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Public Works and Government Services Canada
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10025 Jasper Ave./10025 ave. Jasper
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SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Title - Sujet Waste Water Upgrade	
Solicitation No. - N° de l'invitation EW038-170378/A	Amendment No. - N° modif. 010
Client Reference No. - N° de référence du client Parks EW038-170378	Date 2016-07-21
GETS Reference No. - N° de référence de SEAG PW-\$PWU-183-10786	
File No. - N° de dossier PWU-6-39045 (183)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2016-08-02	
Time Zone Fuseau horaire Mountain Daylight Saving Time MDT	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Tikhonovitch (RPC), Alex	Buyer Id - Id de l'acheteur pwu183
Telephone No. - N° de téléphone (780) 901-7940 ()	FAX No. - N° de FAX (780) 497-3510
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

**ADDENDUM NO. 10
TO THE
CONTRACT SPECIFICATIONS
FOR THE MIETTE HOT SPRINGS
WASTEWATER TREATMENT PLANT UPGRADES
JUNE 2016**

To All Bidders:

July 20, 2016

The following changes, additions, and/or deletions are hereby made a part of the Contract Specifications for "Miette Hot Springs Wastewater Treatment Plant Upgrades Contract Specifications" as fully and completely as if the same were fully set forth therein:

1 Previous Addendums

1.11 ADDENDUM 2

- .1 Please cancel Addendum 2 and replace all contents of Addendum 2 with this Addendum (Addendum 10) including the attached drawings.

2 Drawings

2.11 DRAWING E-03 – SINGLE LINE DIAGRAMS & MCC ELEVATIONS

- .1 Please replace existing E-03 with the E-03 drawing included in this addendum 10.

2.12 DRAWING M-06 – MECHANICAL SITE PLAN AND SECTIONS

- .1 Please replace existing M-06 with M-06 included in this addendum.
- .2 New Alum Injection Line
 - .1 A new alum injection line is to be added, see attached drawings. It will originate from the Alum Skid and split into two lines with valves and rotameters while inside the building. Once outside the building, the alum lines (15-AL-PFA, flexible tubing as specified below) shall travel underground inside the CPVC conduit and inject into each Clarifier inlet. The outdoor conduit shall be insulated and heat traced.
 - .2 A new alum metering pump (the same model as specified in Section 444311) is added for the injection line. The new pump shall be skid mounted and complete with the same accessories as specified in Section 444311 and shall be controlled independently by PLC.
- .3 All the chemical piping outside the building either underground or exposed (15-AL-E4 and 15-SHDS-E4 in original design drawings) should be replaced with the following:
 - .1 15-AL-E4 to be replaced with PFA tubing of the same size as specified as follows.

- .2 15-SHDS-E4 to be replaced with double containment (10mm PFA inner tubing with 20mm FEP outer tubing) tubing as specified as follows.
- .4 The outdoor portion of the PFA and doubled containment tubes shall be enclosed in a 150mm or 80mm (depending on the number of tubes inside) CPVC conduit for protection. The conduit shall be insulated and heat-traced. All 90 degree bends shall be replaced with two 45 degree bends. The conduit shall have a 45 degree lateral fitting at the point where each chemical line rises above the ground. Each conduit shall terminate inside the buildings or enclosures. Inside the building, the PFA tubing transitions to a CPVC pipe as shown in the IFT drawings. No PFA tubing or double containment tubing shall be exposed to the outdoor environment.
- .5 PFA Inner Tubing:
 - .1 PFA Tubing and Fittings shall be manufactured from 100% Virgin PFA complying with ASTM D 6867-03.
 - .2 The PFA tubing and fittings shall resist combustion, shall not promote flame spread and be UL 94 VO rated.
 - .3 The tube material testing shall be per ASTM D2837. The fittings material testing shall be per ASTM D3307-10 Type II. Fittings:
 - .4 All fittings shall be injection molded, connection method: Flared Tubing to be Chemline Industrial Series
- .6 FEP Outer Tubing:
 - .1 The FEP tubing shall resist combustion, shall not promote flame spread and it shall be UL 94 VO rated.
 - .2 The material testing shall be per ASTM D2837.
 - .3 Double wall tubing fittings to be Double Containment Chemflare ® as supplied by Chemline Plastics Ltd.
- .7 Tube flaring shall be done by a mechanical trained by Chemline Plastics.

2.13 DRAWING M-07 – SITE SECTIONS

- .1 Please replace existing M-07 with the M-07 drawing included in this Addendum 10.

2.14 DRAWING S-05 – STRUCTURAL TYPICAL DETAILS

- .1 Drawing S-05 – The lean mix concrete reference should be changed to “fillcrete” as identified in the specs (03 30 00).

3 Specifications

3.11 Please Replace the following Specifications with the updated attached specifications:

- .1 01 35 43 – Environmental Procedures
- .2 01 78 39 - Project Record Documents
- .3 44 61 57 – Disk Filter Equipment Supply
- .4 44 61 81 – Packaged Wastewater Treatment Plant

3.12 01 10 00 – GENERAL REQUIREMENTS

- .1 Add the following to Section 1.6 – Contractor use of Premises, Subsections 18:
 - .18 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
 - .19 Where Work involves breaking into or connecting to existing services, give Departmental Representative one week of notice for necessary interruption of mechanical or electrical service throughout course of work and obtain permission.

 - .2 Add the following to Section 1.7 – Parks Canada Occupancy. Subsection 3:
 - .3 “Access must be maintained to public trails and footpaths during construction.”

 - .3 Add the following to Section 1.12 – Setting out of Work, Subsection 2:
 - .2
 - .6 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
 - .7 Provide devices needed to layout and construct work.
 - .8 Supply such devices as straight edges and templates required to facilitate Departmental Representative’s inspection of work.
 - .9 Supply stakes and other survey markers required for laying out work.
 - .3 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
 - .4 Locate equipment, fixtures and outlets and distribute systems to provide minimum interference and maximum usable space and in accordance with manufacturer’s recommendation for safety, access and maintenance.
 - .5 Inform Departmental Representative of impending installation and obtain his approval for actual location.
 - .6 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

 - .4 Replace 1.15 – Process Mechanical Description of Work, Subsection 7:
 - .7 “Replace existing RBC Train with new RBC Train. Construction must be staged to ensure continuous wastewater treatment. I.e. install RBC Train 2 must be operational first to ensure continuous treatment. “
- With the following:
- .7 “Replace existing RBC Train with new RBC Train. Construction must be staged to ensure continuous wastewater treatment. I.e. install RBC Train 2 must be operational first to ensure continuous treatment. Maintain WWTP flow-through at all times.”

- .5 Add the following as Section 1.24:

1.24 MAINTENANCE

- .1 Contractor shall be responsible for the preventative maintenance program until Substantial Performance.
- .2 Provide all required maintenance as recommended by the equipment manufacturers.
- .3 Provide a detailed electronic list (Excel Spreadsheet) of all maintenance activities performed on the major systems and pieces of equipment during construction prior to Substantial Performance.

3.13 01 27 00 – MEASUREMENT AND PAYMENT

- .1 Replace Section 1.2 – Progress Claims, Subsection 2 – Departmental Representative’s Responsibilities, Clause 1:
 - .1 “Review Contractor's claim, prepare Progress Payment Certificate and issue to Departmental Rep within 10 working days following receipt of Contractor's claim.”
- With the following:
- .1 Review Contractor's claim, prepare Progress Payment Certificate and issue to Contractor within 10 working days following receipt of Contractor's claim.

3.14 01 33 00 – SUBMITTALS

- .1 Add the following to Section 1.3 – Administrative, Subsection 12:
 - .12 Upon initiation of project, prepare a full list of submittals, as requested in individual specification sections, and provide submittal schedule to allow Departmental Representative to adequately plan for the review effort required to meet the Contractor’s construction schedule. Identify any critical dates for submission and return of shop drawings, product data or samples.

3.15 01 45 00 – QUALITY CONTROL

- .5 Add the following to Section 1.8 – Testing, Subsection 12:
 - .12 Engage the services of CSA certified independent Inspection/Testing agencies for the purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor. Allow for minimum number of tests required by these specifications.
- .6 Add the following as Section 1.13:

1.13 PAINT SAMPLES

- .4 Prepare paint palette for building sheeting, finishes and all other building colours for selection by Departmental Representative during Shop Drawing submittal.

3.16 01 75 01 – PRE-START-UP, START-UP AND COMMISSIONING

.1 Replace Section 1.2 – Definitions, Subsection 3:

- .1 “Commissioning: Commissioning consists of placing all the various systems in Work into continuous operation in an orderly manner. Contractor is responsible for the commissioning activities and shall have equipment manufacturer representatives at the site, as well as qualified mechanical, electrical, control and instrumentation personnel. Contractor may be assisted by Departmental Representative relative to process considerations and by Departmental Representative’s operations and maintenance staff. Commissioning is considered to be complete when all systems have been operating continuously for a period of 80 hours without fault and in accordance with the specified performance requirements.”

With the following:

- .1 “Commissioning: Commissioning consists of placing all the various systems in Work into continuous operation in an orderly manner. Contractor is responsible for the commissioning activities and shall have equipment manufacturer representatives at the site, as well as qualified mechanical, electrical, control and instrumentation personnel. Contractor may be assisted by Departmental Representative relative to process considerations and by Departmental Representative’s operations and maintenance staff. Commissioning is considered to be complete when all systems have been operating continuously for a period of 720 hours without fault and in accordance with the specified performance requirements. The 720 hours is measured from the moment the RBC Media Biofilm has the required build-up for treatment operation, as recommended by the Manufacturer.”

.2 Add the following to Section 1.6 – Pre-Start-Up, Subsection 15:

- .15 Complete Factory Acceptance Test of control system prior to site installation. Contractor to provide test package designed for their programme.

.3 Replace Section 1.8 – Commissioning, Subsection 6:

- .6 “Period of time for continuous automatic operation for acceptance of commissioning is 80 hours with all systems operating continuously without fault and all process, mechanical, control and electrical equipment free of vibration, overloading or overheating and functioning in accordance with specified rates, methods and performance.”

With the following:

- .6 “Period of time for continuous automatic operation for acceptance of commissioning is 720 hours with all systems operating continuously without fault and all process, mechanical, control and electrical equipment free of vibration, overloading or overheating and functioning in accordance with specified rates, methods and performance.”

3.17 01 77 00 – CLOSEOUT PROCEDURES

.5 Add the following as Section 1.3:

1.3 AS-BUILT AND SAMPLES

- .1 Maintain at the site one record copy of:
 - .1 Contract Drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Change Orders and other modifications to the Contract
 - .5 Reviewed Shop Drawings, product data, and samples.
 - .6 Field test records
 - .7 Inspection certificates
 - .8 Manufacturer's certificates.
 - .9 Document confirming
- .2 Confirm with appropriate drawings and documents that elevations and locations of completed Work are in conformance, or non-conformance with Contract documents.
- .3 Store record documents and samples in the field office apart from documents used for construction. Provide files, racks, and secure storage.
- .4 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.
- .5 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .6 Keep record documents and samples available for inspection by Departmental Representative.

3.18 01 78 23 – OPERATING AND MAINTENANCE DATA

- .4 Replace Section 1.2 – General, Subsection 1:
 - .1 "Prepare three (3) copies of documentation including as-constructed shop drawings to instruct operations and maintenance staff in the operation and associated maintenance of each piece of equipment and system as supplied and installed."
- With the following:
- .1 "Prepare three (3) copies of paper documentation and four (4) electronic copy of documentation (PDF) including as-constructed shop drawings to instruct operations and maintenance staff in the operation and associated maintenance of each piece of equipment and system as supplied and installed. CAD files to be in dwg format on CD or USB."
- .5 Add the following under Section 1.2 – General, Subsection 4:
 - .4 Provide the completed O&M Manuals a minimum of 4 weeks prior to training, pre-start-up, start-up and commissioning.
 - .6 Add the following as Section 1.4 – Contents, Subsection 13:

- .13 Provide an electronic spreadsheet (Excel) on a CD with the following information for each system and major piece of equipment:
 - .1 Preventative maintenance program complete with:
 - .1 Suggested check-list sheets
 - .2 List of points to be greased or oiled
 - .3 Recommended type, grade and temperature range of lubricants.
 - .4 List of wear points to be inspected and/or adjusted regularly
 - .5 Suggested schedule for lubrication and inspection.
 - .2 Recommended spare parts list
 - .3 Certification, guarantee, warranty.
 - .4 Service representatives – name, address, and telephone number.
 - .5 Suppliers for replacement parts – name, address, and telephone numbers.

