Appendix 23

Training Requirements

SECTION A. DEFINITIONS

A.1 Definitions

A.1.1 Capitalized terms used in this document have the meanings given in the Request for Proposals, General Conditions or as below.

(1) "**Automation and Industrial Controls Group**" or "**AICG**" means the City group who is responsible for the maintenance of the PCS and related systems, including computers, networking, software, etc.

(2) "**Course Lesson Plan**" has the meaning indicated in Section B.3.

(3) "**Electrical and Instrumentation Group**" or "**E&I**" means the City group who is responsible for the maintenance of the electrical and instrumentation systems.

(4) "**Maintenance Personnel**" has the meaning indicated in clause B.6.2.

(5) "**Mechanical Maintenance**" means the City group who is responsible for the maintenance of the mechanical systems.

(6) "**Operation and Maintenance Manuals**" has the meaning indicated in Appendix 22.

(7) "**Operations Personnel**" has the meaning indicated in clause B.6.2.

(8) "**Participant Evaluation Results**" has the meaning indicated in clause B.17.2.

(9) "**Safe Work Procedure**" has the meaning indicated in Appendix 22.

(10) "**Standard Operating Procedure**" has the meaning indicated in Appendix 22.

(11) "**Training Participant Register**" has the meaning indicated in clause B.17.4.

(12) "**Training Material**" has the meaning indicated in Section B.155.

(13) "**Training Participant Groups**" has the meaning indicated in SectionB.6.2.

(14) "**Training Participants**" has the meaning indicated in Section B.6.1.

(15) "**Training Plan**" has the meaning indicated in clause B.2.1.

(16) "**Training Program**" has the meaning indicated in Section B.1.

(17) "**Training Records**" has the meaning indicated in Section B.177.

(18) "**Training Schedule**" has the meaning indicated in Section B.4.

(19) "**Training Videos**" has the meaning indicated in Section B.166.

SECTION B. TRAINING PROGRAM

B.1 General Requirements

B.1.1 Consultant shall develop, implement, continuously update and provide to the City a training program (the "**Training Program**").

B.1.2 The Training Program shall:

(a) be designed to comprehensively train plant staff and external bin removal contractors (if applicable).

(b) The training shall be carried out in accordance with standards, practices, methods and procedures that are to a good commercial standard, conforming to applicable law and exercising the standard of care, skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a qualified, skilled and experienced person supplying similar services for similar projects, in a timely, good and workmanlike manner such that plant staff may competently operate and maintain the Project;

(c) be tailored for the specific audience in each course;

(d) ensure that each course accommodates plant staff shift schedules by providing multiple sessions covering the same content if necessary;

(e) be designed to maximize the transfer of learning, utilizing appropriate training methodologies;

(f) contain both classroom and field training courses, organized in a format to most effectively train plant staff including;

(i) the classroom portion should comprise no more than 40 percent of the training time and the field portion at least 60 percent of the training time; and

(ii) field training shall be completed on the same day as the classroom portion;

(g) include ample opportunities for Training Participants to ask questions and have their questions answered;

(h) be based upon the Operation and Maintenance Manuals with complete consistency between the training and the Operation and Maintenance Manuals, including Standard Operating Procedures, Safe Work Procedures and LOTO;

(i) incorporate feedback from the training into the Operation and Maintenance Manuals in accordance with Appendix 22 – Operation and Maintenance Information;

(j) include the provision of the services of factory trained specialists and equipment manufacturers to instruct plant staff in the operation and

maintenance of all equipment and system components during classroom and field training;

(k) be scheduled and coordinated to not interfere with the operation and maintenance of the existing NEWPCC facility;

(l) ensure that all training sessions include demonstration of learning by the Training Participants. Evaluation methods should reinforce learning, monitor progress and provide feedback on progress. Assessment should be based on course objectives and implemented in accordance with Section B.12;

(m) ensure that all training courses are submitted to the Province of Manitoba to be evaluated for possibility of gaining continuing education credits for wastewater treatment operators certification; and

(n) ensure that all operations personnel and required plant staff have completed the required training, as set out in this Appendix prior to the contractor's substantial performance.

B.2 Training Plan

B.2.1 Consultant shall develop, implement, update and provide a plan document (the "**Training Plan**") that will detail the implementation of the Training Program. The Training Plan will include:

(a) overall training strategies;

(b) for each course:

(i) course name;

(ii) detailed course description, including the specific Project components addressed in the course;

(iii) planned duration;

(iv) planned Training Participant Groups;

(v) specific and measurable learning objectives that can be evaluated at the end of the session;

(vi) format and implementation methodology; and

(vii) Training Participant evaluation methodology;

(c) a clear plan regarding the organization and sequencing of the courses; and

(d) the Training Schedule in accordance with Section B.4, forecasting the number, timing, and duration of each training session.

