



THE CITY OF WINNIPEG

REQUEST FOR PROPOSAL

RFP NO. 889-2017

**REQUEST FOR PROPOSAL FOR PROFESSIONAL CONSULTING SERVICES FOR
A WATER EFFICENCY STUDY AND THE PRELIMINARY DESIGN OF TREATED
WATER PRODUCTION METERS AT THE REGIONAL PUMPING STATIONS**

Proposals shall be submitted to:

**The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg, MB R3B 1J1**

TABLE OF CONTENTS

PART A - PROPOSAL SUBMISSION

Form A: Proposal	1
Form B: Fees	1
Form P: Person Hours	1

PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Site Investigation	1
B4. Enquiries	2
B5. Confidentiality	2
B6. Addenda	3
B7. Proposal Submission	3
B8. Proposal (Section A)	4
B9. Fees (Section B)	4
B10. Experience of Proponent and Subconsultants (Section C)	5
B11. Experience of Key Personnel Assigned to the Project (Section D)	6
B12. Project Understanding and Methodology (Section E)	7
B13. Project Schedule (Section F)	7
B14. Disclosure	7
B15. Qualification	8
B16. Opening of Proposals and Release of Information	9
B17. Irrevocable Offer	9
B18. Withdrawal of Offers	9
B19. Interviews	10
B20. Negotiations	10
B21. Evaluation of Proposals	10
B22. Award of Contract	11

PART C - GENERAL CONDITIONS

C0. General Conditions	1
------------------------	---

PART D - SUPPLEMENTAL CONDITIONS

General

D1. General Conditions	1
D2. Project Manager	1
D3. Definitions	1
D4. Background	2
D5. General Requirements	2
D6. Ownership of Information, Confidentiality and Non Disclosure	5

Submissions

D7. Authority to Carry on Business	5
D8. Insurance	5

Schedule of Services

D9. Commencement	7
D10. Critical Stages	7
D11. Future work	7

PART E - SCOPE OF SERVICES

E1. General	1
E2. Project Management	1
E3. Task 1: Develop a City of Winnipeg Water Demand Projection Model to 2040	2
E4. Task 2: Evaluation of the City of Winnipeg's Water Conservation Program and the Impacts to Water and Sewer Rates	5

E5.	Task 3: Evaluation of the City of Winnipeg's Current and Future Water Conservation Needs	7
E6.	Task 4: Evaluation of the City of Winnipeg's Leak Detection Survey Program	10
E7.	Task 5: Evaluation of Customer Metering Inaccuracies and the Impacts to Revenue Stability	11
E8.	Task 6: Evaluation of City of Winnipeg's Readiness to Implement an Advanced Metering System Solution	13
E9.	Task 7: Preliminary Design for the Replacement of the Treated Water Production Meters at the Regional Pumping Stations	14

PART F - SECURITY CLEARANCE

F1.	Security Clearance	1
-----	--------------------	---

Appendix A – DEFINITIONS OF PROFESSIONAL CONSULTANT SERVICES

Appendix B – HIGH LEVEL SCHEMATIC DRAWING OF THE THREE (3) REGIONAL PUMPING STATIONS AND THE TREATED WATER PRODUCTION METERS

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

- B1.1 REQUEST FOR PROPOSAL FOR PROFESSIONAL CONSULTING SERVICES FOR A WATER EFFICIENCY STUDY AND THE PRELIMINARY DESIGN OF TREATED WATER PRODUCTION METERS AT THE REGIONAL PUMPING STATIONS

B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 12:00 noon Winnipeg time, November 29, 2017.
- B2.2 Proposals determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.
- B2.3 The Project Manager or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. SITE INVESTIGATION

- B3.1 The Project Manager and/or an authorized representative will conduct a Site Investigation of the following facilities on November 2, 2017, starting at 9:00 a.m.:
- (a) G.C. MacLean Pumping Station, 875 Lagimodière Boulevard;
 - (b) McPhillips Pumping Station, 360 McPhillips Street; and
 - (c) W.D. Hurst Pumping Station, 60 Hurst Way.
- B3.1.1 The Site Investigation will commence at the G.C. MacLean Pumping Station and will proceed to the other two locations from here.
- (a) Proponents must provide their own transportation between the facilities.
- B3.1.2 Site Investigation of each pumping station will be limited to the areas related directly to the treated water production meters.
- B3.2 Proponents are requested to register for the Site Investigation **at least 48 hours in advance** by contacting the Project Manager identified in D2.
- B3.2.1 Proponents will be limited to up to two (2) representatives to attend the Site Investigation.
- (a) Proponents wishing to register for the Site Investigation must provide the Project Manager with a Public Safety Verification Check obtained not earlier than one (1) year prior to the Site Investigation.
 - (b) The Public Safety Verification Check may be obtained from Sterling Talent Solutions. Proponents will need to set up a Sterling Talent Solutions account prior to requesting individual background checks. This process should be done 72 hours prior to requesting the first check. The account can be setup using the following link:
<https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>
Note that the Public Safety Verification Check will take up to 48 hours to complete. Refer to PART F -- SECURITY CLEARANCE for further information.
 - (c) The results of the Public Safety Verification Check must be received by the City directly through Sterling Talent Solutions. Proponents must set up an account with Sterling Talent Solutions under their company name and grant Sterling Talent Solutions permission to share the results of the Public Safety Verification Check with the City of Winnipeg.
 - (d) Proponents that do not provide a Public Safety Verification Check to the Project Manager prior to the Site Investigation will be denied entrance to the Sites stated in B3.1.

- B3.3 Proponents are required to bring their own Grade 1 safety shoes (CSA approved Green Triangle), safety glasses and a hard hat for the Site Investigation.
- B3.4 Proponents will not be allowed to take pictures at the Site Investigation. The Proponent may request pictures of specific areas from the Project Manager.
- B3.5 Proponents are advised that site access is restricted and access to view the site can only be made under the supervision of the Project Manager or authorized representative.
- B3.6 The Proponent shall not be entitled to rely on any information or interpretation received at the Site Investigation unless that information or interpretation is the Proponent's direct observation, or is provided by the Project Manager in writing.
- (a) Proponents are advised to review the high level schematic drawing of the three (3) Regional Pumping Stations and the treated water production meters available for reference in Appendix B.
- B3.7 Although attendance at the Site Investigation is not mandatory, the City strongly suggests that Proponents attend.

B4. ENQUIRIES

- B4.1 All enquiries shall be directed to the Project Manager identified in D2.
- B4.2 If the Proponent finds errors, discrepancies or omissions in the Request for Proposal, or is unsure of the meaning or intent of any provision therein, the Proponent shall promptly notify the Project Manager of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.
- B4.3 If the Proponent is unsure of the meaning or intent of any provision therein, the Proponent should request clarification as to the meaning or intent prior to the Submission Deadline.
- B4.4 Responses to enquiries which, in the sole judgment of the Project Manager, require a correction to or a clarification of the Request for Proposal will be provided by the Project Manager to all Proponents by issuing an addendum.
- B4.5 Responses to enquiries which, in the sole judgment of the Project Manager, do not require a correction to or a clarification of the Request for Proposal will be provided by the Project Manager only to the Proponent who made the enquiry.
- B4.6 All correspondence or contact by Proponents with the City in respect of this RFP must be directly and only with the Project Manager. Failure to restrict correspondence and contact to the Project Manager may result in the rejection of the Proponents Proposal Submission.
- B4.7 The Proponent shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Project Manager in writing.

B5. CONFIDENTIALITY

- B5.1 Information provided to a Proponent by the City or acquired by a Proponent by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Project Manager. The use and disclosure of the Confidential Information shall not apply to information which:
- (a) was known to the Proponent before receipt hereof; or
- (b) becomes publicly known other than through the Proponent; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.
- B5.2 The Proponent shall not make any statement of fact or opinion regarding any aspect of the Request for Proposals to the media or any member of the public without the prior written authorization of the Project Manager.

B6. ADDENDA

- B6.1 The Project Manager may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Request for Proposal, or clarifying the meaning or intent of any provision therein.
- B6.2 The Project Manager will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B6.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B6.2.2 The Proponent is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B6.3 The Proponent shall acknowledge receipt of each addendum in Paragraph 9 of Form A: Proposal. Failure to acknowledge receipt of an addendum may render a Proposal non-responsive.

B7. PROPOSAL SUBMISSION

- B7.1 The Proposal shall consist of the following components:
- (a) Form A: Proposal (Section A) in accordance with B8;
 - (b) Fees (Section B) in accordance with B9.
- B7.2 The Proposal should also consist of the following components:
- (a) Experience of Proponent and Subconsultants (Section C) in accordance with B10;
 - (b) Experience of Key Personnel Assigned to the Project (Section D), in accordance with B11;
 - (c) Project Understanding and Methodology (Section E) in accordance with B12; and
 - (d) Project Schedule (Section F) in accordance with B13.
 - (e) Form P: Person Hours
- B7.3 Further to B7.1 all components of the Proposal shall be fully completed or provided in the order indicated, and submitted by the Proponent no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Proposal.
- B7.4 Further to B7.2, all components of the Proposal should be fully completed or provided in the order indicated, and submitted by the Proponent no later than the Submission Deadline, with all required entries made clearly and completely.
- B7.5 Proponents should submit one (1) unbound 8.5" x 11" original (marked "original") including drawings and six (6) copies (copies can be in any size format) for sections identified in B7.1 and B7.2.
- B7.6 Proposal format, including type of binding, number of pages, size of pages and, font, etc., will not be regulated, except that the Proposal should contain a table of contents, page numbering and should be in the Sections identified above. Proponents are encouraged to use their creativity to submit a Proposal which provides the requested information for evaluation and other information which illustrates the strength of their team.
- B7.7 Proponents are advised that inclusion of terms and conditions inconsistent with the Request for Proposal will be evaluated in accordance with B21.1(a).
- B7.8 The Proposal shall be submitted enclosed and sealed in an envelope/package clearly marked with the RFP number and the Proponent's name and address.