3.19 26 32 10 – DIESEL GENERATOR

- .1 Replace the following words from Section 1.9 – Warranty, Subsection 1:
 - .1 “For the diesel engine driven generator set, the warranty period shall be 48 months or 1500 operating hours, whichever occurs first.”
- With the following:
- .1 “For the diesel engine driven generator set, the warranty period shall be 12 months (1 year). The warranty shall include all components if the generator set including cooling and ventilation equipment.”
 - .2 **Replace** Item 1.4.4.16.1 in its entirety with the following:
 - .1 Automatic starting and transfer to load and back to normal power, including time in seconds from start of cranking until unit reaches rated voltage.
 - .3 **Replace** Item 1.4.4.17 in its entirety with the following:
 - .1 Engine controller, and communication interface module, voltage and power factor controller, model numbers, configuration and field wiring.
 - .4 **Replace** Item 1.5.1.1 in its entirety with the following:
 - .1 Operation and maintenance instructions for engine, alternator, control panel, automatic transfer equipment, battery charger, battery, fuel system, ventilation system, exhaust system and accessories, to permit effective operation, maintenance and repair.
 - .5 **Replace** Item 2.8.4 in its entirety with the following:
 - .1 Ventilation:
 - .1 Intake – 24 Volt DC motorized intake damper (with fail contact wired to the control panel, time delay by CWC) (spring to open power to close) with intake silencer, snow hood, and galvanized bird screen.
 - .2 Discharge – Supply and install motorized or gravity operated discharge dampers with discharge duct, silencer, snow hood, and galvanized bird screen.

- .3 Damper motor wiring run to control panel location.
- .4 Manufacturer to provide all necessary equipment required for proper cooling and ventilation of the generator set.

3.20 26 36 23 – AUTOMATIC TRANSFER SWITCHES

- .1 **Add** Item 2.2.3:
The automatic transfer switch shall be open transition type. The delay between the power switch over shall be just long enough to allow motors to wind down before starting the generator. Synchronization is not required.

3.21 44 43 11 – ALUM FEED SYSTEM

- .1 Remove the following words from Section 2.1.5 Weight Scale, Subsection 2:
 - .1 “low alarm relay.”
- .2 **Replace** Item 2.1.3.7 in its entirety with the following:
 - .1 Pumps shall be complete with the following accessories: foot valve, injection valve, self-filling calibration column, PVC adjustable pressure relief valve, PVC pulsation dampener, 50 mm SS liquid filled pressure gauge with PVC isolator, Sch 80 PVC socket weld piping and isolating valves and as shown on the drawings. All items including the duty and standby pumps are to be skid-mounted, pre-assembled, pre-piped, and tested. The piping skid shall be suitable for wall mounted installation. The piping of the skid shall be configured to supply alum solution to three different destinations with three duty pumps respectively.

3.22 44 43 16 – CAUSTIC SODA SYSTEM

- .1 Remove the following words from Section 2.1.5 Weight Scale, Subsection 2:
 - .1 “low alarm relay.”
- .2 **Replace** Item 2.1.3.7 in its entirety with the following:
 - .1 Pumps shall be complete with the following accessories: foot valve, injection valve, self-filling calibration column, CPVC adjustable pressure relief valve, CPVC pulsation dampener, 50 mm SS liquid filled pressure gauge with CPVC isolator. All items including the duty pumps are to be skid-mounted, pre-assembled, pre-piped, and tested. The piping skid shall be suitable for wall-mounted. The piping shall be configured to allow the two duty pumps to feed two injection points respectively.

Questions and Answers:

Q1: Section 44 43 16 - Caustic Soda System.

In ""1.3 Design Criteria"" the required material for the system shall withstand 50% NaOH solution while in ""2.1 Caustic Soda (Sodium Hydroxide) Storage and Feed Equipment"" has equipment requiring material resistant to only 25% NaOH solution. Please confirm that the whole system requires 50% NaOH resistance."

A1: The material resistance is still required to withstand 50% NaOH solution.

Q2: Please provide a proper line list or pipe lengths required for the heat trace. Our subcontractors are unable to complete a proposal without this information.

A2: The pipe lengths can be calculated as a scale is provided.

Q3: We would like clarification on if we can use a 15A, 600V, disconnect to feed the 2kVA, transformer as shown in diagram 3 on drawing E-07?

A3: A disconnect can be used for this application.

Q4: Where is the nearest distribution panel located from the pool mechanical room?

A4: The nearest distribution panel is located approximately 20 metres from the pool mechanical room.

Q5: In order to achieve the requirement for total Phosphorous of 0.15 mg/L, the incoming TP has to be around 0.5 mg/L. In order for us to guarantee the performance prior testing of the water would be required. Also, to reduce total phosphorous there has to be chemical addition not described in the specification 44 61 57. Please comment.

A5: Please see Addendum 10

Q6: Is it expected that TP going to disk filter will be about 0.5 mg/l?

A6: Please see Addendum 10

Q7: Is chemical addition provided by others?

A7: Yes

Q8: Are effluent samples available for testing? Please comment.

A8: Yes

Q9: Is a 200 amp transfer switch is acceptable instead of the 400 amp?

A9: Please see Addendum 10.

Q10: On drawing M-07, -Section 2 contains both a 100-SBD-E1 and 100-SBD-E4 label for the same line, please confirm that 100-SBD-E4 is the correct label.

A10: 100-SBD-E4 is the correct label.

Q11: On drawing M-07, section 4 contains a label of 100-SBD-E3, there is no E3 classification for piping, please confirm the correct label.

A11: 100-SBD-E4 is the correct label.

Q12: Please provide location and the dimension for the Sodium Thiosulfate Skid

A12: 100-SBD-E4 is the correct label.

Q13: In Section 01 45 00 paragraph 1.8.8 calls for the contractor to hire a CSA certified quality assurance testing firm. Is there a specific scope of the job this applies to?

A13: This applies to the complete project.

Q14: Please provide clarification as to which piping are to be insulated. The drawings show multiple lines above the frost line of 2.5m indicated in the Thurber Geotechnical Investigation but there isn't indication to insulation being required. This will also correspond to the previous RFC requesting additional information on electrical heat tracing for the pipe.

A14: For chemical lines please provide heat tracing and insulation (see Addendum 10). For non-chemical lines, provide insulation.

Q15: Addendum No. 2 - Section 1.1.3, would the 4" CPVC conduit be insulated on the outside (resulting in insulation having ID of approximately 4") or the 4" CPVC would be the casing for the insulation of the 15mm PFA tubing (OD of insulation would be 4")?

A15: Please see Addendum 10.

Q16: The plans show a rolling steel door, but spec booklet provides specs for sectional overhead doors. What type of door should be provided?

A16: Sectional Overhead Door required.

Q17: Will it be acceptable to stockpile excavated material in the parking lot prior to hauling it away for disposal?

A17: Refer to Spec 01 10 00, Section 1.6 – Contractor use of premises.

Q18: Will it be acceptable to stockpile snow removed from the construction area on the walking path to the south side of the culvert construction zone?

A18: Refer to Spec 01 10 00, Section 1.6 – Contractor use of premises.

Q19: Will it be acceptable to stockpile rip rap south of the construction boundary on the trail?

A19: Refer to Spec 01 10 00, Section 1.6 – Contractor use of premises.

Q20: Will you accept a package without an air recirculation system? An air recirculation system is rarely seen on a skin tight enclosure. If required, this will increase the cost of the generator package *astronomically*. We would most likely have to consider a "walk-in" type building.

A20: No, recirculation system is not required.

Q21: Will you accept gravity-operated discharge dampers? When used in conjunction with motorized intake louvers, gravity discharge louvers are all that is required to prevent air movement in the generator enclosure and maintain enclosure temperature. Utilizing gravity discharge louvers will also help reduce cost.

A21: Yes, gravity operated discharge dampers is acceptable.

Q22: Are both intake AND discharge snow hoods required? As our enclosure are UL2200, the added benefit of an intake snow hood is questionable. The discharge snow hood is beneficial as the discharge of most standard, enclosed generators is vertical. Without a discharge snow hood, snow/ice can accumulate on & within the discharge.

A22: Yes, please provide both intake and discharge snow hoods.

Q23: Can you specify if you desire standard louvers or insulated louvers?

A23: Insulated louvers are preferred.

Q24: Should an air recirculation system *not* be required, all “modulating” references in item 2.4.3 may be removed.

A24: Please see Addendum 10.

Q25: Should an air recirculation system *not* be required, all “modulating” references in item 2.4.3 may be removed.

A25: Please see Addendum 10.

Q26: Steel pipe specification A1-C-? does not have an exterior coating indicated. As this piping is located in the wet wells, in the process floor area, and underground outdoors, I suspect there should be some coating specified. Some outdoors might well be HDPE piping, as to line this piping requires a lot of buried flanges.

A26: The pipe external coating is specified in Section 09 91 22 Item 2.2. Here are the clarifications regarding to the piping external coating systems:

1. The steel pipes submerged or in contact with water (such as inside the wetwell) shall be coated with epoxy as specified in Section 44 41 22.
2. The external buried steel piping shall be coated with yellow jacket as per Section 44 41 23.
3. All the buried coupling or flanges or any section of pipe that needs field coating application shall be wrapped in tape as specified in Section 44 41 11 item 2.24.

Q27: Addendum #2 references piping code E4 as a conduit for as many as 4-15mm Alum/Caustic soda lines that are double walled. This OD will likely be close to 25mm OD. As this conduit will require wyes and 45 elbows to convey these lines, I question the 100mm sizing. Also E4 is CPVC piping, similar to PVC Sch 80, solvent welded. This piping group does not have wyes and 45s available. Further, what insulation is required, as this developed length goes past 200 feet.

A27: Refer to addendum 10 for updated spec of the PFA tubing and CPVC conduit requirements.

The conduit size to be 150mm for more than 4 tubings and to be 80mm for up to two tubings. Note SCH80 CPVC 45 degree elbow and wyes are available in Spears catalogue.

Q28: On Drwg M-06, there is a lengthy 50 water line, again pip E4. E4 is CPVC solvent welded. Clarify this piping specification. I'd suggest 50 Municipal PE piping.

A28: No change to pipe material. Ensure heat tracing and insulation.

Q29: On Drwg M-06, there shows a 100 drain existing the LH side of the existing plant. Is this existing?

A29: This is a new floor drain line. See Addendum 10.

Q30: On drwg M-06, confirm that the 100 TW from the filtration bldg is A1-C-? if this connects to a 200 PVC line, it might be C900. It might connect with a tee and 45, thrust blocks etc.

A30: The pipe shall be 100-TW-A1-C-D as clarified in Question #1. It can be connected to the existing pipe with a tee and provide transition to PE pipe with flanges. The connection shall be wrapped in Denso tape or equivalent. The tee shall be supported by lean concrete thrust block against the flow from the pipe tie-in.

Q31: The 15 chemical lines double walled piping requires a specification. I can't find any information on it's joining characteristics.

A31: See Addendum 10.

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Refer to and follow the Parks Canada Basic Impact Analysis (BIA) “Miette Hot Springs Wastewater Treatment Plant Upgrades”, File J15-024.

1.2 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.

