimated that approximately 31,500 m^3 of soil will need to be excavated to a maximum depth of 5 m, to remove 1,350 m^3 of Special Waste material, and 15,140 m^3 of additional material greater than the CSR CL/IL standards. For the South Eastern Zone, it is estimated that approximately 63,700 m^3 will be excavated to a maximum depth of 8 m, to remove 8,440 m^3 of Special Waste material, and 19,280 m^3 of additional material greater than the CSR CL/IL standards. In addition, it is also estimated that a minimum of 3,800 m^3 of sediment will be excavated, to remove approximately 1,900 m^3 of Special Waste sediment.

Although Scenario 4 is the most expensive of those remediation strategies considered in this report, the outcome of the qualitative evaluation presented in the table above reveals that of the four scenarios being considered, 2003 Scenario 4 provides the most consistently high ranking for the majority of evaluation criteria.

The Scenario 4 includes the removal of the greatest quantity of contaminated material and consequently results in the highest level of liability reduction. The removal of the contaminant hazard will also result in the elimination of the requirement for long-term risk management. Given that the upland contaminant hazard will be removed there will be little or no restrictions on future land use and therefore there is a high social benefit associated with this scenario. The hazard removal will also result in the elimination of risk to the ecology and human health, thus resulting in a high environmental benefit. The higher level of technical feasibility also provides greater certainty to community, the environmental agencies and the property owners that contaminant issues at the Site will be resolved.

Given the advantages described above, it is anticipated that Scenario 4 will be associated with a high level of acceptability to third parties. Due to the emphasis on hazard reduction, rather than risk management it is anticipated that the approval duration will be relatively short. In addition, since there will be less reliance on ongoing risk management measures, the overall implementation period is relatively short (2 to 4 years).

The selected strategy for remediation of the sediment and proposed source control work will provide significant mitigative and compensatory value to fisheries resources currently in the bay.

2.0 CEAA TRIGGER

Transport Canada

[X] is the proponent of the project.
[ ] proposes to fund part or all of the project.
[ ] proposes to sell, lease or otherwise dispose of land for the project.
[ ] proposes to issue a permit, approval or other authorization on the CEAA Law List Regulations

Other Federal Involvement? Yes [X] not applicable [ ]

Federal Authority	Trigger or role
Fisheries and Oceans Canada	Law List Trigger (S 35 of the *Fisheries Act*); Fisheries and Ocean Canada have provided an *Authorization for Works Or Undertakings Affecting Fish Habitat and Destruction of Fish* (Appendix C)

3.0 SCOPE

3.1 SCOPE OF THE PROJET

Table 1: Project Component Identification

PROJECT PHASE	PROJECT COMPONENTS	
	Core Project Components	*Ancillary Works Other Projects and Activities*
Construction	• Coffer Dam Installation • Sheet Pile Installation	• Onsite access road • Construction of cleaning station • Temporary upland storage site
Operation / Modification	• Remedial works (soils/sediments) • backfilling	• ground/surface water treatment • dewatering soils/sediments
Decommissioning / Abandonment	• Removal of Coffer Dam • Removal of Sheet Pile • Improvements to Foreshore (HAP)	• Site Decommissioning

3.2 SCOPE OF ASSESSMENT

Based on the review of relevant factors (see Section 4.1 and 4.2 below), it was determined that the following factors will be taken into account in assessing the impact of this project on the environment:

1) The effect of the project on the following ecosystem components:
   i) fish and fish habitat as well as the surrounding sediments during the mobilization and dredging
   ii) the potential impacts to human health during dredging due to the contaminated sediments being dredged
   iii) the impacts to non contaminated soils and groundwater during the dewatering in the temporary upland storage area
   iv) the potential increase in noise levels during the life span of the project
   v) the potential for a decrease in air quality during the removal and storage of sediments and soil
   vi) the potential for accidents and malfunctions during mobilization and demobilization

2) the potential environmental effects on the ecosystem components above, and that may include those

induced by malfunctions or accidents that may occur in connection with the project.

3) cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;

4) the significance of all the above effects;

5) comments from the public and other government agencies that are received in accordance with the CEAA and the regulations;

6) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and

7) any other matter deemed relevant to the screening

Table 3: Project-Environment Interaction Matrix

Component	Surface water	Ground water	Soils and sediments	Air Quality and Climate Change	Noise/ Vibration	Terrain and Topography	Vegetation and Wetlands	Fish and Fish Habitat	Wildlife/ Habitat	Migratory Birds	Species at Risk	Socio-Economic Conditions[1]	Heritage/ Archaeology[1]	Land Use[1]	Land use by First Nations	Human Health[1]	Transportation[1] and Navigation
Construction Activities																	
Coffer Dam Installation	X		X	X	X			X									
Temporary Upland Storage Site			X														
Sheet Pile Installation		X		X	X												
Access Road in site				X													
Cleaning Station		X															
Operational Activities																	
Remedial Works	X	X	X	X	X			X					X			X	
Ground/Surface Water Treatment	X	X															
Dewatering of Soils/Sediments	X	X		X													
Backfill of Soils/Sediments			X	X				X									
Decommissionning																	
Removal of Coffer Dam	X		X	X				X									
Removal of Sheet Pile		X		X	X												
Restoration to Original site conditions			X	X													
Improvements to Foreshore			X					X									

[1] *The indirect effects on these Environmental Components resulting from a project impact on the environment must be considered. Direct effects on these Environmental Components may also be considered at the discretion of the RA.*

4.0 DESCRIPTION OF EXISTING ENVIRONMENT

4.1 DESCRIPTION OF BIOPHYSICAL ENVIRONMENT

4.1.1 Geology

The general stratigraphy encountered over the course of various site investigations is summarized below. The fill is described separately for the onshore and offshore areas. Unless described otherwise, other units are continuous between the onshore and offshore areas.

Onshore Fill

This unit consists of mainly sand and gravel, but also contains wood waste, clinker, brick fragments, concrete and other miscellaneous industrial fill materials. Wood waste is generally more prevalent in the South Western Zone. However, wood waste was also noted within fill material in the northern portion of the South Eastern Zone and along the northern shoreline of Rock Bay. In general, the onshore fill unit is continuous across the site and extends from ground surface to depths of about 4 to 5 meters. However, in the locations of the former gasometers and near the north end of the Store Street this unit was found to extend to depths of 7 or 8 m.

Offshore Marine Fill

The offshore fill consists mainly of silt and sand, but also contains some wood waste, shells and other organic material. This unit is typically grey in colour, but was frequently reported as black or having blackish staining. In the northwest end of Rock Bay the fill varied in depth from 0.5 m to 1 m, with an average depth of about 0.8 m. In the southeast end of Rock Bay the offshore fill varied in depth from about 1 m to 4 m, with an average depth of about 2 m. The thickest accumulation of offshore fill (approximate depths of 2 m to 4 m) was identified along the southern shore of Rock Bay between the Store Street alignment and dock area near Outfall No. 626.

Silty Clay

This native unit underlies the (onshore and offshore) fill, and consists of well sorted, medium grained, grey-green and/or mottled brown massive silty clay. Onshore, the silty clay unit is relatively continuous across the site and was encountered immediately beneath the fill layer. The thickness of the silty clay encountered within boreholes at the site ranged from about 1.5 m to 6 m with an average thickness of about 3.5 m. In offshore zones at the northwest portion of Rock Bay, the silty clay unit was observed at most borehole locations. The thickness of the silty clay in this area was generally greater than 2 m. In the southeast portion of Rock Bay the silty clay unit was generally absent from the stratigraphic sequence.

Sand Interbeds within Silty Clay

Discontinuous native sand interbeds were observed in several onshore boreholes within the bottom metre of the silty clay unit. These generally consisted of one to three zones of medium grey, fine-grained sand interbedded with silty clay. The sand layers observed in boreholes ranged in thickness from about 0.1 m to 2.5 m, with an average thickness of about 0.5 m. During investigations in 2000, tar was identified

within the sand layers at the base of the silty clay in an area located to the north of the former Instrumentation Building.

Grey Clay

With the exception of the area of Barclay Point where bedrock is located directly beneath the fill and/or silty clay, the entire site (onshore and offshore) is underlain by a native massive, plastic, uniform grey clay. Well-rounded cobble stones were also observed within this unit at several locations. Where present, the grey clay varied in thickness from 1 to 2 m near the Rock Bay building to greater than 20 m near the southeastern edge of Rock Bay.

Bedrock

Bedrock was encountered at the site in several boreholes in both onshore and offshore portions of the site. In the western portion of the site near Barclay Point, bedrock was encountered at depths between 1 and 7 m, with an average depth of about 4 m. In this area, bedrock was observed beneath either the fill or silty clay unit. In the eastern portion of the site, bedrock ranged in depth from about seven meters near the Rock Bay building to about 28 m near the southeastern end of Rock Bay. Bedrock beneath the site consisted of green mafic intrusive igneous rock, often seen with a high serpentinization/chloritization alteration. The upper surface of this unit was typically characterized by a weathered surface of dense angular to sub-angular bedrock fragments in a highly compacted clay matrix.

4.1.2 Hydrogeology

The hydrogeology of the upland areas of the Site is strongly influenced by the presence of the permeable sand and gravel fill, which overlies the low permeability native silty clay, grey clay and igneous bedrock. Rising head slug tests conducted in monitoring wells completed within the fill have indicated a wide range of hydraulic conductivity between 10^{-4} to 10^{-7} m/s, which is consistent with the heterogeneous nature of the fill. The groundwater discharge zone is postulated to be the marine environment of Rock Bay.

The hydrogeology of the South Western Zone is influenced by permeable wood waste horizons within the fill and the relatively shallow depth of the bedrock. The piezometric surface appears to form a mound above the shallow bedrock, from which groundwater drains radially towards Rock Bay.

The hydrogeology of the South Eastern Zone is influenced by the presence of a groundwater pumping well which forms part of the pump and treatment system operated continuously by BC Hydro in this zone since 1992. Groundwater monitoring prior to the installation of the pumping well indicated that the hydraulic gradient in this zone was approximately 0.019 m/m and directed towards Rock Bay. The piezometric elevation in pumping well is currently maintained at about 4.1 m below ground surface. Monitoring of the piezometric elevations suggests that most of the shallow groundwater within this zone is captured by the pumping well. A concrete storm sewer culvert extends through the northeastern portion of the South Eastern Zone to stormwater Outfall No. 626. The presence of the culvert and the high permeability backfill likely associated with the culvert may act as a boundary to the catchment zone of pumping well.

Groundwater monitoring wells, located in this zone and screened over the bedrock / regolith interface at depths of 15 m to 29 m are artesian. This indicates upward groundwater flow. This suggests that the fill acts as a discharge zone for the native soil and any contaminants being transported by groundwater flowing through the native soil would be captured by the pumping well.

Hydrogeological investigations in the Northern Zone have been limited by infrastructure and the relatively small parcels of land owned by Transport Canada in this zone. The Northern Zone encompasses a wide area that is assumed to include two hydrogeological regimes. The first hydrogeological regime occurs in the relatively flat area between Government Street and Rock Bay previously occupied by a creek, which was backfilled in stages up until the 1950s. The groundwater gradient measured in this area in March 1999 during a low tide event was determined to be 0.007 m/m and directed towards Rock Bay. The second hydrogeological regime occurs to the north of the former creek, where an approximately 6 m high bank rises steeply from the shoreline. The groundwater gradient measured in this area in February 1998 was determined to be 0.02 m/m and directed towards Rock Bay.

The estimation of contaminant flux into Rock Bay from the Site is discussed further in Section 4.1.5 in the context of groundwater quality.

4.1.3 Soil Quality

The principal contaminants of concern (COC) in soil beneath the Site include coal tar and coal tar components (e.g., PAHs), as well as other chemicals within materials known to have been used, and probably released at the Site. These other materials and associated COCs include ammonia liquors, cyanide, hydrocarbon fuels (e.g., Bunker C, as measured by mineral oil & grease (MOG), and LEPH and HEPH), and oxide box wastes (i.e., certain heavy metals and sulphur).

All of these constituents are present in several areas within fills and, in the case of coal tar, have penetrated into underlying native sands where the bases of the gasometers were sub-excavated into native soil during construction. With the possible exception of coal tar, which is mobile or potentially mobile in some locations, all COCs likely exist as residuals, sorbed onto soil solids or entrained as solids in the fill.

Residual and potentially mobile dense non-aqueous phase liquid (DNAPL) has been found in zones within the fill at the Site. These areas mainly occur in the vicinity of the former coal gasification plant. There is no evidence of lateral DNAPL migration to the east beneath Government Street, to the south beneath Pembroke Street, or beneath much of Store Street. There is also no evidence that DNAPL has penetrated through the native plastic grey clay that directly overlies native till and/or bedrock. No visual, olfactory or analytical indications of coal tar contamination have been found at depths greater than about 8 m.

PAHs are most widespread in soil across the Site because of their coal tar association. In general, areas of soil containing PAHs were identified in the South Western and South Eastern Zones. Soil containing PAHs was not observed to extend below a depth of about 5 m in the South Western Zone. In that area, contamination is limited to the fill, which is inferred to have been sourced from the bay, and placed in the South Western Zone during historic land reclamation activities in the early 1900s. In the South Eastern Zone, PAHs are limited to about 8 m depth, primarily within heterogeneous fill but also within underlying native soil at some locations. The affected areas extend to the north where PAHs in soil are contiguous with PAHs found in sediment at the head of Rock Bay.

With only a few exceptions, soil contaminated by constituents other than PAHs occupy relatively small zones within the areas that are also affected by PAHs. Among the other constituents, copper and lead were most commonly detected at levels above the CSR CL standards.

In 1993, remediation was conducted on an area south of Barclay Point where historic disposal of PCB-containing capacitors had occurred. This area was excavated and backfilled with imported clean sand and excavated soil that met the CL standards. During subsequent investigations the PCB concentrations in soil were below CSR CL standards and relatively low, with one exception. This soil sample was collected from an entrained clay layer within sand and gravel backfill near the base of the remedial excavation. A statistical review of the quality of the backfill (DSI, Appendix I) showed that overall the quality of the backfill meets CSR CL standards.

The estimated volume of soil exceeding the CSR CL and the Special Waste standards in for the South Eastern Zone, the South Western Zone and the Northern Zone are shown in Table 4..

