

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

The Consultant should indicate the tasks and man-hour schedule to perform the above contract tender support activities, as the Regions are prepared to provide this cost times the number of contracts issued should the Regions choose this option if the number of contracts is greater than five (5) for each project. If the Consultant(s) fails to provide these tasks separately, then it shall be taken to mean that the Consultant(s) has included these services in their Grand Total Upset Fee Limit.

4.7.14 Construction Contract Administration and Resident Inspection

The Consultant is to develop the Construction Administration Plan based upon the final staging of the construction, but no later than at the 90% completion stage. The Construction Administration Plan is to address how the following items are to be managed:

- Shop drawing review process
- Quality Assurance/Quality Control
- Construction Contract Administration
- Construction site supervision/inspection
- Conflict Resolution
- Specialty Inspection/Testing
- Payment Certificates
- Contract Change Order procedures
- Request for Information (RFI) coordination and handling
- Coordination with existing plant facility and staff
- Record Drawings
- Deficiencies
- Warranties and Guarantees
- Commissioning
- Staff Training
- Operation and Maintenance Manuals

The Consultant(s) shall be required to provide, as a minimum all of the following services during the construction period:

- Provide resident inspection services during the construction period. This will include on-site inspection staff as agreed appropriate by the Regions to ensure that the construction contract(s) will be executed in accordance with the construction drawings, specifications and general intent of the project.
- For the purposes of this RFP, the Regions are requesting the Consultant(s) to identify this task, separately in each phase of the task, man-hour fee schedule and include in their proposal, the following:
- Design a permanent site office building suitable to house the project management team plus the resident site staff for each of the two projects with a conference room, shower and washroom facilities.

If, for feasibility reasons, this option is not implemented, then the Regions reserve the right to delete this portion of work from the Consultant(s)'s agreement.

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

- Alternatively, the Regions shall provide an on-site trailer with sufficient office space as determined suitable for each project
- The Consultant(s) are to have at least one resident engineer with the overall responsibility for each of the two (2) Stage 3 Expansion Projects, with resident inspectors as required to cover each entire project.
- For the purposes of this RFP, the Consultant(s) are to use an estimated minimum of eight (8) as the number of resident inspectors that will be required, full time, on-site to oversee each of the Stage 3 Expansion Projects. Additionally, the Consultant(s) are to assume that each project will have a construction period of 150 weeks. Provide a separate weekly rate for both resident engineers and resident inspectors. Should the Regions deem it appropriate for the Consultant(s) to increase or decrease the number of site inspectors due to the amount of contractor activity, then the monthly billings shall be adjusted by this rate.
- Resident inspector(s) shall be required to be on-site during all times that the relevant contractor(s) are working. Should inspection services for a resident inspector over 44 hours per week be required due to construction activities, then the Consultant(s) shall submit with their monthly billing, details on the nature and extent of site supervision provided.
- The proposed resident engineer must have at least 15 years of on-site experience on similar sized wastewater projects, with a minimum of 10 years in a supervisory role. The proposed resident inspectors must have at least 5 years of on-site experience on similar sized wastewater projects, or be under the direct on-site supervision of a resident inspector with at least 10 years of on-site experience on similar sized wastewater projects.
- Ensure that the contractors are providing the required level of effort to provide the Regions with an end product that meets or exceeds all the requirements of the contract documents.
- Provide resident clerical or administrative support staff on-site during the construction period as required.
- Each resident inspector is to produce and maintain daily logs of all contractors' equipment and manpower on-site, work performed, material removed from site, training conducted, shutdowns, incidents, etc., under his supervision.
- Review and prepare recommendations on contractors' proposed monthly payment draws, extra work claims, extension claims and all related construction correspondence. Extra work orders or extensions to the works are not to be issued without approval from the Regions.
- Respond to all Contractor RFI's as required to prevent project delay or within 2 weeks, whichever is less.
- Provide qualified technical support staff to provide periodic site inspections during construction as required to ensure compliance with the contract specifications, general design intent, and compliance with all applicable regulations and codes.
- Chair and minute site meetings:
- The Consultant(s) will be responsible for; coordinating the agenda, providing meeting materials, chairing, producing minutes within 2 days of each meeting and scheduling regular Site Meetings. Site meetings are to be conducted a minimum of once per month per contract. More frequent meetings may be required, depending upon the circumstances, at the discretion of the Regions' project management team. Attendees for

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

the site meeting are to be a minimum of the Consultant(s)'s project manager and resident engineer, resident inspectors as required, Consultant(s)'s specialists as required, Regions' staff and contractor representatives as yet to be decided.