1.3 REFERENCES

- .1 Reference Standards:
 - .1 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
 - .2 EPA General Construction Permit (GCP) 2012.
 - .2 U.S. Environmental Protection Agency (EPA) / Office of Water

EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices

1.4 ENVIRONMENTAL ASSESSMENT

- .1 Prior to commencement of Work, the Contractor must provide written confirmation that they have read and understood the environmental requirements outlined in the Parks Canada Basic Impact Analysis (BIA) “Miette Hot Springs Wastewater Treatment Plant Upgrades”, File J15-024.
- .2 Potential impacts of Construction have been identified in the BIA, as well as mitigation measures.
- .3 The Contractor shall ensure that all work is performed in accordance with the Parks Canada Basic Impact Analysis (BIA) “Miette Hot Springs Wastewater Treatment Plant Upgrades”, File J15-024.

1.5 SUBMITTALS

- .1 Prior to commencement of construction the Contractor must provide written confirmation that they have read and understood and will comply with environmental procedures as outlined in this section.

- .2 Submit to Departmental Representative in accordance with Section 01 33 00 - Submittal Procedures.
- .3 The Environmental Protection Plan (EPP) must be reviewed and approved by Departmental Representative.
- .4 Product Data: Submit 2 copies of WHMIS MSDS for each chemical.

1.6 The Contractor must use a qualified professional to prepare a project and site-specific Environmental Protection Plan (EPP). The EPP must outline the applicable sections of the federal and provincial legislation and the measures that will be implemented to ensure compliance with those regulations. ENVIRONMENTAL PROTECTION PLAN

- .1 The Contractor must use a qualified professional to prepare a project and site-specific Environmental Protection Plan (EPP). The EPP must outline the applicable sections of the federal and provincial legislation and the measures that will be implemented to ensure compliance with those regulations. The EPP will include measures to:
 - .1 Ensure, during construction, that flows are maintained in Sulphur Creek.
 - .2 Ensure erosion is controlled on exposed slopes so they do not add sediment to the creek.
- .2 The EPP must outline the proposed construction schedule, construction materials and methods to be used during construction activities. The EPP must identify the environmental sensitivities associated with the project location and proposed activities, including those addressed in the Parks Canada Basic Impact Analysis (BIA) "Miette Hot Springs Culvert Removal and Bridge Construction", File J15-088. The EPP must indicate the mitigation measures that will be implemented to prevent or minimize the potential impacts to the environment and will include a plan for contingency measures to be implemented in the event of mitigation measure failure.
- .3 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .5 The EPP will be reviewed by Departmental Representative for approval prior to commencing construction.
 - .1 Include in Environmental Protection Plan (EPP): Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures,

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- sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 The EPP must outline the applicable sections of the federal and provincial legalisation and the measures that will be implemented to ensure compliance with those regulations. The EPP must outline the proposed construction schedule, construction materials and methods to be used during construction activities. The EPP must identify the environmental sensitivities associated with the project location and proposed activities, including those addressed in the EA. The EPP must indicate the mitigation measures that will be implemented to prevent or minimize the potential impacts to the environment and will include a plan for contingency measures to be implemented in the event of mitigation measure failure.
- .8 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
- .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
- .9 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
- .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .10 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .11 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .12 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .13 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .14 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .15 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .16 Pesticide treatment plan to be included and updated, as required.
- .17 The Contractor will ensure effective implementation of the EPP.

1.7 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with EPA 832/R-92-2005 authorities having jurisdiction.NATIONAL PARK REGULATIONS

- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2 All Contractors' vehicles are required to display a vehicle work pass from Parks Canada.

1.8 CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

- .1 Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) Guidelines Order of 2012, subsequent amendments, and Parks Canada's Interim Directive on Implementation of the Canadian Environmental Assessment Act 2012.
- .2 Failure to comply with or observe environmental protection measures as identified in these specifications may result in the work being suspended pending rectification of the problems.

1.9 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.10 SITE CLEARING AND PLANT PROTECTION

- .1 Initial tree clearing as part of Parks Canada Environmental Assessment at Miette to be completed by Parks Canada.
- .2 Protect trees and plants on site and adjacent properties as indicated.
- .3 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- .4 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .5 Minimize stripping of topsoil and vegetation.
- .6 Restrict tree removal to areas indicated by Departmental Representative.

1.11 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only. Do not operate construction equipment in waterways unless specifically authorized by the Departmental Representative to do so.
- .2 Do not use waterway beds for borrow material without Departmental Representative's approval.
- .3 Do not dump excavated fill, waste material, debris, or other extraneous material in waterways under any circumstances.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Do not blast under water or within 100 m of indicated spawning beds.

1.12 TREE AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Wrap in burlap trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.13 PROTECTION OF WORK LIMITS

- .1 The Contractor is to prepare an Environmental Protection Plan (EPP) which details how the work limits shall be marked and what procedures will be employed to ensure trespass outside these limits does not occur, to the satisfaction of the Departmental Representative.
- .2 The Contractor shall prepare a construction site layout plan to be reviewed and approved by the Departmental Representative. The approved plan must indicate project site boundaries, the limits of clearing and excavation, in addition to equipment and material storage and vehicle parking locations. The plan must be reviewed by all crew members during the project Pre-Construction meeting and upon arrival to the project construction site.

1.14 EROSION AND SEDIMENT CONTROL

- .1 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor.
- .2 Erosion control measures that prevent the loss of salvaged topsoil are critical to the preservation of soils, native vegetation species and natural seed banks important for site reclamation.

- .3 Erosion and sediment control measures must be constructed and functional prior to initiating construction activities.
- .4 All ESC measures must be inspected daily prior to the start of construction activities, and immediately following periods of heavy precipitation or storm events.
- .5 All ESC inspections shall be documented and any deficiencies or damaged ESC measures shall be repaired, amended, or altered immediately. If the design of the ESC measures is not functioning effectively they are to be altered or alternative measures implemented. The Departmental Representative and ESO will monitor erosion control performance and must approve all amendments and alterations.
- .6 Temporary ESC measures shall be implemented prior to the start of construction activities and shall remain in place until permanent ESC measures can be implemented, disturbed areas are reclaimed and stabilized, and or until vegetation growth has established to the satisfaction of the Departmental Representative.
- .7 The site will be secured against erosion during any period of construction inactivity or shutdown.

1.15 POLLUTION CONTROL

- .1 The Contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Debris containment measures must be implemented during the following activities to prevent the release or deposition of waste material or debris into Sulphur Creek:
 - .1 Existing Building renovations.
 - .2 Wastewater Treatment Plant demolition and removal.
 - .3 Installation of new process and mechanical equipment and appurtenances.
 - .4 New Building construction.
 - .5 Civil Grading.
 - .6 All other demolition, removal and construction activities at Miette.
- .2 The containment, storage, security, handling, use, unique spill response requirements, and disposal of empty containers, surplus product, or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Hazardous products shall be stored no closer than 100 metres from watercourses banks and slope breaks.
- .3 The Contractor shall provide spill kits at re-fuelling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site.
 - .1 The ESO and Departmental Representative prior to project start-up must approve these spill kits.
 - .2 The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
- .4 Spill kits must be present in all equipment and machinery used on site.
- .5 Timely and effective actions shall be taken to stop, contain, and clean-up spills, as long as the site is safe to enter. Jasper Dispatch will be contacted at 780-852-3100 immediately

of any spill. The Departmental Representative shall be notified following reporting to Jasper Dispatch.

- .6 In the event of a major spill, all work shall be stopped and all personnel devoted to spill containment and clean-up.
- .7 The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Departmental Representative and ESO.

1.16 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION

- .1 The Contractor shall ensure that all soil, seeds, and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) outside the Jasper National Park before delivery to the work site. The Departmental Representative and ESO will have the right to refuse equipment or vehicle entry to the Park and project site if equipment and vehicles are not clean and free of dirt and debris.
- .2 All equipment or vehicles rejected by the Departmental Representative due to presence of dirt, soil weeds or grease or fluid leaks will be removed from the Park immediately. All costs incurred to clean or fix leaks of equipment and vehicles will be borne by the Contractor.
- .3 Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Except for chain saws, any fuelling closer than 100 metres from any streams, wetlands, water bodies, waterways and slope breaks shall require the authorization and oversight of the Departmental Representative.
- .4 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage site is addressed in #2 and #3 of Pollution Control above.
- .5 The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- .6 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the Departmental Representative. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas viewpoints, etc. anywhere within Jasper National Park.
- .7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order. Equipment and Machinery inspections must be documented each day and a record of the inspection kept with each piece of equipment.
- .8 Fuel containers and lubricant product shall be stored only in secure locations specified by the Departmental Representative. Fuel tanks or other potentially deleterious substance containers shall be secured to ensure they are tamper proof, bear proof, and cannot be drained by vandals when left overnight in Jasper National Park. Alternatively, the Contractor may hire a security person employed to prevent vandalism.

1.17 OPERATION OF EQUIPMENT

- .1 Equipment movements shall be restricted to the "footprint" of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Departmental Representative. Unless authorized by the Departmental Representative activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities outside of the permitted project limits.
- .2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering the approved laydown areas or into watercourses or water bodies.
- .3 When, in the opinion of the Departmental Representative, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative and ESO.
- .4 If weeds are identified on site the Departmental Representative will flag the infested areas and restrict vehicle, equipment and construction crew access through the area.
- .5 Construction materials (gravel and aggregate fill) source pits will be inspected by a Parks Canada Environmental Officer before being approved and or transported to the project. The Contractor needs to give 10 calendar days' notice to inspect the source pits.
- .6 Additional project boundary restrictions may be required if sensitive wildlife species, their nests or habitats are identified in the project footprint during construction activities. The Departmental Representative will identify and mark the revised project limits if required.

1.18 FIRE PREVENTION AND CONTROL

- .1 A fire extinguisher shall be carried and available for use on each machine and at locations within office trailers and equipment storage in the event of fire. Basic firefighting equipment will be stored on-site in laydown and material storage areas and in pick-up trucks. Basic equipment includes 2 shovels, 2 Pulaski's, and 20 litre backpack pumps.
- .2 Construction equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.
- .3 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. Designated smoking locations will be established and smoking will be restricted to these locations or inside vehicle cabs. Designated smoking areas will be equipped with fire extinguishers.
- .4 In case of fire, Jasper Dispatch shall be contacted at 780-852-3100 immediately. The Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so.
- .5 Fires or burning of waste materials is not permitted.

1.19 WILDLIFE

- .1 During the Pre-Construction meeting all personnel shall be instructed by the Departmental Representative or ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.
- .2 There are no hour restrictions during winter construction (up to March 21/2016) and the contractor can work 24 hours a day, 7 days a week and in accordance with Section 01 71 14 Health and Safety requirements. If necessary, the construction activity may be scheduled around important wildlife windows.
- .3 No pets are allowed on site or in any vehicles or laydown areas.
- .4 All site workers will observe posted speed limits and avoid or terminate activities on site that attract or disturb wildlife. Workers will vacate the area and stay away from the immediate location if bears, cougars, wolves, elk, or moose display aggressive behaviour or persistent intrusion and shall notify Dispatch immediately. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times. All waste material will be stored in sealed, bear-proof containers and not in the back of pick-up trucks.
- .5 The Contractor will ensure that the work site is properly secured during non-work hours with excavations fenced and covered as required to prevent injury to wildlife.
- .6 Jasper Dispatch will be contacted at 780-852-3100 immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site. Other wildlife-related encounters are to be reported within 24 hours. Notify the Departmental Representative following reporting to Jasper Dispatch.
- .7 The Contractor must fence and cover all excavations over 1.2 m deep when unattended.
- .8 All food, cookware, garbage and other attractants must be stored in wildlife proof containers or vehicles, or removed from site when not in use.
- .9 The Contractor must immediately report all nuisance wildlife and any incidents involving wildlife getting into garbage or attractants to Jasper Dispatch (780-852-6155).
- .10 Feeding, harassment or destruction of any wildlife is strictly prohibited. Wildlife encountered at or near the project location will be allowed to passively disperse without undue harassment.
- .11 To reduce noise and air pollution, the Contractor must turn off machinery and equipment when not in use. Daylight operation of all mechanized equipment must be respected. If stream isolation requires generators and pumps, the Contractor must provide low noise type equipment.
- .12 Any winter road maintenance, required to access the project area, performed by the Contractor will not use pure salt. A maximum salt content of 5% will be included in any abrasive mixture.