B7.9 Proposals submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.

B7.10 Proposals shall be submitted to:

The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg, MB R3B 1J1

B7.11 Any cost or expense incurred by the Proponent that is associated with the preparation of the Proposal shall be borne solely by the Proponent.

B8. PROPOSAL (SECTION A)

B8.1 The Proponent shall complete Form A: Proposal, making all required entries.

B8.2 Paragraph 2 of Form A: Proposal shall be completed in accordance with the following requirements:

- (a) if the Proponent is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
- (b) if the Proponent is a partnership, the full name of the partnership shall be inserted;
- (c) if the Proponent is a corporation, the full name of the corporation shall be inserted; and
- (d) if the Proponent is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B8.2.1 If a Proposal is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Proposal, the Proponent shall identify a contact person who is authorized to represent the Proponent for purposes of the Proposal.

B8.4 Paragraph 11 of Form A: Proposal shall be signed in accordance with the following requirements:

- (a) if the Proponent is a sole proprietor carrying on business in his/her own name, it shall be signed by the Proponent;
- (b) if the Proponent is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Proponent is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed; and
- (d) if the Proponent is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Proposal should be printed below such signatures.

B8.5 If a Proposal is submitted jointly by two or more persons, the word "Proponent" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Proponents in the Proposal and the Contract, when awarded, shall be both joint and several.

B9. FEES (SECTION B)

B9.1 The Proposal shall include a Fixed Fee for all disciplines and/or phases identified in PART E - SCOPE OF SERVICES.

- (a) The Proponent shall utilize and submit Form B: Fees, making all required entries to summarize their Fee proposal for the proposed Services.
 - (b) In addition to Form B Fees, The Proponent should utilize and submit Form P: Person Hours.
- B9.1.1 The Proponent shall be responsible to verify and ensure the correctness of the associated submittals.
- B9.2 The City may, at its discretion, delete tasks from the awarded Scope of Services.
 - (a) The City may remove the following tasks from the Scope of Services in the following order:
 - (i) Task 4: Evaluation of the City of Winnipeg's Leak Detection Survey Program.
 - (ii) Task 6: Evaluation of City of Winnipeg's Readiness to Implement an Advanced Metering System Solution.
 - (iii) Task 7: Preliminary Design for the Replacement of the Treated Water Production Meters at the Regional Pumping Stations.
- B9.3 Adjustments to Fees will only be considered based on increases to the Scope of Services.
- B9.3.1 The City will not consider an adjustment to the Fees based on changes in the Project budget or the Final Total Construction Cost.
- B9.4 Notwithstanding C1.1(b), Fees shall include costs for out of town travel, related meals and accommodations for the duration of the Project and shall not be considered an Allowable Disbursement.
- B9.5 The Fee Proposal shall also include an allowance for Allowable Disbursements as defined in C1.1(b), but shall exclude the costs of any materials testing, soils and hazardous materials investigation during construction.
- B9.6 Notwithstanding C11.1, Fees submitted shall not include the Goods and Services Tax (GST) or Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.
- B9.7 Payments to Non-Resident Consultants are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).
 - (a) Non-Resident Consultants can contact Revenue Canada Agency to see what is required in regards to the Non-Resident Withholding Tax prior to submitting the Proposal using the following link:
<https://www.canada.ca/en/revenue-agency/corporate/contact-information/international-tax-non-resident-enquiries.html>
- B9.8 If the City requires additional services, the rates to be used will be based on the rates provided in the Proponent's proposal.
- B10. EXPERIENCE OF PROPONENT AND SUBCONSULTANTS (SECTION C)**
- B10.1 Proposals should include:
 - (a) Details demonstrating the history and experience of the Proponent and Subconsultants on three (3) projects of similar complexity, scope and value which include:
 - (i) water audit validation and water loss control analysis services;
 - (ii) treated water production meter design services;
 - (iii) advanced metering system solutions and implementation services;
 - (iv) water efficiency/conservation study services; and
 - (v) water demand projection modeling services
- B10.2 For each project listed in B10.1(a), the Proponent should submit:
 - (a) description of the project;

- (b) role of the consultant;
- (c) project's original contracted cost and final cost;
- (d) design and schedule (anticipated Project schedule and actual project delivery schedule, showing design separately);
- (e) project owner; and
- (f) reference information (two (2) current names with email addresses and telephone numbers per project). All references provided by the Proponent should be current and correct.

B10.2.1 Where applicable, information should be separated into Proponent and Subconsultant project listings.

B10.3 The Proposal should include general firm profile information including years in business, average volume of work, number of employees and other pertinent information for the Proponent and all Subconsultants.

B11. EXPERIENCE OF KEY PERSONNEL ASSIGNED TO THE PROJECT (SECTION D)

B11.1 Describe your approach to overall team formation and coordination of team members.

B11.1.1 Include an organizational chart for the Project.

B11.2 Identify the following Key Personnel assigned to the Project:

- (a) Project Manager;
- (b) Senior Reviewer(s);
- (c) Economic / Business / Management Lead(s);
- (d) Engineering Lead(s);
- (e) Key Technical Staff; and
- (f) Any other personnel with over 10% of total Project hours.

B11.3 Submit the experience and qualifications of the Key Personnel assigned to the Project for projects of similar complexity, scope and value, including the principals-in-charge, the Consultants Representative, managers of the key disciplines and lead designers. Include educational background and degrees, professional recognition, job title, years of experience in current position, years of experience in design and years of experience with existing employer. Roles of each of the Key Personnel in the Project should be identified in the organizational chart referred to in B11.1.1.

- (a) The Project team should have recent experience in:
 - (i) water audit validation and water loss control analysis;
 - (ii) design of treated water production meters;
 - (iii) implementation of advanced metering system solutions;
 - (iv) water efficiency/conservation studies; and
 - (v) water demand projection modeling.

B11.4 For each person identified, list at least two (2) comparable projects in which they have played a primary role similar to that proposed for this Project. If a project selected for a key person is included in B10, provide only the project name and the role of the key person. For other projects provide the following:

- (a) description of project;
- (b) role of the person;
- (c) project owner; and
- (d) reference information (two (2) current names with email addresses and telephone numbers per project). All references provided by the Proponent should be current and correct.

B12. PROJECT UNDERSTANDING AND METHODOLOGY (SECTION E)

- B12.1 Describe your firm's project management approach and team organization during the performance of Services, so that the evaluation committee has a clear understanding of the methods the Proponent will use in the delivery of this Project.
- B12.2 Methodology should be presented in accordance with the Scope of Services.
- B12.3 Describe the collaborative process/method to be used by the Key Personnel of the team in the various phases of the Project.
- B12.4 Proposals should address:
- (a) the team's understanding of the broad functional and technical requirements;
 - (b) the team's understanding of the Project deliverables and what tasks are interrelated;
 - (c) the proposed Project budget;
 - (d) the City's Project methodology with respect to the information provided within this RFP; and
 - (e) any other issue that conveys your team's understanding of the Project requirements.
- B12.5 The Proposal should include Form P: Person Hours for all disciplines and or phases identified in the Scope of Services.
- B12.5.1 The total Fees on Form P: Person Hours should match Fees submitted in response to B9.
- B12.6 Proponents may use Form P: Person Hours or a table of their own design provided it includes all information requested in accordance with B12.5.
- B12.7 For each person identified in B11.2, list the percent of time to be dedicated to the Project in accordance with the Scope of Services.

B13. PROJECT SCHEDULE (SECTION F)

- B13.1 Proponents should present a carefully considered Critical Path Method schedule using Microsoft Project or similar project management software, complete with resource assignments (key designers), durations (weekly timescale) and milestone dates or events. The schedule should address each requirement of the Scope of Services.
- B13.2 The Proponent's schedule should include critical dates for review and approval processes by the City and other organizations anticipated during the Project; and
- B13.2.1 Reasonable times (a minimum of three (3) weeks) should be allowed for completion of these processes.
- B13.3 Project meetings and submission dates for Deliverables during the Project.

B14. DISCLOSURE

- B14.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.
- B14.2 The Persons are:
- (a) AECOM Canada Ltd.:
 - (i) City of Winnipeg Regional Water Supply Conceptual Planning Study Update (2011).
 - (b) UtiliWorks Consulting, LLC:
 - (i) City of Winnipeg AMR / AMI Business Case (2011).

- (c) American Water Works Association – Water Loss Control Committee:
 - (i) Water Audit Data Initiative Project (2016).

B15. QUALIFICATION

B15.1 The Proponent shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Proponent does not carry on business in Manitoba, in the jurisdiction where the Proponent does carry on business;
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Services in strict accordance with the terms and provisions of the Contract.

B15.2 The Proponent and any proposed Subconsultant (for the portion of the Services proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>

B15.3 The Proponent and/or any proposed Subconsultant (for the portion of the Services proposed to be subcontracted to them) shall:

- (a) have successfully carried out services for water audit validation and water loss control analysis projects of similar complexity, scope and value; and to those required for this Project;
- (b) have successfully carried out services for the design of treated water production meters projects of similar complexity; scope and value; and to those required for this Project;
- (c) have successfully carried out services for advanced metering system solutions and implementation projects of similar complexity, scope and value; and to those required for the Project;
- (d) have successfully carried out services for water efficiency/conservation studies of similar complexity, scope and value; and to those required for this Project;
- (e) have successfully carried out services for water demand projection modeling projects of similar complexity, scope and value; and to those required for this Project;
- (f) be fully capable of performing the Services required to be in strict accordance with the terms and provisions of the Contract;
- (g) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba);
- (h) have the knowledge and resources to administer the requirements of The Workplace Safety and Health Act (Manitoba) during the construction works associated with this Contract;
- (i) undertake to meet all licensing and regulatory requirements of the appropriate governing authorities and associations in the Province of Manitoba; and
- (j) upon request of the Project Manager, provide the Security Clearances as identified in PART F - SECURITY CLEARANCE.