B.2.2 Training Participants shall complete classroom and field training for a given unit process prior to commencing training in a separate process area.

B.2.3 Consultant shall submit the Training Plan, including all associated Course Lesson Plans a minimum of 30 Calendar Days prior to the commencement of commissioning or training whichever is earlier.

B.3 Course Lesson Plans

B.3.1 Consultant shall develop, for each training course, a detailed description and plan of the training (the "**Course Lesson Plan**").

B.3.2 Each Course Lesson Plan shall be consistent with the Training Plan and provide a detailed description that includes:

(a) the requirements of B.2.1(b), more fully developed and detailed;

(b) instructor(s), including qualifications in accordance with Section B.9;

(c) recommended and minimum number of training sessions;

(d) recommended and maximum number of Training Participants within each session;

(e) Training Participant evaluation methodology;

(f) Training Material in accordance with Section B.15;

(g) identification of any applicable resources in addition to the Training Material; and

(h) other supporting information as appropriate.

B.3.3 For each training course, Consultant shall submit the Course Lesson Plan and have received comments from the City a minimum of 60 Calendar Days prior to the scheduled start of training.

(a) for each training course, Consultant shall submit the corresponding Operation and Maintenance Manuals, in accordance with Operation and Maintenance Information, prior to the submission of the associated Course Lesson Plans; and

(b) as part of the City's review process, the City will assess the Consultant's proposed Training Participant Groups for each course, to ensure appropriate training for plant staff.

B.3.4 Consultant shall:

(a) not proceed with a training course until the corresponding Course Lesson Plan has been reviewed by the City; and

(b) ensure that the portions of the Operation and Maintenance Manuals applicable to each training course have been reviewed by the City prior to the associated Course Lesson Plan being submitted.

B.3.5 Consultant shall update each Course Lesson Plan based upon the completed training and incorporate any changes made to the training. The revised Course Lesson Plan shall be included with the Training Material, as per Section B.15.

B.4 Training Schedule

B.4.1 Consultant shall prepare, provide and update a schedule of all training activities to implement the Training Program (the "**Training Schedule**").

B.4.2 The Training Schedule shall:

(a) include:

(i) course name,

(ii) Course Lesson Plan submittal dates,

(iii) session dates and durations, and

(iv) planned Training Participant Groups;

(b) integrate with the Consultant's Project schedule;

(c) be coordinated with the City in accordance with Section B.7;

(i) planned training session dates shall include sufficient flexibility to allow for availability of plant staff. Consultant shall plan for and acknowledge that plant staff training will be interspersed between the plant staffs' regular daily duties;

(d) group training topics as necessary to ensure training sessions are a minimum of 1 hour in duration;

(e) limit the maximum duration of a training session to 4 hours per day; and

(f) limit training to Business Days within the following windows of time:

(i) 8:00 am to 12:00 pm, with a 15 minute coffee break; and

(ii) 12:45 pm to 3:30 pm, with a 15 minute coffee break.

B.4.3 Consultant shall submit the Training Schedule as part of the Training Plan set out in Section B.2 and incorporate changes to accommodate the schedule of plant staff. The Training Schedule shall be regularly updated such that the City continuously has the latest revision.

B.4.4 Consultant shall complete training promptly after completion of a process area so as not to cause a backlog of training.

B.5 Training Lead

B.5.1 Consultant shall designate a person (the "**Training Lead**") who shall:

(a) be responsible for updating the:

(i) Training Program;

(ii) Training Plan;

(iii) Course Lesson Plans; and

(iv) Training Schedule;

(b) be the primary contact for the Project Manager and coordinate with the City per Section B.7; and

(c) ensure that training sessions are proceeding according to the Training Schedule.

B.6 Training Participants and Groups

B.6.1 Consultant shall provide and implement the Training Program for the plant staff who will or may be required to operate and maintain the Project (the "**Training Participants**").

B.6.2 The Training Participants will include the following groups of plant staff (the "**Training Participant Groups**"):

(a) the plant staff responsible for operation of the NEWPCC facility wastewater treatment process and the associated building mechanical systems (the "**Operations Personnel**") and training branch staff; and

(b) the plant staff responsible for maintenance of the NEWPCC facility (the "**Maintenance Personnel**"), who are further grouped as follows;

(i) Mechanical Maintenance, including maintenance planners;

(ii) Electrical and Instrumentation Maintenance; and

(iii) Automation and Industrial Controls Group.