- Meetings will include a review of construction progress, schedule compliance, upcoming shutdowns, health and safety issues, all QA/QC activities that have occurred, training, start-up and commissioning information, etc.
 - The Consultant(s) shall append all applicable start-up and other appropriate correspondence in order to keep all parties abreast of all construction activity that occurs during the intervening meeting period. Additionally, all RFI's, Change Order lists, all equipment start-up reports, supplier site visits, deficiency lists, etc. shall be appended to the minutes.
 - Health and Safety Inspection reports by the Contractor's Health and Safety representative and the Durham Region Construction Inspector shall be appended to each monthly meeting report
- Ensure that the contractor has obtained all necessary permits required for the contract.
- The Consultant(s) shall identify, arrange, co-ordinate and provide written correspondence of all regulatory agency inspections required, including with local building officials.
- Document existing site conditions through the use of digital photography prior to commencement of construction. Provide digital progress photographs on a monthly basis of major project milestones. Ensure that as a minimum, all areas adjacent to construction activities, and all pre-existing building conditions are returned to pre-construction appearance. Title and date all progress photographs, provide complete compilation upon project completion.
- As part of the on-going construction services, the Consultant(s) shall ensure that the training plans and manuals that are requested by the contract specifications are supplied for review by the appropriate technical staff. Regional staff shall also receive copies for review and comments. The Consultant(s) shall attend all training sessions and document Regional staff attendance. No training shall be conducted, nor commissioning permitted without authorized training occurring.
- The Consultant(s) shall oversee the requirements of the QA/QC plan and shall arrange and coordinate all quality control tests and analyses that are required to ensure the required level of quality control is met and documented.
- No substitution of alternative equipment, products or materials to the specified equipment, products or materials in the contract documents may be approved or authorized by the Consultant(s) without the prior consent and approval of the Regions' project management team.
- The Regions are to be consulted on all proposed shutdowns for construction activities. For major processes, a lead time of ten (10) working days is required and in most other cases a lead time of three (3) working days is required. This is required as it generally takes at least one day to isolate and drain piping of tanks.
- The Duffin Creek WPCP utilizes the Avantis Pro Computerized Maintenance Management System to record equipment information and maintenance activities. The Consultant(s) will be responsible to inventory all newly installed equipment under the contract(s) and provide all relevant information in a Regions supplied, electronic template (i.e. the information collected will contain, serial numbers, model number, all motor nameplate

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

information, tank capacities, cost of each item, supplier contact names, reference against contract drawing number, etc). The Consultant(s) will be required to collect the information from submitted shop drawings, physical installation and review of supplier Operations and Maintenance Manuals. The Consultant(s) will complete the EXCEL supplied spreadsheet by the Regions. The Consultant(s) shall allow for an initial meeting to discuss the template and a second meeting for the Regions to review the draft submission. The Regions will identify what fields it will complete. In addition to the above, the Consultant(s) will also complete the EXCEL spreadsheet supplied by the Regions that incorporates manufacturer's recommended preventative maintenance tasks and frequencies into the computerized maintenance management system. In order to complete the above task, the Consultant(s) will be required to review and summarize the maintenance and inspection procedures supplied within each of the supplier's Operations and Maintenance Manuals. In conjunction with the above, the Consultant(s) will review the Certificate of Approval(s) issued for this assignment and incorporate any maintenance requirements and frequencies into the spreadsheet.

- The Consultant(s) shall be required to prepare an electronic operations manual in a format prescribed by the Regions. The Consultant(s) will be required to modify the existing electronic manual that is currently being prepared by Earth Tech Canada at this time. A sample of the manual under creation will be available for review upon request. The manual will be divided into process sections with a table of contents to support each section. A sample of the table of contents for each section is as follows:
 - The manual will make use of construction drawings, incorporate information from supplier operations and maintenance manuals, include relevant digital photographs to support/identify major process equipment, include all relevant operational set points, alarm levels, etc. The manual will also incorporate any SCADA system manuals prepared by the system integrator(s) chosen for the project.
 - The Consultant(s) will prepare an initial draft for each section for review by Regional staff. Regional staff will provide comments and direction for incorporation into the second draft. The second draft will be reviewed by Plant Operations staff with appropriate sign-off upon review.
 - The completed document will be in an editable format usable by the Regions for modification under future projects. The final Operations manual will be completed within 6 months of the issuance of substantial completion of the project. A failure to provide the completed document by this time will result in a penalty to the Consultant(s) of \$500.00 per day.
- A requirement of all Ministry of the Environment issued Certificates of Approval is the provision of on-site documentation detailing the 'as constructed' condition of the facility. The provision of such drawings is mandated within 6 months of substantial completion of the facility. In order to ensure that this condition is met, substantial completion as defined under the Construction Lien Act, shall be extended to include: successful start-up of equipment, processes and commissioning, as well as submission of Maintenance Manuals in order that the requirement of the Act, 'can be used for the purpose intended' is fully satisfied. This requirement shall be included in the special provisions section of the contract and the contract documents shall include 'an admission and sign off form from the contractor' that he has read and accepted such requirements. Upon receipt of the as-built information from the contractor the consultant will record and produce all changes and deliver to the Regions the required number of copies of as-built drawings in both hard

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

copy and electronic format. A failure to provide the as-constructed drawings to the Regions within the time frame specified within the Certificate of Approval or within six (6) months from the granting of substantial completion to the contractor, whichever is the shorter time period, will result in a penalty to the Consultant(s) of \$500 per day.

