Notice of Addendum STPA Form F 60800 (2008)

Sydney Tar Ponds Agency
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Telephone: (902) 567-1035

Date: April 3, 2009

To: ALL BIDDERS

Subject: Addendum #5

ADDENDUM # 5
Tender # STPA 2008S-23
TP6B SOLIDIFICATION & STABILIZATION AND CHANNEL CONSTRUCTION
for the Sydney Tar Ponds Agency

The following changes are to be noted in the document referenced above:

1) **SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS**

(a) Section dated February 25, 2009 (Addendum No. 3), page 1, clause 1.1.1.1, change the Closing Time to read "up to 2:00:00 pm, Atlantic time, on Thursday, April 30, 2009."

(b) Section dated February 25, 2009 (Addendum No. 3), page 1, clause 1.1.1.3, change to read as follows:

1.1.1.3 Offers will be opened at 2:30:00 pm, Atlantic time, on April 30, 2009 at the Agency Office.

2) **SECTION 00 41 43 – UNIT PRICE BID FORM**

(a) Section dated February 25, 2009 (Addendum No. 3), page 9, second paragraph, line 4, change "(April 22, 2009)" to read "(April 30, 2009)".

(b) Appendix C to the Bid Form – Special Prices, page 1, add new separate price as follows:

7. Odour Suppressant Foam Concentrate $ _____ / litre

Unit Price (_____ */100 Dollars)*

3) **SECTION 01 11 00 - SUMMARY OF WORK**

(a) Page 2, delete clause 1.2.6 in its entirety.

4) **SECTION 01 22 00 – MEASUREMENT AND PAYMENT**

(a) Section dated February 25, 2009 (Addendum No. 3), page 3, delete item 5. and replace to read as follows:

5. Dust, TVOC and Odour Suppression

Mitigative measures implemented to control the generation of dust, odour and VOC's will be measured for payment by the Lump Sum in the Works, separately from the detailed EPP in accordance with the drawings and specifications. This pay item will include all plant, labour and material, to carry out the mitigative measures as per the Environmental Protection Plan. This item also includes rental of foam unit and labour to apply. Reimbursement for usage of foam by liter of usage as per Section 00 41 43, Appendix C – Special Prices. Unit price to include all overhead and profit.

5) **SECTION 02 51 19 - IN-SITU S/S OF CONTAMINATED MATERIALS**

(a) Replace Section with new dated April 3, 2009. Attachment 001.

6) **SECTION 03 26 09 – PLACEMENT OF EXCAVATED S/S SEDIMENT**

(a) Add new section dated April 3, 2009. Attachment 002.

7) **SECTION 32 11 19 – GRANULAR SUB-BASE**

(a) Page 4, delete clause 3.4.1 and replace to read as follows:

3.4.1 Finished sub-base surface to the satisfaction of the Design Engineer but not uniformly high or low.

8) **SECTION 32 11 23 - AGGREGATE BASE COURSES**

(a) Page 1, delete clause 1.4.1 and replace to read as follows:

1.4.1 Deliver and stockpile aggregates in accordance with Section 31 05 17 - Aggregate Materials.

These changes require a revision to the Closing Date and Time to Thursday, April 30, 2009.

In your bid, please indicate that you have noted these changes by including the words "Includes Addendum # 005" on your *Bid Form*. If there is more than one (1) Addendum issued for this tender, please acknowledge each separately on your *Bid Form*.

Yours truly,

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Contract Manager
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ATTACHMENT 001

SECTION 02 51 19 – IN-SITU SOLIDIFICATION/STABILIZATION OF CONTAMINATED MATERIALS, DATED APRIL 3, 2009

PART 1 - GENERAL

1.1 Summary

.1 An in-situ solidification/stabilization (In-situ S/S) system shall be used which provides a safe, reliable method to treat contaminated sediment so that the treated material conforms to the Performance Requirements specified in this Section. Contractors are required to select the most appropriate In-situ S/S system for completion of the works and must provide details of the proposed system as per the Submittals described in this Section.

1.2 Related Sections

.1 Division 01 - General Requirements.

.2 Section 31 23 19 - Construction Water Management.

1.3 References

.1 The most recent version of the following publications are incorporated in this specification:
.1 ASTM C150-07, Standard Specification for Portland Cement.
.2 ASTM D1633-00 (2007), Compressive Strength of Molded Soil-Cement Cylinders.
.3 ASTM D5084-03, Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
.4 Modified EPA Method 1312, the Synthetic Precipitation Leaching Procedure (SPLP), utilizing a structural integrity procedure as per the British Columbia Regulation 63/88.
.5 Applicable environmental and health and safety laws and regulations for the Province of Nova Scotia, and the Cape Breton Regional Municipality.
.6 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

1.4 Definitions

.1 Bulking - the excess volume resulting from adding reagents to the in situ sediment, typically a mixture of sediment and reagents.

.2 Homogeneous Mixture - The column or cell of prepared reagents and contaminated sediment that have been thoroughly mixed together to create a solidified material that meets the Performance Requirements specified in this Section.

1.4 Definitions (Cont'd)

.3 In-situ S/S - In-situ solidification and stabilization.

.4 In-situ S/S Cell - Approximately 250m^3 of sediment.