Table 4 Contaminated Soil Volume Estimates

Depth Interval	South Western Zone		South Eastern Zone		Northern Zone		All Areas	
	Volume CSR CL (m^3)	Volume SW (m^3)	Volume CSR CL (m^3)	Volume SW (m^3)	Volume CSR CL (m^3)	Volume SW (m^3)	Volume CSR CL (m^3)	Volume SW (m^3)
0 to 1 m	2,660	700	5,320	1,490	0	0	7,980	2,190
1 to 2 m	3,620	650	4,790	2,030	0	0	8,410	2,680
2 to 3 m	3,090	0	3,080	1,980	0	0	6,170	1,980
3 to 4 m	3,410	0	3,230	1,670	0	0	6,640	1,670
4 to 5 m	2,360	0	2,150	700	420	0	4,930	700
5 to 6 m	0	0	480	80	245	0	725	80
6 to 8 m	0	0	230	490	0	0	230	490
Total Volumes	**15,140**	**1,350**	**19,280**	**8,440**	**665**	**0**	**35,085**	**9,790**

Note: 1. Volume estimates of CL soil does not include Special Waste.
2. Soil volumes presented do not include material backfilled into the former PCB remediation area (see DSI Appendix I)

4.1.4 Sediment Quality

PAHs are the primary contaminant of concern in the sediment of Rock Bay. The analytical results show that concentrations of PAHs in Rock Bay sediment are above the Victoria Harbour background concentrations. The PAH concentrations vary significantly both horizontally and vertically. Highest concentrations are found in sediment collected at sampling locations adjacent to the former coal gasification plant and stormwater Outfall No. 626 (south-east corner of the Bay).

Surface sediment sampling indicates a complex pattern in PAH contamination across the Site but a distinct spatial trend is observed for sediment samples at depth. The highest PAH concentrations in the subsurface, including sediment with Special Waste concentrations, are observed in the sediment from the head of the Bay and in one localized area off Barclay Point. Special Waste sediment is confined to the overlying silt layer and have not been found to extend into the native clay.

A tracer/fingerprinting study using coprostanol and coronene as marker compounds suggests that PAH inputs in surface sediment in Rock Bay are attributable to storm sewer discharges and not to coal tar derived contamination. The PAH composition of the surface sediment is different from both the upland soil containing coal tar and the upland groundwater discharging to the bay.

A source apportionment study of the PAH contamination in shallow and deep sediment in Rock Bay, which used principal component analysis of the distribution of PAH compounds, as well as an analysis of the individual ratios for several pairs of PAH compounds, indicated that PAH contamination attributable to coal tars is largely confined to the subsurface. This contamination extends from the head of the bay to at least Castor core location 450 and could extend as far as the location of core RBC-4, which is located approximately 160 m from the head of the bay, and 80 m east from Barclay Point . The probable extent of coal tar related PAHs in the sediment at the Site likely lies somewhere between these two points. Further delineation with collection and analysis of additional core samples in this area was undertaken as part of detailed remedial design.

There are also additional coal tar impacts to sediment near Barclay Point. The presumed source of this contamination is from fill containing coal tar residues that was deposited at Barclay Point in the past. The source apportionment study indicated that sediment containing coal tar and associated PAHs as a result of past site uses can be distinctly delineated from sediment in Rock Bay and elsewhere in Upper Victoria Harbour that are impacted by PAHs from storm water sources.

The primary metals contamination in Rock Bay consists of concentrations of copper, lead, mercury, nickel and zinc; lesser concentrations of arsenic, cadmium, and chromium are also observed. However, the acid volatile sulphide (AVS) and simultaneously extractable metals (SEM) ratios for the sediment indicated the metals would not be bioavailable.

Concentrations of PCBs have been detected in samples collected from throughout the Upper Harbour (Envirochem 1996). The overall PCB contamination in Rock Bay sediment is similar to or lower than the ambient PCB contamination throughout Upper Victoria Harbour.

Concentrations of pesticides, total dioxins, furans and chlorophenols in Rock Bay sediment are equal to or lower than concentrations measured in other portions of the Upper Harbour. Further, concentrations of total butyltins from Rock Bay were at the lower end of the range of concentrations observed in Victoria Harbour. Therefore, concentrations of these compounds are indicative of harbour-wide contamination and are not related to historic industrial activities at Rock Bay.

Surface sediment PAH concentrations show no correlation with site-specific measures of sediment quality such as benthic community structure and toxicity. In addition, there is evidence for the potential for seasonal fluctuations in toxicity effects, which would not be expected if the PAHs associated with the former coal gasification plant were the main source of toxicity. In contrast, contaminant loadings from storm sewers have a large seasonal variation in outfall discharge volumes and contaminant concentrations. This suggests that stormwater discharges and not coal tar PAHs are the primary causative agent for the adverse effects observed in Rock Bay.

In general, surficial sediment contamination in Rock Bay is primarily a result of discharge from storm sewers entering the bay. Coal tar contamination from the former coal gasification plant is confined to deeper sediment and does not have an adverse effect on the benthic marine biota in Rock Bay. Any

further efforts to identify the source of toxicity in the bay should therefore emphasize the influence of the stormwater discharges.

Based on an assessment of sediment chemistry for mainly naphthalene, it is estimated that about 28,000 m^3 (+/- 50%) of sediment exceeding (CSeQG+PEL)/2, and about 1,900 m^3 (-50%/+100%) of Special Waste sediment affected by coal tar and related PAHs are present in sediment beneath Rock Bay. The estimated volumes of sediment exceeding the Special Waste standards and (CSeQG+PEL)/2, for 1 m depth intervals are shown in Table 5. Table 5 also shows the estimated volume of sediment with total PAH greater than 20, 50 and 100 µg/g.

Table 5 Contaminated Sediment Volume Estimates

Depth Interval (m)	Volume Special Waste (m^3)	Volume (CSeQG+PEL)/2 naphthalene (m^3)	Volume total PAH >20 µg/g (m^3)	Volume total PAH >50 µg/g (m^3)	Volume total PAH >100 µg/g (m^3)
0 to 1 m	550	9,800	8,960	5,283	3,404
1 to 2 m	510	8,600	7,106	4,960	2,560
2 to 3 m	570	5,000	4,783	3,828	2,962
3 to 4 m	140	4,400	3,368	2,298	1,332
4 to 5 m	100	500	460	368	285
Total Volumes (m^3)	**1,870**	**28,300**	**24,678**	**16,738**	**10,542**

A benthic community survey has indicated that the benthic community is characteristic of poor ecological health, particularly at the head of the bay (EVS, 1999). Furthermore, toxicity identification evaluations have indicated that ammonia and sulphides appear to be the primary causative agents, and not PAHs. The exact cause of the elevated concentrations of ammonia and sulphides that are characteristic of an anoxic environment, is not known, but may be related to organic enrichment from the storm sewers and/or poor circulation within the bay, as a result of historical infilling at Barclay Point.

4.1.5 Groundwater Quality

Soil contamination at the Site, especially in the South Western and South Eastern Zones, likely contributes significantly to groundwater contamination at the Site.

Concentrations of some PAH compounds in excess of the CSR aquatic life water (AW) standards are found in approximately two thirds of the monitoring wells on-site. These wells are evenly and widely distributed throughout the Site with the exception of the uplands in the Northern Zone. Groundwater

contaminated with PAHs in the South Western and South Eastern Zones are located in known areas of soil contaminated with PAHs.

Groundwater samples collected from the South Western and Northern Zones during the supplemental investigations indicated no concentrations of VOCs, including BETX, in excess of the CSR AW standards.

Historical groundwater sampling indicated concentrations of dissolved metals in excess of the CSR AW standards across the Site, including: chromium, mercury, selenium, silver, tin, lead and copper. However, the majority of the historical sample data does not include hardness concentrations for the groundwater samples; therefore, the most stringent of the hardness-dependent standards were applied.

The groundwater chemistry data indicated that metals contamination of groundwater is minor relative to the much more pervasive hydrocarbon contamination. Concentrations of dissolved mercury in excess of the CSR AW standards were noted in a few historically collected samples in the South Eastern and South Western Zones.

Trace concentrations of PCBs (greater than 1 ng/L) were noted in monitoring wells throughout the Site, including areas with no known historic PCB use. However, elevated concentrations (i.e., greater than 100 ng/L) were much more limited.

Although wood waste was determined to be a major component of the fill unit at the Site, most of it was placed in the early 1900s prior to use of chlorinated phenols as a wood preservative. Analysis of groundwater samples collected in the areas of wood waste confirm that there are no concentrations of chlorinated phenols in excess of the CSR AW standards.

Concentrations of ammonia in groundwater in excess of the CSR AW standards are primarily confined to the South Eastern Zone of the Site and are likely associated with the disposal of emulsions and contaminated liquors from the historic ammonia scrubber operation at the Site. A background sample collected upgradient also had an elevated ammonia concentration, which may be associated with detergents used at that property.

Concentrations of cyanide in groundwater in excess of the CSR AW standards have been found in monitoring wells located in the South Eastern Zone. Cyanide in the South Eastern Zone is likely associated with disposal of spent oxide box wastes throughout the zone. Some concentrations of elevated cyanide were also found in monitoring wells located in the western portion of the South Western Zone but the source of cyanide is not known.

Sulphate concentrations in groundwater in excess of the CSR AW were indicated in each of the Zones. Elevated levels of sulphate in groundwater samples are likely a result of salt-water intrusion and/or oxide box wastes.

The PAH flux into Rock Bay has been estimated by dividing the area surrounding the bay into flow tubes, based on contaminant concentrations and changes in groundwater gradients. Groundwater flux was calculated for each flow tube based on Darcy's law, and assuming the appropriate hydraulic gradient for the flow tube, and an average hydraulic conductivity for the fill of 5×10^{-4} m/s. The saturated thickness was assumed to be the depth between the water table and the interface of the fill and native soil. This was estimated to be 2 m in the South Western Zone and 3 m in the northern portion of the South Eastern Zone (north of Outfall No. 626) and the Northern Zone. The estimated PAH flux for each zone may be summarised as follows:

- South Western Zone - 0.1580 kg/day;
- northern area of South Eastern Zone - 0.0087 kg/day
- Northern Zone - 0.00015 kg/day

The flux calculations have indicated that approximately 0.1670 kg/day or 61 kg/yr of total PAHs are migrating into the bay from the uplands. The potential impact of this loading on the marine environment has not been assessed. The discharge of contaminated groundwater from the South Eastern Zone to Rock Bay has been controlled by a groundwater treatment plant, operated continuously by BC Hydro since 1992. Monitoring of groundwater extracted from the pumping well (PW3), indicated that a 51 kg/yr of PAHs in the dissolved phase were removed between July 2000 and July 2001. This supports the estimated magnitude of the PAH flux entering the bay and suggests that the groundwater pump and treat technology can successfully capture a significant proportion of the dissolved phase contaminants that would otherwise be discharged to Rock Bay.

4.1.6 Biological Description

In 1998, Archipelago Marine Research Ltd. conducted an intertidal and subtidal biophysical inventory in Rock Bay and summarized results in the report, Marine Biophysical Inventory of Rock Bay, Upper Victoria Harbour – Final Report, (Archipelago 1998). Detailed biophysical information was collected on a total of 27 intertidal transects and 4 subtidal transects within Rock Bay.

The field investigation showed that the vast majority (over 85%) shoreline (upper intertidal) of Rock Bay had been modified by shoreline hardening (rip rap, cement scree, concrete), with riprap extending into the lower intertidal along the majority of the south side of Rock Bay. Within mudflat areas a build-up of wood and bark debris from historic log storage activity was noted. The study also found that the majority of the Rock Bay basin (subtidal) consists of silt covered by diatoms with a few areas of bacterial mat. Sparse cobble (<5%), boulder (5%) and wood debris (<5%) were also present, affording substrate for the plumose anemone, Metridium senile (Archipelago, 1998).

In addition to the plumose anemone, the following biota were observed during the transects by Archipelago (1998):

- Dungeness crabs (Cancer magister) along with the graceful crab (Cancer gacilis) or juvenile Dungeness were common throughout the subtidal areas.

- The piddock clam (Zirphaca pilsbryi) was observed at two locations (T23 and T18) in clay and silt substrate.
- Two starry flounder (Insopsetta ischyra) were observed in the deeper portion of the bay while a few perch and sculpins were seen in shallower water near the base of T15.
- Other observations included Harbour seals hauled out on log booms south of Barclay Point at the entrance to Rock Bay. Pacific oysters (Crassostrea gigas), barnacles (Balanus), mussels (Mytolis sp.), snails (Littorina sp.), and limpets (Tectura sp.) were present on rip rap, boulders, cobbles and assorted debris throughout the intertial portion of the bay.

In 1999, Archipelago Marine Research Ltd., conducted a subtidal survey of Victoria Harbour, documented in the report, Subtidal Survey of Physical and Biological Features of Victoria Harbour, (Draft - January 2000). The survey plan used an underwater video system to obtain geo-positioned imagery of the seabed. At the time of the survey, the head of Rock Bay had such a high degree of turbidity that video observations were not possible. The reduced visibility extended throughout the bay. This was observed at the time of the video survey (April 1999), during the dive survey (July 1999) and during previous surveys of the area (Archipelago 1998). Sediment input is most likely from the two large City of Victoria (CoV) storm drains at the head of the bay, as well as from adjacent industrial areas (Archipelago 2000).

EVS Environmental Consultants conducted further biological studies in support of a risk assessment in 1999. Documented in the report, Rock Bay Site: Marine Sediment Quality Triad – Assessment Report, Draft (EVS, March 1999), EVS found that at most locations sampled, severe impairment was observed in the benthic community. The toxicity tests indicated significant effects on growth and sub-lethal effects on benthos at each sample location. There was a marked gradient in sediment quality with the greatest impairment along the eastern portion of the site, particularly in the immediate vicinity of the two CoV storm sewers (#626 and #627).

An important finding from the March 1999 EVS study was that surface sediment polycyclic aromatic hydrocarbon (PAH) concentrations were not coal tar derived , and further, PAH concentrations showed no correlation with biological indicators of sediment quality (e.g. benthic community structure, toxicity). This suggests that PAHs, despite exhibiting marginal criteria exceedance at the sediment surface, are not the primary cause for the adverse effects observed in the Bay. As a result of this finding, toxicity identification evaluations were conducted to identify the source of toxicity observed in the bioassays.

The toxicity studies are documented in Rock Bay Site: Toxicity Identification Evaluations (addendum to Marine Sediment Quality Triad – Assessment Report) (EVS June 1999). The toxicity studies did not provide any evidence that the contaminants associated with former industrial activities along the Rock Bay foreshore (i.e. PAHs, metals, PCBs) contributed to toxicity observed in the laboratory toxicity tests. Instead, products of microbial metabolism, specifically ammonia and hydrogen sulphide, were consistently identified as causes of toxicity in porewater tests. A physical effect of sediment deposition was identified as the cause of toxicity with sediment exposures to bivalve larvae. The exact cause (or source) of the elevated concentrations of ammonia and sulphides is unknown (EVS June 1999). The

presence of the storm sewers at the head of the bay, poor bay circulation, and the possible influence of oxide box wastes from the uplands, may all have contributed to an anoxic sediment condition (i.e., high sediment oxygen demand) characterized by elevated ammonia and sulphides (EVS, June 1999).

