THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

INFRASTRUCTURE COMMITTEE MEETING

OF THE VILLAGE OF LIONS BAY
HELD ON MONDAY, NOVEMBER 4, 2019 at 7:00 PM
COUNCIL CHAMBERS, 400 CENTRE ROAD, LIONS BAY

AGENDA

1. Call to Order

2. Appointment of Recorder

3. Approval of the Agenda

4. Public Questions & Comments

5. Approval of Minutes

A. Infrastructure Committee Meeting – September 16, 2019 (Page 3)
THAT the Infrastructure Committee Meeting Minutes of September 16, 2019 be approved as presented.

6. Business Arising from the Minutes

7. Unfinished Business

A. EV Charging System – Norm
B. Harvey Tank Update
C. KG WWTP Update
   i. Scope of work for KG RBC WWTP (Page 9)

8. New Business

9. Public Questions & Comments

10. Adjournment

INFRASTRUCTURE COMMITTEE MEETING
OF THE VILLAGE OF LIONS BAY
Council Chambers, 400 Centre Road, Lions Bay
September 16, 2019 at 7:00 PM

MINUTES

In Attendance:

Council:	Mayor Ron McLaughlin Councillor Neville Abbott Councillor Norm Barmeier Councillor Fred Bain (Chair - Recorder) Tony Greville (Resident) Jim Mutrie (Resident) Brian Ulrich (Resident) Karl Buhr (Resident)
Staff:	Chief Administrative Officer Peter DeJong Public Works Manager Nai Jaffer (Recorder)
Public:	2

1. Call to Order at 1905 hrs.

2. Appointment of Recorder
   Fred and Nai

3. Approval of the Agenda
   Approved with the addition of 7.B.2

4. Public Questions and Comments
   None

5. Delegation
   None

6. Approval of Minutes
   A) Minutes of the meeting of July 4th, 2019
   Approved

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7. Business Arising from the Minutes
   A) re: 8. A. There was a continuation of the lengthy discussion of the role and value of the IC
      I. Notable comments included:
         a. Technical matters should go to the IC (R. Mc)
         b. We are trying to make the procedures more effective (N.B)
         c. If Council needs the IC's input on technical matters, (T.G.)
            - It needs to be proactive, not reactive
            - The IC has contacts that can bring in regional perspectives
               - examples were given for and against
         d. "How does asking questions make a legal liability?" (T.G.)
         e. Accountability and liability are affected when changes are made to engineered plans. (PDJ)
         f. There is very little difference between the old and new Terms of Reference. An important improvement includes that the new Terms of Reference invites IC innovation (PDJ)

The Chair read out his personal thoughts on keeping the Committee working well and Resident committee members requested that they be included in the minutes of the meeting:

1. Communication

There needs to be free communication between IC and Council and staff as needed or desired, as much as possible.
-The IC is Council's advisory group but must be given information from which to advise

2. "Second eyes"

When projects are to be let out or responses are received, the IC should be made privy to that information so as to advise Council of the merits or their concerns of the matters involved.
-Staff are skilled and hard working, but anyone can miss details at times

3. Back stop

The IC members can "see" the long range perspective of issues from their extensive experience and professional contacts.
-With their help there should be less likelihood of issues "blowing past" Council without their awareness.

8. Unfinished Business
   A) Oceanview Drainage Report

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I. The engineering report from ISL on the Oceanview Road drainage problems was presented by Nai and some rough cost estimates of the options were discussed.
II. The report broke down the possible solutions into Option A and Option B
    a. Option A involved rebuilding the ditch, complete with replacing all the culverts involved, on the upper side of Oceanview below 270 Oceanview down to Harvey Creek, and
    b. Option B was focussed on restoring the plugged pipe in the easement between 260 and 270 Oceanview and directing all of the water from above 270 through it to Rundle Creek.
III. There ensued a lengthy discussion about flows and impacts, and many questions for understanding.
IV. The general consensus was that an "Option C" should be investigated
    a. Option C would consist of a hybrid between Option A and B. This would see the flows from above 260 directed through a pipe to Rundle Creek and the restoration of ditches and culverts below 270
        - The thinking was that diverting flows from above 260 would minimize the flows below 270 and thereby not require as large and expensive culverting and depth of ditching.
        - Also, Option B alone would not alleviate further damage to lower Oceanview Road's base and deterioration of the culverts.
    b. The IC recommended that Council should request staff to contact ISL and request pricing for the inclusion of Option C to ISL's report.
    c. The Recommendation to Council is the following:

THAT Council recommend that staff engage again with ISL to increase the scope of the existing Oceanview Road drainage study to incorporate a hybrid of Option A and B. This option consists of diverting drainage above 260 Oceanview through a pipe to Rundle Creek and sizing the drainage system below 270 Oceanview with this reduced flow.

