

Public Works and Government Services Canada

**ISSUED FOR TENDER
Tender Specifications for the
Environmental Site Remediation at**

**Ennadai Lake, Nunavut
Project No.: R.048071.015**

Public Works and Government Services Canada

January 2013

<u>Section</u>	<u>Title</u>	<u>No. of Pages</u>
00 00 01	List of Drawings	1
<u>Division 01 - General Requirements</u>		
01 11 00	Summary of Work	9
01 29 83	Payment Procedures for Testing Laboratory Services	3
01 31 19	Project Meetings	6
01 32 18	Construction Progress Schedules - Bar (GANTT) Chart	3
01 33 00	Submittal Procedures	4
01 35 00.06	Special Procedures for Traffic Control	2
01 35 15	Special Project Procedures for Contaminated Sites	7
01 35 32	Site Specific Health and Safety Plan	12
01 35 43	Environmental Procedures	5
01 41 00	Regulatory Requirements	3
01 45 00	Quality Control	2
01 51 00	Temporary Utilities	3
01 52 00	Construction Facilities	4
01 53 00	Mobilization and Demobilization	2
01 54 00	Camp Facilities	10
01 61 00	Common Product Requirements	3
01 71 01	Survey Requirements	3
01 77 00	Closeout Procedures	1
01 78 00	Closeout Submittals	3
<u>Division 02 – Existing Site Conditions</u>		
02 41 16	Structure Demolition	11
02 41 23	Debris and Miscellaneous Removals	4
02 51 00	Instrumentation	3
02 61 00.01	Soil Remediation	10
02 81 01	Hazardous Materials	18
02 82 00.01	Asbestos Abatement Minimum Precautions	7
02 82 00.02	Asbestos Abatement Intermediate Precautions	8
02 82 00.03	Asbestos Abatement Maximum Precautions	14
02 83 10	Lead-Base Abatement Minimum Precautions	6
02 83 11	Lead-Base Abatement Intermediate Precautions	9
02 83 12	Lead-Base Abatement Maximum Precautions	9
02 84 00	Polychlorinated Biphenyl Remediation	9

Division 31 - Earthworks

31 05 16	Aggregate Material	5
31 22 13	Rough Grading	8
31 23 33.01	Excavating, Trenching and Backfilling	7
31 32 19.01	Geotextile	4
31 32 19.02	Geomembranes	5

Division 34 – Transportation

34 73 16.13	Ice Airstrip Construction	3
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Appendices

Appendix A	AANDC Tracking Forms
Appendix B	PWGSC AOC Benefits Tracking
Appendix C	Demolition, Asbestos and Lead Paint Inventory
Appendix D	Debris Inventory
Appendix E	Photographs
Appendix F	Geotechnical Sample Test Results

LIST OF DRAWINGS

Drawing No.	Drawing Name
C00	Cover Page
C01	Overall Site Plan
C02	General Site Plan
C03	Site Plan Showing Site Access
C04	Site Plan APEC 2, 3, 4, 5, 6, 8, 29
C05	Site Plan APEC 2, 5, 8, 29
C06	Site Plan APEC 1, 7, 8, 9, 10, 11, 12, 13, 18, 29
C07	Site Plan APEC 13, 14, 15, 16, 17, 19, 20, 21
C08	Site Plan APEC 22, 24, 25, 26, 27, 28
C09	Detail of Impacted Soil Areas
C10	Site Plan Showing Landfill, Landfarm, Borrow Areas and Sample Locations
C11	Site Plan Showing Footprint of Designed Landfill and Preferred Location for Landfarm
C12	Landfill Conceptual Design Plan
C13	Landfarm Conceptual Design Plan and Section
C14	Areas of Cultural Significance as Identified by Arviat Community Members

PART 1 - GENERAL

1.1 Precedence

- .1 Division 1 Sections take precedence over technical specification sections in other Divisions of this specification.

1.2 Background Information

- .1 The Ennadai Lake site is a former weather station situated on Ennadai Lake. The site is located within the Kivalliq region of Nunavut. The site was manned from 1949 to approximately 1979. There is currently an un-manned weather station on site.
- .2 The site is approximately 380 km west of Arviat, Nunavut at approximately 61° 07' 51" N latitude and 100° 53' 14" W longitude. The site is on the east shore, on the north arm of Ennadai Lake. The site is located on a sandy esker complex.
- .3 The site consists of thirteen (13) buildings, five (5) large above ground storage tanks (ASTs), pipelines (including one overhead line), five drum caches, several transmittal towers (both upright and on ground), several debris areas, and an unmaintained air strip. The site contains both hazardous and non-hazardous materials. Non-hazardous materials include solid materials such as wood, plastic, metal, and liquid aqueous materials. Hazardous materials include light ballasts; fire extinguishers; asbestos containing insulation, gaskets, shingles and panel boards; leachable lead paint on wood and metal; PCB paint on metal; organic liquids in drums and tanks; and other miscellaneous hazardous materials. The site also contains metal contaminated soil and hydrocarbon contaminated soil.
- .4 The site is considered remote. The materials used in the construction of the former weather station were brought to site via cat train from Churchill, Manitoba. Hunters from Arviat access the site in the winter using snowmobiles, but there are no documented summer trails between the site and Arviat. During the 2012 field program, access was by float plane. There is not a float plane dock on site. An unmaintained gravel/sand airstrip is located approximately 800 m northeast of the site. This airstrip may be able to support the use of a Twin Otter but would require ground-truthing. There is a lodge approximately 60 km southwest of the site that has a runway that can accommodate a Buffalo transport plane.
- .5 The site is located on an esker complex adjacent to Ennadai Lake. Annual mean temperature is approximately -9.4 °C. Mean monthly temperature for July is 14 °C, and for January -24 °C. Snow cover is typical from October to May. Permafrost is present in areas with organic soils. Permafrost was not encountered in the sandy esker soils to a depth of 2.5 m. The site covers approximately 58 ha.
- .6 There are no existing roads on site.
- .7 There is no existing camp on site.
- .8 Supporting documents pertaining to the site include, but are not limited to the following:
 - .1 Integrated Phase I and II Environmental Site Assessment, KW007 – Ennadai Lake. WESA, March 2010. File KB7881-07.
 - .2 Ennadai Lake Site KW007 – Spill Response, Final Report. Nunami Stantec, August 2011. File 123510692.
 - .3 Phase III ESA, Hazardous and Non-hazardous Material Audit, and Geotechnical Evaluation, Ennadai Lake, Nunavut. EBA, January 2013. File Y22101286.0011.
 - .4 Ennadai Lake Remedial Action Plan. EBA, February 2013. File Y22101286.0012.
 - .5 Archaeological Impact Assessment of Ennadai Lake Weather Station. Golder Associates, November 2012. File 12-1372-0045 / NAP 2012-006A.
 - .6 Environmental Screening Assessment of the Proposed Remediation at Ennadai

Lake Former Weather Station. EBA, February 2013. File Y22101286.008

1.3 Site Hazards

Site Hazards that the Contractor should be aware of include, but are not limited to the following:

- .1 Physical hazards of dilapidated structures.
- .2 Fuels and lubrication fluids.
- .3 Wildlife.
- .4 Extreme cold and remote site conditions.
- .5 Hydrocarbon contaminated soil.
- .6 Metal impacted soil.
- .7 Hazardous materials including polychlorinated biphenyls (PCBs), lead paint, batteries, asbestos, and mercury.
- .8 Steep slopes and rugged terrain.
- .9 Scattered debris including nails, metal, and broken glass.

1.4 Description of Work

Work of this Contract comprises the site remediation activities at Ennadai Lake Former Weather Station, as indicated on drawings including, but not limited to, the following:

- .1 Preparation of planning documents and submittals including but not limited to, Site Specific Health and Safety Plan (SSHSP), as specified in Section 01 35 32 – Site Specific Health and Safety Plan.
- .2 Mobilization and demobilization of all personnel, equipment, support facilities and materials required to complete the Work.
- .3 Upgrading of site trails, float plane access and / or airstrip as required to facilitate remediation activities.
- .4 Securing, storing, and utilization and / or incineration of organic liquids.
- .4 Construction of an on-site non-hazardous waste landfill.
- .5 Dismantling and demolition of buildings and infrastructure; segregating hazardous and non-hazardous materials.
- .6 Segregation of non-hazardous wood waste for incineration.
- .7 Collection and containerization of hazardous materials for disposal.
- .8 Excavation, sorting and containerization of buried and partially buried hazardous materials.
- .9 Excavation, sorting, on-site transport, and disposal of non-hazardous materials into the non-hazardous waste landfill.
- .10 Off-site transport and disposal of all hazardous demolition, hazardous debris, hazardous contaminated soils (as per the AMSRP), and hazardous liquids to Contractor's Designated Hazardous Waste Disposal Facility.
- .11 Excavation, containerization, transport and disposal of metal contaminated soils at Contractor's Designated Contaminated Soil Disposal Facility.
- .12 Design and implementation of a petroleum hydrocarbon contaminated soils treatment plan.
- .13 On-site incineration of barrel contents and non-hazardous wood waste.
- .14 Liquid not meeting incineration guideline or water discharge guideline will be

- containerized and transported off site to the Contractor's Designated Disposal Facility.
- .15 Collection, cleaning and appropriate disposal for drums, tanks and their contents.
- .16 Development and reclamation of local borrow sources.
- .17 Backfilling and grading of all excavated areas.
- .18 Decommissioning and regrading landfarm treatment area.
- .19 Provision of the following site support services:
 - .1 Construction Camp as specified in Section 01 54 00 – Camp Facilities, including operation, maintenance, catering and janitorial service.
 - .2 Provision and maintenance of Departmental Representative's vehicles, as specified in Section 01 52 00 Construction Facilities.
 - .3 Safety, fire protection, office, and medical services, as specified in Section 01 35 32 – Site Specific Health and Safety Plan.
 - .4 Communication services for Contractor and Departmental Representative, as specified in Section 01 54 00 – Camp Facilities.
 - .5 Provision of Wildlife Monitors, as specified in Section 01 35 32 – Site Specific Health and Safety Plan.
- .20 The Contractor is advised that the current weather station and its surrounding area, as shown on Drawings C03 and C10 are not to be disturbed.

1.5 Potential Additional Work

- .1 The Table "Potential Additional Work" on the "Basis of Payment: form indicates additional quantities of unknown Work that may or may not be required on site during remedial activities. None of the quantities and items listed are guaranteed; however, if additional work is required, the rates listed will be used by the Contractor. Potential Additional Work may include, but is not limited to:
 - .1 Collection and processing of unknown debris scattered over the site. Unknown debris is debris in areas not identified within the tender drawings.
 - .2 Processing, containerization, transport and disposal off site of unknown hazardous materials.
 - .3 Supply of additional materials as directed by the Departmental Representative.
 - .4 Shipment of additional samples from Ennadai Lake to contractor's specified laboratory.
 - .5 Supply of emergency aircraft flights.
 - .6 Re-grading of additional site areas.
 - .7 Additional excavation and treatment of petroleum contaminated soil.
 - .8 Containerization and transportation of petroleum hydrocarbon contaminated soil off site to the Contractor's Designated Disposal Facility.
- .2 As part of the Potential Additional Work, Unknown Hazardous Materials does not include:
 - .1 Asbestos containing materials from facilities to be demolished.
 - .2 Fuel and fuel residual product from tanks and drums to be disposed.
 - .3 Any hazardous material identified in the Inventory, or elsewhere in these Specifications.

1.6 Definitions

- .1 Departmental Representative: Within the context of these Specifications, the term Departmental Representative refers to the person exercising the roles and attributes of

Canada under the contract.

- .2 Departmental Representative's Authorized Personnel: Within the context of these Specifications, the term Departmental Representative's Authorized Personnel refers to personnel appointed by Departmental Representative or authorized on site by Departmental Representative. Departmental Representative's Authorized Personnel provide recommendations/technical guidance to Departmental Representative as required, for the enforcement of these specifications.
- .3 Contractor: Contractor procured to undertake the remediation Work at Ennadai Lake Former Weather Station is defined, within the context of these specifications, as Contractor. The Contractor is also acting as General Contractor in terms of on-site health and safety requirements.
- .4 Contractor's Site Superintendent: Contractor's resident site representative, who is authorized to make decisions on behalf of Contractor.
- .5 The word "provide" means supply and install, operate, submit or any other procedure necessary to complete the work as intended.

1.7 Submittals

- .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures

1.8 On-Site Documents

- .1 Maintain at job site, one (1) copy each of the following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Requests for clarification and responses.
 - .4 Addenda.
 - .5 Task Authorizations.
 - .6 Change Orders.
 - .7 Reviewed shop drawings.
 - .8 Other modifications to Contract.
 - .9 Field test reports.
 - .10 Copy of approved Work Schedule.
 - .11 Manufacturers' installation and application instructions.
 - .12 Material and Safety Data Sheets.
 - .13 Site Specific Health and Safety Plan including:
 - .1 Spill Contingency Plan.
 - .2 Fire Safety Plan.
 - .3 Emergency Response Plan.
 - .14 Waste disposal Work plan.
 - .15 Land Use Permit.
 - .16 Water License.
 - .17 Quarry Permit.
 - .18 Labour conditions and wage Schedules.
 - .19 Site Medic credentials.

- .20 Up-to-date record drawings.
- .21 License for radio communication.
- .22 All applicable Territorial permits and licenses.
- .23 All applicable Federal permits and licenses.
- .24 Copies of manifests and bills of loading.
- .25 Demolition Plan.
- .26 Worker Training Program.
- .27 Workers' Safety & Compensation Commission (WSCC) Notification of Project.
- .28 Letter of Good Standing with WSCC.
- .29. Inuit Owned Land (IOL) Access/Exemption Certificate.
- .30 Other documents as specified.

1.9 Work Schedule

- .1 Provide and maintain Work Schedule in accordance with instructions of Section 01 32 18 Construction Progress Schedules - Bar (GANTT) Chart.
- .2 Keep the Departmental Representative advised of planned Work activities in accordance with the instructions of Section 01 33 00 – Submittal Procedures.

1.10 Contractor Use of Site

- .1 Contractor use of site is restricted to the terms and conditions of the issued permits, and all applicable guidelines and regulations.
- .2 Do not disturb archaeological features as identified on the Drawings or as identified during the work.
- .3 Coordinate use of premises under direction of Departmental Representative.
- .4 Do not unreasonably encumber sites with materials or equipment.
- .5 Construct Work to accommodate intermittent use of the existing weather station during construction.
- .6 Construct Work to avoid activities on Inuit Owned Land (IOL), as shown on the Drawings, with the exception of IOL within the airstrip area and the main infrastructure area.
- .7 Use of the site will comply with the environmental requirements of Section 01 35 43 – Environmental Procedures.

1.11 Examination of Site

- .1 Prior to mobilization, perform a Pre-Mobilization Site Visit to check field conditions and obtain actual conditions required to ensure correct execution of the Work, and notify Departmental Representative in writing, of all matters which could prejudice proper execution of the Work. Provide a minimum of seven (7) days notice to Departmental Representative prior to examining the site.
- .2 Commencement of mobilization constitutes acceptance of existing conditions, and verification of dimensions.

1.12 Pre-Ordered Products

- .1 Departmental Representative has purchased 56 drums of Jet A fuel to expedite the Work and for other purposes in the Contractors and Departmental Representative's interests in the Work. These drums are currently stored at the Ennadai Lake Lodge.
- .2 On execution of Contractor Agreement, execute an agreement with the Department Representative for purchase of the pre-ordered products.

- .3 Contractor responsibility for purchase, handling, and use for pre-ordered product is the same as for other Contractor-furnished products.

1.13 Permits and Licenses

- .1 Departmental Representative has applied for a Land Use Permit, Water Use License, IOL Access and/or Exemption Certificate, and Quarry Permit. All restrictions and requirements of these apply to the Contractor.
- .2 Be responsible for obtaining and paying for all permits, licenses and approvals associated with the development and operation of a construction camp.
- .3 Register, obtain and pay for all required licenses and permits for individual tradesmen employed for Work as referenced in the various Sections of the Contract Specifications.
- .4 Obtain and pay for any other licenses or permits required to perform the activities required on site, i.e. burn permit, etc.
- .5 Provide supplemental information to the regulators for any necessary license amendments or reporting requirements.
- .6 Pay all costs associated with complying with the requirements for the permits and licenses noted in the above clauses.

1.14 Site Supervision

- .1 Designate Contractor's Site Superintendent to be on site at all times during construction, to have full authority to make decisions for the Contractor, to be knowledgeable of the requirements of the contract, and to act upon Departmental Representative's instructions.
- .2 Notify Departmental Representative at least two (2) weeks in advance of any Site Superintendent change and provide updated chain-of-command.

1.15 Additional Drawings

- .1 Departmental Representative may furnish additional drawings to assist with proper execution of the Work. These drawings will be issued for clarification only. Such drawings have the same meaning and intent as if they were included with plans referred to in the Contract documents.

1.16 Worker Orientation Seminar

- .1 Develop, prior to the start of Work, course material for a Worker Orientation Seminar. The outline of this seminar will be approved by Departmental Representative and is intended to describe the remediation activities at the site, and provide instruction for the applicable health, safety, and environmental policies and regulations as related to the site Work activities. Course material will be prepared and presented in the English language and Inuktitut.
- .2 Submit two (2) hard copies and one (1) electronic copy of the Worker Orientation Seminar course material to the Departmental Representative for review at least 30 days prior to the seminar. Include information describing the facility to be used for conducting the seminar.
- .3 The Orientation Course will address, but is not necessarily limited to, the following topics:
 - .1 Project Communication:
 - .1 Roles of Departmental Representative and Departmental Representative's Authorized Representatives.
 - .2 Roles of Contractor and Contractor's Authorized Representatives.
 - .3 Lines of Project communication.
 - .2 Remediation Activities (Scope of Work):
 - .1 Demolition and disposal of demolition waste materials.

- .2 Excavation and remediation of contaminated soils.
- .3 Asbestos abatement.
- .4 Collection and disposal of site debris.
- .5 Collection, containerization, and transportation of hazardous waste material.
- .3 Regional Overview of the site:
 - .1 Land use of area (hunting, fishing activities, etc.).
 - .2 Location of site relative to communities.
 - .3 Heritage resources, including location of gravesites.
 - .4 Climate.
 - .5 Geology and hydrology.
 - .6 Flora and fauna.
- .4 Project Organization/Schedule/Administration:
 - .1 Personnel policies.
 - .2 Supervisory reporting relationships.
 - .3 Communication.
 - .4 Payroll and banking procedures.
 - .5 Work Schedules and hours.
 - .6 Camp rules.
- .5 Environmental Issues and Protection Procedures:
 - .1 Climate.
 - .2 Land use.
 - .3 Water resources/fisheries.
 - .4 Terrestrial resources.
 - .5 Heritage resources.
 - .6 Spill contingency plans/procedures.
 - .7 Training activities.
 - .8 Emissions control during burning/incineration.
- .6 General Site Specific Health and Safety:
 - .1 Team Work.
 - .2 Work attitudes/productivity.
 - .3 Anti-Harassment Policy.
 - .4 First aid procedures.
 - .5 Protective equipment and clothing.
 - .6 Safe operation of equipment and tools.
 - .7 Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .8 Wildlife awareness.
 - .9 Camp Rules
- .7 Work Specific Task Requirements:
 - .1 Asbestos abatement.
 - .2 Contaminated soil remediation.
 - .3 Demolition and material disposal.
 - .4 Transportation of Dangerous Goods (TDG).
 - .5 Permafrost protection.

- .6 Environmental mitigation procedures.
- .7 Emergency spill response training.
- .8 Barrel collection and disposal/containerization.
- .4 Prior to the start of Work, conduct Worker Orientation Seminars for all supervisors, foremen, Contractor's general workforce, Departmental Representative and Departmental Representative's Authorized Personnel staff based on the course material approved by Departmental Representative.
- .5 Each person on site will attend one of the seminars. Require each attendee to sign a record of attendance upon completion of the seminar. Retain, for Departmental Representative's review at any time, this record of attendance.

1.17 Measurement of Payment

- .1 Work under this contract will be paid for as follows:
 - .1 Lump sum pay items will be paid at the lump sum price tendered for each lump sum item listed in the Basis of Payment Form
 - .2 Unit price items will be paid at the unit price tendered for each unit price item listed in the Basis of Payment Form.
 - .3 Miscellaneous Project costs will be paid at the lump sum price tendered for "Balance of Project Costs" (BOPC) on the Basis of Pricing Form
 - .4 Level of effort for Authorized Potential Additional Work will be negotiated and paid for at firm all inclusive prices tendered for additional Work on the Basis of Payment Form.
- .2 Unit price items, lump sum pay items and provisional cost recoverable items will be paid under the Basis of Pricing, which will form the Basis of Payment Schedule of the proposed contract. All other items, whether specifically defined in the specific sections of the Specifications or not, will be paid under Item BOPC-1, Balance of Project Costs, in the Basis of Payment Schedule.
- .3 Direct costs include all costs directly attributable to a particular pay item including equipment, operators, materials, equipment maintenance and depreciation, etc. All direct costs for lump sum and unit price items are to be included in the appropriate price item in the Basis of Payment Schedule.
- .4 Indirect costs include all costs not directly attributable to the pay items including profit, supervision, overhead, administration, CGL Insurance, WSCC, allowance for equipment maintenance and depreciation repairs, and any other relevant costs. All indirect costs associated with specific unit price or lump sum items will be included in Item BOPC-1, Balance of Project Costs, in the Basis of Payment Schedule.
- .5 Include costs of any statement of, or requirement for Work, goods or services required in this section that are not covered by appropriate payment clauses in other sections in Item BOPC-1, Balance of Project Costs, in the Basis of Payment Schedule.
- .6 Notify Departmental Representative of planned Work activities in accordance with requirements of Section 01 33 00 - Submittal Procedures, and at least two (2) days in advance of operations to permit required measurements for payment.
- .7 All costs for the preparation of the Worker Orientation Seminar material and for conducting the seminars, including the preparation of meeting room facilities as required, are to be included in the unit price for Worker Orientation Seminar, Item 01 11 00-1, as indicated in the Basis of Payment Schedule.
- .8 The unit price payment for the Worker Orientation Seminar will be made in two progress instalments as follows:
 - .1 Sixty percent (60%) of the unit price payment for the Worker Orientation Seminar

will be paid upon completion by Contractor and review by Departmental Representative of the Worker Orientation Seminar course material, and upon conducting the seminar prior to the start of Work.

- .2 The remaining forty percent (40%) of the unit price payment for the Worker Orientation Seminar will be paid upon demonstration by Contractor to the Departmental Representative that all of the Contractor's workforce have attended the seminar at the start of each subsequent construction season. This payment will be made during the last construction season. The Worker Orientation Seminar will be paid under Item 01 11 00 - 1.
- .9 All direct costs for the Pre-Mobilization Site Visit are to be included in the lump sum price for Pre-mobilization Site Visit, Item 01 11 00 - 2, as indicated in Basis of Payment Schedule.
- .10 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

.1 Not used.

PART 3 - EXECUTION

3.1 Not Used

.1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 General

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.
- .2 Provide and pay for all transportation and analyses required for all Contractor's samples to an accredited laboratory to meet the requirements specified.
- .3 An on-site laboratory will provide geotechnical analysis, as described in Section 01 54 00 – Camp Facilities.
- .4 Provide and pay for all transportation required for all Departmental Representative's samples, other than those described in Part 1.1.3 above to the Departmental Representative's designated accredited laboratory via the Contractor's Charter Base.

1.2 Submittals

- .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to the Departmental Representative sixty (60) days prior to the initiation of on-site remediation activities, details of Contractor's proposed methodology to complete sampling and testing requirements including, but not limited to:
 - .1 The Contractor's proposed analytical laboratory.
 - .2 Details of proposed sampling personnel and protocols.
 - .3 Details of the proposed sample packaging and transportation methods.
 - .4 A copy of the proposed laboratory's current ISO 17025 certification valid for all analytical tests to be performed.
- .3 Proposed methods are to meet or exceed requirements of specifications, certified laboratory requirements and industry best practices. Departmental Representative will review Contractor's submittal.
- .4 The analytical testing laboratory designated by the Contractor to carry out off-site tests must be acceptable to the Departmental Representative and independent from the Contractor. The laboratory must maintain ISO 17025 certification for all tests to be performed and in advance of analytical testing.

1.3 Appointment and Payment

- .1 Departmental Representative will appoint and pay for services of testing laboratory required for the following:
 1. Confirmatory testing of hydrocarbon and metal contaminated soil as described in Section 02 61 00 Soil Remediation.
 2. Compaction and gradation testing.
 3. Testing required for quality assurance.
- .2 Appoint and pay for testing services for quality control of Contractor's own Work, including the following:
 1. Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 2. Inspection and testing performed exclusively for Contractor's convenience.
 3. Testing of potable water.
 4. Testing of hazardous waste materials and soils in accordance with all appropriate regulations for packaging, transport and off-site disposal.
 5. Testing for the classification of metal contaminated soil for licensed disposal facility acceptance requirements.
 6. Testing of soil during soil remediation treatment.

7. Testing associated with the characterization of barrel contents for the purpose of determining incineration requirements.
8. Testing associated with the characterization of barrel contents as required in the 2009 INAC Abandoned Military Sites Remediation Protocol.
9. Testing of solvent rinsate used during cleaning of barrels.
10. Testing to determine the disposal requirements of oil-absorbent material used as a filter for liquid wastes resulting from equipment decontamination, fuel tank/pipeline cleaning and barrel processing operations.
11. Testing of explosive vapour concentrations associated with degassing of tanks.
12. Testing of sewage effluent as indicated in Section 01 54 00 – Camp Facilities or as directed by Departmental Representative.
13. Testing of water resulting from all dewatering operations.
14. Testing of wash water resulting from all cleaning activities, including barrel washing and equipment decontamination.
15. Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
16. All tests required by Contractor to ensure conformance and quality control of Contractor's Work.
17. Inspection and testing required by the conditions of permits issued for the Work.
18. Testing air quality for occupational health and safety requirements during asbestos and lead abatement work.
19. Testing required for air quality and emission control during incineration.
- .3 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected Work.
- .4 The analytical testing laboratory designated by Contractor to carry out off-site tests, to be approved by Departmental Representative and certified by the Canadian Association for Environmental Analytical Laboratories (CAEAL) for the specific tests required and in advance of analytical testing. Submit copies of the laboratory's CAEAL certification to Departmental Representative upon request.

1.4 Contractor's Responsibilities

- .1 Provide labour, equipment and facilities to:
 - .1 Provide access to Work to be inspected and tested.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Instruct testing laboratory to include Departmental Representative on result distribution list via facsimile or e-mail.
- .5 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

1.5 Confirmatory Testing

- .1 Confirmatory testing will be carried out on contaminated soil areas by Departmental Representative's testing laboratory as follows:

- .1 The actual location, frequency and method of testing will be determined by Departmental Representative.
- .2 Soil sampling will be carried out by Departmental Representative within the perimeter of each contaminated soil excavation and at depth within the completed excavation area, upon completion of excavation.
- .2 If required, classification testing will be carried out at waste material processing areas to classify and delineate contaminated soil and other materials.
- .3 It is anticipated that test results will be available within approximately fourteen (14) calendar days from the date that samples are transported from the site for laboratory analysis. Deliver Departmental Representative's samples to Departmental Representative's designated testing laboratory within three (3) days maximum from site departure from Ennadai Lake. The work should be aligned in such a manner that 50% regular and 50% rush analysis would meet the schedule requirements of the project.
- .4 Be responsible for all costs associated with the packaging, preservation, handling and transport of Departmental Representative's samples from the site to Departmental Representative's designated testing laboratory. It is critically important that Contractor ensures that the samples are expeditiously delivered from the site and transferred to commercial air service. Where cargo transfers are required from charter to commercial air service, provide personnel at transfer locations to facilitate timely transfers.
- .5 Assume all responsibility for samples damaged during transport including all costs for resampling, shipping, analysis and any resulting delays.
- .6 Maintain interior temperatures of coolers at approximately 4 °C during transport using ice or ice packs.

1.6 Measurement of Payment

- .1 The provision of packaging, handling and off-site transport of Departmental Representative's samples to an accredited lab via the Contractor's Charter Base will be measured for payment by the kilogram and paid under Item 01 29 83-1, Packaging, Handling and Transport of Departmental Representative's Samples, as indicated in the Basis of Payment Schedule.
- .2 The provision of Contractor's Testing Requirements, include sampling packaging, handling, off-site transport and testing of Contractor's samples at an accredited laboratory of choice, will be measured by the sample and paid under Item 01 29 83-2, Contractor's Testing Requirements in the Basis of Payment Schedule.
- .3 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.).

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

PART 1 - GENERAL

1.1 Definitions:

- .1 Project Start-Up Teleconference: conference call to be held within ten (10) days after Contract Award and to include the Contractor and representatives from Aboriginal Affairs and Northern Development Canada (AANDC) and Public Works, Government Services Canada (PWGSC).
- .2 Pre-Construction Meeting: meeting to be held prior to Contractor Mobilization at location of Contractor's choice and to include the Contractor and representatives from AANDC and PWGSC.
- .3 Seasonal Meeting: meeting to be held between construction seasons at location of Contractor's choice and to include the Contractor and Departmental Representatives from AANDC and PWGSC.
- .4 Monthly Meeting: meeting to be held on-site at approximately monthly intervals during the construction season and to include the Contractor and representatives from AANDC and PWGSC.
- .5 Pre-Mobilization Site Visit: Contractor's visit to the site to check field conditions and obtain actual conditions required to ensure correct execution of the Work prior to site mobilization.
- .6 Construction Meeting: meeting to be held on-site at approximately weekly intervals during the construction season and to include the Contractor and Departmental Representative.
- .7 Tailgate Meeting: meeting to be held on-site daily during the construction season and to include Contractor, all construction staff, on-site Departmental Representative and Departmental Representative's authorized personnel.
- .8 Community Meeting: meeting to be held prior to the commencement of each field season and after the final construction season in English and Inuktitut with Departmental Representative, AANDC, local leaders, officials, authorities and public.

1.2 Administrative

- .1 Responsibilities of Departmental Representative:
 - .1 Schedule and administer Project meetings throughout the progress of the Work at the call of Departmental Representative.
 - .2 Prepare agenda for meetings unless otherwise specified.
 - .3 Distribute written notice of each meeting five (5) days in advance of meeting date, except for Tailgate Meetings.
 - .4 Preside at meetings unless otherwise specified.
 - .5 Record the meeting minutes unless otherwise specified. Include significant proceedings and decisions. Identify actions by parties.
 - .6 Reproduce and distribute copies of minutes within three (3) days after meetings and transmit to meeting participants and affected parties not in attendance.
- .2 Responsibilities of Contractor:
 - .1 Provide physical space and make arrangements for meetings.
 - .2 Representative of Contractor, Sub-Contractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 Project Start-up Teleconference Meeting

- .1 Within ten (10) days after award of Contract, request a meeting of parties in the contract to discuss and resolve administrative procedures and responsibilities. The meeting will be a teleconference between all parties in attendance.

- .2 Departmental Representative, Contractor, AANDC, major Sub-Contractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned a minimum of five (5) days before the meeting.
- .4 Departmental Representative will chair the meeting and take minutes. Meeting will be informal and agenda to include the following:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Preliminary Schedule of Work.
 - .3 Preliminary Schedule of submission of Work Plan and Cost Breakdown and other submissions.
 - .4 Preliminary requirements for temporary facilities, site security, camp facilities, equipment and proposed methods of mobilization and demobilization.
 - .5 Set-up of Pre-Construction Meeting.

1.4 Pre-Construction Meeting

- .1 As per Project Start-up Teleconference Meeting, request a meeting of parties in the contract to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representative, Contractor, AANDC, major Sub-Contractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned a minimum of five (5) days before the meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Schedule of Work: in accordance with Section 01 32 18 - Construction Progress Schedules Bar (GANTT) Chart.
 - .2 Schedule of submission in accordance with Section 01 33 00 - Submittal Procedures including but not limited to:
 - .1 Site Specific Health and Safety Plan, Emergency Response Plan, Spill Contingency Plan, and Wildlife Management Plan
 - .2 Insurances and transcripts
 - .3 Equipment to be used by Contractor
 - .4 Proposed camp facilities in accordance with Section 01 54 00 - Camp Facilities.
 - .5 Location of equipment and proposed methods for mobilization and demobilization.
 - .6 Shop drawings
 - .3 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .4 Delivery Schedule of specified equipment.
 - .5 Site security in accordance with 01 54 00 - Camp Facilities.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .7 Departmental Representative provided products.
 - .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .11 Monthly progress claims, administrative procedures, and hold backs.

- .12 Appointment of inspection and testing agencies or firms.
- .13 Regulatory Issues.
- .14 Aboriginal involvement and reporting.
- .15 Project photographs requirements.
- .16 Requirements for Waste Management.

1.5 Pre-Mobilization Site Visit

- .1 Prior to mobilization, perform a Pre-Mobilization Site Visit to check field conditions and obtain actual conditions required to ensure correct execution of the Work.
- .2 Provide a minimum of seven (7) days notice to Departmental Representative prior to examining the site.
- .3 Departmental Representative, Contractor, and AANDC will be in attendance.
- .4 Notify Departmental Representative in writing by submitting a Pre-Mobilization Site Visit Report within seven (7) days of completing the visit, of all matters which could prejudice proper execution of the Work.

1.6 Monthly Progress Meetings

- .1 Department Representative will schedule Monthly Progress Meetings to be held on-site.
- .2 Departmental Representative, Contractor, AANDC, major Sub-Contractors and supervisors will be in attendance.
- .3 Departmental Representative will notify parties five (5) days prior to meetings.
- .4 Departmental Representative will record minutes of meetings and circulate to attending parties and affected parties not in attendance shortly after meeting.
- .5 Agenda may include the following:
 - .1 Summary of the previous month's site activities.
 - .2 Comparison of progress achieved with the Project Schedule.
 - .3 Schedules and action Contractor plans to take to get back on Schedule, if required.
 - .4 Confirmation of quantities.
 - .5 Health, safety and security issues.
 - .6 Summary of interactions with Authority Having Jurisdiction.
 - .7 Work plan for the following month.
 - .8 Camp requirements.
 - .9 Other business.

1.7 Seasonal Meetings

- .1 Request a meeting of parties in contract to discuss the previous and upcoming construction season and resolve issues arising from same.
- .2 Departmental Representative, Contractor, AANDC, major Sub-Contractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum ten (10) days before meeting.
- .4 Departmental Representative will preside.
- .5 Agenda may include:
 - .1 Summary of the previous season's site activities.
 - .2 Comparison of progress achieved with the Project Schedule.
 - .3 Schedules and action Contractor plans to take to get back on Schedule, if

required.

- .4 Confirmation of quantities.
 - .5 Health, safety and security issues.
 - .6 Summary of interactions with Authority Having Jurisdiction.
 - .7 Work plan for the following season, if any.
 - .8 Camp requirements.
- .6 Departmental Representative will record minutes of meetings and circulate to attending parties and affected parties not in attendance within seven (7) days after meeting.

1.8 Construction Meetings

- .1 During course of Work and weeks prior to Project completion, Departmental Representative will schedule construction progress meetings weekly.
- .2 Contractor, major Sub-Contractors involved in Work and Departmental Representative are to be in attendance.
- .3 Departmental Representative will record minutes of meetings and circulate to attending parties and affected parties not in attendance shortly after meeting.
- .4 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction Schedule.
 - .5 Review of off-site fabrication delivery Schedules.
 - .6 Project Schedule review, identifying activities that are behind Schedule and providing measures to regain slippage.
 - .7 Corrective measures and procedures to regain Projected Schedule.
 - .8 Revision to construction Schedule.
 - .9 Progress Schedule, during succeeding Work period.
 - .10 Review submittal Schedules: expedite as required.
 - .11 Maintenance of quality standards.
 - .12 Review proposed changes for effect on construction Schedule and on completion date.
 - .13 Health, Safety and Security issues.
 - .14 Correspondence from Authorities Having Jurisdiction (AHJ) or expected visits from AHJ.
 - .15 Camp requirements.
 - .16 Other business.
- .5 Provide written explanations on activities which are overrunning estimated time. If any such activities are on the critical path, indicate what corrective action will be taken to bring them back on Schedule.

1.9 Daily Tailgate Meetings

- .1 Contractor to preside over daily tailgate meetings with all construction staff and document minutes with daily reporting requirements.

1.10 Community Meetings

- .1 Prior to the commencement of work before each field season, and after the final construction season is completed, arrange meetings with Departmental Representative, AANDC, local leaders, officials, authorities and public in Arviat, Whale Cove and Rankin Inlet, Nunavut. Be prepared to discuss local hiring practices and any other items of

operations which may impact upon the local communities. Minutes will be taken by Departmental Representative.

- .2 Contractor is responsible for advertising the community meeting at least seven (7) days in advance of the meeting. The meeting must be advertised in the local paper, on local radio, and posted within the town office, arena and community centre (if applicable). Postings and radio advertisements are to be pre-approved by AANDC and the Departmental Representative. Proof of advertising and postings must be presented to the Departmental Representative.
- .3 Conduct presentations via computer and projector using "Power Point" software. Provide wording in English and simultaneous translation in Inuktitut during the presentation. Submit presentations to Departmental Representative for review a minimum of 14 days prior to each community meeting.
- .4 Provide and pay for the following associated with these meetings:
 - .1 Meeting facility rental
 - .2 Coffee, tea, pastries, cookies, etc.
 - .3 Translator costs
 - .4 All associated advertising costs.

1.11 Submittals

- .1 Submit Preliminary Construction Schedule to Departmental Representative within seven (7) working days of Contract Award.
- .2 Submit ninety (90) days prior to mobilization, preliminary shop drawings, product data and samples in accordance with 01 33 00 – Submittal Procedures for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Departmental Representative.
- .3 Submit requests for payment for review, and for transmittal to Departmental Representative.
- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Departmental Representative.
- .5 Submit and process substitutions through Departmental Representative.
- .6 Submit and process task authorizations and change orders through Departmental Representative.
- .7 Deliver closeout submittals for review to Departmental Representative.
- .8 Provide submittals to the Departmental Representative for review. Include submittals as noted in Table 01 33 00-1 in Section 01 33 00 – Submittal Procedures.

1.12 Measurement of Payment

- .1 All direct costs for the Pre-construction Meeting are to be included in the lump sum price for Pre-construction Meeting, Item 01 31 19-1, as indicated in Basis of Payment Schedule. Contractor will be responsible for travel and accommodation costs for its own personnel only.
- .2 Include all direct costs for the Pre-mobilization Site Visit in the lump sum price for Pre-mobilization Site Visit, Item 01 11 00-2, as indicated in the Basis of Payment Schedule.
- .3 All direct costs for the Seasonal Meetings are to be included in the unit price bid for Seasonal Meetings at Location of Contractor's Choice, Item 01 31 19-2, as indicated in Basis of Payment Schedule. Contractor will arrange for meeting facilities. Contractor will be responsible for travel and accommodation costs for its own personnel only.
- .4 The facilitation of Monthly Progress Meetings will be measured for payment by the

meetings held and paid under Item 01 31 19-3, Monthly Progress Meetings, in the Basis of Payment Schedule.

- .5 The provision of return transportation from Contractor's charter base to Ennadai of Departmental Representative's personnel during the Monthly Meetings will be measured by the number of person return trips, as described in Section 01 54 00 - Camp Facilities, and paid under item 01 54 00-4, Return Transportation – Charter Base to Ennadai, as indicated in the Basis of Payment Schedule.
- .6 The facilitation of Community Meetings in Arviat, Whale Cove and Rankin Inlet are considered one community meeting. They are to be scheduled together, and will be measured for payment by the number of meetings held and paid under Item 01 31 19-4, Community Meetings, as indicated in the Basis of Payment Schedule.
- .7 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Definitions

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of Schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized Project management system.
- .3 Baseline: original approved plan (for Project, Work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Sunday, inclusive, will provide seven (7) days Work week and define Schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of Work periods (not including holidays or other nonworking periods) required to complete activity or other Project element. Usually expressed as workdays or workweeks.
- .6 Milestone: significant event in Project, usually completion of major deliverable.
- .7 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones; dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives; monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout Project life cycle.

1.2 Requirements

- .1 Ensure detailed Schedule is practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Provide and maintain a work schedule showing anticipated progress stages and final completion of work within time period required by Contract.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.
- .5 Prepare the schedule using critical path analysis techniques, showing resource loading. Identify tasks that lie on the critical path. Show total float for all activities.

1.3 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Project Schedule to Departmental Representative within five (5) working days of acceptance of preliminary construction schedule.

1.4 Project Schedule

- .1 Develop detailed Project Schedule.
- .2 Ensure detailed Project Schedule includes the following as minimum milestone and activity types:
 - .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.

- .4 Mobilization.
- .5 Camp setup.
- .6 Structure demolition.
- .7 Non-hazardous debris collection and disposal.
- .8 Excavation and treatment of hydrocarbon contaminated soil.
- .9 Excavation and disposal of metal contaminated soil.
- .10 Collection and disposal of hazardous materials.
- .11 Regrading.
- .12 Restoration of disturbed areas.
- .13 Camp shut down.
- .14 Interim Certificate of Completion.
- .15 Demobilization.
- .16 Closeout Submittals.
- .17 Final Certificate of Completion.
- .3 Submit preliminary construction progress Schedule in accordance with Section 01 33 00 - Submittal Procedures to Departmental Representative coordinated with Departmental Representative's Project Schedule.
- .4 After review, revise and resubmit Schedule to comply with revised Project Schedule.
- .5 During progress of Work revise, update and resubmit the Project Schedule as directed by Departmental Representative. Provide the Revised Project Schedule a minimum of three (3) days prior to scheduled monthly meetings, or as directed by Departmental Representative.
- 1.5 Project Progress Reporting
 - .1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.
 - .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.
- 1.6 Construction Meetings
 - .1 Discuss Project Schedule at Construction Meetings, identify activities that are behind Schedule and provide measures to regain slippage. Activities considered behind Schedule are those with projected start or completion dates later than current approved dates shown on baseline Schedule.
 - .2 Weather related delays with their remedial measures will be discussed and negotiated.
- 1.7 Cost and Quantity Control
 - .1 Provide a Contract Work Breakdown Structure (CWBS) based on Contractor's Cost Breakdown and any modifications requested by Departmental Representative as follows:
 - .1 CWBS to be an organization of the Work to be performed, services to be provided and data to be submitted by Contractor, as well as payments to be made to Contractor under the terms of the Contract.
 - .2 The CWBS to clearly define the Work elements of each item of the CWBS.
 - .3 The CWBS to include a breakdown of pay items included under Item BOPC -1, Balance of Project Costs in the Basis of Payment Schedule. All unit price, lump sum, and provisional cost sum allowance pay items included in the Basis of Payment Schedule to also be included in the CWBS.

- .4 Prepare the CWBS in computerized spreadsheet format compatible with the most recent release of Microsoft Excel software. Provide CWBS in hard copy format.
- .5 Submit the CWBS within thirty (30) days following contract award date.
- .2 Equipment and Material Control:
 - .1 Record data on status of construction material and equipment and report upon Departmental Representative's request.
- .3 Manpower Performance Measures:
 - .1 Record and report manpower listing for each company employed under this Contract, including Sub-Contractors, detailing daily man-hours during the current month and cumulative total to date and report upon Departmental Representative's request.
 - .2 Provide statistical reporting.
 - .3 Provide statistics related to lost time accidents upon Departmental Representative's request.
 - .4 Monthly Performance Measures Templates are included in this specification in the Appendix.

1.8 Measurement of Payment

- .1 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Definition

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

1.2 Administrative

- .1 Submit to Departmental Representative submittals listed for review. Submittal list is bound into specification section and is for information only. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal is not to proceed until review is complete.
- .3 Present shop drawings and product data, in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 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 Documents. Submittals not stamped, signed, dated and identified as to specific Project will be returned without being examined and will be considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .9 Keep one (1) reviewed copy of each submission on site.

1.3 Shop Drawings Submission

- .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .2 Submit shop drawings bearing stamp and signature of qualified professional Departmental Representative registered or licensed in Territories of Nunavut, Canada as required.
- .3 Submit Preliminary Shop Drawings ninety (90) days prior to mobilization. Submit Final Shop Drawings forty-five (45) days prior to mobilization.
- .4 Allow seven (7) days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

- .7 Verify in shop drawings:
 - .1 Field measurements.
 - .2 Field construction criteria.
 - .3 Catalogue numbers and similar data.
- .8 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .9 Submissions to include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Sub-Contractor.
 - .2 Supplier.
 - .3 Manufacturer.
- .10 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .11 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Single line and schematic diagrams.
 - .9 Relationship to adjacent Work.
- .12 After Departmental Representative's review, distribute copies.
- .13 Submit three (3) prints and an electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .14 Delete information not applicable to Project.
- .15 Supplement standard information to provide details applicable to Project.
- .16 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, two (2) copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .17 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.

- .1 This review does not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which remains with Contractor, and such review does not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents.
- .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.4 Samples

- .1 Submit for review samples in triplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's business address site office.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 Photographs

- .1 Provide digital photos in "Joint Photographic Experts Group" (.jpg) format for Progress Photographs and Final Photographs.
- .2 Digital photographs to have a minimum of 2,592 x 1,944 pixel (5 Megapixel) resolution.
- .3 Progress and Final Photographs to be submitted on a compact disc (CD). Provide one (1) copy of the Progress Photographs, and two (2) copies of the Final Photographs.
- .4 Printed (colour) copies of digital photographs to be provided for Final Photographs only:
 - .1 Size: 100 mm x 125 mm.
 - .2 Two (2) digital photographs per 215 x 280 mm page.
 - .3 Pages to be white, of photographic quality paper and to be three-hole punched, ready for insertion into a three-ring binder. Binder(s) to be vinyl, hard-covered, 3 inch D ring, sized for 215 x 280 mm paper, with spine pocket.
- .5 Identification: Typewritten or generated by computer, the name and number of the Project on cover and spine of binder and CD case. Each photograph to be labelled with the digital photo file name positioned so as to not interfere with the view of the main activity or feature presented on the photograph. Also provide a description of each photograph in photographic log format. Photographic log to be included with each computer disk, CD, and binder. Description to include:
 - .1 Digital photograph file name.
 - .2 Name and description of feature.
 - .3 View direction.
 - .4 Date of exposure.
 - .5 GPS location. If taking multiple photographs of the same activity in same location, first photo must have GPS location.
 - .6 Before and after photograph of location.