B15.4 The Proponent shall submit, within three (3) Business Days of a request by the Project Manager, further proof satisfactory to the Project Manager of the qualifications of the Proponent and of any proposed Subconsultant.

B15.5 The Proponent shall provide, on the request of the Project Manager, full access to any of the Proponent's equipment and facilities to confirm, to the Project Manager's satisfaction, that the Proponent's equipment and facilities are adequate to perform the Services.

B16. OPENING OF PROPOSALS AND RELEASE OF INFORMATION

B16.1 Proposals will not be opened publicly.

B16.2 After award of Contract, the names of the Proponents and the Contract amount of the successful Proponent will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B16.3 To the extent permitted, the City shall treat all Proposal Submissions as confidential, however the Proponent is advised any information contained in any Proposal Submission may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

B16.4 Following the award of Contract, a Proponent will be provided with information related to the evaluation of his/her submission upon written request to the Project Manager.

B17. IRREVOCABLE OFFER

B17.1 The Proposal(s) submitted by the Proponent shall be irrevocable for the time period specified in Paragraph 10 of Form A: Proposal.

B17.2 The acceptance by the City of any Proposal shall not release the Proposals of the other responsive Proponents and these Proponents shall be bound by their offers on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any offer shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 10 of Form A: Proposal.

B18. WITHDRAWAL OF OFFERS

B18.1 A Proponent may withdraw his/her Proposal without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B18.1.1 The time and date of receipt of any notice withdrawing a Proposal shall be the time and date of receipt as determined by the Manager of Materials.

B18.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Proposal or the Proponent's authorized representatives named in Paragraph 11 of Form A: Proposal, and only such person, has authority to give notice of withdrawal.

B18.1.3 If a Proponent gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Proposal until after the Submission Deadline has elapsed;
- (b) open the Proposal to identify the contact person named in Paragraph 3 of Form A: Proposal and the Proponent's authorized representatives named in Paragraph 11 of Form A: Proposal; and
- (c) if the notice has been given by any one of the persons specified in B18.1.3(b), declare the Proposal withdrawn.

B18.2 A Proponent who withdraws its Proposal after the Submission Deadline but before its offer has been released or has lapsed as provided for in B17.2 shall be liable for such damages as are imposed upon the Proponent by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

B19. INTERVIEWS

B19.1 The Project Manager may, in his/her sole discretion, interview Proponents during the evaluation process.

B20. NEGOTIATIONS

B20.1 The City reserves the right to negotiate details of the Contract with any Proponent. Proponents are advised to present their best offer, not a starting point for negotiations in their Proposal Submission.

B20.2 The City may negotiate with the Proponents submitting, in the City's opinion, the most advantageous Proposals. The City may enter into negotiations with one or more Proponents without being obligated to offer the same opportunity to any other Proponents. Negotiations may be concurrent and will involve each Proponent individually. The City shall incur no liability to any Proponent as a result of such negotiations.

B20.3 If, in the course of negotiations pursuant to B20.2, the Proponent amends or modifies a Proposal after the Submission Deadline, the City may consider the amended Proposal as an alternative to the Proposal already submitted without releasing the Proponent from the Proposal as originally submitted.

B21. EVALUATION OF PROPOSALS

B21.1 Award of the Contract shall be based on the following evaluation criteria:

- (a) compliance by the Proponent with the requirements of the Request for Proposal or acceptable deviation therefrom: (pass/fail)
- (b) qualifications of the Proponent and the Subconsultants, if any, pursuant to B15: (pass/fail)
- (c) Fees; (Section B) 40%
- (d) Experience of Proponent and Subconsultants; (Section C) 10%
- (e) Experience of Key Personnel Assigned to the Project; (Section D) 25%
- (f) Project Understanding and Methodology (Section E) 20%
- (g) Project Schedule. (Section F) 5%

B21.2 Further to B21.1(a), the Award Authority may reject a Proposal as being non-responsive if the Proposal Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Proposal, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.

B21.3 Further to B21.1(b), the Award Authority shall reject any Proposal submitted by a Proponent who does not demonstrate, in its Proposal or in other information required to be submitted, that it is responsible and qualified.

B21.4 Further to B21.1(c), Fees will be evaluated based on Fees submitted in accordance with B9.

- (a) The City may, at its discretion, delete tasks from the awarded Scope of Services in accordance with B9.2

B21.5 Further to B21.1(d), Experience of Proponent and Subconsultants will be evaluated considering the experience of the organization on projects of similar size and complexity in accordance with B10 as well as other information requested, including but not limited to the following criteria:

- (a) Similarity of the Proponent's past Projects; and
- (b) Overall satisfaction of the provided references towards the Proponent on past Projects, including:

- (i) The technical proficiency and the availability of the Proponent's staff to complete the job;
 - (ii) Adherence to project budget;
 - (iii) Adherence to project schedule; and
 - (iv) Quality of work.
- B21.5.1 Proposals that receive less than half the available evaluation points for Experience of Proponent and Subconsultants will be rejected in accordance with B21.3
- B21.6 Further to B21.1(e), Experience of Key Personnel Assigned to the Project will be evaluated considering the experience and qualifications of the Key Personnel and Subconsultant personnel on Projects of comparable size and complexity, in accordance with B11, including but not limited to the following criteria:
 - (a) Similarity of Key Personnel past Projects;
 - (b) Appropriateness of related years of experience of the Key Personnel;
 - (c) Relevancy of experience of the Key Personnel; and
 - (d) Appropriateness of approach to overall team formation and coordination of team members.
- B21.6.1 Proposals that receive less than half the available evaluation points for Experience of Key Personnel Assigned to the Project will be rejected in accordance with B21.3.
- B21.7 Further to B21.1(f), Project Understanding and Methodology will be evaluated considering your firm's understanding of the City's Project, project management approach and team organization, in accordance with B12, including, but not limited to the following criteria:
 - (a) Appropriateness of the Project Management Approach;
 - (b) Consistency and completeness of the Methodology;
 - (c) Proponent's understanding of the Project and its constraints;
 - (d) Appropriateness of hours assigned to individual tasks per Person; and
 - (e) Demonstration of insight beyond the information that was presented in this Request for Proposal.
- B21.8 Further to B21.1(g), Project Schedule will be evaluated considering the Proponent's ability to comply with the requirements of the Project, in accordance with B13, including but not limited to the following criteria:
 - (a) Completeness and consistency of the Project schedule and appropriateness of the timelines provided; and
 - (b) Past performance of Proponent with regards to schedule on current or recent City projects or if Proponent has no City experience, past schedule performance on information provided in B10 will be evaluated.
- B21.9 Notwithstanding B21.1(d) to B21.1(g), where Proponents fail to provide a response to B7.2(a) to B7.2(d), the score of zero may be assigned to the incomplete part of the response.
- B21.10 Proposals will be evaluated considering the information in the Proposal Submission and any interviews held in accordance with B19.
- B22. AWARD OF CONTRACT**
- B22.1 The City will give notice of the award of the Contract, or will give notice that no award will be made.
- B22.2 The City will have no obligation to award a Contract to a Proponent, even though one or all of the Proponents are determined to be responsible and qualified, and the Proposals are determined to be responsive.

- B22.2.1 Without limiting the generality of B22.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Services;
 - (b) the prices are materially in excess of the prices received for similar services in the past;
 - (c) the prices are materially in excess of the City's cost to perform the Services, or a significant portion thereof, with its own forces;
 - (d) only one Proposal is received; or
 - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.
- B22.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Proponent submitting the most advantageous offer.
- B22.4 The City may, at its discretion, award the Contract in phases.
- B22.5 Notwithstanding Paragraph 6 of Form A: Proposal and C4, the City will issue a Letter of Intent to the successful Proponent in lieu of execution of a Contract.
- B22.5.1 The Contract documents as defined in C1.1(o)(ii) in their entirety shall be deemed to be incorporated in and to form a part of the Letter of Intent notwithstanding that they are not necessarily attached to or accompany said Letter of Intent.
- B22.6 The form of Contract with the City of Winnipeg will be based on the Contract as defined in C1.1(o).
- B22.7 Following the award of Contract, a Proponent will be provided with information related to the evaluation of its Proposal upon written request to the Project Manager.
- B22.8 If, after the award of Contract, the Project is cancelled, the City reserves the right to terminate the Contract. The Consultant will be paid for all Services rendered up to time of termination.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Consultant Services* (Revision 2017-03-24) are applicable to the Services of the Contract.
- C0.1.1 The *General Conditions for Consultant Services* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm.
- C0.2 A reference in the Request for Proposal to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Consultant Services*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Consultant Services*, these Supplemental Conditions are applicable to the Services of the Contract.

D2. PROJECT MANAGER

D2.1 The Project Manager is:

Brent Houle, C.E.T.

Telephone No. 204 986-5576

Email Address: bhoule@winnipeg.ca

D2.2 At the pre-commencement meeting, the Project Manager will identify additional personnel representing the Project Manager and their respective roles and responsibilities for the Services.

D2.3 Proposal Submissions must be submitted to the address in B7.