B.6.3 For clarity, the operation of the electrical equipment will generally be performed by the Electrical and Instrumentation Maintenance Group, not Operations Personnel.

B.6.4 In addition to the Training Participants, the following may attend and observe the training:

(a) standby Operations Personnel and Maintenance Personnel from other sewage treatment plants in the City;

(b) City supervisors;

(c) City training coordinators;

(d) project coordinators and planners;

(e) the Project Manager; and

(f) delegates of the Project Manager .

B.7 Training Coordination with City

B.7.1 Consultant shall:

(a) coordinate with the Project Manager, or designated representative, regarding dates and times for training sessions. All dates and times are subject to availability of plant staff;

(b) provide all requests to schedule a training session a minimum of 25 Business Days prior to the planned session along with the course name and proposed Training Participant Groups such that the training session date can be confirmed 20 Business Days ahead of the planned session;

(c) hold all training sessions at the NEWPCC facility;

(d) repeat the training session(s) for each group to allow for training of all plant staff. The minimum number of sessions for each group and associated constraints are identified in Table 1, with additional requirements as follows:

(i) where a course is applicable to multiple Training Participant Groups, the total number of sessions shall not be less than the minimum number of sessions identified in Table 1 for any one group, plus one. For clarity, should a course be applicable to all Training Participant Groups, a minimum of 5 classroom training sessions is required;

(ii) notwithstanding B.7.1(d)(i), additional classroom sessions shall be provided in the event that the course content of associated facilities are not appropriate for the potential number of Training Participants;

(iii) plan and coordinate classroom training sessions to limit the maximum number of Training Participants to 12 people. Provide additional repeats of sessions as required to deliver effective classroom training; and

(iv) plan and coordinate field training sessions to limit the maximum number of Training Participants to 5 people for demonstration and hands-on training purposes. Provide additional repeats of sessions as required to deliver effective practical field training; and

(e) coordinate with the City as required to ensure all applicable plant staff are trained.

Table 1 : Training Requirements

Training Participant Groups	Approximate Number of Personnel*	Minimum Number of Sessions*	Constraints
Operations Personnel	40	7	Crew and shift schedules
Maintenance Personnel			
Mechanical Maintenance	20	3	
Electrical and Instrumentation Maintenance	20	3	
Automation and Industrial Controls Group	10	2	

*These numbers will be finalized between the consultant and City Project Manager prior to training.

B.7.2 Consultant shall schedule the training with consideration to the Training Participants' other duties.

B.7.3 Consultant shall avoid unnecessary modifications to the Training Schedule once established.

B.8 Coordination between Consultant & Contractor

B.8.1 Consultant shall oversee and coordinate between Consultant and contractor including suppliers, to provide a comprehensive, cohesive Training Program.

B.8.2 Portions of the training may be provided by the contractor, subbcontractors and suppliers; however, this shall not in any way modify or reduce the Consultant's obligations.

B.9 Instructor Qualification

B.9.1 Consultant shall provide instructor(s) for each course who:

(a) are experienced and qualified for the specific training course;

(b) have demonstrated prior experience in performing similar training; and

(c) have the appropriate instructional and articulate public speaking skills to communicate clearly to the Training Participants.

B.9.2 Consultant shall develop and implement an internal review process to ensure that instructor qualifications are vetted prior to training assignment on a Course Lesson Plan.

B.9.3 Consultant shall implement appropriate plans and procedures to address potential unavailability of an instructor while maintaining the quality of instruction.

B.9.4 Consultant shall ensure that instructors are familiar with the Project, including the Operation and Maintenance Manuals.

B.10 Classroom Training Requirements

B.10.1 Classroom training sessions will be held in a room provided by the City at the NEWPCC facility.

B.10.2 Consultant shall:

(a) use appropriate learning resource materials, including slides and drawings, to aid in training clarity and effectiveness;

(b) make available applicable reference materials where it will be beneficial for the Training Participants to reference the material covered during the training. For example, paper copies of SOPs and SWPs should be provided, if beneficial to the training objectives;

(c) ensure all practical components are provided to ensure that Training Participants are able to see and hear the training. Provide projectors and screens as required, easily viewable and readable by all Training Participants; and

(d) be responsible for any temporary networking or other associated computer and audio requirements to implement the training sessions.

B.10.3 Consultant shall structure the training to provide an interactive environment that promotes active participation. The instructor shall use discussion, questions and activities as appropriate during each session to provide engagement, enhance learning and to verify that the information presented is being understood.

B.10.4 Consultant shall record classroom training sessions in accordance with Section B.16.