- .6 Quantity: Provide sufficient number of photographs to adequately describe the Work activities carried out during the reporting period. A minimum of two (2) photographs taken from two viewpoints are to be provided for each clean-up/construction activity. Viewpoint locations for final digital photographs to be determined by Departmental Representative.
 - .7 Submit progress photographs monthly with last monthly report or as directed by the Departmental Representative.
 - .8 Provide two (2) sets in two binders of final digital photographs.
 - .9 Submit final photographs prior to final progress payment request.
- 1.6 Measurement of Payment
- .1 All direct costs for the submittal of shop drawings, samples, and photographs are to be included in the lump sum price for Submittals, Item 01 33 00 - 1, as indicated in Basis of Payment Schedule.
 - .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

Table 01 33 00-1: Contractor Submittal Schedule

Specification Section	Description	Date
01 11 00	Worker Orientation Course Seminar Information	30 days prior to seminar
01 11 00	Record of Attendance at Training Seminar	Upon Departmental Representative's request
01 11 00	Planned work activities to permit required measurements for payment	2 days in advance of operations
01 11 00	Pre-mobilization Site Visit	7 day in advance of site visit
01 29 83	Proposed methods for sampling and testing	60 days prior to remediation activities
01 29 83	CAEAL Laboratory Certification	Upon Departmental Representative's request
01 31 19	Community Meeting Presentation	7 days prior to meeting
01 31 19	Preliminary Construction Schedule	7 days after Contract Award
01 31 19	Preliminary Shop Drawings	90 days prior to mobilization
01 32 18	Project Schedule	5 days after acceptance of Preliminary Construction Schedule
01 32 18	Progress Reports	Monthly with progress statement
01 32 18	Contractor Work Breakdown Structure (CWBS) - Cash flow projections	30 days after Contract Award
01 32 18	Monthly Statistical Reporting	Monthly with progress statement
01 33 00	Document Submittals	Monthly with progress statement
01 33 00	Progress Photographs	Monthly with progress statement
01 33 00	Final Photographs	Prior to final progress payment request
01 33 00	Final Shop Drawings	45 days prior to mobilization
01 35 00.06	Traffic Accommodation Strategy	30 days prior to commencing Work
01 35 32	Site Specific Health and Safety Plan	30 days after Contract Award
01 35 32	Yearly Updated Site Specific Health and Safety Plan	30 day prior to start of each construction season
01 35 32	Proof of PPE certification and PPE Program	10 days prior to Work activities
01 35 32	Minutes of Weekly Safety Meetings	Within 3 days of meeting
01 35 32	Report Accidents	Verbal report immediately, followed by written report in 24 hours
01 35 32	Wildlife Management Plan	45 days after Contract Award
01 35 43	Details of Sewage / Disposal System	60 days after Contract Award
01 35 43	Erosion, Sediment and Drainage Control Plan	Prior to commencing Work
01 35 43	Work Plan for Work Near Waterbodies	Prior to commencing Work
01 35 43	Copies of Environmental Agency Submittals/Approvals	As required
01 53 00	Mobilization and Demobilization Plan	30 days after Contract Award
01 54 00	Construction Camp Location Plan	20 days after pre-mobilization site visit
01 54 00	Plan of Detailed Camp Layout and Siting	60 days after pre-mobilization site visit
01 54 00	Potable Water test results	Before opening camp
01 54 00	Camp Licences, permits, authorizations	Prior to establishing camp.
01 54 00	Proof of Adherence to Environmental Regulations	Before opening camp
01 54 00	Sketch of Proposed Field Laboratory	Prior to mobilization
01 54 00	Camp Rules	Prior to commencing camp operations
01 61 00	Material and Equipment List	20 days after Contract Award
01 71 01	Surveyor Information	30 days prior to construction commencement each season
01 71 01	Survey Data Submissions	As required and with Progress Claims
01 71 01	Survey Equipment Calibration Records	30 days prior to construction commencement each season
01 78 00	Manufacturers' Data Books	As required
01 78 00	All Records and Survey Information	Prior to project completion
02 41 16	Demolition Plan	30 days after Contract Award
02 41 16	Photographic record of demolition activities	Prior to project completion
02 61 00.01	Product information for all products used during remediation	Within 7 days of Departmental Representative's request
02 61 00.01	Soil Remediation Plan	Within 30 days of Contract Award
02 61 00.01	Remedial Updates and Remedial Plan revisions (if required)	End of each treatment season
02 81 01	Product Data, MSDS sheets	As requested by Departmental Representative
02 81 01	Hazardous Materials Management Plan	Prior to Work commencement
02 81 01	Shipping documents and waste manifests for hazardous waste	As required and with Progress Claims
02 82 00	Proof of Contractor asbestos liability insurance	Prior to Work commencement
02 82 00.01	Proof of appropriate notices and permits	Prior to Work commencement
02 82 00.03	Proof of supervisor attendance at asbestos abatement course	Prior to Work commencement
02 82 00.03	Layout of decontamination facilities	Prior to Work commencement
02 83 10	Proof of general and environmental liability insurance	Prior to Work commencement
02 83 10	Proof of appropriate notices and permits	Prior to Work commencement

Table 01 33 00-1: Contractor Submittal Schedule

Specification Section	Description	Date
02 83 11	Proof of supervisor attendance at lead abatement course	Prior to Work commencement
02 84 00	Workplace Safety and Insurance Broad Certificate and Insurance Certificates	Prior to Work commencement
02 84 00	Certificate of Approval for transportation and disposal of PCB Waste	Prior to Work commencement
02 84 00	PCB Management Plan	4 weeks prior to commencement of Work
31 05 16	Location of proposed borrow sources	30 days after contract award
31 22 13	Location of asbestos in landfill on Project drawings	Upon landfill closure
31 23 33	Notice of excavation work	7 days prior to commencing work
31 23 33	Dewatering and heave protection measures	As requested by Departmental Representative
31 23 33	Culvert installation and removal plan	30 days prior to installation
31 32 19.01	Geotextile approval	Prior to installation
31 32 19.01	Geotextile samples	4 weeks prior to commencement of Work
31 32 19.01	Geotextile mill test and evaluation report	4 weeks prior to commencement of Work
31 32 19.02	Geomembrane approval	Prior to installation
31 32 19.02	Geomembrane samples	4 weeks prior to commencement of Work
31 32 19.02	Geomembrane certificates	4 weeks prior to commencement of Work
34 73 16.13	Ice engineering design	2 months prior to construction
34 73 16.13	Ice monitoring and Safety Procedures (IMSP)	2 months prior to construction
34 73 16.13	Construction and Monitoring Action Plan	2 months prior to construction

PART 1 - GENERAL

1.1 References

- .1 Not used

1.2 Protection of Site Personnel

- .1 Comply with requirements of Acts, Regulations and By-Laws 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.
- .2 Prepare a traffic accommodation strategy (TAS) that outlines, as a minimum, access, traffic management, personnel access to high traffic areas, signage and / or warning devices. TAS must be submitted thirty (30) days before Work commences and approved by the Departmental Representative and in accordance with Section 01 33 00 – Submittal Procedures.
- .3 When working on travelled way:
 - .1 Place equipment in position to minimize interference and hazard to site personnel.
 - .2 Keep equipment units as close together as working conditions permit.
 - .3 Do not leave equipment on travelled way overnight.
- .4 Keep travelled way graded, free from pot holes and of sufficient width for required Work.
- .5 Provide access as directed by Departmental Representative to facilitate passage of traffic and personnel around restricted construction area.
- .6 Provide and maintain access and egress to Work under Contract and in other areas as required, except where other means of access exist that meet approval of Departmental Representative.

1.3 Informational and Warning Devices

- .1 Provide and maintain signs, flashing warning lights and / or other devices as required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and other warning devices in accordance with TAS.
- .3 Meet with Departmental Representative on site prior to commencement of Work to review TAS. If situation on site changes from the approved TAS, revise to approval of Departmental Representative.
- .4 Continually maintain traffic control devices in use:
 - .1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - .2 Remove or cover signs which do not apply to conditions existing from day to day.

1.4 Measurement of Payment

- .1 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 – Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 **Not Used**

.1 Not Used.

PART 3 - EXECUTION

3.1 **Not Used**

.1 Not Used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Definitions

- .1 Process wastewater: Water from decontamination activities, water from dewatering work areas, potentially contaminated groundwater, contact water, and/or any other liquid effluent stream created or encountered during Work activities.
- .2 Contact water: Water that has been in physical contact with known petroleum hydrocarbon contaminated soil, either in defined soil excavations or excavated soil in treatment areas or stockpiles.
- .3 Camp wastewater: Wash water, rinse water, water from operations of camp facilities, and/or any other liquid effluent stream created or encountered during camp activities.
- .4 Processed wastewater: Wastewater processed through the wastewater treatment facility.
- .5 Treated wastewater: Processed wastewater which has been tested and shown to be in compliance with applicable discharge criteria and requirements of this Section and Section 01 35 43 – Environmental Procedures.

1.2 Regulatory Requirements

- .1 Comply with federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.

1.3 Submittals

- .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures

1.4 Equipment Decontamination

- .1 Prior to commencing Work involving equipment contact with potentially contaminated materials, clean soil lumps and particulates from soil excavating and processing equipment prior to mobilization.
- .2 Decontaminate equipment, including tracks and buckets, after working in contaminated Work areas and prior to subsequent Work or travel on clean areas.
- .3 At minimum, perform the following steps during decontamination of equipment:
 - .1 Mechanically remove loose waste solids, grit, dirt, and debris by manual method without using steam or high-pressure water to minimize water usage and potential for contaminated rinsate generated.
 - .2 If decontamination cannot be achieved using the above, use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and approved by Departmental Representative. Perform assessment as directed by Departmental Representative, to determine effectiveness of decontamination.
 - .3 Collect and dispose of the removed solid materials with like materials.
 - .4 Contain any rinsate if created during the removal process of solid waste as contact water. Contain soil removed from equipment with like material.
- .4 Perform final decontamination of the equipment, and materials which may have come in contact with contaminated materials prior to off-site removal.
- .5 Equip personnel engaged in equipment decontamination with personnel protective equipment including suitable disposable clothing, respiratory protection, and face shields as required.
- .6 Each piece of equipment may be inspected by Departmental Representative or designate after decontamination and prior to removal from site and/or travel on clean areas.
- .7 Departmental Representative will have the right to require additional decontamination to be

completed, if deemed necessary.

- .8 Take appropriate measures necessary to minimize drift of mist and spray during decontamination, including provision of wind splash screens, as required.

1.5 Soil Stockpiling Facilities

- .1 Provide, maintain, and operate storage/stockpiling facilities as specified in Section 31 23 33 01.
- .2 Install geomembrane liner below all proposed stockpile locations to prevent contact between stockpile material and ground. With the exception of non-contaminated soils, the geomembrane liner shall be raised at the edges to facilitate collection of any liquids draining from the soils. Cover all stockpiles with tarps capable of completely covering stockpiled material at all times, unless materials are being added to or taken from the stockpiles.
- .3 Segregate all contaminated soil from non-contaminated soil in separate stockpiles.
- .4 The Contractor shall prevent the escape of any liquids from contaminated or impacted stockpiles from escaping from the geomembrane liners. Liquids shall be contained and transferred to the wastewater treatment facility.

1.6 Wastewater Treatment Facility Design Requirements

- .1 Submit design details of wastewater treatment facilities conforming to requirements of Authorities Having Jurisdiction sixty (60) days after contract award date. Wastewater treatment facility designs will be stamped by an Engineer registered or licensed to practice in the Territory of Nunavut.
- .2 Contain wastewater separately from the following sources:
- .1 Camp Operations; including but not limited to, grey water, kitchen sumps, traps and blackwater.
- .2 Contact water from dewatering or from the draining of water from soil in the event that submerged impacted soils are encountered.
- .3 All other process wastewater; including but not limited to, wastewater streams from decontamination, process water, contact water and wash/rinse water.
- .3 Wastewater Treatment Facilities:
- .1 Design wastewater treatment facilities capable of treating water generated from dewatering excavations, process water and Work areas to meet the following requirements:

Parameter	Maximum Allowable Concentration
Volatile Hydrocarbons	15 mg/L
Extractable Hydrocarbons	5 mg/L
Oil and Grease	5 mg/L, non visible
Non-Aqueous Phase Liquid / Free Product	Not Present
pH	6 to 9
Arsenic (total)	100 µg/L
Cadmium (dissolved)	10 µg/L
Chromium (total)	100 µg/L
Cobalt (dissolved)	50 µg/L
Copper (dissolved)	200 µg/L
Lead (dissolved)	50 µg/L
Mercury (total)	0.6 µg/L
Nickel (dissolved)	200 µg/L
Zinc (total)	500 µg/L
Phenols	20 µg/L
PCBs	1,000 µg/L

- .2 Design wastewater treatment facilities capable of treating water generated from camp operations to meet the following requirements:

Parameter	Maximum Allowable Concentration
pH	6 to 9
Oil and Grease	5 mg/L and none visible
Total Suspended Solids	100 mg/L
BOD (Biochemical Oxygen Demand)	80 mg/L
Fecal Coliforms	10,000 CFU/dL
Residual Chlorine	0.1 mg/L

- .3 Provide separate storage for wastewater generated by camp operations and wastewater generated from remediation activities.
- .4 Ensure that discharges from the site are in compliance with applicable permit requirements/limitations and Land Use Permit. Make adjustments to process or provide alternative equipment (at no additional cost) such that wastewater meets the applicable discharge criteria.
- .5 Provide suitable piping to transfer liquid/solid mixtures generated operations which require water treatment to wastewater treatment facility.
- .6 Ensure wastewater treatment facilities are capable of receiving liquid/solid mixtures to not cause delay to dewatering operations.
- .7 Ensure wastewater treatment facilities are capable of oil/water separation.
- .8 In the event of a discrepancy between the above listed wastewater requirements and those provided in the Land Use Permit, the requirements in the Land Use Permit will govern.
- .9 Provide adequate storage for treated wastewater such that samples of treated wastewater can be obtained and analyzed prior to discharge.
- .1 Salvage of tanks on site is permitted, provided that the tanks are empty and clean prior to use.
- .2 Wastewater storage ponds meeting all requirements of AHJ are permitted.
- .4 Installation:
- .1 Provide labour, materials, and equipment and do Work required for setup and construction of wastewater treatment facility.
- .2 Install component systems in accordance with installation procedures and as indicated.
- .3 Following installation of system, implement initial operation test in accordance with procedures developed by Contractor and submitted to Departmental Representative for review.
- .4 Install piping in accordance with manufacturer's instructions and test for leakage using potable water prior to commencing dewatering and filtering operations.
- .5 Initial Testing: Performance of wastewater treatment facility provided by Contractor will initially be determined by Departmental Representative.
- .6 Operation:
- .1 Obtain and analyze influent and effluent samples required to operate the system.
- .2 Make system modifications required for effluent to satisfy effluent criteria based on analytical results.
- .3 Operate wastewater treatment facility by experienced, qualified personnel in accordance with manufacturer's instructions and procedures submitted by Contractor and approved by Departmental Representative.

- .4 Operate the wastewater treatment facility such that storage tanks and storage ponds are either empty at the end of the construction season or have allowances for expansion of water due to freezing.
- .7 Decommissioning/Dismantling:
 - .1 Decontaminate and remove salvageable components of wastewater treatment facility including water filtering system, pumps, piping, and electrical equipment.
 - .2 Dispose of non-salvageable equipment and materials at approved off-site disposal facility. Decontaminate salvageable equipment within facility area as required prior to removal from site.

1.7 Wastewater Storage Tanks

- .1 Provide, operate, and maintain wastewater storage tanks to store wastewater.
- .2 Wastewater includes hand basin, shower, and laundry wastewater from Personnel Hygiene/Decontamination Facility; water collected from dewatering operations; and water collected from Equipment Decontamination Facility.
- .3 Store wastewater from dewatering excavations, process water and Work areas in a separate tank from wastewater from camp operations.
- .4 If toilet facilities are provided in Personnel Hygiene/Decontamination Facility, store wastewater from these toilets with wastewater from hand basins, showers, and laundry for ultimate disposal off site.
- .5 Store processed wastewater from dewatering excavations, process water and Work areas in a separate tank from processed wastewater from camp operations.
- .6 Provide pumps and piping to convey collected wastewater to designated wastewater storage tanks; provide wastewater storage tanks with minimum total live capacity 20,000 L each such that effluent quality can be analyzed and approved prior to discharge on-site.
- .7 Install wastewater storage tanks in locations as directed by Departmental Representative.
- .8 Support wastewater storage tank[s] on temporary aboveground foundation[s].
- .9 Connect pumps, piping, valves, miscellaneous items, and necessary utilities as required for operation of facilities; and protect tanks, valves, pumps, piping, and miscellaneous items from freezing.
- .10 Do not operate wastewater storage tanks until inspected and approved by Departmental Representative.
- .11 Notify Departmental Representative three (3) days minimum in advance of when wastewater storage tank is anticipated to be full.
 - .1 Do not discharge additional liquids to filled tank following sampling by Departmental Representative.
 - .2 Departmental Representative will determine appropriate disposition of wastewater based on sample analysis.
- .12 If processed wastewater does not meet discharge requirements, re-treat the wastewater or transport and dispose of wastewater off-site.
- .13 Treated wastewater will be released onto the ground at a location that is a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters, and will conform to the discharge requirements set out in the Land use Permit and only upon approval from the Departmental Representative.
- .14 Be responsible for transporting and disposing of wastewater to off-site disposal facility in the event that the on-site facility is not functioning.

1.8 Drums

- .1 Storage of Liquid Waste: use steel containers meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.
- .2 Storage of Solid Waste: use steel containers meeting Transportation and Dangerous Goods Act, closable lids, complete with labels for marking contents and date filled.

1.9 Dust and Particulate Control

- .1 Execute Work by methods to minimize raising dust from construction operations.
- .2 Implement and maintain dust and particulate control measures immediately during construction and in accordance with all applicable regulations.

1.10 Water Control

- .1 Maintain excavations free of water.
- .2 Protect site from ponding or running water. Grade site to drain. Provide water barriers as necessary to protect site from soil erosion and runoff of potentially impacted water and soil.
- .3 Prevent surface water runoff from leaving Work areas.
- .4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material without testing and confirmation it meets applicable guidelines for discharge.
- .5 Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable tarp during periods of Work stoppage including at the end of each working day and as directed by Departmental Representative.
- .6 Control surface drainage including ensuring that drainage paths are kept open, water is not directed across or over roads or pathways except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to a suitable outlet.
- .7 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.
- .8 Dispose of water in a manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.
- .9 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other Work areas free from water.
- .10 Contain water from stockpiled materials. Transfer potentially contaminated surface waters to wastewater storage tanks separate from wastewater from camp operations.
- .11 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.
- .12 Contain and collect wastewater and transfer such collected wastewater to Contractor-supplied drums for off-site disposal or wastewater storage tanks/ponds for transfer to on-site treatment facilities.

1.11 Dewatering

- .1 Dewater various parts of Work including, without limitation, excavations, structures, foundations, and Work areas.
- .2 Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.
- .3 Provide sufficient and appropriate labor, plant, and equipment necessary to keep Work free of water including standby equipment necessary to ensure continuous operation of dewatering system.

- .4 Take precautions necessary to prevent uplift of any structure or pipeline and to protect excavations from flooding and damage due to surface runoff.
- .5 Test and analyze water generated from dewatering activities and treat to meet required discharge or disposal criteria.

1.12 Erosion and Sediment Control

- .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.
- .2 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Strip vegetation, re-grade, or otherwise develop in such a way as 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 directed by Departmental Representative.
- .3 Provide and maintain temporary measures which may include, but are not limited to, silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, vegetative cover, dikes, and any other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction.
- .4 Plan construction procedures to avoid damage to Work or equipment encroachment onto water bodies or drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank or water body to existing condition.
- .5 Installation:
 - .1 Construct temporary erosion control items as indicated. Actual alignment and/or location of various items as directed by Departmental Representative.
 - .2 Do not construct silt fence in flowing streams or in swales.
 - .3 Check erosion and sediment control measures weekly and after each rainfall event. During prolonged rainfall check daily.
 - .4 Silt fence may be removed at beginning of workday, but will be replaced at the end of workday.
 - .5 Whenever sedimentation is caused by stripping vegetation, re-grading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.
 - .6 Prior to or during construction, Departmental Representative may require the installation or construction of improvements to prevent or correct temporary conditions on site. Improvements may include berms, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by Departmental Representative.
 - .7 Unless indicated or directed by Departmental Representative, remove temporary erosion and sediment control devices upon completion of Work. Spread accumulated sediments to form a suitable surface for native plant growth or dispose of, and shape area to permit natural drainage to satisfaction of Departmental Representative.
- .6 Construct fill areas by selective placement to avoid erosive surface silts or clays.
- .7 Do not disturb existing embankments or embankment protection.
- .8 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

- .9 If soil and debris from site accumulate in low areas, roadways, ditches, or other areas where in Departmental Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.13 Progress Cleaning

- .1 Maintain cleanliness of Work and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.
- .2 Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.14 Final Decontamination

- .1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.
- .2 Perform decontamination as specified to satisfaction of Departmental Representative. Departmental Representative will direct Contractor to perform additional decontamination if required.

1.15 Removal and Disposal

- .1 Remove surplus materials and temporary facilities from site.
- .2 Dispose of contractor generated waste materials, litter, debris, and rubbish off-site.
- .3 Do not burn rubbish and waste materials on site unless approved by Departmental Representative.
- .4 Do not discharge wastes into water or waterways.
- .5 Dispose of the following materials at appropriate off-site facility identified by the Contractor: solid and liquid hazardous waste; PPE worn during hazardous material handling and packaging; other hazardous materials as directed by the Departmental Representative; materials generated from the decommissioning of the land treatment area; and wastewater generated from final decontamination operations including wastewater storage tank cleaning.

1.16 Measurement of Payment

- .1 All direct costs for the treatment of contaminated groundwater and contact water are to be included in the unit price item for Treated Groundwater and Contact Water, Item 01 35 15-1, as indicated in Basis of Payment Schedule.
- .2 Include all direct costs for the treatment of camp waste water in the lump sum price for Supply, Operation and Maintenance of Camp Facilities, Item 01 54 00-1, as indicated in the Basis of Payment Schedule.
- .3 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 – GENERAL

1.1 Definitions

- .1 Work crew: a work crew of any number of personnel working at a location where immediate medical attention from the site Emergency Medical Technician may not be possible due to any environmental, or any other factor.

1.2 Site Specific Health and Safety Requirements

- .1 Maintain and complete all health and safety, fire safety, and environmental compliance activities in accordance with applicable sections and authorities having jurisdiction.
- .2 Schedule a compliance meeting on an as required basis, as directed by Departmental Representative. Compliance meetings may be held in conjunction with regular meetings.
- .3 The intent of the compliance meeting is to review reporting and inspection requirements to meet the intent of the Nunavut Safety Act, the Water License, the Land Use Permit, regulatory, and other requirements as may be required.
- .4 Compliance meetings to be held at the Work site.
- .5 Departmental Representative will record minutes, chair the meeting and distribute minutes to parties of record prior to the next Scheduled meeting.
- .6 Attendees:
 - .1 Contractor: Manager and / or Supervisor(s), representatives of major Sub-Contractors, and others as necessary.
 - .2 Departmental Representative, and representatives of Independent Inspection Agencies.
 - .3 AANDC representative(s).
- .7 Agenda:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Review of items of significance that could affect Work.
 - .3 Identify and record field observations, problems, and conflicts that must be noted in reports required by the Authorities Having Jurisdiction.
 - .4 Identify corrective measures and procedures to regain approval from Authorities Having Jurisdiction.
 - .5 Identification of requirements for maintenance of quality standards needed for compliance with applicable Codes and Legislation.
 - .6 Review site safety and security issues.
 - .7 Review environmental and regulatory compliance.
 - .8 Identification of any hazard on site.
 - .9 Other topics for discussion as appropriate to current status of the Work.

1.3 Submittals

- .1 Submit three (3) hard copies and one (1) electronic copy of the Site Specific Health and Safety Plan no later than thirty (30) days after contract award to the Departmental Representative for review. Any items, which are identified as missing, will be added and the plan revised, so as to incorporate the additional items. Submit the revised safety plan to the Authorities Having Jurisdiction for review and recommendations to ensure all the elements required by the Nunavut Safety Act, OSHA Regulations, other Authorities Having Jurisdiction and Contract Specifications have been addressed.

- .2 Up-date the Site Specific Health and Safety Plan at the beginning of each construction season, and submit to the Departmental Representative no later than thirty (30) days before the start of each construction season.
- .3 All submittals in accordance with Section 01 33 00 - Submittal Procedures
- .4 The Site Specific Health and Safety Plan will include, but is not limited to the following sections:
 - .1 A Statement of Contractor's Safety Policy.
 - .2 Safety Responsibilities of all on-site personnel.
 - .3 Safe Work Practices and/or Job Procedures.
 - .4 Camp Rules and their enforcement.
 - .5 Results of safety and health risk or hazard analysis for camp and construction activities.
 - .6 Procedures for, but not limited to, cold weather survival, remote Work and general worker health and safety.
 - .7 Procedures for confined space entry.
 - .8 Name and telephone number of Contractor's corporate Safety Officer and on-site Safety Representative.
 - .9 Emergency Response Plan.
 - .10 Fire Safety Plan
 - .11 Spill Contingency Plan
 - .12 Winter Road Safety Plan
 - .13 Wildlife Management Plan.
 - .14 Aircraft Safety Plan
 - .15 Call-in Procedures
 - .16 Safety Incident Reporting Mechanism
 - .17 Medivac phone numbers
 - .18 Helicopter/Aircraft companies phone numbers
 - .19 Ice Monitoring and Safety Procedures (IMSP)
 - .20 Camp Rules
- .5 Conduct and submit to Departmental Representative, a site assessment of deficiencies in health, safety, medical/first aid supplies. Submit to Departmental Representative a Schedule for upgrading deficiencies to meet requirements of Authorities Having Jurisdiction.
- .6 The On-site Emergency Response Plan (ERP) is to address standard operating procedures to be implemented during emergency situations. Plans including procedures are to meet Safety Requirements below.
 - .1 Prepare and coordinate an ERP with contributions from appropriate authorities including the Government of Nunavut Safety Act, Hospitals, RCMP, Ministry of Transportation, and Ministry of Health. Plan will identify off-site Emergency Response Coordinator through whom all information and coordination will flow in the event of an incident.
 - .2 Departmental Representative will have Contractor's On-site ERP reviewed by Authorities Having Jurisdiction and may request modifications or additions as

necessary for the work.

- .7 Complete an inventory of Contractor's health, safety, medical and first aid equipment and supplies on-site to assess compliance with Authorities Having Jurisdiction requirements. Submit the inventory to Departmental Representative within ten (10) days of mobilization each season. Include a schedule for upgrading deficiencies to meet requirements of Authorities Having Jurisdiction.
- .8 The PPE Program will include, but is not limited to, the following:
 - .1 Donning and doffing procedures.
 - .2 PPE Selection based upon site hazards.
 - .3 PPE use and limitations of equipment.
 - .4 Work mission duration, PPE maintenance and storage.
 - .5 PPE decontamination and disposal.
 - .6 PPE inspection procedures prior to, during, and after use.
 - .7 Evaluation of effectiveness of PPE program and limitations during temperature extremes, and other appropriate medical considerations.
 - .8 Medical surveillance requirements for personnel assigned to work at site.
 - .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.
 - .10 Contaminated site working and decontamination procedures for both personnel and equipment.
 - .11 Written respiratory protection program for project activities and proof of respiratory fit testing.

1.4 Construction Safety Measures

- .1 Observe and enforce construction safety measures required by the latest revisions of: Nunavut Safety Act, Nunavut Labour Standards Act, Workers' Safety Compensation Commission (WSCC), National Building Code of Canada, National Fire Code of Canada, Workers' Compensation Board, the applicable Occupational Health and Safety Regulations, and Territorial and local statutes and authorities.
- .2 In the event of discrepancies between any requirements of the above listed authorities, the more stringent requirements will govern.
- .3 Arrange regular safety meetings, to be held no less frequently than once per week. Record the minutes of such meetings and maintain a complete file for review by the appropriate authorities. Submit a copy of these meeting minutes to Departmental Representative within three (3) days of the meeting.
- .4 Maintain at the site, five (5) safety hats with liners, and five safety hi-visibility vests for use by Departmental Representative and visitors. Maintain a supply of ear plugs.
- .5 Maintain a supply of disposable PPE suits of various sizes as required for Contractor's staff, Departmental Representative and up to three (3) visitors for the duration of the Work.
- .6 Departmental Representative or his representative has the authority to stop Work on the contract if, in his/her opinion, the Work is being performed in an unsafe manner as required by the applicable safety legislation.
- .7 Prepare and coordinate an ERP with contributions from appropriate authorities including Government of Nunavut, Hospitals, RCMP, Ministry of Transportation, and Ministry of Health. Plan will identify off-site Emergency Response Coordinator through whom all information and coordination will flow in the event of an incident.

- .8 Verify that emergency procedures including appropriate First aid facilities and First Aid personnel are in place at the Work Site. First aid facilities and First Aid personnel must be in compliance with the Nunavut Safety Act.
- .9 Verify that procedures meet the WSCC requirements.
- .10 Develop, as part of Site Specific Health and Safety Plan written Contaminated Site Working and Decontamination procedures. Working procedures to outline personal protective equipment (PPE) requirements for various parts of site and for different operations.
- .11 Working Procedures and Decontamination procedures consistent with requirements OSHA's 29 CFR 1910.120 HAZWOPER and territorial environmental regulations for:
 - .1 Working activities, where employees are likely to be exposed to 50% of Threshold Limit Values (TLV) listed by American Conference of Governmental Hygienists (ACGIH), TLVs and BEIs based on documentation of Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEI) 2004 and amendments thereto.
- .12 Hazardous Material Discovery
 - .1 Immediately stop Work and notify Departmental Representative for further instructions with respect to abatement procedures required for asbestos conditions encountered when Work occurs in areas having materials resembling asbestos during course of Work that was not identified in the RAP.
- 1.5 Filing of Notice
 - .1 File Notice of Work with Federal and Territorial Authorities Having Jurisdiction prior to commencement of Work.
- 1.6 Regulatory Requirements
 - .1 Comply with specified standards, regulations and orders of Authorities Having Jurisdiction to ensure safe operations at sites containing hazardous or toxic materials and other hazards (such as wildlife encounters, falls, etc.).
- 1.7 Responsibility
 - .1 Be responsible for the safety of persons and property on site and for the protection of public off site and environment to extent that they may be affected by the site and conduct of Work.
 - .2 Control access to the site. Persons with business at the site and who are not Contractor's employees must be briefed on site specific health and safety issues, and provided with a copy of the site specific health and safety plan.
 - .3 Contractor may refuse access to the site to any person not complying with site specific health and safety standards.
 - .4 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, territorial, and local statutes, regulations, and ordinances, and with Site-Specific Health and Safety Plan:
 - .1 Conduct appropriate safety training for all personnel working on the site.
 - .2 Conduct Work place safety inspections for all Work activities.
 - .3 Maintain a log of first aid and safety supplies, and notify appropriate personnel for restocking after each incident, and periodical restocking to replace out dated or consumable (headache medicines, bandages) products.
- 1.8 Hazard Communication Requirements
 - .1 Comply with Work Site Hazardous Materials Information System Regulations of the Authorities Having Jurisdiction.

- .2 Provide Departmental Representative with Material Safety Data Sheets (MSDS) and documentation on any "hazardous" chemical that Contractor or Contractor Representatives plan to bring onto site; bound in one place and stored in accordance with the Site Specific Health and Safety Plan.

1.9 Unforeseen Hazards

- .1 Should any unforeseen or peculiar safety related factor, hazard, or condition become evident, stop Work, assess, take steps to mitigate if necessary at that time and immediately advise Departmental Representative verbally and in writing.
- .2 Monitor potential low oxygen and Lower Explosive Limits areas with oxygen/LEL monitor if workers are working in and around area. These areas include but are not limited to trenches, excavations and areas near machinery exhaust.

1.10 Safety and Hygiene

- .1 Provide training for all persons entering the site in accordance with specified personnel training requirements, maintain log of who was trained, what training was provided and by whom the training was conducted.
- .2 Personal Protective Equipment (PPE):
 - .1 Furnish site personnel with appropriate PPE as required by legislation.
 - .2 Verify that safety equipment and protective clothing is kept clean and well maintained.
 - .3 Ensure all clothing and personal protective equipment used on site, must remain on site, to be either decontaminated or disposed of. No Work clothing is to leave Work site without having been properly decontaminated. This includes, but is not limited to working coveralls.
 - .4 Outline and designate PPE for each site and Work activity in accordance with Authorities Having Jurisdiction.
- .3 Develop written PPE care and use procedures to be included in the Site Specific Health and Safety Plan and verify that procedures are strictly followed by site personnel including, but not limited to, the following:
 - .1 Provisions for prescription eyeglasses with side shields worn as safety glasses and do not permit contact lenses on site within Work zones.
 - .2 Provisions, for footwear, are steel toed safety shoes or boots and are covered by rubber overshoes when entering or working in potentially contaminated Work areas.
 - .3 Dispose of or decontaminate PPE worn on site at end of each workday.
 - .4 Decontaminate reusable PPE before reissuing.
 - .5 Provisions for decontamination arising from entry or exit into contaminated areas.
- .4 Develop a written Respiratory Protection program to be included in the Site Specific Health and Safety Plan and ensure that the program is strictly followed by site personnel; include the following procedures as minimum:
 - .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.
 - .2 Monitor, evaluate, and provide respiratory protection for site personnel.
 - .3 Verify that levels of protection as listed have been chosen to be consistent with site specific potential airborne hazards associated with major contaminants identified on site.

- .4 Immediately notify Departmental Representative when level of respiratory protection required increases.
- .5 Verify that appropriate respiratory protection during Work activities is available and readily accessible; all personnel entering potentially contaminated Work areas will be supplied with and use appropriate respiratory protection.
- .6 Assess ability for site personnel to wear respiratory protection.
- .7 Verify that site personnel have passed respirator fit test prior to entering potentially contaminated Work areas.
- .8 Verify that facial hair does not interfere with proper respirator fit.
- .9 Submit proof of fit testing for site personnel to Departmental Representative. Update submission when new personnel are added to the Work or when new Work activities occur.
- .5 Heat Stress/Cold Stress: Implement heat stress and cold stress monitoring program as applicable and include in the Site Specific Health and Safety Plan.
- .6 Personnel Hygiene and Personnel Decontamination Procedures: provide minimum as follows:
 - .1 Suitable containers for storage and disposal of used disposable PPE.
 - .2 Potable water and suitable sanitation facility.
 - .3 Access to shower facilities.
 - .4 Provisions for proper disposal of contaminated PPE.

1.11 Site Communications

- .1 Post emergency numbers near site satellite telephones.
- .2 Staff will be equipped with radios, and emergency radio-in procedures will be established prior to commencing work.
- .3 Train personnel in the use of the "buddy" system.
- .4 Provide alarm system to notify employees of site emergency situations or to stop Work activities if necessary. Identify emergency stations.

1.12 Safety Meeting

- .1 Conduct task specific safety meetings (toolbox) as per Project requirements and as directed by Departmental Representative.
- .2 Conduct safety meetings with workers engaged in constructing, maintaining, or traveling on winter roads or trails, ice airstrips, and near steep, unstable slopes. Workers must be instructed on the dangers inherent with winter work, and hazard avoidance procedures.
- .3 Conduct safety meetings with workers engaged in outdoor Work under summer or winter conditions. Topics must include hot and cold stress, exhaustion, snowmobile safety, buddy systems, and any other items inherent in working outdoors in winter in isolated environments.
- .4 Conduct mandatory daily safety meetings for personnel, and additionally as required by special or Work related conditions; include refresher training, review ongoing safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on an as needed basis or as specified by the Authorities Having Jurisdiction. Keep records of meetings on file.

1.13 Fuel Management

- .1 All vehicle and equipment refuelling must be conducted by appropriately trained personnel using the effective personal protective equipment. All vehicle and equipment refuelling

must be performed in a manner which meets or exceeds regulatory requirements including using drip pans.

- .2 Records of fuel usage by activity must be maintained.
- .3 All fuel transports including mobile refuelling trucks and fuel transport to stationary equipment such as generators or pumps or distributed storage areas, must occur in approved (CSA) containers with the notification and consent of site safety personnel.

1.14 Vehicle and Equipment Usage

- .1 Seatbelts must be worn at all times vehicle or equipment is in operation.
- .2 Speed limits must be set and obeyed.
- .3 If road conditions are unsafe or marginally unsafe, maintain roads to acceptable standards. Do not risk property damage or injury.
- .4 Vehicles are to not be idled for longer than ten (10) minutes (warm up) unless explicitly used as a place of refuge during animal encounters or for personnel working outdoors during winter operations. Exceptions are to be made in consultation with Departmental Representative.
- .5 Perform vehicle maintenance and lubrication of equipment in a manner that avoids spillage of fuels, oils, grease and coolants. When refuelling equipment, use leak free containers and reinforced rip and puncture proof hoses and nozzles. Remain in attendance for duration of refuelling operation, and ensure that all storage container outlets are properly sealed after use.
- .6 Place drip pans under stationary equipment with potential leaks.
- .7 All equipment brought to the site must have rotating beacons and vehicles should have beacons and buggy whips.

1.15 Flammable Liquids

- .1 The handling, storage and use of flammable liquids will be governed by the current National Fire Code of Canada.
- .2 Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable liquids exceeding 45 litres for Work purposes, requires the permission of the permitting authority.
- .3 Do not transfer flammable liquids in the vicinity of open flames or any type of heat-producing devices.
- .4 Do not use flammable liquids having a flash point below 38°C such as naphtha or gasoline as solvents or cleaning agents.
- .5 Store flammable waste liquids, for disposal, in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and Departmental Representative is to be notified when disposal is required.
- .6 Dispose of all flammable liquids in accordance with all applicable environmental regulations and with the requirements of Section 02 81 01 - Hazardous Materials.

1.16 Storage and Handling of Fuel

- .1 Locate fuel storage areas as approved by Departmental Representative.
- .2 Inspect fuel storage and dispensing facilities daily. Make available fire fighting and spill response equipment for immediate access at each fuel storage location.
- .3 Store all barrels containing fuel and /or hazardous materials in an elevated position, either on their side with bungs facing 9 and 3 o'clock position, or on pallets, upright, and banded.

- .4 All barrels to be individually identified. Label will be to industry standards and will provide all information necessary for health and safety and environmental purposes. Make available, to all personnel, Material Safety Data Sheets for all materials maintained at site or along right-of-ways.
- .5 All barrels/fuel containers brought on-site to be labelled with AANDC's name, and Contractor's name as required by the Land Use Permit.
- .6 Treat all waste petroleum products, including used oil filters as hazardous materials.
- .7 Conduct regular inspections of all machinery hydraulic, fuel and cooling systems. Repair leaks immediately.
- .8 Pre-assemble and maintain emergency spill equipment, including at least two fuel pumps, empty 200 L barrels and absorbent material sufficient to clean up a 1000 litre spill at all fuel storage sites. Maintain spill mats or pan under mobile fuelling containers and a spill kit at the refuelling area.
- .9 Remove all full and empty barrels, fuel storage facilities and associated materials and equipment from site at conclusion of Work.
- .10 All fuel drums delivered to site, regardless of ownership, will be returned to supplier by Contractor for reuse or cleaned, crushed and disposed in accordance to Section 02 81 01 - Hazardous Materials. Fuel drums, if transported, will comply with Section 02 81 01 - Hazardous Materials and applicable regulations.

1.17 Spill Contingency Plan

- .1 Submit to Departmental Representative for approval, detailed Spill Contingency Plan. Identify response capabilities by detailing response times, and types and volumes of spills to which Contractor can respond. Following information is required as a minimum:
 - .1 A description of pre-emergency planning.
 - .2 Personnel roles, lines of authority and communication, emergency phone numbers.
 - .3 Emergency alerting and response procedures.
 - .4 Evacuation routes and procedures, safe distances and places of refuge.
 - .5 Directions/methods of getting to nearest medical facility.
 - .6 Emergency decontamination procedures.
 - .7 Emergency medical treatment and First-Aid.
 - .8 Emergency equipment and materials.
 - .9 Emergency protective equipment.
 - .10 Procedures for reporting incidents, and
 - .11 Spill response and containment plans for all materials that could potentially be spilled.

1.18 Medical

- .1 Provide and maintain first aid and medical care and facilities for all workers as required by the Statutes of the Nunavut Safety Act.
- .2 Maintain first aid supplies and sick quarters separately from general living quarters when camp population normally ranges between 26 and 50 occupants.
- .3 Provide the appropriate Nunavut first aid kit, based on the number of workers, in accordance with the Nunavut Safety Act.
- .4 Establish an emergency response plan acceptable to Departmental Representative, for the

removal of any injured person to medical facilities or a doctor's care in accordance with applicable legislative and regulatory requirements.

- .5 Provide proof of First Aid credentials to Departmental Representative prior to the start of each construction season. Provide the appropriate number of first aid attendants on site in accordance with the Nunavut Safety Act (minimum of one).
- .6 Emergency and First Aid Equipment:
 - .1 Locate and maintain emergency and first aid equipment in appropriate location on site including first aid kit to accommodate number of site personnel; portable emergency eye wash; fire protection equipment as required by legislation.
 - .2 Locate sufficient self contained breathing apparatus units; blankets and towels; stretcher; and one (1) hand held emergency siren in all confined access locations.
 - .3 Provide a minimum of one (1) qualified first aid attendant on site at all times when Work activities are in progress; duties of first aid attendant may be shared with other light duty Work related activities.
 - .4 Provide a full time EMT - Emergency Medical Technician, c/w 1000 hours of classroom and practical training, 6 weeks of practical experience with required # of emergency response calls. The EMT will be territorially certified by a required exam and refresher exams every two (2) years. An EMT is a highly trained medical professional who responds to medical and trauma emergencies in the pre-hospital setting ("in-field") for the purpose of stabilizing a patient's condition before and during transportation to an appropriate medical facility.

1.19 Accidents and Accident Reports

- .1 Immediately report, verbally, followed by a written report within twenty-four (24) hours, to Departmental Representative, all accidents of any sort arising out of or in connection with the performance of the Work, giving full details and statements of witnesses. If death or serious injuries or damages are caused, report the accident promptly to Departmental Representative by telephone or facsimile in addition to any report required under federal and territorial laws and regulations.
- .2 If a claim is made by anyone against Contractor or Sub-Contractor on account of any accident, promptly report the facts in writing to Departmental Representative, giving full details of the claim.

1.20 Security

- .1 Enforce the Camp Rules as provided under Section 01 54 00 - Camp Facilities.
- .2 Limit site access only to persons employed on the Project. Unauthorized persons will be permitted on site only with the approval of Departmental Representative or Contractor.

1.21 Wildlife Management

- .1 Develop a wildlife management plan, as part of the Site Specific Safety Plan, that includes bear and large mammal safety and as a minimum meets the following requirements:
 - .1 Firearms must be stored and used in accordance with all Authorities Having Jurisdiction. Terms of Use for firearms must be submitted to Departmental Representative for review.
 - .2 All wildlife encounters and sightings must be reported to Departmental Representative as part of the weekly report.
 - .3 Sufficient number of people designated as wildlife monitors and trained in firearms and wildlife deterrent use.
 - .4 All persons on-site must be made aware of wildlife attractants and proper procedures to be followed in the event of wildlife encounter.

1.22 Wildlife Monitors

- .1 Provide for the duration of the construction seasons, full-time wildlife monitors acceptable to Departmental Representative. Provide sufficient number of wildlife monitors with firearms and ammunition to protect the safety of all workers in all areas, including Departmental Representative and Departmental Representative's support staff during site operations.
- .2 Assign a wildlife monitor to accompany Departmental Representative and Departmental Representative's support staff during all inspections and soil/material sampling activities that take place away from the construction camp area.
- .3 All Wildlife Monitors are required to have a valid Firearm Certificate as per Authorities Having Jurisdiction. Copies of the firearms certificates to be provided upon request by the Departmental Representative.
- .4 Assume full responsibility for reporting incidents associated with wildlife encounters.
- .5 Supply one (1) All Terrain Vehicle (ATV) per wildlife monitor to facilitate his duties. Ensure wildlife monitors are fully trained in the safe use of the ATV equipment.
- .6 Provide the wildlife monitors with mobile communication radios with charging units for on-site communication between the wildlife monitors, Contractor base radio, and Departmental Representative and Departmental Representative's Authorized Personnel. If radios do not provide sufficient range for continuous communication, provide satellite phones.
- .7 Qualifications and training plans for wildlife monitors must be submitted to Departmental Representative as part of the Site Specific Health and Safety Plan.
- .8 Where possible, use non-lethal ammunition to deter wildlife prior to the use of lethal ammunitions.

1.23 Fire Safety

- .1 Provide all fire prevention, fire protection and fire fighting services at the Project site.
- .2 Implement a fire safety program that includes fire prevention, fire protection and fire fighting requirements that are appropriate for the Work hazards and risks. Submit details of the fire safety program in writing to Departmental Representative for review prior to start of construction. Such review does not relieve Contractor from any obligations or responsibilities required by the Contract.
- .3 Ensure that any Sub-Contractors and other Contractor personnel on-site are briefed on fire safety requirements and are familiar with the fire prevention, fire protection and fire fighting program.
- .4 The fire safety program to meet or exceed the most recent editions of the following codes and standards:
 - .1 Nunavut Safety Act.
 - .2 National Fire Code of Canada.
- .5 Personnel designated for fire fighting services must be provided with training for any special fire hazards that may be present. These personnel must also be provided with protective equipment as required by the Authorities Having Jurisdiction.

1.24 Reporting Fires

- .1 A person discovering a fire and all fire related incidents will report immediately, by fastest available means, to Departmental Representative and site superintendent.
- .2 A person discovering a fire will if possible, remain in the vicinity to direct fire fighting personnel.

1.25 Fire Extinguishers

- .1 Provide and maintain fire extinguishers in sufficient quantity to protect, in an emergency, the Work in progress and the camp on-site.

1.26 Reporting Fires

- .1 A person discovering a fire and all fire related incidents will report immediately, by fastest available means, to Departmental Representative and site superintendent.
- .2 A person discovering a fire will if possible, remain in the vicinity to direct firefighting personnel.

1.27 Smoking Precautions

- .1 Do not permit smoking in hazardous areas. Exercise care in the use of smoking materials in non-restricted areas.
- .2 Smoking is prohibited within the camp facilities unless in accordance with Authorities Having Jurisdiction and as directed by Departmental Representative.
- .3 Provide and place signs prohibiting smoking in areas where smoking is not permitted.
- .4 Signs prohibiting smoking will be in English and Inuktitut and will have black lettering not less than 50 mm high, with a 12 mm wide stroke on a yellow background. In lieu of lettering, symbols of not less than 150 mm by 150 mm may be used.
- .5 Smoking is prohibited within 7.5 metres of fuel storage and dispensing facilities.
- .6 Provide and place signs indicating that smoking within 7.5 metres of fuel storage and dispensing facilities is not permitted, and that the vehicle ignition must be turned off while the vehicle is being refuelled. Provide at least one weather-resistant sign at each fuel dispensing location. The signs will have a minimum dimension of 200 mm and letters not less than 25 mm high. In lieu of lettering, signs may have international "No Smoking - Ignition Off" symbols not less than 100 mm in diameter. Install signs in a location visible to all drivers approaching the dispensing location, and at the dispensing unit.
- .7 Smoking is prohibited within the camp buildings.

1.28 Rubbish and Waste Materials

- .1 Rubbish and waste materials are to be kept to a minimum.
- .2 Storage:
 - .1 Extreme care is required where it is necessary to store oily waste in Work areas to ensure maximum possible cleanliness and safety.
 - .2 Greasy or oily rags or materials subject to spontaneous combustion will be disposed of as hazardous material in accordance with Section 02 81 01 - Hazardous Materials.

1.29 Hazardous Substances

- .1 If the Work entails the use of any toxic or hazardous materials or chemicals, or otherwise creates a hazard to life, safety or health, Work will be in accordance with the National Fire Code of Canada, Occupational Health and Safety Legislation, WSCC and WHMIS.
- .2 Departmental Representative is to be advised, and a "Hot Work" permit issued by Contractor's designated representative in all cases involving welding, burning or the use of blow torches and salamanders, in buildings or facilities. Special precautions are necessary to safeguard life and property from damage by fire or explosives.
- .3 Wherever Work is being carried out in dangerous or hazardous areas involving the use of heat, fire watchers, equipped with sufficient fire extinguishers, will be provided. The determination of dangerous or hazardous areas along with the level of precaution necessary for Fire Watch will be at the discretion of Contractor. Notify Departmental Representative prior to that determination.

- .4 Provide proper ventilation and eliminate all sources of ignition where flammable liquids, such as lacquers or urethanes are used.
 - .5 Do not store flammable substances within 30 metres of the Temporary PCB Materials Storage Area.
- 1.30 Questions and Clarifications
- .1 Direct any questions or clarification to Departmental Representative.
- 1.31 Measurement of Payment
- .1 All costs for the preparation and completion of the Site Specific Health and Safety Plan, are to be included in the lump sum price paid for under Item 01 35 32-1, as indicated in Basis of Payment Schedule. The lump sum price for the Site Specific Health and Safety Plan will be paid after a satisfactory Site Specific Health and Safety Plan has been submitted to Departmental Representative.
 - .2 The provision of Wildlife Monitors, including ATV, will be paid under Item 01 35 32-2, Wildlife Monitors in the Basis of Payment Schedule.
 - .3 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Definitions

- .1 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.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment 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; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 Regulatory Overview

- .1 Comply with all applicable environmental laws, regulations and requirements of Federal, Territorial and other regional authorities, and acquire and comply with such permits, approvals and authorizations as may be required.
- .2 Comply with and be subject to those permits and approvals obtained from Departmental Representative to conduct the Work.
- .3 Pay specific attention to the Land Use Permit and Water License.
- .4 Pay specific attention to the Migratory Birds Convention Act, as amended in 1994.
- .5 Pay specific attention to the Fisheries Act.
- .6 Pay specific attention to the IOL Access and/or Exemption Permit.

1.3 Submittals

- .1 Submit all required Contractor submittals to satisfy environmental requirements directly to the responsible agency and Authorities Having Jurisdiction.
- .2 Submit one (1) complete copy of all submittals and agency approvals to Departmental Representative.
- .3 All submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 Relics and Antiquities

- .1 Relics and antiquities and items of historical or scientific interest such as cairns, tent rings, commemorative plaques, inscribed tablets, and similar objects found on-site or in buildings to be demolished will remain the property of the appropriate Authorities Having Jurisdiction.
- .2 Prior to commencing Work at the site, review the following with Departmental Representative:
 - .1 The extent of the archaeological sensitive areas including gravesites.
 - .2 The methods to be used by Contractor to mark and protect the areas from construction/remediation activities.
- .3 Give immediate notice to Departmental Representative if evidence of archaeological finds are encountered during construction/remediation activities, stop Work, and await Departmental Representative's written instructions before proceeding with Work in this area.
- .4 Protect archaeological finds and similar objects found during course of Work.

1.5 Site Maintenance

- .1 Keep the site free from the accumulation of waste materials and debris.

- .2 Upon completion of the Work, clean away and dispose of all surplus material, supplies, rubbish and temporary works leaving the site neat and tidy to the requirements of Departmental Representative and the Land Use Permit.

1.6 Fires

- .1 Fires and burning of rubbish on site, other than the waste incinerating in accordance to the contract, is not permitted unless approved by Departmental Representative, with the exception of unpainted wood, as stated in Section 02 41 16.
- .2 Where fires or burning is permitted, prevent staining or smoke damage to structures, materials and vegetation which is to be preserved. Restore, clean and return to new condition stained or damaged Work.
- .3 Provide supervision, attendance and fire protection measures as directed.
- .4 Obtain all required permits from Authorities Having Jurisdiction.

1.7 Disposal of Wastes

- .1 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways.

1.8 Fuel Storage

- .1 Comply with CEPA Petroleum Products Regulations, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (2008), CCME Codes of Practice and any regulations obtained from Territorial and other regional authorities, for setting up and operating temporary fuel tanks. Provide Departmental Representative with copies of permits prior to the start of construction in accordance to Section 01 33 00 - Submittal Procedures.

1.9 Water Management

- .1 Provide potable water for drinking and cooking.

1.10 Waste Water Management

- .1 Provide details for sewage and disposal system sixty (60) days after Contract Award.

1.11 Process Wastewater Discharge Criteria

- .1 Wash water, meltwater collection, rinse water resulting from the cleaning of fuel tanks and pipelines, contaminated groundwater, water from dewatering contaminated soil areas, and/or any other liquid effluent stream will be released onto the ground at a location that is a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters, will meet the treatment requirements in Section 01 35 15, and will conform to the discharge requirements set out in the Land Use Permit.
- .2 Contractor must obtain approval from the Departmental Representative prior to discharging treated wastewater.

1.12 Camp Wastewater Discharge Criteria

- .1 Camp Wastewater will be released onto the ground at a location that is a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters and conform to the discharge requirements set out in the Water Licence.
- .2 Treat all camp wastewater to meet the treatment requirements in Section 01 35 15 and to conform to the discharge requirements set out in the Land Use Permit.
- .3 If unable to meet the discharge criteria, provide additional treatment to meet criteria prior to discharge or additional storage and off-site disposal (at no additional cost).
- .4 No direct discharge is allowed to wetland or surface waters.

- .5 Contractor must obtain approval from the Departmental Representative prior to discharging treated wastewater.