B) Harvey Tank Update
    I. Nai reported on the progress to date detailing the finishing procedures leading up to the activation of the new tank into full service:
        a. The new Harvey Tank is constructed
        b. A two-week window was required for the caulking to cure
        c. The tank needed to be hydrostatically tested and then disinfected
        d. After which, electrical and SCADA upgrades would be completed, and the

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tank commissioned

e. Scheduling was on target with a projected completion date of the middle of October.

C) Kelvin Grove WWTP Update

I. Nai reported that EHD Engineering has negotiated with Ministry of the Environment (MOE) and received approval for the "like for like" replacement of the Rotating Batch Contactor (RBC) treatment plant. Further to that, MOE is asking the Municipality to provide a Permit "Bypass" for the time of replacement of the RBC estimated to be about weeks: two weeks for the replacement of the RBC and 4 weeks for biological growth onto the new RBC.

II. Discussions ensued about increased capacity the new RBC could provide and options that could (possibly) eliminate the need for a "Bypass" permit.

- The latter prompted a discussion of capacities of alternate options in relation to our existing permit to operate the WWTP.

III. Nai gave a rough outline of possible timelines, all of which are dependent on options and approvals.

D) ICIP Update

I. The CAO reported that the Municipality was not successful in with our grant application

The CAO also reported that we have an opportunity to use any remaining grant funds from the CWWF grant to offset costs for going ahead with the Bayview PRV and the Mountain Drive control valve

9. New Business

A) EV Charging System

I. Norm presented the concept and answered many questions about concept, purpose and utility of a municipal EV charging station.

a. Questions such as funding and grants, who would be paying for the electricity, costs to Lions Bay, capacity sizing, what would the operating costs, types, and location and what sort of service contract would be useful, were discussed.

II. Staff provided pictures of three prospective locations that could receive the charging station

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III. Norm asked the question of would the IC be interested in developing a Terms of Reference that may answer the above questions.
   a. Tony asked the question of can the IC work away without staff and report to Council their findings.
      - Agreed

10. Public Questions and Comments - None

11. Next meeting: November 4th, 2019

12. Adjournment – 2133hrs.33 hrs.

1. PROJECT DESCRIPTION

This project is for the design, supply, and installation of a new prepackaged secondary treatment system consisting of a Rotating Batch Contactor (RBC) and secondary clarifier to fit within the confines of the existing concrete chamber at the KG WWTP. A condition of the MOE Bypass Authorization is that the wastewater system remain operational during the decommissioning, installation, and commissioning of the new system and that treatment parameters do not exceed those stipulated within the existing operating permit for the site. Therefore, a temporary secondary treatment system is required for the duration of the project.

The scope of work will include, but not be limited to, site preparation, grading and excavation; installation of a temporary secondary treatment plant adjacent to the existing site, including all mechanical, piping and controls and electrical equipment required; decommissioning and disposal of the existing RBC; design, construction, and installation of a new RBC including the provision of all mechanical, piping, and controls and electrical equipment; installation of power, flow monitoring equipment, communications, and SCADA; installation of a backup generator; and site restoration and all ancillary works.

All works must proceed systematically and in accordance with the Ministry of Environment's Bypass Authorisation, enclosed with this tender document. Each stage must be reviewed and approved by the Municipality before proceeding to the next stage.

All approvals and permits must be obtained through all other authorities & regulatory agencies having jurisdiction, as required and including obtaining approvals for utility servicing.

THE FOLLOWING CONDITIONS CONSTITUTE MINIMUM REQUIREMENTS FOR THIS PROJECT AND MAY BE MODIFIED IN WHOLE OR IN PART DURING NEGOTIATIONS WITH A SUCCESSFUL PROPONENT.