4.1.7 Fish Habitat

In 1997, the Victoria and Esquimalt Harbours Environmental Action Program began the Victoria and Esquimalt Harbours Ecological Inventory and Rating project. The intent of the project was to rate the ecological value of intertidal, backshore, and subtidal portions of Victoria Harbour and adjacent water bodies. The intertidal and backshore ecosystem value for Rock Bay was rated "Very Low." This rating is common for areas where industrial and commercial development has substantially modified the natural intertidal and backshore zones (Westland 2000).

Based on the biological assessments prepared by Archipelago (Archipelago, 1998), EVS (EVS 1999), and Westland (Westland 2000) degradation of the marine environment has occurred both in Rock Bay and in the associated riparian zone. As a result, fish habitat within the bay is limited; however, two areas have been previously identified by Archipelago as potentially valued habitat. Archipelago identified the mudflat in the northern portion of Rock Bay as valued habitat, due to the rarity of this habitat in Upper Victoria Harbour and Selkirk Water. The second area that may be considered a potential valued habitat is the 75 m long mud/pebble/sand beach and the associated upper intertidal marsh vegetation (Archipelago 1998).

4.1.8 Riparian Habitat

A site reconnaissance on September 22, 2003 revealed limited riparian vegetation on the armoured banks of Rock Bay and on the adjacent fill. Within the areas to be remediated, vegetation on the high banks and fill was dominated by invasive weedy species, particularly Himalayan blackberry and Scotch broom. Native tree species were limited to six arbutus trees, to heights of about 3m, and one Douglas fir tree, approximately 2m in height. Terrestrial vegetation was generally devoid on the rip rap and cement scree/concrete hardened foreshore, except for the occasional mat of pickleweed (*Salicornia virginica*), where silt had accumulated in the interstitial voids (in tidal areas).

4.1.9 Air Quality, Noise and Vibration Studies

Transport Canada and BC Hydro are currently conducting a Baseline Air Quality Monitoring Program. This program is designed to determine ambient air quality conditions with respect to parameters that may be generated as a result of remedial activities at Rock Bay. This work is being conducted by a specialist consultant, including a Certified Industrial Hygienist who is familiar with accepted industry practices related to occupational hygiene monitoring and sampling programs. Sample methodology includes setting up the sample pumps at fixed locations along the property line on all four sides of the site having a total of four perimeter locations where samples will be collected. Air samples are collected over a period of approximately eight hours. The samples will provide information on the concentration of the parameters being monitored both entering and leaving the site during different wind directions. Samples are analysed for: volatile organic compounds, coal tar pitch volatiles, polycyclic aromatic hydrocarbons, and total particulates. The sampling will be conducted over a period of several months to ensure the baseline data is representative of differing wind conditions.

In conjunction with the air quality monitoring, a noise monitoring program is being conducted. This program is designed to determine ambient noise levels relaive to levels that may be generated as a result of remedial activities at Rock Bay. This program is being conducted by a specialist consultant who is familiar with accepted industry practices related to vibration monitoring. Monitoring methodology includes continuously walking the perimeter of the site with a dosimeter to log the noise levels over the workday period. The monitoring will be conducted over a period of several months to ensure the baseline data is representative of differing off-site activity levels.

Transport Canada and BC Hydro are currently conducting a Baseline Vibration Monitoring Program. This program is designed to determine ambient vibration levels relative to levels that may be generated as a result of remedial activities at Rock Bay. This program is being conducted by a specialist consultant who is familiar with accepted industry practices related to vibration monitoring. This consultant identified several structures onsite and offsite that should be monitored, based on construction type and proximity to the site. Monitoring methodology includes installing one or (for multi-story structures) two tri-axial vibration logging instruments. These instruments are set to record the maximum and minimum vibration levels over a small time interval. These instruments are left to record data over a 24 hour period during a normal work day.

4.2 DESCRIPTION OF SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

4.2.1 The Location and Adjacent Areas

The Site is located within an industrial and commercial area of the City of Victoria, BC. The majority of the upland portion of the Site lies to the south of Rock Bay . The federal lease areas to the north of Rock Bay include only small upland areas, adjacent to the current shoreline.

Ocean Construction Ltd. operate a concrete ready mix plant to north east of Rock Bay, as well as leasing property within the Northern Zone and immediately to the east of Rock Bay. A 7 m wide strip of land owned by Ocean Construction forms the Site boundary to the east of Rock Bay. A commercial/light industrial building extends from the Ocean Construction property towards Government Street. This property houses an auto repair business, a gasoline station and numerous retail stores.

Pembroke Street forms the property boundary to the south of the South Eastern Zone, and numerous commercial and light industrial facilities are located to the south of Pembroke Street. Island Asphalt own an operating asphalt production plant to the south of the South Western Zone, as well as leasing property within the South Western Zone.

SOUTH WESTERN ZONE

The South Western Zone is composed of properties along the southern shore of Rock Bay, to the west of Store Street. The total area of the uplands in the South Western Zone is 1.695 hectares, of which 1.132 hectares is owned by Transport Canada and 0.5630 hectares is owned by BC Hydro. The majority of the South Western Zone, including the reclaimed land to the north of the "natural boundary" shown in Figure

3, is currently owned by Transport Canada. This area includes former federal leaseholds 94902 and 99276, and the following BC Hydro properties:

- P.I.D. 005-439-591;
- Lot 2 of Lots 208, 222, 1363 and 1364 Victoria City and Section 18, Victoria District Plan 8736; and
- 2110 and 2112 Store St.

The civic address of former Lease 94902 is 2140 Store Street, and has the legal lot description, "*...land and land covered by water fronting Lot 222 and 1364...*". The civic address of former Lease 99276 was cited as 2150 Store Street, with no legal lot description, on the former lease agreement.

At the time of completion of the preliminary investigation in April 2000 (Hemmera and Golder, 2001), parts of the South Western Zone were occupied (leased) by the following tenants:

- Island Asphalt Company (Island Asphalt), a division of O.K Industries Ltd. (Portion of P.I.D. 005-439-591); and
- Apex Steel & Gas Ltd. (Apex) (2110 Store St. and portions of P.I.D. 009-837-841 and 009-742-565).

The uplands portion of this zone is covered with a mixture of vegetation, bare ground and packed gravel. The foreshore is covered with rip rap, and the land is approximately 3 m above mean sea level. There is one building in this zone, located at 2110 Store St. (commonly referred to as the Rock Bay Building).

SOUTH EASTERN ZONE

The majority of the South Eastern Zone, including the area to the south of federal Leases 95562 and 107178 (civic addresses 520 and 530 Store Street, respectively), and the upland component of the current federal water Lease W8792199 is currently owned by BC Hydro. The civic addresses of the BC Hydro properties are 502 and 512 Pembroke Street and 2110 Government. The total area of the uplands in the South Eastern Zone is 1.250 hectares, of which 0.239 hectares is owned by Transport Canada and 1.011 hectares is owned by BC Hydro.

The legal lot descriptions for these properties are as follows:

- Former Lease 95562: "...an area comprising 0.161 acres, fronting Lot 1548, Victoria District, B.C...".
- Former Lease 107178: "...land and land covered by water in Rock Bay, Victoria Harbour, fronting Lot 1548, Victoria, B.C..."
- Water lot W8792199: leased by CBR Cement at the time of completion of the preliminary investigation (April 2000) and does not have a civic address.
- BC Hydro properties:
  - P.I.D. 009-396-705, Lot 1548 Victoria City - 502 Pembroke St.;
  - P.I.D. 009-837-841, That part of the bed of the Public Harbour of Victoria shown outlined in Red on Plan 2108R; and
  - P.I.D. 009-742-565, That part of Section3, Victoria District shown outlined in Red on Plan 958R - 2110 Government St.

There are two buildings in the South Eastern Zone - one at 502 Pembroke St. (referred to as the Administration Building) and one at 512 Pembroke St. (the Instrumentation Building). These buildings cover approximately 4% of the land in the South Eastern Zone. At the time of completion of the preliminary investigation in April 2000, the following tenants leased/occupied the upland portion of this zone:

- Garden City Transportation Ltd. (Garden City), now Garden City Transportation and ThirdWave Bus Services (ThirdWave) (502 Pembroke St. and P.I.D. 009-837-841);
- Pacific Coach Lines Ltd. (PCL) (502 Pembroke St., P.I.D. 009-837-841); and
- Apex Steel (Eastern portion of P.I.D. 009-837-841).

The Administration Building, leased to PCL, Garden City and ThirdWave is located in the southwest corner of the South Eastern Zone. The Instrumentation Building is located along the southern boundary of this zone and is vacant. A groundwater treatment plant is located in the central portion of the zone, along the northern boundary.

The southwestern and south-central portions of the South Eastern Zone are paved. The eastern areas and the areas along the northern boundary are generally unpaved and covered in gravel, with a few historic concrete foundations remaining on site.

The water lot W8792199, leased by the Heidelberg Cement Group (formerly CBR Cement) accommodates a dock and filled foreshore for barges/vessels accessing the property to the east, and is zoned Heavy Industrial District under the City of Victoria zoning plan.

NORTHERN ZONE

The Northern Zone, which is entirely owned by Transport Canada, is composed of the upland portion of leases 92473 and 92472 and the northern portion of the water lot lease W8792199, and is located along the northern shore of Rock Bay. The civic address for lease 92473 is 611 Bay Street, and is described as *"...land and land covered by water situated in Victoria Harbour fronting Lot 1, Plan 24311, and on Rock Bay Avenue, Section 4, Victoria District, B.C."*. This lot is zoned M3-S, Special Heavy Industrial District under the City of Victoria Zoning Plan. The total area of the uplands in the Northern Zone is 0.365 hectares, which is entirely owned by Transport Canada.

A search of Transport Canada lease files from 1981 to the present did not reveal any lease information on lease number 92472, a narrow strip comprising mudflats, foreshore and water lot. This vacant lot does not have a civic address or land use zoning under the City of Victoria Zoning Plan. The approximate area of the leasehold is 0.533 hectares consisting of 84% water lot and 16% land. The land is located approximately 1 m to 2 m above mean sea level. The foreshore is covered with rip rap.

The Heidelberg Cement Group operates Ocean Construction Ltd. as a concrete ready mix plant on the leased areas within the Northern Zone and the adjacent properties. Two separate ramps on wood pilings extend from the land of the leaseholds into the water lots. The area of the leaseholds is approximately 0.920 hectares, consisting of 56% water lot and 44% land. The uplands of the leaseholds are covered with vegetation and concrete. The foreshore is composed of sand and gravel in the north, gravel and rocks covered with a thin layer of concrete in the middle portion, and rocks and vegetation in the south. The foreshore is steep with the lease land approximately 3 m above mean sea level.

ROCK BAY

The 'Rock Bay' portion of the subject site is defined here as the bay area, below the high water mark. The total area from the head of the bay to Barclay Point is 2.024 hectares. The centroid of the bay is located at approximately latitude 48° 26' 03" and longitude 123° 22' 15". The average depth of the bay at mean tide is approximately 3 m. All of the floor of Rock Bay is owned by Transport Canada. There is no occupation in the bay, other than transient shipping.

4.2.2 Site History

A review of historic documentation on the Site was presented in the 2001 DSI report (Hemmera Envirochem and Golder, August 2001) and is summarised here.

Shoreline changes

An admiralty chart from 1847 shows a wide bay with the rocks, or islets at the mouth of the bay, that gave Rock Bay its name. The Victoria Gas Co. originally acquired property in the South Eastern Zone in 1860 and filled in a portion of the foreshore. At that time, a creek ran west through the undeveloped foreshore area into the head of Rock Bay, and Government Street stopped at Pembroke Street. In 1883, the City of Victoria obtained permission to use the head of the bay as a dump. Further infilling by a private citizen took place in 1887. Around this time the Victoria Gas Co. also applied to dump ash into the bay. Government Street extended north past Bay Street across the head of Rock Bay via a wooden bridge. A letter from the City of Victoria dated in 1905 indicates that the creek and the easterly indent of Rock Bay

were in-filled in 1888. Drawings and plans accompanying lease applications for foreshore lands suggest that land filling of the foreshore lots abutting the BC Hydro properties within the South Eastern Zone had been completed by approximately 1930. It was indicated that the federal lease areas in this Zone had been filled in with '*federal government dredge*' on a 1946 lease agreement with Victoria Gas Company.

By 1887, the north and south shores of Rock Bay were connected by a bridge running between Constance Street (to the west of Store Street) and Bridge Street. By 1903, the approach to the Rock Bay bridge had been switched to Store Street. An admiralty chart from 1911 and a survey plan of the area from 1924 indicate that the Rock Bay bridge was dismantled sometime between 1911 and 1924. Based on a drawing accompanying an application for the lease of federal lands within the South Western Zone, the area had been completely reclaimed by 1924.

Site activities

In the late 1800s, activities along the shores of Rock Bay included a tannery along the north shore at the mouth of the bay, saw and planning mills at Barclay Point and the head of the bay, and the Victoria Gas Works along the southern shoreline, between Store and Government Streets. By the early 1900s, the tannery on the northern shore was replaced by sawmill operations.

The sawmill on the property west of Store Street along the southern shore of the bay was replaced by a propane tank farm by 1949. The coal gasification plant on the property east of Store Street closed in 1952 and the facility was converted to a storage and distribution centre for propane gas. The sawmill on the eastern and northern shores of Rock Bay ceased operation in the early 1960s. This property was then used for aggregate storage and construction supply sales. From 1973 to the present, a concrete ready mix plant has been operating on the properties on the northern and eastern shores of Rock.

The propane tanks to the north of the South Western Zone were removed by 1992. The South Western Zone remained unoccupied until Island Asphalt leased the BC Hydro properties in 1998. Since that time, aggregate bins have been constructed on the western portion of the properties and directly north of the Rock Bay Building. The remainder of this zone is unoccupied.

By 1992, the only buildings remaining on the South Eastern Zone were the Administration Building and the Instrumentation Building. A Groundwater Treatment Plant was constructed along the northern portion of the South Eastern Zone in 1992. A Special Waste Storage Facility was constructed along the southern portion of the South Eastern Zone in 1993 and was subsequently removed in 2001.

CURRENT SITE STATUS

The Site is currently used by a number of light industrial and commercial operations. In the South Western Zone, the Site is largely barren, with scattered small areas of vegetation. The Transport Canada portion of this zone was separated from the BC Hydro portion of the site by fencing in 2000. A large concrete foundation, which formerly supported the propane storage tanks, is located in the middle of this zone. BC Hydro currently lease the southern portion of the zone to Island Asphalt.