1.13 Drainage

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .4 Provide an Erosion, Sediment and Drainage Control Plan that identifies type and location of erosion and sediment controls to be provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal and Territorial laws and regulations.
- .5 Submit an Erosion, Sediment and Drainage Control Plan to Departmental Representative for review and approval prior to commencing. All submittals shall be in accordance with Section 01 33 00 - Submittal Procedures. Address any Work in fisheries sensitive areas or in areas that may affect fisheries sensitive areas and specifically address the protection of water bodies, water courses, and the following:
 - .1 Details of grading Work to prevent surface drainage into or out of Work areas.
 - .2 Details of erosion control works and materials to be used, including the deployment of silt fencing, floating silt curtains and containment booms during construction and excavation activities.
 - .3 Work Schedule including the sequence and duration of all related Work activities.
 - .4 The treatment of site runoff to prevent siltation of watercourses.
 - .5 Dewatering procedures for excavated materials including silt removal procedures prior to discharge.
 - .6 Stabilizing procedures during excavation.
 - .7 Maintenance of filters and sedimentation traps.
- 6 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

1.14 Site Clearing and Plant Protection

- .1 Protect native vegetation on site and adjacent properties where indicated.
- .2 Demarcate areas adjacent to work areas as appropriate to protect native vegetation. This may include, but not be limited to use of snow fencing or burlap wrapping.
- .3 Minimize stripping of topsoil and vegetation.

1.15 Work Adjacent to Waterways

- .1 Submit a Work Plan for work to be undertaken in or near drainage channel and spring, to Departmental Representative for review prior to commencing Work. A separate plan to be submitted for the following Work activities:
 - .1 Contaminated Soil Removal near the spring at Ennadai Lake (Area of Potential Environmental Concern [APEC] 20 and 21) and potential development of a temporary road with culvert over the drainage channel for access to APEC 22.
 - .2 The Work Plan is to include the following:
 - .1 Sketch of working area, including placement of erosion control, culvert, and temporary roadway as required.
 - .2 Timing of Work.

- .3 Work schedule including the sequence and duration of all related Work activities.
- .4 Maintenance, monitoring, and final removal of erosion control, culvert, and roadway works.
- .2 Do not operate construction equipment in waterways.
- .3 Do not use waterway beds for borrow material.
- .4 Do not dump excavated fill, waste material or debris in waterways.
- .5 Design and construct temporary crossings to minimize erosion to waterways.
- .6 Do not skid logs or construction materials across waterways.
- .7 Do not use shoreline grounds (30 metres from edge) as staging area, vehicle/equipment maintenance, parking, storage of fuel or for stockpiling of granular and other fill.
- .8 If drainage course crossing is required, use methodologies to prevent sedimentation into waterbodies.

1.16 Pollution Control

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.17 Environment Protection Supplies

- .1 Comply with federal and territorial fisheries and environmental protection legislation, including preventing the loss or destruction of fish habitat, and minimizing the impact of sedimentation, siltation or otherwise causing a degradation in water quality.
- .2 Provide a minimum of 30 metres or more and as required of polypropylene silt fence (typical height of 0.9 metres) and the necessary stakes for installation. This will be used as necessary to prevent sediment transport into water bodies. Product acceptance will be based on compliance with the following minimum/maximum average values.
 - .1 Minimum Grab Tensile Strength (ASTM D4632):520 N.
 - .2 Maximum Elongation (ASTM D4632):15 %.
 - .3 Minimum Puncture Strength (ASTM D4833):250 N.
 - .4 Maximum Apparent Opening Size (ASTM D4751) 500 µm.
- .3 Provide a minimum of fifty (50) lineal metres or more and as required of 200 mm diameter hydrophobic, sorbent booms. This will be used as necessary to prevent the migration of hydrocarbons.
- .4 Supply, transport, install and maintain erosion, sediment and drainage controls necessary to complete the Work in accordance with the requirements of Departmental Representative.
- .5 At the completion of construction, dispose of used silt fence off-site as non-Hazardous Waste. Dispose of used absorbent boom in accordance with Section 02 81 01 - Hazardous Material.
- .6 Unused Erosion, Sediment and Drainage Control supplies will remain the property of Departmental Representative until the completion of the Contract.
- .7 Provide inventory of environmental protection supplies prior to mobilization.

1.18 Historical Archaeological Control

- .1 Provide historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on Project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.
- .2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

1.19 Notification

- .1 Departmental Representative will notify Contractor in writing of observed non-compliance with Federal, Territorial or Municipal environmental laws or regulations, permits, licences, etc.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.20 Measurement of Payment

- .1 Include all direct costs for the installation, supply and transport of the specified Environmental Protection activities including the silt fence and the sorbent booms and all necessary stakes and connecting hardware in the lump sum price for Environmental Protection, Item 01 35 43-1, as indicated in the Basis of Payment Schedule.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Temporary Erosion Sedimentation Control

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff to adjacent properties, according to requirements of Authorities Having Jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during Work.
- .3 Implement silt curtains and other erosion control methods as directed by Departmental Representative.

- END OF SECTION -

PART 1 - GENERAL

1.1 References and Codes

- .1 Perform Work in accordance with National Building Code of Canada (NBC) including all amendments and other codes of territorial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.
- .3 Perform Work in accordance with the Specifications and meet or exceed all codes, standards, and regulations applicable to the Work and issued under the authority of the Government of Canada and the Government of Nunavut. Advise Departmental Representative of any discrepancies in the codes, standards and regulations applicable to the Work.

1.2 References and Codes - Federal

- .1 Meet or exceed the governing codes, standards and guidelines, and regulations applicable to Work and issued under the authority of the Government of Canada as follows:
 - .1 Canadian Environmental Protection Act, 1999.
 - .2 Controlled Products Regulations (SOR/88-66).
 - .3 Interprovincial Movement of Hazardous Waste Regulation (SOR/2002-301).
 - .4 National Fire Code of Canada, 2010.
 - .5 Ozone-depleting Substances Regulations, 1998 (SOR/99-7).
 - .6 Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34).
 - .7 Transportation of Dangerous Goods Regulations (SOR/2012-245).
 - .8 Territorial Land Use Regulations (C.R.C., c.1524).
 - .9 Storage Tank System for Petroleum Products & Allied Petroleum Products Regulations (SOR / 2008-197).
 - .10 Migratory Birds Convention Act (S.C. 1994, c. 22).
 - .11 Fisheries Act (R.S.C., 1985, c. F-14).
 - .12 Abandoned Military Site Remediation Protocol (INAC, 2009).
 - .13 Guidelines for Canadian Drinking Water Quality (Health Canada, August 2012).
 - .14 Wastewater Systems Effluent Regulations (SOR/2012-139).
 - .15 Technical Document for Batch Waste Incineration (EC, 2010).
 - .16 Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003).
 - .17 Nunavut Land Claim Agreement (Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada, 1993).
 - .18 Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 1999).
 - .19 Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil (CCME, 2001).
 - .20 Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 1999).
 - .21 Contaminated Sites Management Policy (INAC, 2002).
 - .22 A Federal Approach to Contaminated Sites (Contaminated Sites Management Working Group (CSMWG), 1999).
 - .23 NCSP Project Level Risk Management Guidance (INAC, 2008).
 - .24 Contaminated Sites Cost Estimating Guide (AANDC, 2012).

- .25 Treasury Board Policy on Management of Real Property (TB, 2006).
- .26 Material Safety Data Sheets (MSDS), Health Canada / Workplace Hazardous Materials Information System (WHMIS).
- .27 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
- .28 Federal Mobile PCB Treatment and Destruction Regulations (SOR/90-5).
- .29 PCB Regulations (SOR/2008-273).
- .30 Mobile PCB Destruction Facilities, RRO 1990, Reg 352.
- .31 PCB Waste Export Regulations (SOR/97-109).

1.3 References and Codes - Nunavut

- .1 Meet or exceed the governing codes, standards and guidelines, and regulations applicable to Work and issued under the authority of the Government of Nunavut as follows:
 - .1 Nunavut Labour Standards Act, (R.S.N.W.T. 1988, c.L-1).
 - .2 Canadian Environmental Protection Act (R.S.N.W.T. 1988, c. E-7) current to 2010.
 - .3 Fire Prevention Act (R.S.N.W.T. 1988, c.F-6), current to 2006.
 - .4 Labour Standards Act (R.S.N.W.T. 1988, c.L-1) current to 2012.
 - .5 Public Health Act (R.S.N.W.T. 1988, c.P-12) current to 2011.
 - .6 Spill Contingency Planning and Reporting Regulations R-068-93.
 - .7 Safety Act (R.S.N.W.T. 1988,c.S-1) current to 2007.

1.4 Standard and Guidelines

- .1 Department of the Environment, Government of Nunavut:
 - .1 Environmental Guideline for the Burning and Incineration of Solid Waste (2012).
 - .2 Environmental Guideline for the General Management of Hazardous Waste (2010).
 - .3 Environmental Guideline for Contaminated Site Remediation (2009).
 - .4 Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities (2011).
 - .5 Environmental Guideline for Mercury-Containing Products and Waste Mercury (2010).
 - .6 Environmental Guideline for Waste Paint (2010).
 - .7 Environmental Guideline for Ozone Depleting Substances (2011).
 - .8 Environmental Guideline for Waste Antifreeze (2011).
 - .9 Environmental Guideline for Waste Asbestos (2011).
 - .10 Environmental Guideline for Waste Batteries (2011).
 - .11 Environmental Guideline for Waste Lead and Lead Paint (2011).
 - .12 Environmental Guideline for Waste Solvent Division (2011).
 - .13 Environmental Guideline for Ambient Air Quality (2011).
 - .14 Environmental Guideline for Dust Suppression (2002).
- .2 Environmental Health and Safety Management System Manual (AANDC, 2012).

1.5 Permits and Licenses

- .1 The following permits and licenses will be provided to Contractor when received by AANDC:
 - .1 Water License, granted by the Nunavut Water Board in accordance with the Nunavut Water and Surface Rights Tribunal Act.
 - .2 Land Use Permit, granted by AANDC and Nunavut – Land Administration Division.
 - .3 Quarry Permit, granted by AANDC.

- .4 Inuit Owned Lands (IOL) Access and / or Exemption Permit/Certificate, granted by the Kivalliq Inuit Association (KIA).
 - .2 Any deviations from the current remediation plan may require land use permit amendments or field authorizations. Notify Departmental Representative of any proposed deviations so AANDC can contact the appropriate agency to obtain approval for the deviation.
- 1.6 Hazardous Material Discovery
 - .1 Asbestos: Demolition of spray or trowel-applied asbestos is hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in course of demolition Work that is not identified in Appendix C, immediately stop Work and notify Departmental Representative. Refer to Section [02 82 10 - Asbestos Abatement (Minimum Precautions), 02 82 11 - Asbestos Abatement (Intermediate Precautions) and 02 82 12 - Asbestos Abatement (Maximum Precautions).
 - .2 Stop Work immediately and notify Departmental Representative upon discovery of following materials that are not identified in Appendix C during the course of Work:
 - .1 Designated substances and toxic and hazardous materials such as PCBs, asbestos, and mercury.
 - .3 Work at site will involve contact with:
 - .1 Metal impacted soil.
 - .2 PHC (petroleum hydrocarbons) impacted soils.
 - .3 Hazardous solids, liquids and petroleum based sludges.
 - .4 Demolition debris with lead based and PCB amended paints.
 - .5 Asbestos containing materials.
- 1.7 WHMIS
 - .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 acceptable to Labour Canada and Health and Welfare Canada.
 - .2 Deliver one (1) copy of all WHMIS data sheets to Departmental Representative on delivery of materials.
- 1.8 Submittals
 - .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures
- 1.9 Measurement of Payment
 - .1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Inspection

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative will pay cost of examination and replacement.

1.2 Submittals

- .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.3 Independent Inspection Agencies

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

1.4 Access to Work

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.5 Procedures

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 Rejected Work

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

- .2 Make good other Contractor's Work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work is not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.7 Reports

- .1 Submit three (3) copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to Sub-Contractor of Work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

1.8 Tests and Mix Designs

- .1 Furnish test results and mix designs as may be requested.
- .2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.9 Measurement of Payment

- .1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Installation and Removal

- .1 Provide temporary utilities to facilitate all construction and camp activities.
- .2 Remove from site all such Work after use.
- .3 Provide all temporary utilities consisting of the design, supply, construction, maintenance, operation and removal of the utilities and services required to support the remediation of the site. Temporary utilities to meet requirements of Land Use Permit issued for the Work, satisfy requirements of Federal, Territorial and local Authorities Having Jurisdiction, and comply with the requirements of Section 01 35 43 - Environmental Procedures.

1.2 Submittals

- .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.3 Existing Services

- .1 The location of equipment and utility services specified or indicated on the Drawings is to be considered as approximate.
- .2 Before commencing Work, establish location and extent of services in area of Work, and notify Departmental Representative of findings.
- .3 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .4 Take necessary precautions and prevent damage to existing services and facilities.
- .5 Repair and replace services or facilities damaged as a result of Contractor's operations at no additional cost to Departmental Representative.

1.4 Water Supply

- .1 Provide continuous supply of potable water for construction use.
- .2 Provide means to conserve water on-site, as suitable water sources may be seasonal. Consider using tanks to store water during high flow events.
- .3 Abide by terms of Water Licence regarding water usage.

1.5 Temporary Heating and Ventilation

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders (multi-fuel cast iron stoves) are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Provide adequate ventilation to meet health regulations for safe working environment.
 - .3 Protect Work and products against dampness and cold.
 - .4 Prevent condensation from forming on surfaces.
 - .5 Provide ambient temperatures and humidity levels for storage and installation of materials.
- .4 Provide ventilation for temporary facilities as follows:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of Work process to assure removal of harmful elements.
 - .7 Provide carbon monoxide detectors for occupied areas.
 - .8 Provide smoke detectors for work areas.
 - .6 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
 - .7 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.
- 1.6 Temporary Power and Light
- .1 Provide, operate, and maintain an electrical power supply system, in accordance with governing regulations, to service Contractor's site power requirements.
 - .2 Install temporary facilities as necessary for power distribution, such as power cable and pole lines, subject to Departmental Representative's approval.
 - .3 Provide lighting and power at site for use during Work by Contractor, Sub-Contractors, and Departmental Representative's support personnel including outdoor lighting for night shift as applicable.
- 1.7 Temporary Communication Facilities
- .1 Provide and pay for temporary telephone, fax, and data hook up equipment necessary for Contractor use and use of Departmental Representative.
- 1.8 Fire Protection
- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies, Authorities Having Jurisdiction, and governing codes, regulations and bylaws.
- 1.9 Drainage
- .1 Refer to Section 01 35 43 - Environmental Procedures
- 1.10 Signs and Notices
- .1 Safety and Instruction Signs and Notices:
 - .1 Signs and notices for safety and instruction to be in English and Inuktitut.
 - .2 Maintenance and Disposal of Site Signs:
 - .1 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.

1.11 Measurement of Payment

- .1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 -Construction Progress Schedules – Bar GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 – GENERAL

1.1 Installation and Removal

- .1 Provide construction facilities in order to execute Work expeditiously.
- .2 Provide all temporary facilities consisting of the design, supply, construction, maintenance, operation and removal of the facilities and services required to support the remediation of the site. Provide temporary facilities as specified at the Work site, and any other location where temporary facilities are essential to the Work. Temporary facilities to meet requirements of Land Use Permit issued for the Work, satisfy requirements of Federal, Territorial and local Authorities Having Jurisdiction, and comply with the requirements of Section 01 35 43 - Environmental Procedures.
- .3 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.
- .4 Remove from site all such Work after use.

1.2 Location of Equipment and Fixtures

- .1 Inform Departmental Representative of impending installation and obtain his approval for location.
- .2 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.3 Access and Dust Control

- .1 Provide and maintain adequate access, including snow removal, to all working areas of the site, camp, utilities and offices during all periods of Work by Contractor, Sub-Contractors and other Contractors performing Work for Departmental Representative.
- .2 Access includes removal of snow, as may be required, to gain access to site, as required, to meet the Project Schedule.
- .3 Control site remediation operations to eliminate all excessive dust-creating activities, or as directed by Departmental Representative. The use of oil or calcium chloride for dust control is prohibited. Use only water.

1.4 Scaffolding

- .1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs as necessary for the completion of Work.
- .2 Construct and maintain scaffolding in a rigid, secure and safe manner.
- .3 Erect scaffolding independent of walls. Remove promptly when no longer required.
- .4 Design and construct scaffolding in accordance with CSA S269.2-M87. Provide details and procedures for ensuring all scaffolding equipment, materials, and construction practices meet all applicable regulations and site specific requirements.
- .5 Conform to safety requirements of Section 01 35 32, Site Specific Health and Safety Plan.

1.5 Hoisting

- .1 Provide, operate and maintain hoists required for moving of materials and equipment. Make financial arrangements with Sub-Contractors for use thereof.
- .2 Hoists to be operated by qualified operator.

1.6 Site Storage/Loading

- .1 Confine Work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.7 All-Terrain Vehicles

- .1 Provide one (1) two-passenger four-wheel drive all-terrain vehicles (ATVs) complete with hard enclosures for use by the Departmental Representative. ATVs will have:
 - .1 original equipment manufacturer supplied pick-up style rear box suitable for carrying samples and equipment.
 - .2 675 cc gasoline or equivalent diesel engine.
 - .3 Roll over protection system.
 - .4 Hard enclosure with glass windshield and windshield wipers.
 - .5 Equip ATVs with buggy whips and rotating beacon.
 - .6 Tire repair kit and air pump.
- .2 The use of this vehicle will not be shared with Contractor.
- .3 Provide sufficient vehicles (number and type) for use during the Contract to expedite the work expeditiously.
- .3 Vehicles provided for purposes of this contract are accepted at risk of supplier whether in possession of supplier or Departmental Representative.
- .4 Deliver vehicles to location designated by Departmental Representative at the site.
- .5 Store vehicles in accordance with manufacturer's recommendations.
- .6 Maintain all vehicles in good running order for duration of Project. If vehicles are out of commission for any period of time, provide other replacement vehicles.
- .7 Repair and maintain vehicles expeditiously.
- .9 Provide and pay for all fuel and lubricants required to operate the vehicles for the duration of the Project.
- .12 Provide applicable insurance for damage to vehicles and ATVs under use by Departmental Representative or Departmental Representative's Authorized Personnel.

1.8 Equipment, Tool and Materials Storage

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with Work activities.

1.9 Sanitary Facilities

- .1 Provide sanitary facilities for Work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.10 Construction Signage

- .1 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.

1.11 Start-up and Winterizing of Facilities

- .1 Commission camp, vehicles and equipment at the beginning of each construction season.

- .2 Winterize and secure camp, equipment and vehicles at the end of each construction season.
- .3 When Project is closed down at end of construction season, keep facilities operational until close down is approved by Departmental Representative.
- 1.12 Installation and Removal
 - .1 Provide temporary controls in order to execute Work expeditiously.
 - .2 Remove from site all such work after use.
- 1.13 Barricades
 - .1 Provide secure barricades around deep excavations and roofs.
 - .2 Provide as required by governing authorities.
- 1.14 Fire Routes
 - .1 Maintain access to property including overhead clearances for use by emergency response vehicles/aircraft.
- 1.15 Protection for Off-Site and Public Property
 - .1 Protect surrounding private and public property, including historical gravesites from damage during performance of Work.
 - .2 Be responsible for damage incurred.
- 1.16 Measurement of Payment
 - .1 All direct costs for the Start-up and Winterizing of Facilities are to be included in the unit price for Supply, Operation and Maintenance of Camp Facilities 01 54 00-1 , as indicated in Basis of Payment Schedule.
 - .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Temporary Storage Area

- .1 Develop Temporary Storage Areas at Ennadai Lake for the storage of containerized Hazardous Materials, hydrocarbons and contaminated soil.
- .2 Prepare the Temporary Storage Area to comply with the following (at minimum):
 - .1 Provide an easy access to the off-site transport equipment and the on-site landfill transport equipment.
 - .2 The area is to be free of standing/ponding water.
 - .3 Allow the containers to be flat and evenly distribute the weight of the containers to the supporting surface.
 - .4 The area must not be subject to flooding or excessive snow drifting.
 - .5 Supply, place, and compact additional granular fill as required.
 - .6 Surface water run-on to the area must be minimized.
 - .7 Size the area sufficiently so that it will accommodate all waste.

- .8 Sufficiently compact the area to prevent the containers from settling into the ground.
- .3 Confirm the location of the Temporary Storage Areas with Departmental Representative at least one (1) week prior to commencing operations to allow for baseline sampling if required.
- .4 The Temporary Storage Areas are to be located as follows:
 - .1 More than 30 metres away from any waterbody/wetland/spring.
 - .2 On stable and compact ground and lined with 1.5 mm impermeable geomembrane liner in accordance with Section 31 32 19.02 Geomembranes underneath all contents except non-hazardous materials.
 - .3 In an area not routinely accessed or essential to Contractor's employees or on-site personnel.
 - .4 More than 30 metres away from all flammable materials.
- .5 Temporary Storage Areas, must segregate the various types of materials, as specified in Section 02 81 01 – Hazardous Materials, as follows:
 - .1 Containerized Metal Contaminated Soil (as required if waiting for off-site disposal)
 - .2 Containerized Hazardous Solid and Liquid Materials.
 - .3 Containerized Drum, Tank, and Pipeline Contents.
 - .4 Non-hazardous Materials (as required if waiting for landfill construction).

- END OF SECTION -

PART 1 – GENERAL

1.1 Mobilization and Demobilization

- .1 Provide all labour, equipment and materials, and performance of all Work necessary for mobilization to, and demobilization from site. This will include all Departmental Representative provided supplies, equipment and material.
- .2 Mobilization to include transportation to site of Contractor's labour, equipment, materials, and assembling, erecting, and preparing site in readiness to start Work, all in accordance with Contractor's Schedule.
- .3 Demobilization to include dismantling and removal from site, of all Contractor's equipment, camp facilities and materials, waste resulting from cleanup of site and transportation of labour from site.
- .4 Decontaminate and clean all equipment used on the Project prior to demobilization according to Section 01 35 15 – Special Procedures for Contaminated Sites.
- .5 Do not mobilize to the site without written authorization from the Departmental Representative.
- .6 Summarize the proposed mode, route, equipment, labour and all other requirements for the mobilization and demobilization of all required equipment, materials, waste and personnel to complete the remediation of the project, as indicated in these specifications, in a Mobilization and Demobilization Plan.
- .7 If utilizing an ice air strip, construction and maintenance required as per Section 34 73 16 13.
- .8 All mobilization and demobilization methods to comply with the requirements of all applicable codes, standards, guidelines and Land Use Permit, Water License and IOL Access and / or Exemption Permit.
- .9 A Post-Demobilization site visit will be required as part of the Post-Demobilization Inspection as per Section 01 77 00 – Closeout Procedures.

1.2 Submittals

- .1 Submit Mobilization and Demobilization Plan in accordance with Section 01 33 00 - Submittal Procedure for review by Departmental Representative thirty (30) days after contract award.
- .2 Submit to Departmental Representative, three (3) hard copies and one (1) electronic copy of the final Mobilization and Demobilization Plan.

1.3 Measurement of Payment

- .1 Mobilization via ice airstrip, air charter and/or additional mobilizations methods to be paid for at the lump sum price tendered for under Item 01 53 00 - 1 on the Basis of Payment.
- .2 Demobilization via ice airstrip, air charter and/or additional demobilizations methods to be paid for at the lump sum price tendered for under Item 01 53 00 - 2 on the Basis of Payment.
- .3 All costs for Mobilization of all equipment and materials, including the submission of the Mobilization and Demobilization Plan, are to be included in the lump sum price for Mobilization, Item 01 53 00-1, as indicated in the Basis of Payment Schedule. The lump sum price for mobilization is to include all labour, equipment, materials, meals, accommodation, flights and any other costs necessary to undertake Work required.
- .4 All costs for Demobilization of all equipment and materials are to be included in the lump sum price for Demobilization, Item 01 53 00-2 as indicated in the Basis of Payment Schedule. The lump sum price for Demobilization is to include all labour equipment, materials, meals, accommodation, flights and any other costs necessary to undertake the

work required. Payment for Demobilization will be made after satisfactory clean-up of the site, removal from the site of all equipment, materials, site demolition debris materials and contaminated soils, as indicated and submission to Departmental Representative of all Contractor submittals.

- .5 All costs for mobilization and demobilization must be for the duration of the project until the Work is completed as per the terms within these Specifications.
- .6 All costs for Transportation of Contractor's Personnel, including all transportation cost for crew rotations, meals in transit, accommodations in transit and any other cost necessary to mobilize and demobilize Contractor's Personnel are to be included in the lump sum for Transportation of Contractor's Personnel, Item 01 53 00-3 as indicated in the Basis of Payment Schedule.
- .7 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 – GENERAL

1.1 Preliminary Requirements

- .1 Prior to installation of camp facilities and service area submit location and layout plan to Departmental Representative for review.
- .2 The location of the camp facilities must be approved by Departmental Representative. Provide twenty (20) days after Pre-Mobilization Site visit.
- .3 Temporary camp facilities to be established and operated in accordance with local regulations and Authorities Having Jurisdiction.
- .4 Provide and operate complete camp facilities services, including provision, preparation and serving of food, for construction personnel, Departmental Representative and his authorized personnel, and other specified site visitors.
- .5 Provision of camp facilities services consisting of but not limited to:
 - .1 Design, supply, installation, and operation and maintenance of camp facilities including:
 - .1 All associated facilities.
 - .2 Utilities and services required for camp facilities such as heating, lighting, fuel, potable, and domestic water systems.
 - .3 Sewage collection.
 - .4 Treatment and disposal systems.
 - .5 Waste, refuse and garbage collection and disposal system.
 - .6 Camp facilities fire prevention.
 - .7 Alarm and firefighting system.
 - .8 Camp facilities safety and security service.
 - .9 Meals and catering service.
 - .10 Shower/wash facilities.
 - .11 Sleeping and washroom facilities.
 - .12 Bedding and bedding laundry services.
 - .13 Janitorial services.
 - .14 Personnel laundry facilities.
 - .15 Recreational facilities.
 - .16 Snow removal services
 - .17 Camp re-supply and staff rotation charter flights.
 - .18 Satellite communications (phone, fax and internet).
 - .2 Obtain and pay for, as part of provision of camp facilities services all licenses, permits, and authorizations required to comply fully with all laws, ordinances and regulations of Federal and local authorities in connection with the performance of Work of this section.
 - .3 Provide camp facilities services for own workforce, surveyors, laboratory testing personnel, Departmental Representative, specialist inspectors and for three (3) overnight visitors. Separate space is to be provided for cook(s), cook's helpers and for female staff.
 - .4 Demobilize camp facilities from site at completion of contract.
- .6 Provide camp facilities services for own workforce, Departmental Representative, and Departmental Representative's authorized personnel as follows:
 - .1 Resident Departmental Representative: duration of the Project.
 - .2 Specialist Inspectors: one (1) person for the duration of the Project.

- .3 Departmental Representative, Departmental Representative's Authorized Personnel, PWGSC, and AANDC Office Personnel: on an as required basis (maximum of three (3) persons at any one time) to accommodate the Departmental Representative's Authorized Personnel, AANDC Personnel, visitors and shift change overlap.

1.2 Regulatory Requirements

- .1 Camp facilities including utilities, services, location and operation is subject to Departmental Representative's approval and is to be designed, established and operated in accordance with applicable Federal, Territorial and local codes, regulations and requirements governing camp facilities.
- .2 Camp facilities location to be established at a location which does not interfere with operations undertaken on site. Camp facilities and service area locations are subject to Departmental Representative's approval.
- .3 Obtain applicable licenses, permits and authorizations prior to establishing camp. Submit proof of same to Departmental Representative. Pay for all costs for inspection of camp facilities and electrical facilities by Authorities Having Jurisdiction.
- .4 Provide water that meets Health Canada Guidelines for Canadian Drinking Water Quality. Submit information on water, including the source and water quality test results to Departmental Representative prior to opening the camp facilities.
- .5 Comply with all requirements of the Water Use License, Land Use Permit and all other licenses, permits and authorizations.
- .6 Operate the camp in accordance with the camp rules as specified in this Section and the provisions of Section 01 35 32 Site Specific Health and Safety Plan.

1.3 Environment

- .1 Comply with environmental regulations as per Section 01 35 43 - Environmental Procedures.
- .2 Adhere to applicable guidelines and in accordance with Authorities Having Jurisdiction.
- .3 Submit to Departmental Representative before opening of camp facilities, proof of adherence to all environmental regulations. Display all applicable regulatory permits at the camp facilities site.
- .4 Comply with sewage treatment, disposal and closure requirements as outlined in Section 01 35 43 - Environmental Procedures.
- .5 Install and maintain fire protection equipment as specified in Section 01 35 32 – Site Specific Health and Safety Plan.

1.4 Camp Facilities Installation and Removal

- .1 Mobilize equipment, camp facilities, personnel, and materials.
- .2 Establish approved temporary buildings, shops, offices and facilities required.
- .3 Place all camp facilities so as not to interfere with any construction or other site activities.
- .4 Carry out all Work necessary to protect environment, such as constructing pads (if required), prior to actual installation of camp facilities.
- .5 Locate camp generators minimum thirty (30) metres to any sleeping facility, camp kitchen or an area with constant human presence.
- .6 Winterize and secure camp, equipment, and vehicles at the end the construction season.
- .7 Remove camp facilities, clean up, and leave site in condition satisfactory to Departmental Representative.

1.5 Site Location

- .1 Locate camp facilities at a site that provides for the safety and welfare of its residents for the duration of the Work. Contractor is responsible for the camp facilities location.
- .2 Locate camp facilities within walking distance of the Work site, if possible.
- .3 Locate camp facilities up wind of any locations in which materials may be burned.
- .4 Locate the medic's center in the camp facilities, if the camp facilities are within one (1) kilometre of the Work.
- .5 Locate the communications center within one (1) kilometre of the Work.
- .6 Co-locate the communications center with an office, or other facility where other workers are present.
- .7 Locate the communications center in the camp facilities, if the camp facilities are within one (1) kilometre of the Work.
- .8 Locate any temporary shelter to be used as a workshop near the Work.
- .9 Construct an access road to the selected location, as needed or as directed by Departmental Representative.

1.6 Existing Site Facilities

- .1 Contractor is advised that some of the existing site facilities to be demolished and/or handled as part of the Work contain painted materials that might be contaminated with polychlorinated biphenyls (PCBs). PCBs at concentrations in excess of 50 ppm are considered to be hazardous substances. Storage, handling and disposal of PCBs are regulated under the Canadian Environmental Protection Act, PCB Regulations and the Federal Transportation of Dangerous Goods Act. The Contractor must comply with all applicable PCB regulations.

1.7 Maintenance

- .1 Maintain camp facilities in tidy and sanitary condition.
- .2 Heat camp facilities to provide environmentally controlled conditions between 20 and 22 °C.
- .3 Equip camp facilities with furnace sized to heat rooms. Equip camp facilities with carbon monoxide and smoke detectors.
- .4 Furnace to have forced air circulation system with minimum of one (1) hot air outlet per room in sleeper units. Alternatively, other heating systems may be used upon approval by the Departmental Representative.
- .5 Clean camp facilities daily. Clean and sanitize toilets, urinals, showers, washbasins, washing machine, and laundry tubs daily.
- .6 Provide adequate bug, pest and wildlife control to all buildings, and camp facilities.
- .7 Maintain camp facilities power plant, fuel storage facilities, water lines, sewage system, garbage disposal containers, heating and cooling units, appliances and furniture in neat, clean and good operating condition and make repairs as necessary.

1.8 Departmental Representative's Requirements

- .1 Provide for sole use of Departmental Representative, one room for sleeping. Space to be furnished in same manner as rooms used by Contractor's personnel.
- .2 Provide one room for sleeping for the sole use of the specialist inspectors. Provide space for up to three (3) overnighting or occasional site visitors as and when required in the camp facilities.
- .3 Departmental Representative and specialist inspectors require office space. Space must

- also accommodate laboratory testing personnel, surveyors and additional specialist inspectors on a periodic basis.
- .4 Furnish office space with two (2) desks with top service not less than 150 cm (60") by 75 cm (30"), two (2) desk chairs and two (2) stacking type chairs, one (1) plan table and stationary as required to support a small office.
 - .5 Provide one (1) remote communications device compatible with all site communications, one (1) outlet for computer connections. Equip with surge protectors and an UPS (uninterruptible power supply) bar. Provide access to reliable communications systems for Departmental Representative and support staff.
 - .6 Provide and maintain at Departmental Representative's office two satellite phone lines or equivalent communication approved by Departmental Representative.
 - .7 Provide, for the use by Departmental Representative and Departmental Representative's Authorized Personnel, two (2) mobile communication radios, complete with charging units. The radios are to allow for on-site communication between Departmental Representative, Departmental Representative's Authorized Personnel and Contractor. The radios are to have a minimum range of 5 kilometres.
 - .8 It is critically important that the communication equipment provided by Contractor for Departmental Representative's use is reliable and of the highest quality. Immediate repair or replace faulty equipment. The equipment is to be operational from the day the Work commences.
 - .9 Provide for use by Departmental Representative, inspectors and support personnel 1 printer/copier/scanner/fax all-in-one type device. Provide network connections or hubs to permit Departmental Representative, inspectors and support personnel to remotely print to the device.

1.9 Field Laboratory

- .1 Supply and pay for a field laboratory, complete with furniture, for the use by the Departmental Representative's Authorized Personnel. The lab will accommodate geotechnical and analytical testing.
- .2 Locate the field laboratory in the camp complex and make ready for use three (3) days prior to the first day Work commences for which testing is required, and remain available for the duration for which testing is required.
- .3 The lab will be complete with heating system, lighting system, a minimum of three (3) 110 and one 220 volt, 60 cycle electric outlets, water and sewer system, sink, work benches, garbage cans, stove, hood and fan, shelving and clothes rack, two (2) desks, two (2) 0.75 m x 1.50 m tables, three (3) chairs, one (1) four-drawer filing cabinets and adequate windows.
- .4 The lab will have a minimum floor area of 20 m².
- .5 Equip the lab with a standard refrigerator with a total minimum capacity of 0.48 cubic metres (17 cubic feet) and a chest freezer with a total minimum capacity of 0.28 cubic metres (10 cubic feet). The refrigerators and freezer will remain the property of the Contractor.
- .6 Equip the lab with the following new granular material testing equipment:
 - .1 One (1) forced convection bench top laboratory oven with digital controls, stainless steel interior and suitable for effective drying of soil samples.
 - .2 One (1) rack of sieves: 200 mm metric sieves, or equivalent. Sieve sizes: 0.080, 0.160, 0.425, 1.25, 2.5, 5.0, 10.0, 25.0, 50.0, 75.0 and 100.0 mm.
 - .3 One (1) wash sieve, lid and pan.
 - .4 Pans and Tares:
Two (2) each 13" x 9" x 2"

- Two (2) each 26" x 18" x 3.5"
- Two (2) each 9.3" x 5.3" x 2.7"
- 100 paper plates - 200 mm min. diameter.
- 100 aluminum pie plates - 200 mm min. diameter (for use in oven).
- .5 One (1) brass sieve brush and one soft sieve brush.
- .6 One (1) precision grade electronic scale with an accuracy and readability to 0.1 g and a minimum capacity of 8 kg.
- .7 One (1) polyethylene tarp for sample splitting: 1.8 m x 1.8 m minimum size.
- .8 One (1) 115 V / 60 Hz portable sieve shaker with timer and minimum 1/3 hp motor drive. This unit must be capable of securing a minimum of ten full size 8" sieves
- .9 One (1) pair of oven mitts.
- .7 Clean the lab at least two times per week, and maintain all electric lights, heating, water and sewer systems in good working condition during the period the laboratory is required. Maintain facility in acceptable condition.
- .8 Provide power to the lab on a 24 hour/day basis while the remediation activities, requiring laboratory services, are in operation. Equip all power supplies with adequate surge protection. Damage to equipment resulting from power surges will be repaired or replaced at no cost to the Departmental Representative or his authorized personnel.
- .9 Submit to the Departmental Representative for approval, a sketch of the proposed lab twenty (20) days before fabrication or construction.
- .10 Provide Departmental Representative with key-locks for the field lab prior to commencement of activities requiring laboratory services being in operation.
- 1.10 Departmental Representative's and Departmental Representative's Authorized Personnel Sleeping Quarters
 - .1 Sleeping quarters for Departmental Representative and his authorized personnel are to be within the camp complex, but segregated from those for Contractor's staff.
 - .2 It is anticipated that Departmental Representative's Work force will include both male and female personnel. Design and operate the construction camp with due consideration of the separate and private requirements for this Work force.
 - .3 Provide single sleeping quarters for use by Resident Departmental Representative with a minimum floor area of 6 m².
 - .4 Sleeping quarters for other Departmental Representative's support personnel, as indicated in this Section, are to provide for maximum double occupancy with a minimum floor area of 9.2 m².
 - .5 Provide a minimum of 11 m³ of air space for each occupant.
 - .6 Provide key locks and keys for Departmental Representative and Departmental Representative's staff sleeping quarters upon their use of these facilities.
 - .7 Provide storage lockers and/or shelving to store personnel items. Provide at least one (1) power outlet per occupant. Provide one (1) reading light above each bed.
- 1.11 Kitchen Dining Complex
 - .1 Functional design of kitchen to include all equipment necessary for food storage, preparation, cooking and serving three (3) meals daily to meet camp population requirements.
 - .2 Provide dishwashing and garbage handling equipment, consistent with required function of kitchen.
 - .3 Provide seating capacity of dining area to meet camp population requirements.

- .4 Store all non-perishable food supplies in adequate, vermin-proof containers, kept in an orderly manner and under sanitary conditions.
- .5 Store all perishable food supplies in properly refrigerated indoor areas within camp facilities to preclude attraction of wildlife.

1.12 Linen, Bedding and Laundry

- .1 Supply three (3) blankets, two (2) sheets, one (1) bath towel, one (1) face cloth, and two (2) pillow and one (1) pillow case for each person living in camp facilities.
- .2 Change two (2) sheets and one (1) pillow case weekly or whenever occupancy changes.
- .3 Launder sheets and pillow covers regularly to provide weekly supply of clean linen.
- .4 Provide clean blankets to all camp occupants. Clean blankets as conditions warrant.
- .5 Cooking staff to wear suitable kitchen attire. Launder kitchen attire daily.

1.13 Ablution and Latrine Facilities

- .1 Provide ablution and latrine facilities as per Authorities Having Jurisdiction and codes requirements and as per camp occupancy requirements as follows:
 - .1 Flush toilets as required.
 - .2 Individual shower units with non-slip flooring together with adjacent dressing cubicles as required.
- .2 Maintain separate ablution and latrine facilities for female/male populations.
- .3 Maintain separate ablution and latrine facilities for Departmental Representative and Departmental Representative's support staff.
- .4 Clean ablution and latrine facilities daily. Supply adequate amounts of paper towels, toilet tissue, and individual drinking cups in washrooms.

1.14 Food Quality and Schedule

- .1 Groceries to be of top quality. Eggs and dairy products to be grade "A". Canned fruit and vegetables to be choice or fancy.
- .2 Beef to be Canada Grade "A", pork to be Grade "I", turkey, chicken or other fowl to be "utility" or better.
- .3 Provide choices of traditional food. Provide healthy choices in food preparation.
- .4 As a minimum, provide three (3) meals a day. Provide casual meals or fourth meals if irregular shifts are worked or irregular travel by personnel is required.
- .5 Main courses to be served at meals are classified as follows:
 - .1 First Line: Beef steak, roast beef, roast pork, veal cutlets, baked ham, ham steak, chicken, turkey, pork chops, roast lamb, roast veal.
 - .2 Second Line: Fish, short ribs, spare ribs, stews, meat pies, liver, curried dishes, spaghetti and meatballs, sausages, Salisbury steak, Swiss steak, ground beef, corned beef, stir fries.
 - .3 Third Line: Hot dogs, omelettes, chili con carne, baked beans, chicken and turkey turnovers, dishes using leftover meats, soup and sandwiches.
- .6 Lunch is to include one (1) second line item and a third line item. Do not repeat the same selection more than twice weekly. Provide a vegetarian option upon request.
- .7 Supper to include one (1) first line and a choice between a second and third line. Do not repeat the same selection more than twice weekly. Beef steak to be served at least once per week. A vegetarian option to be available on request.
- .8 Breakfast to include fruit juice or fruits, coffee, tea, milk, hot and cold cereals, porridge, toast and preserves, peanut butter, hot cakes, eggs, bacon, ham and sausages.

- .9 Provide box lunches for all camp occupants who will not be in camp facilities for noon meal.
 - .10 Contractor will be given twelve (12) hours notice to serve fourth and/or casual meals to Work forces of other Contractors and Departmental Representative.
 - .11 Provide "Mug Up" nightly at 2100 hours consisting of tea, coffee, hot chocolate, fruit juice and any left-over pastries at cook's discretion. Make coffee available at coffee breaks.
 - .12 Provide beverages and snacks at all times. A variety of snacks should be available, including snacks that are appropriate for diabetics or persons with blood sugar concerns. Snacks may consist of fresh fruit or vegetables, granola bars, cheese and crackers, bannock, or other suitable items.
 - .13 Make available daily apples and oranges; serve other types of fresh fruit at least once per week. Fresh salads are to be provided daily.
 - .14 Provide whole milk each day; powdered milk is not acceptable for drinking, but may be used for cooking.
- 1.15 Service Facilities
- .1 Install, hook-up, test and make necessary repairs to sewage, water supply, heating, and electrical services.
 - .2 Situate power plant in camp facilities area to minimize noise, and prevent exhaust fumes from blowing through camp facilities during prevailing winds.
 - .3 Ground all buildings and electrical equipment with an approved grounding system.
- 1.16 Recreation
- .1 Provide an area for recreation for all camp occupants.
 - .2 Area to be of a size suitable for accommodating at least 50% of camp occupants, and to be suitably furnished with lounge and stacking chairs.
 - .3 Provide a TV and DVD player for use by camp occupants. Alternatively, provide a satellite system.
 - .4 Provide a minimum of twenty (20) DVD Movies and rotate these movies every two weeks or provide a TV with satellite link.
 - .5 Provide an assortment of books (soft cover) and magazines for reading.
- 1.17 Camp Facilities Rules
- .1 Camp facilities of this size and nature in a remote location require that certain basic rules be established for mutual benefit of all camp occupants.
 - .2 Prepare a set of camp facilities rules, for approval by Departmental Representative, prior to commencing operations.
 - .3 In order to protect all residents, the following activities are strictly prohibited and could result in dismissal and removal from site:
 - .1 Tampering with smoke or fire detectors/alarms, any other safety equipment or electrical outlets/fixtures.
 - .2 Possession and consumption or use of alcohol or illegal drugs.
 - .3 Possession or use of firearms, ammunition or other lethal weapons.
 - .4 Fighting, physical violence, stealing, vandalism or destruction of property.
 - .5 Harassment in any form.
 - .6 The employee or visitors departure from the site for any of these reasons will be on the first available scheduled transportation. Should this person wish to leave immediately the costs will be the responsibility of the employee.

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- .4 Make all camp residents familiar with all emergency procedures, exits, signals and alarms. Keep accesses to fire equipment clear at all times, and immediately report any damaged fire or safety apparatus to your supervisor.
 - .5 Use of vehicles or equipment only when trained and authorized to do so.
 - .6 Use, adjust and repair equipment or machinery only when authorized by the supervisor.
 - .7 Vehicle/Equipment checks must be completed and the logbook updated at the beginning of every shift or when starting any vehicle or piece of equipment. Seat belts must be worn at all times in vehicles and equipment.
 - .8 Keep living areas as clean as possible.
 - .9 Have warm emergency clothing available at all times during the wet or cold weather.
 - .10 Keep clothing or other flammable goods away from baseboard heaters.
 - .11 Ensure that personal items and clothing are marked for easy identification. Provide space for workers to hang wet clothing to dry prior to next shift.
 - .12 Employees must store/remove all personal effects and belongings when going off rotation or permanently off site.
 - .13 No loose clothing, dangling neckwear, bracelets, rings or similar articles are to be worn where there is a risk of coming into contact with moving machinery or electrical energized equipment.
 - .14 Keep workplace and equipment neat and orderly. Complete an inspection of your Work place tools and equipment prior to starting Work. Correct any hazards immediately.
 - .15 Provide a copy of camp facilities rules to all camp occupants prior to or upon arrival in camp.
 - .16 Enforce camp facilities rules.
- 1.18 Controlled Access Trailer
- .1 Provide a suitably sized trailer to house the decontamination rooms for entire construction crew, Departmental Representative, inspectors and up to five (5) visitors to the site.
 - .1 The trailer is to have two (2) access doorways where construction workers and field personnel can enter from the construction side, change out their PPE and field clothes, and wash up prior to entering the camp facilities or clean site of the trailer.
 - .2 Provide a washer and dryer, to be incorporated into the decontamination side of the trailer.
 - .3 Provide the necessary utilities and connections to operate the decontamination trailer.
 - .4 Provide a designated area for all construction equipment, located in such a manner as to minimize the potential for contaminated material (PCBs, asbestos, soil and the like) to enter the camp facilities.
- 1.19 Laundry Facilities
- .1 Within the camp, provide both personnel laundry facilities and facilities dedicated to the camp (ex: bedding, kitchen linens) separate from those in the Controlled Access Trailer.
 - .2 Laundry facilities for washing of PPE (e.g: coveralls and other exterior work clothing) to be located within or adjacent to the Controlled Access Trailer.
- 1.20 Equipment, Tool and Materials Storage
- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
 - .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with Work activities.

1.21 Sanitary Facilities

- .1 Washroom facilities are to be provided at, or in close proximity to, the respective camp facilities and Work areas.
- .2 Washroom facilities provided to have running hot and cold water for workers not able to return to the camp facilities for lunch.

1.22 Security

- .1 Restrict access to camp facilities. Only persons employed on Project to be allowed normal access. Unauthorized persons will be permitted on site only with approval of Departmental Representative and/or Contractor.

1.23 Access to Work

- .1 Be responsible for the transport of personnel and equipment to the various Work areas on the site.

1.24 Transportation

- .1 Provide return air transportation services for Departmental Representative and Departmental Representative's Authorized Personnel from Contractor's Charter Base to the Ennadai Lake site.
- .2 It is anticipated that air transport of Departmental Representative's Authorized Personnel will be scheduled to coincide with the transport of Contractor's workforce to and from the site. Provide air transportation for Departmental Representative's personnel at a minimum frequency of one return trip per week and two additional trips per month scheduled according to Departmental Representative's request.
- .3 Departmental Representative will advise Contractor of Departmental Representative's and Departmental Representative's personnel air transportation requirements one (1) week in advance of trip departure.

1.25 Refuse/Garbage Management

- .1 Store refuse and waste in wildlife-proof containers prior to incineration or off-site disposal.
- .2 Burnable refuse/waste may be incinerated by following burn schedule, and ensuring that it meets air quality guidelines.

1.26 Submittals

- .1 All submittals in accordance with Section 01 33 00 – Submittals Procedures.

1.27 Measurement of Payment

- .1 All costs for the supply, operation and maintenance of all camp facilities and equipment, including water treatment and sewage treatment, inspection of camp facilities and electrical facilities by officials, on-site mobile communication equipment, as well as the provision of catering, rooms, and laundry and janitorial services for the camp facilities are to be included in the lump sum payment under Item 01 54 00-1, as indicated in the Basis of Payment Schedule.
- .2 The provision of room and board and associated services for Departmental Representative and Authorized Personnel will be measured for payment by the person-day for each day that personnel reside overnight at the camp facilities. Departmental Representative's room and board will be paid under Item 01 54 00-2 in the Basis of Payment Schedule.
- .3 Provision of casual meals to visiting Departmental Representative's authorized personnel will be measured for payment by the number of meals served. Casual meals will be paid under Item 01 54 00-3 in the Basis of Payment Schedule.
- .4 The provision of air transportation from Contractor's Charter Base to the Ennadai Lake site of Departmental Representative's Authorized Personnel will be measured for payment by

the number of person return trips and will be paid Item 01 54 00-4 in the Basis of Payment Schedule.

- .5 All costs for the supply, installation and operation of satellite and/or long distance communication links for Departmental Representative and authorized personnel in the lump sum price for Communication links, Item 01 54 00-5, as indicated in the Basis of Payment Schedule.
- .6 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 -Construction Progress Schedules – Bar GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

PART 1 - GENERAL

1.1 General

- .1 Use new material and like new equipment acceptable to Departmental Representative unless otherwise specified.
- .2 No later than twenty (20) days after contract award, submit the following information for materials and equipment proposed for supply:
 - .1 Name and address of manufacturer,
 - .2 Trade name, model and catalogue number,
 - .3 Performance, descriptive and test data,
 - .4 Manufacturer's installation or application instructions,
 - .5 Evidence of arrangements to procure.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.
- .5 Provide material and equipment of specified design and quality, performing to published ratings, and for which replacement parts are readily available.

1.2 Submittals

- .1 All submittals in accordance with Section 01 33 00 - Submittal Procedures

1.3 Reference Standards

- .1 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .2 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .3 Conform to latest date of issue of referenced standards in effect except where specific date or issue is specifically noted.

1.4 Quality

- .1 Products, materials, and articles (referred to as products throughout specifications) incorporated in Work to be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacturer for any particular or like item throughout.

1.5 Availability

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. 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 Work.

- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.6 Storage, Handling and Protection

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints, solvents and other liquids in heated and ventilated room. Refer to WHMIS MSDS for proper storage of all products used on site. Dispose of oily rags and other combustible debris daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.7 Transportation

- .1 Pay costs of transportation of products required in performance of Work.

1.8 Manufacturer's Instructions

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative may establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.9 Quality of Work

- .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 required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.10 Coordination

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.11 Measurement of Payment

- .1 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 – GENERAL

1.1 Qualifications of Surveyor

- .1 Qualified registered surveyor, licensed to practice in Nunavut, with a minimum of five (5) years of surveying experience, acceptable to Departmental Representative.
- .2 Surveyor cannot be an employee of Contractor.

1.2 References

- .1 Departmental Representative's identification of existing survey control points and property limits.