1.1 Submittals

.1 Provide design information in one complete submittal for Municipal review:

a) Shop drawings showing

- detailed equipment types, datasheets, arrangement and dimensions of the entire RBC assembly and secondary clarifier;
- description of all major components including the location of all piping, hydraulic, electrical, instrumentation and structural connections;
- process and electrical schematics, and layouts.

b) A control narrative for SCADA

c) Manufacturer's data including equipment weight and construction details.

d) Range of settings of indicators and dials to operate the equipment.

e) Spare parts list with recommended spare parts.

.2 The submittal shall clearly state retention time through the RBC unit at each stage of the treatment process and secondary clarifier system. Any restrictions, weirs and flow controls shall be included in retention time calculations. All system components that contribute to the retention time shall be itemized as well as the desired rate of rotation for the media packs. Retention times shall be stated for Design Peak flows and current Average Daily hydraulic flows.

1.2 Quality Assurance

.1 A single proponent qualified and experienced in the production of similar prepackaged RBC secondary treatment systems shall provide the works for this project. Proponent must have at least 5 years of experience in manufacturing and delivering RBC wastewater treatment technology. The ideal proponent should have a minimum of 10 installations operating worldwide using the individual technology components.

1.3 Operations & Maintenance Manuals

.2 The RBC secondary treatment system proponent shall provide complete operations manuals and maintenance information for installation, inspection, operation, maintenance, and lubrication requirements for each unit of mechanical, electrical, and instrumentation equipment or system and each instrument.

.3 Operation and maintenance information shall be submitted in a three-ring hard-cover binder and electronic unlocked PDF searchable format.

.4 With the maintenance information, submit a copy of colour-coded Equipment Record Forms 01831-A or B or C, as appropriate, and 01831-D for all mechanical, electrical and instrumentation equipment and all instruments. The Warranty Date on this form will be completed by the Owner in accordance with the General Conditions of the Contract.

.5 As a minimum, the operations manual shall contain the following:

a) Include the manufacturer's recommended step-by-step procedures for starting and stopping under normal and emergency operation. Include all specified modes of operation including recommended operation after the assembly or equipment has been in long-term storage.

b) Provide control diagrams with data and information to explain operation and control of systems and specific equipment.

c) Provide technical information on all alarms and monitoring devices provided with the equipment.

.6 Maintenance Instructions shall:

a) Provide requirements to set up and inspect each system. Include all required and recommended step-by-step inspections, lubrications, adjustments, alignments, balancing and calibrations. Include protective device settings and warnings and cautions to prevent equipment damage and to ensure personnel safety.

b) Provide manufacturer's description of routine preventive maintenance, inspections, tests, and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair.

c) Provide manufacturer's recommendations on procedures and instructions for correcting problems and making repairs.

d) Provide step-by-step procedures to isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

e) Provide step-by-step procedures and list special required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings, and adjustments required.

.7 Lubrication Data

a) Provide a table showing recommended lubricants for specific temperature ranges and applications.

b) Provide charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities. If equipment or instrument is not lubricated, add the words "Not Applicable".

.8 Warranties

a) Provide a copy of all written warrantees and guarantees required by the contract documents for the specific pieces of equipment or instruments and provide all additional manufacturer's standard warrantees and guarantees received by the proponent. Indicate the time frame of each warrantee or guarantee.

1.4 Temporary Treatment and Project Phasing – Ministry of Environment Approved Bypass Authorisation

.1 A temporary treatment plant meeting the Municipality’s existing permit requirements is to be installed to ensure permit requirements are met during the construction process. Approved Ministry of Environment Bypass phasing of the project is:

a) Phase 1 – temporary treatment plant installed inline and feeds the existing RBC plant. Temporary treatment plant is commissioned, and sampling is conducted to ensure it meets the permit requirements for BOD_5 and TSS.

b) Phase 2 – Bypass existing plant and begin demolition and then construction of new RBC plant.

c) Phase 3/Phase 3A – Commissioning of new RBC plant is completed and bypass is removed. Effluent from the temporary treatment plant flows through the new RBC system to seed growth onto media disks. Once growth has established and the new system is operating as designed, the temporary treatment unit can be decommissioned. Pumped waste transfer may be required in Phase 3A to enable confirmation that the new RBC plant is independently discharging effluent to the permit requirements for BOD_5 and TSS.

d) Phase 4 – removal of temporary treatment plant and site restoration.