1.20 VEGETATION

- .1 The Contractor shall minimize the area disturbed by this project. The Environmental Surveillance Officer (ESO) shall clearly mark work space boundaries and laydown areas with the Project Manager prior to the commencement of on-site activities.

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- .2 All trees to be removed must be clearly marked prior to the commencement of work. Root systems must be left intact wherever possible. The Contractor must replace removed trees at a 2:1 ration with native tree species. Replacement tree locations are subject to approval by Parks Canada.
 - .3 The Contractor must salvage top soil to use for restoration activities, except in areas where a significant orange hawkweed infestation is known. The Contractor must consult with Landon Shepherd to identify and flag areas of orange hawkweed infestation where topsoil is NOT to be salvaged prior to construction. Where possible intact sod mats will be salvaged. The Contractor must cover top soil salvage piles to prevent loss due to erosion.
 - .4 The Contractor must restore all disturbed areas in consultation with the Parks Canada Vegetation Restoration Specialist (Landon Shepherd: 780-883-0473 or through email: Landon.Shepherd@pc.gc.ca), who will advise on actions to be taken, timing, and seed type for the site.
 - .5 A seed certificate must be presented to Parks Canada for approval prior to applying seed.
 - .6 The Contractor must conduct clearing with the goal of having a low impact on the landscape. This can be accomplished by clearly delineating clearing limits, disposing of cleared vegetation appropriately and removing larger wood debris to the wood pile for use as firewood.
 - .7 Prior to accessing the site, the Contractor must ensure all machinery and equipment is clean of mud and vegetative debris.
 - .8 To prevent the spread of non-native seeds, the Contractor must clean all machinery on site prior to mobilizing to other parts of the Park.
 - .9 To prevent the spread of non-native seeds and to lessen the disturbance to vegetation, the Contractor must put down rig mats on vegetated areas, if there is less than 30cm of snow cover.
 - .10 Erosion and Sediment Control
 - .1 Lay-down areas for equipment and materials shall be located on non-vegetated areas, such as the trail and the parking lot, or be on rigmats, tarps, or poly.
 - .2 The Contractor must use erosion control measures free of hay and straw to prevent the spread of non-native seeds and to prevent attracting wildlife. Coconut matting and other 100% biodegradable erosion control products are appropriate substitutes.
 - .3 A detailed erosion control plan for the slope above the dechlorination channel and bridge area will be prepared and included within the Environmental Protection Plan prepared by a Qualified Environmental Professional (QEP).
 - .11 During the Pre-Construction meeting all personnel shall be instructed by the Departmental Representative or ESO on procedures to follow for the management and or removal of the existing vegetation. The project limits and vegetation to be cleared or removed will be clearly marked prior to construction.
 - .12 Vegetation will be cleared and or felled away from watercourses, water bodies and wetlands.

- .13 Riparian vegetation must be preserved. Riparian vegetation must be pruned or topped to retain root system and maintain bank stability if clearing is required to complete construction activities.
- .14 If required, topsoil or sod removed from riparian areas will be salvaged and stockpiled separately and be used later during reclamation.
- .15 Disturbed areas must be reclaimed immediately following construction activities. All site workers will observe posted speed limits and avoid or terminate activities. The approved seed mix (Part 2, Section 2.1) will be used on-site to reclaim all disturbed areas.

1.21 RELICS OR ANTIQUITIES

- .1 Artifacts, relics, antiquities, and items of historical interest such as cornerstones, commemorative plaques, inscribed tablets, and similar objects found on the work site shall be reported to the ESO or the Departmental Representative immediately. The Contractor and workers shall wait for instruction before proceeding with their work.
- .2 All historical or archaeological objects found in Jasper National Park are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction for the ESO or the Departmental Representative.

1.22 WASTE MATERIALS STORAGE AND REMOVAL

- .1 The Contractor and workers shall dispose of hazardous wastes in conformance with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
- .2 All wastes originating from construction, trade, hazardous and domestic sources, shall not be mixed, but will be kept separate.
- .3 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in Jasper National Park. These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers, and disposed of at an appropriate waste landfill site located outside the park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full. Waste containers will have sealed, bear-proof lids, and waste shall be covered while being transported.
- .4 A concerted effort shall be made by the Contractor and workers to reduce reuse and recycle materials.
- .5 All efforts to prevent wildlife from obtaining food, garbage or other domestic waste shall be made by the Contractor and contract staff while undertaking their work in Jasper National Park. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products to bear-proof containers is mandatory.
- .6 The Contractor and workers shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to Jasper Dispatch at 780-852-3100 and report the details.

- .7 Sanitary facilities, such as portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

1.23 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

- .1 If required, a Contractor's office and work headquarters material laydown, equipment parking and storage area will be permitted at the work site.
- .2 The National Park Act regulation prohibits anyone working within Jasper National Park from camping in non-designated areas.

1.24 CONSTRUCTION SITE ACCESS AND PARKING

- .1 All private vehicles must be parked on Laydown Areas pre-approved by the Departmental Representative. Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.
- .2 The Contractor shall ensure that the environment either within and beyond the work limits is not negatively impacted or damaged by workers' vehicles or construction machinery. The Contractor shall instruct all workers of the project limits so that the "footprint" of the project is kept within defined boundaries.

1.25 STANDARD MITIGATIONS

- .1 The Contractor must conduct all line locates prior to all aspects of work.
- .2 The Contractor must obtain all necessary permits prior to the commencement of installation activities.
- .3 The Contractor is responsible for public and site safety at all times.
- .4 The Contractor must provide, and make available at all times, a spill response kit capable of handling 110% of the total fuels on-site. The Contractor must ensure that all staff are trained in its use.
- .5 The Contractor must immediately address any detected leaks with absorbent pads, and the faulty equipment must be either removed from site or repaired immediately. Equipment stored overnight must be stored on tarps with appropriate containment if required. Drip trays must be used under all stationary equipment.
- .6 Equipment must remain on previously disturbed ground, on rigmats, or at least 30cm of snow.
- .7 Refueling
 - .1 The Contractor must ensure:
 - .1 Refueling occurs on tarps or other impervious barriers.
 - .2 Refueling of equipment will occur on land at least 30 m from any watercourse. Where 30 m is not possible, a location as far as possible from the watercourse will be chosen. Topographic features and slope will be considered.
 - .3 The refueling has a spill containment kit immediately accessible.
 - .2 In the event of any fluid spills or leaks exceeding 1 L or any spill quantity to water, the Contractor must notify Parks Canada Dispatch (780-852-6155) and the

- ESO (780-883-0794) immediately. Any absorbent materials used in the clean up or soils contaminated by the spill must be disposed of at the appropriate facility.
- .8 The Contractor must ensure that all garbage is stored and handled in compliance with the National Parks Garbage Regulations. Burning or burial of waste is not permitted. Waste is to be source separated and disposed of as follows:
- .1 Sorted materials: clean wood, glass, metal, concrete and clean fill shall be disposed of separately.
 - .2 All cardboard must be recycled.
 - .3 Unsorted waste: including drywall, carpets, treated or painted wood, asphalt, tar paper, tar and gravel shingles and other mixed construction debris must be disposed of at an approved landfill site, the closest being the West Yellowhead Regional landfill located in Hinton.
 - .4 Hazardous waste: such as contaminated soil, fuel tanks, asbestos, materials treated With lead paint, mercury switches and light ballasts, must be disposed of at an approved landfill site, the closest being Hinton at the West Yellowhead Regional Landfill. Contact with the facility in advance is required for the delivery and acceptance of these materials. Parks Canada must be provided with a receipt from the landfill facility documenting the amount and type of hazardous materials accepted.
- .9 The Contractor must ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the *Canada National Parks Act* and Regulations.
- .10 The Contractor must contact the Environmental Surveillance Officer (ESO) (Jurgen Deagle at 780-883-0794 and Jurgen.Deagle@pc.gc.ca) two weeks (or as soon as possible) prior to commencement of work. The ESO will schedule an onsite environmental briefing with all construction personnel, arrange site surveillance, and will issue applicable Special Activity Permits. The role of the ESO is as follows:
- .1 The ESO will oversee construction activities and ensure all Project operations are conducted in accordance with all identified environmental protection measures.
 - .2 The ESO will approve required workspaces and limits of clearing.
 - .3 The ESO or designate may require additional mitigations in response to any unforeseen environmental impacts.

Part 2 Products

2.1 SEED MIX

- .1 The primary purpose of re-vegetation of the project area is to provide soil stabilisation and, by using a native grass mixture, reduce the amount of invasive plant establishment. The site should be prepared by reducing compaction leaving surface rough and loose with small woody debris loosely spread around then hydro-seeded.
- .2 The recommended species below do not represent a naturally-occurring community of plants, but all are native to the park and are believed to grow successfully from seed in reclamation projects. Criteria for inclusion are: 1) naturally occurring in Jasper National Park, 2) grass sp, 3) known to have some success germinating and establishing by

seeding, and 4) known to establish in reclamation sites (bare soil). They must be native collected seeds and not cultivars or ecovar variants.

- .1 Slender wheatgrass for early establishment, erosion control, and weed suppression, followed by Foothills Rough Fescue, Alpine Bluegrass, and June grass (ratio: equal through percentage volume).
- .2 The Contractor shall submit seed mix design to the Department Representative for review.
- .3 Weather Conditions
 - .1 Work shall not be performed under adverse field conditions such as frozen soils, excessively wet or dry soil, or soil wetted with snow, ice or standing water.
 - .2 Mulching shall not take place when wind conditions are such that material is being carried beyond the designated work areas or that the material is not being uniformly applied.
 - .3 Must be applied during calm conditions and dry forecast for ≥ 24 hours.
- .4 Materials
 - .1 Mulch shall be clean and free of weeds and other foreign matter.
 - .2 Mulch shall be 100% biodegradable, compatible with the environment, and shall contain no germination inhibiting components (unless project warrants the use of inorganic mulches).
 - .3 Hydraulic mulch materials for use in Banff National Park must be one of the following types:
 - .4 Wood Fiber:
 - .1 Wood fiber mulch is a component of hydraulic applications.
 - .2 Wood fiber must be a minimum of 4 mm
 - .3 Must be manufactured virgin wood fibers
 - .5 Hydraulic Matrix:
 - .1 Hydraulic matrix is a combination of wood fiber mulch and tackifier applied as a slurry.
 - .6 Bonded Fibre Matrix (BFM):
 - .1 Bonded fiber matrix (BFM) is a hydraulically-applied system of fibers and adhesives that upon drying forms an erosion-resistant blanket that promotes vegetation, and prevents soil erosion.
 - .2 Tackifier must be capable of joining together the mulch particles to secure the mulch to the ground. The binder shall not form an impervious seal that will prevent the penetration of moisture to underlying soil.
 - .3 Water supplied by the Contractor shall be free of any impurities that might inhibit germination of the seed.
- .5 Application:
 - .1 Wood Fiber:
 - .1 It is typically applied at the rate of 2,250 to 4,500 kilograms per hectare (kg/ha) (2,000 to 4,000 lb/ac) with 0-5% by weight of a stabilizing emulsion or tackifier (e.g., guar, psyllium, acrylic copolymer) and applied as a slurry.

- .2 Hydraulic Matrix:
 - .1 It is typically applied at the rate of 2,250 to 4,500 kg/ha with 5-10% by weight of a stabilizing emulsion or tackifier (e.g., guar, psyllium, acrylic copolymer).
- .3 Bonded Fibre Matrix (BFM):
 - .1 BFMs are typically applied at rates from 3,400 kg/ha to 4,500 kg/ha based on the manufacturer's recommendation. The biodegradable BFM is composed of materials that are 100% biodegradable. The binder in the BFM should also be biodegradable and should not dissolve or disperse upon re-wetting. Typically, biodegradable BFMs should not be applied immediately before, during or immediately after rainfall if the soil is saturated. Depending on the product, BFMs require 12 to 24 hours to dry to become effective.