D3. DEFINITIONS

D3.1 When used in this Request for Proposal:

- (a) "ACE" means the Association for the Advancement of Cost Engineering
- (b) "AMS" means Advanced Metering Systems which includes Advanced Metering Infrastructure and Automated Meter Reading
- (c) "ASME" means American Society of Mechanical Engineers
- (d) "AWE" means the Alliance for Water Efficiency
- (e) "AWWA" means the American Water Works Association
- (f) "BOE" means basis of estimate City of Winnipeg
- (g) "CAD" means an AutoCAD drawing file
- (h) "CMA" means Census Metropolitan Area; which includes the City of Winnipeg and the Municipalities of: West St Paul, East St Paul, Headingley, Macdonald, Richot, Tache, Springfield, Rosser, St Francois Xavier, St Clements, and Brokenhead First Nation
- (i) "Department" means Water and Waste Department of the City of Winnipeg
- (j) "I/O" means an input or output from an instrumentation device or panel, which is either an analog signal, a digital signal or an interlock
- (k) "ISO" means International Organization for Standardization
- (l) "IWA" means International Water Association
- (m) "MaP" means Maximum Performance
- (n) "MCC" means a Motor Control Centre
- (o) "NIST" means National Institute of Standards and Technology
- (p) "PDF" means a Portable Document Format electronic file
- (q) "PLC" means a Programmable Logic Controller
- (r) "PUB" means the Public Utilities Board of Manitoba
- (s) "RFP" means Request for Proposal
- (t) "ROI" means Return on Investment

- (u) "SCADA" means Supervisory Control and Data Acquisition
- (v) "SOP" means Standard Operating Procedures
- (w) "UPS" means an Uninterrupted Power Supply
- (x) "WADI" means AWWA's Water Audit Data Initiative Project
- (y) "WBS" means Work Breakdown Structure
- (z) "WLCC" means AWWA's Water Loss Control Committee
- (aa) "WRF" means the Water Research Foundation

D3.2 Notwithstanding C1.1, when used in this Request for Proposal:

D4. BACKGROUND

D4.1 The City of Winnipeg (City) provides citizens with a safe and adequate supply of drinking water.

D4.2 In 1992, the City's "Slow the Flow" water conservation program was launched after a Comprehensive Regional Water Supply Conceptual Planning Study predicted that overall water demand would exceed the supply capacity of the Shoal Lake Aqueduct. The main goal of the program was to maintain water demand within the Shoal Lake Aqueduct capacity by providing long-term water demand side management solutions. The program introduced various long-term water conservation initiatives in the mid-1990's that assisted in reducing the City's overall water demand to well within the Shoal Lake Aqueduct capacity despite an increased population.

D4.3 In 2011, the City completed some major planning initiatives:

- (a) Adopted OurWinnipeg and four direction strategies including A Sustainable Winnipeg and Sustainable Water and Waste, a 25 year planning vision (until 2035). In A Sustainable Winnipeg direction strategy it reinforced water conservation and the Sustainable Water and Waste direction strategy stated that the City will continue with the successful "Slow the Flow" water conservation program.
- (b) Adopted the American Water Works Association / International Water Association Water Audit methodology which includes standard definitions and a water balance for all major forms of water consumption and water losses encountered in drinking water distribution system.
- (c) Updated water demand projection models as part of the Regional Water Supply Conceptual Planning Study.
- (d) Completed an Automated Meter Reading / Advanced Metering Infrastructure Business Case.

D4.4 In 2013, the City began an in-house Leak Detection Survey Program. The goals of the program were to create a proactive non-evasive approach for leak detection to reduce non-revenue water, to identify trouble areas for inclusion in the City's water main renewal program and to get insight into the extent and magnitude of un-surfaced leaks.

D4.5 In 2016, the City participated in the American Water Works Association's Water Audit Data Initiative Project. This project produced a level 1 water audit validation and identified areas of attention for the City.

D4.6 This RFP consists of various tasks related to water efficiency and conservation plus preliminary design of treated water production meters as described in the Scope of Services.

D5. GENERAL REQUIREMENTS

D5.1 General Requirements of the Consultant

D5.1.1 The Consultant shall ensure that the Scope of Services is performed under direct supervision of a Professional Engineer.

- (a) All drawings, reports, recommendations and other documents involving the practice of professional engineering shall bear the stamp or seal and signature of a qualified engineer as required by the Engineering and Geoscientific Professions Act of the Province of Manitoba and By-laws of the Association of Professional Engineers and Geoscientists of the Province of Manitoba.
- (b) Final design documents irrespective of the level of design shall have an engineer's seal.
- (c) Other reports and documents not involving the practice of professional engineering, such as letters of information, minutes of meetings, may be originated and signed by other personnel engaged by the Consultant and accepted by the City.

D5.1.2 Progress estimates, completion certificates and other reports related to the technical aspects of this Project, must be endorsed by the Consultant's Project Manager in a manner acceptable to the City.

D5.1.3 The Consultant shall, as a minimum, utilize the most current industry standard sustainable practices and conform to the latest codes, standards, regulations and legislative requirements in effect. The Consultant shall liaise with the City on the application of codes and standards.

D5.2 General Requirements for Project Deliverables

D5.2.1 Project Deliverables include but are not limited to technical memorandums, reports, drawings and cost estimates.

D5.2.2 All Project Deliverables are to be delivered with a documentation lifecycle approach.

D5.2.3 Where possible, all documents provided as PDF shall be searchable.

D5.2.4 Unless otherwise indicated, the review period for Project Deliverables shall be a minimum of three (3) weeks and correspond to the number of pages and complexity of the document.

D5.2.5 All Deliverables shall have incorporated the Consultant's internal quality procedures before being submitted to the City.

D5.2.6 The Deliverables shall be submitted in a substantially completed draft format for review prior to submittal as a final document. All Deliverables shall be submitted to the Project Manager.

D5.3 General Requirements for Technical Memorandums and Preliminary Design Report

D5.3.1 The City requires a number of technical memorandums and a preliminary design report to be prepared as part of the Consultant's Scope of Services. The technical memorandums and the preliminary design report shall include sufficient evaluation documentation, including but not limited to:

- (a) Background information;
- (b) Review of options;
- (c) Cost comparison;
- (d) Conclusions; and
- (e) Recommendations.

D5.3.2 The technical memorandums and preliminary design report shall be written as standalone documents and submitted separately for review. All City review comments shall be incorporated into the final technical memorandums and preliminary design report.

D5.4 General Requirements for Drawings

D5.4.1 The drawings shall reflect the Department's CAD-GIS Specifications.

- D5.4.2 The drawings shall not be prepared using the City's GeoMedia and Google Earth screen captures and instead shall be prepared from the legal plans, certificates of title, as-built records and topographic survey.
- D5.4.3 All profile components of drawings shall be in natural scale.
- D5.4.4 Where existing systems are being modified, the existing drawings shall be modified or superseded rather than creating a new drawing only showing a limited portion of the new work.
- D5.4.5 The City will provide comments on the draft drawings. Comments should be reviewed and incorporated into the final drawings.
- D5.4.6 All drawings shall be submitted in AutoCAD format version 2012 and in 11x17 hard copy format, unless otherwise specified.
- D5.4.7 The final drawings shall be stamped and sealed by a Professional Engineer registered in Manitoba and submitted to the Project Manager.
- D5.4.8 All work is to be completed in accordance with the current versions of the following Department standards. Copies will be provided by the City.
- (a) The City of Winnipeg Water & Waste Department Electrical Design Guide;
 - (b) The City of Winnipeg Water & Waste Identification Standard; and
 - (c) The City of Winnipeg Water & Waste Department Water and Wastewater Treatment Process – Drawing Standard.
- D5.5 General Requirements for Submissions
- D5.5.1 Ten (10) Working Days prior to all report submission dates issue one preliminary electronic copy of the report to the Project Manager for quality review. Within three (3) Working Days after receiving the document the Project Manager will either accept the document for submission or reject the document. In the event of document rejection the Proponent will correct quality issues and resubmit the document. The document will not be issued for review by the City's Advisory Committee until the Project Manager's quality review is satisfied.
- D5.5.2 Submit one (1) bound hard copy and one (1) electronic Native Format and PDF of the "Draft Reports".
- D5.5.3 Allow a minimum of fifteen (15) Working Days for the City review of the draft reports.
- D5.5.4 Upon receipt of the Advisory Committee's review comments on the draft reports finalize the reports within ten (10) Working Days.
- D5.5.5 Submit six (6) hard copies and one (1) electronic Native Format and PDF of the "Final Reports".
- D5.6 General Requirements for Cost Estimates
- D5.6.1 Complete AACE Class 5 cost estimates as required in Task 6 and complete AACE Class 4 cost estimates as required in Task 7.
- (a) Submit all cost estimates using the City's Basis of Estimate (BOE) form. Form will be provided by the City.
- D5.7 General Requirements for Photographs
- D5.7.1 All photographs submitted to the City as part of the Project shall include captions with the following information:
- (a) date photograph was taken;
 - (b) location and orientation where the photograph was taken; and
 - (c) a brief description of what is depicted by the photograph.

D5.8 General Requirements for Meetings

- D5.8.1 Schedule and lead a Project kick-off meeting after award of the Project to review the Project management plan, scope of work and Project team.
- (a) Provide an agenda within two (2) Working Days of the meeting date.
 - (b) Provide meeting minutes within seven (7) Working Days of the meeting date.
- D5.8.2 Schedule and lead Project meetings as listed in Scope of Services (E3 through E9).
- (a) The Consultant may, if appropriate combine meetings. Prior approval from the Project Manager is required.
 - (b) Provide an agenda within two (2) Working Days of the meeting date.
 - (c) Provide meeting minutes within seven (7) Working Days of the meeting date.