B.11 Field Training Requirements

B.11.1 For all field training sessions, Consultant shall:

(a) implement the training using the constructed Project, unless otherwise approved by the Project Manager;

(b) provide field training sessions in a manner that all Training Participants can see and hear all demonstrations provided;

(c) arrange for and require plant staff to perform the demonstrated procedures, as part of the Training Participant evaluation requirements identified in Section B.12; and

(d) ensure all training is in accordance with Safe Work Plans and Standard Operating Procedures and include training on their application and use.

B.12 Participant Evaluation Requirements

B.12.1 As part of each classroom training session, Consultant shall provide and execute a written training evaluation methodology, such as a quiz or test, to test each individual Training Participant in their understanding of the learning objectives and course content.

B.12.2 Consultant shall provide the specific written evaluation methodology as part of the Course Lesson Plan, in accordance with Section B.3.

B.12.3 Consultant shall record the results of all classroom Training Participant evaluations and include in the Training Records, as per Section B.17.

B.12.4 As part of each field training session, Consultant shall provide and execute an evaluation method consisting of either written or practical demonstration components to test each Training Participant in their understanding of the learning objectives, course content and ability to perform the tasks addressed by the course.

B.12.5 Consultant shall describe the evaluation methodology as part of the Course Lesson Plan, in accordance with Section B.3.

B.12.6 Consultant shall ensure that the evaluation components are sufficiently detailed to affirm that a passing grade of the evaluation signifies that the Training Participant is qualified to operate and/or maintain the component of the Project associated with the training course.

B.12.7 Consultant shall review the evaluation results and update the training material as required to improve the training for subsequent sessions.

B.12.8 Approximately 180 Calendar Days after a training session is completed, the Training Participants shall be re-evaluated by the instructor to determine if the Training Participants are carrying out tasks in accordance with the training received. If Training Participants fail the evaluation, Consultant shall provide additional training in those topics, in accordance with this Appendix 23.

B.13 Training Participant Feedback Requirements

B.13.1 Consultant shall:

(a) At the end of each training session, provide each Training Participant with a copy of the Training Participant Feedback Form, included in this Appendix 23 as Template B;

(b) collect the forms and deliver to the City a copy of each Training Participant Feedback Form; and

(c) Utilize feedback provided to update the training material and improve the training for subsequent sessions.

B.14 Training Deliverables

B.14.1 Consultant shall provide all material used in the training to the City, including:

(a) the Training Plan in accordance with Section B.2;

(b) Course Lesson Plans in accordance with Section B.3;

(c) Training Material in accordance with Section B.15;

(d) Training Records in accordance with Section B.17; and

(e) creation of shareable content object reference model (SCORM) of Training Materials to be used for future City training.

(i) SCORM is a collection of standards and specifications for web-based electronic educational technology (also called e-learning). By using software like Adobe Captivate, Storyline etc. to create training modules which incorporate slide content information, edited videos, etc. and contain module quizzes to test employees' knowledge in a single e-learning pack package for upload to a learning management system.

(ii) SCORM courses should include presentation slides from classroom training, embedded and edited videos and an end of module quiz including a minimum of 5 questions specific to the learning objectives. Each course should be customized for the specific training groups, for example, operations, mechanical maintenance and electrical maintenance.

(iii) Training Videos may be embedded in the SCORM and shall meet the requirements of Section B.16.

B.14.2 Consultant shall incorporate training deliverables into the Operation and Maintenance Manuals in accordance with Appendix 22 – Operation and Maintenance Information.

B.15 Training Material

B.15.1 Consultant shall provide a copy of all training materials used in each classroom and field training course within the Training Program (the "**Training Material**").

B.15.2 The Training Material shall be provided in electronic native, editable file format and include the following:

(a) Course Lesson Plans, as per Section B.3;

(b) a list of all course materials;

(c) classroom slide presentations in Microsoft PowerPoint format;

(d) other audio / visual material (videos, etc.);

(e) handouts;

(f) speaking notes (as applicable);

(g) course Training Participant evaluation material (quizzes, tests, etc.); and

(h) answer keys for the course Training Participant evaluations.

B.15.3 The Training Material shall be organized by course, with material systematically arranged in a consistent manner.

B.16 Training Videos

B.16.1 Consultant shall provide videos to augment the SCORM (the "**Training Videos**"). When Training Videos are embedded in the SCORM, Consultant shall:

(a) provide a minimum of one set of videos for each classroom training course;

(b) select sessions to record to provide the most comprehensive and highest quality of video training; and

(c) replace or amend videos as required in the event that the training content for a course is amended after recording a training session.