1.5 Operating Criteria for the RBC Secondary Treatment System

.1 System Specification

a) The system must be designed to handle daily flows not exceeding 340 m^3/day with the objective of maximizing the treatment capacity. Historical flow data for 2017 and 2018 are contained within the Annual Reports here: https://bit.ly/2q7zVWJ.

b) Raw effluent characteristics taken from a sample in March 2019 are as follows:

Parameter	Value
BOD_5 (mg/L)	218
TSS (mg/L)	131

c) Water Temperature: 10°C to 30°C

d) Ambient Air Temperature (extremes): -10°C to 35°C

.2 Performance Requirements

a) Required effluent BOD_5 limits not to exceed 45 mg/L at the exit of the secondary clarifier.

b) Required effluent TSS limits not to exceed 60 mg/L at the exit of the secondary clarifier.

.3 Power Requirements

a) Proponent to confirm existing power supply.

b) Proponent is responsible for all permits and upgrades required for power supply to the site.

.4 Design Parameters

a) The system shall consist of RBC discs and equipment installed in coated steel tanks.

b) The complete RBC treatment system including secondary clarifier shall fit within the confines of the existing concrete well space; refer to as constructed drawings.

c) The RBC treatment system is to be furnished with the latest manufacturer's components and equipment available at the time of shipment.

d) In consideration of worker safety, the RBC tank and secondary clarifier shall be designed to provide for ease of access during maintenance and servicing and shall consider items such as:

- External versus internal greasing points;
- Intrinsic blowers and exhaust fans;
- Intrinsic lighting sufficient to clearly illuminate the workings of the RBC unit; and
- Intrinsic safety anchors and tie-off points for worker safety harnesses

e) Consideration will be given to RBC system designs that

- simplify the sludge removal and dewatering processes;
- contain odour mitigation and control measures;
- control internal condensation from affecting performance; and that
- provide for easy access to system components including instrumentation, rotors, bearings, etc.

1.6 Warranty

.1 The equipment furnished under this section will be free of defects in material and workmanship, including damages that may be incurred during shipping for a period of five (5) years from date of start-up.

2. Products

2.1 Materials of Construction

.1 The layout shall be based on the parameters of the existing concrete well, secondary clarifier, and chlorine contact chamber as depicted in the as-constructed drawings.

.2 All metal components in contact with the effluent shall be at minimum Type 316L stainless steel. Aluminum wetted materials shall not be used.

.3 Tanks to be epoxy coated and lined steel using the manufacture's highest quality coating standards and conforming to the following reference standards:

a) ASTM D16, Standard Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products

b) ASTM D2200, Pictorial Surface Preparation

c) SSPC-Visl, Standards for Painting Steel Surfaces

d) ASTM D3359, Methods for Measuring Adhesion by Tape Test-Method A

e) ASTM D3960, Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings

f) ASTM D4417, Field Measurement of Surface Profile of Blast-Cleaned Steel

g) SSPC, Steel Structures Painting Council Specifications, Vol. 2

h) NSF 61, Drinking Water System Components Health Effects

i) WSBC, Industrial Health and Safety Regulations.

.4 The tanks shall be designed as a post-disaster structure by the RBC supplier and shall be designed such that there is no leakage. The design of the tanks shall be signed and sealed by a Professional Engineer (P.Eng.) licensed to practice in the Province of British Columbia and it shall be to the requirements of Canadian and British Columbia standards.

.5 The proponent shall provide Letters of Assurance and certificate of conformance which are signed and sealed by a professional engineer (P.Eng.) licensed to practice in British Columbia.

.6 All module welded metal components in contact with effluent will be Type 316L stainless steel.

.7 All metal components located in or directly on top of the channel shall be constructed of minimum 316L stainless steel.

2.2 RBC Modules

.1 The RBC module shall provide the maximum total effective media surface area that is feasible within the confines of the existing concrete chamber.

.2 RBC media will be fabricated from high-density polyethylene or polypropylene, vacuum-formed into a corrugated profile to provide the maximum surface area and uniform irrigation of wastewater throughout the pack.