D5.9 General Requirements for Site Visits

- D5.9.1 Schedule all site visits with the Project Manager as listed in Scope of Services (E3 through E9).
- (a) Provide a minimum of two (2) Working Days' notice prior to site visits that do not require assistance from City personnel.
 - (b) Provide at least seven (7) Working Days' notice prior to any site visit that requires assistance from City personnel.

D6. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

- D6.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Consultant are the property of the City and shall not be appropriated for the Consultants own use, or for the use of any third party.
- D6.2 The Consultant shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Project Manager.
- D6.3 The following shall be confidential and shall not be disclosed by the Consultant to the media or any member of the public without the prior written authorization of the Project Manager;
- (a) information provided to the Consultant by the City or acquired by the Consultant during the course of the Work;
 - (b) the Contract, all deliverables produced or developed; and
 - (c) any statement of fact or opinion regarding any aspect of the Contract.
- D6.4 A Consultant who violates any provision of D6 may be determined to be in breach of Contract.

SUBMISSIONS

D7. AUTHORITY TO CARRY ON BUSINESS

- D7.1 The Consultant shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Consultant does not carry on business in Manitoba, in the jurisdiction where the Consultant does carry on business, throughout the term of the Contract, and shall provide the Project Manager with evidence thereof upon request.

D8. INSURANCE

- D8.1 The Consultant shall procure and maintain, at its own expense and cost, insurance policies with limits no less than those shown below.

- D8.2 As a minimum, the Consultant shall, without limiting its obligations or liabilities under any other contract with the City, procure and maintain, at its own expense and cost, the following insurance policies:
- (a) Comprehensive or Commercial General Liability Insurance including:
 - (i) an inclusive limit of not less than \$2,000,000 for each occurrence or accident with a minimum \$2,000,000 Products and Completed Operations aggregate and \$5,000,000 general aggregate;
 - (ii) all sums which the Consultant shall become legally obligated to pay for damages because of bodily injury (including death at any time resulting therefrom) sustained by any person or persons or because of damage to or destruction of property caused by an occurrence or accident arising out of or related to the Services or any operations carried on in connection with this Contract;
 - (iii) coverage for Products/Completed Operations, Blanket Contractual, Consultant's Protective, Personal Injury, Contingent Employer's Liability, Broad Form Property Damage, Employees as Additional Insured, and Non-Owned Automobile Liability; and
 - (iv) a Cross Liability clause and/or Severability of Interest clause providing that the inclusion of more than one Insured shall not in any way affect the rights of any other Insured hereunder in respect to any claim, demand, suit or judgment made against any other Insured;
 - (b) If applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Consultant directly or indirectly in the performance of the Service. The limit of liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
 - (c) Professional Errors and Omissions Liability Insurance including:
 - (i) an amount not less than \$500,000 per claim and \$1,000,000 in the aggregate.
- D8.2.1 The Consultant's Professional Errors and Omissions Liability Insurance shall remain in force for the duration of the Project and for twelve (12) months after total performance.
- D8.3 The policies required in D8.2(a) shall provide that the City is named as an Additional Insured thereunder and that said policies are primary without any right of contribution from any insurance otherwise maintained by the City.
- D8.4 The Consultant shall require each of its Subconsultants to provide comparable insurance to that set forth under D8.2(a) and D8.2(c).
- D8.5 The Consultant shall provide the Project Manager with a certificate(s) of insurance for itself and for all of its Subconsultants, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Services, but in no event later than the date specified in C4.1 for the return of the executed Contract. Such certificates shall state the exact description of the Services and provide for written notice in accordance with D8.8.
- D8.6 The Consultant may take out such additional insurance as it may consider necessary and desirable. All such additional insurance shall be at no expense to the City.
- D8.7 All insurance, which the Consultant is required to obtain with respect to this Contract, shall be with insurance companies registered in and licensed to underwrite such insurance in the Province of Manitoba.
- D8.8 The Consultant shall not cancel, materially alter, or cause any policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the City.

SCHEDULE OF SERVICES

D9. COMMENCEMENT

- D9.1 The Consultant shall not commence any Services until it is in receipt of a notice of award from the City authorizing the commencement of the Services.
- D9.2 The Consultant shall not commence any Services until:
- (a) the Project Manager has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D7; and
 - (ii) evidence of the insurance specified in D8;
 - (b) the Consultant has attended a meeting with the Project Manager, or the Project Manager has waived the requirement for a meeting.
- D9.3 The City intends to award this Contract by January 31, 2018.

D10. CRITICAL STAGES

- D10.1 The seven (7) tasks presented in E3 to E9 are not in order of priority. The Consultant must consider how the tasks are interrelated when preparing the WBS.
- D10.2 The Consultant shall achieve critical stages of the Services for this Contract in accordance with the following requirements:
- (a) submission of the draft technical memorandums, SOPs and preliminary design report within 10 months from award; and
 - (b) submission of the final technical memorandums, SOPs and preliminary design report within 12 months from award.

D11. FUTURE WORK

- D11.1 Any future engineering work resulting from recommendations made as part of the project will be posted as a separate RFP for professional consulting services.

PART E - SCOPE OF SERVICES

E1. GENERAL

E1.1 These Terms of Reference are supplemental to the Standard Terms and Conditions of Consultant Services and the "Definition of Standard Consulting Engineering Services" required by the City of Winnipeg. The "Definition of Standard Consulting Engineering Services" is available for reference in Appendix A.

E2. PROJECT MANAGEMENT

E2.1 The Consultant's Project Manager shall be the prime contact for the duration of the Project. The Consultant shall not substitute or replace Key Personnel throughout the duration of the Project without the written approval of the Project Manager.

E2.2 The Consultant's Project Manager shall be directly responsible for:

- (a) Managing the Project in accordance with the Project Management Plan described in E2.3;
- (b) Organizing, chairing, providing minutes and agendas for Project meetings;
- (c) Liaising with the City's Project Manager on a biweekly basis to provide Project status updates; and
- (d) Submitting monthly progress reports. Monthly progress reports shall be submitted to the City's Project Manager for review a minimum five (5) Working Days prior to issuing the associated monthly invoice. The reports shall consist of a maximum two (2) pages, and include the following as a minimum:
 - (i) work carried out in the previous month;
 - (ii) work in progress;
 - (iii) work anticipated for the following month, including projected person-hours;
 - (iv) percentage completion of each task and the overall Project;
 - (v) information request for the following month;
 - (vi) issues to date;
 - (vii) schedule and quality performance. In particular, report on items that are behind schedule and how they will be addressed;
 - (viii) budget and actual cost for completed tasks and projected cost for planned tasks; and
 - (ix) modifications to the Project Management Plan described in E2.3.

E2.3 Project Management Plan

Develop and submit a Project Management Plan to the Project Manager at least two (2) Working Days prior to the Project kick off meeting. The Project Management Plan shall include the following at a minimum:

- (a) Scope and Schedule
 - (i) Include the information required in B12 and B13.
 - (ii) Provide a deliverable based Work Breakdown Structure (WBS) that identifies major elements relative to how the assignment will be managed and in terms of tangible and verifiable results (including milestones, critical triggers, deliverables etc.).
 - (iii) Provide a Project schedule, identifying task activities, milestones and responsibility.
 - (iv) The approved schedule will be used as the Project baseline throughout the project. Revised schedules will not be accepted.
- (b) Budget
 - (i) Include the information required in B9.

- (ii) Include a description of the processes used to carry out earned value analysis such that the Project's performance can be measured against scope, schedule and cost baselines.
- (c) **Quality Management**
 - (i) Describe quality management methods used to address quality planning, quality assurance and quality control for the following:
 - Data review, verification, and validation;
 - Inter-discipline coordination;
 - City reviews;
 - Corrective action process; and
 - Quality assurance and control of Deliverables.
- (d) **Human Resources**
 - (i) Describe the team organizational and management approach.
 - (ii) Include an organizational chart.
- (e) **Communication**
 - (i) Describe communication interfaces (organizational, technical and interpersonal) and the roles and responsibilities of each stakeholder.
 - (ii) Identify the processes that will be used to liaise with the City throughout the provision of the Services and to provide ample opportunity for input and review by the City's Project team.
- (f) **Health, Safety and Security**
 - (i) Include a Health and Safety Plan (which will be updated as needed throughout the Project) specific to the Scope of Services.
 - (ii) Describe the Consultant's plan to obtain and renew security clearances throughout the Project as described in PART F - SECURITY CLEARANCE.

E2.4 Project Management Deliverables

- (a) The following Project Management Deliverables are required:
 - (i) Project Management Plan
 - (ii) Monthly progress reports

E3. TASK 1: DEVELOP A CITY OF WINNIPEG WATER DEMAND PROJECTION MODEL TO 2040

E3.1 Background

In 2011, water demand projections for the City of Winnipeg were completed as part of the Regional Water Supply Conceptual Planning Study Update. The following components were evaluated to develop high, mid, and low water demand projections to 2035 for the City of Winnipeg and for the Winnipeg Census Metropolitan Area (CMA):

- (a) Residential water use including:
 - (i) Adoption of water efficient fixtures and appliances and
 - (ii) Indoor and outdoor water use
- (b) Commercial and Industrial water use;
- (c) Continued water conservation promotion and practices; and
- (d) Non-revenue water.

Actual supplied water use was below the "low" projection for the City of Winnipeg in 2013, 2015 and 2016.