1.3 Survey Reference Points

- .1 Base horizontal and vertical control points will need to be established.
- .2 Locate, confirm and protect control points prior to starting site Work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.4 Survey Requirements

- .1 Establish two (2) 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.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Prepare a topographic map of Work sites prior to demolition or excavation Work as directed by Departmental Representative to provide a baseline survey for quantity measurements.
- .4 Stake location of landfill(s) and landfarm(s) in the field, and prepare a record drawing showing final location and contours of the landfill(s) and landfarm(s).
- .5 Prepare drawings showing areas where repairs were undertaken.
- .6 Layout area to be cleared at the landfill(s) and landfarm(s) site, measure area(s) cleared, provide a drawing showing area cleared and calculations.
- .7 Maintain surveys for quantity calculations.
- .8 Survey locations of all environmental samples and geotechnical work as directed by Departmental Representative. Provide drawings showing all appropriate details to Departmental Representative as required.

1.5 Survey Equipment

- .1 Maintain at site, for duration of the construction period, a complete set of survey equipment for occasional use by the Departmental Representative. Shared use of Contractor's survey equipment is acceptable.
- .2 Equipment to include:
 - .1 Surveying Total Station with data recording capability, tripod, spare battery, battery charger, downloading hardware and software and all associated ancillary items cables, hardlock, etc. Preference to be for equipment that operates in both English and French.

- .2 Automatic level with tripod.
- .3 Single prism with 5 metre collapsible range pole.
- .4 Triple prism with tripod.
- .5 50 metre cloth tape (steel reinforced)
- .6 5 metre collapsible level rod.
- .7 Magnetic pin finder (high frequency).
- .8 One 1.2 m carpenter's level.
- .3 Calibrate all equipment prior to each construction season. Submit to the Departmental Representative documentation certifying the calibration of the equipment thirty (30) days prior to construction commencement.

1.6 Survey Markers

- .1 Provide all survey markers and other items required to complete Work as specified, including, but not limited to:
 - .1 Pointed stakes (minimum 1.2 m in length, 12 mm thick, 38 mm wide)
 - .2 Pointed hubs (minimum 0.5 m in length, 20 mm thick, 38 mm wide)
 - .3 Nails (100 mm long), spikes (250 mm long), pins (1 m long), etc.
 - .4 Fluorescent paint, flagging, etc.
 - .5 Felt markers, chalk, wax pens, etc.
- .2 Maintain supply of survey markers for Departmental Representative's use.

1.7 Records

- .1 Maintain a complete, accurate log of control and survey Work as it progresses.

1.8 Submittals

- .1 Submit name and address of Surveyor to Departmental Representative thirty (30) days prior to construction commencement.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering Work.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.
- .4 Submit all drawings electronically in accordance within PWGSC protocols for AutoCAD drawings and by hard copy. Hard copy drawings must be signed by a professional engineer registered in the Territories.
- .5 Submit survey data backup for quantities claimed.
- .6 Submit raw survey data in electronic form.
- .7 Submit the record survey data file as the latest as constructed information.

1.9 Measurement of Payment

- .1 Work identified in this section will be paid for in the lump sum price under Item 01 71 01 - 1 Survey in the Basis of Payment Schedule. Tendered price to include all labour, equipment, materials, meals, accommodation, flights, and any other costs necessary to undertake Work required.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 -Construction Progress Schedules – Bar GANTT) Chart.

PART 2 - PRODUCTS

2.1 **Not Used**

.1 Not used.

PART 3 - EXECUTION

3.1 **Not Used**

.1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Closeout Procedures

- .1 Notify Departmental Representative when Work is considered ready for Substantial Completion.
- .2 Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Departmental Representative's instructions for correction of items of Work listed in executed Certificate of Substantial Completion.
- .4 Notify Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's final inspection.

1.2 Inspection and Declaration

- .1 Contractor's Inspection: Contractor and all Sub-Contractors to conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request Departmental Representative's Inspection.
- .2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform an inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Work is complete and ready for Final Inspection.
- .4 Final Inspection: when items noted above are completed, request Final Inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.
- .5 Post-Demobilization Inspection: once demobilization is completed, Departmental Representative will request a Post-Demobilization inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

1.3 Measurement of Payment

- .1 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 -Construction Progress Schedules – Bar GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Format

- .1 Organize data in the form of an instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf [219 x 279] mm with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of Project and identify subject matter of contents.
- .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: Manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dxf or dwg format on CD.

1.2 Contents – Each Volume

- .1 Table of Contents: provide title of Project.
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
 - .4 Summary of health and safety issues, environmental issues and performance indicators .
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of Sub-Contractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified.

1.3 Final Survey

- .1 Submit final site survey certificate in accordance with Section 01 71 01 - Survey, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.4 As-Builts

- 1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one (1) record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.

- .4 Task Authorizations.
- .5 Change Orders and other modifications to the Contract.
- .6 Reviewed shop drawings and product data.
- .7 Field test records.
- .8 Inspection certificates.
- .9 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.5 Recording Actual Site Conditions

- .1 Record information on set of black line opaque drawings provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
- .5 References to related shop drawings and modifications.
 - .1 Field changes of dimension and detail.
 - .2 Changes made by Task Authorization, Change Order or Field Order.
- .6 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Task Authorization, Addenda and change orders.
- .7 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.6 Record Drawings

- .1 Departmental Representative will provide to Contractor, two (2) sets of white prints for record drawing purposes.
- .2 Maintain Project record drawings and record accurately deviations from Contract documents on one set of prints.
- .3 Record changes in red or on separate layer electronically.
- .4 At completion of Project and prior to final inspection, neatly transfer record notations to second set of drawings and submit both sets to Departmental Representative. Forward information on completed areas at the end of the construction season.

1.7 Other Records

- .1 Prior to completion of Project, submit the following to the Departmental Representative:
 - .1 Copies of all documents and permits obtained by the Contractor.
 - .2 Results of all testing carried out by the Contractor.
 - .3 Any other pertinent information.
 - .4 Copies of all shipping documents identifying the shipper, the receiver and all carriers involved in the transport of materials.
 - .5 Information as required by the Land Use Permit.
 - .6 Information as required by the Water License.
 - .7 Information as required by the Quarry Permit.
 - .8 Information as required by the IOL Access and /or Exemption Permit.
 - .9 Information as required by all other applicable regulatory bodies and Authorities Having Jurisdiction.
 - .10 Copies of all Transportation of Dangerous Goods documentation.
 - .11 Copies of all waste manifests.
 - .12 Copies of all weigh scale tickets.
 - .13 Documentation as required for PCB material management.
- .2 Consolidate the above information in one (1) document and submit five (5) copies to the Departmental Representative.

1.8 Measurement of Payment

- .1 All direct costs for the Project Record Documents are to be included in the lump sum price for Project Record Documents, Item 01 78 00 - 1, as indicated in Basis of Payment Schedule.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 -Construction Progress Schedules – Bar GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Not Used

- .1 Not used.

- END OF SECTION -

PART 1 - GENERAL

1.1 Description

- .1 Methods and procedures for demolition, removal and disposal of buildings and tanks at the Site as indicated on Drawing C04 to C08 and in Appendix C (Demolition, Asbestos and Lead Painted Substrate Inventory Tables). The thirteen (13) buildings and five (5) tanks that will require demolition prior to disposal are: Buildings 1-9 in APECs 14-22, the Medium Cabin (APEC 6), the Small Cabin (APEC 7), the Pump house (APEC 29), Building 10 (APEC N/A) and Tanks 1-5 (APEC 4 and APECs 9-12).
- .2 Methods and procedures for demolition of buildings with lead and PCB paint on buildings, as indicated on Drawings.
- .3 Inventory of materials as included in Appendix C.
- .3 Methods and procedures for demolition of buildings with visible mould on materials (mostly wood) within Building 1, APEC 14, as indicated on Drawing C07 and materials noted in Appendix C. This also includes mould found during remediation.

1.2 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT) Chart.
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 23 – Debris and Miscellaneous Removals.
- .7 Section 02 81 01 – Hazardous Materials.
- .8 Section 02 82 00.01 – Asbestos Abatement Minimum Precautions.
- .9 Section 02 82 00.02 – Asbestos Abatement Intermediate Precautions.
- .10 Section 02 82 00.03 – Asbestos Abatement Maximum Precautions.
- .11 Section 02 83 10 – Lead Based Paint Abatement Minimum Precautions.
- .12 Section 02 83 11 – Lead Based Paint Abatement Intermediate Precautions.
- .13 Section 02 83 12 – Lead Based Paint Abatement Maximum Precautions.
- .14 Section 02 84 00 – Polychlorinated Biphenyl Remediation

1.3 Definitions

- .1 Air/ground/marine shipping container: The container into which the leachable-lead material and intermediates containers are placed for purposes of shipping to a disposal facility.
- .2 Contractor's Designated Hazardous Waste Disposal Facility: A Licensed Hazardous Waste Disposal Facility designated by the Contractor for the disposal of all hazardous materials specified under the provisions of this contract. The facility must be pre-approved by the Departmental Representative prior to beginning work. Contractor must provide documentation from the Designated Hazardous Waste Disposal Facility indicating full responsibility for all hazardous materials accepted from the Site.
- .3 Hazardous material: Items or debris no longer used for their original purpose; now hazardous and intended for recycling, treatment or disposal. Also material that is designated as "hazardous" under Nunavut Territorial or Federal Legislation; or as a "dangerous good" under the TDGA. This may include dangerous substances, dangerous

- goods, hazardous commodities and hazardous products, include but not limited to poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.
- .4 Intermediate container: Container used to consolidate small PCB and leachable-lead materials within the marine shipping container.
 - .5 Leachable-lead painted material: Material that is coated with lead based paint that has been analyzed and determined to contain leachable lead concentrations in excess of 5 ppm.
 - .6 Total lead painted material: Material that is coated with lead based paint that has been analyzed and determined to contain total lead concentrations in excess of 600 ppm.
 - .7 Mould Contaminated Work Area: Specific area or location where actual work is being performed or such other areas of a facility where it has been determined that it may be hazardous to public health as result of visible mould amplification.
 - .8 Non-hazardous waste: Materials that are not designated as hazardous under Territorial or Federal Legislation. Material and which do not meet the definition of hazardous materials as defined in Section 02 81 01 - Hazardous Materials.
 - .9 Physical hazard: Poses a slip, trip or fall risk to personnel and wildlife, risk to damage any vehicle (for example ATV, snowmobile, etc.).
 - .10 Temporary Storage Area: A designated area used for the consolidation and storage of containerized hazardous materials as specified in Section 01 52 00 – Construction Facilities.
 - .11 Waste Management Co-ordinator (WMC): Contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.
 - .12 Hazardous Materials Specialist: Contractor representative responsible for supervising all hazardous waste activities as well as coordinating required submittal and reporting requirements.
 - .13 Unpainted Wooden Materials: Wooden debris that is not painted, chemically treated or contaminated in any way and is suitable for on-site incineration. Unpainted pressboard or plywood is considered unpainted wooden materials.

1.4 References

- .1 Department of the Environment, Government of Nunavut:
 - .1 Environmental Guideline for the Burning and Incineration of Solid Waste (2012).
 - .2 Environmental Guideline for the General Management of Hazardous Materials (2010).
 - .3 Environmental Guideline for Contaminated Site Remediation (2009).
 - .4 Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities (2011)
 - .5 Environmental Guideline for Mercury-Containing Products and Waste Mercury (2010).
 - .6 Environmental Guideline for Waste Paint (2010).
 - .7 Environmental Guideline for Ozone Depleting Substances (2011).
 - .8 Environmental Guideline for Waste Antifreeze (2011).
 - .9 Environmental Guideline for Waste Asbestos (2011).
 - .10 Environmental Guideline for Waste Batteries (2011).
 - .11 Environmental Guideline for Waste Lead and Lead Paint (2011).
 - .12 Environmental Guideline for Waste Solvent Division (2011).

- .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33:
 - .1 CCME PN 1326-2008, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.
 - .2 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
 - .3 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
 - .4 SOR/2003-355, Off-Road Small Spark-Ignition Engine Emission Regulations.
 - .5 SOR/2005-32, Off-Road Compression-Ignition Engine Emission Regulations.
 - .6 SOR/2011-10, Marine Spark-Ignition Engine, Vessel and off-Road Recreational Vehicle Emission Regulations.
- .3 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1999, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).
- .4 Canadian Standards Association:
 - .1 CSA Standard Z94.4-93 – Selection, Use and Care of Respirators.
- .5 Health Canada:
 - .1 Hazardous Products Act - Workplace Hazardous Materials Information System (WHMIS) Requirements.
- .6 CSA International:
 - .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.
- .7 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC-S660-08, Standard for Non-metallic Underground Piping for Flammable and Combustible Liquids.
- .8 National Institute for Occupational Safety and Health (NIOSH):
 - .1 Occupational Safety and Health Guidance Manual for Hazardous Materials Site Activities: NIOSH Publication No. 85 115.
- 1.5 Administrative Requirements
 - .1 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting prior to beginning the work of this Section with the Contractor's Representative and Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify project requirements.
 - .2 Verify existing site conditions adjacent to demolition work.
 - .3 Co-ordination with other construction sub-trades as required.
 - .2 Hold project meetings every week.
 - .3 Ensure key personnel, site supervisor and subcontractor representatives attend.
 - .4 WMC must provide written report on status of waste diversion activity at each meeting.
 - .5 Departmental Representative will provide written notification of change to meeting schedule established upon contract award twenty-four(24) hours prior to scheduled meeting.
 - .2 Scheduling:
 - .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.

- .1 In the event of unforeseen delay, notify Departmental Representative in writing.

1.6 Instruction and Training

- .1 Before commencing work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in potential health hazards of mould exposure, handling of hazardous materials, and in the use of applicable respirators and protective clothing. This training can be performed as part of a program to comply with the requirements of OSHA Hazard Communication Standard 29 CFR 1910.1200.
- .2 Instruction and training must be provided by a qualified construction safety advisor.

1.7 Submittals

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 The WMC is responsible for fulfilment of reporting requirements.
- .3 Prior to beginning of Work on site, submit detailed Waste Reduction Workplan in accordance with Section 01 35 15 – Special Project Procedures for Contaminated Sites and indicate:
 - .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
 - .2 Schedule of selective demolition.
 - .3 Number and location of dumpsters.
 - .4 Name and address of haulers, waste facilities and waste receiving organizations.
- .4 Submit copies of certified weigh bills, bills of lading and receipts from authorized disposal sites and reuse and recycling facilities for material removed from site on a weekly basis upon request of Departmental Representative.
 - .1 Written authorization from Departmental Representative is required to deviate from haulers, facilities and receiving organizations listed in Waste Reduction Workplan.
- .5 Where required by Authorities Having Jurisdiction, submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures.
- .6 Do not commence demolition work, including asbestos abatement removal, until the Contractor has demonstrated to Departmental Representative that all required permits for the work that have been obtained.

1.8 Quality Assurance

- .1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, TDGA, and applicable Territorial and Municipal regulations.

1.9 Site Conditions

- .1 Environmental Protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
 - .1 Ensure Work does not adversely affect adjacent watercourses, groundwater, and wildlife, or contribute to excess air and noise pollution.
 - .2 Fires and burning of waste or materials (other than unpainted wood) is not permitted on site.
 - .3 Do not bury camp generated materials unless directed by the Departmental Representative to dispose of in the on-site engineered landfill.

- .4 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, hazardous materials or toxic cleaning solutions into watercourses.
- .5 Ensure proper collection and disposal procedures are maintained throughout Work.
- .2 Do not pump water containing suspended materials into watercourses or onto adjacent land.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Authorities Having Jurisdiction, the Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities (GN, 2011) and as directed by the Departmental Representative.
- .4 Protect native vegetation on site and adjacent properties where indicated.
- .5 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work as required.
- .6 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads or trails.
- .7 Take precautions to support structures as necessary prior to personnel entering and, if safety of building being demolished or adjacent structures or services appear to be endangered, cease operations and notify Departmental Representative.
- .8 Provide safe passage of persons around area of demolition.
- .9 Weather conditions and forecast are to be considered. Do not proceed with demolition work when weather conditions constitute a hazard to the workers and site.
- .10 All personnel engaged in demolition activities are to wear and use protective clothing and equipment required for such work.
- .11 When working with PCB-containing materials, leachable lead-based paints, asbestos, and other hazardous materials, workers are to wear protective clothing and equipment acceptable to Labour Canada or Territorial Labour Department as suitable for exposure in the work area and as detailed in Section 02 81 01 - Hazardous Materials. Follow NIOSH guidelines in providing protection for on-site personnel including contract employees, subcontractors, Departmental Representative, Departmental Representative's staff, and other authorized personnel.
- .12 Fluorescent lamp ballasts are to be handled, and general safety precautions followed, as stated below:
 - .1 Some ballasts in the buildings to be demolished may contain PCB-filled capacitors.
 - .2 Appropriate health and safety precautions, such as an exposure control plan, should be taken as per Contractor's Site Specific Health and Safety Plan while handling ballasts.
 - .3 Refer to Section 02 84 00 - Polychlorinated Biphenyl Remediation and Environment Canada Publication, "Identification of Fluorescent Lamp Ballasts Containing PCBs".

1.10 Existing Conditions

- .1 If material resembling spray or trowel applied asbestos or other designated substance listed as hazardous not identified in Appendix C is encountered in the course of demolition, stop work, take preventative measures, and notify the Departmental Representative immediately. Proceed only after receipt of written instructions have been received from Departmental Representative.

- .2 Structures to be demolished are based on their condition on the date that tender is accepted.
- .3 The information presented in the Appendices, including photographs and inventory tables, provide brief descriptions for structures and facilities to be demolished. These tables and drawings indicate only the major construction details and building systems, and are not to be construed as exact for final demolition requirements. Be responsible for all work described in this Section, which includes the complete demolition of all facilities and structures designated for demolition.
 - .1 The information presented in the Appendices indicates types and quantities of hazardous materials that have been previously identified, and must be removed and disposed of in accordance with these Specifications. Should potentially hazardous material, other than that already identified, be encountered in the course of demolition work, stop work immediately, and notify Departmental Representative. Do not proceed until written instructions have been received from Departmental Representative.
 - .2 A listing of the components of each facility is presented in Appendix C. Not all painted surfaces of facilities and structures to be demolished have been sampled and tested for PCBs, leachable lead or asbestos. Further testing by Departmental Representative at the beginning of the first construction season may identify further asbestos or PCB-amended Paint.

1.11 Qualifications

- .1 Contractor and Contractor's workers to be thoroughly familiar with and knowledgeable about existing site conditions, scope of work, and requirements of the Specification.
- .2 Only Contractor's workers able to provide a history of satisfactory experience in the area of hazardous materials management and can satisfy Federal and Territorial requirements will be permitted to supervise and conduct the work of this Section. Contractor's Hazardous Materials Specialist responsible for the work of this Section is to have a minimum of five (5) years of experience in the area of hazardous materials management. This is to include moderate and high risk safe work procedures.
- .3 Follow guidelines such as those established in Occupational Safety and Health Guidance Manual for Hazardous Materials Site Activities: NIOSH Publication No. 85 115.
- .4 Contractor's personnel, who have been trained as described in this Section, are to instruct and direct all workers with respect to the waste management procedures, labour and safety practices to be followed in carrying out the work.
- .5 Provide all workers with protection appropriate to the potential type and level of exposure. Establish specific safety protocols and implement an exposure control plan prior to commencing clean-up activities of an identified or suspect hazardous material.
- .6 Provide suitable personal protective clothing and equipment as required during the course of the work. Supply sufficient quantities and various sizes of protection equipment to fit all site personnel including Departmental Representative, Departmental Representative's staff, and site visitors.
- .7 Trained and certified personnel are required to complete all TDGA documentation and recording requirements.

1.12 Measurement for Payment

- .1 Include all direct costs in lump sum price for Item 02 41 16-1 Structure Demolition as indicated in the Basis of Payment Schedule. Work indicated under lump sum item includes, but is not limited to:
 - .1 Removal, handling, segregation, hauling and incineration of unpainted wood materials on site is to include, but not limited to:

- .1 Obtain necessary burn permits required from Authority Having Jurisdiction.
- .2 Collection, sorting and on-site transport of all untreated wood to the burning location.
- .3 Provide an ash collection system which is capable of containing ash until it is sampled. A water-tight metal tray with sides of at least 300 mm high is acceptable. A tray salvaged from materials on site is acceptable. Provide means to protect the ash from wind and water until it is sampled as described in Section 02 41 23 - Debris and Miscellaneous Removals.
- .2 Removal, handling, segregation, hauling and disposal of non-hazardous materials to the landfill on site, including, but not limited to: buildings, metal, shingles, rubber, plastic, windows, fibreglass insulation, styrofoam, textiles, porcelain, crushed drums (20 L and 205 L), non-hazardous liquids, metal pole and tower supports and other inert items.
- .3 Separation, abatement, handling, and segregation, of asbestos and/or lead/PCB painted materials for transport/disposal.
- .4 Removal, handling, packaging and disposal of creosote treated wood materials.
- .5 Separation, removal, handling, and segregation of all other hazardous materials, including, but not limited to, miscellaneous solid hazardous waste (batteries, light ballasts, electrical parts, ODS, lead seals, etc.) and miscellaneous hazardous liquid waste (battery electrolyte, chemicals, oil/lubricants/fuels, paint and flammable drum content, etc.).
- .6 Abatement, removal, segregation, and containerization of leachable-lead painted materials, including provisions for containment of paint chips. .
- .7 Hauling of asbestos and creosote treated wood and materials that have had the lead/PCB paint removed to the on-site landfill.
- .8 On-site hauling of all materials to be shipped off site to the Temporary Storage Area.
- .2 Include all direct costs in lump sum price for Item 02 41 16-2 Demolition and On-site Landfilling of Tanks 1-5 as indicated in the Basis of Payment Schedule. Work indicated under lump sum item includes, but is not limited to:
 - .1 Removal, cleaning, demolition and landfilling of Tanks 1-5.
- .3 Construction of Temporary Storage Areas will not be included for payment under this section, but is to be provided as indicated in Section 01 52 00 – Construction Facilities.
- .4 Containerization, transport and disposal of hazardous material will not be included for payment under this section, but is to be provided as indicated in Section 02 81 01 - Hazardous Materials.
- .5 Securing, consolidation or segregation, as required, of liquid organic waste in drums, tanks and pipelines for use or incineration on site or removal by authorized personnel and treatment of rinsate will not be included for payment under this section but is to be provided as indicated in Section 02 81 01 - Hazardous Materials.
- .6 Except as indicated above, work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Worker Protection Working Within or Adjacent to Mould on Building Materials

- .1 Non-powered disposable filter-type respirator at a minimum of type N95, suitable for protection against mould and acceptable to Territorial or Federal Authority Having Jurisdiction.
- .2 Disposable gloves.
- .3 Eye protection.
- .4 Disposable paper coveralls are recommended.
- .5 No person required to enter Mould Contaminated Work Area to have facial hair that affects seal between respirator and face.
- .6 Eating, drinking and chewing are not permitted in the Mould Contaminated Work Area.
- .7 Before leaving the Mould Contaminated Work Area, dispose of protective clothing as waste as specified.
- .8 Ensure workers wash hands and face at the designated decontamination area after leaving the Mould Contaminated Work Area.

PART 3 - EXECUTION

3.1 Preparation

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures as needed to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent areas and waterways, according to: requirements of Authorities Having Jurisdiction.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.
- .2 Protection of in-place conditions:
 - .1 Work in accordance with Section 01 35 43 - Environmental Procedures.
- .3 Surface Preparation:
 - .1 Locate, disconnect and dig-up electrical, telephone service lines and other underground cables and lines entering and adjacent to buildings to be demolished. This includes leachable lead cables, as mentioned in Section 02 81 01 Hazardous Materials.
 - .2 Disconnect and cap mechanical services:
 - .1 Fuel supply lines: remove in accordance with Authority Having Jurisdiction as directed by Departmental Representative.
 - .2 Sewer and water lines: remove entirely in accordance with Authority Having Jurisdiction as directed by Departmental Representative.
 - .3 Other underground services: remove and dispose of as indicated as directed by Departmental Representative.
 - .3 Septic Tanks:
 - .1 Pump out buried septic tank, leave in place. Fill with sand so it does not pose a physical hazard.
 - .2 Break 5 cm holes, one hole per 10 m² in the base of the septic tank to prevent accumulation of water.
 - .4 Do not backfill basement areas until inspected by Departmental Representative.

- .5 Remove rodent and vermin as required by Departmental Representative.

3.2 Demolition

- .1 Blasting operations are not permitted during demolition.
- .2 Remove contaminated, hazardous or dangerous materials, as defined by Appendix C from site and dispose of in safe manner to minimize danger at site or during disposal.
- .3 Prior to start of Work remove contaminated or hazardous materials as directed by Departmental Representative from site and dispose at designated disposal facilities in safe manner and in accordance with TDGA, other applicable requirements, and Section 02 81 01 - Hazardous Materials. Refer to Existing Conditions in PART 1.
- .4 Demolish the entire structure.
- .5 Leave concrete in place on the Site, as directed by the Department Representative and where it does not pose a physical hazard.
 - .1 Demolish basement walls to a minimum of 30 cm below finished grade, so it does not pose a physical hazard.
 - .2 Break 5 cm holes, one hole per 10 m² in concrete floors and the basement to prevent accumulation of water.
 - .3 Backfill the open basement, so it does not pose a physical hazard.
 - .4 Do not backfill basement areas until inspected by Departmental Representative.
 - .5 At the end of each day's work, leave Work in safe and stable condition minimizing or controlling identified hazards.
 - .6 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.
 - .7 Use sprayer (low velocity, fine mist) to mist (not wet) materials containing mould to be cut, scraped or demolished. Perform work in a manner to reduce dust creation to lowest levels practicable.
 - .8 Contain fibrous materials to minimize release of airborne fibres while being transported within facility.
 - .9 Remove structural framing.
 - .10 Remove and dispose of demolished materials, except where noted otherwise and in accordance with Authorities Having Jurisdiction.
 - .11 There are no special requirements for disposal of mould impacted building material, as such they can be disposed of in the on-site landfill.
 - .12 Remove the unpainted, non-hazardous wood materials, store and protect.
 - .1 Comply with all regulatory requirements, burning procedures and obtain Burn Permit, if required.
 - .2 Provide supervision, attendance and fire protection measures in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
 - .3 Conduct a controlled burn within an approved container, under appropriate emissions controls, ideally where there is little vegetation, and at a time of year when moisture conditions are higher and there is a low likelihood of causing a tundra fire.
 - .4 Fire suppression equipment will be readily available and air monitoring will be conducted in accordance to the Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste (2012) and other applicable guidelines.
 - .5 Conduct the burn in accordance with the Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste (2012) and other applicable regulations.

- .6 Remove the other non-hazardous materials (includes metal, tanks, shingles, rubber, plastic, windows, fibreglass insulation, styrofoam, textiles, porcelain, drums (20 L and 205 L) and other inert items in various locations) store and protect in location designated by Departmental Representative:
 - .1 Conduct the separation of non-hazardous materials from buildings and removal from debris areas. If removal of non-hazardous materials may cause the disturbance of hazardous materials, appropriate PPE must be implemented.
 - .2 Clean drums and tanks and remove residual fluids/fuels from machinery according to Section 02 81 01 - Hazardous Materials.
 - .3 Cut up the tanks; crush the metal materials, drums and machinery.
 - .4 Haul materials to an on-site landfill, compact the materials, and cover the materials as required.
- .7 Remove the asbestos containing materials (ACM), store and protect.
 - .1 Follow appropriate work procedures as outlined in Sections 02 82 00.01, 02 82 00.02 and 02 82 00.03 (Asbestos Abatement – Minimum, Intermediate and Maximum Precautions).
 - .2 Abate ACM at the sites using trained asbestos abatement workers, according to the Government of Nunavut Environmental Guideline for Waste Asbestos, 2011.
 - .3 Asbestos waste will be double bagged in approved 6 mil yellow asbestos disposal bags and sealed with duct tape. The bags must have a warning label stating that it contains asbestos waste. The exterior of the bags must be cleaned with a damp cloth or HEPA vacuum prior to removing from work area.
 - .4 Conduct the required inspections and air monitoring during and post abatement. Ensure asbestos removal, prior to any demolition being carried out.
 - .5 Haul materials to an on-site landfill, place all waste asbestos in the same location, and record this location and cover when all waste asbestos has been accounted for. Cover according to applicable guidelines.
- .8 Remove or demolish the lead and PCB painted materials and landfill off site (substrate can be landfilled on site if the lead and/or PCB paint is removed and transported off site).
 - .1 Follow appropriate work procedures as outlined in Sections 02 83 10, 02 83 11 and 02 83 12 (Lead Based Paint Abatement – Minimum, Intermediate and Maximum Precautions).
- .9 Remove the mould impacted materials, store and protect until it is landfilled on site
 - .1 Follow appropriate work procedures and abate the mould impacted materials at the sites using trained mould abatement workers, according to the Government of Alberta Best Practices: Mould at the Work Site (2009).
- .10 Remove the liquid organic content, store and protect.
 - .1 Within first field season, secure all organic content in drums, ASTs, tanks, and fuel lines. This can include, but is not limited to: tightening of all valves, unions, junctions, installation of secondary containment, or transferring of fluids into empty drums.
 - .2 Fuel suitable for heating fuel is available to the Contractor to be used on site. Laboratory analysis of tank contents and drums is provided in the Phase III ESA Report.
 - .3 Fuel not utilized by the contractor or not suitable for heating is to be transferred into drums. Drums to be supplied by the Crown.
 - .4 Incineration on site following approved procedures for all organic content that cannot be used on site or removed off site by authorized personnel.
 - .5 Conduct air quality monitoring while this process is occurring, for predetermined parameters according to Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste (2012) and other applicable guidelines.

- .11 Disconnect any existing piping before tank removal and empty tanks as specified.
 - .1 Purge harmful and flammable vapours from fuel storage tanks in accordance with applicable standards prior to cutting tanks. Upon request, submit the LEL results of volatile organic compound (VOC) testing to Departmental Representative.
 - .2 Cut structural steel and bulk tanks in accordance with applicable standards.
- .12 Remove the creosote treated wood, store and protect.
 - .1 Conduct the separation of creosote treated wood from buildings and removal from debris areas.
 - .2 Wrap the wood securely in 6 mil polyethylene sheets, in accordance with the Abandoned Military Site Remediation Protocol (2009).
 - .3 Haul materials to an on-site landfill, compact and cover.
- .13 Use natural lighting to do Work where possible.
 - .1 Shut off lighting except those required for security purposes at end of each day.
- .14 Cut non-hazardous materials in such shapes and sizes as to minimize voids when material is containerized.
- .15 Structure foundations (not including concrete, as mentioned in this section) are to be included in the demolition of all structures.
- .16 At end of each day's work, leave work in safe condition so that no part is in danger of falling.
- .17 Demolish, containerize and transport to the on-site Temporary Storage Area all non-hazardous building components, building contents, and tanks identified for demolition.
- .18 Apply appropriate labelling and placards to the containers to be shipped off site in the Temporary Storage Area as required by TDGA.

3.3 Cleaning

- .1 Designate appropriate security resources / measures to prevent vandalism, damage and theft.
- .2 Stockpile materials designated for off-site disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.
 - .1 Label stockpiles, indicating material type and quantity.
- .3 Stockpile materials in a neat and orderly fashion in the location and as directed by Departmental Representative for disposal in the on-site landfill. Stockpile materials in accordance with applicable fire and safety regulations. Separate from general waste stream each of following materials.
 - .1 Wood waste.
 - .2 Other non-hazardous waste.
 - .3 Creosote soaked wood.
- .4 Supply separate, clearly marked areas for categories of waste material, crush as appropriate.
- .5 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project construction.
- .6 Remove stockpiles of like materials by on-site disposal option once the landfill construction and collection of materials is complete in accordance with 1.2 - Related Sections.
- .7 Remove stockpiles of like materials for off-site disposal option once packaging and collection of the materials is complete in accordance with 1.2 - Related Sections.

PART 1 - GENERAL

1.1 Description

- .1 This Section typically specifies the requirements for the collection, sorting, handling, transport, incineration and/or removal/disposal off-site of scattered debris throughout and adjacent to the Site.
- .2 The limits of known scattered debris and material amounts are provided in Drawings C04-C08 and an inventory (summary and volume) of known debris is provided in Appendix D.

1.2 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT) Chart.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 61 00.01 – Soil Remediation.
- .1 Section 02 82 00.01 - Asbestos Abatement Minimum Precautions.
- .2 Section 02 82 00.02 - Asbestos Abatement Intermediate Precautions.
- .3 Section 02 82 00.03 - Asbestos Abatement Maximum Precautions.
- .4 Section 02 83 10 – Lead-Base Paint Abatement Minimum Precautions.
- .5 Section 02 83 11 - Lead-Base Paint Abatement Intermediate Precautions.
- .6 Section 02 83 12 - Lead-Base Paint Abatement Maximum Precautions.
- .7 Section 02 84 00 - Polychlorinated Biphenyl Remediation.

1.3 References

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-2003, Sealer for Application of Asbestos Fibre Releasing Materials.
- .2 Department of the Environment, Government of Nunavut.
 - .1 Environmental Guideline for the Burning and Incineration of Solid Waste (2012).
 - .2 Environmental Guideline for the General Management of Hazardous Wastes (2010).
 - .3 Environmental Guideline for Contaminated Site Remediation (2009).
 - .4 Environmental Guideline for Waste Asbestos (January 2011).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).
- .4 Aboriginal Affairs and Northern Development Canada
 - .1 Abandoned Military Site Remediation Protocol. Volume 1 – Main Report (2009).
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1999, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).
- .6 Underwriters' Laboratories of Canada (ULC)

1.4 Definitions

- .1 Known debris: Scattered or accumulated visible debris on existing ground surface, including open storage areas, partially buried debris within 0.5 metres of the existing ground, or debris located within the upper 1 m of water and consisting of hazardous and/or non-hazardous material, and that:
 - .1 has been identified on the Drawings as debris to be removed; or
 - .2 is located approx. within 50 metres of any access road or water course on the site.
- .2 Unknown debris: Scattered debris on the existing ground surface, partially buried debris and/or debris that may be exposed during site remediation consisting of hazardous and/or non-hazardous material other than the Known Debris.
- .3 Hazardous materials: Items or debris no longer used for their original purpose; now hazardous and intended for recycling, treatment or disposal. Also material that is designated as "hazardous" under Nunavut Territorial or Federal Legislation; or as a "dangerous good" under the TDGA. This may include dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.
- .4 Untreated wooden debris: Wooden debris that is not painted or chemically treated in any way and is suitable for on-site burning/incineration. Unpainted pressboard or plywood would be considered untreated wooden debris.
- .5 Non-hazardous materials: Materials that are not designated as hazardous under Territorial or Federal Legislation. Material and which do not meet the definition of hazardous materials as defined in Section 02 81 01 - Hazardous Materials.
- .6 Physical hazard: Poses a slip, trip or fall risk to personnel and wildlife, risk to damage any vehicle (for example ATV, snowmobile, etc.).

1.5 Measurement for Payment

- .1 Include all direct costs for the collection, handling and landfilling at the on-site landfill of all known non-hazardous debris and miscellaneous removals in the lump sum price for, Item 02 41 23-1 – Debris and Miscellaneous Removals in the Basis of Payment Schedule.
- .2 An inventory of the known debris and miscellaneous materials at the site is provided in Appendix D.
- .3 The scope of work for payment Item 02 41 23-1 is to include, but is not limited to:
 - .1 Collection, segregation, stockpiling, temporary storage, and hauling as needed before incineration or landfilling on site of all known non-hazardous debris from the Site to disposal on site as per the regulations listed in this Specification or other related Sections.
 - .2 Landfilling and incinerating all known non-hazardous debris as appropriate.
 - .3 Provide and operate a drum crusher on site, including provision of all required absorbent materials to contain spills and/or contaminated run-off. Handling and disposal of contaminated soils produced from the drum crushing operations will not be paid to the Contractor for this task.
 - .4 Incineration of untreated wood is to include, but not limited to:
 - .1 Obtain necessary burn permits required from Authority Having Jurisdiction.
 - .2 Collection, sorting and on-site transport of all untreated wood to the burning location.

- .3 Provide an ash collection system which is capable of containing ash until it is sampled. A water-tight metal tray with sides of at least 300 mm high is acceptable. A tray salvaged from materials on-site is acceptable. Provide means to protect the ash from wind and water until it is sampled.
- .5 The collection and disposal of the vehicles and other machinery will not be measured separately. Payment will be included under Item 02 41 23 – 1, as indicated in the Basis of Payment Schedule.
- .6 Collection and disposal of liquids from within vehicles and machinery.
- .4 The following work items will be incidental to the work described in this Section, and will not be measured separately:
 - .1 Cutting, crushing and placement of this material in the non-hazardous stockpiles, if required, before on-site landfill disposal.
 - .2 Collection and sorting, as required of all non-hazardous debris.
 - .3 Reshaping or regrading areas associated with the removal of debris.
 - .4 Labour, materials and equipment required to remove existing buried or partially buried materials, or visible foreign materials along the shoreline or in the lake of the site limits, as shown on the drawings.
- .5 All costs for the collection and disposal of unknown non-hazardous surface debris will not be considered for payment under Section 02 41 23-1, but will be negotiated with Departmental Representative using the Labour and Materials rates provided in the Potential Additional Work section of the Basis of Payment Schedule.
- .6 Collection and disposal of hazardous materials will not be included for payment under this section, but is to be provided as indicated in Section 02 81 01 - Hazardous Materials.
- .7 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not used.

- .1 Not used.

PART 3 - EXECUTION

3.1 Protection Procedures

- .1 When excavating in the vicinity of a drainage course or a body of water, erect silt fences and/or floating silt curtains to prevent the release of sediment or deleterious materials into the water.
- .2 Environmental protection measures, including containment of ash from burning of untreated wood, are to be in accordance with the requirements specified in Section 01 35 43 - Environmental Procedures.
- .3 Remove oil, antifreeze, fuel and brake fluid from vehicles and equipment to be shipped and disposed of off-site in accordance with the applicable regulations and guidelines.

3.2 Removal and Sorting

- .1 Examine the site in order to assess the material type and nature of the debris.
- .2 Leave concrete pads in place on the site, as directed by the Department Representative and where it does not pose a physical hazard, as defined in Section 02 41 16.
- .3 Continually monitor the operation to identify potentially hazardous material.

- .4 Immediately stop the local operation if suspected hazardous material or hazardous debris is identified and report to the Departmental Representative.
- .5 Remove, segregate, store and haul non-hazardous materials and hazardous materials that are not being shipped off-site, to the on-site landfill as described in Section 02 41 16 – Structure Demolition.
- .6 Store all suspicious material in a secured area and in secured containers, if the nature of the material or debris cannot be confirmed, notify Departmental Representative about the findings. Testing for classification of hazardous products will be carried out and paid for by Departmental Representative.
- .7 Clean all empty drums and those drums full of aqueous liquid waste, in accordance with the requirements of Section 02 81 01 - Hazardous Materials. Crush the clean, empty drums without leachable lead paint in a manner to reduce the total original drum volume by a minimum of 75 percent. Crush the clean, empty drums with leachable lead paint in accordance with the requirements of Section 02 81 01 – Hazardous Materials.
- .8 Advise Departmental Representative of any stained soils encountered during debris removal operations. If authorized by Departmental Representative, excavate stained and contaminated soil areas identified during debris removal operations, in accordance with the requirements of Section 02 61 00.01 – Soil Remediation. Testing for classification and confirmatory testing will be carried out and paid for by Departmental Representative.

3.3 On-Site Burning of Untreated Wooden Debris

- .1 Contain and collect all ash generated from any burning activities and dispose of as described in this Section.
 - .1 A leachate extraction test is to be carried out by Departmental Representative on the solid residual material resulting from the burning process. The leachate toxicity of the material will be determined in accordance with the TDGA and the regulations listed in this Section. Dispose of materials found to be non-hazardous on-site, according to the applicable regulations. Dispose of materials found not to be leachate toxic, but exceeding CCME PEHH, CCME CWS criteria and site specific criteria as described in Section 02 61 00.01 – Soil Remediation. Package leachate toxic material in accordance with TDGA regulations, as required, and dispose of as described in Section 02 81 01 - Hazardous Materials.

3.4 Off-Site Disposal Facilities

- .1 Provide off-site transport of containerized hazardous debris to Contractor's Designated Hazardous Waste Disposal Facility as per the requirements of Section 02 81 01 - Hazardous Materials.

- END OF SECTION -

PART 1 – GENERAL

1.1 Description

- .1 This Section specifies the requirements for the supply and installation of monitoring wells and survey control monuments. All instrumentation is to be installed under the supervision of the Departmental Representative.
- .2 Complete the installation of the background monitoring wells as indicated, just prior to first season camp closure.
- .3 Wells are to be installed at the landfill and at the landfarm.

1.2 Measurement for Payment

- .1 Include all costs as a cost per metre of well installed for the drilling of boreholes, in Item 02 51 00-1 Monitoring Well Drilling in the Basis of Payment Schedule. Cost to include but is not limited to:
 - .1 Transport to site equipment required to complete the work.
 - .2 All drilling supplies and temporary borehole casings.
- .2 Include all costs for the supply and installation of monitoring wells in Item 02 51 00-2 Monitoring Well Installation in the Basis of Payment Schedule. Cost to include, but is not limited to:
 - .1 Well supplies, bentonite, permanent well casings, barricades and all other supplies require for functional water wells.
- .3 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Drilling Equipment.

- .1 Equipment capable of accessing required locations for installation.
- .2 Equipment capable of drilling 125 mm diameter holes.
- .3 Equipment capable of drilling into frozen and unfrozen soils, including through coarse fragments, ice and saturated soils.

2.2 Monitoring Wells

- .1 50 mm, nominal diameter, Schedule 10 #304 stainless steel pipe with watertight end caps (top and bottom).
- .2 50 mm (nominal diameter), Schedule 10 #304 stainless steel screen, 1.0 m maximum section length with flush threads both ends. Screen slot size to be 0.5 mm.
- .3 All pipe and screen to remain in protection wrapping until installation.
- .4 Filter sock, complete with stainless steel band clamps as cover over monitoring well screen.

2.3 Monitoring Well Protective Casing

- .1 150 mm diameter galvanized, Schedule 40 steel pipe, threaded as required,
- .2 Threaded, locking steel cap for monitoring wells.
- .3 Keyed padlock to be provided by Departmental Representative.

2.4 Filter Sand

- .1 Inert and free of organic material.
- .2 #20 - #40 sand.

2.4 Bentonite Seal

- .1 Bentonite product certified as polymner, granular, and organic free.

2.4 Grout

- .1 Preblended, cementitious, ready to use, pile and rock bolt grout, suitable for placement into substrates to -10 °C.

2.4 Paint

- .1 Flourescent orange that is suitable for environment and substrate.

2.4 Survey Controls

- .1 25 mm (nominal diameter), steel piple, threaded or welded as required.
- .2 The steel pipe shall have a flange welded to base. Flange size should be not less than the hole diameter less 50 mm.

PART 3 - EXECUTION

3.1 Installation of Monitoring Wells

- .1 Monitoring wells shall be installed around both the landfarm and landfill areas.
- .2 Monitoring wells to be placed to a depth determined by the Departmental Representative.
- .3 Provide a minimum ten (10) days notice to Departmental Representative prior to drilling event. Departmental Representative will be present during drilling event.
- .4 Wells to be positioned down-gradient, cross-gradient and up-gradient from the landfarm and landfill areas.
- .5 Confirm location of monitoring wells with Departmental Representative prior to drilling.
- .6 Make available on site, temporary hole casing material and install as required to prevent sloughing of drill hole.
- .7 Install wells in accordance with standard operating procedures in cold climates.
- .8 Measure stick up of pipe from ground surface.
- .9 Place protective casing and lockable cap over pipe. Paint metal casing, cap and marker posts (if required) with fluorescent orange paint.

3.2 Protection of Monitoring Wells

- .1 Provide clearly visible barricades to protect the monitoring wells. Immediately replace, at contractors cost, any barricades or wells damaged by the Contractor.
- .2 Provide access to the monitoring wells, and facilitate sampling by the Departmental Representative.

3.3 Installation of Permanent Survey Control Monuments

- .1 Install permanent survey control monuments at locations directed by the Departmental Representative, to a minimum depth of 5 metres.
- .2 If bedrock is encountered, depth may be reduced at the discretion of the Departmental Representative.
- .3 Make available on site hole casing material. Install hole casing in the drill hole as required to prevent sloughing.

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- .4 Apply "food-grade" grease to the 25 mm steel pipe before installation.
 - .5 Grout the control monument in the hole for the lower 2 m only. Use Sika Grout Arctic 100 or Set-45 Grout according to the manufacturers recommendations. Grout must be suitable for placement into substrates to -10 °C. Fill the remaining void with sand.
 - .6 Control monument must be flush with ground surface upon completion. Ensure positive drainage away from survey monument.
 - .7 Following set-up of the grout, tie-in survey control monuments to the site survey coordinate system. Survey horizontal accuracy to 0.1 cm and vertical accuracy to 1 cm. Mark with a drill hole or punch the top of the 25 mm steel pipe. Provide coordinates and elevation data at this mark to the Departmental Representative for each monument installed.
 - .8 Construct visible markers around the survey control monuments to prevent damage and facilitate identification. Immediately replace or repair, at contractors cost, any monuments damaged by the Contractor.

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 78 00 - Closeout Submittals.
- .3 Section 01 35 32 – Site Specific Health and Safety Plan.
- .4 Section 01 35 43 – Environmental Procedure.
- .5 Section 31 05 16 – Aggregate Materials.
- .6 Section 31 23 33.01 – Excavating, Trenching, and Backfilling.
- .7 Section 31 32 19.02 - Geomembranes.
- .8 Section 01 71 00 – Site Surveys.

1.2 Definitions

- .1 Hydrocarbon contaminated soil is defined as soil exceeding the AMSRP guidelines for Type B hydrocarbons. Refer to the site specific criteria listed in the AMSRP and the RAP for specific details regarding hydrocarbon contaminated soil (EBA, 2013).
- .2 Metal contaminated soil: Soils exceeding concentrations of any or all the parameters listed in the CCME PEHH or AMSRP guidelines. Refer to the RAP for specific details regarding metal contaminated soil (EBA, 2013).
- .3 Clean soil: Soil that has been sampled, analyzed, and determined to have concentrations of the above listed contaminants below the above defined guideline.
- .4 Ex-Situ Treatment: Ex-situ refers to soil which has been excavated for treatment; and water which has been removed for treatment.
- .5 Land Farming System: Technology is used to treat soil contaminated by petroleum hydrocarbons through enhanced bio-remediation. Bio-remediation can be accelerated through the use of aeration, nutrients, fertilizers, oxidizers, and water.
- .6 Low Temperature Thermal Desorption: Technology is used to treat soils contaminated by organic compounds (halogenated or not) and fuels. It is not appropriate for use with inorganic contaminants. Note that a supply of fuel is required.
- .7 Root Zone Soil/Topsoil: The upper most layer of soil that contains organic matter and typically has a darker color due to the addition of humic acids (via organic matter decomposition). Can range in depth, but at this location typically 5 – 10 cm thick.

1.3 References

- .1 Applicable environmental and health and safety laws and regulations for the Nunavut Territory and Canada.
- .2 Aboriginal Affairs and Northern Development Canada (AANDC):
 - .1 Abandoned Military Site Remediation Protocol (AMSRP). Volume 1-Main Report (2009)
- .3 Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (PEHH) by Canadian Council of Ministers of the Environment (CCME), 2007.
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

- .5 EBA Engineering and Consultants Ltd (EBA).
 - .1 Ennadai Lake Remedial Action Plan (RAP), 2013. File Y22101286.012.
 - .2 Ennadai Lake Phase III Environmental Site Assessment (ESA), 2013. File Y22101286.011.

1.4 Existing Conditions

- .1 Review the Phase III ESA and RAP Report documents, summarizing extent of contaminated soil.

1.5 Summary of Work

- .1 Section specifies the requirements for the excavation, treatment, and disposal of contaminated soils, including the following:
 - .1 Hydrocarbon Contaminated Soil (2,200 m³).
 - .1 Excavation, remediation of hydrocarbon contaminated soil to the remedial targets identified in the RAP (EBA 2013) in accordance with the appropriate remediation guidelines.
 - .2 Metal Contaminated Soil (0.5 m³).
 - .1 Excavation and disposal of metal contaminated soil to the remedial targets identified in the RAP in accordance with the appropriate remediation guidelines.
- .2 Work Includes:
 - .1 Obtaining required federal/territorial permits and Certificates of Approval for operation of systems.
 - .2 Provide materials, tools and facilities required for hydrocarbon contaminated soil remediation.
 - .3 Co-ordination, supervision and preparation for treatment of hydrocarbon contaminated soil.
 - .4 Specification of final treatment design and facilities required for hydrocarbon contaminated soil treatment.
 - .5 Provision of necessary materials for construction of hydrocarbon contaminated soil treatment facilities.
 - .6 Provision and installation of materials and equipment necessary to remediate site.
 - .7 Preparation of treatment area layout and/or installation of hydrocarbon contaminated soil treatment equipment and/or any additional treatment options chosen by the Contractor with consideration of the RAP.
 - .8 Implementation of safety work zones, Site-Specific Health and Safety Plans and Emergency Response Plans.
 - .9 Excavation of all contaminated soil.
 - .10 Removal of metal contaminated soil off-site to the Contractor's disposal facility
 - .11 Determine treatment performance of hydrocarbon contaminated soil.
 - .12 Interpretation of analysis data, data quality analysis, evaluation of hydrocarbon contaminated soil treatment progress, determination and implementation of the hydrocarbon contaminated soil treatment system and/or procedure to achieve objectives defined in the contract.
 - .13 Ensure that treatment has no negative impact on the environment.
 - .14 Construction of water control and recovery structures (if required).

- .15 Management of contaminated waters generated during soil remediation work, including separation, recovery, and disposal of free product (if required).
- .16 Dismantling facilities following acceptance of final report by Departmental Representative.
- .17 Backfilling of excavations shall be conducted as per Section 31 23 33.01-Excavating, Trenching, and Backfilling. Root zone material shall be segregated for later use as the uppermost layer of backfill.
- .18 Decommissioning and reclamation of the landfarm area and off-site disposal of materials as indicated in Section 31 22 13 – Rough Grading.