.5 In-situ S/S Design Elevations:
.1 Top Elevation of Sediment - the elevation of the top of sediment as verified by field measurements and field surveys prior to disturbance of North or South Pond sediment or application of reagents.
.2 Bottom Elevation of Sediment - the elevation of the bottom of sediment as verified by field measurements prior to disturbance of sediment and the underlying soil.
.3 Underlying Material - material beneath North or South Pond sediment.

.6 Reagents - Cemetitious and/or non-cementitious additives mixed into the contaminated sediment to be treated to create a solidified/stabilized material meeting the established performance requirements

.7 Sediment - Sediment within the North or South Pond containing a mixture of water, solids and liquids contaminated with organic and inorganic compounds.

.8 Treatment Mix - In-situ S/S mix, the finalized mixture of reagents and contaminated sediment in proportions established by the Contractor.

.9 Debris - solid, non-organic material that is neither sediment, soil nor rock and is not naturally occurring. It may be defective or otherwise not usable for its original purpose and it may be the remains or fragments of manufactured material.

.10 Oversize Material - When the total sediment thickness is less than one (1) metre, material that exceeds 200 mm in any dimension is to be considered as oversized material. When the total sediment thickness is one metre or more, material that exceeds 400 mm in any direction is to be considered as oversized material. In addition material exceeding the dimensions described in previous sentences will only be considered oversize if they cannot be incorporated into the S/S process due to interference with the S/S mixing process or the quality of the final product.

.11 Contaminated Material - Exhibits visible or ordourous characteristics of contaminated (e.g. coal tar, hydrocarbon odour) or is covered in soil that was unearthed in a location of known contamination. Contaminated material does not have to meet the

1.4 Definitions (Cont'd)

.11 (Cont'd)
criteria of Class 6 Hazardous Waste. All debris from the Tar Ponds is to be considered as contaminated material.

1.5 Submittals

.1 An In-situ S/S Work Plan shall be included as part of the Bid Submittal. The Work Plan shall address the technical requirements listed in this section and shall include, but is not limited to the following:

.1 Contractor Experience: Information to demonstrate that the S/S Contractor meets the qualification requirements outlined in this section.

.2 Treatment Mix Design: The proposed mix design and method of mixing to be used in treating the unamended material (See Clause 1.11), including certified laboratory results detailing that the treatment mix design meets the performance criteria of UCS, hydraulic conductivity and leachate.

.3 Equipment: Specifications for the proposed homogenization and mixing equipment, batching equipment and process control instrumentation. Process flow diagrams, mixing times, and processing rates shall be included. Any anticipated pretreatment of the unamended material shall be identified.

.4 Drawings: Drawings indicating dimensions and layout of the S/S system on the site. Drawings shall be to scale.

.5 Emissions: Air emissions, dust, odours and noise from the system shall be identified and estimated. Control systems required to maintain compliance with site, local, provincial and federal regulations shall be described as appropriate.

.6 Quality Control: A quality control plan which complies with the Design Engineer QCP in Appendix C and addresses control and documentation of batch proportions, mixing time, mixing speed, sample collection and frequency, sample curing, and post-treatment testing.

.7 Materials: Describe procedures for delivery, storage and management of all S/S reagents/additives or treatment material including any water used in the S/S process.

.8 Sampling:

.1 Describe means and methods by which Contractor will obtain samples for QA/QC testing of treated sediment. Samples to be collected at various depth to be determined by the Contractor's QC on-site representative.

.2 Describe the protocol for field measurement to determine the Bottom Elevation. Protocol will be approved by the Design Engineer as part of the S/S work plan.

1.5 Submittals (Cont'd)

.1 (Cont'd)

.9 Table of Contents for the Daily and Weekly Work Summaries.

.10 Monolith protection means and methods as per clause 1.13.1.

1.6 Project Reporting

.1 The following shall be submitted in accordance with contract documents.

.1 Project Data, Work Plan, Contractor, Quality Control Tests, and Material Safety Data Sheets for all amendment materials.

.2 Key Personnel: Resumes of key personnel shall be submitted to the Design Engineer at least 5 working days prior to the personnel assuming duties on site.

.3 Daily Reports: Contractor to provide daily reports in accordance with the TP6B QCP, Section 5.2), which includes submittals to the Design Engineer during the Work summarizing the following minimum information in a format acceptable to the Design Engineer:

.1 In-situ S/S Cell or Column Information:

.1 In-situ S/S Cell Reference Number (referenced to a drawing showing location of cell or column)

.2 Cell or column location and coordinates

.3 Dimensions of cell or column and volume of contaminated material treated (geodetic datum, ATS 77).

.4 Top elevation of cell or column (prior to and following treatment relative to geodetic datum).

.5 Actual depth of In-situ S/S treatment (to geodetic datum). Minimum of three point elevations are required to establish "bottom" and "top" elevations.

.6 In-situ S/S Cell sediment density (prior to addition of reagents).

.2 In-situ S/S Cell Processing Information:

.1 Date.

.2 Start and finish time of mixing for each In-situ S/S Cell.

.3 Mix design calculations including quantities of reagents used during the In-situ S/S work.

.4 Equipment used.