2.2 MONITORING

- .1 The Departmental Representative will have an Environmental Surveillance Officer (ESO) attending the site to monitor the construction activity for conformance with the Environmental Procedures. The ESO will be allowed access to the construction site for the purposes of ensuring activities are completed in compliance with the applicable legislation and regulations, and the recommendations of the EA. The ESO or Departmental Representative will present the "environmental briefing". The ESO's main duties are to monitor progress of the construction on an on-going basis to ensure compliance with the environmental protection measures, and to provide guidance through the Departmental Representative, in event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violation, direction to the Contractor will be the duty of the Departmental Representative.

2.3 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written 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.

Part 3 Execution

3.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.

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- .2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
 - .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 RECORD DRAWINGS

- .1 Departmental Representative will provide two sets of clean white prints for record drawing purposes.
- .2 Identify drawings as "Project Record Copy".
- .3 Maintain record drawings in new condition.
- .4 Make record drawings available for inspection on-site by Departmental Representative.
- .5 Record neatly and accurately deviations from Contract Documents.
- .6 Provide ball point marking pens, maintenance separate colours for each major system, for recording information. Mark changes in red ink.
- .7 Record actual construction information on one set of contract drawings and on shop drawings:
 - .1 Measured depths of various elements of foundation in relation finish first floor datum.
 - .2 Measured horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
 - .3 Measured location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by Change Order or field direction.
 - .6 Details not on original Contract Drawings
 - .7 References to related shop drawings and modifications
- .8 Provide photo image of record drawings.
- .9 At completion of project and prior to final inspection, neatly transfer notations to second set of prints and submit both sets of record drawings to Departmental Representative.

1.2 RECORD DRAWINGS

- .1 Departmental Representative will provide one set of specifications for record purposes.
- .2 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 Addenda and change orders.

1.3 OTHER DOCUMENTS

- .1 Maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

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 SUMMARY OF WORK

- .1 Design, fabrication, testing, supply, deliver, installation, start-up, and commission of two (2) complete disk filter treatment systems specify herein and as shown on the drawings. The equipment shall include packaged disk filters, pumps, piping, valves, process control devices, instruments and all other appurtenances necessary for a complete installation and functional operation. Installation training, inspection, start-up, commissioning, and operator training services are also to be provided.
- .2 Equipment off-loading, storage and installation shall be under the supervision by factory-trained personnel from the equipment supplier. Start-up and commissioning of the entire system shall be under the supervision of the Supplier for the process equipment specified.
- .3 The equipment specified herein shall be fabricated and shipped as units requiring a minimum of field installation, labour, and materials.
- .4 The Supplier shall provide the details relating to the specific equipment, the extent of shop assembly, as well as field work including inspection, certification of installation, start-up and commissioning and training requirements.

1.2 MEASUREMENT AND PAYMENT

- .1 There shall be no additional payment for items specified in this section. Payment shall be included in relevant bid items. Priced as lump sum.

1.3 RELATED WORKS

- .1 Section 44 41 31 - Hydrostatic and Pressure Testing.
- .2 Section 44 41 32 - Process Piping Materials and Methods.
- .3 Division 26.

1.4 ADDITIONAL INFORMATION

- .1 The drawings and layout have been developed based on the Disk Filter from Aqua-Aerobic.
- .2 The contractor shall be responsible for any redesign required to accommodate equipment that varies from the drawings and layout shown.
 - .1 Submit shop drawings for all redesign.
 - .2 Submit shop drawings sealed by a professional engineer registered in Alberta for all structural redesign.
 - .3 The Departmental Representative will not pay for any costs associated with redesign.

1.5 OPERATION AND MAINTENANCE DATA

- .1 Prior to delivery of the equipment, the Supplier shall jointly furnish to the Departmental Representative and the General Contractor, four (4) sets of complete installation and operation and maintenance data. The data shall include complete and detailed descriptions and instructions for the installation, operation, maintenance and lubrication of all pieces of equipment and all auxiliaries furnished by the Supplier. Each data set shall include a copy of the approved shop drawings. Operations and Maintenance data shall be prepared in accordance with requirements of Section 01 78 23.

1.6 PERFORMANCE REQUIREMENTS

- .1 The influent data for the Disk Filter System is shown below:

Parameter	Monthly Avg (mg/L)
Total Suspended Solids, mg/L	< 15
sBOD, mg/L (Summer)	< 7.5
Particulate BOD, mg/L (Summer)	< 7.5
Ammonia, Total (N), mg/L (Summer)	< 1

- .2 Assume summer influent conditions throughout winter months.
- .3 Each Disk Filter System to ultimately treat 420 m³/d of secondary effluent with the following characteristics:

Parameter	Monthly Avg (mg/L)
Total Suspended Solids, mg/L	< 15
sBOD, mg/L (Summer)	< 7.5
Particulate BOD, mg/L (Summer)	< 7.5
sBOD, mg/L (Winter)	< 15
Particulate BOD, mg/L (Winter)	< 15

- .1 Each Disk Filter System to deliver the following treated effluent parameters:

Parameter	Monthly Avg (mg/L)
Total Suspended Solids, mg/L	< 5
sBOD, mg/L (Summer)	< 7.5
Particulate BOD, mg/L (Summer)	< 1.75
sBOD, mg/L (Winter)	< 15
Particulate BOD, mg/L (Winter)	< 3.75
Total Phosphorus, mg/L	75% Removal

- .2 Provide a Performance Guarantee (Process Warranty) for one (1) year, as specified in overall Contract Specifications.
- .3 The water quality provided in this section is for information purposes only Conduct any additional tests that they deem necessary to comply with the Proposal requirements. These tests shall be identified in the bidding document, and shall be conducted at the expense of the Proponent.
- .4 Supply of the disk filter systems that shall be designed to allow any piece of equipment to be taken out of service without affecting the systems ability to provide the nominated net capacity of treated water.
- .5 Provide a statement of how and how effectively the proposed system can meet the requirements. Describe specific features of the proposed system that will achieve these requirements.

1.7 WARRANTIES

- .1 Refer to Section 01 78 00 – Closeout Submittals.

Part 2 Products

2.1 GENERAL

- .1 Quality Control: All equipment shall be designed, fabricated, and assembled in accordance with accepted industry standards. Individual parts shall be manufactured to standard sizes and gauges so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicated units shall be interchangeable. Equipment shall not have been in service at any time prior to delivery, except as required by tests. The equipment shall be delivered, off loaded, tested, and commissioned in proper operating condition in full conformity with the detailed drawings, specifications, engineering data, instructions, and recommendations furnished by the Supplier.
- .2 Safety:
 - .1 All equipment shall be designed, manufactured, and provided with due regard to safety of operation, accessibility, and durability of parts, and shall comply with all Alberta Occupational Health & Safety Regulations.
 - .2 All belt or chain drives, fan blades, couplings, and other moving or rotating parts shall be covered on all sides by a safety guard. Safety guards shall be fabricated of corrosion resistant materials. Each guard shall be designed for easy installation and removal. All necessary supports and accessories shall be provided for each guard. Supports and accessories, including bolts, shall be galvanized, unless otherwise noted.
- .3 Noise Control:
 - .1 The sound pressure level (SPL) from the equipment specified under these specification sections, including all ancillary equipment and driven devices, shall not exceed 80 dBA (corrected to free field conditions) when measured 900 mm in the horizontal plane from any major surface of the equipment and 1,500 mm from the floor, ground, or personnel platform with the equipment operating at any load point up to and including rated load in accordance with these specifications.
- .4 Lubrication:
 - .1 Equipment shall be adequately lubricated by systems that require attention no more frequently than weekly during continuous operation. Lubrication systems shall not require attention during start-up or shutdown and shall not waste lubricants.
 - .2 Lubricants of the type recommended by the equipment manufacturer shall be provided in sufficient quantity to fill all lubricant reservoirs and to replace all consumption during testing, startup and operation prior to Substantial Performance.
- .5 Accessories:
 - .1 Identification Plate: One 16 gauge stainless steel identification plate shall be securely mounted on each component in a readily accessible and visible location.

The plate shall have die-stamped thereon the identification number assigned to the component as provided.

.2 Lifting Lugs: Components weighing over 45 kilograms shall be provided with lifting lugs.

.3 Anchor Bolts: Anchor bolts shall be provided by the General Contractor.

.6 Monitoring, Control and Instrumentation:

.1 All monitoring, control and instrumentation devices including electrical/ pneumatic operated or self-contained process valves necessary for automatic operation and protecting the disk filter equipment against damage shall be supplied with the system.

2.2 SUMMARY OF EQUIPMENT SUPPLY

.1 The main equipment and services shall be provided are as follows:

.1 Disk Filter equipment including all accessories required to ensure the supplied equipment operates as an integral system. Disk filters to use cloth filtration technology that has been accepted for compliance with the State of California Water Recycling Criteria (Title 22).

.2 Refer to Instrumentation Summary of Work Div 1, Drawings, Div 25 and 40 for System Integration (PLC, HMI etc.).

.3 Refer to the Control Philosophy and HMI Guidelines for integration of Disk Filter to the WWTP.

.4 Refer to Electrical Summary of Work Div 1, Divg 26 and Drawings.

.5 Miscellaneous Equipment:

.1 Other miscellaneous instrumentation and equipment required to integrate the supplier's system into the existing plant.

2.3 GENERAL MOTOR SPECIFICATIONS

.1 Unless otherwise indicated on drawings, electrical motors supplied with the equipment are generally as follows:

.1	Less than 0.50 HP:	110 VAC/1ph/60Hz	Open Drip Proof (ODP).
.2	0.50 HP or more:	600 VAC/3ph/60 Hz	NEMA 3 Design B NEMA Class "B" Temperature Rise Premium Efficiency.

.2 Motors fitted to Pumps are TEFC type.

.3 Motors for use with VFDs will be inverter duty rated. Motors will have cast iron or steel frames, cast iron end brackets, cast iron conduit box and 1.15 service factor at 40°C.

.4 Motors will be USEM, Brooks Hansen, GE, Reliance or as approved alternate.

2.4 FASTENERS & HARDWARE

.1 All necessary assembly bolts, plates, nuts, washers and other hardware necessary to install the Disk Filter System are to be provided by the Supplier and will be of stainless steel if wetted (including high humidity or areas subject to spray) and carbon steel if non-wetted. Supplier to ensure compatibility of dissimilar materials.

2.5 ACCEPTABLE MANUFACTURERS

- .1 Acceptable Manufacturers: Aqua-Aerobic Systems Inc. or approved alternate.

Part 3 Execution

3.1 RECEIVING AND STORAGE

- .1 The disk filter equipment and appurtenances shall be delivered to the site in a condition satisfactory to the Departmental Representative and any omissions, discrepancies or damage evident on delivery shall be made good by the Supplier, at no cost to the Departmental Representative.
- .2 The General Contractor will sign the carrier's bill of lading to indicate receipt of the required number of crates, packages, etc., and will note thereon any apparent shortages of or visible damage to such crates, packages, etc. The Supplier shall furnish to the General Contractor, lists showing the contents of the said crates, packages, etc., complete with all necessary handling and off-loading instructions. Such lists shall be furnished sufficiently early so that copies will be available at the site when delivery of the said equipment and appurtenances is made. Within seven days after the date of delivery to the site, the General Contractor will notify the Supplier in writing of shortages or damage in the equipment delivered.
- .3 The General Contractor will be responsible for off-loading at site under the supervision of the Supplier's factory trained technical representative, for storing the equipment, appurtenances and materials and for protection against weather, loss, damage or theft. The Supplier shall provide full instructions in the Disk Filter Equipment Supply Contract of all precautions to be observed in connection with the handling, storing and protection of the equipment.