1.6 Signs

- .1 Signage: Provide and erect signage at access points to the Contaminated Soil Treatment Area and/or stock piling areas. Signage is to be visible from all sides of these areas. The sign is to be posted in both English and Inuktitut and is to read:
 - .1 Caution, Contaminated Soil Treatment Area Trespassing is Prohibited.
- .2 Graphic Symbols: All lettering is to conform to CAN3-A321-77, or latest edition thereof. All lettering is to be black, not less than 100mm high, with a 25mm wide stroke, on a white background.

1.7 Qualifications

- .1 Provide detailed descriptions of firm and sub-contractors, indicating experience in soil treatment and in running such systems. Provide descriptions of similar systems used in past five years including names of individuals in charge of such systems.
- .2 Identify members of project team including project manager. Define experience, education and training, qualifications, tasks and responsibilities of each team member. Supply résumés of key technical and management staff.
- .3 Be thoroughly familiar with and knowledgeable about existing site conditions, scope of work and requirements of the Specification.
- .4 Guidelines such as those established in NIOSH Publication No. 85-115, or Hazardous Waste Worker Training Manual: Canadian LIUNA-Contractors Training Council, 1992 must be followed at all times.
- .5 Handling of hazardous materials is to be directly supervised by Contractor's personnel who have successfully completed a 40 hour training course for Hazardous Waste Operations and Emergency Response (HAZWOPER) in compliance with OSHA 29 CFR 1910.120 or other approved equivalent training courses such as the Canadian Hazardous Waste Workers Program.
- .6 Contractor's personnel trained as described in this Section are to instruct and direct all workers with respect to the waste management procedures and labour and safety practices to be followed in carrying out the work.
- .7 Provide workers, Departmental Representative and Departmental Representative's staff when required with personal protection equipment appropriate to the potential type and level of exposure. Establish specific safety protocols in the Site Specific Health and Safety Plan.
- .8 Provide suitable safety clothing and personal protective equipment as required during the course of work.
- .9 Trained and certified personnel are required to complete all Transportation of Dangerous Goods Act (TDGA) and International Air Transport Association (IATA) training, documentation and recording requirements.
- .10 Personnel conducting ground disturbance must have valid Ground Disturbance training as well as First Aid, WHMIS and TDG training (ground, air and/or marine).

1.8 System Description

.1 Design Requirements

- .1 Soil Remediation Technology is required to meet the AMSRP guidelines to achieve the remedial goals of the project. Refer to the RAP for potential remedial options. Proven Contractor process knowledge of the remedial technique is needed to achieve the remedial goals.

1.9 Submittals

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data.

- .1 Provide all manufacturer's product data in accordance with section 01 33 00 - Submittal Procedures as follows:

.1 Submit two (2) copies of product descriptions for:

- .1 All manufactured good/materials pertaining to soil treatment.
.2 Hydrocarbon resistant Geomembranes.
.3 Amendment products and nutrients (if required).

.2 Submit to Departmental Representative within seven (7) days of receipt of written request:

- .1 Manufacturer's name and address.
.2 Trademark, model and catalogue numbers.
.3 Technical data.
.4 Manufacturer's instructions concerning installation and application.
.5 Proof of procurement method.

.3 Quality Assurance and Quality Control Submittals.

- .1 Provide Detailed Soil Remediation Plan in accordance with section 01 33 00 - Submittal Procedures within thirty (30) days of contract award. Plan includes the following as a minimum:

- .1 Description of emergency plans, in case of breakdown, spill or other problem.
.2 Description of contingency plan, in case of variations of critical parameters during system operation.
.3 Waste management plan and complete list of wastes, including waste registration numbers as required by provincial/territorial regulations, that will be generated by activities.
.4 Methods that will be used to restore site to its legally acceptable condition and applicable site criteria.
.5 Information on proposed technology required to meet remedial objectives including, but not limited to:
.1 Environmental impact[s].
.2 Treatment methods
.3 Contingencies for weather delays.
.4 Remediation schedule.
.5 Sampling procedures and frequency.

.4 Meetings and Reporting.

- .1 Project Meetings shall be conducted as per Section 01 31 19 Project Meetings.
.2 Reports of any analytical testing with respect to but not exclusively the soil treatment, shall be presented to the Department Representative within one (1) week of receipt.

.5 Closeout Submittals.

- .1 Provide Closeout Submittals in accordance with Section 01 78 00 - Closeout Submittals.

1.10 Quality Assurance

.1 Regulatory Requirements.

.1 Perform work in accordance with:

- .1 Acts, regulations, laws, guidelines, codes of practice, directives and policies of government authorities pertaining to: environment; noise; water supply; wastewater; air quality; health and safety; transportation; waste management; and wildlife.
- .2 WHMIS.
- .3 Canadian Environmental Protection Act (New Substance Notification Regulations).
- .4 Transportation of Dangerous Goods Act.
- .5 National Building Code of Canada.
- .6 National Fire Code of Canada.
- .7 The Fisheries Act.
- .8 Migratory Birds Convention Act.
- .9 Migratory Birds Regulations.

.2 Certifications.

- .1 All analytical work conducted on behalf of the Contractor and/or Departmental Representative must be conducted by a certified, accredited laboratory (under the Standards Council of Canada (SCC) and CALA) for the parameters of concern. QA/QC procedures must be explained in detail.

.3 Field Samples.

- .1 The Departmental Representative shall take field samples to verify remedial activities. The Departmental Representative shall indicate position of sampling points, sampling method and frequency, number of samples collected, sample preservation and analytical techniques, number of samples analyzed, parameters measured and turnaround time, chain of custody procedures, quality control samples as outlined by federal or territorial regulations.

1.11 Delivery, Storage, and Handling

.1 Contaminated Soil.

- .1 Storage and stockpiling of contaminated soil must be performed to minimize and ensure that no environmental release occurs. Analysis, transport and remediation of contaminated soil must be performed in accordance with federal regulations.
- .2 Store non-contaminated soil only on non-contaminated site surface areas. Ensure no contact between non-contaminated excavated soil and drainage or contaminated water or contaminated soil.
- .3 Segregate root zone soil from non-contaminated and contaminated sub-soils.
- .4 Prevent compaction of root zone soil such that it can be reused during site reclamation.
- .5 Segregate non-contaminated materials for reuse as backfill.

.2 New Materials and Equipment.

- .1 Ship, store and preserve in original packaging, with manufacturer's seal and label remaining intact.
- .2 Ensure materials and equipment are not damaged, altered or soiled during shipment, handling and storage.
- .3 Transport rejected equipment and materials from work site immediately.
- .4 Store materials and equipment according to manufacturer's and supplier's instructions.
- .5 Establish quality management system for materials and equipment.

1.12 Sequencing

- .1 When floating free product is present, remove free product from saturated soil without further contaminating soil or groundwater prior to commencing other decontamination Work.
- .2 Collect free product, if present, for treatment, incineration, or off-site disposal.
- .3 Decontaminate equipment used in decontamination procedures before removing equipment from job site.

1.13 Maintenance

- .1 Access Roads.
 - .1 Maintain Access Roads as follows:
 - .1 Obtain permission to use existing roads/trails/runways to access site.
 - .2 Maintain and clean roads/trails for duration of Work.
 - .3 Repair damage incurred from use of roads/trails.
 - .4 Provide photographic documentation of roads/trails used by construction vehicles before, during and after Work.

1.14 Measurement of Payment

- .1 Include all direct costs in a unit cost for Item 02 61 00.01-1 Hydrocarbon Contaminated Soil Treatment as indicated in the Basis of Payment Schedule. The unit costs includes, but is not limited to:
 - .1 The treatment and analytical testing required to meet guidelines according to AMSRP.
 - .2 Equipment, materials and supplies required to treat hydrocarbon contaminated soils.
- .2 Include all direct costs in a unit cost for Item 02 61 00.01-2 Metal Contaminated Soil Disposal as indicated in the Basis of Payment Schedule. The unit costs includes, but is not limited to:
 - .1 Excavation, stockpiling and containerization of metal contaminated soil.
 - .2 Transport and disposal of metal contaminated soil to an approved facility.
- .3 No extra payment will be made for the excavation, remediation, or disposal of soil removed beyond the specified limits of excavation, unless such work has been specifically directed by the Departmental Representative. The volume of contaminated soil excavation will be determined by survey as stated in Section 01 71 00 – Site Surveys and in Section 31 23 33 – Excavating, Trenching and Backfilling.
- .4 Costs for excavating, hauling, stockpiling of contaminated soil and backfilling of excavations will not be included for payment under this Section, but are provided as indicated in Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .5 Removal and treatment of contaminated groundwater and contact water will not be included for payment under this Section, but is to be provided as indicated as Item 01 35 15-1 Treated Groundwater and Contact Water in the Basis of Payment Schedule.

- .6 The following activities are considered incidental to the work identified by Items 02 61 00.01-1 and 02 61 00.01-2 in the Basis of Payment Schedule and will not be measured separately:
 - .1 Dewatering of excavations.
 - .2 Dust suppression.
 - .3 Any necessary excavation to facilitate testing of contaminated soils.
 - .4 Equipment decontamination, including preparation and operation of the equipment decontamination area.
 - .5 Provision of all necessary safety equipment and clothing, as specified in Section 01 35 32 - Site Specific Health and Safety Plan.
 - .6 All field screening tool or techniques for confirmatory soil sampling.
 - .7 Any necessary work to facilitate Departmental Representative confirmatory sampling.
 - .8 Any requirements of permits.
 - .9 Hauling/transporting contaminated soil around site and/or to staging area.
 - .10 Grading of backfilled excavations to prevent ponding and contouring in with the surrounding terrain, as directed Departmental Representative.
- .7 Hydrocarbon and metal contaminated soils excavated for treatment in excess of the defined volumes identified in this contract will be paid in accordance with the unit price established for Potential Additional Work.

PART 2 - PRODUCTS

2.1 Materials

- .1 Fill.
 - .1 If required, use fill from borrow sources outlined in Section 31 05 16-Aggregate Materials.
- .2 Geomembrane.
 - .1 All Geomembrane used on-site for soil remediation must be impermeable in accordance with Section 31 32 19.02 - Geomembranes.

2.2 Equipment

- .1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.
- .2 Free Product Recovery System.
 - .1 In the event of free product, an oil water separator to remove contaminated water for treatment shall be used. The Departmental Representative shall be contacted immediately in the event of free product. All efforts shall be performed to reduce the spread of contamination.
 - .1 Free Product (if required) will be disposed of off-site in accordance with the appropriate Federal and Territorial regulations.
- .3 Trucks.
 - .1 Cleaned thoroughly between loads of contaminated soil and clean fill.
 - .2 Cleaned thoroughly at end of work day.
 - .3 Use watertight truck bodies for transporting contaminated soil.
- .4 Personal Protective Equipment/Safety.

- .1 Some areas designated for remediation under this contract involve soils which contain inorganic elements, hydrocarbons and potentially other contaminants which are considered hazardous to human health.
- .2 When working with inorganic elements, hydrocarbons, and other contaminants, workers are to wear personal protective clothing and equipment acceptable to Labour Code of Canada or Territorial labour Department as suitable for exposure in the work area. Follow National Institute for Occupational Safety and Health (NIOSH) guidelines in providing protection for on-site personnel including contract employees and subcontractor(s), Departmental Representative(s) and other authorized site personnel. Provide details of protective clothing and equipment required for each work area in the Site Specific Health and Safety Plan as required by Section 01 35 32 – Site Specific Health and Safety Plan.
- .3 Supply sufficient quantities of personal protective equipment to fit all site personnel including Departmental Representative(s) and authorized visitors.

PART 3 - EXECUTION

3.1 Examination

- .1 Site Verification of Conditions.
 - .1 Determine site conditions prior to submitting Remediation Plan.

3.2 Preparation

- .1 Protection.
 - .1 Keep excavation sites water free throughout work and manage recovered water according to contamination level and federal/territory regulations
 - .2 Provide temporary structures to divert flow of surface waters from excavation.
 - .3 Provide safety measures to ensure worker and public safety.
 - .4 Consult Departmental Representative regarding potential site specific geotechnical considerations.

3.3 Application

- .1 Soil Management.
 - .1 Store, transport, and eliminate off-site or treat residues generated by soil treatment process in accordance with applicable federal and / or territorial standards, requirements and regulations.
 - .2 Do not dilute contaminated soil with less contaminated soil.
- .2 Air Management.
 - .1 Comply with applicable air regulations.
- .3 Groundwater Management.
 - .1 Dispose of or treat groundwater in accordance with Section 01 35 15 - Special Project Procedures for Contaminated Sites.
 - .2 Treat or incinerate residues, including free product (if present) generated by water treatment process in accordance with federal and or territorial standards, requirements and regulations or store, transport and dispose of off-site.

3.4 Method of Remediation

- .1 Treat contaminated soil using industry accepted technology and / or process, as to meet the AMSRP guidelines and/or the CCME PEHH guidelines as defined in the Remedial Action Plan (RAP, EBA 2013) and Phase III Environmental Site Assessment (EBA 2013). Soil remediation technology has been presented in the RAP. Consideration of the technologies should be incorporated into Contractors remediation plan or an alternative that will meet the remedial goals of the project.
- .2 Excavations are indicated within the RAP and Drawings C04 – C09. Remediation includes:
 - .1 Layout and excavate areas of contaminated soil to the limits as indicated in Drawings. All layouts are to be field verified by Departmental Representative prior to excavation.
 - .2 Remove all surface debris prior to excavation. Remove all debris from excavated soil, sort and stock pile accordingly.
 - .3 Strip and stockpile separately any root zone soil if present.
 - .4 Protect non-contaminated soils from contaminated soil.
 - .5 Suppress dust generated during excavation and hauling operations with water spray. Prevent surface water from entering the excavated area.
 - .6 Dewater excavations, as required. Maintain soil excavations free of pooled water during soil removal, and confirmatory sampling activities. Comply with the requirements of the wastewater discharge criteria indicated in Section 01 35 15 - Special Project Procedures for Contaminated Sites.
 - .7 When excavating within 30 metres of a drainage course or a water body, erect silt fences, floating silt curtains and/or containment berms to prevent the release of sediment and materials into the water.
 - .8 Clean the excavating equipment including buckets and tracks of soil prior to mobilizing to the next contaminated soil area. Collect and dispose of the removed soil in accordance with the contaminated soil designation. Take special precautions to mitigate the tracking of contaminated soil over the site area.
 - .9 Excavate all contaminated soil into approved containers, stock piles and/or treatment areas.
 - .10 Transport all contaminated soil to the appropriate treatment area.
 - .11 Use appropriate technology within the treatment area to remediate the contaminated soils to the meet the AMSRP guidelines and/or the CCME PEHH guidelines as defined in the RAP (EBA 2013).
 - .12 Special consideration to be made with respect to meeting remedial objectives and project completion timelines.
 - .13 The Departmental Representative will collect confirmatory soil samples after reaching the contaminated soil excavation limits indicated on the Drawings and once notified by the Contractor. No further excavation of the soil will proceed until the results of confirmatory samples are assessed by Departmental Representative.
 - .14 Upon Contractor notification to the Departmental Representative that an excavation is ready to have confirmatory sampling conducted, there shall be no operation of equipment within the identified contaminated soil area(s) until Departmental Representative has confirmed, based on the analytical results of confirmatory testing, that no further excavation of contaminated soil in the area is required.
 - .15 Once directed by Departmental Representative, either re-grade and reshape area or supply fill, backfill excavation areas to original ground and compact as per Section 31 23 33.01 – Excavating, Trenching, and Backfilling.
 - .16 Store soil in approved containers and/or stock pile areas and/or treatment areas as approved by the Departmental representative. Impermeable membranes as defined in Section 31 32 19.02 – Geomembranes, shall be used for contaminated soil to ensure contamination does not spread.

- .17 Restore excavated areas after approval from the Departmental Representative.

3.5 Installation

- .1 Wells.
- .1 Provided in Section 02 51 00 – Instrumentation.
- .2 Pipes.
- .1 Not used
- .3 Erosion, Sediment, and Drainage Controls.
- .1 Prior to commencement of work, install temporary erosion, sediment and drainage controls to prevent siltation and disruption of water bodies in accordance with this Section and Section 01 35 43 Environmental Procedures.
- .2 Erosion, sediment and drainage controls are to be maintained during all stages of work.
- .3 At the completion of contaminated soil excavation, remove the erosion, sediment and drainage controls as directed by Departmental Representative. Dispose of all non-granular erosion, sediment and drainage control materials off-site.

3.6 Restoration

- .1 Backfill excavations and compact soil to density similar to adjacent natural soil upon completion of soil remediation. Ensure confirmatory sampling results indicate that contaminant concentrations are in compliance with applicable guidelines prior to backfilling. Confirmatory sampling results must be verified by Departmental Representative prior to backfilling as stated in Section 31 23 33.01 Excavating, Trenching, and Backfilling.
- .2 Re-instate surface grading to give site same appearance as before remediation work as stated in Section 31 23 33.01-Excavating, Trenching, and Backfilling.
- .3 Clean access road of contamination resulting from project activity at request of Departmental Representative.

3.7 Field Quality Control

- .1 Site Tests.
- .1 Not used.

3.8 Equipment Decontamination

- .1 Decontaminate equipment that comes into contact with the contaminated soils by steam cleaning or other means acceptable to the Departmental Representative in a separate area capable of containing the waste generated by cleaning operations. Decontaminate as outlined in Section 01 35 15 Special Project Procedures for Contaminated Sites.
- .2 Collect and dispose of any contaminated soil that leaks, spills or otherwise leaves the equipment during transport from the area of work to the decontamination area.
- .3 Remove and dispose of material that becomes contaminated as a result of Contractor's operation at no additional cost.
- .4 Dispose of liquid waste in accordance with the wastewater discharge criteria outlined in Section 01 35 15 Special Project Procedures for Contaminated Sites.
- .5 Treat any waste soil resulting from the decontamination procedure as hydrocarbon contaminated soil or metal contaminated soil depending on the source of the material and handle accordingly.

PART 1 - GENERAL

1.1 Description

- .1 The section specifies the requirements for the collection and containerization of Hazardous Materials including the following:
 - .1 Collection of Known Hazardous Debris as indicated in Drawings C04-C08 and in Appendices C and D.
 - .2 On-site transport of the containerized Hazardous Materials to the Temporary Storage Area for disposal off site.

1.2 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT) Chart.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 15 - Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 - Site Specific Health and Safety Plan.
- .5 Section 01 35 43 - Environmental Procedures.
- .6 Section 02 41 16 - Structure Demolition.
- .7 Section 02 41 23 - Debris and Miscellaneous Removals
- .8 Section 02 61 00.01 - Soil Remediation
- .9 Section 02 82 00.01 - Asbestos Abatement Minimum Precautions
- .10 Section 02 82 00.02 - Asbestos Abatement Intermediate Precautions
- .11 Section 02 82 00.03 - Asbestos Abatement Maximum Precautions
- .12 Section 02 83 10 – Lead-Base Paint Abatement Minimum Precautions
- .13 Section 02 83 11 - Lead-Base Paint Abatement Intermediate Precautions
- .14 Section 02 83 12 - Lead-Base Paint Abatement Maximum Precautions
- .15 Section 02 84 00 - Polychlorinated Biphenyl Remediation

1.3 References

- .1 Health Canada / Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
- .2 National Research Council Canada Institute for Research in Construction (NRC-IRC).
 - .1 National Fire Code of Canada, 2010.
- .3 Canadian Environmental Protection Act, 1999 (CEPA 1999).
 - .1 Export and Import of Hazardous Materials and Hazardous Recyclable Material Regulations (SOR/2005-149).
 - .3 Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR / 2008-197).
 - .4 Interprovincial Movement of Hazardous Waste Regulation (SOR/2002-301).
 - .5 Federal Mobile PCB Treatment and Destruction Regulations (SOR/90-5).
 - .6 PCB Regulations (SOR/2008-273).
- .4 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1999, (c. 34).

- .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).
- .5 Department of the Environment, Government of Nunavut.
 - .1 Environmental Guideline for the Burning and Incineration of Solid Waste (2012).
 - .2 Environmental Guideline for the General Management of Hazardous Materials (2010).
 - .3 Environmental Guideline for Contaminated Site Remediation (2009).
 - .4 Environmental Guideline for Industrial Waste Discharges (January 2002).
 - .5 Environmental Guideline for Mercury-Containing Products and Waste Mercury (2010).
 - .6 Environmental Guideline for Waste Paint (2010).
 - .7 Environmental Guideline for Ozone Depleting Substances (2011).
 - .8 Environmental Guideline for Waste Antifreeze (2011).
 - .9 Environmental Guideline for Waste Asbestos (2011).
 - .10 Environmental Guideline for Waste Batteries (2011).
 - .11 Environmental Guideline for Waste Lead and Lead Paint (2011).
 - .12 Environmental Guideline for Waste Solvent Division (2011).
- .6 Aboriginal Affairs and Northern Development Canada.
 - .1 Abandoned Military Site Remediation Protocol. Volume 1 – Main Report (2009).
- .7 United States Department of Labor Occupational Safety and Health Administration (OSHA)
 - .1 Occupational Safety and Health Guidance Manual for Hazardous Materials Site Activities: NIOSH Publication No. 85 115.
- .8 Environment Canada.
 - .1 Environmental Code of Practice on Halons (1996)
 - .2 Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems (1996).

1.4 Definitions

- .1 Dangerous Goods: Product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: Product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3 Dangerous Goods: A product, substance, or organism specifically identified or meeting hazard criteria established in Transportation of Dangerous Goods Regulations.
- .4 Hazardous Material: Items or debris no longer used for their original purpose; now hazardous and intended for recycling, treatment or disposal. Also, material that is designated as "hazardous" under Nunavut Territorial or Federal Legislation; or as a "dangerous good" under the TDGA. The following substances, typical of remote Arctic sites, are designated as "hazardous" in accordance with the aforementioned legislation:
 - .1 Asbestos and asbestos contaminated materials
 - .2 Batteries and battery electrolyte
 - .3 Fire extinguishers
 - .4 Mercury vapour in fluorescent lights, elemental mercury in thermostats
 - .5 Organic liquid wastes, particulates and sludge in drums, pipelines and tanks
 - .6 Ozone depleting substances (ODS)
 - .7 Compressed air cylinder

- .8 Propane tanks
- .9 Leachable lead cables, leachable lead seals on cast iron pipes, lead solder on copper pipes
- .10 Miscellaneous chemicals in containers and drums including, but not necessarily limited to: antifreeze, paint thinners, medical drugs, oil absorbent, unknown white crystallized materials, etc.
 - .1 Petroleum distillates, including free product that may be recovered during impacted soil excavation work.
 - .2 Miscellaneous petroleum, oil, or lubricating (POL) materials in drums, pipelines, tanks and containers not meeting incineration criteria.
 - .3 Paint cans and paint chips from drums, equipment, debris and building materials containing total lead paint at concentrations in excess of 600 parts per million (ppm), leachable lead paint at concentrations in excess of five (5) milligrams per litre (mg/L) and/or PCB paint at concentrations in excess of 50 ppm.
 - .4 Material, including aqueous liquid in drums, wastewater, groundwater and surface water, identified to be hazardous as the result of testing.
 - .5 Electrical equipment including, but not necessarily limited to: liquid, solder, or ballasts which contain or is suspected to contain lead, mercury or PCBs at concentrations in excess of 50 ppm.
 - .6 Miscellaneous hazardous materials defined as those materials not classified as 1 to 13 above but suspected to fall under the definition of Hazardous Materials and Materials as stated in this Section.
- .5 Debris: Visible debris on or within 0.5 metres of the existing ground surface, or material that has been identified on the Drawings as debris, consisting of hazardous and non-hazardous material.
- .6 PCB amended paint (PAP): Material that is coated with PCB based paint that has been analyzed and determined to contain total PCB concentrations in excess of 50 ppm.
- .7 Lead amended paint materials: Material that is coated with lead based paint that has been analyzed and determined to contain total lead concentrations in excess of 600 ppm.
- .8 Leachable lead amended paint material: Material that is coated with lead based paint that has been analyzed and determined to contain leachable lead concentrations in excess of 5 mg/L.
- .9 "Processing" refers to the sampling, testing, packaging, and containerization of hazardous materials.
- .10 Packaging container: The type of container required to contain the hazardous material placed in it, as required by the TDGA.
- .11 Shipping container: The container into which the packaging containers are placed for purposes of shipping to an off-site disposal facility.
- .12 Intermediate container: Container used to consolidate small PCB and leachable-lead materials within the marine/air/ground shipping container.
- .13 Temporary Storage Area: The designated area, approved by Departmental Representative, for the storage of packaging and/or shipping containers prior to transport off site. Requirements for the Temporary Storage Area are outlined in Section 01 52 00.
- .14 Contaminated groundwater: Groundwater encountered during contaminated soil or debris excavation that contains free product or does not conform to the wastewater discharge criteria outlined in Section 01 35 15 - Special Project Procedures for Contaminated Sites.
- .15 Free product: Separated phase liquid petroleum hydrocarbon product.
- .16 Contractor's Designated Hazardous Waste Disposal Facility: A Licensed Hazardous Waste Disposal Facility designated by the Contractor for the disposal of all hazardous materials specified under the provisions of this contract. The facility must be pre-approved by the Departmental Representative prior to beginning work. Contractor must provide

documentation from the Designated Hazardous Waste Disposal Facility indicating full responsibility for all hazardous materials accepted from the site.

- .17 Known hazardous material: Material designated as hazardous in accordance with the definition of hazardous materials in this Section, and which is identified for collection and disposal in the specifications and drawings.
- .18 Unknown hazardous material: Material designated as hazardous in accordance with the definition of Hazardous Materials material in this section, and which has not been specifically identified for collection and disposal as part of other work components.
- .19 Calibrated scale: A scale that has been calibrated using a minimum of 3 known weights to ensure the scale is outputting the correct measurement. Known weights must be within the range of weights of materials being weighted. Calibration entails placing a known weight on the scale and then the scale is adjusted until it yields a correct corresponding weight measurement.

1.5 Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit two (2) copies of WHMIS MSDS in accordance with Section 02 81 01 Hazardous Materials.
 - .2 Provide Hazardous Materials Management Plan to Departmental Representative that identifies hazardous materials, their usage, location, personal protective equipment requirements, disposal procedure and arrangements.
 - .3 Submit qualifications and training certificates for all Contractor's personnel performing Work as described under this Section prior to commencing Work.
 - .4 Submit waste transport manifests and chains of custody to the Authority Having Jurisdiction, as required, in accordance with applicable regulations.
 - .5 In the event of an environmental incident or damage to waste containers, notify the Departmental Representative and applicable Authority Having Jurisdiction.

1.6 Qualifications and Personal Protection

- .1 Contractor's workers must be thoroughly familiar with and knowledgeable about existing site conditions, scope of work, and requirements of the Specification.
- .2 Only Contractor's workers able to provide a history of satisfactory experience in the area of hazardous materials management and can satisfy Federal and Territorial requirements will be permitted to supervise and conduct the work of this Section. Contractor's Hazardous Materials Specialist responsible for the work of this Section is to have a minimum of five (5) years of experience in the area of hazardous materials management.
- .3 Follow guidelines such as those established in Section 1.3 References.
- .4 Any activity involving the handling of hazardous materials is to be supervised directly by Contractor's personnel who have successfully completed a forty (40) hour training course for hazardous materials activities in compliance with OSHA 29 CFR 1910.120 or other approved equivalent training courses such as the Canadian Hazardous Materials Workers Program. Contractor's key personnel responsible for the removal of leachable lead coatings must demonstrate an appropriate level of experience in the lead control and abatement industry.
- .5 Contractor's personnel, who have been trained as described in this Section, are to instruct and direct all workers with respect to the waste management procedures and labour and safety practices to be followed in carrying out the work.
- .6 Provide all workers with protection appropriate to the potential type and level of exposure. Establish specific safety protocols prior to commencing clean-up activities.

- .7 Provide suitable personal protective clothing and equipment as required during the course of the work. Supply sufficient quantities and various sizes of PPE to fit all site personnel including Departmental Representative, Departmental Representative's staff, and site visitors.
 - .1 Trained and certified personnel are required to complete all TDGA documentation and recording requirements.

1.7 Measurement for Payment

- .1 Include all direct costs in lump sum price for Item 02 81 01-1 Processing Organic Content as indicated in the Basis of Payment Schedule. Work indicated in lump sum item includes, but is not limited to:
 - .1 Securing the organic liquids in tanks, ASTs, drums and pipeline.
 - .2 Transfer of organic liquids into drums, as required.
 - .3 Any and all analytical testing of liquid organics required for re-use, incineration, or by the Contractor's Designated Hazardous Waste Disposal Facility and territorial regulations as applicable.
 - .4 All costs associated with storage, transfer and use if used by Contractor on site.
 - .5 Preparation, handling, collection, and on-site incineration of drum and tank contents meeting the incineration criteria.
 - .6 Treatment and disposal of all rinsate generated during drum and tank cleaning.
- .2 Include all direct costs in lump sum price for Item 02 81 01-2 Containerization and Transport of Known Hazardous Materials as indicated in the Basis of Payment Schedule. Work indicated in lump sum item includes, but is not limited to:
 - .1 Any and all analytical testing of materials required by the Contractor's Designated Hazardous Waste Disposal Facility and territorial or provincial regulations as applicable.
 - .2 Preparation and submission of waste transport manifests to the Departmental Representative to meet all requirements of the TDGA and Regulations and Interprovincial Movement of Hazardous Waste Regulation (IMHWR).
 - .3 Development of a Hazardous Materials Processing Area to properly handle, package, containerize, and make ready for transport all hazardous materials.
 - .4 Management of a Temporary Storage Area as required prior to and during transport to Contractor's Designated Hazardous Waste Disposal Facility. The development, operation, and closure of the Temporary Storage Area will be paid for as specified in Section 01 52 00 – Construction Facilities.
 - .5 Permitting, transport, and off-loading of the containerized hazardous materials at the Contractor's Designated Hazardous Waste Disposal Facility.
- .3 Include all direct costs in lump sum price for Item 02 81 01-3 Off-site Disposal of Known Hazardous Materials as indicated in the Basis of Payment Schedule. Work indicated in lump sum item includes but is not limited to:
 - .1 Disposal of all known hazardous materials including but not limited to lead paint, PCB/lead paint, other PCB waste, cylinders, organic liquids, mercury, and other hazardous waste as identified in this, and other Sections of this specification.
 - .2 Disposal of hazardous materials at the Contractor's Designated Hazardous Waste Disposal Facility.
 - .2 Tracking and submittals of all appropriate documentation to Departmental Representative and Authorities Having Jurisdiction.

- .4 Include all direct costs in lump sum price for Item 02 81 01-4 Supply of Air/Land Transport Containers for Hazardous Liquid Waste and for Item 02 81 01-5 Supply of Air/Land Transport Containers for Known Hazardous Solid Waste as indicated in the Basis of Payment Schedule. Work indicated in lump sum item includes, but is not limited to:
 - .1 The supply and transport to site the containers required to transport hazardous materials. This includes packaging, labels, signage, materials required within the transport vessel required for safe and secure transport.
 - .2 Containers must be approved for the type of waste to be transported.
 - .3 Containerized hazardous waste shall meet all the requirements of the TDG Act and Regulations CEPA Regulations, Interprovincial Movement of Hazardous Waste Regulation and all other applicable Regulations.
- .5 Costs for the collection and containerization of unknown hazardous materials will be negotiated with Departmental Representative using Contractor's Labour, Equipment, Materials and Services Rates provided in the Potential Additional Work within the Basis of Payment. The scope of work for the collection and containerization of unknown hazardous materials includes, but is not limited to the following:
 - .1 Supply and transport of containers to the site for unknown hazardous materials.
 - .2 Equipment and labour for the containerization and on-site transportation of unknown hazardous materials to a Temporary Storage Area.
 - .3 Collection, sorting, and classification of unknown hazardous materials for disposal.
 - .4 Analytical testing associated with the disposal of unknown hazardous waste.
 - .6 Supply and transport of detergents and solvents to the site, required for drum processing.
 - .7 On-site transport of unknown hazardous materials following confirmation from Departmental Representative that they are categorized as hazardous materials.
 - .8 Containerization and transport of unknown hazardous materials to the on-site Temporary Storage Area.
 - .9 Disposal of empty drums resulting from the collection and consolidation of hazardous materials.
 - .10 Off-site transport and disposal of hazardous materials to the designated licensed disposal facilities.
- .6 Costs incidental to Items 02 81 01-01 to 02 81 01-10 include:
 - .1 Signs, barricades required to complete the Work.
 - .2 All costs associated with repackaging of container contents resulting from the Contractor failing to properly pack and secure the container and/or its contents.
 - .3 Additional costs for analytical testing and / or transport should materials not be acceptable for receipt at the Contractor's Hazardous Waste Disposal Facility.
- .7 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Description:
 - .1 Bring on site only quantities of hazardous material required to perform Work, if any.
 - .2 MSDS for suggested hazardous materials are to be approved by the Departmental Representative prior to transporting to site.

- .3 Upon approval, maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

2.2 Hazardous Materials Containers

- .1 Hazardous Materials Containers:
 - .1 Containers must satisfy the requirements of the most recent edition of the TDGA and Regulations, and in particular, the requirements for intermediate bulk containers for marine/air/ground transport of hazardous materials.
 - .2 Submit specifications of the containers to Departmental Representative for review prior to beginning work. These details are to include written confirmation from Transport Canada that Contractor's proposed containers satisfy TDGA regulatory requirements for marine/air/ground transport.
 - .3 Containers are to include all necessary liners to satisfy the TDGA requirements for marine/air/ground transport.
- .2 With respect to packaging and containerization requirements of hazardous materials, all requirements of the TDGA and Regulations and CEPA Interprovincial Movement of Hazardous Waste must be met.
- .3 Departmental Representative must direct and inspect all hazardous material packaging upon arrival and prior to shipment.

2.3 Solvent (Drum Rinse)

- .1 Minimum flash points within the MSDS for solvents must be submitted to Departmental Representative prior to shipment to the site. The solvent shipped to the site is to remain the property of Contractor.

PART 3 - EXECUTION

3.1 General Requirements

- .1 Conduct all work in accordance with all appropriate Federal, Provincial and Territorial legislation, and international conventions.
- .2 Individuals shipping and receiving hazardous materials are to be licensed under the TDGA and Regulations, and appropriate Federal, Provincial and Territorial environmental Acts and regulations.
- .3 Only trained individuals or individuals working under the direct supervision of trained persons are to handle or transport dangerous goods.
- .4 Establish Hazardous Materials Processing Area at the site, where hazardous materials are present, for the storage of potentially hazardous materials for inspection, testing, classification and packaging, as well as for the consolidation, incineration, and packaging of barrel liquids and sediments, and for the cleaning of barrels. Provide measures to mitigate release of contaminants to the environment including, but not limited to liners, silt fences, sorbent materials, ditching and grading, etc.
- .5 Establish a Temporary Storage Area at the site as specified in Section 01 52 00 – Construction Facilities, to provide a secure area for hazardous material prior to shipment for disposal as described in this Section.

3.2 Protection

- .1 Perform all work in an environmentally acceptable manner. Comply with requirements of Section 01 35 43 – Environmental Procedures and Sections 02 83 10 to 12 Lead Base Paint Abatement and 02 84 00 Polychlorinated Biphenyl Remediation.

- .2 Avoid releasing any hazardous materials into the environment during handling and storage.
- .3 In the event of a spill, implement the emergency response plan and take appropriate action.
- .4 When working with PCB-containing materials, leachable lead materials, asbestos, and other contaminants, workers must wear protective clothing and equipment acceptable to the Territorial Labour Department suitable for exposure in the work area. Follow National Institute for Occupational Safety and Health (NIOSH) guidelines in providing protection for on-site personnel including contract employees, subcontractors, Departmental Representative, Departmental Representative's staff, and other authorized personnel or visitors.
- .5 Any wastewater created from the cleaning of fuel tanks, pipelines and barrels is to conform to the wastewater discharge criteria in Section 01 35 15 - Special Project Procedures for Contaminated Sites prior to release. Wash water should be treated to meet the discharge criteria, or dispose of any liquid effluent not conforming to the Discharge Criteria as a waste material at Contractor's own cost, in accordance with the requirements of this Section.
- .6 Departmental Representative is to carry out baseline soil sampling and analyses of the temporary storage area and hazardous materials processing area at the site, where hazardous materials will be stored, prior to commencing work, and confirmatory sampling following the decommissioning of the areas. The Contractor is responsible for any soil impacts resulting from the improper storage and handling of hazardous materials over the duration of site activities. In the event of such impacts, the Contractor is to submit to Departmental Representative a plan for site remediation in accordance with all Federal and Territorial Regulations to be enacted upon immediately following approval by Departmental Representative. All clean-up costs, including but not limited to excavation and disposal, will be borne by Contractor.
- .7 PPE, as per Section 01 35 32, Site Specific Health and Safety Plan, is to include clothing, protective suits, respirators, etc. in accordance with NIOSH Guidelines and to comply with anticipated and potential emergency conditions.
- .8 Site personnel in the vicinity of the debris removal operations or handling hazardous material are required to wear PPE in accordance with NIOSH guidelines.
- .9 Provide a full range of clean-up and protective equipment at the site to contain and clean-up spills, and protect personnel, as detailed in the Spill Contingency plan and specified in Section 01 35 32 – Site Specific Health and Safety Plan. The clean-up equipment is to include booms (sorbent and containment), sorbents for clean-up, fire extinguishers for A-B-C fires, overpacks for contaminated soils, pumps, hand shovels, picks and containment barriers, such as plastic sheeting. Personal protective equipment is to include clothing, protective suits, respirators, etc. to comply with potential emergency conditions and in accordance with NIOSH guidelines.
- .10 Handle materials containing asbestos or suspected to contain asbestos in accordance with Section 02 82 00.03 – Asbestos Abatement – Maximum Precautions, Section 02 82 00.02 - Asbestos Abatement – Intermediate Precautions and Section 02 82 00.01 – Asbestos Abatement – Minimum Precautions.
- .11 Handle materials containing PCB/lead paint or suspected to contain PCB/lead paint in accordance with Section 02 83 12 – Lead Based Paint Abatement-Maximum Precautions, Section 02 83 11 – Lead Based Paint Abatement – Intermediate Precautions and Section 02 83 10 – Lead Based Paint Abatement – Minimum Precautions.
- .12 Vent non-ventilated gas cylinders and fire extinguishers in a remote and safe area acceptable to Departmental Representative. Stockpile empty and ventilated gas cylinders and fire extinguishers as non-hazardous waste. Do not explode or vent cylinders known or suspected to contain any ozone depleting substances. Containerize these materials in accordance with TDGA packaging standards.
- .13 The contractor is responsible for safely venting, containerizing and disposing of all unknown substances within pressurized cylinders and fire extinguishers that are on site.

3.3 Materials Processing Areas

- .1 Establish hazardous materials processing areas for the purpose of:
 - .1 Sorting, packaging, sampling, and processing of unknown and known hazardous materials; and,
 - .2 Consolidation of compatible liquids and sediments.
 - .3 Processing of drums and drum contents, including transferring of liquids for re-use into appropriate containers, incineration of remaining organic liquids meeting incineration criteria, packaging for off-site shipment, and cleaning of drums.
- .2 Establish hazardous materials processing areas to:
 - .1 Minimize the handling of hazardous materials.
 - .2 Provide for the sampling, testing, and packaging of hazardous materials, drum contents and wash water,
 - .3 Accommodate the volume of material and number of drums to be processed at any one time.
 - .4 Isolate hazardous materials, drum contents and wash water from other work operations.
 - .5 Provide access for consolidation, packaging, cleaning of drums, and transporting containers to the Temporary Storage Area.
 - .6 Be leak-proof and able to contain all runoff water, spills, and leaks so as not to impact the environment.
- .3 Provide safe working conditions for all personnel working in and around these areas.
- .4 Must meet requirements of Authority Having Jurisdiction. The clean-up of spills and leaks will be performed as per Section 01 35 32, Site Specific Health and Safety Plan.
- .5 The Materials Processing Areas are to be located as follows:
 - .1 At least 30 metres away from any water body or drainage course.
 - .2 On stable ground which is not subject to flooding or seasonal saturation.
 - .3 In a previously disturbed area if possible.
 - .4 In a location that will not impede other work.
- .6 Do not construct the Hazardous Materials Processing Area until baseline sampling has been completed by the Departmental Representative.
 - .1 Immediately clean up any spills, leaks, or other releases of liquid or sediment from this area using proper techniques.
 - .2 Submit the details of the Materials Processing Area to Departmental Representative for review and approval prior to beginning work.

3.4 Removal and Sorting of Hazardous Materials

- .1 Continually monitor remediation operations to identify potentially hazardous material.
- .2 Immediately suspend operations if suspected hazardous material or debris is identified and obtain visual confirmation of the nature of the material or debris.
- .3 Store suspicious material in a secured area or secured container, if the nature of the material or debris cannot be confirmed. Inform Departmental Representative about the findings. The suspicious material needs to be seized until the nature of the material is confirmed by Departmental Representative. Sampling and testing of the material for classification will be conducted and paid for by Departmental Representative.

- .4 Remove hazardous materials derived from demolition work from their place of origin in accordance with Section 02 41 16 – Structure Demolition, place in approved containers, and transport containers to the Temporary Storage Area.
- .5 Remove asbestos in accordance with Section 02 82 00.01 – Asbestos Abatement - Minimum Precautions or Section 02 82.00 02 – Asbestos Abatement – Intermediate Precautions and Section 02 82 00.03 – Asbestos Abatement – Maximum Precautions.
- .6 Handle materials containing PCB/lead paint or suspected to contain PCB/lead paint in accordance with Section 02 83 12 – Lead Based Paint Abatement-Maximum Precautions, Section 02 83 11 – Lead Based Paint Abatement-Intermediate Precautions and Section 02 83 10 – Lead Based Paint Abatement-Minimum Precautions.
- .6 Handle materials containing PCBs or suspected to contain PCBs in accordance with Section 02 84 00 – Polychlorinated Biphenyl Remediation.
- .7 Advise Departmental Representative of any stained soils encountered during hazardous material removal operations. Excavate stained and impacted soil areas, identified during removal operations upon approval from Departmental Representative and in accordance with the requirements of Section 02 61 00 – Soil Remediation. Testing for confirmation of impacts will be carried out and paid for by Departmental Representative.
- .8 Submit specifications of the containers for handling and disposal of hazardous materials to Departmental Representative for review and approval prior to commencement of site remediation activities. Include all required approvals, as well as a description of the type and volume of containers.

3.5 Containerization of Hazardous PCB Painted Materials and Leachable Lead Materials

- .1 Place dismantled hazardous PCB painted material and leachable lead painted materials in the containers described in this section, in a manner to minimize voids within the container. Sort and provide separate containers for the various components coated with PAP and/or leachable lead painted materials as follows:
 - .1 Segregate and place PCB-amended paint and/or leachable lead painted materials and/or CEPA PCB soil and/or leachable lead soil into Intermediate Containers:
 - .1 Segregate and place materials into separate Intermediate Containers, designated specifically for that type of hazardous waste.
 - .2 Place into Intermediate Containers all material that is sized or that can be easily sized to fit within the lined intermediate containers.
 - .3 Place the material in the intermediate container such that no movement of the material will occur during normal transport conditions.
 - .4 Place full and sealed Intermediate Containers into marine/air/ground shipping containers.
 - .2 Placement of PCB materials and leachable lead painted materials into marine/air/ground shipping containers.
 - .1 Prior to loading materials into barge containers, place a drip tray into the bottom of the container. The drip tray is to extend a distance of at least 400 mm up the sides of the container.
 - .2 Place all filled intermediate containers and larger demolition materials that cannot fit within the intermediate containers neatly into the barge containers.
 - .3 Construct a wooden frame at the front and rear of the container to prevent movement of materials within the container and to prevent pressure on the door. Anchor the bracing material to the structural frame of the container.

- .4 Distribute the weight of the material evenly over the length of the container. When items of a varying weight are to be packaged into a container or when a container will not be full, arrange the material so that the centre of gravity of the cargo is close to the middle of the container. Do not concentrate heavy loads on small areas of the container floor.
 - .5 Position materials within the container so that the centre of gravity is below the half-height of the container.
 - .6 Position materials within the container such that lateral bracing for the load is NOT provided by the sidewalls of the container. Provide and use wood bracing material or strapping to ensure that the material does not move during transport. Anchor the strapping material to the fastening loops built into the frame of the containers. Anchor the bracing material to the structural frame of the container.
 - .7 Do not leave any gaps between intermediate containers, larger materials and front or side walls of the barge containers that would allow cargo shifting.
- .2 Provide a photographic record of the interior of all filled marine/air/ground/air/ground (as applicable) shipping containers prior to closing. Submit the photographic record to Departmental Representative with the corresponding inventory of each container upon completion of work. Trained and certified Contractor personnel are required to complete all TDGA and Regulations documentation and recording requirements. The Contractor will represent the generator of the waste and will sign all documentation as required.
 - .3 Clearly mark on all containers the contents in accordance with the requirements of the DOJ, PCB Regulations (SOR/2008-273) and with the TDG Regulations. The container should be numbered with an internal number for tracking.
 - .4 The labels must state "ATTENTION — contains 50 mg/kg or more of PCBs / content 50 mg/kg ou plus de BPC" in black lettering on a white background, in a font size of no less than 36 points; measure at least 150 mm by 150 mm or at least 76 mm by 76 mm in the case of capacitors; and in the case of equipment for which an extension is applied for under Section 17, state a unique identification number. They shall affix a label in a readily visible location on any product containing PCBs in a concentration of 50 mg/kg or more and that are stored at the PCB storage site, which states "Date of Commencement of Storage / Date de début de stockage" and the date on which the storage begins.
 - .5 Store the containers in the Temporary Storage Areas in a manner that prevents access to the contents by unauthorized personnel.
 - .6 Remove bulk contamination (i.e. contaminated dust) from disposable clothing containing PCB or leachable lead materials and place in double polyethylene bags designated as hazardous waste. Upon cleaning of surficial contamination, remove outer clothing before leaving work area and place in doubled polyethylene bags. Place bags in hazardous waste containers specified in this Section.
 - .7 Decontaminate all equipment that comes into contact with hazardous materials. Place all rags or cloths used during the equipment decontamination in designated polyethylene bags. Place bags in the hazardous waste containers specified in this Section.
 - .8 All drop cloths used to collect paint particles during dismantling operations must be sprayed or dampened with water prior to their removal from the facility. Place the drop cloths in designated polyethylene bags, and place the bags in the hazardous waste containers specified in this Section.

3.6 Drum Processing

- .1 A flow diagram for the methodology for the processing, clean-up and disposal of drums is shown on Figure 01 at the end of this Section.

- .2 Inspection:
 - .1 All drums must be inspected by Departmental Representative and Contractor. The purpose of the inspection is to identify the process for opening, sampling, testing and handling of the drums. The inspection is to address the following items as a minimum:
 - .1 Symbols, words, or other marks on the drum that identify its contents, and/or that its contents are hazardous; e.g., radioactive, explosive, corrosive, toxic, flammable.
 - .2 Symbols, words, or other marks on the drum that indicate it contains discarded laboratory chemicals, reagents, or other potentially dangerous materials in small-volume containers.
 - .3 Signs of deterioration such as corrosion, rust, or leaks at seams, rims, and V grooves.
 - .4 Evidence of spills or other contamination on the top and sides of the drum.
 - .5 Signs that the drum is under pressure such as bulging and swelling.
- .3 Test areas around drums that show evidence of holes, rust points, or openings using a VOC instrument prior to movement. If levels exceed 20 percent LEL as measured by the VOC, conduct all handling, storage, and transportation operations in accordance with the appropriate sections of the NIOSH guidelines, National Fire Code of Canada, and the TDGA for flammable and combustible materials.
- .4 Drum Opening:
 - .1 Pressurized drums are extremely hazardous. Open with extreme caution. Use only non-sparking equipment to open drums (i.e. brass or beryllium). Provide all personnel opening drums with appropriate safety equipment and protective clothing. Open drums in accordance with the procedures outlined in the Occupational Safety and Health Administration (OSHA) Code of Federal Regulations Title 29, Part 1910, Section 120 (29 CFR 1910.120) Hazardous Materials Operations and Emergency Response (HAZWOPER).
 - .2 If the bungs of a drum can be readily moved, then open the drum slowly, allowing time for any pressure in the drum to be released before the bungs are fully removed.
 - .3 If the bungs of a drum cannot be readily moved, or if inspection suggests opening the drum may present a special hazard, vent the drums remotely to relieve any internal pressure that may be present prior to opening. Conduct remote drum venting using a suitable device.
 - .4 Conduct the remote venting operation at a safe distance from other site operations, and from behind suitable walls or barricades.
 - .5 All drums are to be clearly numbered on the lid and side of the drum and cross-referenced to sample numbers.
 - .6 Do not transport drums until it has been determined that they are not pressurized, do not leak, and are sufficiently sound for transport.
- .5 Sampling and testing of drum contents:
 - .1 Samples of the contents of the drums are to be collected by the Contractor.
 - .2 Combine drum contents that are determined, through field screening, visual observations and labeling to contain the same liquids.
 - .3 Consolidate drum contents only in the Materials Processing Areas.
 - .4 Do not consolidate drum contents consisting of black oil.
 - .5 Collect drums and store at the Materials Processing Areas.