.3 Media will be resistant to disintegration, ultraviolet degradation, erosion and aging. The media will contain flow passages, which will be of adequate size and spacing for biological growth development and bio solids flushing.

2.3 Media Support Assembly

.1 Media support assembly shall be 304 stainless steel pipes.

.2 Media will be assembled into media pack assemblies, allowing for the removal of the media discs in smaller pieces.

2.4 RBC Shaft

.1 The shaft is designed for load bearing capacity considering the maximum anticipated biofilm growth and shall include a 1.5 safety factor. The shaft will 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 conform to Canadian Welding Bureau's welding and quality control standards.

.3 Central shaft shall be coated with a protective coating suitable for humid and corrosive conditions.

.4 The main shaft shall be sand blasted to SSPC-SP10, white metal blast cleaning followed by 2-coat epoxy finish, 12 - 14 mils thick.

.5 Surface finish of drive units, bearings and control equipment shall be to manufacturer's standards.

2.5 Drive Assembly and Motor

.1 The RBC unit shall be provided with a drive assembly with a shaft mounted gear reducer.

.2 The drive motor shall be rated for continuous duty and sized such that it shall not be required to provide more than rated nameplate horsepower, at unit service factor, under any possible operating condition.

.3 The drive motor shall include a soft starter

.4 The drive motor shall meet the Provincial Minimum Motor Efficiency Standards (CSA Standard C390-10)

.5 All grease lubricated bearings shall be provided with standard "Alemite" fittings.

.6 Eyebolts or lifting lugs shall be provided on the motors and they shall be of adequate strength for lifting the motor. All metal parts shall be inherently corrosion-resistant or shall be protected with corrosion-proof coatings.

.7 Gear reducer will consist of a gear box made from high-strength cast iron housing, hardened teeth gears. Reducer and motor mount will be coated for corrosion protection.

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

.9 The bearings shall be capable of being replaced without removing the entire RBC shaft and assembly.

2.6 Effluent Recirculation

.1 An assembly unit shall be included with each RBC to return flow from the fourth stage to the first stage of the RBC without pumping.

.2 Steel piping recirculation buckets shall be 304 stainless steel. Fasteners are to be 316 L stainless steel.

.3 The buckets shall be capable of returning 15% of the design average daily flow.

2.7 Secondary Clarifier & Chlorine Contact Chamber

.1 The treated effluent from the RBC unit flows into the secondary clarifier (Final Clarifier), where the sloughed solids settle and the clarified supernatant overflows into the chlorine contact chamber.

.2 The chlorine contact chamber shall include the following:

a) Effluent trough with an adjustable V-notch effluent weir in epoxy-coated steel c/w scum baffle.

b) Weir shall be anchored to the launder for zero water leakage between weir plate and launder.

2.8 FLOW METER

.1 A flowmeter shall be provided at the chlorine contact chamber prior to discharge of the treated effluent.

.2 At the minimum, the flow meter shall be provided with a display board capable of providing rate of flow and totalization. Operating parameters and units of measurement shall be operator definable. Data gathered through the flow meter shall be transmitted to the Municipal SCADA system.

2.9 SCADA & COMMUNICATION

.1 Provide all programming and configuration necessary to provide a fully debugged and operating wastewater treatment system including an integrated Supervisory Control and Data Acquisition (SCADA) system complete, tested, and in full operation.

.2 The Proponent shall provide all SCADA system hardware, support equipment, and support software completely programmed and configured as a fully operational control system.

.3 To provide seamless integration with the Works Yard Programmable Logic Controller (PLC), preferred control system shall be Allen Bradley Compact Logix series PLC.

.4 Alternatively, an intelligent terminal I/O terminal strip capable of communicating directly with the external main plant PLC (Allen Bradley Compact Logix) control system by means of Allen-Bradley Ethernet/IP protocol will be considered.

.5 At the minimum, RBC system process monitoring shall include:

i. Effluent temperature,

ii. Shaft rotation rate,

iii. Effluent flow monitoring.,

iv. Equipment status (local/off/remote/running/stopped/alarms)

v. Resettable run hours for all major equipment components

vi. Generator status;

vii. All process/system alarms

All process parameters and alarms must be displayed locally (panel mounted HMI) as well as communicated back to the Works Yard SCADA system.