.5 Any unforeseen site conditions or equipment problems that affected treatment efforts.

.6 Total volume of water treated/discharged along with any testing results.

1.6 Project Reporting (Cont'd)

.3 Daily Reports:(Cont'd)
.2 (Cont'd)
.7 The quantity of oversized material removed and disposed of.
.8 Any modifications or deviations from the Specifications and Drawings or the Technical Work Plan.
.9 Daily batch proportion and mixing quality control data.
.10 The volume and source of water added.
.3 Daily Work Summaries will be submitted by noon the next operating day.
.4 All QC testing information will be included in the daily report for the day the samples were collected and on the day the results were received by the Contractor. Results will be listed if received, or noted as pending.

.4 Weekly Reports: Contractor to provide weekly reports in accordance with the Design Engineer QCP (Section 5.3), which includes submittals to the Design Engineer during the Work summarizing the following information as a minimum:
.1 Total quantity of sediment solidified for the week (cubic metres) and surface area(s) treated.
.2 Quantities of reagents used during the week.
.3 Quantities of reagents delivered to the site during the week with backup in the form of weight receipts, or equivalent.
.4 Total weight (metric tonnes) of debris transferred off-site to the TP2 Materials Storage & Handling facility.
.5 Percent complete for In-situ S/S treatment operations.
.6 Treatment progress schedule.
.7 Any modifications to the project schedule based on the weekly production.
.8 Bulking handling methods and quantities managed.
.9 Wash out and reagents disposal and handling methods and quantities managed for the week.
.10 Records of calibration.
.11 Site plan showing completed cell locations.
.12 Summary of all QC testing conducted during the week.
.13 Weekly reports will be submitted by Tuesday noon of the following week.

.5 Certificates: Additive composition, certificates of analysis and MSDS documentation are to be provided to the Design Engineer. A confidentiality agreement may be requested if proprietary additives are being used.

1.6 Project Reporting (Cont'd)

.6 Contractor shall create and submit a template form acceptable to the Design Engineer detailing the calculation of minimum reagent proportions for the following parameters:
.1 The volume of material (in cubic metres) to be treated in an established In-situ S/S Cell.
.2 The weight (in metric tonnes) of material to be treated based on the calculated volume and the unit density of the material. The average density of the contaminated sediment should be calculated for every treatment cell prior to reagent addition.

.7 All data collected are to be in formats suitable for use with standard Geographical Information Systems (GIS), specifically the formats used by the PWGSC. Refer to the Agency's draft document entitled Data Collection and Reporting Geographical Information System Format Requirements. Coordinates to be collected in ATS 77 reference frames.

.8 Electronic copies of all submittals will be provided according to the following specifications:
.1 Reports in Adobe Portable Document Formats (PDF) Version 6 or greater
.2 All reports, drawings, spreadsheets, field notes, etc, can be developed separately in their native programs such as MS Word, MS Excel, GINT, AutoCAD, etc. provided the software is compatible with Adobe.
.3 Images, drawings, etc. are to be `printed' as PDF where possible and inserted in to PDF report document.

.9 In addition to figures being embedded in the PDF version of the submittals, the data from all figures shall be submitted separately meeting the following criteria. The intent is to accomplish two requirements, first to be able to reproduce a figure easily in its entirety within the GIS, and second to incorporate the geo-referenced data such as points, lines, and polygons, into the mapping database of the GIS.
.1 Figures produced entirely within AutoCAD shall meet the following conditions:
.1 Figures to be in AutoCAD DWG format.
.2 AutoCAD version must be prior to R2005. R14, R2000, R2002, etc. are acceptable.
.3 A single DWG file with different layouts corresponding to the different Figures is preferred.
.4 If a single DWG file is used, each significant figure item must be on a different layer, i.e. Site Location Plan, Cell Outline,

1.6 Project Reporting (Cont'd)

.9 (Cont'd)
.1 (Cont'd)
.4 (Cont'd)
Channel Design, Surface Water Flow indicators, etc.
.5 Layer names must be easily recognizable and follow the CAD standard issued for the STPA or the US national CAD Standards.
.6 AutoCAD blocks are to be used where needed.
.7 Use a standard AutoCAD Font.
.8 The ATS77 Zone 4 coordinate system must be used as Model space to allow seamless integration of the data into the GIS.
.9 The coordinate system and ATS Zone 4 of the drawing must be identified within the Figure, usually on the North Arrow.

.10 Monthly Reports: Contractor to provide monthly reports in accordance with the Design Engineer QCP, Section 5.4).

.11 Final Report: Contractor to provide a final report in accordance with the Design Engineer QCP, Section 5.5).

1.7 Qualifications

.1 Contractor shall have successfully completed at least five (5) In-situ S/S projects of comparable complexity and comparable size, in accordance with local, provincial, federal or international requirements using a proven system.

.2 The site superintendent shall have at least 15 years construction experience with 5 years in the S/S industry. Supervisory staff shall have at lest 10 years construction experience and 5 years in the S/S industry. Other key personnel (Project Manager, Quality Control Supervisor and Technical Leads) shall have demonstrated S/S field experience.

1.8 Performance Requirements

.1 The In-situ S/S treated sediment from each In-situ S/S cell shall meet the Performance Requirements outlined in this Section.