In the South Eastern Zone, BC Hydro lease an area for a school bus parking lot. The Transport Canada property in this zone is vacant. This is also the location of the existing groundwater treatment plant, pumping wells and was the location of the former Special Waste storage facility. This former Special Waste storage facility, which contained approximately 2941 m^3 of PCB contaminated soil, has now been decommissioned, and this contaminated soil has been removed and disposed of off-site. The site is fenced to the east along Government Street, to the south along Pembroke Street, to the north along the boundary between the Ocean Cement facilities and the school bus parking area and to the west along the boundary with the South-Western zone. Numerous old foundations are present in this zone, some with metal supports protruding from the ground.

For all zones, there are likely numerous old pipelines present in the ground. In addition, one of the former coal gasification plant buildings (retort house constructed in approximately 1922) was built on as many as 184 piles which were capped by a 76 cm thick cap of concrete. These are likely still in place. The location of all services will be confirmed as far as possible prior to initiating the remediation. The shoreline for all zones is largely composed of rip rap and debris, with old piles in place at the eastern end.

There are currently two piers located at the eastern end of the bay. The only regular boat traffic within the bay is operated by Ocean Construction who transport material by barge to the dock situated at the eastern end of the bay. The City of Victoria stormwater outfalls 623C (300 mm diameter), 626 (900 mm), 627 (1800 mm) and 629 (500 mm) discharge into Rock Bay.

5.0 ENVIRONMENTAL EFFECTS & MITIGATION

5.1 DISCUSSION OF EFFECTS AND PROPOSED MITIGATION

5.1.1 Construction

Environmental Component: Air Quality

Description of Effects:

- During the development of the site in preparation for the remedial works, various activities have the potential to impact air quality. Both the installation of the sheet pile and coffer dam may create higher concentrations of particulate in the area.
- Vehicles and construction machinery contribute to green house gas emissions.

Description of mitigation:

- Transport Canada and BC Hydro must develop an Air Quality Management Plan prior to project implementation. It is highly recommended that the proponents consult with Environment Canada and other applicable levels of government to ensure this management plan will aid in meeting current applicable criteria.
- Establish a complaint monitoring, reporting and response program
- Use properly constructed road bases on unpaved construction haul routes
- Use water or other dust suppression on haul routes and other travel surfaces as needed to suppress visible dust emissions
- Control speed limits on haul routes and minimize vehicle idling
- Continue Air Quality monitoring and have in place an action plan for if and when air quality decrease beyond base line limits

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Noise

Description of Effect:

- Due to construction activities there is a potential for noise impacts on the public and adjacent businesses associated with the installation of the coffer dam and sheet pile.

Description of Mitigation:

- Limit work hours during which pile driving is occurring
- Minimize work on site during holidays or special events in area. Work within the City of Victoria's Noise Bylaws
- Maintenance of heavy equipment to ensure mufflers and other noise reduction devices are in good condition

- Installation of temporary noise barriers around pumps, compressors and other stationary sources of loud noises if applicable
- Establish a complaint monitoring, reporting and response program

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Surface Water, Ground Water and Soils and Sediments

Description of Effects:

- Works related to the installation of the coffer dam and sheet pile have the potential to cause siltation in either the surface water or ground water as well as has the potential to spread contaminants to non contaminated soils/sediments.

Description of Mitigation

- Transport Canada and BC Hydro must develop a Soils/Sediments Quality Management Plan prior to project implementation. It is highly recommended that the proponents consult with Environment Canada and other applicable levels of government to ensure this management plan will aid in meeting current applicable criteria.
- Transport Canada and BC Hydro must develop a Water Management Plan prior to project implementation. It is highly recommended that the proponents consult with Environment Canada and other applicable levels of government to ensure this management plan will aid in meeting current applicable criteria.
- All machinery used on-site should be in good working condition and no fuels, lubricants or construction wastes should enter marine waters. As a precaution, the contractor must have spill containment kits containing sufficient quantities of absorbent materials on-site in close proximity to working machinery.
- Install silt fences or curtains, if needed
- Install booms and absorbent pads if needed
- During the installation of the coffer dam and the dewatering of the Bay behind the coffer dam, monitoring of the dewatering process should occur. Contaminated water should be treated through treatment plant.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Fisheries and Fish Habitat

Description of Effect:

- Coffer dams will be installed in two locations (Southeastern and Southwestern sections) of Rock Bay. The installation of the coffer dams will temporarily reduce available fish habitat for a period of up to six months.
- Fish may become stranded during the dewatering process behind the coffer dam.
- The installation of the cofferdam may produce siltation and pressure waves causing destruction to fish.

Description of Mitigation:

- All works relating to the installation of the coffer dams must comply with conditions as found in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*
- Fish that become stranded should be captured and released where possible
- Construction Activities will not occur during the fisheries sensitive period.

Likelihood of Residual Effects:

There will be a temporary loss of fish habitat with the installation of the coffer dams.

Significance of Residual Effects:

Fisheries and Oceans Canada has set several conditions in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish* that relate to the replacement/restoration of damaged fish and fish habitat. The proponent is responsible for ensuring that these conditions are implemented and monitored as required by the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*

If the conditions and monitoring are carried out successfully, it is expected that there will be an overall increase in available fish habitat, with little or no residual effects.

5.1.2 Operation and Maintenance

Environmental Component: Air Quality

Description of Effects:

- The excavation of sediments and soils as well as their temporary storage may impact air quality levels at the construction site as well as to the public and businesses downwind.
- Vehicles and construction machinery contribute to green house gas emissions.
- Due to the contaminant levels associated with the material being removed, there is a potential for increased contaminated particulate and odour on the construction site as well as to the adjacent businesses and public/tourists.

Description of mitigation:

- Use water or other dust suppression on haul routes and other travel surfaces as needed to suppress visible dust emissions
- Control speed limits on haul routes and minimize vehicle idling
- Continue Air Quality monitoring and have in place an action plan for if and when air quality decrease beyond base line limits
- Cover or otherwise stabilize any stockpiles of soils/sediments or other bulk materials
- Minimize the number of excavations being worked on at once
- Limit works hours and time of year during which excavation takes place to reduce impact during peak tourism period and during special events or unfavourable wind conditions
- If and when required, based on odour monitoring, used odour suppressant foams

- Monitor emissions as part of the worker health and safety plan. When required, workers should use respirators.

Likelihood of Residual Effects:
If mitigations are implemented, no residual impacts are expected

Environmental Component: Noise
Description of Effect:

- During the excavation, the construction site will likely increase noise levels for the adjacent businesses and public
- This project is expected to have 2, 697 truck loads associated with back filling the site and other material delivery trucks visiting the site, increasing vehicular noise to the area

Description of Mitigation:

- Minimize work on site during holidays or special events in area. Work within the City of Victoria's Noise Bylaws
- Limit the number of trucks that can line up on street outside site gate
- Maintenance of heavy equipment to ensure mufflers and other noise reduction devices are in good condition
- Installation of temporary noise barriers around pumps, compressors and other stationary sources of loud noises if applicable
- Continue a complaint monitoring, reporting and response program

Likelihood of Residual Effects:
If mitigations are implemented, no residual impacts are expected

Environmental Component: Surface Water/ Groundwater
Description of Effects:

- Removals of sediments have the potential to cause turbidity to areas beyond the coffer dam if the coffer dam is not properly sealed.
- Stockpiles located on the temporary upland storage site have the potential to cause runoff during bad weather events, potentially effecting the surrounding marine environment.
- Leaks from the cleaning station could possibly provide a contaminant source to both surface and groundwater
- Leaks from the dewatering process could provide a new contaminant source to both soils/sediments, surface and groundwater.

Description of Mitigation:

- Monitor suspended sediments outside of the coffer dams in Rock Bay to ensure coffer dam does not leak. If a significant leak is detected, all works must be stopped until the situation is corrected.
- All machinery used on-site should be in good working condition and no fuels, lubricants or construction wastes should enter marine waters. As a precaution, the contractor must have spill

containment kits containing sufficient quantities of absorbent materials on-site in close proximity to working machinery.

- Cover or otherwise stabilize any stockpiles of soils/sediments or other bulk materials
- The decontamination pad for all vehicles leaving the site must be checked daily and maintained to ensure that it is a closed system and that all "grey water" is discharged into the sanitary sewer, with proper permitting.
- All contaminated liquid that is a product of the dewatering process must be fully contained and treated. The resulting water should be disposed of to the sanitary sewer system, with proper permitting from the Capital Regional District.

Likelihood of Residual Effects:
If mitigations are implemented, no residual impacts are expected

Environmental Component: Sediments and Soils
Description of Effects:

- The improper handling of contaminated sediments/soils during their removal, temporary storage and disposal could lead to further contamination of clean sediments/soils/groundwater/fish habitat.
- Fill that does not meet current applicable standards may provide a new source of contamination and further deteriorate the marine environment as well as groundwater.
- Improperly stored soils/sediments can lead to sedimentation in local catchbasins if not properly covered/contained during rain/wind events
- Due to high vehicular traffic on and off the site, there is increased opportunity for contaminated sediments/soils to leave the site via tires. This can lead to off site contamination and sedimentation of catchbasins.
- Disposal of sediments/soils via barge during bad weather could lead to a loss of load.

Description of Mitigation:

- All works relating to the excavation of sediments must comply with conditions as found in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*
- All works relating to the backfill of clean sediments must comply with conditions as found in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*
- The coffer dam must be monitored to ensure that there are no leaks. Monitoring should be completed as deemed necessary by a supervising environmental monitor on the outside walls of the coffer dam for suspended sediments.
- The decontamination pad for all vehicles leaving the site must be checked daily and maintained to ensure that it is a closed system and that all vehicles are inspected prior to leaving the site.
- Catchbasins on and off the site which have the potential to be impacted by sedimentation via site activities or vehicular traffic leaving the site should be protected, inspected and maintained as deemed necessary to ensure sediments/silts are not entering into the system.
- Transport Canada will ensure that all sediments/soils which are used as back-filling material on federal property, as part of this project does not contain contaminant levels which exceed BC

CSR Commercial Land Use Standards (BC MELP, 1997), or levels that could impact groundwater.

- Excavation sites open at one time should be minimized to allow maximum control over potential sedimentation/situation from open pits.
- All excavated soils will be properly stockpiled on/in an impervious material and covered until it can be tested, and proper treatment or disposal can be undertaken. These soils will be contained in a way which minimizes the chance for contaminants to spread to other areas on-site or to adjacent properties via the air (dust), or water (run-off).
- Excavation of Soils sediments should not exceed the storage capacity of the upland site.
- The proponent is responsible for ensuring that appropriate manifests are obtained (Manifest Special Waste Soils as per the Transportation of Dangerous Goods Regulation).
- All soils/sediments that are removed must be disposed of at an approved facility (in accordance with all applicable laws of the jurisdiction at which the waste is to be destroyed or disposed of). Some form of documentation (e.g. certificate, letter, etc.) must be obtained from the approved facility/landfill upon disposal. A copy of the documentation must be sent to Transport Canada. This mitigation is applicable to all debris, including hazardous or special wastes. If debris needs to be taken to various approved facilities, documentation must be received from each facility upon disposal. The documentation must include the name of the facility, location of facility, evidence of it being an approved facility, the date the debris was disposed of and a general description of the debris disposed.
- A traffic plan for barge and vehicular traffic should be established. It should outline the appropriate traffic movements and patterns for the movement of sediments/soils, as well as provide an operational plan that provides guidance for "bad weather situations". Weather should be monitored prior to barge movements across the Georgia Strait and should be documented for each trip.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected to soils and sediments. The removal of sediments will have and impact on fish habitat and is discussed below.

Environmental Component: Fish and Fish Habitat

Description of Effects:

Improper remediation/storage and disposal of soils/sediments could lead to further degradation of fish habitat.

Description of mitigation:

- All works relating to this project must comply with conditions as found in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*

Likelihood of Residual Effects:

The temporary loss of habitat due to the coffer dam will lead to a loss of fish habitat

Significance of Residual Effects:

Fisheries and Oceans Canada has set several conditions in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish* that relate to the replacement/restoration of damaged fish and fish habitat. The proponent is responsible for ensuring that these conditions are implemented and monitored as required by the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*

If the conditions and monitoring are carried out successfully, it is expected that there will be an overall increase in available fish habitat, with little or no residual effects.

Environmental Component: **Human Health and Safety**

Description of Effect:

Improper handling and storage of hazardous materials, including contaminated soils, sediments and water could lead to serious health effects.

Description of Mitigation:

- In order to protect the health of personnel working on-site, and the general public, the Contractor must ensure the implementation of an appropriate Health and Safety Plan prior to the excavation, handling, treatment or movement of any contaminated soils. All employees of the Contractor must be suitably trained and experienced and fully comply with all federal and provincial health and safety standards.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Heritage/Archaeology

Description of Effect:

The area near the remediation site might have been the setting for a historic battleground for local First Nations. The removal of soils/sediments may cause irreparable damage to buried artefacts.

Description of Mitigation:

Although it is unlikely that any archaeological artefacts will be found due to the fact that the area has been covered in fill since pre-contact times, it is appropriate to be aware that the potential might exist. Transport Canada is responsible for ensuring that if any potential artefacts or sites are uncovered during this project, work will be halted immediately within the vicinity of the excavation, and an archaeologist will be brought on-site to determine the appropriate course of action.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

5.1.3 Decommissioning and Abandonment

Environmental Component: Air Quality

Description of Effects:

- During the decommissioning of the site (e.g. removal of coffer dam, sheet pile and returning the site back to original conditions) it is expected that there will still be a high volume of machinery and vehicular traffic contributing to air borne particulate.
- Vehicles and construction machinery contribute to green house gas emissions.

Description of mitigation:

- Use water or other dust suppression on haul routes and other travel surfaces as needed to suppress visible dust emissions
- Control speed limits on haul routes and minimize vehicle idling
- Continue Air Quality monitoring and have in place an action plan for if and when air quality decrease beyond base line limits

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Noise

Description of Effect:

- Due to machinery and the need for maintenance vehicles on site during the decommissioning of the project, the construction site will likely still be a source of increased noise levels for the adjacent businesses and public

Description of Mitigation:

- Minimize work on site during holidays or special events in area. Work within the City of Victoria's Noise Bylaws
- Limit the number of trucks that can line up on street outside site gate
- Maintenance of heavy equipment to ensure mufflers and other noise reduction devices are in good condition
- Installation of temporary noise barriers around pumps, compressors and other stationary sources of loud noises if applicable
- Continue complaint monitoring, reporting and response program

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Surface and Ground Water, Soils and Sediments

Description of Environmental Effects:

- The removal of the coffer dam may cause temporary turbidity in Rock Bay as water is permitted back into is natural space.
- Improper backfilling/compaction of the upland site could lead to siltation of local catch basins.