B.16.2 Training Videos shall:

(a) be in a SCORM-compatible format;

(b) have high definition audio (48 kHz, 16 bit) or better;

(c) be separated and organized by course and into clips/segments on each topic, with each clip/segment limited to approximately 15 minutes;

(d) be recorded with sufficient technical skill and recording quality to clearly illustrate the subject matter;

(e) be structured to provide a logical sequence of learning;

(f) be edited to remove distractions;

(g) be edited to prevent embarrassment of Training Participants;

(h) be edited to fill in any gaps in the live presentation, such that the recording completely addresses the learning objectives of the training; and

(i) be recorded in adequate lighting to ensure a high quality of video. the Consultant shall provide additional lighting, if necessary.

B.17 Training Records

B.17.1 Consultant shall provide comprehensive records indicating the specific training provided (the "**Training Records**"), along with the supporting documentation in accordance with the Training Program.

B.17.2 The Training Records shall include for each session:

(a) Training Participant Registers;

(b) results of evaluation quizzes and tests by individual and summarized by course (the "**Participant Evaluation Results**"); and

(c) Training Participant Feedback Forms.

B.17.3 Organize the Training Records in a hierarchical manner as follows:

(a) area or general as applicable;

(b) Training Participant Groups (Operations, Mechanical Maintenance, Electrical and Instrumentation Maintenance, Automation and Industrial Controls Group) or general as applicable; and

(c) training course (title):

(i) Training Participant Registers;

(ii) Participant Evaluation Results; and

(iii) Training Participant Evaluation Forms.

B.17.4 Consultant shall record all Training Participants for each training session on a register (the "**Training Participant Register**").

(a) the Training Participant Registers shall be based upon the template included in this Appendix 23 as Template A.

B.17.5 Consultant shall provide all Training Records in pdf file format.

B.17.6 Consultant shall submit all Training Records no later than 60 Calendar Days after commissioning or Training whichever is later.

B.18 Declaration of Course Completion

B.18.1 Upon completion of the requirements for each course in the Training Plan, the Consultant shall provide a completed and signed Declaration of Course Completion form, included in this Appendix 23 as Template C.

SECTION C. TRAINING CONTENT REQUIREMENTS

C.1 General

C.1.1 The purpose of Section C is to provide general guidance to the Consultant regarding the requirements of the Training Program. However, the indication of any specific training requirement in Section C does not reduce or eliminate the requirement of the Consultant to provide comprehensive training in accordance with Sections B.1.2.

C.1.2 Except as indicated in Section C.2, the Training Program shall address all aspects of the Project, including:

(a) overview, including theory of each process and process flow diagrams;

(b) plant layout, including major process equipment;

(c) building and equipment layout for each process area, including P&IDs;

(d) process/mechanical equipment and systems;

(e) chemical receiving, make-up, and dosing systems;

(f) electrical equipment and systems;

(g) electrical protection and control systems;

(h) automation systems;

(i) networking and communication infrastructure;

(j) grounding system, including lightning protection;

(k) DC battery systems;

(l) uninterruptible power supplies (UPS);

(m) lighting and lighting control;

(n) fire alarm system;

(o) security / card access system;

(p) public address system;

(q) emergency lighting system;

(r) building mechanical systems;

(s) cranes, hoists, monorails, davits, and other lifting mechanism;

(t) HVAC; and

(u) safety systems.

C.1.3 Consultant shall include the following in all training sessions as applicable:

(a) all activities covered by a Safe Work Procedure;

(b) all activities covered by a Standard Operating Procedure;

(c) all activities covered by LOTO;

(d) changing the modes of operation of the systems;

(e) operating the system locally;

(f) operating the system remotely (from the HMI);

(g) operation of the Project during fault or upset conditions, including:

(i) the identification of, and appropriate responses to, potential faults and errors; and

(ii) the restoration of the system(s) to normal operating conditions; and

(h) use of tools and equipment provided under the Project.

C.1.4 Learning requirements include:

(a) trained personnel will be able to operate the Project under normal and abnormal operating scenarios;

(b) trained personnel will be able to restore the constructed Project to normal operation conditions after fault or upset conditions; and

(c) trained personnel will be able to maintain the Project under both routine and failure scenarios, including:

(i) troubleshooting and maintaining all aspects of the electrical protection and control systems; and

(ii) placing all components of the Project in a safe, zero energy state with correct barriers and groundings in place.

C.1.5 In addition to the requirements of this Section, include and integrate training requirements identified in Appendix 11- WSTP E&I Standardization Clauses R04 and WSTP E&I Standardization Summary R05.