.2 The 28 day unconfined compressive strength (UCS) shall be not less than 0.17 MPa (25 psi) for any single test result.

.3 The 28-day hydraulic conductivity shall not be greater than $1x10^{-6}$cm/s for any single test result.

1.8 Performance Requirements (Cont'd)

.4 The following testing parameters will be required for the hydraulic conductivity test:

.1 The hydraulic gradient shall be a maximum of 20.

.2 The B-value will be a minimum of 0.95.

.3 The confining pressure utilized will be 3 psi with the use of vacuum grease, or 5 psi with no use of vacuum grease.

.5 Pre-treatment and Post-treatment leachate testing shall be conducted for all analytes listed in the following table. Post-treatment leachate sample results must not exceed lower of the SSLC Derived from Ecologically Based Criteria in the table and pre-treatment leachate concentration X500 criterion as described in the notes following the table.

Parameter	**SSLC Derived from Ecologically Based Criteria** (ug/L)
Modified TPH (Tier1)	50000
Aluminum (Al)	Not Available
Antimony (Sb)	50000
Arsenic (As)	50000
Barium (Ba)	50000
Beryllium (Be)	50000
Boron (B)	Not Available
Cadmium (Cd)	1600
Chromium (Cr)	50000
Cobalt (Co)	Not Available
Copper (Cu)	Not Available
Iron (Fe)	Not Available
Lead (Pb)	9000
Lithium (Li)	Not Available
Manganese	Not Available
Mercury (Hg)	14000
Molybdenum (Mo)	Not Available
Nickel (Ni)	50000
Selenium (Se)	50000
Silver (Ag)	540
Strontium (Sr)	Not Available
Thallium (Tl)	50000
Tin (Sn)	Not Available
Uranium (U)	Not Available
Vanadium (V)	50000
Zinc (Zn)	50000
1-Methylnaphthalene	Not Available
2-Methylnaphthalene	50000
Acenaphthene	50000
Acenaphthylene	25000
Benzo(a)anthracene	50000
Benzo(a)pyrene	50000
Benzo(b)fluoranthene	50000
Benzo(g,h,i)perylene	14000
Benzo(k)fluoranthene	50000
Chrysene	50000
Dibenzo(a,h)anthracene	29000
Fluoranthene	50000
Fluorene	25000
Indeno(1,2,3-cd)pyrene	50000
Naphthalene	50000
Perylene	Not Available
Phenanthrene	50000
Pyrene	16000
Total PAH	50000
Total PCB	10000

1.8 Performance Requirements (Cont'd) (Cont'd)

NOTES:

1) The value in the table is based on the most conservative of the ecologically based MCP GW-3 standard and the 50,000 ug/L ceiling value defined by MCP GW-3.

2) Where MCP GW-3 criteria are not available, criteria are based on pre-treatment leachate (SPLP) concentration. The post-leachate concentration must not be more than 500X the pre-treatment leachate concentration.

3) Contractor must establish 500X pre-treataement leachate value for all parameters in the table. The most restrictive of the 500X pre-treatment leachate value and the MCP GW-3 criteria provided in the table will be applied as the post-treatment leachate criteria.

1.9 Equipment

.1 Mixing Equipment: The mixing equipment shall have a minimum capacity adequate to meet the performance and schedule requirements.

.2 Reagent Feed Units / Reagents Mixing Plant: Satisfactory means of incorporating, weighing or metering measurement shall be provided to separately batch the required amount of each reagent. If silos and/or feeders are used, they shall be equipped and operated so that no caking of material or variation in feed occurs. Provision shall be made so that each reagent can be easily sampled.

.3 Accuracy of Measurement Equipment: Scales, meters, and volumetric measuring devices used for measuring contaminated material, reagents, and/or water for In-situ S/S processing shall be accurate to plus or minus 0.1 percent of the quantity being measured. Records of calibration shall be submitted to the Design Engineer within 24 hours of calibration testing.

.4 Positioning Mixing Head Equipment: If the Contractor uses mixing head equipment install and operate vertical and horizontal positioning equipment (mixing head coordinate system monitor) suitable to position mixing head within 0.05m of target location (vertically and horizontally). Provide records of mixing depths and lateral mix extents for each

1.9 Equipment (Cont'd)

.4 Positioning Mixing Head Equipment:(Cont'd) treatment cell, or any part thereof, of in-situ sediment.

1.10 Scheduling

.1 Contractor to ensure scheduled work activities will meet overall project milestones as per schedule. In-situ S/S for the construction of the channel to be given schedule priority of S/S of the rest of the phase to facilitate water conveyance.

1.11 Treatment Mix Designs

.1 Contractor shall perform mix design studies prior to award of the Contract to determine the "Treatment Mix Design(s)" to be used for treatment to meet the established Performance Requirements outlined in this Section.

.2 Contractor may use data from bench scale and pilot scale studies to support the selection of their treatment mix design.

.3 Contractor shall provide a report detailing the proposed Treatment Mix Design(s) in writing to the Design Engineer as part of the Bid Submittal. The report is to include laboratory reports from a certified laboratory.

.4 Contractor shall not modify the approved Treatment Mix Design(s) without prior written approval from the Design Engineer.