.6 The design and implementation of the SCADA data link back to the Works Yard is a part of the project and the Contract Administrator must approve the design before it is implemented.

.7 Communication between the PLC's and the HMI system shall be Ethernet.

.8 All analog and discrete process data, equipment operating status, process pipes, and related information shall be displayed in the HMI. Graphic symbols shall be similar to

those shown on the existing SCADA water treatment process and instrumentation diagrams (P&IDs) or in accordance with ISA or industry-standard symbology. Layout of the screens shall be organized similarly to the layout of the P&IDs.

.9 The successful proponent shall be responsible for incorporating the new RBC data into the existing SCADA system at the Works Yard. This includes all graphics, process data, alarms, process data logging as well as RBC process controls.

.10 The Proponent is to configure daily, weekly, monthly, and annual reports of operational data.

2.10 Internet Service

.1 The proponent will be responsible for the installation and connection of an internet service to the facility, including the installation of ducting from the connection point to the facility.

.2 The internet service provider will be determined during negotiations with the successful proponent.

2.11 GENSET

.1 The proponent shall include all labour, equipment, shipping, and material costs for the supply, installation, and testing of a new weatherproof standby power genset sized to ensure operation of all functions of the WWTP during power outages.

.2 The genset housing shall be a rigid, free-standing, fully protective coated cabinet, fabricated to EEMAC 3 standards with sufficient bracing to form a structure capable of withstanding wind, snow and ice loading.

.3 Access to all regularly serviced items within the enclosure shall be provided by hinged doors and handles that shall be lockable in the closed position.

.4 The engine exhaust system shall incorporate seamless, stainless steel flex-connectors and black steel silencing type mufflers with minimum sound attenuation of 35-45dBA, all mounted within the genset enclosure.

.5 The enclosed genset overall full load operating noise level shall be less than 79 dBA when measured at a distance of 6 meters from any side of the enclosure and 1 meter above ground.

.6 Engine shall be a water-cooled compression ignition diesel, designed for operation on No. 2 domestic fuel oil.

.7 A speed governing system shall be provided to give not more than 5 percent speed variation between no-load and full-load conditions.

.8 Engine shall comply with current Canadian Off-Road Compression-Ignition Engine Emission Regulations, P.C. 2005-138, equivalent to EPA Tier 2.

2.12 Spare Parts and Safety Equipment

.1 The following spare parts and safety requirements shall be provided as a minimum:

a) Spares

i. 4 additional bearings

ii. 1 additional drive chain

iii. ??

1. Testing and Commissioning

1.1 Testing

.1 Provide testing to demonstrate compliance with operating and performance requirements including but not limited to demonstrating that all associated alarms and controls are operating as specified.

.2 Verify all overload protection set points.

.3 Program PLC's as required.

.4 Performance Test

a) The testing of equipment shall be completed with clean water. After all equipment, pipes, valves, and other appurtenances have been tested and are accepted by the Engineer, commissioning of the treatment plant with raw sewage may begin.

b) If equipment fails for any reason, or exhibits signs of improper operations, immediately halt testing and make adjustments as required. Repeat tests until mechanism operates satisfactorily. Certify all equipment and systems are within operational tolerances.

c) After the start of the commissioning the wastewater treatment plant is expected to meet the Permit effluent requirements within 30 days. The effluent requirements are to be less than 45 mg/L BOD_5 and 60 mg/L for TSS.

1.2 Field Quality Control

.1 An employee of the proponent (start-up technician) shall commission the equipment.

.2 The start-up technician shall certify to the Owner that all equipment is properly installed, and that the plant operators have been instructed on proper operation and maintenance procedures.

1.3 Commissioning

.1 The proponent shall be available during the commissioning period to provide immediate assistance in case of failure of any portion of the system being operated. The proponent shall be prepared to make modifications to the system or individual components thereof to ensure functionality of the new system. At the end of the commissioning period and when all corrections required by the Contract Administrator to assure a reliable and completely operational plant are complete, the Contract Administrator will issue a completion certificate.

.2 During the commissioning period, the Proponent will be responsible for all normal operational costs and shall include the costs of all necessary repairs or replacements, including labour and materials, required to keep the plant being commissioned, operational in the tender price.