3.2 SUPPLIER SERVICES

- .1 The Supplier shall furnish the services of trained technical representatives as needed to provide the following:
 - .1 Not less than two (2) trips and four (4) days on the job site for inspection and supervision during installation. This is to ensure that the General Contractor installs all equipment in exact accordance with the Supplier's written instructions and as directed on the jobsite. Deviation from the Supplier's written or verbal instructions shall be subject to approval by the Departmental Representative and discrepancies or unsatisfactory work shall be reported in writing by the equipment Supplier's representative jointly to the Departmental Representative and the General Contractor.
 - .2 Not less than one (1) trip and five (5) days on the job site for inspection and certification of installed equipment and functional and performance testing of equipment.
 - .3 Not less than one (1) trip and six (6) days on the job site comprising three (3) days for start-up and commissioning and an additional three (3) days on the job site for operator training.
 - .4 The Supplier shall provide the services of a trained and experience technician (hereinafter referred to as the Supplier's Representative) for:

- .1 Delivery Inspection.
- .2 Installation Training.
- .3 Witnessing of equipment installation (disk filters and ancillary equipment).
- .4 Assistance in equipment and process performance testing.
- .5 Operations and maintenance training.
- .5 The contractor shall that the delivery of the equipment and the provision of field services meet and conform to the construction schedule and to these Contract Documents.
- .6 The Supplier will be required to certify:
 - .1 Satisfactory delivery of the equipment.
 - .2 Satisfactory equipment installation training.
 - .3 Satisfactory equipment installation.
 - .4 Satisfactory equipment and process performance testing.

3.3 EQUIPMENT TESTING PROCEDURE

- .1 Submit a thorough description of the procedures to be employed in testing the disk filter equipment. The procedure will be reviewed by the Departmental Representative for suitability and should be submitted 3 weeks prior to any testing.
- .2 Include:
 - .1 Intended methods of testing manual and automatic start, stop features.
 - .2 Intended routes of water flows caused by testing.
 - .3 Safety precautions to be employed.
 - .4 Previous testing experience of Supplier's personnel or subtrades.

3.4 FIELD INSPECTION AND TESTING

- .1 The Supplier shall provide a pre-start-up check list with the equipment. This checklist shall be completed by the General Contractor and returned to the Departmental Representative prior to requesting the Supplier's presence for the pre-start-up inspection and start-up services. When the equipment installation has been completed to the standards indicated by these specifications, the General Contractor shall arrange for the services of the equipment manufacturer's technical representative.
- .2 The equipment manufacturer's technical representative shall inspect the installation to ensure that the equipment has been installed in accordance with the manufacturer's requirements. If the installation is not in order, the General Contractor will correct the deficiencies indicated by the technical representative. The General Contractor will start, run and adjust equipment at this time. The technical representative shall then advise the Departmental Representative in writing that the installation has been checked, has been installed correctly and is in working order.

3.5 START-UP AND COMMISSIONING

- .1 The Supplier shall provide a factory trained supervisor(s) skilled and experienced in the manufacture, assembly, installation, PLC programming, operation and maintenance of all equipment specified herein for each stage of the construction, as specified in Section 01 78 23 – Operations and Maintenance Data, Section 01 78 24 – Spare Parts and Maintenance, and Section 01 75 01 – Pre-Start-up, Start-up and Commissioning.

- .2 The General Contractor will be responsible for providing all labour, equipment and materials necessary to unload, install, assemble, and test the equipment under the direction of the above Supervisor(s). The Supervisor(s) shall check all completed installations and report unsatisfactory work to the Departmental Representative. The Supervisor(s) shall fully cooperate with the Departmental Representative and General Contractor and shall provide such direction and assistance as is required by the Departmental Representative and General Contractor in testing and commissioning the equipment.
- .3 The Supervisor(s) is (are) to assist the Departmental Representative toward ensuring that the General Contractor carries out the installation of this equipment expeditiously, in a proper and satisfactory manner.

TRAINING OF PERSONNEL

- .4 General
 - .1 Supplier shall provide training outline for review and approval three (3) weeks prior to on-site training.
 - .2 Supplier shall provide for training of Parks Canada's personnel in the operation and maintenance of all components and controls provided under this Section.
 - .3 Training shall consist of both classroom and hand-on sessions conducted.
 - .4 Supplier shall designate a person responsible for scheduling and coordinating all training.
- .5 System training shall include but not necessarily be limited to:
 - .1 System operations philosophy.
 - .2 Equipment functions/Operator interface.
 - .3 Component operation (start-up and shut down), and troubleshooting.
 - .4 Routine and annual maintenance.

3.6 INSTRUMENTATION AND CONTROL

- .1 Wires in and to control panel are to be labeled using instrument/equipment PLC tag not direct addressing (for example: Flow control valve FCV-1234 open status would have 2 wires labeled as ZIO-1234-1 and ZIO-1234-2). All wires must be labeled.
- .2 Provide one final copy of the PLC program on disk for Parks Canada's file. Turnover HMI runtime license and PLC programming software to Parks Canada. All programming software to be registered under Parks Canada.

3.7 PROCESS WARRANTY

- .1 Performance Guarantee: Contractor shall guarantee that each of the two (2) disk filter units will meet the following treated water quality limits subject to the system being operated in accordance with the Supplier's operating instructions and within the design parameters of the system:
 - .1 Effluent Particulate BOD less than 1.75 mg/L in summer and 3.75 mg/L in winter on a monthly average basis, under all operating conditions.
 - .2 Effluent Total BOD less than 10 mg/L in summer and 20 mg/L in winter on a monthly average basis, under all operating conditions.

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- .3 Effluent TSS less than 10 mg/L, on a monthly average basis, under all operating conditions.
 - .4 75% Removal of Effluent Particulate Phosphorus on a monthly average basis, under all operating conditions.

END OF SECTION

Part 1 General

1.1 SUMMARY OF WORK

- .1 The Summary of the Work includes: supply, deliver, off-load at the site, store, install, align, field pipe, wire, and commission two (2) Packaged Wastewater Treatment Plants (WWTP) and accessories as outlined in this Section and as shown on the Drawings.
- .2 The equipment specified herein shall be fabricated and shipped as units requiring a minimum of field installation, labour, and materials.

1.2 MEASUREMENT AND PAYMENT

- .1 There shall be no additional payment for items specified in this section. Payment shall be included in relevant bid items. Priced as lump sum.

1.3 QUALITY ASSURANCE

- .1 Ensure that installations conform to all applicable local, Provincial, and/or Federal codes, standards, and regulations in effect at time of bid.
- .2 Comply with the requirements of the following organizations, at a minimum:
 - .1 AGMA, American Gear Manufacturers Association.
 - .2 AISC, American Institute of Steel Construction.
 - .3 AISI, American Iron and Steel Institute.
 - .4 ANSI, American National Standards Institute.
 - .5 ASME, American Society of Mechanical Engineers.
 - .6 ASTM, American Society for Testing and Materials.
 - .7 AWWA, American Water Works Association.
 - .8 CEC, Canadian Electrical Code.
 - .9 CSA, Canadian Standards Association.
 - .10 EEMAC, Electrical and Electronic Manufacturers Association of Canada.
 - .11 ESA, Electrical Safety Authority.
 - .12 IEEE, Institute of Electrical and Electronics Engineers.
 - .13 ISA, Instrument Society of America.
 - .14 NEC, National Electrical Code.
 - .15 NFPA, National Fire Protection Association.
 - .16 NEMA, National Electrical Manufacturers Association.
 - .17 SSPC, Steel Structures Painting Council.
 - .18 Alberta Building Code.
 - .19 CPC, Canadian Plumbing Code.

1.4 SHOP DRAWINGS AND PRODUCT DATA SUBMITTALS

- .1 Shop Drawing Package to include the following:

- .1 Design criteria, which includes: flow rate, hydraulic loading and detention time.
- .2 Process and control description.
- .3 Equipment specification sheet.
- .4 Equipment cut sheets for all components.
- .5 General arrangement drawings, process and instrumentation diagram and electrical drawings. The drawings shall provide detailed concrete pad dimensions.

1.5 ADDITIONAL INFORMATION

- .1 The drawings and layout have been developed based on the Packaged WWTP from Capital H2O (Napier-Reid).
- .2 The contractor shall be responsible for any redesign required to accommodate equipment that varies from the drawings and layout shown.
 - .1 Submit shop drawings for all redesign.
 - .2 Submit shop drawings sealed by a Professional Engineer registered in Alberta for all structural redesign.
 - .3 The Departmental Representative will not pay for any costs associated with redesign.

1.6 OPERATING & MAINTENANCE DATA

- .1 Prior to delivery of the equipment, the Supplier shall jointly furnish to the Departmental Representative and General Construction Contractor, one (1) electronic (.pdf) and four (4) paper sets of complete installation, operation and maintenance data and instructions for incorporation into the Operation and Maintenance Manual that will be prepared as specified in Section 01 78 23 - Operating and Maintenance Data.
- .2 Data to include:
 - .1 Manufacturer's name, type, model, year, capacity and serial number.
 - .2 Details on operation, servicing and maintenance.
 - .3 Recommended spare parts list and addresses of representatives.

1.7 TREATMENT REQUIREMENTS

- .1 The influent data to the Septic Tank is shown below:

Table 1.7.1- Summary of Wastewater Influent Data (Prior to Septic Tank)

Year	Number Observations	BOD mg/L	NH4-N mg/L	Total P mg/L	TSS mg/L	pH
Yearly Averages						
2001	8	62	4.5	4.0	40	
2003	2	162			70	
2004	14	158			131	
2005	15	182	14.4	5.3	247	
2006	16	141	9.8	3.9	132	7.55
2007	4	111	34.1	3.4	97	7.37

Year	No. of Observations	BOD mg/L	NH ₄ -N mg/L	Total P mg/L	TSS mg/L	pH	Fecal Coliforms per 100 mL
Parks Leadership Targets		<10 (summer)	<1 (summer)	<0.15 ³	<10	—	<20
MHS Yearly Averages							
2008	7	<2.00	<0.06	0.66	15.7	7.42	7
2009	3	<2.73	<0.05	0.43	5.67	7.51	26
2010	5	<2.32	<0.08	0.23	6.40	7.48	3
2011	6	<2.33	<0.07	0.40	5.33	7.75	8
2012	6	<3.23	<0.07	0.40	8.00	7.62	54
2013	6	<2.08	<0.07	0.26	3.50	8.01	5
2014	5	<2.00	<0.05	<0.15	3.04	8.04	4
Overall Analysis							

No. of Results		38	36	38	38	36	36
Min		<2.0	<0.050	0.10	<3.0	6.73	<1
10 th Percentile		<2.0	<0.050	0.125	<3.0	7.34	<1
Median		<2.0	<0.050	0.305	5.5	7.83	2
Avg		<2.4	<0.066	0.373	7.2	7.69	13
90 th Percentile		<3.4	<0.093	0.630	18	8.07	45
Max		6.0	0.137	1.37	23	8.46	91

¹ Grab samples.

² **Bolded/Highlighted values** are not in compliance with Parks Canada interim discharge limit for Total P or Leadership Targets for other parameters.

³ For total P, an interim discharge limit of <0.15 mg/L is being utilized; the actual Leadership Target for total P is much lower at <0.005 mg/L.

.4 The packaged treatment system (RBC & Clarifier) must deliver the following effluent:

Parameter	Design (mg/L)	Monthly Avg (mg/L)
Total Suspended Solids, mg/L	< 10	< 15
sBOD, mg/L (Summer)	< 7.5	< 7.5
Particulate BOD, mg/L (Summer)	< 7.5	< 7.5
sBOD, mg/L (Winter)	< 15	< 15
Particulate BOD, mg/L (Winter)	< 15	< 15
Ammonia, Total (N), mg/L (Summer)	< 1	< 1
Ammonia, Total (N), mg/L (Winter)	< 5	< 5

.5 Provide a Performance Guarantee (Process Warranty) for one (1) year, as specified in overall Contract Specifications.