After successful commissioning of the overall project, the Consultant(s) will be responsible for the provision of on-going inspection, warranty review and post-construction process evaluation services. The Consultant(s) shall perform the following services:

- Perform a post-construction process audit to determine if EACH of the process modules is performing/operating as envisaged at the design stage and at what level, either above or below the specified criteria and performance parameters and in comparison to the MOE Consolidated Certificate of Approval (if applicable). Identify all laboratory analysis required, in the opinion of the Consultant(s), to assist them in making a competent evaluation of the plant treatment processes. Identify all tests that the Consultant(s) deemed necessary to make a proper evaluation of the treatment process. Identify what tests the Regions may be required to perform under direction by the Consultant(s) (i.e. laboratory analytical works).
- The Consultant(s) shall provide post construction services during the two year guaranteed maintenance period of each of the construction contract(s). The work shall include the following:
 - Inspect the work and report semi annually, with the last report 3 months prior to the expiration date of the two year guaranteed maintenance period of the contract. The Consultant(s) shall interview plant operating staff, perform a site inspection, review CMMS work files and any relevant correspondence issued by the Regions to formulate the report.
 - Provide deficiency resolution service for the contract during this phase. Assist the Regions during the warranty period, in managing work that has been identified as the contractor's responsibility, and in the documentation of the progress work.
 - Maintain and resolve on-going deficiency lists and update them on a bi-monthly basis.
 - Issue a semi-annual report on the equipment warranty and/or deficiency items. Include all supporting documentation including site photographs, Regions' and supplier generated correspondence, etc.

Co-ordinate the 'return site visit' by suppliers of all major equipment within the last (3) months of the warranty period, and obtain suppliers inspection and recommendation report. Note that the contract specifications shall include this additional site visit and inspection report.

4.7.15 Commissioning

The Consultant(s) shall oversee, coordinate and actively participate in the commissioning of the construction contracts to ensure the materials, equipment and construction meet the specified performance requirements. As noted in item n) above, a commissioning plan is to be prepared and submitted to the Regions. This shall be supplied at least twenty (20) working days prior to the initial start-up of any piece of equipment or process. The Consultant(s) is responsible for the integration of the various pieces of equipment or processes operating together to provide the Regions with an overall system capable of providing the required level of treatment.

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

- Initial Start-up Procedure:
 - Retain a specialist consultant to prepare a Pre-Start Health and Safety Report prior to start-up of each of the contracts, in accordance with the requirements of Section 7 of the Ministry of Labour for Industrial Establishments Regulation (O. Reg. 528/00). The specialist consultant will act as a sub consultant to your project team.
 - During the facilities start-up phase, performance testing phase and synchronization with plant processes, coordinate the activities of the contractor and the plant in order to maintain operation of plant facilities and progress of the contract without any interruptions and delays. Provide necessary technical staff to assist during start-up of specialized equipment or process systems.
 - Prior to the initial start-up of any piece of equipment, the Consultant(s) is to ensure that all checks have been successfully completed as specified by the manufacturer. The Consultant(s) is responsible for ensuring that all test results, whether completed by the contractor, the sub-contractor, the manufacturer's sales representative, the supplier or the manufacturer's representative, have been submitted and distributed. Start-up can not commence until the Regions' project management team has provided consent.
 - Arrange for the contractor, the sub-contractor, the manufacturer's sales representative, the supplier or the manufacturer's representative plus the Consultant(s)'s staff and the Regions' staff to be present to witness the equipment start-up and check-out for verification of conformance to the installation to the manufacturer's satisfaction or specifications.
 - Arrange for the contractor, the sub-contractor, the manufacturer's sales representative, the supplier or the manufacturer's representative plus the Consultant(s)'s staff and the Regions' staff to be present to witness the equipment check-out for verification of conformance to the contract performance specifications and intended operation requirements by the Consultant(s).
 - On successful completion of the equipment start-up, arrange through the appropriate channels for the equipment manufacturer to provide the specified training of the Regions' staff.
- Staff Training - Equipment
 - After start-up, arrange for the staff training on each individual piece of equipment as per the recommendations of the manufacturer. The training time will be split into at least two sessions since it may not be possible to have all the necessary plant staff available at one session. Additional time will also be required if the recommendations of the manufacturer suggest separate training sessions for training on operation and for training on maintenance. The manufacturer will be responsible for supplying all training materials, text, charts and Operation and Maintenance manuals. The Consultant(s) is responsible for the coordination with the Regions staff and selection of an appropriate location for the training.
 - All training must be completed prior to commissioning.
- Commissioning