E3.2 Scope of Work

1. Evaluation of 2011 Water Demand Projections
 - (a) Review the contributing cause(s) of discrepancy between the 2011 water demand projections and actual supplied water use from 2011 to 2016 from a thorough evaluation of recent trends and variations in water consumption, including the following:
 - (i) water use by customer class;
 - (ii) per capita water use;
 - (iii) seasonal use;
 - (iv) water and sewer rate increases;
 - (v) rainfall records;
 - (vi) daily maximum and minimum pumped flows; and
 - (vii) non-revenue water.
 2. Development of new Water Demand Projection Model to 2040
 - (a) Using the results obtained from E3.2(a); develop a spreadsheet model for high, mid and low average annual water demand projections for the City of Winnipeg and CMA to the year 2040.
 - (b) In addition to the 2011 water demand projection model components, the updated projections must consider the following:
 - (i) Impacts of climate change (seasonal use variations);
 - (ii) Recent economic development forecasts;
 - (iii) Customer behaviour due to socio-economic factors (rate increases, possible rate structure changes, conservation practices, etc.); and
 - (iv) Continued innovation and adoption of water efficient fixtures and appliances and the forecasted timelines for their eventual market saturation including but not limited to:
 - City of Winnipeg Residential Toilet Replacement Credit Program;
 - Manitoba Hydro Power Smart Water & Energy Saver Kit Program;
 - Relevant regulatory changes including the Manitoba and National Plumbing codes; and
 - Introduction of non-potable water systems.
 - (v) Water Research Foundation Projects 4309, 4501 and 4558.
 - (c) The spreadsheet model should:
 - (i) be in Microsoft Excel format;
 - (ii) be user-friendly;
 - (iii) include adjustable parameters based on the items listed in E3.2(b); and
 - (iv) include a written instructions tab.

E3.3 Deliverables

1. Submit a draft and final technical memorandum that summarizes all items in E3.2.
2. Submit the final water demand projection model.

E3.4 Site Visits, Interviews and Meetings

1. Schedule and lead one (1) draft review meeting after the submission of the draft technical memorandum to discuss the City's comments. Note that this meeting can be combined with other tasks.
2. Contact Manitoba Hydro to review their Power Smart Water & Energy Saver Kit Program adoption / saturation rates and future programming plans.

3. Schedule and lead one (1) training session with the City to go over the new water demand projection model including how to adjust factors, assumptions, uncertainties and general troubleshooting (as per E3.2.2). Note that this meeting can be combined with other tasks.

E3.5 Relevant Reports, Supporting Documents and Data

The following is a list of relevant City of Winnipeg documents and data that will be provided to the Consultant:

- (a) Regional Water Supply Conceptual Planning Study Update Report including the water demand projection model (2011);
- (b) Water Supply and Consumption Summary Report (2016);
- (c) Water Consumption Statistics and Database (2011-16);
- (d) Population, Housing and Economic Forecast Report (2016); and
- (e) 2016 to 2018 Water and Sewer Rates Report (2016).

The following is a list of available relevant supporting documents for consideration by the Consultant:

- (a) Manitoba Hydro Power Smart Water & Energy Saver Kit Program (2010);
- (b) Manitoba Plumbing Code (2011);
- (c) Water Research Foundation (WRF) Projects:
 - (i) 4263 – Changes in Water Use Under Regional Climate Change Scenarios (2013);
 - (ii) 4375 – Methodology for Evaluating Water Use in the Commercial, Institutional, and Industrial Sectors (2015);
 - (iii) 4596 – Urban Water Demand Roundtable (2015);
 - (iv) 4309 – Residential End Uses of Water, Version 2 (2016);
 - (v) 4458 – Water Demand Forecasting in Uncertain Times: Isolating the Effects of the Great Recession (2016);
 - (vi) 4527 – Evaluation of Customer Information and Data Processing Needs for Water Demand Analysis, Planning, and Management (2016);
 - (vii) 4558 – Uncertainty in Long-Term Water Demand Forecasts: A Primer on Concepts and Review of Water Industry Practices (2016);
 - (viii) 4649 – Integration of Behavioural Change into Demand Forecasting and Water Efficiency Practices (2016);
 - (ix) 4501 – Short-Term Water Demand Forecasting: Survey, Manual and Research Report (2017);
 - (x) 4495 – Integrating Water Use From Efficient Technology and New Building Codes into Demand Forecasting (2018);
 - (xi) 4554 – Water Use in the Multi-Family Housing Sector (2018);
 - (xii) 4619 – Developing Water Use Metrics and Class Characterization for Categories in the CII Sector (2019); and
 - (xiii) 4667 – Long Term Water Demand Forecasting Practices for Water Resources and Infrastructure Planning (2020).
- (d) National Plumbing Code of Canada (2015);
- (e) Alliance for Water Efficiency (AWE) Reports:
 - (i) The Status of Legislation, Regulation, Codes & Standards on Indoor Plumbing Water Efficiency (2016);
 - (ii) Water Savings & Financial Benefits of Single-Family Package Graywater Systems Canadian Version (2017); and
 - (iii) Saturation Study of Non-Efficient Water Closets in Key States (2017).
- (f) City of Guelph Technical Memorandum – Analysis of Water Demand and Consumption by Sector (2016);

- (g) Pacific Institute Report – A Community Guide for Evaluating Future Urban Water Demand (2016);
- (h) American Water Works Association (AWWA) M50 Manual – Water Resources Planning, 3rd Edition (2017); and
- (i) Maximum Performance (MaP) Reports:
 - (i) Shower-Based Water Savings Flow Rate vs. Duration vs. Volume (2017);
 - (ii) Residential Showering Time-of-Day Analysis (2017); and
 - (iii) Residential Faucets - Saving Water (or NOT)? (2017).

E4. TASK 2: EVALUATION OF THE CITY OF WINNIPEG'S WATER CONSERVATION PROGRAM AND THE IMPACTS TO WATER AND SEWER RATES

E4.1 Background

In 1992, City Council adopted the recommendation to embark on a long-term water conservation program in response to the increasing per capita water supplied in the City of Winnipeg.

The main goals of this program were to maintain water demand within the aqueduct capacity, create an awareness of the value of water and defer major capital investment.

Several water conservation initiatives have been studied, piloted and implemented such as the sale of water conservation devices and home retrofit kits, the "Slow the Flow" water education campaign and more recently the residential toilet replacement credit program.

City initiatives that still exist today are the:

- (a) "Slow the Flow" water education campaign, including the youth water education program delivered through a partnership grant with FortWhyte Alive; and
- (b) Residential toilet replacement credit program.

E4.2 Scope of Work

1. Summarize the City's "Slow the Flow" water conservation efforts since the onset of program including the:
 - (a) Sale of water conservation devices and home retrofit kits;
 - (b) Education and outreach; and
 - (c) Residential toilet replacement credit program.
2. Estimate the amount of water that has been conserved annually due to the onset of the City's "Slow the Flow" water conservation program. When estimating the amount of water conserved, consider as a minimum the:
 - (a) Historical billed water consumption data;
 - (b) Participation rates for water conservation devices and home retrofit kits; and
 - (c) Participation rates for the residential toilet replacement credit program.
3. Produce graphical representations of the water saved due to conservation. As a minimum:
 - (a) One graphic should represent annual total water billed had the 1992 per capita rate remained the same versus actual annual total water billed; and
 - (b) One graphic should represent percentage breakdown of water conserved annually due to:
 - (i) The City's "Slow the Flow" water conservation program listed in E4.2.1; and
 - (ii) The sum of other factors not associated with the "Slow the Flow" water conservation program including but not limited to the innovation of water efficient fixtures and appliances, water efficiency standards in the Manitoba Plumbing Code, Manitoba Hydro's Power Smart Program, and socio-economic factors.

4. Estimate the net present value of the water conserved since the onset of the “Slow the Flow” water conservation program. As a minimum consider the:
 - (a) Annual operating budget of the “Slow the Flow” water conservation program including the grant for public education and outreach;
 - (b) Deferral of capital expansion projects for the City, including but not limited to the:
 - (i) Shoal Lake Aqueduct;
 - (ii) Water treatment plant;
 - (iii) Three regional in-town reservoirs and pumping stations; and
 - (iv) Three wastewater treatment plants.
 - (c) Variable production cost of water pre (2009) and post (2010) water treatment plant; and
 - (d) Cost to treat wastewater.
5. Estimate the portion of the net present value calculated in E4.2.4 attributed to:
 - (a) Each of the efforts listed in E4.2.1. Take into account the:
 - (i) Cost to administer the program;
 - (ii) Participation levels in the program;
 - (iii) Timing of the program; and
 - (iv) Estimated water conserved per program participant.
 - (b) The sum of other factors not associated with the “Slow the Flow” water conservation program including but not limited to the innovation of water efficient fixtures and appliances, water efficiency standards in the Manitoba Plumbing Code, Manitoba Hydro’s Power Smart Program and socio-economic factors.
6. Produce graphical representations of the annual effect of water conservation on water and sewer rates. As a minimum:
 - (a) One graphic should represent the annual water and sewer rates that would have occurred had the 1992 per capita rate remained the same versus the actual water and sewer rates.
7. Summarize the qualitative benefits that have been achieved due to the City’s “Slow the Flow” water conservation program, including but not limited to:
 - (a) City;
 - (b) Customer; and
 - (c) Environment.

E4.3 Deliverables

1. Submit a draft and final technical memorandum that summarizes all items in E4.2.

E4.4 Site Visits, Interviews and Meetings

1. Schedule and lead one (1) meeting with the City to discuss the Water Conservation Program. Note that this meeting can be combined with other tasks.
2. Contact FortWhyte Alive to discuss the “Slow the Flow” Youth Water Education Program.
3. Schedule and lead one (1) draft review meeting after the submission of the draft technical memorandum to discuss the City’s comments. Note that this meeting can be combined with other tasks.