- Improper removal of the dewatering/water treatment system and the decontaminant station could lead to contaminated water becoming a contaminant

Description of Mitigation:

- All works relating to the removal of the coffer dam must comply with conditions as found in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*
- The upland remediated site must have at least 15 cm of clean gravel at surface of the remaining backfill.
- If, at anytime during the decommissioning of the site, an area of the upland poses a risk to siltation, appropriate measures must be taken to ensure that a) the situation is corrected and b) appropriate methods to protect waterways from siltation are employed.
- Prior to the removal of the dewatering/water treatment station and the decontamination station, both systems must be flushed out to ensure the removal of any residual contaminants. Again flushing should go into the sanitary sewer system with the appropriate permits from the Capital Regional District.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Fish and Fish Habitat

Description of Effects:

- The proponent is required by Fisheries and Oceans Canada to carry out fish habitat compensation as a condition of being allowed to carry out this remediation project. Improper restoration techniques could further lead to degradation of fish habitat and put the proponent in violation with the Fisheries Act.

Description of Mitigation:

- All works relating to fish habitat compensation must comply with conditions as found in the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*
- The proponent is responsible for ensuring that an appropriate monitoring program, as outlined and required by the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish* is completed in a competent manner and that all follow up documentation is submitted as required by the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish.*

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

5.2 ACCIDENTS AND MALFUNCTIONS

Environmental Component: Soils/Sediments, Surface and Ground Water

Description of Effect:

Due to the large number of machinery present on site, there is an increased risk of a fuel spill to the immediate working area around leaking, faulty machinery.

Due to the volume of sediments/soils being removed, stored and disposed of there is an increased risk of contaminated sediments/soils being spilled due to accidents or malfunction of equipment.

Description of Mitigation:

The proponent must have an overall emergency spill response plan that should be made available to all contractors during all phase of the remediation project.

- All machinery used on-site should be in good working condition and no fuels, lubricants or construction wastes should enter marine waters. As a precaution, the contractor must have spill containment kits containing sufficient quantities of absorbent materials on-site in close proximity to working machinery.
- A fuelling station should be established away from water sources and entry ways (e.g. storm catch basins) and be designated and labelled as such for the duration of the remediation project.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

5.3 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

Environmental Component: Air Quality

Description of Effect:

- High temperatures may increase of the apparent odour of the site and the volatility of the air borne particulate causing a potential health hazard to workers on site.

Description of Mitigation:

- If and when required, based on odour monitoring, used odour suppressant foams
- Monitor emissions as part of the worker health and safety plan. When required, workers should use respirators.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

Environmental Component: Surface Water

Description of Effects:

- Extreme rain events may impact both the remedial activities and the storage of sediments and soils. Uncontrolled storm runoff can cause sedimentation and siltation to localised waterways.

Description of Mitigation:

- In the event of extreme weather events, the propend must have a surface water management plan that can be implemented as required.
- Weather may cause a delay in the timing of the project. If this occurs, timing windows as described by DFO may become difficult to meet. In the case of an inability to meet DFO timing window, DFO must be contacted regarding permission to continue work, and appropriate mitigations for working within a time considered higher risk for fisheries impacts.

Likelihood of Residual Effects:

If mitigations are implemented, no residual impacts are expected

5.4 OTHER PROJECTS RELEVANT TO THE CUMULATIVE EFFECTS ASSESSMENT

Identify and describe other past, existing or future projects or activities (certain and reasonably foreseeable) that affect or may affect the same environmental components as this project. If no other projects are identified, specify "Not Applicable" in the table below.

Table 6. Identification of Other Projects

Category	Projects or Activities	Description
Past or Existing Projects or Activities	1. City of Victoria Stormwater outfalls	• Two large stormwater outfalls, draining approx. 30% of City of Victoria, have historically and will continue to drain into Rock Bay.
Certain Projects or Activities	2. N/A	•
Reasonably Foreseeable Projects or Activities	3. N/A	•

5.5 CUMULATIVE EFFECTS

Environmental Component: Fish and Fish Habitat

Description of Effect:

- The Rock Bay area has been used by several industries in the past, including a coal gasification plant, a tannery, and sawmills. Rock Bay has also been subject to the impacts of significant infilling since the 1860's and also the discharge of stormwater for approximately one third of the City of Victoria. Although the proponent's are cleaning up sediments and providing fish habitat compensation for the loss of habitat occurred during the remediation project, the City of Victoria storm water outfalls will continue to impact fish and fish habitat in Rock Bay

Description of Mitigation:

- The City of Victoria has a stormwater management plan in place to upgrade stormwaters and to implement best management practices. The City also is implementing a monitoring program, with increasingly stringent targets.

Likelihood of Residual Effects:

Stormwater outfalls have been, and will continue to be, the most significant impact on fish habitat and sediment quality in Rock Bay. If the City of Victoria strives to meet their Storm water quality targets the overall impact to fish and fish habitat will eventually decrease over time.

Significance of Residual Effect:

There will not be an increased cumulative impact of this remediation project and the continued release of storm water on fish and fish habitat in Rock Bay. This remediation project is removing a contaminant source and increasing availability of fish habitat.

5.6 ANY OTHER MATTER

None

5.7 ENVIRONMENTAL EFFECTS SUMMARY CHECKLIST

Table 7 Environmental Effects Checklist

Environmental Component	Potential Project Effects						Residual Effects	
	Potential Adverse Effect?			Can Be It Be Mitigated?			Is it Significant?	
	Yes	*No*	*Uncertain*	*Yes*	*No*	*Uncertain*	*Yes*	*No*
Topography		X						
Species/Habitat of Special Status		X						
Vegetation		X						
Wildlife / Habitat		X						
Fish and Fish Habitat	X			X				X
Marine Resources	X			X				X
Soils	X			X				X
Drinking Water		X						
Groundwater	X			X				X
Surface Water / Hydrology	X			X				X
Wetlands		X						
Sediments	X			X				X
Climate and Air Quality	X			X				X
Noise	X			X				X
Vibration	X			X				X
Transportation and Navigation		X						
Land Use		X						
Human Health[1]	X			X				X
Socio-economic Conditions[1]		X						
Physical/Cultural Heritage[1]	X			X				X
Aboriginal Use of Traditional Lands/Resources[1]		X						
Structures/Sites of Significance[1]		X						
Other		X						
Other Factors								
Accidents and Malfunctions	X			X				X
Effects of Environment on the Project	X			X				X
Cumulative Effects								
Fish and Fish Habitat	X			X				X
Other								
Other								

1. *The indirect effects on these Environmental Components resulting from a project impact on the environment must be considered. Direct effects on these Environmental Components may also be considered at the discretion of the RA.*

6.0 CONSULTATION

6.1 PUBLIC PARTICIPATION UNDER SUBSECTION 18(3)

Is the public participation deemed necessary under Subsection 18(3): Yes [ ] No [X]

Scope of factors posted on the CEAR: Yes [ ] Not applicable [X]

Notice of public input posted on the CEAR: Yes [ ] Not applicable [X]

6.2 CONSULTATION WITH THE PUBLIC

Transport Canada and BC Hydro have developed a Communication Plan for the Rock Bay Project. This communication plan includes: identification of audience (including stakeholders), components (presentations, letters, open houses, news releases, signage, etc), and schedule. The preliminary aspects of the plan have been implemented, including presentations to the City of Victoria. Public Presentations, information sessions, awareness and promotion will be ongoing throughout all phase of the project. Concerns raised through public consultation will be identified and taken into consideration.

6.3 Consultation with Aboriginal Peoples

Transport Canada has consulted with Aboriginal Peoples with respect to the proposed remedial project at Rock Bay. This consultation has taken the following form:

Group contacted:	Esquimalt First Nation
Individual contacted:	Chief and council, band members
Dates:	1999 – 2004, various meetings
Location:	Victoria, Esquimalt
Issues raised:	Presentations and discussions; no issues raised.
Method addressed:	Not required.

Group contacted:	Songhees First Nation
Individual contacted:	Chief and council, band members
Dates:	1999 – 2004, various meetings
Location:	Victoria, Esquimalt
Issues raised:	Presentations and discussions; no issues raised.
Method addressed:	Not required.

6.4 Consultation with Other Federal Departments and Agencies

Transport Canada has consulted with other Federal Departments with respect to the proposed remedial project at Rock Bay. This consultation has taken the following form:

Group contacted:	Environment Canada
Individual contacted:	Richard Glue, Athana Mentzelopoulos
Dates:	1995 – 2004, various meetings
Location:	Victoria, Vancouver
Issues raised:	Potential impacts to aquatic life and migratory birds
Method addressed:	Numerous presentations made to senior Environment Canada staff, the most recent of which was on 2004/09/24. Environment Canada's concerns were addressed by modifying the remedial approach, as described in the revised *Recommended Remedial Strategy* (Golder, 2003). Environment Canada reviewed the *RRS* and agreed with the remedial approach. Environment Canada also reviewed the project during the Federal Contaminated Sites Accelerated Action Plan submission.

Group contacted:	Fisheries and Oceans Canada
Individual contacted:	March Klaver, Rob Russell
Dates:	1995 – 2004, various meetings
Location:	Victoria, Vancouver, Port Alberni
Issues raised:	Potential impacts to aquatic life
Method addressed:	Fisheries and Oceans Canada's concerns were addressed by modifying the remedial approach, as described in the revised *Recommended Remedial Strategy* (Golder, 2003). Further, Fisheries and Oceans Canada made comment on the mitigative and compensatory measures when Transport Canada applied for an *Authorization for Works or Undertakings Affecting Fish habitat and Destruction of Fish*, which has subsequently been approved.

Group contacted:	Health Canada
Individual contacted:	Sanya Petrovich
Dates:	Nov. 2003
Location:	Vancouver
Issues raised:	Worker health
Method addressed:	Health Canada reviewed the project during the Federal Contaminated Sites Accelerated Action Plan submission.

6.5 Consultation with Other Jurisdictions

Letters of support from other jurisdictions can be found in Appendix D.

Group contacted:	B.C. Provincial Ministry of Water, Land and Air Protection
Individual contacted:	Doug Walton, Dave Brown, Allan McCammon
Dates:	1995 – 2004, various meetings
Location:	Victoria, Vancouver
Issues raised:	Remedial approach.
Method addressed:	The Ministry of Water, Land and Air Protection's concerns were addressed by modifying the remedial approach, as described in the revised *Recommended Remedial Strategy* (Golder, 2003). The Ministry of Water, Land and Air Protection reviewed the *RRS* and agreed with the remedial approach.

Group contacted:	City of Victoria, City Staff
Individual contacted:	Ken Silvester, Bruce Kerr, Dennis Carlsen
Dates:	1998 – 2004, various meetings
Location:	Victoria
Issues raised:	Stormwater outfalls, impacts on City infrastructure (roads), impacts on neighbouring businesses (vibrations), impacts on general public.
Method addressed:	Some of the City staff's concerns were addressed by modifying the remedial approach, as described in the revised *Recommended Remedial Strategy* (Golder, 2003), which the City has reviewed and approved. Other concerns were addressed in the document *Construction Considerations for Recommended Remedial Strategy* (Hemmera, 2003). All remaining concerns were addresed by contacting Ocean Cement and Island Asphalt directly.

Group contacted:	Ocean Cement (immediate neighbour)
Individual contacted:	Pat Heale, Dave Buchanan
Dates:	1995 – 2004, various meetings
Location:	Vancouver
Issues raised:	Coordination of remedial project with Ocean Cement's activities.
Method addressed:	Provided a schedule of construction in meeting of 2004/03/04.

Group contacted:	Island Asphalt (immediate neighbour)
Individual contacted:	Allen Towne, Cory Singha
Dates:	1999 – 2004, various meetings
Location:	Victoria
Issues raised:	Coordination of remedial project with Island Asphalt's activities.
Method addressed:	Provided a schedule of construction in meeting of 2004/02/23.

Group contacted:	City of Victoria, City Council
Individual contacted:	Mayor and council for City of Victoria

Dates:	2003/11/20
Location:	Victoria
Issues raised:	Presentations followed by questions. Main questions were (i) when work would be completed and (ii) what would be end use of site.
Method addressed:	No issues to be addressed. Answers were (i) project is anticipated to commence in summer of 2004 and last for 2 to 3 years, and (ii) after remediation, the property would be subject to the divestiture process (ie unknown end use).

Group contacted:	City of Victoria Environment and Shoreline and Advisory Committee
Individual contacted:	Advisory committee (including City staff and councillors), public
Dates:	2004/01/21
Location:	Victoria
Issues raised:	None
Method addressed:	Not applicable. Committee carried a motion to encourage the City of Victoria to support the remediation at Rock Bay.

Group contacted:	Greater Victoria Harbour Authority
Individual contacted:	Open to public
Dates:	2003/12/10
Location:	Victoria
Issues raised:	Presentations followed by questions. Main questions were (i) when work would be completed and (ii) what would be end use of site.
Method addressed:	No issues to be addressed. Answers were (i) project is anticipated to commence in summer of 2004 and last for 2 to 3 years, and (ii) after remediation, the property would be subject to the divestiture process (ie unknown end use).

Group contacted:	Victoria and Esquimalt Harbours Environmental Action Program
Individual contacted:	Federal and local governments
Dates:	1998 – 2004, various meetings
Location:	Victoria
Issues raised:	Presentations followed by questions
Method addressed:	Questions responded to in periodic updates.

The project was assessed in collaboration with another jurisdiction through a bilateral agreement:
Yes [ ] No [X] Regime:

7.0 REFERENCES

Archipelago Marine Research Ltd.. *Marine Biophysical Inventory of Rock Bay, Upper harbour*. October 1998.

Archipelago Marine Research Ltd. *Draft Subtidal Survey of Physical and Biological Features of Victoria Harbour*. January 2000

Envirochem Special Projects Inc. *Preliminary Sediment Quality Investigation, Rock Bay, Victoria, BC*. December 1996.

EVS Environmental Consutants. *Rock Bay Site: Marine Sediment Quality Triad – Assessment Report*. March 1999.

Hemmera Envirochem Inc. and Golder Associates Ltd. *Rock Bay, Victoria Harbour, Detailed Site Investigation*. October 2001.

Golder Associates Ltd., *Revised Recommended Remedial Strategy for the Rock Bay Site, Victoria, BC*, July 22, 2003.

Hemmera Envirochem Inc, *Permit Application to Alter or Disturb Fish Habitat, Rock Bay, Victoria, BC*, October 2003.

Hemmera Envirochem Inc, *Construction Considerations for Recommended Remedial Strategy, Rock Bay, Victoria, BC*, October 2003.

Westland Resource Group. *Victoria and Esquimalt Harbours Ecological Inventory and Rating*. January 2000.

8.0 *CEAA* DETERMINATION

On the basis on this screening, the Department has determined, in accordance with subsection 20(1) of the Act, that the impact of this project on the environment is as follows:

[X] The project is not likely to cause significant adverse environmental effects: the project can proceed with application of the mitigation measures specified in this report.