1.12 As Builts

.1 Contractor to provide as built survey of the monolith for each work area at the end of each phase. The as builts are to conform to acceptable tolerances to the satisfaction of the Design Engineer.

1.13 Coordination with TP7 Surface Cap

.1 The top elevation for the in-situ S/S monolith in order to meet the requirements of TP7 Surface Cap is as per the drawings. Volume expansion to ensure compliance is to be managed by the Contractor. Protection of the monolith against abrasion and degradation from weather or climatological activity and construction activity until installation of the grading layer under TP7 is the Contractor's responsibility. Contractor means and methods are to be described in their Technical Submission (Envelope A).

PART 2 - PRODUCTS

2.1 Materials

.1 Water:

.1 For wet slurry reagents designs, the Contractor shall provide a means of measuring water for batch mixing. The measuring device shall measure total and instantaneous flows. Non-contaminated water is to be used for the treatment mix. Decontaminated water from TP2 can be used as "makeup water" for S/S work.

.2 For dry reagent application, surface water can be utilized if required.

.3 Contractor shall provide and maintain all pipes and hoses used to connect the reagents mixing plant to the water supply source and all reagents supply lines to In-situ S/S Cells.

.4 If water for In-situ S/S is stored on the site, storage containers shall be free of any waste materials, debris, and other items that may be deleterious to the execution of the In-situ S/S process.

.2 Reagents:

.1 Contractor shall provide mix reagents required to solidify/stabilize the sediment as per the Design Engineer-approved Treatment Mix Design.

.2 Contractor shall coordinate the delivery, handling and storage of all reagents required for the Work. Reagents shall be shipped in properly labeled containers with instructions for handling and storage. The instructions shall be strictly adhered to.

.3 Contractor shall, at all times, maintain an adequate quantity of reagents on-site so that the Work is completed without delay.

.4 Contractor shall provide all equipment, materials, and personnel needed to properly prepare the reagents in accordance with the Design Engineer-approved treatment mix design and these specifications. Reagents mixing and pumping equipment will be of size and capacity as to not limit the production of the In-situ S/S mixing equipment.

.5 Containers or storage locations for reagents shall be protected from precipitation, moisture, and other potential deleterious events.

.6 Containers for reagent storage shall be equipped with proper labeling as per supplier's requirements, and the Contractor shall maintain on-site material safety data sheets (MSDS) for all reagents.

.7 Reagents shall be delivered in a dry (pneumatic) form.

2.1 Materials (Cont'd)

.2 Reagents:(Cont'd)

.8 Periodically, the Design Engineer will visually inspect each batch of mixed reagents to ensure that the reagents have been sufficiently mixed prior to addition to the sediment. The Contractor shall continue to mix reagents until it is thoroughly mixed to the satisfaction of the Design Engineer.

.9 Processed wet reagents held for greater than 3 hours prior to use shall be discarded off-site at the Contractor's expense.

.10 Contractor shall be responsible for any costs of reagents used due to waste or over-application.

PART 3 - EXECUTION

3.1 Weather Conditions

.1 The Contractor is permitted to work in weather conditions it finds suitable to produce treated sediment that meets required performance criteria.

.2 Contaminated sediment shall not be treated if it contains any frozen material unless approved by the Design Engineer. The Contractor's schedule should take into consideration allowances for weather conditions considered typical for the area.

3.2 Management of Oversized Material

.1 Oversized material and debris will be managed in accordance with the EPP.

.2 The standard procedures do not include combing or other methods as part of the treatment procedure. Debris as encountered will be incorporated as part of the mixture.

.3 Remove and take to the TP2 Facility for decontamination and disposal by others.

.4 All other material or debris encountered that is outside of the definitions will be assessed by the Design Engineer and handled in an appropriate manner.

3.3 Construction Water Management

.1 Contractor to progressively decant standing water over sediment throughout the contract as per Section 31 23 19 and the Detailed EPP.

.2 Contractor to remove standing water over South and North Pond sediment to undertake

3.3 Construction Water Management (Cont'd)

.2 (Cont'd) solidification/stabilization work in accordance with the Detailed EPP and Section 31 23 19.

3.4 In-situ S/S Methodology

.1 Water and/or reagent addition shall be in general accordance with the ratios defined in the Design Engineer-reviewed Treatment Mix Design(s) developed by the Contractor prior to award. Contractor shall minimize the water ratio to maximize strength of the final material and minimize bulking. During the conduct of the work, any change in mix design required to meet performance requirements shall be submitted in writing to the Design Engineer for review and approval before implementing change. Approval of change in mix design does not establish a basis for an increase in Contract Price.

.2 Contractor shall provide all personnel, equipment and materials required to conduct the Work identified in these specifications.

.3 Contractor shall provide sufficient quantities of reagents on-site to maintain the required production rate(s).

.4 The estimates of Top Elevation of Sediment and Bottom elevation of Sediment are provided on the Drawings based upon a sparse data set and are for general information only. Contractor to make specific measurements at all locations where mixing is to occur. Contractor shall assess volumes of each point of mixing by verifying top of sediment and bottom of sediment.

.5 The Design Engineer and Contractor shall jointly agree on the depth area and volume of each treatment cell prior to mixing. In the instance of a disagreement, the Design Engineer will make the final determination.