1.9 'MANUFACTURER AND SUPPLIER

.1 The equipment specified herein shall be fabricated and shipped as units requiring a minimum of field installation, labour, and materials.

.2 The supplier shall provide the details relating to the specific equipment, the extent of shop assembly, as well as fieldwork including inspection, certification of installation, start-up and commissioning supervision, and training requirements by factory-trained personnel.

.3 Approved supplier: Napier-Reid (represented by Capital H₂O Systems Inc.) or approved alternate.

Part 2 Products

2.1 GENERAL REQUIREMENTS

.1 Description

.1 There are two (2) packaged wastewater treatment plants. Each packaged wastewater treatment plant shall consist of a Rotating Biological Contactor (RBC) unit and a secondary clarifier and shall be an integral component (unit process) of the overall treatment scheme for the wastewater treatment plant.

.2 Clarifier sludge will be discharged to the existing sanitary sewer.

.2 Quality Control

- .1 All equipment shall be designed, fabricated, and assembled in accordance with accepted industry standards. Individual parts shall be manufactured to standard sizes and gauges so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicated units shall be interchangeable.
- .2 Equipment shall not have been in service at any time prior to delivery, except as required by tests. The equipment shall be delivered, off-loaded, tested, and commissioned in proper operating condition in full conformity with the detailed drawings, specifications, engineering data, instructions, and recommendations furnished by the Supplier.

.3 Safety

- .1 All equipment shall be designed, manufactured, and provided with due regard to safety of operation, accessibility, and durability of parts, and shall comply with all Alberta Occupational Health & Safety Regulations.
- .2 All belt or chain drives, fan blades, couplings, and other moving or rotating parts shall be covered on all sides by a safety guard. Safety guards shall be fabricated of corrosion-resistant materials. Each guard shall be designed for easy installation and removal. All necessary supports and accessories shall be provided for each guard. Supports and accessories, including bolts, shall be stainless steel, unless otherwise noted.
- .3 Noise Control: The sound pressure level (SPL) from the equipment specified under these specification sections, including all ancillary equipment and driven devices, shall not exceed 85 dBA (corrected to free field conditions) when measured 1000 mm in the horizontal plane from any major surface of the equipment and 1500 mm from the floor, ground, or personnel platform with the equipment operating at any load point up to and including rated load in accordance with these specifications.

.4 Lubrication

- .1 Equipment shall be adequately lubricated by systems that require attention no more frequently than weekly during continuous operation. Lubrication systems shall not require attention during start-up or shutdown and shall not waste lubricants.
- .2 Lubricants of the type recommended by the equipment manufacturer shall be provided in sufficient quantity to fill all lubricant reservoirs and to replace all consumption during testing, start-up and operation prior to Substantial Performance.

.5 Accessories

- .1 Identification Plate: One 16-gauge stainless steel identification plate shall be securely mounted on each component in a readily accessible and visible location. The plate shall have die-stamped thereon the identification number assigned to the component as provided.
- .2 Lifting Lugs: Components weighing over 45 kilograms shall be provided with lifting lugs.
- .3 Anchor Bolts: Anchor bolts shall be provided and shall be of stainless steel.

.6 Monitoring, Control and Instrumentation

- .1 All monitoring, control and instrumentation devices including electrical/pneumatic operated or self-contained process valves necessary for automatic operation shall be supplied with the system.
- .7 All pipe materials to be new, free from defects, and conforming to applicable reference standards.
- .8 Where dissimilar metals are to be connected, furnish dielectric fittings and/or isolation flanges.

2.2 SUMMARY OF EQUIPMENT SUPPLY

- .1 The main equipment and services that are to be included in this section shall include but not limited to the following:
 - .1 RBC equipment necessary for meeting the Process Warranty.
 - .2 Secondary Clarifier designed to meet the Process Warranty.
 - .3 Electrical
 - .1 All motor starters for skid-mounted motors.
 - .2 Panels, cabinets and terminals for electrical distribution devices.
 - .3 All other electrical devices and interconnect cabling that are required on skid-assembled units.
 - .4 Miscellaneous Equipment
 - .1 Other miscellaneous instrumentation and equipment required to integrate the supplier's system into the new plant.
 - .5 General
 - .1 Equipment General Arrangement and Layout Drawings.
 - .2 Operation and Maintenance Manuals.
 - .3 Spare Parts (as required).
 - .4 Installation Assistance.
 - .5 Process Start-up and Commissioning Services and Assistance.
 - .6 Operating and Training.
 - .7 Performance Guarantee.
 - .8 A minimum of one (1) year warranty of the RBC unit, final clarifier and all ancillary components.
 - .9 Equipment delivery FOB Miette Hot Springs wastewater treatment Plant.

2.3 ROTATING BIOLOGICAL CONTACTOR (RBC)

- .1 RBC Module
 - .1 The RBC module shall be 3.66 m (12') in diameter, with a minimum total effective media surface area of 9,536 m² (102,600 ft²).
 - .2 The RBC media shall be divided into four stages and the media surface area for each stage shall not be less than the area as follows:
 - .1 Stage 1 – 2,543 m² (27,360 ft²) media.
 - .2 Stage 2 – 2,331 m² (25,080 ft²) media.
 - .3 Stage 3 – 2,331 m² (25,080 ft²) media.

-
- .4 Stage 4 – 2,331 m² (25,080 ft²) media.
 - .2 RBC Shaft
 - .1 The shaft shall be designed for load bearing capacity for each shaft considering the maximum anticipated biofilm growth of 3 mm and shall include an adequate margin of safety. The shaft shall be designed for unbalanced loads and cyclic fatigue.
 - .2 The stub ends shall be made from solid carbon steel, which are machined and structurally attached by welding to the central shaft to make the transition from the pipe to the stub ends. All fabrication during construction shall confirm to Canadian Welding Bureau's welding and quality control standards.
 - .3 The central shaft shall be coated with a protective coating suitable for humid and corrosive conditions.
 - .3 Surface Preparation and Paint Specification
 - .1 The main shaft shall be sand blasted to SSPC-SP10 white metal blast cleaning followed by 2-coat epoxy finish, 12-14 mils thick.
 - .2 Surface finish of drive units, bearings and control equipment shall be done to manufacturer's standard.
 - .4 RBC Media
 - .1 RBC media shall be of 3.66 m in diameter. The media shall be fabricated from high-density polyethylene, vacuum-formed into a corrugated sinusoidal profile to provide the specified surface area and uniform irrigation of wastewater throughout the pack. The media shall be fabricated with corrugations for stiffness and to provide larger surface area. The media shall be suitable and durable for the rotating biological contactor process.
 - .2 The media shall be resistant to disintegration, ultraviolet degradation, erosion and aging. Ultraviolet protection shall be provided by the incorporation of a carbon black stabilizer. The media shall contain flow passages, which shall be of adequate size and spacing for biological growth development and bio solids flushing.
 - .5 RBC Media Support Assembly
 - .1 The media shall be assembled into pie-shaped packs and held together at 3-points by diameter galvanized steel pipes. The holes in each media sheet shall be formed to provide flat contact surface to the connecting pipes to eliminate an edge contact with the pipes to prevent enlarging of the holes due to friction and eliminating lateral movement of the packs.
 - .2 The media shall be assembled into 32 media pack assemblies. The RBC media packs shall be assembled onto to RBC shaft at manufacturer's factory.
 - .6 RBC Drive Assembly and Motor
 - .1 Each RBC unit shall be provided with a drive assembly with a shaft mounted gear reducer and explosion proof motor.
 - .2 The drive motor shall be 3 to 5 hp, TEFC, explosion proof, 575V/3/60. 1200 rpm with 1.15 service factor.
 - .3 The gear reducer shall consist of a gear box made from high-strength cast iron housing, hardened teeth gears, with a service factor of 1.25. The reducer and

motor mount shall be coated for corrosion protection according to the reducer manufacturer's standards.

.7 Re-circulation Bucket

- .1 Two re-circulation bucket assemblies are included with each RBC. The buckets are designed to return some flow from RBC's last stage to the first stage for RBC better performance. The buckets are fabricated from commercial quality steel and coated for corrosion protection according to this specification. Buckets are secured to the RBC by stainless steel fasteners.

.8 RBC Tanks

- .1 RBC tanks shall be (each overall dimensions of approx. 8700mm L x 4200mm W x 1900mm H), made in 6 mm steel plates suitably reinforced with structural members to withstand full loading during normal operation with the tank full of wastewater. All internal baffling shall be provided as well fasteners for the RBC bearing and drive unit.
- .2 RBC tank shall be sandblasted inside and outside to SSPC-SP10 near white, followed by 14 mils of coal tar epoxy coating.
- .3 RBC tank shall be shipped loose for installation by others on the concrete pads above the ground. Supplier shall provide the section of grating on both ends of RBC and handrails loose to be installed by others on site.
- .4 Insulation shall be provided around outside of the tank to maintain operating temperature and prevent freezing.
- .5 Cathodic protection system with sacrificial anodes will be supplied for field installation by others.

.9 Bucket Feeder

- .1 One bucket feeder assembly shall be included with each RBC unit. The feed buckets shall be fabricated from high quality steel and coated for corrosion protection. Buckets shall be secured to the RBC unit by stainless steel fasteners.

.10 RBC Bearings

- .1 The RBC units shall be supported at both ends by grease lubricated, tapered roller, self-aligning pillow block bearings. All bearings shall be shipped loose for field installation. A non-expansion bearing shall be mounted on the drive end and an expansion bearing on the idle end.

2.4 SECONDARY CLARIFIER

- .1 The treated effluent from RBC unit flows into the secondary clarifier, where the sloughed solids are allowed to settle and the clarified supernatant overflows into the treated effluent chamber. The clarifier tank shall be made, not less than 6 mm in thickness, of epoxy coated steel plate.
- .2 The clarifier system shall include the following items:
 - .1 Inlet distribution piping with stainless steel supports.
 - .2 Central stilling well made of epoxy-coated steel plates, supported from the access walkway.
 - .3 Effluent trough with adjustable V-notch effluent weir in epoxy-coated steel c/w scum baffle.

- .4 Submersible sludge return pump for returning settled biological solids to the existing sanitary sewer.
- .5 Galvanized grating on the secondary clarifier.

2.5 ELECTRIC HEATER

- .1 Electric heaters will be provided to maintain operating temperature and prevent freezing RBC unit.
- .2 Electric heater should be explosion proof convection heater, designed for heating spaces where explosive substances are not or may be present. The heater should be available with CSA C/US approval. All units should be fitted with an externally adjustable thermostat and resistant moisture coat. The construction of the heater should consist of large convector surface area and high mass fins to ensure safe and efficient low temperature heat transfer to the environment. Convectors should be black anodized to resist oxidation and maximize heat transfer.
- .3 The heater should be available for wall or floor mounting, c/w mounting brackets and wire guards.
- .4 A 30A, 600V feed will be provided to the RBC control panel. Contractor is responsible for providing necessary voltages as required.

2.6 PACKAGED PLANT ENCLOSURE

- .1 Provide packaged plant enclosure to protect the RBC media and biological growth and secondary clarifier from adverse weather conditions and direct sunlight exposure, and to prevent vandalism and aesthetical objections.
- .2 The enclosures shall be made from pre-fabricated fibreglass panels. Panels shall be designed to withstand all wind, snow, and weather loads.
- .3 The enclosures shall be supplied in modular panel sections for onsite assembly. Mounting hardware and installation instructions shall be provided.
- .4 Each enclosure shall be furnished with access doors, observation ports, and ventilation louvres.
- .5 The Contractor is to provide the anchor bolts for securing the enclosure to concrete floor.

2.7 PACKAGE PLANT CONTROL PANELS

- .1 The control panel shall be in NEMA 4 enclosure rated for 575/3/60. All control logic shall be done by using PLC code.
- .2 All vendor provided packages containing PLC controllers are to use Siemens SIMATIC-S7 based processors or approved equivalent. Communication protocol used must be Profibus as per instrumentation scope of work, connect to plant network as per network block diagram.
- .3 Vendor specified Ethernet switches are to be managed Sixnet SLX series or approved equivalent.