E4.5 Relevant Reports, Supporting Documents and Data

The following is a list of relevant City of Winnipeg documents and data that will be provided to the Consultant:

- (a) Regional Water Supply Conceptual Planning Study Reports (1989, 1994 and 2011):

- (i) Water Demand Evaluation and Projections Reports (1998 and 2004); and
- (ii) Water Conservation Reports (1992 - 94 and 1997).
- (b) Water Supply and Consumption Summary Report (2016);
- (c) Water Consumption Statistics and Database (1989 - 16);
- (d) Summer Excess Water Demand and Water Treatment Capacity Assessment Report (1999);
- (e) Water Treatment Plant Conceptual Design Value Engineering Study Reports (2003 - 04);
- (f) Water Treatment Plant Preliminary Design Report (2005);
- (g) Water Conservation Devices and Kits Sales:
 - (i) Kit sales summary workbook (2010); and
 - (ii) Inventory summary workbook (2012).
- (h) Residential Toilet Replacement Credit Program:
 - (i) Summary Report (2009 - 16); and
 - (ii) Preliminary Savings Analysis spreadsheet (2016).
- (i) OurWinnipeg (2011):
 - (i) Sustainable Water and Waste Direction Strategy;
 - (ii) A Sustainable Winnipeg Direction Strategy; and
 - (iii) OurWinnipeg Report to the Community (2012-16).
- (j) Water Conservation Program Update Presentation (2016);
- (k) 2016 to 2018 Water and Sewer Rates Report (2016);
- (l) Historical and current water and sewer treatment costs; and
- (m) Historical and current water and sewer rates.

The following is a list of available relevant supporting documents for consideration by the Consultant:

- (a) Manitoba Plumbing Code (2011);
- (b) Manitoba Public Utilities Board (PUB) Report – A hearing in regards to the City of Winnipeg’s Water and Sewer Utilities Order No. 56/12 (2012);
- (c) AWE – Financing Sustainable Water Initiative (2014);
- (d) AWE – Water Conservation Tracking Tool, Version 3 (2016);
- (e) WRF Project 4309 – Residential End Uses of Water, Version 2 (2016);
- (f) City of Guelph Technical Memorandum – Water Conservation and Efficiency Program Progress Report (2016); and
- (g) United States Environmental Protection Agency (EPA) Report – Best Practices to Consider When Evaluating Water Conservation and Efficiency as an Alternative for Water Supply Expansion (2016).

E5. TASK 3: EVALUATION OF THE CITY OF WINNIPEG’S CURRENT AND FUTURE WATER CONSERVATION NEEDS

E5.1 Background

In 2011, City Council adopted OurWinnipeg and four direction strategies including a Sustainable Winnipeg and a Sustainable Water and Waste, a 25 year planning vision (until 2035) for the City of Winnipeg. In a Sustainable Winnipeg direction strategy it reinforces water conservation and the Sustainable Water and Waste direction strategy states that the City will continue with the successful “Slow the Flow” water conservation program.

The City of Winnipeg “Slow the Flow” water conservation initiatives that still exist today are the:

- (a) "Slow the Flow" public water education campaign, including the youth water education program delivered through a partnership grant with FortWhyte Alive; and
- (b) Residential toilet replacement credit program.

E5.2 Scope of Work

1. From the water demand projection curves developed in E3 (Task 1), estimate when upgrades to increase capacity would be required for the:
 - (a) Shoal Lake Aqueduct;
 - (b) Water treatment plant;
 - (c) Three in-town regional reservoirs and pumping stations; and
 - (d) Three wastewater treatment plants.
2. Make a recommendation in regards to the continuation, discontinuation, or expansion of the City's Residential Toilet Replacement Credit Program. As a minimum consider the following:
 - (a) Costs to administer the program;
 - (b) Customer participation in the program and eventual market saturation;
 - (c) Water volume saved;
 - (d) Operational cost savings (treatment cost, energy costs, etc.);
 - (e) Effect on the established water and sewer rates; and
 - (f) The current per capita water supplied as compared to other major Canadian cities of similar size.
3. Make a recommendation in regards to the continuation of the City's partnership grant with FortWhyte Alive on the Youth Water Education Program. As a minimum consider the following:
 - (a) Costs to administer the program;
 - (b) Teacher participation rates in the program;
 - (c) Cost per student participation as compared to typical youth water education programs; and
 - (d) Estimated cost to administer the program in-house.
4. Provide a recommendation as to three (3) cost-effective and quantifiable water conservation initiatives suitable for the City of Winnipeg. Make a recommendation as to which of the three (3) water conservation initiative is the most advantageous return on investment (ROI) to the City of Winnipeg. For each water conservation initiative consider as a minimum the:
 - (a) OurWinnipeg Strategy, specifically:
 - (i) Our Winnipeg, Section 03-1, Direction 4 "Work Within Municipal Service Areas as a Collaborator on Poverty Reduction";
 - (ii) OurWinnipeg "A Sustainable Winnipeg" Direction Strategy, Section 08-2, "Sustainable Water and Waste"; and
 - (iii) Our Winnipeg "Sustainable Water and Waste" Direction Strategy, Section 03-5, "Maximize our Existing Water Supply/Ensure Availability of Future Water Supplies", Section 04-5c "Evaluate Water Recycling/Reuse Technologies", and Section 08-1 "Water Supply Supporting Polices".
 - (b) Cost to administer the water conservation initiative;
 - (c) Associated water volume and operational cost savings due to the water conservation initiative;
 - (d) Potential customer participation rates for the water conservation initiative; and
 - (e) Effect of the water conservation initiative on water and sewer rates.

5. Assuming that additional water conservation initiatives are not presently pursued, estimate when additional water conservation initiatives should be reinstated. As a minimum consider the:
 - (a) Deferral of upgrades due to capacity shortcomings to the:
 - (i) Shoal Lake Aqueduct;
 - (ii) Water treatment plant;
 - (iii) Three in-town regional reservoirs and pumping stations; and
 - (iv) Three wastewater treatment plants.
 - (b) Current per capita water supplied as compared to other major Canadian cities of similar size.

E5.3 Deliverables

1. Submit a draft and final technical memorandum that summarizes all items in E5.2.

E5.4 Site Visits, Interviews and Meetings

1. Contact FortWhyte Alive to discuss the “Slow the Flow” Youth Water Education Program.
2. Schedule and lead one (1) draft review meeting after the submission of the draft technical memorandum to discuss the City’s comments. Note that this meeting can be combined with other tasks.

E5.5 Relevant Reports, Supporting Documents and Data

The Consultant will be provided all capacity information for related water and wastewater infrastructure.

The Consultant will be provided with all relevant OurWinnipeg documents. Please note the City of Winnipeg has begun a process to review and update OurWinnipeg. A revised OurWinnipeg is estimated to be completed by July 2019.

The Consultant will be provided with water conservation information as it relates to the City of Winnipeg’s Web Self-Service Project currently in progress.

The Consultant will use all relevant reports, supporting documents, data and findings from previous completed tasks.

The following is a list of available relevant supporting documents for consideration by the Consultant:

- (a) AWWA Water Conservation Community Resource web page:
 - (i) M52 Manual – Water Conservation Programs - A Planning Manual, 1st Edition (2006).
 - (ii) National Survey of Commercial, Industrial and Institutional Water Efficiency Programs (2016).
- (b) WRF Projects:
 - (i) 4175 – A Balanced Approach to Water Conservation in Utility Planning (2012).
 - (ii) Case Study 4543 – A City Prepared for an Uncertain Future: Colorado Springs Utilities Balances Water Conservation and Revenue Stability (2014).
- (c) AWE – Financing Sustainable Water Initiative (2014);
- (d) AWE – Water Conservation Tracking Tool, Version 3 (2016);
- (e) AWE Report – Water Savings & Financial Benefits of Single-Family Package Graywater Systems, Canadian Version (2017);
- (f) 2016 City of Guelph Water Efficiency Strategy Update:

- (i) Background Research Report – Literature Review on Best Practices of Water Conservation & Efficiency (2015);
 - (ii) Technical Memorandum – Mass Fixture Retrofit Programs for Multi-Residential Settings (2015);
 - (iii) Technical Memorandum – Private Customer Leak Detection Notification Technologies (2015);
 - (iv) Technical Memorandum – Water Reuse and Demand Substitution Technologies (2015); and
 - (v) Technical Memorandum – Summary Report of Program Alternatives (2016).
- (g) EPA Report – Best Practices to Consider When Evaluating Water Conservation and Efficiency as an Alternative for Water Supply Expansion (2016).

E6. TASK 4: EVALUATION OF THE CITY OF WINNIPEG'S LEAK DETECTION SURVEY PROGRAM

E6.1 Background

The City of Winnipeg owns and maintains approximately 2600 kilometres (km) of water mains and about 600 km (23%) are cast and ductile iron. The estimated service life of cast and ductile iron is 50 to 100 years. Much the City's water main inventory was installed in the early 1900's and is reaching the end of its optimal service life.

In 2013, the City began an in-house Leak Detection Survey Program. The goals of the program were to create a proactive non-evasive approach for leak detection to reduce non-revenue water, to identify trouble areas for inclusion in the City's water main renewal program and to get insight into the extent and magnitude of un-surfaced leaks.

Prior to implementing this program, three (3) reactionary methods of leak detection were and are still used by the City. These include; detecting a noticeable drop in water pressure at a pressure monitoring point; finding clean water in the sewers with the City's sewer televising program; and observing running water on the streets.

The City's Leak Detection Survey Program has surveyed approximately 580 km of cast, ductile iron, and concrete pipes.