[ ] The project is likely to cause significant adverse environmental effects that cannot be justified. The project does not proceed.

[ ] Refer the project to the Minister of the Environment for referral to a mediator or a review panel because:

- [ ] of uncertainty as to whether the project is likely to cause significant adverse environmental effects;
- [ ] the project is likely to cause significant adverse environmental effects; and
- [ ] of public concern.

9.0 FOLLOW-UP PROGRAM & MONITORING

Is a follow-up program considered appropriate for this project? Yes [ ] No [X]

This project will not being using new or unusual methods during any phase of this remediation project. Follow-up has not been considered necessary.

Follow-up program posted on the CEAR	Yes [ ]		Not applicable [X]
Other FA will participate in the follow-up program:	Yes [ ]	No [ ]	Not applicable [X]

Monitoring to be implemented for this project	Yes [X]	No [ ]
Other FA will assist in mitigation measures	Yes [X]	No [ ]

Fisheries and Oceans Canada will be responsible for ensuring that the proponents conduct an appropriate monitoring program, as outlined and required by the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish*. It is the proponent's responsibility to ensure monitoring is completed in a competent manner and that all follow up documentation is submitted as required by the *Authorization for Works or Undertakings Affecting Fish Habitat and Destruction of Fish*.

10.0 SIGN-OFF

Screening report or how to obtain a copy posted on the CEAR: [X]
Decision posted on the CEAR: [X]

Obtain all relevant sign-offs for the screening report.

Environmental Screening Report prepared by:

04.04.23

Karen Hall
Environmental Officer
Transport Canada

Date

The above has completed the CEAA Screening Report to the best of her/his ability or knowledge.

Environmental Screening Report approved by:

04.04.23

Robert Sisler
Regional Manager, Environmental Services
Transport Canada

Date

And;

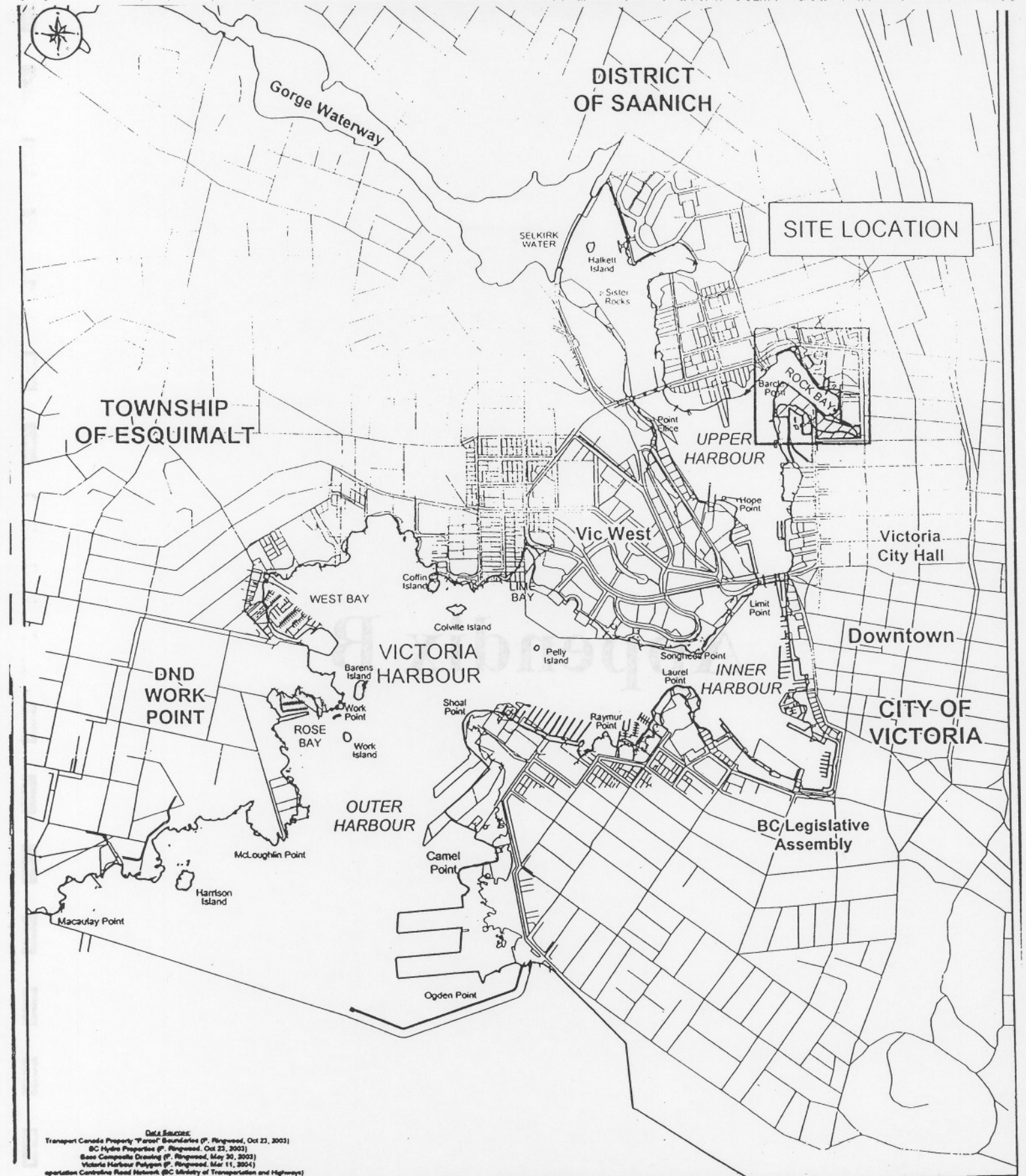
April 23/2004

Rob Russell
A/Senior Habitat Management Biolgist
South Coast Area
Fisheries and Oceans Canada

Date

The above has reviewed this environmental screening report and agrees that it meets the requirements of the CEAA.

Appendix A



Data Sources:
Transport Canada Property "Parcel" Boundaries (P. Ringwood, Oct 23, 2003)
BC Hydro Properties (P. Ringwood, Oct 23, 2003)
Base Composite Drawing (P. Ringwood, May 30, 2003)
Victoria Harbour Polygon (P. Ringwood, Mar 11, 2004)
Transportation Centreline Road Network (BC Ministry of Transportation and Highways)

Legend

- Transport Canada Properties
- BC Hydro Properties

Rock Bay Site Location Map

April 2004

0 120 240 480 720 960 Meters

1:18,500

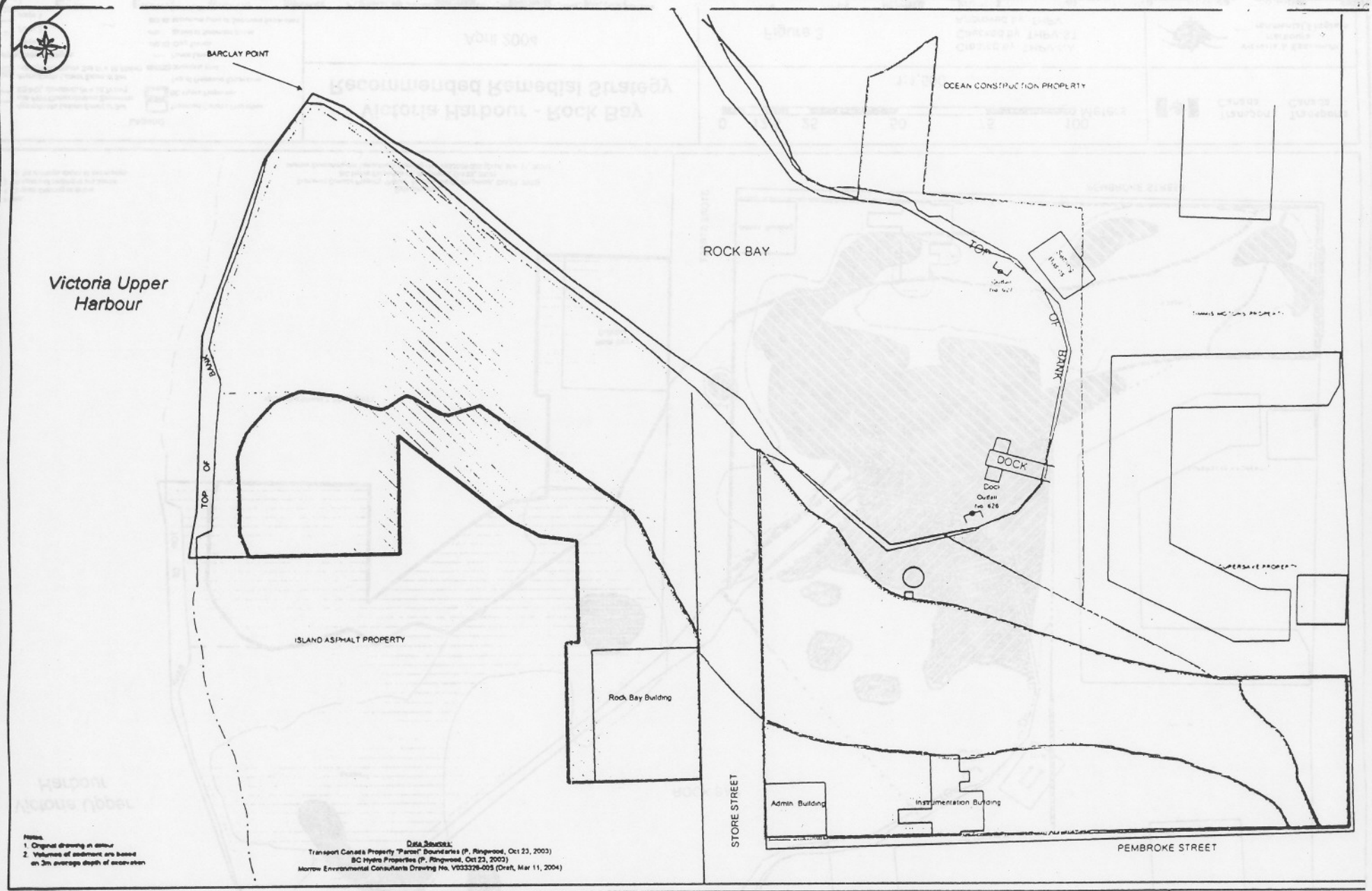
Figure 1

Created by: THPV-NA
Checked by: THPV-ST
Approved by: THPV

Transport Canada / Transports Canada

Appendix B

May 2004 Rock Bay PAD



Legend

- Transport Canada Properties
- BC Hydro Properties
- Exisiing Shoreline
- Fence Line

Contamination Zones

- Northern Zone
- SouthEastern Zone
- SouthWestern Zone

Victoria Harbour - Rock Bay Contamination Zones

April 2004

P:\...\ArcMap Map Documents\Rock Bay\CEAA_Screening\040420_RBay_PAD_CEAA_Zones.mxd

0 12.5 25 50 75 100 Meters

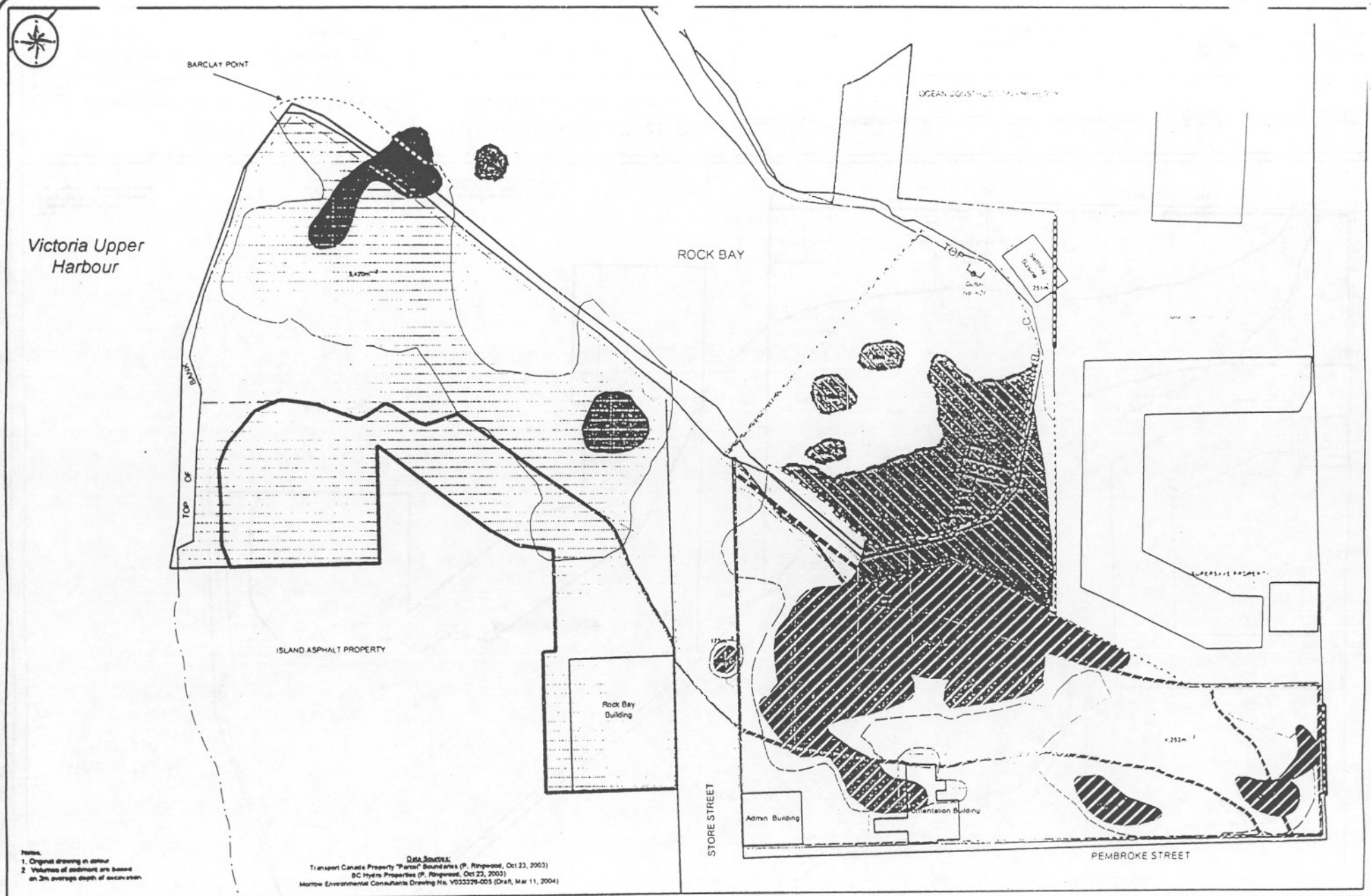
1:1,500

Figure 2

Created by: THPV-NA
Checked by: THPV-ST
Approved by: THPV

Transport Canada Transport Canada

Victoria & Esquimalt Harbours Environmental Progra



Legend

- Approximate Lateral Extent of Soil with PAH Concentrations Exceeding CSR/CL standards (V = 38,741m³)
- Approximate Lateral Extent of Soil with Special Waste Soil (V = 10,888m³)
- Remediation Stages
  - Stage 1
  - Stage 2
  - Stage 3
- Transport Canada Properties
- BC Hydro Properties
- Top of Proposed Excavation
- Sheetpile Wall
- Fence Line
- Clay Trench
- Extent of Sediment Areas
- Maximum Limit of Sediment Excavation
- Existing Shoreline