C.2 Specific Limitations

C.2.1 Except as indicated elsewhere in this Appendix 23, the following are not required to be included in the Training Program:

(a) instruction on repair of equipment, where the repair is not likely to occur within the first two years after Final Completion;

(b) civil maintenance, except any special considerations associated with working safely around electrical equipment;

(c) basic trade knowledge of a journeyman electrician;

(d) basic trade knowledge of a journeyman mechanic; and

(e) Unity Pro and HMI programming, other than specific application nuances that would not be common knowledge to a programmer.

C.3 Classroom Training

C.3.1 Consultant shall provide classroom training, which other than the overview course, shall be specific for each Training Participant Group.

C.3.2 The classroom training topics for all Training Participants shall include at minimum:

(a) overview of the Project, including the locations of equipment;

(b) general purpose, intent, and plant function of the equipment;

(c) high level functional and performance requirements;

(d) overview of the PCS HMI system, including the graphic scheme and alarming system;

(e) general hazard awareness;

(f) electrical high voltage awareness;

(g) applicable safety features and procedures;

(h) placing every component of the Project in a safe, zero energy state with appropriate safety provisions, including barriers and grounding, and in accordance with the Safe Work Procedures (duplicated in both classroom and field training); and

(i) emergency procedures.

C.3.3 In addition to the requirements of Section C.3.2, the classroom training topics for Operations Personnel shall include at minimum:

(a) troubleshooting for common operational issues by area;

(b) required equipment exercise procedures and intervals;

(c) overview of the Operation and Maintenance Manuals applicable to Operations Personnel;

(d) monitoring and operation of all aspects of the Project from the PCS, including a basic understanding of the power monitoring;

(e) appropriate response to all alarms generated on the PCS from an Operations perspective. It is appropriate to train Operations Personnel to call Maintenance Personnel to address alarms they are not qualified or trained to address; and

(f) for building mechanical systems, including HVAC:

(i) start-up, shutdown, normal operation and emergency procedures;

(ii) routine inspection and troubleshooting procedures, including operator detection, without test instruments, of specific equipment trouble symptoms; and

(iii) required equipment exercise procedures and intervals.

C.3.4 In addition to the requirements of Section C.3.2, the classroom training topics for Mechanical Maintenance Personnel shall address the mechanical systems and include at minimum:

(a) overview of the Operation and Maintenance Manuals as applicable to Mechanical Maintenance Personnel;

(b) start-up, shutdown, normal operation and emergency procedures, including system integration and interlocks, if any;

(c) routine inspection and troubleshooting procedures, including operator detection, without test instruments, of specific equipment trouble symptoms;

(d) routine inspection and troubleshooting procedures, including operator detection for the purposes of predictive maintenance;

(e) routine preventive maintenance, including applicable specific details on lubrication, maintenance of corrosion protection of the equipment and ancillary components and the use of special tools;

(f) required equipment exercise procedures and intervals; and

(g) disassembly and assembly of equipment, if applicable, for purposes such as routine inspection or maintenance of the equipment.

C.3.5 In addition to the requirements of Section C.3.2, the classroom training topics for Electrical and Instrumentation Maintenance Personnel shall include at minimum:

(a) overview of the Operation and Maintenance Manuals as applicable to Electrical and Instrumentation Maintenance Personnel. For clarity, PLC hardware shall be included as part of the electrical equipment discussed in this Section;

(b) configuration of the upgraded distribution system (provide detailed understanding of single line diagrams);

(c) operating theory of the equipment including control narratives;

(d) locations of all electrical equipment;

(e) purpose, intent, and plant function of the equipment, including functional descriptions;

(f) basic theory of the system, equipment and equipment operation;

(g) basic understanding and theory of electrical protection systems and the electrical protection installed as part of the Project;

(h) sequence of operation;

(i) manual and automatic switching procedures;

(j) routine preventive maintenance;

(k) identification and brief description of recommended predictive maintenance;

(l) equipment inspection and troubleshooting procedures, including blown fuses and faulty modules. Include items that are difficult to demonstrate in the field or are sufficiently significant to demonstrate in both the classroom and field sessions;

(m) safety features and procedures related to the maintenance of the equipment, referencing and utilizing specific Safe Work Procedures;

(n) understanding of arc flash mitigation systems;

(o) arc flash identification and PPE selection;

(p) monitoring and operation of the electrical components of the Project from the PCS, including operation of the switchgear auto-transfer systems;

(q) appropriate responses to all applicable PCS alarms;

(r) appropriate responses to all electrical protection alarms and trips, including the identification of the type and nature of protective trip;

(s) understanding of and troubleshooting of electrical interlocks;

(t) start-up, shutdown, normal operation and emergency operating procedures, including system integration and electrical interlocks;

(u) understanding of automation integration;

(v) basic use of power meter, including switching between displays and content of major displays;

(w) black-start procedures; and

(x) required equipment exercise procedures and intervals.