.6 Contractor shall ensure that the reagents are distributed evenly throughout the cell or column and that the reagents and contaminated sediment is a homogenous mixture meeting the requirements of this Section.

.7 Prior to the addition of mix reagents, the Contractor will remove oversize material as per clauses 1.4.10 and 3.2 of this Section. No adjustment in agreed volume of In-situ S/S material will be made to account for removed material.

3.4 In-situ S/S Methodology (Cont'd)

.8 Completion of In-situ S/S operations shall be conducted in a manner to solidify/stabilize the entire area and provide an overlap of a minimum of 300 mm between adjacent cells or columns so that no material is untreated. Ensure no untreated sediment remains along boundaries of In-situ S/S Cells.

.9 Immediately following mixing operations, samples will be collected from each treated In-situ S/S Cell to demonstrate treated material meets Performance Requirements of this Section.

.10 Contractor may collect additional samples at the same time and location of the original QA and QC samples for each In-situ S/S Cell if it so chooses. Contractor is encouraged to collect additional samples to verify situations where cells fail to meet Performance Requirements, or Quality Assurance requirements.

.11 All sampling and testing will be subject to Quality Control and Quality Assurance requirements of this Section.

.12 The Design Engineer may require additional sampling during the course of the project. Contractor to provide equipment, materials and labour necessary to assist Design Engineer collect samples.

.13 Before proceeding onto previously In-situ S/S treated material, Contractor to demonstrate to the satisfaction of the Design Engineer that In-situ S/S equipment can safely move onto and correctly operate over these treated areas. Contractor to demonstrate to the satisfaction of the Design Engineer that material will not be damaged by loads (cracking of In-situ S/S mass) imposed by driving or operating heavy equipment over In-situ S/S treated material.

.14 Treated material supplied to the QA and QC geotechnical laboratories by the Contractor for sample preparation purposes, as well as tested material may be reincorporated into the North or South Pond.

3.5 Dust, TVOC, and Oudour Suppression

.1 All dust, VOC and odour control is to be conducted in accordance with Section 01 35 43, Environmental Procedures, specifically Articles 1.12, Dust and Particular Control, and 1.13 Pollution Control.

3.6 Quality Control

.1 The Contractor is responsible for collecting and testing In-situ S/S Treated samples to demonstrate Performance Requirements described in this Section have been met. Contractor to submit all test results to Design Engineer within 48 hours of receipt of test results.

.1 For purposes of defining the frequency of QAQC samples, an in situ cell is assumed to be approximately 250m^3 of sediment. In order to quantify QAQC sample frequency if the cell size varies from 250m^3 of sediment, an elaboration of this definition is provided. If the volume of sediment treated by any one crew in one day is less than 250m^3 of sediment, the volume constitutes a cell and must be sampled for QA/QC. If the volume of sediment treated by an one crew in one day is more than 250m^3 but less than or equal to 500m^3 of sediment, the volume treated constitutes two cells and QA/QC samples must be obtained for two cells at the frequency specified in Paragraph 3.6.2. If the volume of sediment treated by an one crew in one day is more than 500m^3 but less than or equal to 750m^3, the volume treated constitutes three cells and QA/QC samples must be obtained for three cells. The Contractor is advised that additional QA/QC samples will be collected in accordance with this schedule for volumes over 750m^3.

3.6 Quality Control (Cont'd)
(Cont'd)

.2 The Contractor shall implement quality control tests as follows:

Test Type	Standard/ Method	QC Frequency	Testing Period
Unconfined compressive strength	ASTM D1633 Method B	2 per cell ($\sim 250 m^3$) as per clause 3.6.2.1	at 28 days
Hydraulic Conductivity	ASTM D5084	1 per cell ($\sim 250 m^3$) as per clause 3.6.2.1	at 28 days
Leachate, for PCBS, PAHS, Metals Mercury, Atlantic RBCA Tier 1	Modified SPLP 1312, utilizing a structural integrity procedure (SIP) as per the British Columbia (BC) Regulation 63/88.	as per table in clause 3.6.2.1	after 28 days

3.6 Quality Control (Cont'd)

.2 (Cont'd)

.1 The QC testing frequency shall be as follows:

Cell Depth and Sample Frequency

Test	Cell Number	Sediment Less Than 2 Metres Thick	Sediment Greater Than 2 Metres Thick
Unconfined compressive Strength	All Cells	2 finite location homogeneous samples	1 homogeneous sample collected from the upper zone & 1 homogeneous sample collected from the lower zone
Hydraulic Conductivity	All Cells	1 composite sample created from the two collected for UCS testing	1 composite sample created from the upper and lower zone samples collected for UCS testing
Leachate	1 through 20	1 composite sample created from the two collected for UCS testing	1 composite sample created from the upper and lower zone samples collected for UCS testing
	21 through 41	1 composite sample created from the two collected for UCS testing from every other cell	1 composite sample created from the upper and lower zone samples collected for UCS testing from every other cell
	42 and above	1 composite sample created from the two collected for UCS testing from every 4th cell	1 composite sample created from the upper and lower zone samples collected for UCS testing from every 4th cell

3.6 Quality Control (Cont'd)

.2 (Cont'd)

.1 (Cont'd)

Note: 1) Pre-treatment sample collection for leachate analysis is required for comparison to post-treatment leachate concentrations as per clause 1.8.5. Pre-treatment samples should be collected from similar composite locations prior to the addition of reagents.