Victoria Harbour - Rock Bay Recommended Remedial Strategy

0 12.5 25 50 75 100 Meters

1:1,500

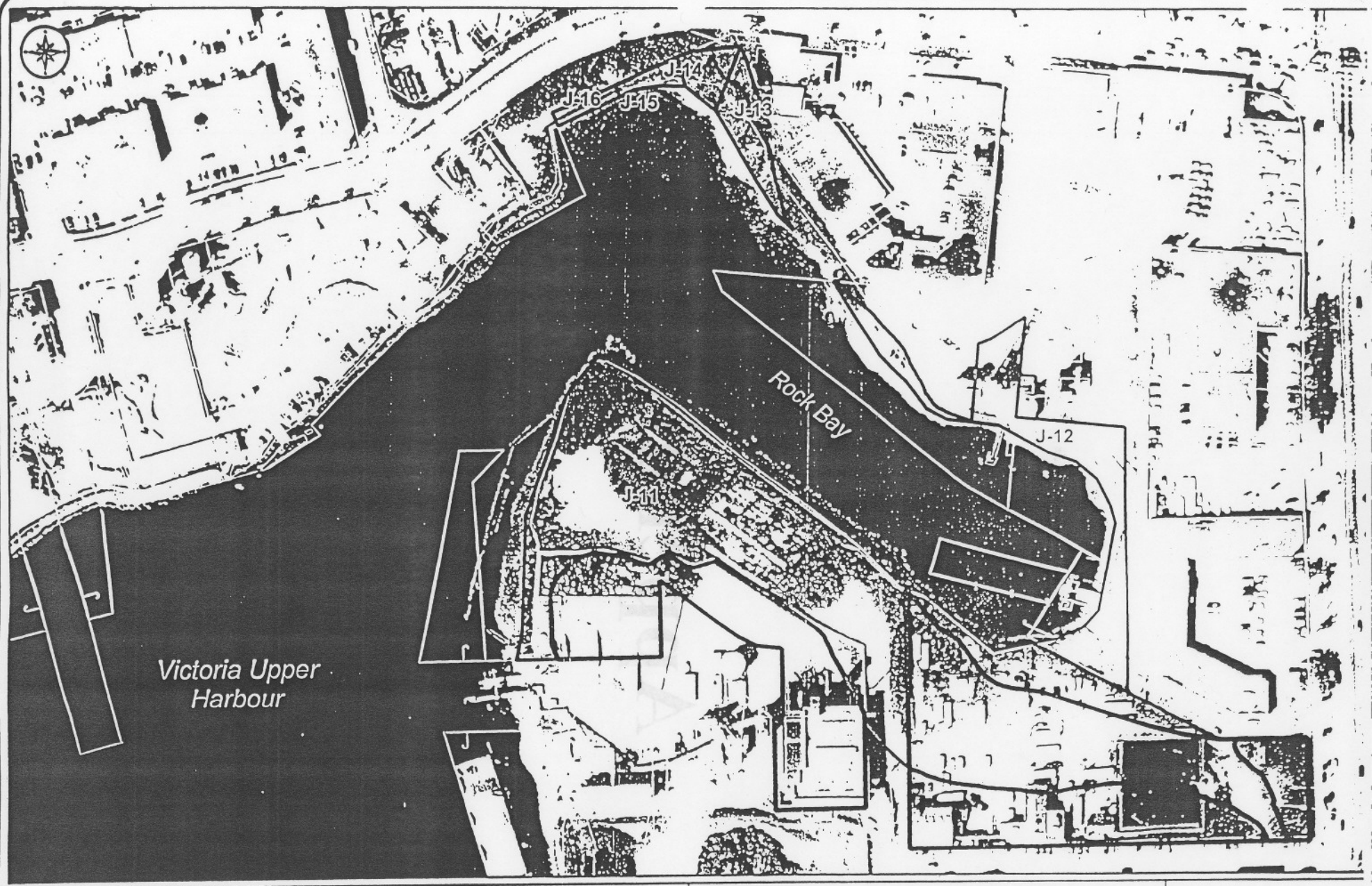
April 2004

Figure 3

Created by THPV-NA
Checked by THPV-ST
Approved by THPV

Transport Canada / Transports Canada

Victoria & Esquimalt Harbours Environmental Program



Legend

Transport Canada Rock Bay Properties

BC Hydro Properties

Data Sources
Transport Canada Property "Parcel" Boundaries (P. Ringwood, Oct 23, 2003)
BC Hydro Properties (P. Ringwood, Oct 23, 2003)
Base Composite Drawing (P. Ringwood, May 30, 2003)
Transportation Commotions Road Network (BC Ministry of Transportation and Highways)

Victoria Harbour - Rock Bay Area

April 2004

P:\ArcMap Map Documents\Rock Bay\CEAA_Screening\040420_RBay_PAD_CEAA_Ortho.mxd

0 15 30 60 90 120 Meters

1:2,200

Figure 4

Created by THPV-NA
Checked by THPV-ST
Approved by THPV

Transport Canada

Transport Canada

Appendix C

S. 35(2) of the *Fisheries Act*

Authorization No.
99-HPAC-PA3-000-000747

AUTHORIZATION FOR WORKS OR UNDERTAKINGS AFFECTING FISH HABITAT AND DESTRUCTION OF FISH

Authorization issued to:

Name: Transport Canada; Robert MacDonald, Project Director and BC Hydro and Power Authority; Walter Udell, Project Manager

Address: TC: Suite 620 – 800 Burrard Street, Vancouver, BC, V6Z 2K5 and
BCH: 6911 Southpoint Drive (E04), Burnaby, BC, V3N 4X8

Telephone: TC: Tel: (604) 666-5381 Fax: (604) 666-2961 Cell: (604) 202-7131 and
BCH: Tel: (604) 528-3139 Fax: (604) 528-2111 Cell: (604) 312-6651

Location of Project

Rock Bay, Victoria Harbour, BC

Valid Authorization Period

The valid authorization period is January 15, 2004 to December 31 2007.

Description of Works or Undertakings

Coffer dams will be installed in two locations (Southeastern and Southwestern sections) of Rock Bay. Contaminated soils will be excavated and replaced with clean sediment, gravel and rock. Portions of a hard substrate bank will be removed and replaced with intertidal saltmarsh and native backshore vegetation. The coffer dams will be removed and tidal circulation will be returned to the bay after all contaminated soils in the designated restoration zone are removed. Boulder/cobble blankets will be placed at the outlets of culverts #626 and 627 to stabilize the foreshore at these locations and provide attachment surfaces for marine animals.

The harmful alteration, disruption and destruction of fish habitat hereby authorized is:

1/ Approximately **4,500m²** of intertidal and shallow subtidal substrate at the Southeastern end of Rock Bay.

2/ Approximately **1,300m²** of intertidal and shallow subtidal substrate along the Southwestern foreshore of Rock Bay.

Conditions of Authorization

Transport Canada (TC) and BC Hydro (BCH) confirm that all plans and specifications relating to this Authorization have been duly prepared and reviewed by appropriate professionals working on behalf of TC & BCH. TC & BCH acknowledge they are solely responsible for all design, safety and workmanship aspects of all of the works associated with this Authorization.

Conditions that relate to the installation of the coffer dams and removal of contaminated sediments:

1. All construction activities must conform to mitigative conditions outlined by Hemmera Envirochem Inc. in the report dated October, 2003 ;

2. A qualified marine biological consultant acting as an environmental monitor must be on-site during the critical phases of coffer dam installation and dredging of the contaminated sediments in order to ensure that fish and invertebrates are salvaged properly and returned safely to the marine environment.

3. A qualified marine biological consultant must be on-site during the critical phases of bolder/cobble blanket placement and coffer dam removal to ensure that appropriate mitigation is carried out and to initiate fish habitat monitoring of replacement fish habitats.

Conditions that relate to the replacement/restoration of damaged fish habitat:

1. A qualified specialist in native backshore vegetation and saltmarsh transplanting techniques must be retained by TC & BCH to ensure that this phase of the mitigation and fish habitat compensation is carried out in a professional manner. A list of appropriate plant species for revegetation of the Rock Bay area is included on page 41 of the Hemmera Envirochem Inc. report dated October, 2003.

2. The excavated marine sediments will be replaced with clean, uncontaminated sediments in the following fashion: a) the majority of the area affected by removal of contaminated sediments (**2,775m²**) will be replaced with fine textured materials emulating the former silt substrates. b) a boulder layer will be placed at the outlet of culverts #626 and #627 (areas of approximately **510m²** and **300m²** respectively) c) The boulder field would then be surrounded by a mix of cobble and boulder in the transition to the finer sediments (areas of approximately **615m²** at culvert #626 and **300m²** at culvert #627).

Monitoring Program

1. TC & BCH shall carry out a monitoring program (the "Monitoring Program"), which includes the following:

   a) A SCUBA/intertidal site assessment of the restored/compensatory boulder/cobble and fine sediment habitats will be conducted annually between June 1 and August 31 for a period of 5 years post-construction. The assessment will be conducted by a qualified marine biological consultant who will submit a report to the Chief, Habitat Management, South Coast Area, or designate, on or before September 30 in each year that the monitoring assessment is conducted.

The assessment will compare remediation of the restored/compensatory habitats with both pre-restoration conditions for similar habitats in Rock Bay and with similar habitats ("controls") within Victoria Harbour. DFO recognizes that duplicate habitats in Victoria Harbour may not be exactly the same and the Harbour habitats will be subject to environmental influences of their own, however, an effort must be made to find similar habitats to the restored/compensatory habitats for the sake of comparison. DFO also recognizes that City of Victoria storm sewer outfalls #626 and 627 may also influence restoration/recovery of newly created habitats in Rock Bay.

b) The monitoring assessment will include, but will not be limited to, defining the species and areal coverage by transplanted and volunteer vegetation (backshore and intertidal and subtidal vegetation will be documented in the survey). In addition, a species list of observed marine invertebrates and fish will be compiled and an estimate of numbers of individuals will be recorded. Based on the results of the assessment, a statement with respect to the productive capacity of the restored/created fish habitat should be included in the annual monitoring report.

c) If the SCUBA/intertidal assessment of the restored/compensatory habitat at Rock Bay determines that the backshore, intertidal and subtidal fish habitats are being successfully restored, DFO will be satisfied that the goal of No Net Loss has been achieved. If vegetation and invertebrate/fish numbers within Rock Bay have not reached the coverage and density levels found in adjacent similar habitats in Victoria Harbour within five years of the remedial work, TC & BCH may need to provide additional compensation to replace the productive capacity of lost habitats within the bay. It is expected that appropriate additional replacement habitat will be negotiated by TC & BCH (with the assistance of a qualified marine biological consultant) and the DFO Chief, Habitat Management, South Coast Area or designate.

2. The restored/compensatory habitat will be deemed to be functioning as intended if, in the opinion of DFO, the habitat is physically stable and the backshore, intertidal saltmarsh, subtidal alga, marine invertebrates and fish appear to be expanding and undergoing normal reproductive processes. It is anticipated that the restored/compensatory backshore vegetation and saltmarsh habitats will have the same density and shoot height/vigour as natural vegetation in the vicinity of Victoria Harbour. The restored/compensatory intertidal and subtidal bedrock/boulder and fine sediments will support healthy marine invertebrates and fish at density levels similar to adjacent natural habitats in Victoria Harbour. Determination of the success of the restoration/compensation will be made jointly by TC & BCH (with assistance from a qualified biological consultant doing the assessment) and DFO (the Chief of Habitat Management, South Coast or designate). It is understood that restoration/compensation success may be influenced by conditions in Victoria Harbour, and more specifically, by Victoria sewer outfalls 626 and 627.

Following the initial monitoring period, and any extensions thereof, DFO will assess the success of the restored/compensatory habitat and determine whether or not it is functioning as intended, and choose the appropriate course of action as outlined below:

a) If the restored/compensatory habitat is functioning as intended and will be self-sustaining without further remedial work, the Monitoring Program will be terminated; or

b) If the restored/compensatory habitat is not functioning as intended, TC & BCH shall extend the Monitoring Program, including any remedial work required, for an additional two years to allow more time for the habitat to become adequately established.

c) If the restored/compensatory habitat is not functioning as intended and further remedial work is not likely to rectify the situation, TC & BCH shall then carry out alternative compensatory works mutually agreed upon by TC & BCH, their qualified marine biological consultant and DFO (Chief, Habitat Management or designate).

3. TC & BCH shall ensure that the restored/compensatory habitat is functioning as intended as long as the Rock Bay site is under their jurisdiction. If at any time TC & BCH becomes aware that the compensatory habitat is not functioning as intended, for example by reason of natural erosion or being covered by large amounts of wood debris, TC & BCH shall carry out any works which are necessary to enable the compensatory habitat to function as designed. If TC & BCH transfers their interest in the project site, and the transferee assumes the obligations noted above in a form satisfactory to DFO, TC & BCH shall thereafter be relieved of these obligations.

4. TC & BCH confirm they shall leave the restored/compensatory habitat undisturbed. After the restored/compensatory habitat is functioning as intended, TC & BCH shall not carry on any work or undertaking that will adversely disturb or impact the restored/compensatory habitat, and will take all reasonable steps to ensure that the restored/compensatory habitat is not disturbed by others, so long as TC & BCH are associated with the remediation site at Rock Bay. If any disturbance of the restored/compensatory habitat is anticipated as a result of another authorized Federal activity, additional offsetting compensatory habitat must be provided by TC & BCH, subject to negotiation with DFO (Chief, Habitat Management or designate).

5. TC & BCH shall not be required to deliver to DFO a letter of credit or surety from a Canadian bank. Initiation of construction of the project will not occur until all parties, TC & BCH and DFO, have signed this authorization. **All correspondence regarding fish habitat compensation monitoring will be directed to the Chief, Habitat Management, South Coast Area, or designate, Fisheries and Oceans Canada, 3225 Stephenson Point Road, Nanaimo, BC V9T 1K3.**

The holder of this authorization is hereby authorized under the authority of section 35(2) of the Fisheries Act, R.S.C., 1985, c. F. 14, to carry out the work or undertaking described herein.