C.3.6 In addition to the requirements of Section C.3.2, the classroom training topics for the Automation and Industrial Controls Group Maintenance Personnel shall include at minimum:

(a) overview of the Operation and Maintenance Manuals as applicable to the Automation and Industrial Controls Group Maintenance Personnel;

(b) locations of all automation equipment, including networking;

(c) purpose, intent, and plant function of the equipment, including functional descriptions;

(d) basic theory of the system, equipment and communication between components;

(e) troubleshooting and identification of issues, including blown fuses and faulty modules;

(f) downloading, uploading and basic software maintenance of PLC systems;

(g) software and hardware maintenance of HMI, historian and other computer software systems;

(h) security management, including the addition of users and modification of user permissions / security levels;

(i) identification of and general procedures for routine preventive maintenance;

(j) equipment inspection and troubleshooting procedures;

(k) safety procedures related to the maintenance of the equipment, referencing and utilizing specific Safe Work Procedures;

(l) overview of the configuration of the PLC systems, including which component or PLC processes various functions;

(m) overview of the configuration of the HMI system; and

(n) overview of the configuration of the Historian system.

C.4 Field Training

C.4.1 Consulant shall provide field training, which shall be specific for each Training Participant Group.

C.4.2 The field training topics for all Training Participants, tailored specific to each Training Participant Group, shall include at minimum:

(a) overview of the Project, including locations of specific equipment;

(b) demonstration of routine inspections and round checks, including the reading of gauges;

(c) routine visual inspection of lifting devices, but not certification;

(d) demonstration of Standard Operating Procedures;

(e) demonstration of operating parameter or setting adjustments for optimized equipment / system operation;

(f) demonstration of start-up and shutdown procedures;

(g) demonstration of the required equipment exercise procedures;

(h) placing every component of the Project in a safe, zero energy state with appropriate safety provisions, including barriers and grounding and in accordance with the Safe Work Procedures; and

(i) demonstration of the use of all special tools and equipment.

C.4.3 In addition to the requirements of Section C.4.2, the field training topics for Operations Personnel shall include at minimum:

(a) identifying and reviewing safety items and demonstration of Safe Work Procedures applicable to Operations Personnel;

(b) performing routine maintenance procedures, including the routine disassembly and assembly of equipment, as applicable. For example, replacement of HVAC filters; and

(c) performing seasonal adjustments.

C.4.4 In addition to the requirements of Section C.4.2, the field training topics for Mechanical Maintenance Personnel shall include at minimum:

(a) identification of all equipment and instrumentation, including discussing the purpose, basic operation, and interpretation of any indicators or readouts;

(b) demonstration of the required equipment exercise procedures;

(c) identification and review safety items and demonstration of Safe Work Procedures applicable to Maintenance Personnel;

(d) troubleshooting equipment problems;

(e) performing routine maintenance procedures, including the routine disassembly and assembly of equipment, as applicable. For example, replacement of scrubber media; and

(f) performing repair procedures, as would be applicable within the first 2 years after Final Completion.

C.4.5 In addition to the requirements of Section C.4.2, the field training topics for Electrical and Instrumentation Maintenance Personnel shall include at minimum:

(a) identification of all equipment and instrumentation, including discussing the purpose, basic operation, and interpretation of any indicators or readouts;

(b) performing switching procedures;

(c) identification and review safety items and demonstration of Safe Work Procedures applicable to Electrical and Instrumentation Maintenance Personnel;

(d) racking of breakers (medium voltage and low voltage);

(e) key and electrical interlock systems;

(f) replacement of PLC modules and automation components;

(g) performing the preventive maintenance activities;

(h) troubleshooting equipment problems;

(i) interrogation of smart networked instruments and other devices via software and tools, as applicable;

(j) detection, without test instruments, of specific equipment trouble symptoms utilizing senses, including visual, audible, smell and touch cues;

(k) adjustment of protection settings (but not programming);

(l) replacement of protection relays, including loading of protection settings;

(m) performing maintenance procedures, including the routine disassembly and assembly of equipment, as applicable;

(n) performing repair procedures, as would be applicable within the first 2 years after Final Completion;

(o) routine predictive and preventive maintenance. For example, include identification of and general procedures for taking transformer oil samples;

(p) use of power meters;

(q) use of the power metering software; and

(r) use of special tools, such as breaker lifting trucks.