- .6 Liquid samples are to be inspected and classified by the Contractor as containing water or organic materials.
- .7 Based on the results of the analysis by the Contractor; treat drum contents in accordance with the requirements detailed in Figure 02 at the end of this section.
- .8 The Departmental Representative will perform the necessary QA/QC analysis and review of the results obtained by the Contractor.
- .6 Disposal of Drum Contents:
 - .1 Dispose of drums containing rust and sediment as empty drums, as described below.
 - .2 For small volumes (50 mm at bottom of drum) agitation with oil-absorbent material to remove any organic material is acceptable.
 - .3 Collect wastewater for disposal in accordance with wastewater discharge criteria, Section 01 35 43 – Environmental Procedures.
 - .4 Test used oil-absorbent material to determine treatment and disposal requirements. Provide a dual chamber, forced air, fuel fired POL incinerator to incinerate all waste POL product and used oil-absorbent material meeting the following criteria on site in accordance with site permit requirements and the Environmental Guideline for the Burning and Incineration of Solid Waste (EGBISW) or package for disposal off site at a licensed disposal facility:
 - .1 PCBs < 2 ppm
 - .2 Chlorine < 1000 ppm
 - .3 Cadmium < 2 ppm
 - .4 Chromium < 10 ppm
 - .5 Lead < 100 ppmContents and used oil-absorbent material that do not meet incineration criteria in accordance with TDGA regulations will be packaged for disposal off site at a licensed disposal facility as required.
 - .5 Incinerate the contents of drums containing water with glycol and/or alcohol or organic phases, that meet the criteria indicated above (in accordance with site permit requirements and the EGBISW on site or package contents for off-site disposal at a licensed disposal facility.
 - .6 Package the contents of drums containing materials in excess of the concentrations indicated above, in accordance with TDGA regulations, as required, for disposal at an off-site licensed disposal facility. Contents may be combined with compatible materials for shipping purposes in accordance with TDGA regulations, as required.
 - .7 Leachate extraction tests and total CCME metals analysis are to be carried out by Departmental Representative on the solid residual material resulting from the incineration process. The leachate toxicity of the material will be determined in accordance with Appendix 4 of Part 2 of the TDGA and with CEPA regulations. Treat materials found not to be leachate toxic and that meet appropriate metals guidelines, as hydrocarbon contaminated soil as described in Section 02 61 00.01 – Soil Remediation. Package leachate toxic material or that does not meet metals guidelines in accordance with TDGA regulations, and dispose of off site.
- .7 Cleaning and disposal of drums:
 - .1 Clean to remove oil, sludge, wax, tar and other fuel residue adhering to the surface of the empty drums, following the removal and consolidation of drum contents.

- .2 If residue remains, use a manual detergent cleaning method. For heavily oil-soaked surfaces, a second detergent application may be required.
- .3 Only in the event that two detergent applications prove ineffective, use an appropriate solvent rinse for residue removal. Solvent rinsate material is to be tested by Departmental Representative to determine disposal requirements. If the solvent rinsate meets the criteria indicated above, incinerate the material on site. If the solvent rinsate is in excess of the criteria, package the material in accordance with TDGA regulations, as required, for disposal off site at a licensed disposal facility.
- .4 Recycling of steam cleaning rinsate is permitted if steam cleaning rinsate is passed through an oil-water separator. Oily waste residue separated by agitation and removed with oil-absorbent material to remove any organic material is permitted.
- .5 The resulting rinsate is to be tested by Departmental Representative for the wastewater discharge criteria in Section 01 35 15 - Special Project Procedures for Contaminated Sites. If the concentrations of the rinsate is greater than the indicated levels, then package the rinsate in accordance with TDGA regulations, as required, for disposal off site at a licensed disposal facility.
- .6 Dispose of the used oil-absorbent material and/or oily liquid waste in excess of the concentrations indicated in this section.
- .7 Crush all empty drums prior to containerization. Crush the drums to reduce the total original drum volume by a minimum of 75 percent. Containerize empty drums with no leachable lead paint as non-hazardous materials in accordance with Section 02 41 23 – Debris and Miscellaneous Removals. Containerize empty drums with leachable lead paint in accordance with this Section.

3.7 Cleaning of Fuel Tanks/ASTs/Pipelines

- 1 Debris at this site may consist of fuel tanks, ASTs and pipelines which may contain fuel.
 - 2 Prior to the demolition and removal of fuel tanks, ASTs and pipelines:
 - .1 Allow use of liquids contained in the tanks and pipelines by local personnel, for site equipment, incinerate, or dispose of these liquids off site. In the event of incineration, incinerate in a container to prevent soil or water contamination and ensure an oxygen-rich environment to promote complete combustion. Incineration to occur in accordance with Section 01 35 32 – Site Specific Health and Safety Plan, the site permit requirements, and the EGBISW.
 - .2 Rinse the tanks with water to remove any residual product. Filter the wash water through oil-absorbent material or oil/water separator.
 - .3 Test the used oil-absorbent material to determine disposal requirements. Incinerate oil-absorbent material meeting the following criteria on site or package for disposal off site at a licensed disposal facility:
 - .1 PCBs < 2 ppm
 - .2 Chlorine < 1000 ppm
 - .3 Cadmium < 2 ppm
 - .4 Chromium < 10 ppm
 - .5 Lead < 100 ppm
- Treat if necessary and dispose of the remaining waste wash water in accordance with the wastewater discharge criteria outlined in Section 01 35 15 - Special Project Procedures for Contaminated Sites.

- .4 The oil-absorbent material containing contaminants in excess of the above criteria should be packed in accordance with TDGA regulations, as required, for disposal off site at a licensed disposal facility.
- .5 The contractor is to submit purging and off gassing safe work procedures for approval by the Departmental Representative prior to commencing off gassing. These safe work procedures must follow applicable regulations and guidelines.
- .6 Following degassing, check interior explosive vapour concentrations which must be less than 20 percent LEL prior to demolition.

3.8 Cleaning of Sewage Tanks

- .1 Sewer lines must be rinsed with wash water prior to demolition. Sample and analyze the liquids, including wash water, in accordance with the wastewater discharge criteria outlined in Section 01 35 43 – Environmental Procedures. Package material in excess of these criteria in accordance with TDGA regulations as required.
- .2 Analyze sewage sludge in accordance with the impacted soil criteria described in Section 02 61 00.01 – Soil Remediation. Dispose of this material in accordance with the requirements of Section 02 61 00.01.

3.9 Packaging, Labelling and Inventory of Containers

- .1 Use a numbering system and maintain an inventory of all containers to be transported and disposed of off site.
- .2 Label all containers, using spray paint or other means, with the Container number and contents (e.g., haz soil, haz debris, etc.). Package and label each "hazardous material" in accordance with the "Class" and "Packaging Group" as per the TDGA.
- .3 Submit to Departmental Representative, a copy of the inventory of the contents of each container.

3.10 Temporary Storage Area

- .1 Develop Temporary Storage Areas at the site for the storage of containerized hazardous materials.
- .2 Temporary Storage Area must comply with the requirements identified in Construction Facilities - Section 01 52 00 of these Specifications.
- .3 The location and size of the Temporary Storage Area must allow for the minimization of handling of materials, isolate materials from other work operations and provide for the collection and removal of materials from the site.
- .4 Segregate materials within the Temporary Storage Area as follows:
 - .1 Containerized Metal Impacted Soil (as required if waiting for landfill construction or off-site disposal).
 - .2 Containerized Hazardous Solid and Liquid Materials.
 - .3 Containerized Drum, Tank, and Pipeline Contents.
 - .4 Non-hazardous Materials (as required if waiting for landfill construction).
- 5 Store hazardous materials in their appropriate packaging containers in accordance with the TDGA requirements.
- .6 No stacking of hazardous materials containers will be allowed during storage.
- .7 In accordance with Section 01 78 00 – Closeout Submittals, submit to Departmental Representative a detailed inventory of the Temporary Storage Area indicating the location and contents of each container and assigned internal tracking numbers (as required) and packaging configuration.

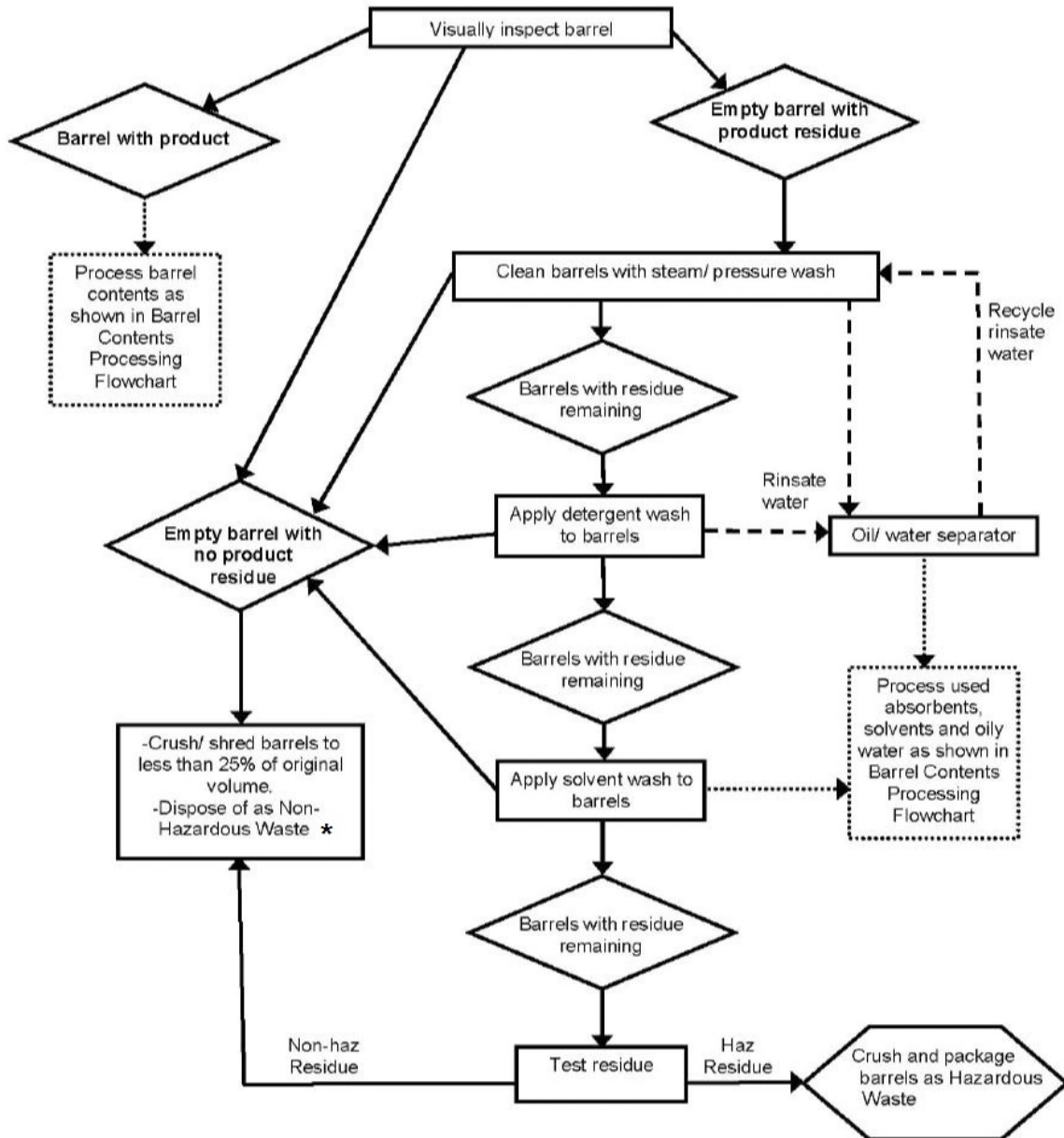
- .8 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .9 Flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use will be shipped on site in amounts approved by the Departmental Representative.
- .10 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.
- .11 Storage of quantities of flammable and combustible liquids exceeding a volume (determined by the Departmental Representative) for work purposes requires the written approval of the Departmental Representative.
- .12 Transfer of flammable and combustible liquids is prohibited within buildings or where ventilation is not considered adequate.
- .13 Transfer flammable and combustible liquids away from open flames or heat-producing devices.
- .14 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.
- .15 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.
- .16 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled and in active work areas.

3.11 Cleaning

- .1 Leave Work area clean at end of each day.
- .2 Upon completion, remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for transport off site.
 - .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
 - .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
 - .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
 - .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
 - .5 Disposal of hazardous materials in waterways or in municipal solid waste landfills is prohibited.
 - .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
 - .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
 - .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
 - .1 Hazardous wastes recycled in manner constituting disposal.
 - .2 Hazardous waste burned for energy recovery.
 - .3 Lead-acid battery recycling.
 - .4 Hazardous wastes with economically recoverable precious metals.

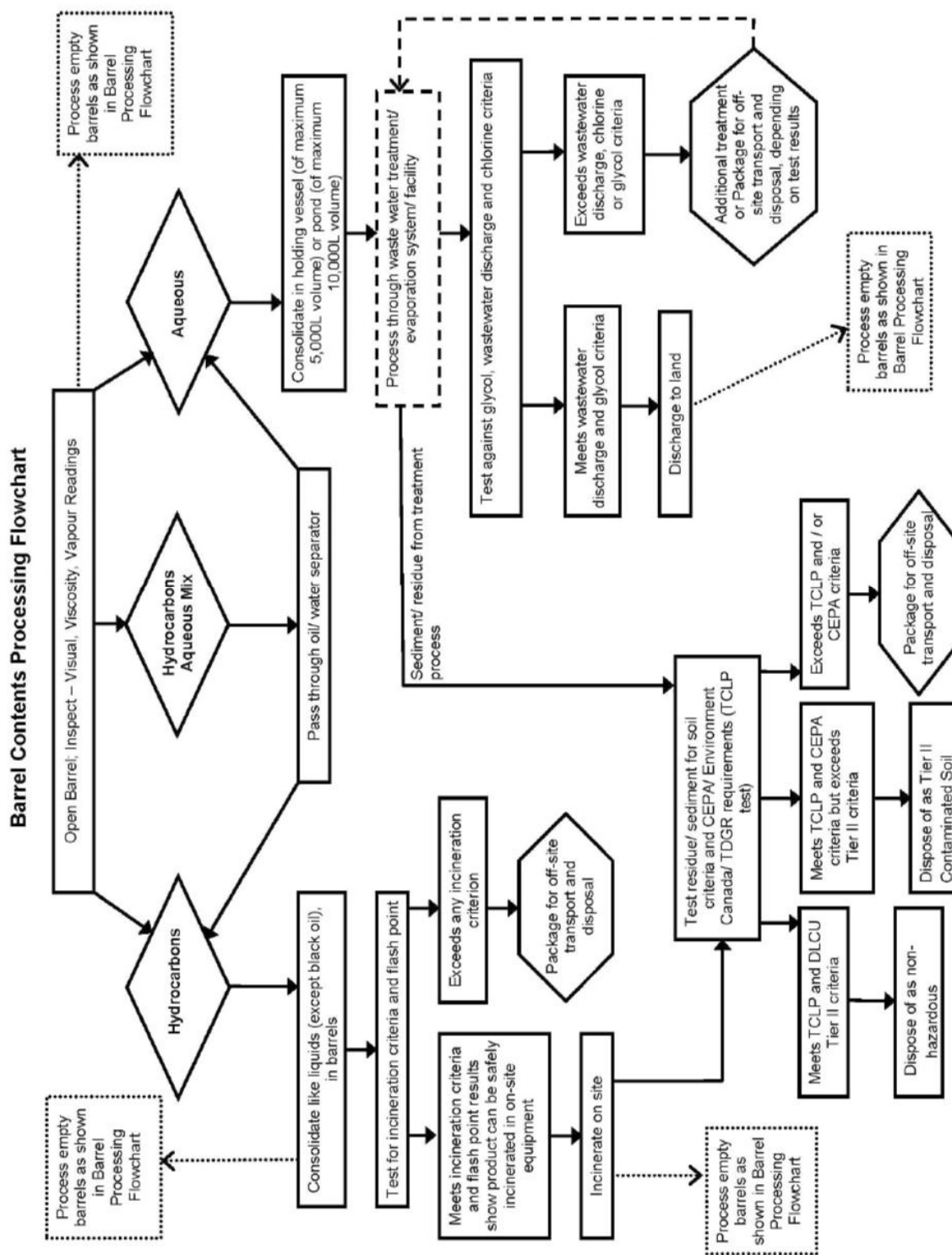
Figure 1

Barrel Processing Flowchart



* Please note that some of the barrels themselves may be hazardous.

Figure 2



PART 1 - GENERAL

1.1 Description

- .1 Comply with requirements of this Section when performing the following work:
 - .1 Removing non-friable asbestos-containing materials such as window caulking, heat resistant chimney tiles, white transite pipe and tank gaskets if the material is removed without being broken, cut, drilled, abraded, ground, sanded or vibrated within the buildings, as indicated on Drawings C04-C08 and Appendix C and D. If removal is to incorporate any of these methods then work procedures are to be upgraded as approved by the Departmental Representative. The volumes of asbestos-containing material are indicated in the following table:

Asbestos-containing Material Volumes by the Type of Material Table

Type of Material	APEC and Building Description	Uncrushed Volume (m ³)
Asbestos tank gasket	APEC 9 (Tank 1), APEC 10 (Tank 2), APEC 11 (Tank 3) and APEC 12 (Tank 4)	0.08
Asbestos window caulking	APEC 14 (Building 1 Living Quarters and Operations), 15 (Building 2 Powerhouse), 16 (Building 3), 17 (Building 4), 18 (Building 5 Garage), 20 (Building 7), 21 (Building 8) and 29 (Pump house)	0.13
Asbestos heat resistant chimney tile	APEC 17 (Building 4), 18 (Building 5 Garage)	0.02
Asbestos white pipe	APEC 20 (Building 7), 23 (Drum Cache 1), N/A (Scattered Debris by Drum Cache 2)	3.5
Total ACM		4.85

1.2 Section Includes

- .1 Requirements and procedures for asbestos abatement of non-friable asbestos-containing materials.

1.3 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT).
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 41 23 – Debris and Miscellaneous Removals.
- .8 Section 02 81 01 – Hazardous Materials.
- .9 Section 02 82 00.002 – Asbestos Intermediate Precautions.
- .10 Section 02 82 00.003 – Asbestos Maximum Precautions.

1.4 References

- .1 Department of Justice Canada (DOJ)

- .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-2003, Sealer for Application of Asbestos Fibre Releasing Materials.
- .3 Environmental Protection Service, Department of Sustainable Development, Government of the Nunavut
 - .1 Environmental Guideline for Waste Asbestos (January 2011)
- .4 Government of Alberta (GA)
 - .1 Alberta Asbestos Abatement Manual, 2012
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 Indian and Northern Affairs Canada
 - .1 Abandoned Military Site Remediation Protocol. Volume 1 – Main Report (2009).
- .7 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1999, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).

1.5 Definitions

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Amended Water: Water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): Materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: Area where work takes place which will, or may, disturb ACMs.
- .5 Authorized Visitors: Designated representative(s) and representative(s) of regulatory agencies.
- .6 Competent worker: In relation to specific work, means a worker who,
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the referenced provincial and federal laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material: Material that
 - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
 - .2 Is crumbled, pulverized or powdered.
- .8 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: Any area of the building or work site that is outside Asbestos Work Area where non-protected personnel may be present.

- .10 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.
- .12 Supervisor: Contractor's worker able to provide a history of satisfactory experience in the area of asbestos abatement that can satisfy Federal and Territorial requirements and will be permitted to supervise the work of this Section. The supervisor responsible for the work of this Section is to have a minimum of five (5) years of experience in the area of asbestos abatement.

1.6 Submittals

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of Authority Having Jurisdiction.
- .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to Departmental Representative necessary permits for hauling and disposal of asbestos-containing waste and proof that asbestos-containing waste has been properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test or equal) with respirator that is personally issued.

1.7 Quality Assurance

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
 - .1 Perform construction occupational health and safety in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
 - .2 Safety Requirements: worker protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction for the identified safe work procedure. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary. The respirator identified to have damaged or deteriorated parts shall be replaced prior to being

used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker is not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing, and to be repaired or replaced if torn. The contractor is to provide suitable footwear relevant to the safe work procedure. This may be steel toed rubber boots or steel toed boots extending above the ankle.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .4 Facilities for washing hands and face shall be provided where the main point of ingress and egress has been identified for the Asbestos Work Area.
- .5 Ensure workers wash hands, face and respirator when leaving Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 If at any time the contractor, Departmental Representative or analytical confirmation shows that the protection factor of the minimum asbestos abatement procedure is inadequate, work procedures are to be upgraded to intermediate or high risk work procedures or additional controls must be requested by the contractor in writing for approval by the Departmental Representative.

1.8 Waste Management and Disposal

- .1 Disposal of asbestos waste generated by removal activities must comply with Federal, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm bags or leak proof drums. Label containers with appropriate warning labels.
- .2 Provide manifests describing and listing waste created. Transport containers by approved means to the on-site landfill, burial in a marked and recorded location. Cover the asbestos waste according to the applicable references.

1.9 Existing Conditions

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are listed in this section.

- .2 Notify Departmental Representative of suspect asbestos containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.10 Owner's Instructions

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.

1.11 Measurement For Payment

- .1 The abatement, separation, packaging and disposal of asbestos from buildings, structures and facilities to be demolished will not be measured for payment and should be included in the price for demolition of the structures as described in Section 02 41 16 - Structure Demolition and in Section 02 81 01 – Hazardous Materials including, but not limited to the following:
 - .1 Supply of all materials, labour, and equipment necessary to perform the work in accordance with these specifications, including the supply and transport to the site of asbestos waste containers.
 - .2 Construction of temporary enclosures and drop sheets when necessary.
 - .3 Handling, separation and disposal of asbestos materials from other debris and miscellaneous materials.
 - .4 Preparation of asbestos inventory.
 - .5 Temporary storage as required, prior to transport on site and on-site landfilling of asbestos waste.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Drop Sheets:
 - .1 Polyethylene: 0.15 mm thick.
 - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
 - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.

- .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
- .3 Labelling requirements: affix pre-printed cautionary asbestos warning in three official languages (English, French and Inuktitut) that is visible when ready for removal to disposal site.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .6 Encapsulant: surface film forming or penetrating type conforming to CAN/CGSB-1.205.
- .7 Provide 24 volt safety lighting and ground fault interrupter (GFI) circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.

PART 3 - EXECUTION

3.1 Procedures

- .1 Complete construction occupational health and safety in accordance with the Asbestos Abatement Manual and Section 01 35 32 – Site Specific Health and Safety Plan.
- .2 Before beginning Work, at each access to Asbestos Work Area, install warning signs in three official languages (English, French and Inuktitut) in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
- .3 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in three official languages (English, French and Inuktitut) that are visible at access routes to Asbestos Work Area.
 - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
 - .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
 - .3 Do not use compressed air to clean up or remove dust from any surface.
- .4 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
- .5 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity fine - mist sprayer.
 - .2 Perform Work to reduce dust creation to lowest levels practicable.
 - .3 Work will be subject to visual inspection and air monitoring.
 - .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

- .6 Frequently and at regular intervals during Work and immediately on completion of work:
 - .1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container, and
 - .2 Drop sheets to be wetted and placed in a waste container as soon as practicable.
- .7 Cleanup:
 - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
 - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.
 - .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
 - .4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

PART 1 - GENERAL

1.1 Description

- .1 Comply with requirements of this Section when performing the following Work:
 - .1 Removing non-friable asbestos containing materials such as interior panels (some panels are lead painted), black felt, green asphalt shingles and exterior siding (Building 5) by breaking, cutting, drilling, abrading, grounding, sanding or vibrating, if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
 - .2 These materials can also be removed by breaking, cutting, drilling, abrading, grounding, sanding or vibrating if:
 - .1 The material is wetted to control the spread of dust or fibres, and
 - .2 The work is done only by means of non-powered hand-held tools.
 - .3 These materials are identified on Drawings C04-C08, Appendix C and D and the following table.

Asbestos-containing Material Volumes by the Type of Material Table

Type of Material	APEC and Building Description	Uncrushed Volume (m ³)
Asbestos black felt	APEC 6 (Medium Cabin), 7 (Small Cabin), 14 (Building 1 Living Quarters and Operations), 16 (Building 3), 17 (Building 4), 18 (Building 5 Garage), 20 (Building 7), 21 (Building 8) and 29 (Pump house)	10
Asbestos panels ¹	APEC 7 (Small Cabin), 17 (Building 4), 22 (Building 9), N/A (Building 10) and N/A (Scattered Debris throughout and adjacent to the Site)	5.12
Asbestos green asphalt shingles	APEC 14 (Building 1 Living Quarters and Operations), 20 (Building 7) and APEC 21 (Building 8)	4.05
Asbestos exterior siding	APEC 18 (Building 5 Garage)	3
Total ACM		22.17
Notes: 1. The remaining asbestos panels (7 m ³) in APEC 14 (Building 1 Living Quarters and Operations) are coated with total and leachable lead amended paint and are included in Section 02 83 11. Lead-based Paint Abatement - Intermediation Precautions.		

1.2 Section Includes

- .1 Requirements and procedures for asbestos abatement of asbestos containing materials of the type described within.

1.3 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT).
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.

- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 41 23 – Debris and Miscellaneous Removals.
- .8 Section 02 81 01 – Hazardous Materials.
- .9 Section 02 82 00.001 – Asbestos Minimum Precautions.
- .10 Section 02 82 00.003 – Asbestos Maximum Precautions.

1.4 References

- .1 Department of Justice Canada (DOJ)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-2003, Sealer for Application of Asbestos Fibre Releasing Materials.
- .3 Environmental Protection Service, Department of Sustainable Development, Government of the Nunavut
 - .1 Environmental Guideline for Waste Asbestos (January 2011)
- .4 Government of Alberta (GA)
 - .1 Alberta Asbestos Abatement Manual, 2012
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 Indian and Northern Affairs Canada
 - .1 Abandoned Military Site Remediation Protocol. Volume 1 – Main Report (2009).
- .7 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1999, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).

1.5 Definitions

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Amended Water: Water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): Materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: Area where work takes place which will, or may, disturb ACMs.
- .5 Authorized Visitors: Designated representative(s) and representative(s) of regulatory agencies.
- .6 Competent worker: In relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the referenced provincial and federal laws and with the provisions of the regulations that apply to the work.

- .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material: Material that,
 - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or;
 - .2 Is crumbled, pulverized or powdered.
- .8 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: Any area of the building or work site that is outside Asbestos Work Area and non-protected personnel are present.
- .10 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.
- .12 Supervisor: Contractor's worker able to provide a history of satisfactory experience in the area of asbestos abatement that can satisfy Federal and Territorial requirements and will be permitted to supervise the Work of this Section. The supervisor responsible for the Work of this Section is to have a minimum of five (5) years of experience in the area of asbestos abatement.

1.6 Submittals

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of Authority Having Jurisdiction.
- .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to Departmental Representative necessary permits for hauling and disposal of asbestos-containing waste and proof that asbestos-containing waste has been properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test or equal) with respirator that is personally issued.

1.7 Quality Assurance

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
 - .1 Perform construction occupational health and safety in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
 - .2 Safety Requirements: worker protection.

- .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority Having Jurisdiction for the identified safe work procedure. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary. The respirator identified to have damaged or deteriorated parts shall be replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker is not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.
 - .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing and to be repaired or replaced if torn. The contractor is to provide suitable footwear relevant to the safe work procedure. This may be steel toed rubber boots or steel toed boots extending above the ankle.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .4 Facilities for washing hands and face shall be provided where the main point of ingress and egress has been identified for the Asbestos Work Area.
- .5 Ensure workers wash hands, face and respirator when leaving Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 If at any time the contractor, Departmental Representative or analytical confirmation shows that the protection factor of the intermediate asbestos abatement procedure is inadequate, work procedures are to be upgraded to high risk or additional controls must be requested by the contractor in writing for approval by the Departmental Representative.

1.8 Waste Management and Disposal

- .1 Disposal of asbestos waste generated by removal activities must comply with Federal, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm bags or leak proof drums. Label containers with appropriate warning labels.
- .2 Provide manifests describing and listing waste created. Transport containers by approved means to the on-site landfill burial in a marked and recorded location. Cover the asbestos waste according to the applicable references.

1.9 Existing Conditions

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are listed in this section.
- .2 Notify Departmental Representative of suspect asbestos containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.10 Owner's Instructions

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.

1.11 Measurement For Payment

- .1 The abatement, separation, packaging and disposal of asbestos from buildings, structures and facilities to be demolished will not be measured for payment and should be included in the price for demolition of the structures, as described Section 02 41 16 – Structure Demolition and Section 02 81 01 – Hazardous Materials including, but not limited to the following:
 - .1 Supply of all materials, labour, and equipment necessary to perform the work in accordance with these specifications, including the supply and transport to the site of asbestos waste containers.
 - .2 Construction of temporary enclosures and drop sheets when necessary.
 - .3 Handling, separation and disposal of asbestos materials from other debris and miscellaneous materials.
 - .4 Preparation of asbestos inventory.
 - .5 Transport and on-site disposal of asbestos waste.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Drop Sheets:
 - .1 Polyethylene: 0.15 mm thick.
 - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
 - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .3 Labelling requirements: affix pre-printed cautionary asbestos warning in three official languages (English, French and Inuktitut) that is visible when ready for removal to disposal site.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .6 Encapsulant: surface film forming or penetrating type conforming to CAN/CGSB-1.205.
- .7 Provide 24 volt safety lighting and ground fault interrupter (GFI) circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.

PART 3 - EXECUTION

3.1 Supervision

- .1 Minimum of one (1) Supervisor for every ten (10) workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.2 Procedures

- .1 Complete construction occupational health and safety in accordance with the Asbestos Abatement Manual and Section 01 35 32 – Site Specific Health and Safety Plan.
- .2 Before beginning Work, at each access to Asbestos Work Area, install warning signs in three official languages (English, French and Inuktitut) in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
- .3 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in three official languages (English, French and Inuktitut) that are visible at access routes to Asbestos Work Area.
 - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.

- .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
- .3 Do not use compressed air to clean up or remove dust from any surface.
- .4 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
- .5 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity fine - mist sprayer.
 - .2 Perform Work to reduce dust creation to lowest levels practicable.
 - .3 Work is subject to visual inspection and air monitoring.
 - .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .6 Cleanup:
 - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
 - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
 - .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority Having Jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the guidelines and regulations for asbestos disposal are followed.
 - .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.3 Air Monitoring

- .1 From beginning of Work until completion of cleaning operations, the Departmental Representative is to take air samples on daily basis outside of Asbestos Work Area (enclosures) and an occupational air sample on a worker in the active asbestos work area in accordance with the Alberta Provincial and Territorial Occupational Health and Safety Regulations.
 - .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Alberta Provincial and Territorial Occupational Health and Safety Regulations.
- .2 If air monitoring shows that areas outside Asbestos Work Area enclosure(s) are contaminated, all work is to cease and the area is to be enclosed, maintained and cleaned in the same manner as applicable to Asbestos Work Area.
- .3 Ensure that respiratory protection factors are not exceeded.

- .4 During the course of Work, the Departmental Representative is to measure fibre content of air outside Work areas by means of air samples analyzed by Phase Contrast Microscopy (PCM).
 - .1 Stop Work when PCM measurements exceed 0.05 f/cc, review and correct safe work procedures as necessary.

PART 1 - GENERAL

1.1 Description

- .1 Comply with requirements of this Section when performing the following Work:
 - .1 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos containing flooring, ceiling tile, attic insulation, fibreglass insulation, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.
 - .2 These materials are identified on Drawings C04-C08, Appendix C and D and the following table.

Asbestos-containing Material Volumes by the Type of Material Table

Type of Material	APEC and Building Description	Uncrushed Volume (m ³)
Asbestos tile and sheet flooring	APEC 14 (Building 1 Living Quarters and Operations) and 20 (Building 7)	2.5
Asbestos attic insulation (vermiculite)	APEC 14 (Building 1 Living Quarters and Operations), 16 (Building 3) and 17 (Building 4)	124
Fibre glass insulation ¹ (Asbestos/vermiculite contaminated)	APEC 14 (Building 1 Living Quarters and Operations), 16 (Building 3) and 17 (Building 4)	44
Total ACM		170.5
Notes: <ol style="list-style-type: none"> 1. The asbestos attic insulation may have migrated overtime from the attic into the walls, causing the fiberglass wall insulation to become asbestos contaminated. 2. The ceiling tiles (11 m³) in APEC 14 (Building 1 Living Quarters and Operations) and APEC 17 (Building 4) and also are coated with total and leachable lead amended paint and are included in Section 02 83 11. Lead-based Paint Abatement - Intermediation Precautions. 		

1.2 Section Includes

- .1 Requirements and procedures for asbestos abatement of asbestos containing materials of the type described within.

1.3 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT).
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 41 23 – Debris and Miscellaneous Removals.
- .8 Section 02 81 01 – Hazardous Materials.
- .9 Section 02 82 00.001 – Asbestos Minimum Precautions.
- .10 Section 02 82 00.002 – Asbestos Intermediate Precautions.

1.4 References

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-2003, Sealer for Application of Asbestos Fibre Releasing Materials.
- .3 Department of Justice Canada (DOJ)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 Environmental Protection Service, Department of Sustainable Development, Government of the Nunavut
 - .1 Environmental Guideline for Waste Asbestos (January 2011)
- .5 Government of Alberta (GA)
 - .1 Alberta Asbestos Abatement Manual, 2011
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .7 Indian and Northern Affairs Canada
 - .1 Abandoned Military Site Remediation Protocol. Volume 1 – Main Report (2009).
- .8 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1999, (c. 34).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).
- .9 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention (CDC)/National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH 94-113 NIOSH Manual of Analytical Methods (NMAM), 5th Edition.
- .10 U.S. Department of Labour - Occupational Safety and Health Administration - Toxic and Hazardous Substances
 - .1 29 CFR 1910.1001, Asbestos Regulations.

1.5 Definitions

- .1 Airlock: System for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two double curtained doorways at least 2 metres apart.
- .2 Amended Water: Water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): Materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: Area where work takes place which will, or may, disturb ACMs.
- .5 Authorized Visitors: Designated representative(s) and representative(s) of regulatory agencies.
- .6 Competent worker: In relation to specific work, means a worker who,
 - .1 Is qualified because of knowledge, training and experience to perform the work.

- .2 Is familiar with the referenced provincial and federal laws and with the provisions of the regulations that apply to the work.
- .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Curtained doorway: Arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
 - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.
- .8 DOP Test: Testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.
- .9 Friable material: Material that,
 - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
 - .2 Is crumbled, pulverized or powdered.
- .10 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .11 Negative pressure: System that extracts air directly from work area, filters such extracted air through HEPA filtering system, and discharges this air directly outside work area to exterior of building.
 - .1 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.
- .12 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .13 Occupied Area: Any area of the building or work site that is outside Asbestos Work Area and non-protected personnel are present.
- .14 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .15 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.
- .16 Supervisor: Contractor's workers able to provide a history of satisfactory experience in the area of asbestos abatement that can satisfy Federal and Territorial requirements and will be permitted to supervise the work of this Section. The supervisor responsible for the work of this Section is to have a minimum of five (5) years of experience in the area of asbestos abatement.

1.6 Submittals

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Before beginning work:

- .1 Obtain from appropriate agency and submit to Departmental Representative necessary permits for transportation and disposal of asbestos waste. Ensure that the Departmental Representative is fully aware of hazardous nature of material being disposed, and proper methods of disposal. Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to landfill the asbestos waste on-site, cover, and record its location.
- .2 Submit proof satisfactory to Departmental Representative all asbestos workers have received appropriate training and education by a competent person on hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Submit proof of attendance in form of certificate.
- .3 Ensure supervisory personnel have attended asbestos abatement course, of not less than two (2) days duration, approved by Departmental Representative. Submit proof of attendance in form of certificate. Minimum of one (1) Supervisor for every ten (10) workers.
- .4 Submit layout of proposed enclosures and decontamination facilities including waste transfer room to Departmental Representative for review.
- .5 Submit documentation including test results for sealer proposed for use.
- .6 Submit Provincial/Territorial and/or local requirements for Notice of Project form.
- .7 Submit proof of Contractor's Asbestos Liability Insurance.
- .8 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test or equal) with respirator that is personally issued.
- .9 Submit Worker's Compensation Board status and transcription of insurance.
- .10 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including but not limited to following:
 - .1 Encapsulants.
 - .2 Amended water.
 - .3 Slow drying sealer.

1.7 Quality Assurance

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Perform construction occupational health and safety in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area includes:
 - .1 Powered air purifying respirator (PAPR) with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority Having Jurisdiction for the identified safe work procedure. The respirator to be fitted so that there is an effective seal between the respirator and the worker's

face, unless the respirator is equipped with a hood or helmet. The respirator is to be cleaned, disinfected and inspected after use on each shift, or more often if necessary. The respirator to have damaged or deteriorated parts shall be replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker is not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the skin under the protective clothing, and is to be repaired or replaced if torn. Within the enclosure, contractor must make available steel toed rubber boots that are to size for Department Representative or visitors which may be required to enter an enclosure. Steel toed rubber boots used in the enclosure are not to be removed until decontaminated at the end of the abatement procedure. Requirements for each worker during ingress and egress of Asbestos Work Area:
 - .1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean disposable coveralls and head covers. Proceed into the Equipment and Access Rooms pass through the shower and into the “dirty” access room with access to the Asbestos Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
 - .2 Remove gross contamination from disposable coveralls before leaving work area then proceed to the “dirty” access room and remove clothing except respirators. Place contaminated work suits in receptacles for disposal with other asbestos - contaminated materials. Still wearing the respirator proceed naked to showers. Using soap and water wash body and hair thoroughly. Clean outside of respirator with soap and water while showering; remove respirator; remove filters and wet them and dispose of filters in container provided for purpose; and wash and rinse respirator. When not in use in work area, store work footwear in dirty Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from dirty Access Room.
 - .3 After showering and drying off, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.

- .4 Enter waste transfer room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Transfer from the enclosure must not be occurring at the same time as clean transfer to an on-site landfill. Workers must not use this system as means to leave or enter work area.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Ensure workers are fully protected with respirators and protective clothing as outlined in section 02 82 00.001-Asbestos Abatement-Minimum Precautions during preparation of system of enclosures prior to commencing actual asbestos abatement.
- .4 Provide and post in Clean Change Room and in dirty Access Room the procedures described in this Section, in three official languages (English, French and Inuktitut).
- .5 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .6 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.8 Waste Management And Disposal

- .1 Disposal of asbestos waste generated by removal activities must comply with Federal, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm bags or leak proof drums. Label containers with appropriate warning labels.
- .2 Provide manifests describing and listing waste created. Transport containers by approved means to the on-site landfill burial in a marked and recorded location. Cover the asbestos waste according to the applicable references.

1.9 Existing Conditions

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are listed in this section.
- .2 Notify Departmental Representative of suspect asbestos containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.10 Scheduling

- .1 Not later than ten (10) days before beginning Work on this Project notify following in writing:
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
 - .2 Regional Office of Labour Canada.
 - .3 Provincial/Territorial, Department of Labour.
- .2 Inform sub-trades of presence of asbestos containing materials identified in Existing Conditions.
- .3 Submit to Departmental Representative copy of notifications prior to start of Work.

1.11 Owner's Instructions

- .1 Before beginning Work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene including dress and showers, in entry and exit from Asbestos Work Area, in aspects of work procedures including glove bag procedures, and in use, cleaning, and disposal of contaminated respirators and protective clothing.
- .2 Instruction, training and documentation related to respirators includes, at minimum:
 - .1 Proper fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.
- .4 Supervisory personnel to complete required training as outlined in this section.

1.12 Measurement For Payment

- .1 The abatement, separation, packaging and disposal of asbestos from buildings, structures and facilities to be demolished will not be measured for payment and should be included in the price for demolition of the structures as described in Section 02 41 16 Structure Demolition and Section 02 81 01 – Hazardous Materials including, but not limited to the following:
 - .1 Supply of all materials, labour, and equipment necessary to perform the work in accordance with these specifications, including the supply and transport to the site of asbestos waste containers.
 - .2 Construction of temporary enclosures and drop sheets when necessary.
 - .3 Handling, separation and disposal of asbestos materials from other debris and miscellaneous materials.
 - .4 Preparation of asbestos inventory.
 - .5 Transport and on-site disposal of asbestos waste.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS**2.1 Materials**

- .1 Polyethylene: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .4 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Departmental Representative, mixed with water in concentration to provide adequate penetration and wetting of asbestos containing material.
- .5 Waste Containers: contain waste in two separate containers.

- .1 Inner container: 0.15 mm thick sealable polyethylene bag.
- .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
- .3 Labelling requirements: affix preprinted cautionary asbestos warning, in three official languages (English, French and Inuktitut), that is visible when ready for removal to disposal site.
- .6 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .7 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least eight (8) hours and designed for purpose of trapping residual asbestos fibres.
- .8 Sealer: flame spread and smoke developed rating less than 50.
- .9 Encapsulants: surface film forming or penetrating type conforming to CAN/CGSB-1.205.

PART 3 - EXECUTION

3.1 Preparation

- .1 Complete construction occupational health and safety in accordance with the Asbestos Abatement Manual and Section 01 35 32 – Site Specific Health and Safety Plan.
- .2 Work Areas:
 - .1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.
 - .2 Pre-clean moveable furniture within proposed work area(s) using HEPA vacuum and remove from work area(s) to temporary staging location to be landfilled.
 - .3 Pre-clean fixed casework, equipment, and items to be demolished along with the building, within proposed work area(s), using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
 - .4 Clean proposed work area(s) using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.
 - .5 The spread of dust from the work area to be prevented by:
 - .1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.
 - .2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.
 - .6 Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. Provide continuous monitoring of pressure difference using automatic recording instrument. The system to maintain a negative air pressure of 5 Pa, relative to the area outside the enclosed area. The system to be inspected and maintained by a competent person prior to each use to ensure that there is no air

- leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used during the active abatement.
- .7 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .8 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Use two layers of FR polyethylene on floors. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.
 - .9 Build airlocks at entrances to and exits from work area(s) so that work area(s) are always closed off by one curtained doorway when workers enter or exit.
 - .10 At each access to work areas install warning signs in three official languages (English, French and Inuktitut), in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)".
 - .11 After work area isolation, remove heating, ventilating, and air conditioning filters, pack in sealed plastic bags 0.15 mm minimum thick and treat as contaminated asbestos waste. Remove ceiling - mounted objects such as lights, partitions, other fixtures not previously sealed off, and other objects that interfere with asbestos removal, as directed by Departmental Representative. Use localized water spray during fixture removal to reduce fibre dispersal.
 - .12 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to the Authority Having Jurisdiction.
 - .13 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.
 - .14 Before removing suspended ceilings, remove friable material on upper surfaces using HEPA vacuum equipment.
 - .15 After preparation of work areas and Decontamination Enclosure Systems, remove designated asbestos containing ceiling tiles within work areas progressively and carefully, clean using HEPA vacuum and damp sponge, wrap clean panels in 0.10 mm minimum thick polyethylene or bags, and store in building as directed by Departmental Representative and dispose of as contaminated waste. Clean "T" grid suspension system within work areas using wet sponge during clean up.
 - .16 After preparation of work areas and Decontamination Enclosure Systems, remove the asbestos containing materials. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.
 - .17 After preparation of work areas and Decontamination Enclosure Systems, for the removal of all other asbestos containing materials, remove within work area and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.
- .3 Worker Decontamination Enclosure System:
- .1 Worker Decontamination Enclosure System includes Equipment and Access Room ("dirty room"), Shower Room, and Clean Room, as follows:
 - .1 Equipment and Access Room: build Equipment and Access Room between Shower Room and work areas, with two double curtained doorways, one to Shower Room and one to work areas. Install portable toilet, waste receptor, and storage facilities for workers' shoes and protective clothing to be reworn

- in work areas. Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.
- .2 Shower Room: build Shower Room between Clean Room and Equipment and Access Room, with two double curtained doorways, one to Clean Room and one to Equipment and Access Room. Provide one shower for every five workers. Provide constant supply of hot and cold or warm water. Cold water source is available at Ennadai Lake. Hot water source is available at the hot water tank. Provide piping and connect to water sources and drains. Pump waste water through 5 micrometre filter system acceptable to Departmental Representative before disposing on-site. Sampling of the waste water may be conducted following the Government of Nunavut Environmental Guideline for Industrial Waste Discharges, 2002. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.
- .3 Clean Room: build Clean Room between Shower Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
- .4 Container and Equipment Decontamination Enclosure System:
- .1 Container and Equipment Decontamination Enclosure System consists of Staging Area within work area, Washroom, Holding Room, and Unloading Room. Purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which Worker Decontamination Enclosure System is not suitable.
- .1 Staging Area: designate Staging Area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to Washroom. Equip Staging Area with curtained doorway to Washroom.
- .2 Washroom: build Washroom between Staging Area and Holding Room with two curtained doorways, one to Staging Area and one to Holding Room. Provide high - pressure low - volume sprays for washing of waste containers and equipment. Pump waste water through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.
- .3 Holding Room: build Holding Room between Washroom and Unloading Room, with two curtained doorways, one to Washroom and one to Unloading Room. Build Holding Room sized to accommodate at least two waste containers and largest item of equipment used. The curtain doorway is to be sealed on each side except for when transfer of waste is occurring.
- .4 Unloading Room: build Unloading Room between Holding Room and outside, with two curtained doorways, one to Holding Room and one to outside.
- .5 Construction of Decontamination Enclosures:
- .1 Build suitable framing for enclosures or use existing rooms where convenient and line with polyethylene sheeting sealed with tape. Use two layers of FR polyethylene on floors.
- .2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

- .6 Separation of Work Areas from Occupied Areas:
 - .1 Separate parts of building required to remain in use from parts of building used for asbestos abatement by means of airtight barrier system constructed as follows:
 - .1 Build suitable floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting sealed with tape, and apply 9 mm minimum thick plywood. Seal joints between plywood sheets and between plywood and adjacent materials with surface film forming type sealer, to create airtight barrier.
 - .2 Cover plywood barrier with polyethylene sealed with tape, as specified for work areas.
- .7 Maintenance of Enclosures:
 - .1 Maintain enclosures in tidy condition.
 - .2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
 - .3 Visually inspect enclosures at beginning of each working period.
 - .4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.
- .8 Do not begin Asbestos Abatement work until:
 - .1 Arrangements have been made for disposal of waste.
 - .2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.
 - .3 Work areas, decontamination enclosures, and parts of building required to remain in use are effectively segregated.
 - .4 Tools, equipment, and materials waste containers are on hand.
 - .5 Arrangements have been made for building security.
 - .6 Warning signs are displayed where access to contaminated areas is possible.
 - .7 Notifications have been completed and other preparatory steps have been taken.

3.2 Supervision

- .1 Minimum of one (1) Supervisor for every ten (10) workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos containing materials.

3.3 Asbestos Removal

- .1 Before removing asbestos:
 - .1 Prepare site.
 - .2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.
- .2 Remove saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet

sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure that containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.

- .4 After completion of stripping work, wire brushed and wet sponged surfaces from which asbestos has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible asbestos, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.
- .6 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .7 Cleanup:
 - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
 - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
 - .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority Having Jurisdiction. Supervise disposal and ensure that landfill operator is fully aware of hazardous nature of material to be landfilled and that guidelines and regulations for asbestos disposal are followed.
 - .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.4 Final Cleanup

- .1 Following cleaning specified above, and when air sampling shows that asbestos levels on both sides of seals do not exceed 0.01 fibres/cc as determined by membrane filter method at 400-500X magnification phase contrast microscopy (PCM), as described in NIOSH Method 94-113 Method 7400 or equivalent, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
- .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Include in clean-up Work areas, Equipment and Access Room, Washroom, Shower Room, and other contaminated enclosures.
- .5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.

- .6 Conduct final check to ensure that no dust or debris remains on surfaces as result of dismantling operations and carry out air monitoring again to ensure that asbestos levels in building do not exceed 0.01 fibres/cc. Repeat cleaning using HEPA vacuum equipment, or wet cleaning methods where feasible, in conjunction with sampling until levels meet this criteria.
- .7 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in accordance with the applicable requirements. Ensure that each asbestos waste containers transported to the landfill is accompanied by Contractor's representative to ensure that the burial is done in accordance with governing regulations.

3.5 Air Monitoring

- .1 From beginning of Work until completion of cleaning operations, the Departmental Representative is to collect air samples on daily basis outside of work area enclosure in accordance with Health Canada recommendations.
 - .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial/Territorial Occupational Health and Safety Regulations.
- .2 Use results of air monitoring inside work area to establish type of respirators to be used. Workers may be required to wear sample pumps for up to full-shift periods.
 - .1 If fibre levels are above safety protection factor of respirators in use, stop abatement, apply means of dust suppression, and use higher safety protection factor in respiratory protection for persons inside enclosure.
 - .2 If air monitoring shows that areas outside work area enclosures are contaminated, enclose, maintain and clean these areas, in same manner as that applicable to work areas.
- .3 During course of Work, the Departmental Representative is to measure fibre content of air outside work areas by means air samples analyzed by PCM.
- .4 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.
- .5 Final air monitoring to be conducted as follows: After Asbestos Work Area has passed visual inspection and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period has passed, the Departmental Representative will perform air monitoring within Asbestos Work Area by aggressive methods.
 - .1 Final air monitoring results must show fibre levels of less than 0.01 f/cc.
 - .2 If air monitoring results show fibre levels in excess of 0.01 f/cc, re-clean work area and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until fibre levels are less than 0.01 f/cc.

3.6 Inspection

- .1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviations from these requirements that have not been approved in writing by Departmental Representative may result in Work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect Work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

- .3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur Departmental Representative may order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

PART 1 - GENERAL

1.1 Description

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead-containing coatings with a chemical gel or paste, or with non-powered hand tools (other than manual scraping and sanding) as deemed feasible by the Contractor and as approved by the Departmental Representative
 - .2 These materials are identified on Drawings C04-C08 and Appendix C and D.

1.2 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT).
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 41 23 – Debris and Miscellaneous Removals.
- .8 Section 02 81 01 – Hazardous Materials.
- .9 Section 02 83 11 – Lead-Base Paint Abatement – Intermediate Precautions.
- .10 Section 02 83 12 – Lead-Base Paint Abatement – Maximum Precautions.

1.3 References

- .1 Department of Justice Canada.
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Government of Nunavut.
 - .1 Environmental Guideline for Waste Lead and Lead Paint (2011).
- .3 Health Canada.
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Human Resources and Social Development Canada (HRSDC).
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .5 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 U.S. Environmental Protection Agency (EPA).
 - .1 EPA 747-R-95-007-(1995), Sampling House Dust for Lead.
- .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH).
 - .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).