2) Upper zone refers to the top 1/3 of sediment thickness. Lower zone refers to the bottom 2/3 of sediment thickness.

.3 The Design Engineer or another party hired by the Agency may conduct audits of the Contractors laboratories to verify testing is being completed in accordance with Standards and requirements specified in this Tender Document.

.4 If any one UCS, hydraulic conductivity or leachate result fails to achieve Performance Requirements established in this Section for a specific In-situ S/S Cell, and where the Contractor has obtained and cured additional In-situ S/S treated sediment samples from the same specific In-situ S/S Cell, the additional samples can be tested for the failed parameters after additional curing time. The maximum additional curing time will be 56 days after the sample was collected. Where the results of the first round of testing indicate Performance Requirements are not achieved, the test results will be disregarded and the second round test results utilized for both the calculation/verification of the individual In-situ S/S Cell, and the overall performance of the total In-situ S/S North or South Pond sediment. In-situ S/S cells that do not meet the Performance Requirements after additional curing time shall be reprocessed by breaking up sediment/reagents mixture, re-treating, re-sampling and re-testing at the Contractors expense until the cell meets the Performance Requirements.

.5 Where the Quality Assurance tests conducted by the IQAC show In-situ S/S Treated material does not meet Performance Requirements of this Section, the Contractor shall do one of the following:

.1 Where Contractor has additional samples of correctly cured In-situ S/S treated material, the Contractor will test these samples for the failed parameter(s) to verify In-situ S/S treated material

3.6 Quality Control (Cont'd)

.5 (Cont'd)
.1 (Cont'd)
meets Performance Requirements as per clause 3.6.4 of this Section.
.2 Where no additional samples have been archived by the Contractor, the In-situ S/S Cell will be rejected, and the In-situ S/S Cell shall be broken up, and retreated with the In-situ S/S reagents and tested at no cost to the Agency.

.6 A minimum of two (2) cylinders will be tested for each UCS sample collected. All test results will be reported.

3.7 Quality Assurance

.1 The Agency will retain the services of an Independent Quality Assurance Consultant (IQAC) to provide independent testing and inspection services. Contractor shall make allowances for sampling and testing by IQAC personnel in both its production opeations and schedule.

.2 The IQAC will collect Quality Assurance samples from In-situ S/S Treated material at its discretion throughout the work. Samples are to be collected at the same time and location as the QC samples.

.3 The IQAC will return In Situ S/S treated and tested sample material to the Contractor for disposal.

.4 The IQAC will:
.1 Collect and test In-situ treated material for UCS, permeability and leachate in accordance with clause 3.6.2 of this specification at a frequency of not less than 10 per cent of the Contractor QC frequency. Samples are to be collected at the same time and at the same location as QC samples.
.2 Collect and Test reagent water as specified in clause 2.1.1 for PAH, hardness and dissolved solids.
.3 Inspect each initial delivery of each mill run for each reagent for compliance.

.5 In accordance with clause 3.6.4, additional QA samples can be tested for the failed parameters after additional curing time. The maximum curing time will be 56 days after the sample was collected.

.6 Environmental testing and inspection will be conducted in accordance with the Environmental Testing and Inspection section of the of the Independent Quality Assurance Plan (IQAP).

3.7 Quality Assurance (Cont'd)

.7 The IQAC will report the results of tests and inspections in accordance with the scope of the Independent Quality Assurance Plan (IQAP).

.8 The IQAC will attend meetings on-site and at Agency offices and comply with the requirements of the scope of the Independent Quality Assurance Plan (IQAP).

END

ATTACHMENT 002

SECTION 03 26 09 – PLACEMENT OF EXCAVATED S/S SEDIMENT
DATED APRIL 3, 2009

PART 1 - GENERAL

1.1 Summary

.1 This specification addresses reuse of Excavated Tar Pond S/S Treated Sediment (herein referred to as Excavated S/S Sediment) following in situ treatment to meet performance criteria as specified elsewhere in these Technical Specifications.

1.2 Intent

.1 The intent is to identify minimum requirements that the Contractor will have to meet if excavating Tar Ponds S/S Sediment post-treatment for re-use on site.

1.3 Definitions

.1 Excavated S/S Sediment. S/S Treated Sediment which has passed the performance specifications of Section 02 51 19 and subsequently must be excavated to achieve lines and grades established for this project.

.2 Unrestricted Placement. Placement above or below the water table within the lines and grades established for this project. For unrestricted placement, excavated S/S Treated Sediment must be retreated as necessary to meet UCS and hydraulic conductivity criteria consistent with test methods and criterion specified in Section 02 51 19 in the final placement location.

.3 Restricted Placement. Placement above the water table within the lines and grades established for this project. For restricted placement, excavated S/S Treated Sediment must meet the specified backfill and compaction criteria of this Section.