C.4.6 In addition to the requirements of Section C.4.2, the field training topics for the Automation and Industrial Controls Group Maintenance Personnel shall include at minimum:

(a) identification of all automation equipment, including discussing the purpose, basic operation, and interpretation of any indicators or readouts;

(b) identifying and reviewing safety items and demonstration of Safe Work Procedures applicable to the Automation and Industrial Controls Group Maintenance Personnel;

(c) performing routine maintenance procedures;

(d) replacement of PLC modules and other automation components;

(e) downloading, uploading and basic software maintenance of PLC systems; and

(f) setup and configuration of an HMI operator workstation.

SECTION D. TRAINING COMPLETION

D.1 General

D.1.1 Consultant shall perform the training in accordance with the Training Program and to the satisfaction of the Project Manager. The Project Manager may provide feedback, which shall be incorporated into subsequent training sessions or require repeat of one or more training sessions to address training quality issues.

D.1.2 All training criteria shall be interpreted in accordance with the RFP and this Appendix and as determined by the Project Manager.

D.2 Training Completion

D.2.1 The training is considered complete if the following has been carried out to the satisfaction of the City:

(a) plant staff have been fully trained, and such training is in accordance with the Training Plan, the Course Lesson Plans and this Appendix;

(b) Consultant has submitted all associated Training Material and Training Records to the City; and

(c) a Declaration of Course Completion has been issued by the Consultant for each corresponding course component within the Training Plan.

TEMPLATE A

TRAINING PARTICIPANT TEMPLATE

The existing template is attached as an image on the following page.

The City reserves the right to update the template at any time, including up until the time the template is required for training purposes.

The Microsoft Word format template will be made available after the Effective Date at request of the Consultant.

Winnipeg VEOLIA	**Training Participant Register**	Document Code:
		Date: yyyy-mm-dd

Project:	NEWPCC Upgrade	Location:	Indicate facility and room name
Topic:	Description of topic		
Organization:	Name of organization providing the training		
Trainer(s):	First and last names of all trainers		

Name	**Signature**	**Organization / Group**					
		Eng.	**Ops.**	**Mech. Maint.**	**E&I**	**AICG**	**Other**

TEMPLATE B

TRAINING PARTICIPANT FEEDBACK FORM

The existing form is attached as an image on the following page.

The City reserves the right to update the form at any time, including up until the time the template is required for training purposes.

The Microsoft Word format template will be made available after the Effective Date at the request of the Consultant.

Winnipeg VEOLIA	**Training Participant Feedback Form**		
Project:	NEWPCC Upgrade		
Course:	Name of course		
Organization:	Name of organization providing the training		
Date:	Date of course	Trainer(s):	First and last names of all trainers

Instructions: Please circle the number 0 to 4 that indicates your level of agreement with the following statements.		**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1	The objectives of the session were clearly defined.	0	1	2	3	4
2	The objectives of the session were met.	0	1	2	3	4
3	The topics covered were relevant to my work.	0	1	2	3	4
4	I will be able to apply the information to my work.	0	1	2	3	4
5	The content was organized and easy to follow.	0	1	2	3	4
6	Participation and discussion were encouraged.	0	1	2	3	4
7	Materials provided were helpful.	0	1	2	3	4
8	The trainer was well prepared and knowledgeable of the topic.	0	1	2	3	4
9	The trainer clearly presented the content.	0	1	2	3	4
10	The time allotted was sufficient.	0	1	2	3	4
11	The meeting room and facilities were appropriate.	0	1	2	3	4
Other Comments:						
Name (optional):						

TEMPLATE C

DECLARATION OF COURSE COMPLETION

The template is attached as an image on the following.

The City reserves the right to update the template at any time, including up until the time the template is required for training purposes.

The Microsoft Word format template will be made available after the Effective Date at request of the Consultant.

Winnipeg VEOLIA	**Declaration Of Course Completion**	Document Code:
		Date: yyyy-mm-dd
Project:	NEWPCC Upgrade	
Course:	Name of course	
Organization:	Name of organization providing the training	
Trainer(s):	First and last names of all trainers	

Session	**Supporting Documents** (Provide Document Numbers)		
	Attendance Register	**Attendee Evaluation (Quizzes, etc.)**	**Post-Course Evaluation Feedback Forms**
1			
2			
3			
4			

We have completed the indicated course and the attendees have been adequately trained in the operation and maintenance of the specific Infrastructure, in accordance with the Training Plan, the specific Course Lesson Plan and Appendix 18G of the Design Build Agreement.

Print Name (Trainer)	Signature	Date (yyyy/mm/dd)
Print Name (Authorized Representative of Design Builder)	Signature	Date (yyyy/mm/dd)