- .8 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances.

- .1 Lead in Construction Regulation - 29 CFR 1926.62-2007.

- .9 Underwriters' Laboratories of Canada (ULC).

1.4 Definitions

- .1 Authorized Visitors: Departmental Representative or designated representatives.
- .2 Competent person: Departmental Representative capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.
- .3 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .4 Action level: Employee exposure, without regard to use of respirators, to airborne concentration of lead of 50 micrograms per cubic meter of air (50 ug/m³) calculated as 8-hour time-weighted average (TWA). Minimum precautions for lead abatement are based on airborne lead concentrations less than 0.05 milligrams per cubic meter of air for removal of lead based paint by methods noted in paragraph 1.1.
- .5 Lead dust: Dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot when wipe sampling on vertical surfaces and/or horizontal surfaces.
- .6 Occupied Area: Areas of building or work site that is outside Work Area.
- .7 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects over cuts and tears, and elsewhere as required to provide protection and isolation. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.
- .8 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

1.5 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of Authority Having Jurisdiction.
- .3 Provide proof of Contractor's General and Environmental Liability Insurance.
- .4 Quality Control:
 - .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that lead based paint waste has been received and properly disposed.
 - .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, and aspects of work procedures and protective measures.

1.6 Quality Assurance

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead paint, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

- .2 Health and Safety:
 - .1 Perform construction occupational health and safety in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers and visitors in Work area include:
 - .1 Respirator NIOSH approved and equipped with replaceable HEPA filter cartridges with an assigned protection factor of ten (10) and acceptable to Authority Having Jurisdiction. Suitable for type of lead and level of lead dust exposure. Provide sufficient amount of filters.
 - .2 Half mask respirator: half-mask particulate respirator with N, R or P - series filter, and 100% efficiency could be provided.
 - .2 Eating, drinking, chewing, and smoking are not permitted in work area.
 - .3 Ensure workers wash hands and face when leaving work area.
 - .4 Visitor Protection:
 - .1 Provide approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

1.7 Waste Management and Disposal

- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations and guidelines.
- .2 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.
- .3 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 Existing Conditions

- .1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection within the Remedial Action Plan, EBA 2013.
- .2 Notify Departmental Representative of suspect lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 Scheduling

- .1 Not later than two (2) days before beginning Work on this Project notify following in writing:
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
 - .2 Provincial Ministry of Labour.
 - .3 Disposal Authority.
- .2 Inform sub trades presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.

1.10 Owner's Instructions

- .1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.

- .2 Instruction and training related to respirators includes, at minimum:
 - .1 Proper fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.
- .4 Supervisory personnel to complete required training.

1.11 Measurement For Payment

- .1 The abatement, separation, packaging, transport and disposal of lead based paint from buildings and structures to be demolished and debris areas are included in the price for demolition of the structures as described in Section 02 41 16 - Structure Demolition and in Section 02 81 01 – Hazardous Materials including, but not limited to the following:
 - .1 Supply of all materials, labour, and equipment necessary to perform the work in accordance with these specifications, including the supply and transport to the site of lead waste containers.
 - .2 Construction of temporary enclosures and drop sheets when necessary.
 - .3 Handling, separation and disposal of lead based painted materials from other debris and miscellaneous materials.
 - .4 Preparation of lead based paint waste inventory.
 - .5 Transport and off-site disposal of lead based paint waste and on-site landfilling of the unpainted substrate.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Polyethylene 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .3 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual lead paint residue.
- .4 Lead waste containers: metal or fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
 - .1 Label containers with pre-printed cautionary warning Lead clearly visible (in English and Inuktitut) when ready for removal to disposal site.

PART 3 - EXECUTION

3.1 Supervision

- .1 One Supervisor for every ten workers is required.
- .2 Supervisor must remain within work area during disturbance, removal, or handling of lead based paints.

3.2 Preparation

- .1 Work Area:
 - .1 Pre-clean fixed casework and equipment within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.
 - .2 Clean work area using HEPA vacuum. If not practicable, use wet cleaning method. Do not raise airborne dust level.
 - .3 Seal off openings with polyethylene sheeting and seal with tape.
 - .4 Protect floor surfaces covered from wall to wall with polyethylene sheets.
 - .5 Maintain emergency fire exits or establish alternatives satisfactory to Authority Having Jurisdiction.
 - .6 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized for application of water as required.
 - .7 Provide 24 volt safety lighting and ground fault interrupter (GFI) circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.
- .2 Do not start work until:
 - .1 Arrangements have been made for disposal of waste.
 - .2 Tools, equipment, and materials waste containers are on site.
 - .3 Arrangements have been made for building security.
 - .4 Notifications have been completed and preparatory steps have been taken.

3.3 Lead Abatement

- .1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; or removal equipped with HEPA filters; or removal with using non-powered hand tool, other than manual scraping and sanding.
- .2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean entire work area, and equipment used in process. After inspection by Departmental Representative, apply continuous coat of slow drying sealer to surfaces of work area. Do not disturb work area for eight (8) hours (no entry), activity, ventilation, or disturbance during this period.

3.4 Inspection

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
 - .1 Adherence to specific procedures and materials.

- .2 Final cleanliness and completion.
- .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 Lead Surface Sampling - Work Areas

- .1 Final lead surface sampling to be conducted as follows:
 - .1 After work area has passed a visual inspection for cleanliness approved and accepted by Departmental Representative. Apply coat of lock-down agent to surfaces within enclosure, and appropriate setting period of eight (8) hours has passed, Departmental Representative will perform lead wipe sampling.
 - .1 Final lead wipe sampling results from horizontal and vertical surfaces must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples collected and analyzed in accordance with EPA 747-R-95-007.
 - .2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 Final Cleanup

- .1 Following cleaning and when lead wipe surfaces sampling are below acceptable concentrations, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

PART 1 - GENERAL

1.1 Summary

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead based paint from the D-6 Caterpillar (20 m³) within Building 5, APEC 18 with a chemical gel or paste, scraping, sanding or sand blasting using non-powered hand tools, as deemed feasible by the Contractor and as approved by the Departmental Representative.
 - .2 Manual demolition of the following lead-painted plaster walls or building components by striking wall with sledgehammer or similar tool: Asbestos panels (7 m³), asbestos ceiling tile (10 m³), wood (3 m³), and particulate board (12 m³) in Building 1, APEC 14 (that may occur if asbestos abatement maximum precautions are in place) or any other lead painted materials on site that will be manually demolished, as deemed feasible by the Departmental Representative and the contractor.
 - .3 These materials are identified on Drawings C04-C08 and Appendix C and D.

1.2 Section Includes

- .1 Requirements and procedures for abatement of lead based paints.

1.3 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT).
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 41 23 – Debris and Miscellaneous Removals.
- .8 Section 02 81 01 – Hazardous Materials.
- .9 Section 02 83 10 – Lead-Base Paint Abatement – Minimum Precautions.
- .10 Section 02 83 12 – Lead-Base Paint Abatement – Maximum Precautions.

1.4 References

- .1 Department of Justice Canada.
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Government of Nunavut.
 - .1 Environmental Guideline for Waste Lead and Lead Paint (2011).
- .3 Health Canada.
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Human Resources and Social Development Canada (HRSDC).
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.

- .5 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 U.S. Environmental Protection Agency (EPA).
 - .1 EPA 747-R-95-007-(1995), Sampling House Dust for Lead.
- .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH).
 - .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
- .8 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances.
 - .1 Lead in Construction Regulation - 29 CFR 1926.62-2007.
- .9 Underwriters' Laboratories of Canada (ULC).

1.5 Definitions

- .1 Action level: Employee exposure, without regard to usage of respirators, to an airborne concentration of lead of 50 micrograms per cubic metre of air calculated as an eight (8) hour time-weighted average (TWA). Maximum precautions for lead abatement are based on airborne lead concentrations greater than 1.25 milligrams per cubic meter of air within Work Area.
- .2 Airlock: Ingress or egress system, without permitting air movement between contaminated area and uncontaminated area. Consisting of two (2) curtained doorways at least 2 metres apart.
- .3 Authorized Visitors: Departmental Representative or designated representatives.
- .4 Competent person: Departmental Representative capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.
- .5 Curtained doorway: Arrangement of closures to allow ingress and egress from one room to another. Typically constructed as follows:
 - .1 Place two (2) overlapping polyethylene sheets over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one sheet along one vertical side of doorway, and secure other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings 1.5 m on each side.
- .6 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .7 Lead dust: Dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot by wipe sampling on vertical surfaces and/or horizontal surfaces.
- .8 Occupied Area: Areas of building or work site that is outside Work Area and non-protected workers are present.
- .9 Polyethylene: Polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects over cuts and tears, and elsewhere as required to provide protection and isolation. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.

- .10 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

1.6 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of Authority Having Jurisdiction.
- .3 Provide: Provincial, Territorial and local requirements for Notice of Project Form.
- .4 Provide proof of Contractor's General and Environmental Liability Insurance.
- .5 Quality Control:
 - .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that it has been received and properly disposed.
 - .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
 - .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two (2) days duration, approved by Departmental Representative. Minimum of one (1) supervisor for every ten (10) workers.
- .6 Product data:
 - .1 Provide documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 Encapsulants.
 - .2 Amended water.
 - .3 Slow drying sealer.

1.7 Quality Assurance

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead paint, in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Perform construction occupational health and safety in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers and visitors in Work Area includes:
 - .1 Respirator NIOSH approved and equipped with filter cartridges with assigned protection factor of fifty (50), acceptable to Authority Having Jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Provide sufficient filters so workers can install new filters following disposal of used filters and before re-entering contaminated areas.
 - .2 Disposable type protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

- .2 Requirements for workers:
 - .1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clean disposable coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
 - .2 Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in Work Area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from Work Area or from Equipment and Access Room.
 - .3 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not to use this system as means to leave or enter work area. Doorways of transfer room are to remain sealed except when transfer of waste is occurring.
- .3 Eating, drinking, chewing, and smoking are not permitted in Work Area.
- .4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead abatement.
- .5 Ensure workers wash hands, face and respirator when leaving Work Area.
- .6 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in three official languages (English, French and Inuktitut).
- .7 Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.
- .8 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors for Work Areas.
 - .2 Instruct Authorized Visitors in use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work Area.

1.8 Waste Management and Disposal

- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .2 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.
- .3 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.9 Existing Conditions

- .1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection within the Remedial Action Plan, EBA 2013.
- .2 Notify Departmental Representative of suspect lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.10 Scheduling

- .1 Not later than two (2) days before beginning Work on this Project notify the following in writing, where appropriate:
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
 - .2 Provincial Ministry of Labour.
 - .3 Disposal Authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.

1.11 Measurement For Payment

- .1 The abatement, separation, packaging, transport and disposal of lead based paint from buildings and structures to be demolished and debris areas are included in the price for demolition of the structures as described in Section 02 41 16 - Structure Demolition and in Section 02 81 01 – Hazardous Materials including, but not limited to the following:
 - .1 Supply of all materials, labour, and equipment necessary to perform the work in accordance with these specifications, including the supply and transport to the site of lead waste containers.
 - .2 Construction of temporary enclosures and drop sheets when necessary.
 - .3 Handling, separation and disposal of lead based painted materials from other debris and miscellaneous materials.
 - .4 Preparation of lead based paint waste inventory.
 - .5 Transport and off-site disposal of lead based paint waste and on-site landfilling of the unpainted substrate.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Polyethylene: 0.15 mm unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: 0.15 mm woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least eight (8) hours and designed for trapping residual lead paint residue.

- .5 Lead waste containers: metal or fibre type acceptable to landfill operator with tightly fitting covers and 0.15 mm sealable polyethylene liners.
- .1 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible (in English and Inuktitut) when ready for removal to disposal site.

PART 3 - EXECUTION

3.1 Supervision

- .1 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead based paints.

3.2 Preparation

- .1 Remove and wrap items to be salvaged or reused, and transport and store in area specified by Departmental Representative.
- .2 Work Area:
 - .1 Pre-clean fixed casework, and equipment within work areas, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
 - .2 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise air borne dust levels, such as dry sweeping, or vacuuming using other than HEPA vacuum.
 - .3 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .4 Cover floor surfaces in work area from wall to wall with FR polyethylene drop sheets to protect existing floor during removal.
 - .5 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.
 - .6 At point of access to work areas install warning signs in three official languages (English, French and Inuktitut) in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used:
 - .1 CAUTION LEAD HAZARD AREA (25 mm).
 - .2 NO UNAUTHORIZED ENTRY (19 mm).
 - .3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm).
 - .4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).
 - .7 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority Having Jurisdiction.
 - .8 Where water application is required for wetting lead containing materials, provide temporary water supply by use of appropriately sized hoses for application of water as required.
 - .9 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter (GFI) circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.
- .3 Worker Decontamination Enclosure System:
 - .1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:

- .1 Equipment and Access Room: construct between exit and work areas, with two curtained doorways, one to the clean area of the enclosure, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change comfortably.
- .2 Clean Room: construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
- .4 Construction of Decontamination Enclosures:
 - .1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two layers of FR polyethylene on floor.
 - .2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.
- .5 Separation of Work Areas from Occupied Areas
 - .1 Barriers between Work Area and occupied area to be constructed as follows:
 - .1 Construct floor to ceiling wood or metal stud framing, cover with polyethylene sheeting and seal with duct tape. Apply plywood over polyethylene sheeting. Seal plywood joints and between adjacent materials with surface film forming sealer, to create airtight barrier.
 - .2 Cover plywood with polyethylene sheeting and sealed with duct tape.
- .6 Maintenance of Enclosures:
 - .1 Maintain enclosures in clean condition.
 - .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
 - .3 Visually inspect enclosures at beginning of each work day.
 - .4 Use smoke test method to test effectiveness of barriers as directed by Departmental Representative.

3.3 Lead-Base Paint Abatement

- .1 Removal of lead based paint to be performed by scraping or sanding using non-powered hand tools, or manual demolition of lead-painted plaster walls or building components by striking a wall with sledgehammer or similar tool.
- .2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean work area including

equipment and access room, and equipment used in process. After inspection by Departmental Representative, apply continuous coat of slow drying sealer to surfaces. Do not disturb work for eight (8) hours with no entry, activity, ventilation or disturbance during this period.

- .6 After enclosing lead painted surfaces, wet clean work area and equipment and access room. During settling period no entry, activity, or ventilation will be permitted.

3.4 Inspection

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When lead dust leakage from Work Area occurs Departmental Representative may order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 Lead Surface Sampling - Work Areas

- .1 Final lead surface sampling to be conducted as follows:
 - .1 After Work Area has passed a visual inspection for cleanliness approved by Departmental Representative and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of eight (8) hours has passed. Departmental Representative will perform lead wipe sampling in Work Area.
 - .1 Final lead wipe sampling results from horizontal and vertical surfaces where lead based paints have been removed must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples must be collected and analyzed in accordance with EPA 747-R-95-007.
 - .2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 Final Cleanup

- .1 Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
- .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Clean-up Work Areas, Equipment and Access Room, and other contaminated enclosures.

- .5 Clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

PART 1 - GENERAL

1.1 Description

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead based paint from Concrete supports (1 m³) in APEC 13; basement concrete (5 m³) in Building 1, APEC 14; concrete floor (4 m³) in Building 2, APEC 15 as deemed feasible by the Departmental Representative and the contractor, using power tools with an effective dust collection system equipped with HEPA filter. The volumes of concrete are the stripped exterior of the concrete.
 - .2 Abrasive blasting of PCB and lead based paint on generators (2 m³) in Building 2, APEC 15 and generator parts (1 m³) in Building 5, APEC 18. Abrasive blasting of lead based orange paint on concrete mixer (0.5 m³) adjacent to Building 8, APEC 21. Abrasive blasting will occur on these materials and other materials to the discretion and feasibility according to the Departmental Representative and the contractor.
 - .3 Removal of lead-containing dust using air mist extraction system.
 - .4 These materials are identified on Drawings C04-C08 and Appendix C and D.

1.2 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT).
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 41 23 – Debris and Miscellaneous Removals.
- .8 Section 02 81 01 – Hazardous Materials.
- .9 Section 02 83 10 – Lead-Base Paint Abatement Minimum Precautions.
- .10 Section 02 83 11 – Lead-Base Paint Abatement Intermediate Precautions.

1.3 References

- .1 Department of Justice Canada.
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Government of Nunavut.
 - .1 Environmental Guideline for Waste Lead and Lead Paint (2011).
- .3 Health Canada.
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Human Resources and Social Development Canada (HRSDC).
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .5 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

- .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).
- .6 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007-(1995), Sampling House Dust for Lead.
- .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH).
 - .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
- .8 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances.
 - .1 Lead in Construction Regulation - 29 CFR 1926.62-2007.
- .9 Underwriters' Laboratories of Canada (ULC).

1.4 Definitions

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Authorized Visitors: Departmental Representative or designated representatives of regulatory agencies.
- .3 Occupied Area: Area of building or work site outside Work Area where non-protected workers are present.
- .4 Dioctyl Phthalate (DOP) Test: Testing method used to evaluate particle penetration and air flow resistance properties of filtration materials - HEPA filter leak test.
- .5 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Appropriate capacity for scope of work.
- .6 Airlock: Ingress or egress system without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 2 m apart.
- .7 Curtained doorway: Arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
 - .1 Place two (2) overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings 1.5 m on each side.
- .8 Competent person: Departmental Representative capable of identifying existing lead hazards in workplace and taking corrective measures to eliminate them.
- .9 Lead in Dust: Dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot if wipe sampling on the vertical and/or horizontal surfaces.
- .10 Negative Air Pressure Machine: Extracts air directly from work area and filters extracted air through a HEPA filter, discharge air to exterior of building.
 - .1 Maintain pressure differential of 5 to 7 Pa relative to adjacent areas outside of work areas. Machine to be equipped with alarm to warn of system breakdown, and equipped with instrument to continuously monitor and automatically record pressure differences.

1.5 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of Authority Having Jurisdiction.
- .3 Provide Territorial requirements for Notice of Project Form.
- .4 Provide proof of Contractor's General and Environmental Liability Insurance.
- .5 Quality Control:
 - .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof it has been received and properly disposed.
 - .2 Provide proof satisfactory to Departmental Representative that employees had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
 - .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two days duration, approved by Departmental Representative. Minimum of one (1) supervisor for every ten (10) workers.
- .6 Product data:
 - .1 Provide documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 Encapsulants.
 - .2 Amended water.
 - .3 Slow drying sealer.

1.6 Quality Assurance

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead, in case of conflict among those requirements or with these specifications the more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Require construction work to be in compliance with the occupational health and safety regulations in Section 01 35 32 – Site Specific Health and Safety Plan.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Lead Work Area includes:
 - .1 Lead paint removal using power tool: respirator NIOSH approved and equipped with filter cartridges with assigned protection factor of 50, acceptable to Authority Having Jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Provide sufficient filters so workers can install new filters following disposal of used filters and before re-entering contaminated areas.
 - .2 Abrasive blasting of lead paint: NIOSH approved and equipped with filter cartridges with assigned protection factor of 1000 and acceptable to Authority Having Jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Respirator to be equivalent Type CE abrasive blast supplied air respirator operated in a pressure demand or positive pressure mode with a tight-fitting full-face-piece. Compressed air used to supply supplied

- air respirators to meet breathing air purity requirements of CAN/CSA-Z180.1. Where an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm to be provided.
- .3 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.
- .2 Requirements for workers:
- .1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clean coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
- .2 Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.
- .3 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter Work Area.
- .3 Eating, drinking, chewing, and smoking are not permitted in Work Area.
- .4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead abatement.
- .5 Ensure workers wash hands and face when leaving Work Area.
- .6 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section in three official languages (English, French and Inuktitut).
- .7 Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.
- .8 Visitor Protection:
- .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
- .2 Instruct Authorized Visitors in use of protective clothing, respirators and procedures.
- .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work Area.

1.7 Waste Management and Disposal

- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .2 Disposal of lead waste generated by removal activities must comply with Federal, Territorial, Provincial and Municipal regulations and guidelines. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

- .3 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for disposal.

1.8 Existing Conditions

- .1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection within the Remedial Action Plan, EBA 2013.
- .2 Notify Departmental Representative of suspect lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 Scheduling

- .1 No later than two (2) days before beginning Work on this Project notify the following in writing; where appropriate.
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
 - .2 Provincial Ministry of Labour.
 - .3 Disposal Authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.

1.10 Measurement For Payment

- .1 The abatement, separation, packaging, transport and disposal of lead based paint from buildings and structures to be demolished and debris areas are included in the price for demolition of the structures as described in Section 02 41 16 - Structure Demolition and in Section 02 81 01 – Hazardous Materials including, but not limited to the following:
 - .1 Supply of all materials, labour, and equipment necessary to perform the work in accordance with these specifications, including the supply and transport to the site of lead waste containers.
 - .2 Construction of temporary enclosures and drop sheets when necessary.
 - .3 Handling, separation and disposal of lead based painted materials from other debris and miscellaneous materials.
 - .4 Preparation of lead base paint waste inventory.
 - .5 Transport and off-site disposal of lead based paint waste and on-site landfilling of the unpainted substrate.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Polyethylene 0.15 mm unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: 0.15 mm woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.

- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least eight (8) hours and designed for trapping residual lead paint residue.
- .5 Lead waste containers: metal or fibre type acceptable to landfill operator with tightly fitting covers and 0.15 mm sealable polyethylene liners.
 - .1 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

PART 3 - EXECUTION

3.1 Supervision

- .1 Approved Supervisor must remain within Work Area during disturbance, removal, or handling of lead-based paints.

3.2 Preparation

- .1 Remove and wrap items to be salvaged or reused, and transport and store in area specified by Departmental Representative.
- .2 Work Area:
 - .1 Pre-clean fixed casework, and equipment within work areas, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
 - .2 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise airborne dust levels, such as dry sweeping, or vacuuming using other than HEPA vacuum.
 - .3 Install negative pressure machine system and operate continuously from installation of polyethylene sheeting until completion of final cleanup. Provide automatic continuous monitoring and recording instrument of pressure difference.
 - .4 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .5 Cover floor surfaces in work area from wall to wall with FR polyethylene drop sheets to protect existing floor during removal.
 - .6 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.
 - .7 At point of access to work areas install warning signs in three official languages (English, French and Inuktitut) in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used:
 - .1 CAUTION LEAD HAZARD AREA (25 mm).
 - .2 NO UNAUTHORIZED ENTRY (19 mm)
 - .3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm).
 - .4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).
 - .8 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority Having Jurisdiction.
 - .9 Where water application is required for wetting lead containing materials, provide temporary water supply by use of appropriately sized hoses for application of water as required.
 - .10 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter (GFI) circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

- .3 Worker Decontamination Enclosure System:
 - .1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:
 - .1 Equipment and Access Room: construct between exit and work areas, with two (2) double curtained doorways, one to the clean side of the enclosure, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one (1) worker allowing sufficient space to change comfortably.
 - .2 Clean Room: construct with double curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
- .4 Construction of Decontamination Enclosures:
 - .1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two (2) layers of FR polyethylene on floor.
 - .2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closure comprising doorway always remains closed.
 - .3 Shower room in decontamination facility to be provided with the following:
 - .1 Hot and cold water or water of constant temperature not less than 40 degrees Celsius or more than 50 degrees Celsius.
 - .2 Individual controls inside to regulate water flow and temperature.
 - .4 Prior to each shift in which a decontamination facility is being used, a competent person should inspect the facility to ensure that there are no defects that would allow lead-containing dust to escape. Defects should be repaired before the facility is used. The decontamination facility should be maintained in a clean and sanitary condition.
- .5 Separation of Work Areas from Occupied Areas:
 - .1 Barriers between Work Area and occupied area to be constructed as follows:
 - .1 Construct floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting and seal with duct tape. Apply plywood over polyethylene sheeting. Seal plywood joints and between adjacent materials with surface film forming sealer, to create airtight barrier.
 - .2 Cover plywood with polyethylene sheeting and seal with duct tape.
- .6 Maintenance of Enclosures:
 - .1 Maintain enclosures in tidy condition.
 - .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
 - .3 Visually inspect enclosures at beginning of each working day.
 - .4 Use smoke test method to test effectiveness of barriers as directed by Departmental Representative.

3.3 Lead-Base Paint Abatement

- .1 Removal of lead based paint to be performed using power tools that are attached to dust-collecting vacuums with HEPA filters.
- .2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.

- .3 Wet method to be used to reduce dust generation. Examples of wet methods include wetting surfaces, wet scraping, and wet shovelling. Wet method is not to be used if it creates a hazard or cause damage to equipment or to project. Power tools to be equipped with a shroud, and to be kept flush with surface.
- .4 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove immediately from working area to staging area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls. Curtain doorways are to remain sealed on all four sides when transfer of waste is not occurring.
- .5 After completion of stripping work, wire brush and wet sponge surface to remove visible material. During this work keep surfaces wet. After wire brushing and wet sponging, wet clean and HEPA vacuum entire work area including Equipment and Access Room. Compressed air or dry sweeping not be used to clean up lead-containing dust or waste. After inspection and approval by Departmental Representative apply continuous coat of slow drying sealer to surfaces. Do not disturb work area for eight (8) hours, no entry, activity, or ventilation other than operation negative air machine during this period.
- .6 After enclosing lead painted surfaces, wet clean work area and equipment and access room. During settling period no entry, activity, or ventilation will be permitted.

3.4 Inspection

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from requirements not been approved in writing by Departmental Representative will result in Work shutdown, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed for additional labour or materials required to provide specified performance level.
- .3 When lead dust leakage from Work Area occurs Departmental Representative will order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 Lead Surface Sampling - Work Areas

- .1 Final lead surface sampling conducted as follows:
 - .1 After Work Area has passed a visual inspection for cleanliness approved by Departmental Representative and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of eight (8) hours has passed, Departmental Representative will perform lead wipe sampling in Work Area.
 - .1 Final lead wipe sampling results from horizontal and vertical surfaces must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples collected and analyzed in accordance with EPA 747-R-95-007.
 - .2 If wipe sampling results show levels of lead dust in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until lead dust levels are less than 40 micrograms per square foot.

3.6 Final Cleanup

- .1 Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Clean-up Work areas, Equipment and Access Room, and other contaminated enclosures.
- .5 Remove sealed waste containers and equipment used in Work and remove from work areas at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure no dust or debris remain on surfaces as result of dismantling operations.

PART 1 - GENERAL

1.1 Description

- .1 Procedures and materials required for the safe handling, management and storage of polychlorinated biphenyl (PCB) material as specified on Drawings C04-C08, Appendix C and at the following locations:
 - .1 PCB light ballasts and electrical equipment: Building 1, APEC 14 (0.21 m³); Building 2, APEC 15 (0.14 m³) and Building 7, APEC 20 (0.5 m³).
 - .2 Painted materials: Wood, plastic, equipment and metal in Building 2, APEC 15 (7 m³) and equipment in Building 5, APEC 18 (1 m³).

1.2 Related Sections

- .1 Section 01 32 18 – Construction Progress Schedules - Bar (GANTT).
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 01 35 15 – Special Project Procedures for Contaminated Sites.
- .4 Section 01 35 32 – Site Specific Health and Safety Plan.
- .5 Section 01 35 43 – Environmental Procedures.
- .6 Section 02 41 16 – Structure Demolition.
- .7 Section 02 41 23 – Debris and Miscellaneous Removals.
- .8 Section 02 81 01 – Hazardous Materials.

1.3 References

- .1 American Board of Industrial Hygiene (ABIH).
- .2 Canadian Council of Ministers of the Environment (CCME).
 - .1 PN1205-1995, PCB Transformer Decontamination: Standards and Protocols.
- .3 Department of Justice Canada (DOJ)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
 - .2 Federal Mobile PCB Treatment and Destruction Regulations (SOR/90-5).
 - .3 PCB Regulations (SOR/2008-273).
 - .4 Regulations Amending the PCB Regulations (SOR/2010-57).
 - .5 PCB Waste Export Regulations (SOR/97-109).
 - .6 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
 - .7 Mobile PCB Destruction Facilities, RRO 1990, Reg 352.
- .4 Environment Canada.
 - .1 Manual for Spills of Hazardous Materials 1984.
 - .2 Identification of Light Ballasts Containing PCBs, EPS C/22/C (1991 revised).
- .5 Saskatchewan: Consolidated Statutes of Saskatchewan/Environmental Management and Protection Act 2002.
 - .1 The PCB Waste Storage Regulations 21/89, R.R.S., c. E-10.2.

- .6 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
 - .2 Transportation of Dangerous Goods Regulations (SOR/2012-245).

1.4 Definitions

- .1 Authorized visitors: Engineers, or designated representatives, and representatives of regulatory agencies.
- .2 Contractor's Site Superintendent: Contractor's resident site representative, who is authorized to make decisions on behalf of Contractor.

1.5 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to starting work, Contractor performing work of this section to provide:
 - .1 Workplace Safety and Insurance Board Clearance Certificate.
 - .2 Insurance certificates.
 - .3 Site Specific Health and Safety Plan.
 - .4 Certificate of Approval for Transportation of PCB Waste and Location of Destruction Facility.
 - .5 WHMIS Training Certificates for Personnel.
 - .6 Material Safety Data Sheets for chemicals or material to be used.
- .3 Submittals to Local Fire Department and Departmental Representative.
 - .1 Two (2) copies of books and records listed under Record Keeping of Control Submittals Article in PART 1 of this Section.
- .4 Waste location and description in a PCB Management Plan that includes, but is not limited to:
 - .1 Building in which PCB waste is stored.
 - .2 Size of property used for storage site.
 - .3 Precise location of PCB waste at storage site.
 - .4 Container storage method used.
 - .5 Spill containment features in place at storage site.
 - .6 Security measures in place at storage site.

1.6 Control Submittals

- .1 Co-ordinate procedural requirements with Section 01 45 00 - Quality Control.
- .2 Record keeping: maintain and make available for review by Departmental Representative.
 - .1 Receipt of waste showing:
 - .1 Date of receipt of waste.
 - .2 Description of PCB waste including nameplate description, serial number, PCB registration number and quantity.
 - .3 Condition of PCB waste.
 - .4 Source of PCB waste.
 - .5 Name of carrier of PCB waste.
 - .6 Name of individual who accepted receipt of PCB waste.

- .2 Removal of waste showing:
 - .1 Date of removal of PCB waste.
 - .2 Description of PCB waste including nameplate description, serial number, PCB registration number and quantity.
 - .3 Condition of PCB waste.
 - .4 Name of carrier of PCB waste.
 - .5 Destination of PCB waste.
 - .6 Name of individual authorizing transport of PCB waste.
- .3 Monthly inspection, repair and replacement reports.
- .4 Submit records to Departmental Representative.

1.7 Quality Assurance

- .1 Co-ordinate with Section 01 45 00 - Quality Control.
- .2 Instruct personnel on dangers of PCB exposure, respirator use, decontamination and applicable Federal, Provincial/Territorial and Municipal Regulations.
- .3 Obtain services of industrial hygienist certified by American Board of Industrial Hygiene to certify training, review and approve PCB removal plan, including determination of need for personnel protective equipment (PPE) in performing PCB removal work.
- .4 Complete work so that at no time do PCBs contaminate the buildings, the site and the environment.

1.8 Supervision

- .1 Provide on-site, a supervisor, with authority to oversee health and safety, remediation methods, scheduling, labour and equipment requirements.
- .2 One (1) supervisor for every ten (10) workers is required.

1.9 Delivery, Storage and Handling

- .1 Place materials defined as hazardous or toxic in designated containers.
- .2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations and guidelines.
- .3 Owners or operators of storage sites.
 - .1 Provide method for determining concentration of PCBs in particular materials at request of environment officer or inspector or Departmental Representative.
 - .2 Ensure personnel are familiar with and understand current PCB waste management procedures and use of personal protection equipment and clean up techniques.
- .4 Disposal of PCB waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations.
 - .1 Dispose of PCB waste in leak proof drums.
 - .2 Containers must be labelled with appropriate warning labels.
- .5 Create manifests describing and listing waste created and transport containers by approved means to licenced facility for storage.
 - .1 For each bulk load of PCBs: identify PCB waste, earliest date of removal from service for disposal, and weight in kilograms of the PCB waste.

- .2 For each PCB Article Container or PCB Container: unique identifying number, type of PCB waste (i.e., soil, debris, small capacitors), earliest date of removal from service for disposal, and weight in kilograms of PCB waste contained.
- .3 For each PCB Article not in PCB Container or PCB Article Container: serial number if available, or other identification if there is no serial number, date of removal from service for disposal, and weight in kilograms of PCB waste in each PCB Article.

1.5 Measurement For Payment

- .1 The abatement, separation, packaging, transport and disposal of PCBs from buildings and structures to be demolished and debris areas are included in the price for demolition of the structures as described in Section 02 41 16 - Structure Demolition and in Section 02 81 01 – Hazardous Materials including, but not limited to the following:
 - .1 Supply of all materials, labour, and equipment necessary to perform the work in accordance with these specifications, including the supply and transport to the site of PCB containers.
 - .2 Construction of temporary enclosures and drop sheets when necessary.
 - .3 Handling, separation and disposal of PCB materials from other debris and miscellaneous materials.
 - .4 Preparation of PCB inventory.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Storage General

- .1 Storage of PCB materials in accordance with CEPA SOR/92-507 and Authority Having Jurisdiction.

2.2 Storage Enclosure

- .1 Isolate PCB control area by physical boundaries to prevent unauthorized entry of personnel.
- .2 Food, drink and smoking materials are not permitted in areas where PCBs are handled or PCB items are stored.
- .3 Room, building or structure to be equipped with lockable entrance.
- .4 Temporary storage facility to be a fully enclosed room within building with appropriate warning signs in both English and Inuktitut.
- .5 Woven mesh wire fence or other fence with similar characteristics at least 2.5metres high, with lockable entrance.
- .6 Smoking is not permitted within 15 metres of PCB control area.
 - .1 Provide and post "No Smoking" signs as directed by Departmental Representative.

2.3 Storage Containers

- .1 Exterior containers:

- .1 Structurally-sound and weather-sealed to hold PCB solids, PCB light ballasts, drained PCB containers or drained PCB equipment.
- .2 PCB solid and liquid storage.
 - .1 Drums and containers:
 - .1 Designed with sufficient durability and strength to prevent PCB solid and liquid from being released into environment, affected by weather, or contaminated by external sources.
 - .2 Steel or other material approved by Departmental Representative.
 - .2 Drums:
 - .1 Capacity no greater than 205 litres.
 - .2 Steel of minimum 1.2 mm for solids 1.52 mm for liquids.
 - .3 Ensure removable steel lid securely attached and complete with PCB-resistant gasket for solids or closed-head double-bung steel drum.
 - .4 Paint or treat interior and exterior to prevent rusting.
 - .3 Drum Liners:
 - .1 6 mil clear polyethylene bag, 914 mm x 1524 mm, with opening at 914 mm end.

2.4 Emergency Response Equipment and Systems

- .1 Safety requirements in storage area:
 - .1 Fire extinguishers present within the area.
- .2 Storage site clean-up materials:
 - .1 Ensure availability at all time of sorbent or solvents, for clean-up of liquid or solids.
 - .2 Ensure availability at all times of inert absorbent in sufficient quantity to contain minor leakage.
 - .1 Place in bottom of each container holding PCB equipment or fluorescent lighting ballasts.
- .3 Respirators: Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
 - .1 Use approved full-face organic vapour cartridge respirator for exposure to hot PCB.
 - .2 Vapour concentration less than or equal to 5 mg/m³.
 - .1 Supplied-air respirator with full face piece, helmet or hood.
 - .2 Self-contained breathing apparatus with full face piece.
 - .3 Vapour concentration greater than 5 mg/m³ or unknown concentrations.
 - .1 Self-contained breathing apparatus with full face piece operated in positive pressure mode.
 - .2 Type C supplied-air respirator with full face piece operated in positive pressure of continuous flow mode and auxiliary self-contained breathing apparatus operated in positive pressure mode.

2.5 Warning Signs and Labels

- .1 Label containers with PCB materials as follows: "ATTENTION — contains 50 mg/kg or more of PCBs / contient 50 mg/kg ou plus de BPC" in black lettering on a white background, in a font size of no less than 36 points; measure at least 150 mm by 150 mm or at least 76 mm by 76 mm in the case of capacitors; and in the case of equipment for which an extension is applied for under section 17, state a unique identification number. They shall affix a label in a readily visible location on any product containing PCBs in a concentration of 50 mg/kg or

more and that are stored at the PCB storage site, which states "Date of Commencement of Storage / Date de début de stockage" and the date on which the storage begins.

- .2 Maintain signs and labels in clear and legible condition in English, French and Inuktitut.

PART 3 - EXECUTION

3.1 General

- .1 Perform construction occupational health and safety in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
- .2 Follow procedures set out in PART 2 – PRODUCTS.
- .3 Store PCB waste materials to CEPA (SOR/2008-273).
- .4 Select PCB removal procedure to minimize contamination of work areas with PCB or other PCB-contaminated debris/waste. Handle PCBs such that no skin contact occurs.
- .5 As feasible, do not carry out PCB handling operations in confined spaces. Confined space means space having limited means of egress and inadequate cross ventilation.
- .6 Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with Federal, Provincial/Territorial and Municipal Regulations and applicable requirements of this Section, including but not limited to:
 - .1 Obtaining advance approval of PCB storage sites.
 - .2 Notify Departmental Representative prior to beginning operations.
 - .3 Report leaks and spills to Departmental Representative.
 - .4 Maintain access log of employees working in PCB control area and provide copy to Departmental Representative upon completion of operations.
 - .5 Inspect PCB and PCB-contaminated items and waste containers for leaks and forward copies of inspection reports to Departmental Representative.
 - .6 Maintain spill kit for emergency spills entitled "PCB Spill Kit" provide content list to Departmental Representative for approval.
 - .7 Maintain inspection, inventory and spill records.

3.2 Access To Storage Site

- .1 Keep entrance to site locked or guarded.
- .2 Maintain register at site containing name, address, telephone number and place of business of each person who enters, or is authorized to enter site.
- .3 Permit only authorized personnel to enter site.

3.3 Access To Stored Material

- .1 Store materials and equipment to permit easy access for inspection.

3.4 Storage Practices

- .1 Stack containers only if designed for stacking.
- .2 Stack liquid containers or drums no higher than two (2) containers.
- .3 Separate stacked drums from each other with pallets.
- .4 Store material to prevent it catching fire.
- .5 Store material to prevent it being released.

- .6 Store PCB material together, and away from other stored materials.
- .7 Exterior:
 - .1 Cover PCB liquid containers with waterproof roof or cover extending beyond sides of container.
 - .2 Elevate PCB waste containers and PCB equipment on pallets or other suitable devices to reduce corrosion.
 - .3 Store transformers on skids.
- .8 Interior:
 - .1 Place on skids or pallets PCB equipment and containers of PCB material not permanently secured to floor or surface.

3.5 Handling Liquid Chlorobiphenyl (54% Chlorine)

- .1 Use impervious clothing (nitrile), gloves, face shields 200 mm minimum and other appropriate protective clothing necessary to prevent skin contact. Do not use natural rubber, neoprene, or polyvinyl chloride (PVC).
- .2 Place contaminated clothing in closed containers for storage. Dispose of contaminated clothing in same manner as PCBs.
- .3 Ensure that contaminated non-pervious clothing is removed promptly and not reworn until cleaned.
- .4 Wear splash-proof safety goggles where liquid chlorobiphenyl (54% chlorine) may contact eyes.

3.6 Emergency Responses

- .1 General:
 - .1 Immediately report to Departmental Representative PCB spills on ground or in water, PCB spills in drip pans, or PCB leaks.
 - .2 Rope off area around edges of PCB leak or spill and post "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to drip pan or other container.
 - .3 Initiate clean-up of spills as soon as possible, but no later than forty-eight (48) hours of its discovery. If misting, elevated temperatures or open flames are present, or if spill is situated in confined space, notify Departmental Representative. Mop up liquid with rags or other conventional absorbent. Properly contained and dispose of spent absorbent as solid PCB materials.
 - .4 Workers to evacuate site. When leaving, shut down water in use. Only personnel trained in use of, and wearing self-contained breathing apparatus, will be allowed to re-enter site.
 - .5 Do not return to site until Departmental Representative and Ministry of the Environment representatives have declared the area safe for re-entry.
- .2 Spill, leak, and disposal procedures:
 - .1 Permit access to only those wearing protective equipment and clothing.
 - .2 Issue poison warnings.
 - .3 Call local fire department or PCB Emergency Response Team.
 - .4 Avoid contact and inhalation.
 - .5 Remove ignition sources.
 - .6 Ventilate areas of spill or leak.
 - .7 Stop or reduce discharge if possible without risk.
 - .8 Collect spilled material for reclamation.

- .9 Do not flush to sewer.
- .10 Use only inert sawdust /dry sand/earth absorbents as approved by Departmental Representative.
- .11 Wipe contaminated area with rags and kerosene/fuel oil/1,1,1 trichloroethane chloroethene VG solvent. Do not use acetone or toluene.
- .12 Notify environmental authorities to determine disposal and clean-up procedures.
- .3 Fire protection and emergency procedures plan for storage sites.
 - .1 Ensure most recent revision of plan is in effect.
 - .2 Develop plan in consultation with appropriate fire officials.
 - .3 Ensure employees authorized to enter PCB storage site are familiar with contents of fire protection and emergency procedures plan.
 - .4 Send one (1) copy to appropriate fire officials.
 - .5 Display one (1) copy at storage site in area accessible in fire or spill situation.
 - .6 Display one (1) copy at storage site owner's place of business.
- .4 Respirators:
 - .1 Use when chlorobiphenyl concentrations are above permissible exposure levels.
 - .2 Use when entering tanks or closed vessels.
 - .3 Use in emergency situations.
 - .4 0.5 milligram of chlorobiphenyl (54% chlorine) per cubic metre of air, averaged over 8 hours, 1.0 microgram of chlorobiphenyl (54% chlorine) per cubic metre of air up to 10 hours/day.
- .5 Fire protection:
 - .1 Wear totally encapsulated suit and self-contained breathing apparatus with full face piece operated in positive pressure mode

3.7 Sanitation

- .1 Promptly wash liquid-contaminated skin with soap or mild detergent and water.
- .2 Prohibit eating and smoking in areas where liquid chlorobiphenyl (54% chlorine) is handled, processed or stored.
- .3 Wash hands thoroughly with soap or mild detergent and water after handling liquid chlorobiphenyl (54% chlorine).

3.8 Transportation and Disposal

- .1 Furnish labour, materials, and equipment necessary to store, transport, and dispose of PCB contaminated material in accordance with Federal, Provincial/Territorial and Municipal requirements and guidelines.
- .2 Prepare and maintain waste shipment records and manifests as required.
- .3 Transport PCB contaminated soils in vehicles designed to carry PCB contaminated soils in accordance with Federal, Provincial/Territorial and Municipal requirements.
- .4 Transport PCB contaminated solid material, articles, or equipment in approved containers with removable heads in accordance with TDGA.
- .5 Store liquid PCBs in Specification approved containers in accordance with TDGA.
- .6 In addition to those requirements:
 - .1 Inspect and document vehicles and containers for proper operation and covering. Repair or replace damaged containers.
 - .2 Inspect vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

- .3 Perform and document decontamination procedures prior to leaving the site and again before leaving disposal site.
- .4 Shipping Documentation:
 - .1 Before transporting PCB materials, the Departmental Representative will sign and date the manifests.
 - .2 Provide copies of manifests to Departmental Representative.
 - .3 Ensure that manifest accompanies PCB waste at all times.
 - .4 Ensure transporter provides copy of manifest signed and dated by disposal facility.
- .5 Solvent Cleaning:
 - .1 Clean contaminated tools, and containers, after use by rinsing three (3) times with appropriate solvent or by wiping down three (3) times with solvent wetted rag. Suggested solvents are stoddard solvent or hexane.
- .7 Reports:
 - .1 Prepare and submit a remediation closeout report at completion of Work.

3.9 Field Quality Control

- .1 Owners or Operators of Storage Sites:
 - .1 At request of Departmental Representative, measure concentration of PCBs in accordance with CEPA PCB Regulations (SOR/2008-273, amended December 8, 2011).
 - .2 Inspect storage site weekly and repair or replace, if necessary, PCB equipment, floors, drains, drainage systems, waterproof roofs or barriers, fire prevention apparatus, personnel protection equipment, security fences and materials used for clean-up at site.
 - .3 Immediately contain, repair or replace drum, container or equipment found to be leaking PCBs. Report action taken to Departmental Representative.
 - .4 Immediately clean up contaminated area.
 - .5 Ensure controlled access to storage site to prevent entry by unauthorized persons.

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 31 22 13 – Rough Grading.
- .3 Section 31 23 33.1 – Excavating, Trenching, and Backfilling.

1.2 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D4791-99, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
 - .2 ASTM C136-01, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM C117-04, Standard Test Method for Materials Finer than 75 µm Sieve in Mineral Aggregates by Washing.

1.3 Samples

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Aggregate will be subject to sampling by Departmental Representative during production, at the source and/or at the place of work. The aggregate is to meet the required specifications, regardless of the place of sampling.
- .3 Provide Departmental Representative with access to aggregate source and processed aggregate material for purpose of sampling and testing.
- .4 Samples are to be obtained according to industry accepted practices.

1.4 Description

- .1 This Section specifies general requirements for the processing of aggregates to be incorporated into the work as granular fill.
- .2 It is anticipated that there will be no requirement for crushing of granular materials to satisfy gradation specifications. There may be requirements to select, blend, and/or screen granular materials to satisfy gradation specifications, as indicated in this Section. Moisture conditioning of material from borrow sources to satisfy granular fill may be required.

1.5 Potential Borrow Sources

- .1 Sources of borrow materials to be incorporated into work requires approval by Departmental Representative. Potential areas of borrow material are identified as Borrow Sources B1, B2, B4, B5, B6, B7, and B8 are indicated on Drawings C10 and C11. Photos of these borrow sources and the results of lab tests on samples collected from these borrow sources are presented in Appendices E and F, respectively.
- .2 Defined borrow areas (sources) and stockpiles are to be used. Approval to excavate borrow material from a previously undisturbed area will be granted by Departmental Representative only when all previously identified sources are depleted or determined by Departmental Representative to be unsuitable.
- .3 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least seven (7) days prior to commencing production. Submittals in accordance to Section 01 33 00 Submittal Procedures.

- .4 If, in the opinion of the Departmental Representative, materials from the proposed source do not meet, or cannot reasonably be processed to meet specified requirements, locate an alternate source.
- .5 Should a change of material source be proposed during work, advise Departmental Representative one week in advance of proposed change to allow sampling and testing.
- .6 Geotechnical information, including borrow assessment and the results of laboratory analysis of soil samples obtained from the site are included in the RAP report.

1.6 Measurement For Payment

- .1 Location and development of borrow sources including stripping, processing, handling, stockpiling, transport, replacement of organics, and any necessary restoration will be incidental to the work of Section 31 22 13 - Rough Grading, and will not be measured separately.
- .2 Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
- .2 Type 1 Granular Fill:
 - .1 Type 1 Granular Fill is selected material obtained from excavations or borrow areas approved by Departmental Representative, consisting of well-graded sand and gravel with a trace of cobbles, free from rocks larger than 250 mm, waste, or other deleterious material. Gradations to be within the following limits when tested to ASTM C136 and ASTM C117, sieve sizes to CAN/CGSB-8.1:

Sieve Designation (mm)	% Passing by Weight
250	100
50	60 - 100
5	30 - 65
0.425	10 - 35
0.08	2 – 15

Refer to Section 31 22 13 – Rough Grading - for placement, moisture conditioning and compaction of Type 1 granular fill.

- .2 Type 1 Granular Fill is generally used for:
 - .1 Regrading low areas, upgrading existing road or constructing new access road, as required.
 - .2 Backfill for contaminated soil excavations.
 - .3 General site grading requirements.
 - .4 Watercourse/drainage course crossings upgrades as needed.
 - .5 Soil berm construction for landfill and landfarm.
 - .6 Landfill cover.

- .3 When coarser-grained materials are encountered on site satisfying the upper gradation limits and maximum particle size of Type 1 Granular Fill, then this material shall be classified as Select Type 1 Granular Fill to be used for surfacing the side slopes of the landfill to enhance erosion protection. Select Type 1 granular fill shall be approved by Departmental Representative and meet the following gradation limits:

Sieve Designation (mm)	% Passing by Weight
250	40-100
100	20-80
50	0-50
10	0 - 20

- .3 Type 2 Granular Fill:

- .1 Type 2 Granular Fill is selected material obtained from excavations or borrow areas approved by Departmental Representative, consisting of sand, gravel and sand, in an unfrozen state and free from rocks larger than 25 mm, waste, or other deleterious material. Crushed particles will not be allowed.

- .2 Gradations to be within the following limits:

Sieve Designation (mm)	% Passing by Weight
25	100
12.5	80 – 100
5	60 – 100
2	30 – 70
0.425	10 – 40
0.08	0 – 7

- .3 Type 2 Granular Fill is generally used for:

- .1 Bedding material to protect the landfarm liner system prior to placement of hydrocarbon contaminated soil as indicated;
- .2 Intermediate fill between waste layers in landfill as needed.
- .3 Backfill for contaminated soil excavations in areas not susceptible to erosion from runoff.

- .4 Unsuitable materials to use as aggregate will include:

- .1 Soils with moisture content exceeding optimum moisture by 5% or more.
- .2 Soils containing organic material, snow, ice or other deleterious material.

- .5 Screening maybe required to meet the Type 1 and Type 2 Granular Fill requirements. Field testing data is provided in Appendix F.

2.2 Source Quality Control

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least seven days prior to commencing production. Departmental Representative will conduct confirmatory testing of borrow material, if required, to determine if any contamination is present.
- .2 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

- .3 Notify Departmental Representative whenever unsuitable materials are encountered in borrow areas.