1.4 Related Sections

.1 Section 02 51 19 In-situ S/S of Contaminated Materials

.2 Section 02 51 20 Channel Construction

.3 Section 31 05 17 Aggregate Materials

.4 Section 31 23 10 Excavation Backfilling Trenching

.5 Section 31 05 19 Corrected Dry Density for Fill

1.5 References

.1 ASTM D1586-08a, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils.

.2 ASTM D6938-08a, Standard Test Method for In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth.)

.3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregate.

1.6 Submissions

.1 SS Treated Sediment for Unrestricted Placement Performance testing data per Specification 02 51 19: In-situ S/S of Contaminated Material consistent with testing frequency requirements cited therein.

.2 SS Treated Sediment for Restricted Placement

.1 Provide test pad results demonstrating the following:

.1 Dry density as a function of lift thickness and number of compactor passes.

.2 Bearing capacity based on SPT results using a criterion approved by the Design Engineer. Minimum acceptable bearing capacity must exceed 140 kPa which correlates approximately to SPT N = 7 at depth.

.2 The Contractor submittal response will establish the minimum acceptable requirements for compaction in terms of compactor size, lift thickness, and number of passes based on test pad results. The Design Engineer will process the submittal in accordance with Construction Oversight Procedure No. 2.11.

.3 The compaction standard for compliance with this Section shall be demonstrated by lift thickness not exceeding and roller passes not less than those determined during the test pad demonstration.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 Excavated S/S Sediment for Unrestricted Placement

.1 Following excavation, the Contractor shall retreat sediment as necessary to meet performance requirements as outlined in in Section 02 51 19 for UCS and hydraulic conductivity criteria consistent with test methods and criteria established in Section 02 51 19 In-situ S/S of Contaminated Materials. The frequency of demonstration that performance criteria are met shall be the same as outlined in Section 02 51 19.

3.2 Excavated S/S Sediment for Restricted Placement

.1 Test Pads: A test pad must be constructed for every 10,000m^3 of excavated S/S material intended for restricted placement or more frequently at the request of the Design Engineer. A separate test pad will also be required to qualify each type of compaction equipment used on the project. More frequent test pad construction will be determined by the Design Engineer on the basis that the material properties affecting compaction substantively changed. The Contractor is not entitled to additional reimbursement for construction and testing of additional test pads.

.1 All test pads are to be constructed under the oversight of the Design Engineer. Test pads are constructed to determine the minimum acceptable performance requirement for compaction (i.e. maximum acceptable lift thickness and the minimum number of compactor passes).

.2 Post-excavated material must have no particle greater than 200mm in any one dimension and 95% of the material must pass the standard sieve size of 50mm.

.3 A test pad must be a minimum of 200m^2. Test pads should permit the compactor to achieve normal operating speed while on the test pad.

.4 Test pad construction must include measurement of in-place dry density and number of passes of the compactor. A minimum of three measurements shall be made for each compactor pass for each lift. No test data will be accepted if collected outside the oversight of the Design Engineer. One test pad must consist of at least three lifts of equal thickness of 300mm. Test pad to be constructed such that each lift is compacted to the same density, plus or minus 2 percent. The Contractor may build additional test pads using different lift thicknesses if a greater lift thickness is desired for construction.

3.2 Excavated S/S Sediment for Restricted Placement (Cont'd)

.1 Test Pads:(Cont'd)

.5 The compactor used should be equivalent to a CAT 563 series or greater operated in vibratory mode unless otherwise approved by Design Engineer. A minimum of 5 passes of the compactor shall be performed for each lift on any pad constructed. Should the Design Engineer request additional compactor passes, the contractor must perform additional passes.

.6 Following test pad completion, Standard Penetration Testing (SPT) shall be completed at locations where density measurements were conducted on the final lift. SPT data shall be collected continuously for the entire thickness of the test pad at each location. No test data will be accepted if collected outside the oversight of the Design Engineer.

3.3 Processing of Materials

.1 Following excavation, the Contractor must ensure S/S Sediment contains no particles greater than 200 mm and 95% of the particles must pass the 50mm sieve based on submission of results of at least one test sample performed in accordance with ASTM C136-06.

.2 All stockpiled material must be managed to prevent degradation of the environment resulting from the materials. The Design Engineer may request additional protection measures if deemed necessary to protect the environment.

.3 The Contractor may be required to resize S/S Sediment if, after exposure to the weather, the maximum particle size appears greater than 200mm.

3.4 Placement of Material

.1 Prior to placement, the Contractor shall establish the grade elevation to verify material placement is above the water table.

.2 S/S Sediment shall then be placed according to the approved compaction standard identified in section 1.6.2 to form a stable and dense fill. All placement activities shall be performed under the inspection of the Design Engineer. The Design Engineer may request additional compaction if it is warranted based on in place density measurements and/or visual observation.

3.5 Quality Control Testing

.1 The Contractor shall implement quality control control tests during test pad construction as follows:

Test Type	Standard/Method	QC Frequency
In-place Density	ASTM D6938-08a	3 measurements per pass/lift
Standard Penetration Test	ASTM D1586-08a	3 per test pad
Sieve Analysis	ASTM C136-06	1 per test pad

.2 The Contractor shall implement quality control tests during reworked material placement as follows:

Test Type	Standard/Method	QC Frequency
Roll passes	Visual	Continuous

END