- .4 Vendor packages containing PLC controllers are to provide completed memory map, tag list and HMI screens for integration into master HMI system.
- .5 Care Systems Solutions Ltd. is responsible for integrating all vendor provided HMI screens into master SCADA system, including all tags, alarms and historical trending information. PLC programs/files must be turned over to client at the end of project in editable PLC code format.
- .6 All equipment outline as a vendor package shall be specified and supplied by the associated vendor. Submit shop drawings for Departmental Representative's approval for each piece of equipment outlined within the vendor package
- .7 Programming of the vendor PLC will be the responsibility of the vendor; however, both the vendor and programming integrator are required to cooperate with Care Systems Solutions Ltd. for commissioning and integration with master HMI and turnover of computer/PLC equipment as requested.
- .8 The programming integrator is responsible for the integration of all vendor packaged systems into the master hmi/plc system, including all PLC tags required for control of the vendor package. Once the vendor has completed commissioning of their HMI and PLC the programmer shall import the tags, alarm structure and control logic into the main PLC program and make available all signals to the HMI vendor Care Systems Solutions Ltd. via BACnet/IP protocol. All vendor tags must be monitored, trended and alarmed through the master SCADA system similar to all other local tags. The Master HMI navigations shall have a button that links to and from the vendor screens. The operators must also have the ability to acknowledge and reset all vendor alarms through the master SCADA system. The modification by the programmer of vendor screen content is not permitted without the vendors consent.
- .9 The programming integrator will coordinate the integration, communications and remote service access with each vendor. Master PLC to vendor PLC communication for the RBC/Clarifier systems will be handled via Profibus. All available I/O for the vendor systems shall be available at the Master PLC. In the case of vendor control panels which do not connect directly to the plant network, all specified discrete and analog I/O will be wired directly to the nearest Master PLC for remote control.
- .10 All motors shall have hand-off-auto selector switches, pilot lights and motor overload protectors in the control panel.
- .11 Vendor to provide 1500VA UPS, Power Conditioner and Surge Protection devices in all vendor provided control panels.

Part 3 Execution

3.1 TRANSPORT, RECEIVING AND STORAGE

- .1 The Contractor shall coordinate delivery of the two (2) packaged wastewater treatment plants and appurtenances to the site in a condition satisfactory to the Departmental Representative and any omissions, discrepancies or damage evident on delivery shall be made good by the Contractor at no cost to the Departmental Representative.

- .2 The Contractor shall arrange for a supplier's representative to be present during delivery. The Contractor shall jointly inspect products with Department Representative and Supplier, record shortages, damages, or defective items. The Contractor must obtain a certificate from the supplier's representative stating the equipment can be installed and that supplier's warranty is still in effect.
- .3 The Contractor will be responsible for off-loading at site, for storing the equipment, appurtenances and materials and for protection against weather, loss, damage or theft. The Supplier shall provide full instructions of all precautions to be observed in connection with the handling, storing and protection of the equipment.

3.2 INSTALLATION

- .1 The Contractor shall confirm all requirements (piping, wiring, connection termination, and all other requirements) necessary for a complete and functional system. No additional or reduced compensation will be paid to the Contractor for installation of the supplied equipment. As a general guide:
 - .1 All field piping, wiring and instrument air lines connecting the equipment and instruments shall be supplied and installed by the Contractor.
 - .2 All piping, valves and additional auxiliary equipment shown on the P&ID's, general arrangement drawings and called for in the specifications shall be supplied and installed by the Contractor. Install all equipment in strict accordance with manufacturer's and supplier's instructions.
- .2 Any damage resulting from either failure to observe the installation instructions or as a result of proceeding with the work without complete knowledge of how it is to be done will be the Contractor's responsibility.
- .3 Make equipment installation and connections by skilled tradesmen to the best standard.
 - .1 Carry out work to produce a neat, accurate, secure, functional installation.
 - .2 Repair at own expense, any damage done to the installation of materials while carrying out the work.
- .4 Set base plates in place and shim to correct alignment. A minimum of 25 mm of grout shall be placed under bases.
- .5 Upon completion of installation, fill, add to, and check equipment requiring lubricating oils, greases and coolants. Types and amounts to be in strict accordance with manufacturer's recommendations.

3.3 SUPERVISION AND START-UP

- .1 The Supplier shall provide a factory trained technical representative skilled and experienced in the manufacture, assembly, installation, operation and maintenance of all equipment specified herein.

3.4 FIELD INSPECTION AND TESTING

- .1 The equipment shall be field tested for leaks or damage in shipment. Field tests shall consist of hydrostatic testing with potable water for a minimum period of 24 hours, at which time no visible leakage shall be evident. Damage or leaks in the equipment shall be

repaired or replaced by the Supplier. The Contractor will conduct the field testing under the supervision of the equipment manufacturer's representative.

- .2 The Supplier shall provide a pre-start-up checklist with the equipment. This checklist shall be completed by the Contractor and returned to the Departmental Representative prior to requesting the Supplier's presence for the pre-start-up inspection and start-up services. When the equipment installation has been completed to the standards indicated by these specifications, the Contractor shall arrange for the services of the equipment manufacturer's technical representative.
- .3 The equipment manufacturer's technical representative shall inspect the installation to ensure that the equipment has been installed in accordance with the manufacturer's requirements.
 - .1 If the installation is not in order, correct the deficiencies indicated by the technical representative. Start, run and adjust equipment at this time. The technical representative shall then advise the Departmental Representative in writing that the installation has been checked, has been installed correctly and is in working order.
- .4 The Supplier shall provide a minimum of five (5) days field service by a fully qualified service technician to provide installation direction, inspect the completed installation, start-up and commissioning assistance, and train the Operator in its operation and maintenance. The contractor shall bear all the costs of the equipment manufacturer's technical representative for additional field services required due to deficiencies or contractor delays in completing the work.
- .5 The Contractor will, at their own expense, repair any irregularities or discrepancies determined during the examination. Any additional trips required by the manufacturer's representative for re-testing due to faulty installation or incomplete systems shall be borne by the Contractor.

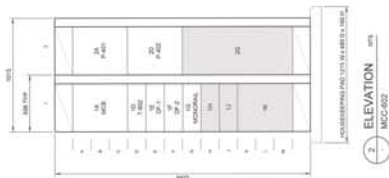
3.5 TRAINING OF PERSONNEL

- .1 General
 - .1 Supplier shall provide for training of Departmental Representative's personnel in the operation and maintenance of all components and controls provided under this Section.
 - .2 Supplier shall designate a person responsible for scheduling and coordinating all training.
- .2 System training shall include but not necessarily be limited to:
 - .1 System operations philosophy.
 - .2 Equipment functions/Operator interface.
 - .3 Component operation (start-up and shut down), and troubleshooting.
 - .4 Routine and annual maintenance.

3.6 PROCESS WARRANTY

- .1 Performance Guarantee: Contractor shall guarantee that each of the two (2) packaged wastewater plants meet the following treated water quality and production limits subject to the system being operated in accordance with the Supplier's operating instructions and within the design parameters of the system:
 - .1 Effluent sBOD less than 7.5 mg/L in summer and 15 mg/L in winter on a monthly average basis, under all operating conditions.
 - .2 Effluent Total BOD less than 15 mg/L in summer and 30 mg/L in winter on a monthly average basis, under all operating conditions.
 - .3 Effluent TSS less than 15 mg/L, on a monthly average basis, under all operating conditions.
 - .4 Effluent Ammonia-N (NH₄-N) less than 1.0 mg/L in summer and 5.0 mg/L in winter, on a monthly average basis, under all operating conditions.

END OF SECTION

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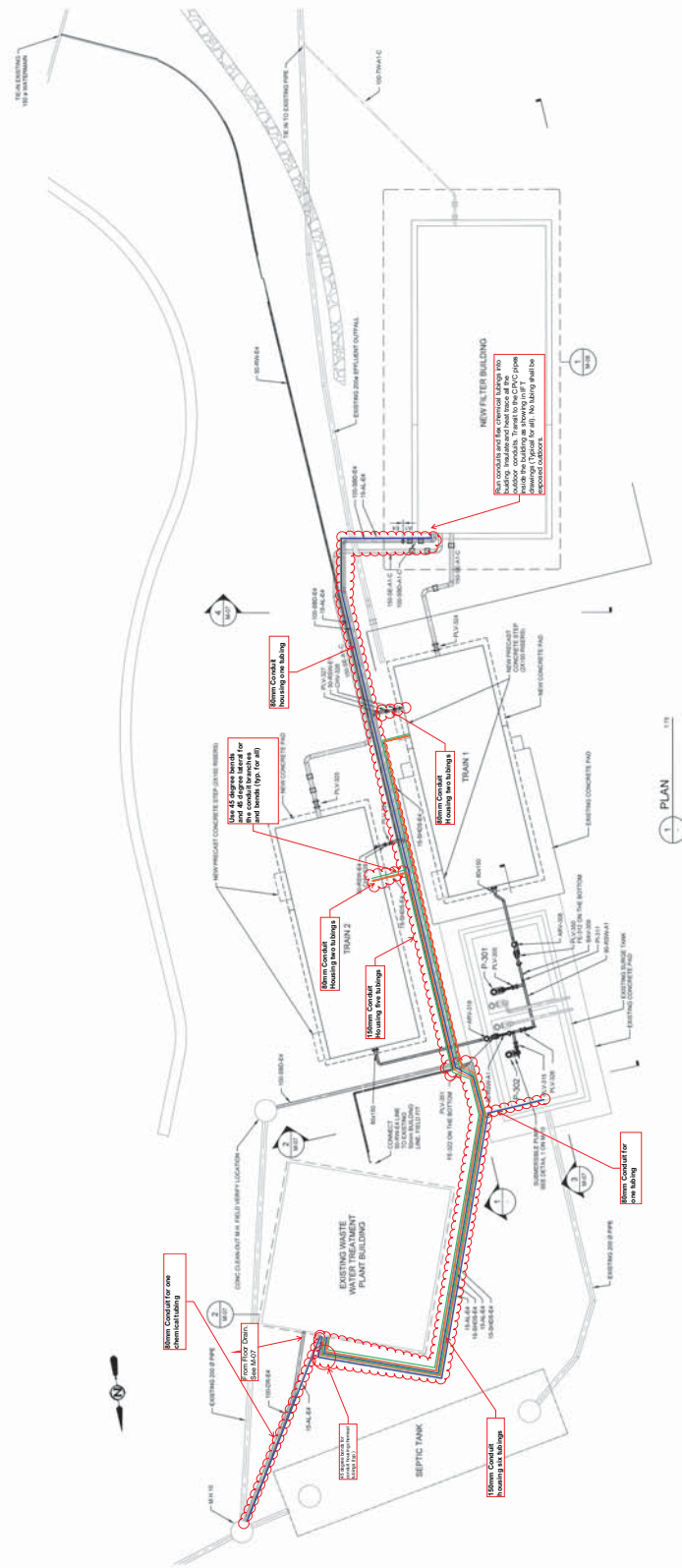
25.3 DESIGN LOAD (KVA)
25.4 DESIGN AMPS

Project: Miette Hot Springs
 Wastewater Upgrade
 Jasper National Park

ELECTRICAL
 SINGLE LINE DIAGRAMS &
 MCC ELEVATIONS

Sheet: 01 of 01
 Date: 10/10/2010
 Drawn by: W. H. H. H.
 Checked by: W. H. H. H.
 Approved by: W. H. H. H.
 Project Manager: W. H. H. H.
 Client: W. H. H. H.

Project No.: W. H. H. H.
 Drawing No.: W. H. H. H.
 Revision: W. H. H. H.
 E-03



Surveyed by/Sequence per	Survey by/Sequence per	Date/Place
S. Strand	S. Strand	20/08/2011

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