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

- Upon completion of the staff training on the components of a process, the Consultant(s) is to arrange for the contractor, the sub-contractor, the manufacturer's sales representative, the supplier or the manufacturer's representative plus the Consultant(s)'s staff and the Regions' staff to be present to conduct and witness the commissioning of a system or process system for verification of conformance to the contract performance specifications and intended operation requirements by the Consultant(s). The contractor shall be responsible for the initial operation of the system for the duration of the commissioning period as specified.
- The Consultant(s) shall maintain a daily log of all commissioning.
- Commissioning shall commence only on a Monday or Tuesday.
- Successful commissioning of a process will be defined as a minimum of thirty (30) calendar days of continuous operation to verify performance conformation plus an additional sixty (60) calendar days of continuous, trouble-free operation under normal conditions, for a total of ninety (90) days of continuous operation.
- Upon successful completion of the commissioning, the Consultant(s) shall collate and prepare the Commissioning Report including:
 - A listing of all equipment and the respective equipment inspection report confirming installation is in accordance with the manufacturer's requirements
 - A listing of all equipment and the respective equipment start-up report confirming all incidents, repairs or modifications to the equipment prior to confirmation of successful operation and the performance is in accordance with the manufacturer's specifications
 - A listing of each of the systems or process systems and the respective commissioning report confirming all incidents, repairs or modifications to the equipment or system prior to confirmation of the successful operation and performance is in accordance to the contract specifications
 - All field testing reports
 - All calibration reports
 - All air balancing reports
 - All other tests performed not covered by above
- Staff Training - Liquids Process
 - The Consultant(s) is to provide at least twenty (20) days for staff training in the design and process operation of the individual process systems and the treatment process as a whole only after completion of the construction works and the entire plant process is in full operation. This time will be split into at least two (2) – ten (10) day sessions due to the nature of shift work and that the plant cannot be left unattended. The Consultant(s) is to provide all teaching materials, text, charts and copies of the Operation and Maintenance manuals during the training, and have the various process specialists or other appropriate specialists conduct the training. The Consultant(s) is responsible for the training session, coordination with the Regions staff and selection of an appropriate location for the training.
- Staff Training - Solids Process

Proposal:	P-05-29
Description:	Engineering Services for the Stage 3 Expansion at Duffin Creek WPCP
Closing Date:	Tuesday, April 5, 2005
Closing Time:	1:00 p.m. (Local Time)

- Dewatering and Incineration staff work on a 12 hour a day, rotating schedule composed of 4 shifts. The Consultant(s) shall allow for four (4) – ten (10) day sessions of process training to be conducted upon completion of the construction works, when the entire solids side is in operation for the dewatering operations, and four (4) - ten (10) day blocks of process training to be conducted upon completion of the construction works, when the entire solids side is in operation for the incineration operations. The Consultant(s) is responsible for the training session, coordination with the Regions staff and selection of an appropriate location for the training.
- Staff Training - General
 - A training outline and plan shall be submitted to the Regions for approval prior to any training occurring. The training will be a combination of classroom and field or site 'walk arounds'. The training will be conducted by each of the discipline leads responsible for the design. The intent of the training is for plant staff to understand the 'theory and design intent' of how the system was designed to operate.
 - Training will require at a minimum: the review of all process flow diagrams, heating and ventilating schematics, electrical distribution drawings, instrumentation and control drawings and relevant design information.
 - The Consultant(s) shall provide all materials, texts, charts, data, relevant sections of the Operations and Maintenance manual as content for the training.
 - The Consultant(s) will document all attendance at the training using the Region's standard course attendance form and submit it to the Regions. The Consultant(s) shall be prepared to provide (30) copies of all documentation to be provided and distributed. An electronic copy of all training content distributed shall also be provided to the Region's on a CD in ADOBE ACROBAT form.

In the task, man-hour and fee schedule of the proposal, provide a unit cost for conducting any additional training at a unit cost per day (assume the cost for a training day is an 8 hour day)

- PLC/RPU Programming:
 - The PLC/RPU programming, configuration of the HMI, including modifying of existing screens (graphics), designing of new screens, as well as integrating of the field controllers and associated software, networking devices and the HMI into the existing system, will be included under construction contracts. The Consultant(s) will be fully responsible for the following:
 - Co-ordination of the work, including but not limited to all required factory and site acceptance testing.
 - Integration of the documentation generated by third party consultants and contractors into the SCADA Operations Manual.

Quality control and quality assurance process required for a seamless integration into the existing SCADA system.