This authorization is valid only with respect to fish habitat and for no other purposes. It does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

Failure to comply with any condition of this authorization may result in charges under the Fisheries Act.

This authorization form should be held on site and work crews should be made familiar with the conditions attached.

Date of issuance: April 22, 2004.

Approved by: C.A. Russell A/Snr Habitat Biologist

Title: Chief, South Coast Habitat Unit
Habitat and Enhancement Branch

Transport Canada and BC Hydro acknowledge that DFO has consulted with them regarding the terms of this Authorization, and confirm that they have reviewed and understand the terms of this Authorization, and it will comply with them.

Executed by an authorized signatory of Transport Canada on the 16th day of April, 2004 in the presence of:

Scott Tomlinson
Witness (signature)

SCOTT TOMLINSON
(print name)

Transport Canada

Per: Robert MacDonald
Authorized signatory

ROBERT MACDONALD
Name

PROJECT DIRECTOR, VICTORIA AND ESQUIMALT HARBOURS ENVIRONMENTAL PROGRAM.
Title

Executed by an authorized signatory of BC Hydro on the 21ST day of APRIL, 2004 in the presence of:

G. R. Haddow
Witness (signature)

GEORGIE R. HADDOW
(print name)

BC Hydro

Per: G. W. Udell
Authorized signatory

GORDON WALTER UDELL
Name

PROJECT MANAGER
Title

Appendix D

CRD
Environmental Services

Capital Regional District

Central Saanich
Colwood
Esquimalt
Highlands
Langford
Metchosin
North Saanich
Oak Bay
Saanich
Sidney
Sooke
Victoria
View Royal
Juan de Fuca (EA)
Salt Spring Island (EA)
Southern Gulf Islands (EA)

Mailing Address:
PO Box 1000
Victoria, BC
V8W 2S6

Office:
625 Fisgard Street

Tel:(250)360-3045
Fax:(250)360-3047

www.crd.bc.ca

April 14, 2004

ESD File: 5280-56.15

Mr. Rob MacDonald
Project Director
Transport Canada
620 – 800 Burrard Street
Vancouver, BC V6Z 2J8

Dear Mr. MacDonald:

RE: REMOVAL OF CONTAMINATED SEDIMENT AND SOILS FROM THE ROCK BAY AREA, VICTORIA, BRITISH COLUMBIA

The Capital Regional District (CRD) Stormwater Quality program (SQP) would like to express our support for Transport Canada and BC Hydro plans to remove contaminated sediment and soils from the Rock Bay area of Victoria, British Columbia.

We support the work being done by the City of Victoria, the Rock Bay Contaminant Reduction committee and the Burnside Gorge Community Association to restore the Rock Bay area. It is our hope that the area is rehabilitated so that the bay and the surrounding land can become a useful green space for the region's residents and tourists. Past efforts to increase the aesthetics and recreational functionality of neighbouring areas such as the Selkirk waterway and the Cecelia Creek area have met with overwhelming community support and appreciation. The clean up of Rock Bay will build on these efforts.

The SQP is working to protect water bodies such as Rock Bay by developing model regulations for the protection of storm drains, watercourses and the nearshore marine environment from stormwater-carried contaminants. These stormwater regulations are designed for municipal adoption and will significantly reduce, at the source, the amount of contamination entering Rock Bay from upland sources. We have invested significant resources in this initiative in partnership with the City of Victoria, Environment Canada and the Georgia Basin Action Plan. The model stormwater regulations have been drafted in consultation with municipal, provincial and federal governments as well as local businesses, community groups and professional associations. The City of Victoria is moving to adopt and enforce these regulations.

Our program strongly supports the efforts of the City of Victoria, Transport Canada and BC Hydro to restore Rock Bay to a usable condition. We encourage your ministry to commit the necessary funds to the clean up of this environmentally damaged yet significant area.

Sincerely,

Rob Miller, Supervisor
Stormwater Quality Program

DG/lt
cc Seamus McDonnell, PEng, Manager Engineering & Scientific Services
Laura Taylor, MSc, Director Environmental Programs
Craig Mount, MSc, PGeo, Stormwater Quality Program

::ODMA\PCDOCS\DOCSHQ\166912

Capital Regional District

524 Yates Street P.O. Box 1000 Victoria, B.C. V8W 2S6 Telephone (250) 360-3000

CRD Web Site: http://www.crd.bc.ca

3 February 2004

File: 0550-85.03 & 0580-90.03

The Honourable Tony Valeri, PC, MP, Minister of Transport
Tower C, Place de Ville, 330 Sparks Street
Ottawa, ON K1A 0N5

Dear Mr. Valeri:

RE: ROCK BAY REMEDIATION PROJECT – VICTORIA, BC

The purpose of this letter is to express to you the strong support of the Capital Regional District (CRD) Roundtable on the Environment (RTE) for the planned remediation of Victoria's Rock Bay area by your ministry and its project partner BC Hydro.

As you are aware, the Rock Bay area has been used over the last 100 years for industrial applications, such as a coal gasification plant. As a result both the foreshore and the seabed have been heavily contaminated with PCB's, coal tar, metals and other pollutants.

The RTE is a community-based multi-stakeholder group appointed by the CRD Board that assists the CRD in addressing regional environmental issues. The RTE believes that the clean up of Rock Bay is essential to the long term economic and environmental vitality of Victoria's harbour. Accordingly, the RTE urges you to give this project the highest priority and initiate it at the earliest opportunity.

The City of Victoria has apparently already implemented a number of costly measures to reduce contamination of Rock Bay from stormwater discharges. The City is also working closely with CRD staff on regulation for source control of stormwater contamination. These improvements will work to maintain the environmental health of the area once your remediation work is completed.

I would also urge you to have your staff consult with CRD Environmental Services staff to explore some potentially significant cost saving options with respect to the disposal of the contaminated soils that will be produced by the remediation project.

Once again, the RTE applauds the efforts of your ministry, BC Hydro and the City of Victoria and looks forward to the successful completion of this long needed remediation project.

Sincerely,

COPY

Denise Savoie, Chair
CRD Roundtable on the Environment

TW/wd

cc: Rob MacDonald, Transport Canada, Pacific Region
Douglas Grimes, BC Hydro
Don Amos, CRD Board Chair
David Cubberly, Chair, CRD Environment Committee
Michael C. Williams, PEng, General Manager, Environmental Services, CRD

May 2004 Rock Bay PAD

Office of the
City Manager

Legislative
Services

#1 Centennial Square
Victoria
British Columbia
V8W 1P6

Tel (250) 361-0571
Fax (250) 361-0348
www.city.victoria.bc.ca

THE CITY OF VICTORIA

January 27, 2004

Transport Canada
Suite 620, 800 Burrard Street
Vancouver, BC
V6Z 2J8

Dear Sir or Madam:

Subject: Rock Bay Remediation Project

At its meeting on January 22, 2004, Victoria City Council resolved as follows:

> that a letter be sent to Transport Canada, Environment Canada, and BC Hydro, reiterating that The City of Victoria strongly supports the Rock Bay Remediation Project including the removal of soil and sediment at the Rock Bay site.
>
> Carried

Please contact the undersigned at 361-0203 should you have any further questions regarding this matter.

Yours truly,

Robert G. Woodland
Corporate Administrator
/bls

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May 2004 Rock Bay PAD

Environment and Shoreline Advisory Committee
Minutes
January 21, 2004

Present: Brian Emmett, Michael Canzi, Tara Hastings, Donna Sanford. Lisa McBain, Janette Brown, and Aaron Welch.

Regrets: June Pretzer, Alana Duncan, Marcella Snijders, and Eric Lott.

Staff: Councilor Denise Savoie, Ken Silvester, Water & Environment Engineering, and Soki Kaur, Recording Secretary.

The meeting was called to order at 11:36 am with Brian Emmett in the Chair.

APPROVAL OF AGENDA

MOVED SECONDED

That the agenda dated January 21, 2004 be approved with the following change and addition:

- Next meeting will take place in Committee Meeting Room #1.
- That the next meeting include a "30 second check in" right after approval of the agenda.

CARRIED

APPROVAL OF THE MINUTES

MOVED SECONDED

That the minutes of the meeting on December 17, 2003 be approved as circulated.

CARRIED

ROCK BAY RESTORATION PROJECT

Robert MacDonald from Transport Canada gave a presentation on the Rock Bay Restoration Project. Transport Canada is working closely with BC Hydro and invites the City for its involvement in this project. Robert MacDonald will forward appropriate documents to Environment and Shoreline Advisory Committee members. He can be contacted at (604) 666-5381 or macdork@tc.gc.ca for further inquiries.

MOVED SECONDED

That the Environment and Shoreline Advisory Committee encourages the City of Victoria to support, in principle, the intention of Transport Canada and BC Hydro to remediate contaminated soil and sediments from the Rock Bay site.

CARRIED

COMMUNITY GARDENS POLICY

Emily MacNair's group discussed the benefits of community gardens in general and listed some communities that are active in this initiative locally, nationally and internationally. It was suggested that the City of Victoria support community gardens development within the City, as well as develop a community gardens policy. Currently, there are only five community gardens in the City. The Saanich Community Gardens Policy could serve as a guide in the development of the City of Victoria's Community Gardens Policy, thereby avoiding duplication. It was noted that Food Security Report will be available in early February, 2004, a copy of which can be obtained from Capital Regional District.

ACTION:

- Aaron Welch will formulate a draft community garden policy for discussion next week.

COUNCIL LIAISON REPORT

Councillor Savoie informed Committee members that the:

1. Committee of the Whole has approved the Integrated Pest Management Policy with the goal of reducing the use of chemical pesticides. The Capital Regional District Roundtable's Subcommittee on Pesticide Reduction is now preparing a discussion paper on a pesticide reduction model bylaw. This discussion paper will be used as the basis for stakeholder consultation in the Capital Regional District this spring.

2. Greenway Policy is pending. Person responsible is on sick leave.

WORKING GROUP REPORT (BUILT ENVIRONMENT)

Michael Canzi attended the Advisory Transportation Committee meeting on January 20, 2004 to investigate potential projects that overlap between the Environment and Shoreline Advisory Committee and the Advisory Transportation Committee. The development of a task group was suggested.

Committee members touched on the Greenways Plan. The status of the Greenways Plan is unknown.

ACTION:

- Brian to look into the status of the Greenways Plan.

OTHER ISSUES

It was suggested that an assessment of the Committee's performance be considered for the near future for its effectiveness. A "2 minute meeting evaluation" was also mentioned as a standing item on all agendas just prior to adjournment.

ACTION:

- Janette Brown to email the check-list for the assessment.
- Committee members to review the check-list prior to the February 2004 meeting.
- The Chair to place the assessment as an agenda item for the February 2004 meeting.

NEXT MEETING

Next Meeting: Wednesday, February 18, 2004, 11:30 – 1:30 pm, Committee Room #1.

ADJOURNMENT

The meeting was adjourned at 13:13 pm.

Transport Canada
Transports Canada

Programs Branch
Pacific Region
Suite 620 - 800 Burrard Street
Vancouver, B.C. V6Z 2J8

Groupe des programmes
Region du Pacific
800, rue Burrard, Bureau 620
Vancouver, C-B V6Z 2J8

TC file:RDIMS 4970217
DFO File: 99-HPAC-PA3-000-0000747

May 20, 2009

Scott Northrup, Habitat Management Biologist
Habitat Protection and Sustainable Development
3225 Stephenson Point Road
Nanaimo, BC V9T 1K3

RE: AMENDMENT TO ROCK BAY SITE REMEDIATION S.35(2) AUTHORIZATION

Dear Mr. Northrup:

Thank you for the amendment to the S.35(2) Authorization No.: 99-HPAC-PA2-000-00747 for the Rock Bay remediation project in Victoria Harbour, BC.

As requested, I am returning the original copy of the amendment signed by Robert Sisler, the Transport Canada authorized signatory. We will attach a copy of this amendment to the original authorization and keep a copy on site during works. I believe that we will receive a copy with the DFO signature.

We are continuing with plans to complete part of Stage 3 referred to as Barclay Point hotspots in the late summer or early fall of 2009 and complete the remainder of Stage 3 in the 2010 work period. We will keep you informed as our plans and schedules are confirmed.

Please also note that Robert Macdonald has returned to our office and resumed his role as the Transport Canada Project Manager. Rob will be the TC contact for this file going forward and can be contacted at Robert.macdonald@tc.gc.ca or 604-666-2581.

Regards,

Ian Chatwell
Senior Environmental Officer

cc. Karen Hutton – DFO
Robert Macdonald – TC

Encl. (1)

Canada

FISHERIES ACT S. 35(2) AUTHORIZATION
99-HPAC-PA3-000-000747

AMENDMENT "A"

Date of Amendment: March 26, 2009

Authorization issued to:

Name: Robert Sisler, Transport Canada
Regional Manager Environmental Services

Address: Suite 620 – 800 Burrard Street, Vancouver, BC, V6Z 2J8

Telephone: (604) 666-5370 Fax: (604) 666-2961

Location of Project:

Rock Bay, Victoria Harbour, BC

Authorization Amendment:

All conditions of the original Authorization (99-HPAC-PA3-000-000747) remain applicable. The Amended changes are as follows:

1. The name and address of the person and company responsible for the Authorization (noted above); and,
2. The Valid Authorization Period.

The Amended Valid Authorization Period is as follows:

> **All works that may result in the harmful alteration, disruption or destruction (HADD) of fish habitat associated with the Rock Bay site remediation project (Stage 3) must occur during the period July 1, 2009 through February 15, 2010 and July 1, 2010 through February 15, 2011, with amendments as necessary as a result of monitoring information and in consultation with Fisheries and Oceans Canada.**

Canada

Fisheries and Oceans Canada)

Per: _____)

Nick Leone)
Senior Habitat Biologist)
Habitat Management Branch)
South Coast Area)

Transport Canada)

Per: R. Sisler)
Authorized signatory

Robert Sisler)
Print Name

Manager Environmental Services)
Title

APPENDIX E

Geo-Environmental and Geotechnical Investigation Report – Uplands South Rock Bay Remediation Project Stage 3 Planning Victoria, BC

Provided separately

APPENDIX F

Geo-Environmental and Geotechnical Investigation Report – Marine Works Rock Bay Remediation Project Stage 3 Planning Victoria, BC

Provided separately

APPENDIX G

Geo-Environmental and Geotechnical Investigation Rock Bay - Stage 3 - Outfalls For Transport Canada Victoria, BC

Provided separately

Appendix H

Factual Geotechnical and Geo-Environmental Report – Northern Area, Rock Bay – Stage 3 Remedial Planning Victoria, BC

Provided separately

Appendix I

Compendium of Stage 3 Groundwater Quality and Quantity Investigations/Assessments, Rock Bay Remediation Project, Victoria Harbour, BC

Provided separately