PART 3 - EXECUTION

3.1 Preparation

- .1 Stripping
 - .1 Remove boulders from the ground surface of the borrow area as directed by Departmental Representative. Avoid mixing boulders with subsoil.
 - .2 Strip root zone material, as delineated in Section 02 61 00.01 to depths as directed by Departmental Representative. Avoid mixing topsoil with subsoil.
 - .3 Topsoil can be reused for grading the borrow areas as directed by Departmental Representative.
- .2 Aggregate source preparation
 - .1 Prior to excavating materials for aggregate production, strip unsuitable surface materials. Dispose of unsuitable materials as directed by Departmental Representative.
 - .2 Strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
 - .3 Upon completion of final grading, leave all slopes in a stable condition and spread all stripped organics.
 - .4 Trim off and dress slopes of waste material piles and leave site in neat condition
- .3 Processing
 - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregates, if required, to obtain gradation requirements. Use methods and equipment approved by Departmental Representative.
 - .3 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.
 - .4 Moisten aggregate as required to achieve the specified density (compaction). Dry aggregate as required to compact according to specification.
- .4 Handling
 - .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- .5 Stockpiling
 - .1 Stockpile aggregates on site in locations specified by the Departmental Representative. Stockpiles are not to be located on undisturbed tundra unless specified by the Departmental Representative.
 - .2 Stockpile aggregates in sufficient quantities to meet Project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - 4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.

- .5 Separate different aggregate stockpiles far enough apart to prevent intermixing.
- .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
- .7 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .8 Do not cone piles or spill material over edges of piles (2 m maximum height and flatten top).
- .9 During winter operations (snowy conditions), prevent ice and snow from becoming mixed into stockpile.

3.2 Excavating

- .1 Obtain aggregate from potential borrow areas as indicated.
- .2 Ensure drainage of all excavated areas and maintain crowns and cross slopes to provide surface drainage.
- .3 Notify Departmental Representative whenever unsuitable materials are encountered.
- .4 Dispose of waste material as directed by Departmental Representative.
- .5 Excavating and stockpiling of borrow material in locations as directed by Departmental Representative.
- .6 Transport granular fill from borrow areas to the work areas via existing access routes where available. Maintain and provide for dust control on the access route between the borrow area and the work areas.

3.3 Cleaning

- .1 Final grading of borrow area upon completion to be tidy, in a well-drained condition, free of standing water to the satisfaction of Departmental Representative.
- .2 Upon completion of final grading, leave all slopes in a stable condition, no steeper than 3H:1V, and spread all stripped topsoil or organics. Trim and backblade to a condition acceptable to Departmental Representative. The final grading should mimic the natural topography.
- .3 Leave temporary aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Upon completion of Work, unused aggregates to be left in stable condition, with slopes mimicking natural topography. The final condition must meet the satisfaction of Departmental Representative.
- .5 For temporary or permanent abandonment of aggregate source, restore source to condition meeting satisfaction of Departmental Representative.

PART 1 – GENERAL

1.1 Related Sections

- .1 Section 31 05 16 – Aggregate Materials.
- .2 Section 31 23 33.01 - Excavation, Trenching and Backfilling.

1.2 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D698-[91(1998)], Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m).

1.3 Description

- .1 The Section specifies earthwork associated with construction of landfill and landfarm; upgrading existing roads and constructing new roads; and decommissioning and reclaiming the landfarm area.
- .2 This section includes the removal of aggregate material from borrow sources needed for construction of landfill and landfarm and upgrading existing roads and constructing new roads.

1.4 Definitions

- .1 Constructing: The supply and placement of granular fill in designated areas to construct soil berms, cover and intermediate fill layers for an on-site landfill facility, soil berms and liner bedding materials for an on-site landfarm facility, and requirements for upgrading existing and constructing new, site access roads.
- .2 Reshaping: The levelling and grading, to a maximum depth of 600 mm, including the movement of boulders, in designated areas to blend in with the natural terrain and provide positive drainage. Reshaping does not require the supply and placement of additional granular fill material.
- .3 Regrading: The supply and placement of granular fill in designated areas to blend in with the natural terrain, to provide positive drainage, and to place additional granular fill material at the drainage channel crossings.
- .4 Granular Fill Type 1: Material as specified in Section 31 05 16 - Aggregate Materials used for:
 - .1 Regrading low areas and constructing new access roads, as needed;
 - .2 Backfill for contaminated soil excavations;
 - .3 General site grading requirements;
 - .4 Watercourse/drainage course crossings upgrades as needed;
 - .5 Soil berm construction for landfill, and landfarm;
 - .6 Landfill cover.
- .5 Granular Fill Select Type 1: Material as specified in Section 31 05 16 - Aggregate Materials used for the same purposes as Type 1, however priority for this material is erosion control on the surface of the landfill side slopes.
- .6 Granular Fill Type 2: Material as specified in Section 31 05 16 - Aggregate Materials used for:
 - .1 Bedding material on landfarm prior to placement of hydrocarbon contaminated soil as indicated;
 - .2 Intermediate fill between waste layers in landfill as needed.

- .3 Backfill for contaminated soil excavations in areas not susceptible to erosion from runoff.
- .6 Waste Material: Excavated material unsuitable for use in work or surplus to requirements.
- .7 Borrow Material: Material obtained from approved areas and required for construction, re-grading and backfilling requirements.
- .8 Maximum Dry Density is determined by the Standard Proctor Method in accordance with ASTM D698.
- .9 Truck box: The capacity of the granular fill hauling vehicle that will be measured to the closest 0.1 cubic metre. The vehicle once measured will not be changed without the consent of the Departmental Representative. The box is to be levelled by the Contractor, using a strike-off method prior to measurement. No heaping or mounding of the truck box is allowed. The following bulking factors will be applied to truck box measurements:
 - .1 Granular materials: 15%.
 - .2 Debris: 50%.

1.5 Existing Conditions

- .1 Contractor is advised that soft ground conditions may be at the site during periods of maximum thaw of the permafrost. Schedule and carry out work to minimize disturbance to permafrost soils.
- .2 Contractor is advised that existing access roads to be used during construction activities may require repair and upgrading. Drawing C03 show existing access trails at the site.
- .3 Examine geotechnical information provided in the Phase III ESA and RAP reports which are available for review on the website.
- .4 Contractor is advised that locations of buried objects are to be established before commencing the work.
- .5 Contractor is advised that the current weather station area, as indicated on Drawings C03 and C10, is not to be disturbed.

1.6 Protection

- .1 Maintain access roads to prevent accumulation of construction related debris on roads.
- .2 Prevent damage to surface or underground services or utility lines which are to remain. Immediately repair any damage to the above or replace the above in the event of damage, at no cost to Departmental Representative.
- .3 Protect archaeological sites from construction and construction traffic.
- .4 Unanticipated archaeological resources may be encountered during construction; suspend all activities in that area and notify Departmental Representative immediately.
- .5 Protect and do not disturb nesting sites, fish spawning beds and wildlife breeding grounds during construction.
- .6 Environmental protection measures are to be in accordance with the requirements specified in Section 01 35 43 - Environmental Procedures. Follow the approved Erosion, Sediment and Drainage Control Plan submitted in accordance with Section 01 35 43 – Environmental Procedures.

1.7 Measurement For Payment

- .1 Payment for grading will be based on cubic metres of borrow material placed for constructing of an on-site landfill facility and an on-site landfarm facility.
- .2 The supply and placement of Type 1 and Select Type 1 Granular Fill for the landfill berms and cover, and landfarm berms, will be measured for payment by the cubic metre in place in each of the landfill and landfarm, as determined by the survey method. Type 1 Granular Fill will be paid under Item 31 22 13-1 in the Basis of Payment Schedule.
- .3 The supply and placement of Type 2 Granular Fill for the landfarm will be measured for payment by the cubic metre in place in the landfarm, as determined by survey. Type 2 Granular Fill used for the landfarm will be paid under Item 31 22 13-2 in the Basis of Payment Schedule.
- .4 The supply and placement of Type 2 Granular Fill for the intermediate fill for the landfill will be measured for payment by truck box as described in Article 1.4 - Definitions of this Section. The capacity of the truck box will not be changed without consent of the Departmental Representative. The Departmental Representative may, at their own discretion, determine the granular material volume without enforcing the strike-off method. Truck boxes are to be thoroughly cleaned when unloading. Type 2 Granular Fill used for the landfill will be paid under Item 31 22 13-2 in the Basis of Payment Schedule.
- .5 Decommissioning and reclamation of the landfarm area, including the removal and off-site disposal of the geotextile and geomembrane material, will be lump sum and will be paid under Item 31-22-13-3 in the Basis of Payment Schedule.
- .6 No measurement for payment will be made for:
 - .1 Building, enhancing or maintaining roads;
 - .2 Preparation of borrow sources;
 - .3 Excavations to prove borrow sources;
 - .4 Surplus material;
 - .5 Waste and reject material;
 - .6 Placement of granular fill beyond the limits and depths specified, unless specifically authorized by the Departmental Representative.
- .7 The following work items will be incidental to the work described in this Section, and will not be measured separately:
 - .1 Stripping, stockpiling and replacement or placement of organic material from borrow areas as directed by the Departmental Representative, and where required from construction areas upon where granular material is to be placed.
 - .2 Construction of access roads and upgrading the infrastructure to facilitate site remediation activities as required for construction including placement of granular material and installation of culverts.
 - .3 Disposal of waste material from the borrow areas.
 - .4 Removal of surficial boulders over 300 mm in diameter from borrow areas. separating, processing, screening, and stockpiling of borrow materials.

- .5 Grading of borrow areas to approximate the before-construction condition upon completion.
- .6 Loading, hauling and haul road construction, maintenance and rehabilitation.
- .7 Water for moisture conditioning, compaction, and dust control should be used as per water permit requirements.
- .8 Surveying and calculation of granular material quantities for progress payment purposes.
- .9 Reshaping and regrading of borrow areas and Contractor's laydown areas including the supply, placement and compaction of granular material.
- .10 Draining of wet areas prior to regrading operations.
- .11 Removal and disposal or burial of abandoned utility lines exposed by Contractor during the excavation or granular materials.
- .8 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Materials

- .1 Fill materials in accordance with Section 31 05 16 – Aggregate Materials and Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Fill materials require the approval of Departmental Representative.
- .3 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Departmental Representative.

PART 3 - EXECUTION

3.1 Stripping of Root Zone Material/Topsoil

- .1 Suspend operations whenever climatic conditions are unsatisfactory for grading to conform to this Specification.
- .2 Do not operate equipment in work areas until the material has dried sufficiently to prevent excessive rutting.
- .3 Areas to be graded are to be free from debris and excessive snow, ice and standing water.
- .4 Root zone material to be stockpiled on site for re-grading requirement at the borrow areas.
- .5 Strip root zone material to depths as directed by Department Representative. Avoid mixing root zone material with subsoil.
- .6 Stockpile in locations as directed by Department Representative. Stockpile height not to exceed 2 metres.

3.2 Landfill and Landfarm Construction

- .1 Landfill
 - .1 Examine Drawing C12 for landfill design.

- .2 Set grades and lay out work in detail from control points in areas of granular fill placement. Verify the original ground topography by survey. If survey verification is not completed, original ground is to be as shown on the Drawings.
- .3 Level and maintain the landfill base elevation 335.45 metre by cut and fill as required.
- .4 Haul granular fill material from borrow areas to designated landfill area.
- .5 Place granular fill material to the lines, grades, elevations and dimensions indicated on the Drawings, or agreed to with Departmental Representative.
- .6 Do not place fill material which is frozen or place fill material on frozen surfaces.
- .7 Do not place granular fill on snow or surface ice.
- .8 Maintain natural drainage patterns, unless otherwise directed.
- .9 Construct landfill perimeter berms to design elevations (Type 1 granular fill), while leaving an access corridor.
- .10 Do not dump fill material over the side slopes of berms.
- .11 Place and compact fill material in horizontal lifts.
- .12 Place waste in 0.5 metre lifts separated by 0.15 metre intermediate cover (Type 2 granular fill); place lifts to design height.
- .13 Cover with a minimum 1 metre of Type 1 granular fill. For erosion protection, the top 0.5 metre should be Select Type 1 granular fill on the side slopes as indicated on Drawing C12.
- .14 All granular fill is to be placed in an unfrozen state. Fill material to be free from debris, snow and ice. Do not place granular fill if the outside air temperature is below 0°C, unless otherwise directed by Departmental Representative.
- .15 Maintain a crowned surface during construction to ensure ready runoff of surface water. Do not place material in free standing water. Drain low areas, before placing material.
- .16 Moisture condition granular fill as required to meet compaction requirements. Provide a water truck capable of efficiently placing water on granular fill. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
- .17 Compact Type 1 and Select Type 1 Granular Fill material to a minimum of 95 percent of Maximum Dry Density in accordance with ASTM D698 or as determined from a Control Strip Density. The method for determining the maximum dry density will be established by Departmental Representative.
- .18 Control Strip Density:
 - .1 A Control Strip is a lift of granular material placed over a minimum 300 m² area that requires regrading.
 - .2 To determine the Control Density, moisture and density readings are to be taken by Departmental Representative during the compaction process until a maximum dry density is attained.
 - .3 The density and moisture content of the Control Strip are to be measured by Departmental Representative after each pass of the compaction equipment to determine the type of equipment and number of passes required to obtain the specified density.
 - .4 A new Control Strip will be required if, as established by Departmental Representative, the material type, moisture content, or subgrade of the area to be regraded is significantly different than that of the Control Strip.

- .5 Proof-roll areas compacted in accordance with the Control Strip Density upon completion of grading and compaction or as requested by Departmental Representative.
- .6 Use a fully loaded tandem axle truck (or an approved equivalent piece of heavy equipment) for the proof-rolling operation. The speed of the vehicle is not to exceed 4 kilometres per hour during proof-rolling. Departmental Representative may authorize the use of alternative proof-rolling equipment.
- .7 Make sufficient passes with the proof-rolling equipment to subject every point on the surface to three separate passes of a loaded tire.
- .8 Where proof-rolling reveals areas of defective granular fill, remove and recompact the granular fill, and modify the compaction process, as required.
- .9 The Control Strip Density method for compaction is not intended to relax the specified compaction requirements, but to reduce compaction testing requirements.
- .19 If granular fill has dried out prematurely due to weather conditions, scarify surface, adjust moisture condition and re-compact at Departmental Representative's discretion. No extra payment will be made for extra costs incurred as a result of any extra work.
- .20 Compaction equipment must be capable of obtaining required densities uniformly in materials on project. Hand equipment must be available for compaction in areas where large equipment cannot access and around instrumentation.
- .21 Landfilling Non-hazardous Wastes
 - .1 Place Non-Hazardous Wastes in the designated area(s) in uniform, horizontal lifts between and against the berm. The thickness of each waste lift is to be such that there are minimal voids within the waste.
 - .2 Compact waste during placement with a double steel drum compactor or approved alternative during placing and spreading of the waste material. The equipment must be capable of crushing demolition debris.
 - .3 For placement in landfills, cut all demolition material and debris as required:
 - .1 To minimize displacement and lifting of landfilled materials resulting from landfill compaction operations;
 - .2 To satisfy the overall landfill dimension requirements as indicated on the Drawings.
 - .3 Large equipment/vehicles shall be cut to length and reduced in volume at the recommendation and discretion of the on-site Departmental Representative.
 - .4 Cut structural steel materials into separate members prior to placement in landfills. Place large materials including structural steel members on the base of the landfill preferably, so that the materials lay on a compacted, flat surface. Cut hollow components or objects, such as tanks, as required, to allow for nesting of materials. As a minimum, hollow components are to be cut in half parallel to the lengthwise axis. Within the landfill, support the underside of nested materials with intermediate cover or other debris material to minimize displacement and lifting of materials.
 - .5 Segregate all asbestos material from other material, and consolidate in one single location within the landfill. The proposed location of the asbestos waste within the landfill is to be reviewed by Departmental Representative. Record the specific location and depth of this material on the Project Record Drawings.

- .6 Hand place double bagged asbestos in the landfill. Provide daily intermediate cover of minimum 150 millimetre on asbestos waste. Do not operate equipment directly on asbestos waste containers. Replace ripped or torn asbestos waste bags. Location and quantity of asbestos shall be surveyed and recorded on the final landfill as-built drawings.
 - .7 Crush, cut or shred barrels to be landfilled on site to reduce the total original barrel volume by a minimum of 75 percent.
- .2 Landfarm
- .1 Examine Drawing C13 for landfarm design.
 - .2 Set grades and lay out work in detail from control points in areas of granular fill placement. Verify the original ground topography by survey. If survey verification is not completed, original ground is to be as shown on the Drawings.
 - .3 Remove cobbles, boulders, and sharp objects within the landfarm footprint.
 - .4 Place granular fill material to the lines, grades, elevations and dimensions indicated on the Drawings, or agreed to with Departmental Representative.
 - .5 Haul granular fill material from borrow areas to designated landfarm area.
 - .6 Do not place fill material which is frozen or place fill material on frozen surfaces. Do not place granular fill on snow or surface ice.
 - .7 Moisture condition granular fill as required to meet compaction requirements. Provide a water truck capable of efficiently placing water on granular fill. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
 - .8 Compact Type 1, Granular Fill material to a minimum of 95 percent of Maximum Dry Density in accordance with ASTM D698 or as determined from a Control Strip Density. For details of Control Strip Density see Section 31 33 13 Rough Grading Part 3.2.1.19. The method for determining the maximum dry density will be established by Departmental Representative.
 - .9 Construct landfarm perimeter berms using Type 1 granular fill and compact fill material to at least 95% of standard maximum dry density (ASTM D698).
 - .10 Place geotextiles in accordance with Section 31 32 19.01 Geotextiles.
 - .11 Place geomembranes in accordance with Section 31 32 19.02 Geomembranes and follow up geotextiles.
 - .12 Install a sump within a corner of the landfarm where 1 to 2 % slope downward to the sump.
 - .1 Sump must be sized appropriately for the size of the landfarm area.
 - .2 Equipment designed for liquid removal must be sized and managed appropriately so to not overflow the sump.
 - .13 Place 300 mm maximum thickness of Type 2 fill above the top layer of geotextile. All granular fill is to be placed in an unfrozen state. Fill material to be free from debris, snow and ice. Do not place granular fill if the outside air temperature is below 0°C, unless otherwise directed by Departmental Representative.
 - .14 Place 300 mm maximum thickness of hydrocarbon contaminated soil.
 - .15 Upon completion of landfarm activities, decommission and reclaim landfarm area. Decommissioning and reclamation to include, but not limited to:
 - .1 Removal and off-site disposal of geomembrane and geotextile material at the contractors approved waste disposal facility.
 - .2 Recontouring of berms to mimic natural topography.
 - .3 Ensure surface water ponding does not occur.

3.3 Upgrading Existing Roads and Constructing New Roads

- .1 Improve stability of the existing roads for equipment access, as required. Drawing C03 shows existing access trails at the site.
- .2 Strip topsoil in areas where new access roads are required to be constructed.
- .3 Haul granular fill material from borrow areas to designated areas.
- .4 Do not place fill material which is frozen
- .5 Maintain natural drainage patterns, unless otherwise directed, and fill depressions to avoid any ponding of water adjacent to embankments.
- .6 All granular fill is to be placed in an unfrozen state. Fill material to be free from debris, snow and ice. Do not place granular fill if the outside air temperature is below 0°C, unless otherwise directed by Departmental Representative.
- .7 Maintain a crowned surface during construction to ensure ready runoff of surface water. Do not place material in free standing water. Drain low areas, before placing material.
- .8 Place Type 1 granular fill generally consisting of well-graded sand and gravel and free from rocks larger than 300 mm, waste or other deleterious material:
- .9 If granular fill has dried out prematurely due to weather conditions, scarify surface, adjust moisture condition and recompact at Departmental Representative's discretion. No extra payment will be made for extra costs incurred as a result of any extra work.
- .10 Where the alignment of a new access road or upgrading of an existing trail crosses a natural drainage channel or watercourse that is flowing with water or intermittently flows with water, then the Contractor may be required to install a culvert (or equivalent) to permit water flow under the road to maintain natural drainage patterns until such time that the access road is no longer required.
- .11 The Contractor is required to submit a Drainage and Sediment Control Plan prior to commencing work as described in Section 01 35 43 Environmental Procedures.
- .12 Compaction equipment must be capable of obtaining required densities uniformly in materials on project. Hand equipment must be available for compaction in areas where large equipment cannot access and around instrumentation.

3.4 Testing

- .1 Inspection and testing of soil compaction will be carried out by Departmental Representative.

3.5 Surplus Material

- .1 Surplus material and material unsuitable for filling or grading will be distributed in the borrow area to match the natural terrain as directed by Departmental Representative.

- END OF SECTION -

PART 1 - GENERAL

1.1 Related Requirements

- .1 Section 02 61 00.01 - Soil Remediation.
- .2 Section 31 05 16 - Aggregate Materials.
- .3 Section 31 22 13 - Rough Grading.

1.2 Description

- .1 This Section is specific to the excavating, trenching and backfilling that is required for the removal and treatment of contaminated soils.
- .2 This Section is specific to the installation and removal of culverts, if required.

1.3 Measurement For Payment

- .1 Payment for the excavation and stockpiling of clean overburden material will be based on cubic metres of overburden placed. Payment includes excavating, hauling (if required), stockpiling, and replacement and is included in the payment under Item 31 23 33-1, as indicated in the Basis of Payment Schedule. Payment will be based on initial and final cross sections as follows:
 - .1 Initial survey of the ground profile prior to backfilling.
 - .2 Final survey of the ground profile upon backfilling. Clean overburden limits will be determined by the Departmental Representative.
- .2 Payment for excavation of contaminated soil will be based on cubic metres of contaminated soil excavated and incorporated into the work as determined by survey. Payment includes excavating, loading, hauling to treatment area, and stockpiling and is included in the payment under Item 31 23 33-2, as indicated in the Basis of Payment Schedule. Payment will be based on initial and final cross sections as follows:
 - .1 Initial survey of the original ground profile prior to excavating the areas of environmental concern.
 - .2 Final survey of the ground profile upon completion of excavating the areas of environmental concern.
- .3 Payment for the backfilling of the contaminated soil excavations will be based on cubic metres as determined by survey. Payment includes loading, hauling, backfilling, compacting and reshaping the areas to conform to existing condition and is included in the payment under Item 31 23 33-3, as indicated in the Basis of Payment Schedule. Payment will be based on initial and final cross sections as follows:
 - .1 Initial survey of the original ground profile prior to excavating the areas of environmental concern.
 - .2 Final survey of the ground profile upon completion of excavating the areas of environmental concern.
 - .3 Backfilling to existing conditions is not required for APEC 3 and APECs 9 through 12. Backfill required for APEC 3 is 25% of contaminated soil volume and 50% of contaminated soil volume for APECs 9 through 12. These reductions have been reflected in the volume provided in the Basis of Payment Schedule Item 31 23 33-3.
- .4 Payment for the backfilling of the basement located in Building 1 will be based on cubic metres volume of the basement. Payment includes loading, hauling, backfilling, compacting, and reshaping of the area to make it safe and is included in the payment under Item 31 23 33-3, as indicated in the Basis of Payment Schedule.

- .5 The following work items will be incidental to the work described in this Section, and will not be measured separately:
- .1 Construction of access roads and watercourse/drainage course crossings to facilitate site remediation activities as required for construction including placement of granular material and installation and removal of culverts.
 - .2 Loading, hauling, backfilling and compacting Type 1 and Type 2 Granular Fill materials at the excavation limits. Contractor is advised that areas susceptible to erosion will require Select Type 1 Granular fill as surface materials.
 - .3 Final grading of excavation areas to approximate the before-construction condition upon completion.
 - .4 Site access road construction, maintenance and rehabilitation.
 - .5 Water for moisture conditioning, compaction, and dust control.
 - .6 Surveying and calculation of granular material quantities for progress payment purposes.
 - .7 Reshaping and regrading of borrow areas and Contractor's laydown areas including the supply, placement and compaction of granular material.
 - .8 Draining of wet areas prior to regrading operations.
- .6 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

1.4 References

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C136-[05], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 ASTM D422-63[2002], Standard Test Method for Particle-Size Analysis of Soils.
 - .3 ASTM D698-[00ae1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft²) (600 kN-m/m²).

1.5 Definitions

- .1 Excavation of hydrocarbon impacted soils will be recognized for this project.
 - .1 Soil containing Type B hydrocarbons at concentrations above the Abandoned Military Site Remediation Protocol (AMSRP) residential/parkland criteria for BTEXS, and F1 to F4. This soil is referred to as "Hydrocarbon contaminated Soil" in Basis of Payment. The hydrocarbon contaminated soils are located in various APECs at Ennadai Lake – see RAP for details.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .4 Recycled fill material: material, considered inert, obtained from alternate sources and Departmental Representative to meet requirements of fill areas.
- .5 Topsoil: native surficial material can be reused for landscaping purpose as approved by Departmental Representative.

1.6 Submittals

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Quality Control in accordance with Section 01 45 00 - Quality Control:
 - .1 Submit survey of existing conditions as described in Article 1.9 of this Section.
 - .2 Submit to Departmental Representative written notice at least seven (7) days prior to excavation work, to ensure cross sections are taken.
 - .3 Submit to Departmental Representative written notice when bottom of excavation is reached.
 - .4 Submit to Departmental Representative testing/inspection results and report as described in PART 3 of this Section.
 - .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .4 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Contractor will provide sieve analysis for Type 1, Select Type 1, and Type 2 granular fill from the borrow areas. Borrow materials to be accepted by Departmental Representative prior to use by the Contractor.
- 1.7 Quality Assurance
- .1 Qualification Statement: submit proof of insurance coverage for professional liability.
 - .2 Health and Safety Requirements:
 - .1 Conduct construction occupational health and safety in accordance with Section 01 35 32 – Site Specific Health and Safety Plan.
- 1.8 Waste Management And Disposal
- .1 Divert hydrocarbon-impacted soils to an on-site landfarm facility for treatment in accordance with Section 02 61 00 – Soil Remediation.
 - .2 Divert non-hazardous waste to an on-site non-hazardous waste landfill facility for disposal.
- 1.9 Existing Conditions
- .1 Examine Phase III ESA and RAP reports available.
 - .2 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative, condition survey of the natural ecosystem which may be affected by Work.
 - .2 As much as possible, protect the natural ecosystem from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

PART 2 - PRODUCTS

2.1 Materials

- .1 Type 1 and Type 2 fill as described in Section 31 05 16 - Aggregate Materials.
- .2 Environmental Protection Supplies as per Section 01 35 43 – Environmental Procedures.

PART 3 - EXECUTION

3.1 Temporary Erosion And Sedimentation Control

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust into watercourses or onto tundra, according to requirements of Section 01 35 43 - Environmental Procedures.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls once vegetation has been established.

3.2 Site Preparation

- .1 Remove physical features, obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Remove all brush, weeds, grasses and accumulated debris from the site.

3.3 Preparation/Protection

- .1 Keep excavations clean, free of standing water, and loose soil.
- .2 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing tundra from damage.
- .4 Environmental protection measures are to be in accordance with the Environmental Protection Plan and as specified in Section 01 35 43 - Environmental Procedures.
- .5 Install temporary erosion, sediment and drainage controls prior to construction and excavation activities.
- .6 Suspend operations whenever climatic conditions are unsatisfactory for excavation or grading to conform with this specification.
- .7 Some areas designated for clean-up under this contract involve soils and hazardous materials which contain PCBs, inorganic elements, and other contaminants which are considered hazardous to human health.
- .8 A listing of the waste materials that may exist within the existing Work areas is included in Appendices C and D of the specification.
- .9 When working with inorganic elements, PCB containing materials, and other contaminants, workers are to wear protective clothing and equipment acceptable to Labour Canada or Territorial Labour Department as suitable for exposure in the work area. Follow National Institute for Occupational Safety and Health (NIOSH) guidelines in providing protection for on-site personnel including contract employees and subcontractor, Departmental Representative and Departmental Representative's Authorized Personnel. Comply with all applicable regulations as indicated in Section 02 82 00.01 - Asbestos Abatement Minimum Precautions, Section 02 84 00 – PCBs, and Section 02 81 01 - Hazardous Materials.
- .10 Unless otherwise specified, carry out excavation work in accordance with Section 01 35 32 - Site Specific Health and Safety Plan.

3.4 Stockpiling

- .1 Stockpile hydrocarbon-impacted soils in areas designated by Departmental Representative.
- .2 Cover impacted materials from precipitation to reduce leachate pending transportation to landfarm area.

- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into waterbodies.
- .4 Place stockpile of contaminated materials at a distance from the excavation equal to the depth of the excavation. Stockpile height not to exceed 2 metres.

3.5 Waste Materials Processing Area

- .1 Establish a Waste Material Processing Area as specified in Section 02 81 01 - Hazardous Materials, for processing of excavated materials.

3.6 Dewatering

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative review details of proposed dewatering or heave prevention methods, including dikes and well points.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
 - .1 Prevent piping or bottom heave of excavations by groundwater lowering, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved collection runoff areas and in manner not detrimental to personnel, the natural environment, or portion of Work completed or under construction.
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.7 Excavation

- .1 Contractor to initiate and complete topographic survey in advance of excavation operations for initial cross sections to be taken.
- .2 Remove concrete, above-ground tanks, demolished foundations and rubble and other obstructions encountered during excavation in accordance with Section 02 41 16 - Structure Demolition.
- .3 Prior to excavation of impacted areas, remove all surface snow/ice and direct surface water run-off around the excavation.
- .4 Excavate to lines, grades, elevations and dimensions as indicated and as directed by Departmental Representative.
- .5 When excavating in the vicinity of a drainage course or a body of water, erect silt fences, floating slit curtains and/or containment berms to prevent the release of sediment or deleterious materials into the water.
- .6 Collect melt water/groundwater/leachate at the low point of the excavation and provide for settling of sediments and testing of water prior to discharge to the environment. Carry out testing of melt water/groundwater. Release of water is to conform to the wastewater discharge criteria described in Section 01 35 43 - Environmental Procedures. Submit results of testing to Departmental Representative.
- .7 Use a VOC instrument to continuously measure the concentrations of VOC during excavation operations. When the concentrations of VOC exceed 20% LEL, temporarily halt work until ventilation (natural or induced) reduces the concentration levels to a safe working level.
- .8 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 metres of trench in advance of installation operations and do not leave open more than 15 metres at end of day's operation.

- .9 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
- .10 Dispose of surplus and unsuitable excavated non-hazardous materials in approved location on site landfill location as directed by Departmental Representative.
- .11 Do not obstruct flow of surface drainage or natural watercourses.
- .12 Notify Departmental Representative when bottom of excavation is reached.
- .13 Obtain Departmental Representative approval of completed excavation.
- .14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .15 No damage to permafrost during the excavation.

3.8 Fill Types and Compaction

- .1 Compact Type 1 - Granular Fill Section 31 05 16 Aggregate Materials to 95% Standard Proctor maximum dry density [ASTM D698].
- .2 Place Type 2 bedding sand material in unfrozen condition in areas as indicated.

3.9 Backfilling

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Survey of the ground profile upon completion of the final excavation limits and Departmental Representative has inspected and approved final excavation limits.
 - .2 The confirmatory soil results indicate that soils along the final excavation limits meet the applicable guidelines and confirmed by Departmental Representative.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 250 mm compacted thickness up to 0.3 metres above original grade to account for settlement, prevent ponding and blend into the surrounding terrain. Compact each layer before placing succeeding layer.
- .5 Backfill for contaminated soil areas APEC 3 and APECs 9 to 12 does not need to meet original grade elevations, but must blend into the surrounding terrain and prevent ponding. Have Departmental Representative approve final grades for these APEC areas.
- .6 Place Select Type 1 Granular Fill on surfaces where there is potential for erosion. Have Departmental Representative approve amount and areas for Select Type 1 Granular Fill.

3.10 Culvert Installation and Removal

- .1 Submittal of "Culvert Installation and Removal Plan" to Departmental Representative for review and approval. Submittals in accordance to Section 01 33 00 Submittal Procedures.
- .2 Following completion of all required Work, all watercourse/drainage course crossing infrastructure will be decommissioned.
- .3 The Contractor to remove all fill materials that were placed on top of the culverts. Place and blend fill materials into the surrounding terrain.
- .4 Following removal of surficial fill from the top of the culverts, remove and dispose of all the culverts placed within the watercourse/drainage course crossing location.
- .5 Following culvert removal, trim back slopes of excavation to a maximum slope of 10H:1V, or as directed by Departmental Representative, to provide a stable channel for drainage flow.
- .6 Install appropriate sediment and erosion control measures to ensure deleterious materials do not enter watercourses while removing fill materials or culverts.

3.11 Restoration

- .1 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .2 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

PART 1 - GENERAL

1.1 Related Requirements

- .1 Section 31 22 13 – Rough Grading.
- .2 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .3 Section 31 32 19.02 – Geomembranes.

1.2 Measurement and Payment

- .1 All costs for the supply, delivery, and placement of geotextiles are to be included in the lump sum payment under Item 31 32 19.01-1
- .2 No payment will be made for other construction applications where geotextile is required.
- .3 Payment at the tendered price shall be full compensation for furnishing all materials, preparation, delivery, storage, laying the geotextile and for all labour, equipment, tools and other work incidental to this section.
- .4 Overlap and seams of geotextile shall be considered incidental to surface area covered.
- .5 No separate payment for repairs to damaged geotextile.
- .6 No separate payment for surface preparation.
- .7 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

1.3 References

- .1 All references to this Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D4491-[99a(2009)], Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .2 ASTM D4595-[09], Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method. ASTM D4716-[08], Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .3 ASTM D4751-[04], Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-[2004], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2-[M85], Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3-[M85], Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - .3 No.6.1-[93], Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
 - .4 No.7.3-[92], Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

- .5 No. 10-[94], Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

1.4 Submittals

- .1 Obtain written acceptance from Departmental Representative for geotextile before the installation of material in Work.
- .2 Submit in accordance with Section [01 33 00 - Submittal Procedures].
- .3 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.
- .4 Samples:
 - .1 Submit following samples four (4) weeks prior to beginning Work:
 - .1 Minimum length of 2 m of roll width of geotextile.
 - .2 Methods of joining – minimum of 1 m seam with at least 300 mm of geotextile on both sides of seam.
- .5 Test and Evaluation Reports:
 - .1 Submit three (3) copies of mill test data and certificate at least four (4) weeks prior to start of Work.

1.5 Delivery, Storage and Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Contractor to supply and deliver all geotextile to the site in sufficient quantities to cover the area designated in the Contract Documents and as requested by Departmental Representative.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.
 - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 Materials

- .1 Geotextile fabric shall consist of polymeric filament or yarns such as polypropylene, polyethylene, polyester, or other polymers excluding polyamides, formed into a stable network such that the filaments or yarns retain their relative position to each other. The geotextile shall be inert to commonly encountered chemicals, resistant to ultraviolet light and heat exposure, and shall be indestructible by micro-organisms and insects.
- .2 Where sections of geotextile are joined, seam strength shall meet the minimum tensile strength requirements for the class of geotextile, unless otherwise specified in the Contract Documents.
- .3 Seams of the geotextile shall be sewn with thread of the material meeting the material requirements for the geotextile.

- .4 Geotextile rolls shall be supplied with an opaque protective covering by the manufacturer or supplier.
- .5 Geotextiles shall be non-woven synthetic fibre fabric, supplied in rolls:
 - .1 Width: 4.5 m minimum.
 - .2 Length: 91 m minimum.
 - .3 Composed of minimum 85% by mass of polypropylene or polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure.
- .6 Physical Properties:
 - .1 Thickness: to [CAN/CGSB-148.1, No.3], minimum 1.5 mm.
 - .2 Mass per unit area: to [CAN/CGSB-148.1, No.2], minimum 406 g/m².
 - .3 Grab tensile strength and elongation (in any principal direction): to [ASTM D4595].
 - .1 Tensile strength: minimum 1,330 N.
 - .2 Elongation at break: 50%.
- .7 Hydraulic properties:
 - .1 Apparent opening size (AOS): to [ASTM D4751], 150 micrometres.
 - .2 Permittivity: to [ASTM D4491], 1.0 sec⁻¹
- .8 Securing pins and washers: to [CSA G40.21], Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to [ASTM A123/A123M].
- .9 Factory seams: sewn in accordance with manufacturer's recommendations.
- .10 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.
- .11 Materials not meeting these specifications will not be accepted without prior authorization by the Departmental Representative.

PART 3 - EXECUTION

3.1 Examination

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 Installation

- .1 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .2 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile to avoid horizontal seams.
- .3 Overlap each successive strip of geotextile a minimum of 600 mm over previously laid strip. Do not use securing pins when placing geotextile material over the geomembrane liner.
- .4 Employ sufficient temporary anchorage to hold geotextile in place during placement, and during placement of other elements if the liner system until backfilled.

- .5 Heat track of glue geotextile overlaps prior to placing granular fill cover to prevent lifting or separation of overlap.
- .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .7 After installation, cover with overlying layer within four (4) hours of placement.
- .8 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
- .9 Place geomembrane in accordance with Section 31 32 19.02, follow by an additional layer of geotextile, bedding soil layer, and hydrocarbon contaminated soil layer in accordance with Section 31 22 13 – Rough Grading.

3.3 Cleaning

- .1 Remove construction debris, crushed cleaned containers and bins from Project site and dispose of debris and materials at appropriate landfill facility.

3.4 Protection

- .1 Vehicular traffic not permitted directly on geotextile.

- END OF SECTION -

PART 1 - GENERAL

1.1 Related Requirements

- .1 Section 31 22 13 – Rough Grading.
- .2 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .3 Section 31 32 19.01 – Geotextiles.

1.2 Measurement and Payment

- .1 All costs for the supply, delivery, and installation of geomembrane are to be included in the lump sum payment under Item 31 32 19.02-1.
- .2 No payment will be made for other construction applications where geomembrane is required.
- .3 Payment at the tendered price shall be full compensation for furnishing all materials, preparation, delivery, storage, laying the geomembrane and for all labour, equipment, tools and other work incidental to this section.
- .4 Overlap and seams of geomembranes shall be considered incidental to surface area covered.
- .5 No separate payment for repairs to damaged geomembranes.
- .6 No separate payment for surface preparation.
- .7 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

1.3 References

- .1 All references to this Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including all amendments.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D413-[98(2007)], Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate.
 - .2 ASTM D638-[10], Standard Test Method for Tensile Properties of Plastics.
 - .3 ASTM D746-[07], Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
 - .4 ASTM D792-[08], Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
 - .5 ASTM D1004-[09], Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
 - .6 ASTM D1204-[08], Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature.
 - .7 ASTM D1238-[10], Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
 - .8 ASTM D1593-[09], Standard Specification for Nonrigid Vinyl Chloride Plastic Film and Sheeting.
 - .9 ASTM D1603-[06], Standard Test Method for Carbon Black in Olefin Plastics.

- .10 ASTM D1693-[08], Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics.
- .11 ASTM D882-[10], Standard Test Methods for Tensile Properties of Thin Plastic Sheeting.
- .12 ASTM D1203-[10], Standard Test Methods for Volatile Loss from Plastics Using Activated Carbon Methods.
- .13 ASTM D1790-[08], Standard Test Method for Brittleness Temperature of Plastic Sheeting by Impact.

1.4 Action and Informational Submittals

- .1 Obtain written acceptance from Departmental Representative for geomembrane before installation of material in work.
- .2 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for geomembranes and include product characteristics, performance criteria, physical size, finish and limitations.
- .4 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Nunavut or Northwest Territories, Canada.
 - .2 Submit shop drawings and indicate installation layout, dimensions and details, including fabricated and field seams, anchor trenches and protrusion details.
- .5 Samples:
 - .1 Submit following samples 4 weeks minimum before beginning Work:
 - .1 Minimum 2 m length of standard width membrane.
 - .2 Minimum of 1 m seam with at least 300 mm of membrane on both sides of seam.
- .6 Certificates:
 - .1 Submit 3 copies of manufacturer's mill test data 4 weeks minimum before beginning Work.
 - .2 Submit certificates, including test results 2 weeks before delivery to job site.

1.5 Quality Assurance

- .1 Test quality of resin and membrane to ensure consistency of raw material and geomembrane quality in accordance with manufacturer's recommendations.
- .2 Test seams in strength and peel at beginning of each seaming period, and at least once every 4 hours if welding operation is interrupted, for each seaming apparatus and seamer used that day.
 - .1 Also test at least two samples from each panel, with samples taken from extra material, such that panel is not damaged and blanket geometry is not altered.
- .3 If seam test specimen fails in seam, repeat on new specimen.
 - .1 If new specimen fails in seam, material will not be used for seaming until deficiencies are corrected and two consecutive successful test seams are achieved.
- .4 Test seams by non-destructive methods over their full length, using vacuum test unit or air pressure test.

- .1 Vacuum chamber to contain glass viewport and seal for sealing chamber to seam area. With chamber sealed in place and after partly filling chamber with water, apply vacuum of 17.2 kPa. Seam failure is detected by presence of air bubbles through water.
- .2 Use air lance to apply air at 343 kPa through nozzle directed at edge of overlap seam. Seam failure is indicated by inflation or lifting of any part of geomembrane.
- .5 Provide test results to Departmental Representative, for each shift's production, including documentation of non-destructive testing and repairs at end of each shift.

1.6 Delivery, Storage and Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Contractor to supply and deliver all geomembranes to the site in sufficient quantities to cover the area designated in the Contract Documents and as requested by Departmental Representative.
- .3 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .4 During delivery and storage, protect geo-membranes from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.
- .5 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 Materials

- .1 Geomembrane: extruded synthetic sheet.
 - .1 Supplied in:
 - .1 Rolls of 1.8 m minimum width.
 - .2 Panels of size as indicated.
 - .2 Composed of 60 mil (1.5 mm) high density polyethylene or, polyvinyl chloride resin with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure.
- .2 Physical Properties:
 - .1 Specific gravity of resin: to ASTM D792, Method A, minimum 0.93 g/cm³.
 - .2 Melt index of resin: to ASTM D1238, Condition E, minimum 0.14 g/min.
 - .3 Thickness: to ASTM D1593, minimum 1.5 mm.
 - .4 Tensile strength and elongation at yield: to ASTM D638.
 - .1 Tensile strength: minimum 22 N/mm.
 - .2 Elongation: minimum 12%.
 - .5 Tensile strength and elongation at break: to ASTM D638:
 - .1 Tensile strength: minimum 40 N/mm.
 - .2 Elongation: minimum 700%.
 - .6 Tear resistance: to ASTM D1004, Die C, minimum 187 N.

- .7 Puncture resistance: to Federal Tests Methods Standards, USA, 101 B/2065; minimum 480 N.
 - .8 Low temperature brittleness: to ASTM D746, Procedure B.
 - .9 Brittleness temperature: to ASTM D1790.
 - .10 Carbon black content: to ASTM D1603, 2.0-3.0%.
 - .11 Geomembrane: free of striations, roughness, pinholes, bubbles, blisters, undispersed raw materials and any sign of contamination by foreign matter.
 - .12 Required physical properties may vary with type of Geomembrane material. Properties other than those listed above may be required.
- .3 Seams: welded in accordance with manufacturer's recommendations.
- .1 Physical properties for resin used for welding are same as those for resin used in manufacture of membrane.

PART 3 - EXECUTION

3.1 Examination

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geomembranes installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 Preparation

- .1 Geotextile fabric shall be prepared in accordance with Section 31 32 19.01 – Geotextiles prior to geomembrane installation.

3.3 Installation

- .1 Maintain area of installation free of water and snow accumulations.
- .2 Prepare excessively soft supporting material as directed by Departmental Representative.
- .3 Do not proceed with panel placement and seaming when ambient temperatures are below minus 5 degrees C or above 40 degrees C, during precipitation, in presence of excessive moisture (i.e., fog, dew), nor in presence of high winds.
- .4 Place and seam panels in accordance with manufacturer's recommendations on graded surface in orientation and locations indicated. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material.
- .5 Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.
- .6 Replace damaged, torn or permanently twisted panels to approval of Departmental Representative. Remove rejected damaged panels from site.
- .7 Keep field seaming to minimum. Locate field seams up and down slopes, with no horizontal field seam less than 1.5 m beyond toe of slope.
- .8 Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

- .9 Make field seam samples in accordance with requirements described in PART 2 on fragment pieces of geo-membrane and test to verify that seaming conditions are adequate.
- .10 Test field seams as seaming work progresses by non-destructive methods over their full length. Repair seams which do not pass non-destructive test. Reconstruct seam between failed location and any passed test location, until non-destructive testing is successful.
- .11 Repair minor tears and pinholes by patching until non-destructive testing is successful. Patches to be round or oval in shape, made of same geomembrane material, and extend minimum of 75 mm beyond edge of defect.

3.4 Protection

- .1 Do not permit vehicular traffic directly on membrane.

- END OF SECTION -

PART 1 – GENERAL

1.1 Related Sections

- .1 Section 01 35 32 - Site Specific Health and Safety Plan.
- .2 Section 01 53 00 – Mobilization and Demobilization.

1.2 Background

- .1 Remedial activities at the Ennadai Lake Former Weather Station may require the development of an ice aerodrome to transport equipment and materials on and off site. If an ice airstrip is used, it is estimated that 26 trips may be made each over the course of two winter seasons.
- .2 The site is located at approximately 61° 07' 51" N latitude and 100° 53' 14" W longitude.
- .3 The aerodrome will be needed to allow aircraft to safely use the ice surface for standard aircraft operations. The aerodrome will consist of three components (dimensions approximate):
 - .1 Ice runway (1600 m x 60 m).
 - .2 Ice Apron (100 m x 100 m).
 - .3 Ice access road (40 m wide, length to be determined).
- .4 Each component will be designed separately; however, all three components need to be incorporated into the aerodrome planning/construction. The layout of the ice aerodrome will be determined in consultation with the aircraft provider.
- .5 Ice airstrip construction must be built according to the Authority Having Jurisdiction and the company supplying the aircraft.

1.3 References

- .1 Transport Canada AC301-003, Ice Aerodrome Development – Guidelines and Recommended Practices. RDMIS No. 5210212 – V15, Effective Date 2011-11-07.
- .2 Government of Alberta, 2009, Best Practice for Building and Working Safely on Ice Covers in Alberta, published October 2009, Publication # SH010.

1.4 Definitions

- .1 Ice apron: An apron is an area off the runway reserved for loading and unloading aircrafts.
- .2 Ice engineering design and monitoring plan: The design of an ice aerodrome is based on operational requirements and certain material properties of the ice cover. The assumed material properties need to be verified through monitoring (see IMSP).
- .3 Ice Monitoring and Safety procedures (IMSP): An IMSP describes project specific on-ice monitoring procedures related to the design of and travelling & working safely on ice covers.
- .4 Lake survey: A lake survey consist of laying out and marking the boundaries of the ice aerodrome on the ice cover in consultation with the aircraft provider.
- .5 Ice profiling: Ice profiling involves the determination of ice and snow thicknesses and the quality of the ice cover within the marked area of the ice aerodrome.
- .6 Ice cracks: Ice cracks are part of an ice cover. Bad cracks are those that could initiate a potential breakthrough.
- .7 Freeboard (FB): FB of an ice cover is the distance between water level and the top of the ice surface in a hole drilled through the ice cover. In case of an unloaded ice cover the water level is below the ice surface.

1.5 Measurement For Payment

- .1 All costs associated with the planning, construction and maintenance of the Ice Airstrip is to be included in Items 01 53 00-1 Mobilization and 01 53 00-2 Demobilization and will not be measured separately.
- .2 Except as otherwise indicated herein, Work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this Work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 - PRODUCTS

2.1 Not Used

- .1 Not used.

PART 3 - EXECUTION

3.1 Planning

- .1 There are three components to planning:
 - .1 A strategy document for planning & executing the project.
 - .2 Guidelines for working safely on ice.
 - .3 Monitoring Plan for ice aerodrome during construction and operation.
- .2 Without limitation, the successful proponent will be required to provide services (personnel, equipment, supplies, and materials) to:
 - .1 Assess the location of the aerodrome for suitability and associated hazards.
 - .2 Obtain environmental data from the closest weather station including locally available ice and snow data.
 - .3 Develop an ice thickness design curve based on the data listed under 3.1.2.2.
 - .4 Obtain particulars of aircrafts and vehicles to be used on the ice.
 - .5 Prepare and submit an ice engineering design of the aerodrome to the Departmental Representative for review two (2) months prior to aerodrome construction start date.
 - .6 Develop and submit an Ice Monitoring and Safety Procedures (IMSP) for all work conducted on the ice and submit to the Departmental Representative for review two (2) months prior to aerodrome construction start date.
 - .7 Prepare an action plan for constructing and maintaining the aerodrome, including contingencies and submit to the Departmental Representative for review. The action plan will include lake surveys, proposed snow clearing, and ice thickening methods. The action plan to be submitted two (2) months prior to aerodrome construction start date.
 - .8 Develop a project schedule and submit to the Departmental Representative for review. It is recognized that the final schedule will depend on ice/weather conditions. This is to be submitted two (2) months prior to aerodrome construction start date. It is the Contractor's responsibility to report an updated schedule to the Departmental Representative.

3.2 Construction

- .1 Provide an Ice Engineering Professional to design the ice aerodrome and to oversee ice safety related matters, ice construction and operational activities. Responsibilities of the Ice Engineering Professional may include, but are not limited to, the following activities:

- .1 Implementing ice safety plans by providing on-ice safety training to on-site personnel prior to the commencement of on-ice activities.
- .2 Directing the ice aerodrome construction activities including initial ice cover hazard assessment, construction ice profiling, and operational ice profiling.
- .3 Monitoring and directing the repair of ice cracks.
- .2 Maintain and submit daily logs of all construction activities, including environmental conditions, ice build-up rates, freeboard measurements and snow/ice thicknesses to the Departmental Representative.

3.3 Maintenance

- .1 Provide an Ice Engineering Professional to oversee the all maintenance controls.
- .2 Maintain weekly logs of all maintenance activities that would include but not be limited to:
 - .1 Snow clearing: The aerodrome has to be cleared of snow in accordance with the IMSP and to the requirements of the aircraft provider.
 - .2 Cracks: Cracks in the ice need to be monitored and repaired-if required- in accordance to the IMSP.
 - .3 During operation, the aircraft provider may require a report describing the aerodrome condition prior to landing an aircraft.