E6.2 Scope of Work

1. Conduct and summarize a literature review and other documentation on current municipal real water loss control programs and best practices in North America.
2. Evaluate the City's leak detection survey equipment and compare it to current / emerging industry technology trends.
3. Estimate the net present value of the City's Leak Detection Survey Program. As a minimum consider the:
 - (a) Cost to administer the program;
 - (b) Cost to perform the repair of a small leak at a planned time verses the cost to repair a large leak at an unplanned time;
 - (c) Cost of the water that would have leaked should the planned repairs not taken place; and
 - (d) Amount of leaks found to date.
4. Make a recommendation in regards to the continuation of the City's Leak Detection Survey Program and the technology used.
5. Make a recommendation as to additional leak detection options that could be used to supplement or enhance the current program. As a minimum provide:
 - (a) Cost comparison estimates of options including capital and operating;

- (b) In-house forces required to administer each option; and
- (c) Estimated water volume and operational cost savings from each option.

E6.3 Deliverables

1. Submit a draft and final technical memorandum that summarizes all items in E6.

E6.4 Site Visits, Interviews and Meetings

1. Schedule and lead one (1) meeting with City to discuss the Leak Detection Survey Program, Water Main Renewal Program, Water Loss Component Analysis and non-revenue water. Note that this meeting can be combined with other tasks.
2. Schedule and lead one (1) draft review meeting after the submission of the draft technical memorandum to discuss the City's comments. Note that this meeting can be combined with other tasks.

E6.5 Relevant Reports, Supporting Documents and Data

The following is a list of relevant City of Winnipeg documents and data that will be provided to the Consultant:

- (a) Annual Leak Survey Data and Presentation (2016);
- (b) Water Main Break Data and Year End Summary (2016);
- (c) Water Supply and Consumption Summary Report (2016);
- (d) Water Audit Workbook (2016);
- (e) AWWA Water Audit Data Initiative (WADI) Survey Results (2016);
- (f) 2016 to 2018 Water and Sewer Rates Report (2016);
- (g) Water Main Renewal Program Details;
- (h) Cost estimates for water main break repairs; and
- (i) Product literature for leak detection equipment currently used for the program.

The following is a list of available relevant supporting documents for consideration by the Consultant:

- (a) AWWA Water Loss Control Resource Community web page:
 - (i) M36 Manual – Water Audits and Loss Control Programs, 4th Edition (2016).
 - (ii) White Paper – The State of Water Loss Control in Drinking Water Utilities (2016).
- (b) WRF Project 4372a – Real Loss Component Analysis: A Tool for Economic Water Loss Control (2014).

E7. TASK 5: EVALUATION OF CUSTOMER METERING INACCURACIES AND THE IMPACTS TO REVENUE STABILITY

E7.1 Background

The City of Winnipeg owns approximately 205,000 water meters with 195,000 in residential properties and 10,000 in commercial / industrial locations.

The majority of water meters currently in service in the City are mechanical devices with a finite life cycle.

The optimal service life for a typical residential water meter is 15 years (based on City meter testing). The average residential water meter age in Winnipeg is 19 years and 62% of the residential water meters are past their optimal service life.

The City estimated customer metering inaccuracies accounted for 3,011 megalitres (ML) of the 2015 non-revenue water.

In 2016, the City participated in AWWA's Water Loss Control Committee (WLCC) Water Audit Data Initiative (WADI) Project. After receiving a level 1 validation, customer metering inaccuracies was identified as a priority area for attention.

E7.2 Scope of Work

1. Estimate the amount of unbilled water due to customer metering inaccuracies.
 - (a) Estimate the amount of unbilled water due to customer metering inaccuracies in each of the next ten (10) years. When preparing this estimate consider the City of Winnipeg:
 - (i) Customer Meter Accuracy Testing Results;
 - (ii) Customer Meter Inventory Data; and
 - (iii) Customer Meter Replacement Rates and Growth.
 - (b) Comment on the validity of the estimate generated in E7.2(a). When commenting on the validity of the estimate consider the:
 - (i) Customer metering inaccuracies projections generated in the AWWA WADI Project; and
 - (ii) Industry estimates for customer metering inaccuracies.
2. Estimate the potential financial impacts due to customer metering inaccuracies.
 - (a) Project the estimated annual water and sewer rate increases (\$/m³) that would be required in each of the next ten (10) years in order to compensate for the customer metering inaccuracies. When preparing the estimate consider the:
 - (i) Estimated water loss (apparent losses) in volume (ML) due to customer metering inaccuracies generated in E7.2.1.; and
 - (ii) The loss in revenue using customer unit cost of the unbilled water due to customer metering inaccuracies.

E7.3 Deliverables

1. Submit a draft and final technical memorandum that summarizes all items in E7.2.

E7.4 Site Visits, Interviews and Meetings

1. Schedule and lead one (1) meeting with City to establish and review estimates required under E7.2. Note that this meeting can be combined with other tasks.
2. Schedule and lead one (1) draft review meeting after the submission of the draft technical memorandum to discuss the City's comments. Note that this meeting can be combined with other tasks.

E7.5 Relevant Reports and Supporting Documents

The following is a list of relevant City of Winnipeg documents and data that will be provided to the Consultant:

- (a) Water Audit Workbook (2016);
- (b) AWWA WADI Utility Practices Survey Results (2016);
- (c) Customer Meter Accuracy Testing Results (2010);
- (d) Customer Meter Inventory Data including Growth (2016); and
- (e) Customer Meter Replacement Rates (2003-16).

The following is a list of available relevant supporting documents for consideration by the Consultant:

- (a) WRF Project 4028 – Accuracy of In-Service Water Meters at Low and High Flow Rates (2011);
- (b) AWWA Water Loss Control Resource Community web page:
 - (i) M6 Manual – Water Meters–Selection, Installation, Testing and Maintenance, 5th Edition (2012);
 - (ii) M36 Manual – Water Audits and Loss Control Programs, 4th Edition (2016); and
 - (iii) White Paper – The State of Water Loss Control in Drinking Water Utilities (2016).
- (c) WRF Projects:
 - (i) 4639a – Level 1 Water Audit Validation: Guidance Manual (2016); and
 - (ii) 4639b – Utility Water Audit Validation: Principles and Programs (2017).

E8. TASK 6: EVALUATION OF CITY OF WINNIPEG'S READINESS TO IMPLEMENT AN ADVANCED METERING SYSTEM SOLUTION

E8.1 Background

As the majority of the City of Winnipeg's water meters are past their optimal service life this presents the City with an opportunity to plan for the implementation of an Advanced Metering System (AMS) solution.

The City has delayed a major capital investment in water meters while new AMS technologies stabilized and were reviewed.

In 2011, an AMS business case was completed for the City but did not proceed due to the cost and lack of viable financing solutions.

In 2016, the City participated in AWWA's WLCC WADI Project. After receiving a level 1 validation, billed consumption as it relates to manual reading of customer water meters was identified as a priority area for attention.

E8.2 Scope of Work

1. Summarize the current and emerging AMS industry trends and technologies including how these evolving technologies are impacting the overall costs to implement an AMS solution.
2. Review the previous City of Winnipeg AMS business case including the proposed solution and cost estimate. Comment on the validity of the proposed solution and cost estimate considering the findings in E8.2.1.
3. Develop an updated AMS solution based on the findings in E8.2.1 and E8.2.2 including an AACE Class 5 cost estimate.
4. Evaluate the City's readiness to implement an AMS solution using the WRF Project 4583 as a guide and complete the AMS project readiness assessment list in Table 4.2 of the report. When evaluating the readiness consider the impacts to the City's:
 - (a) Information technology systems;
 - (b) Workforce (in-house or contract out);
 - (c) Business processes;
 - (d) Financing; and
 - (e) Customers.

E8.3 Deliverables

1. Submit a draft and final technical memorandum that summarizes all items in E8.2.

E8.4 Site Visits, Interviews and Meetings

1. Schedule and lead two (2) meetings with City to discuss the past and current strategy for an AMS solution plus the readiness to implement an AMS solution. Note that these meetings can be combined with other tasks.
2. Schedule and lead one (1) draft review meeting after the submission of the draft technical memorandum to discuss the City's comments. Note that this meeting can be combined with other tasks.

E8.5 Relevant Reports and Supporting Documents

The consultant will be provided:

- (a) City of Winnipeg AMR / AMI Business Case (2011)

The consultant must review:

- (b) WRF Project 4583 – Planning and Implementing CIS and AMR/AMI Projects (2016)

E9. **TASK 7: PRELIMINARY DESIGN FOR THE REPLACEMENT OF THE TREATED WATER PRODUCTION METERS AT THE REGIONAL PUMPING STATIONS**

E9.1 Background

The City of Winnipeg has three (3) Regional Pumping Stations - G.C. MacLean, McPhillips and W.D. Hurst.

Each of the three (3) Regional Pumping Stations has two (2) treated water production meters. Four (4) of the treated water production meters are electromagnetic flowmeters (magmeters) and two (2) are differential pressure (venturi) flowmeters and they are located as follows:

- (a) Two (2) magmeters (one at each discharge) at the G.C. MacLean Pumping Station;
- (b) Two (2) magmeters (one at each discharge) at the McPhillips Pumping Station; and
- (c) Two (2) venturi flowmeters (one at each discharge) at the W.D. Hurst Pumping Station.

Each the three (3) Regional Pumping Stations relies on the treated water production meters for flow pacing of chlorine disinfection.

Volumetric drop testing has been used in the past to verify the accuracy of the treated water production meters at the three (3) Regional Pumping Stations. This has yielded varying results.

The treated water production magmeters at the G.C. MacLean and McPhillips Pumping Stations are of 1960's vintage and spare parts are no longer available.

In 2016, the City participated in AWWA's WLCC WADI Project. After receiving a level 1 validation, treated water production meters were identified as a priority area for attention.

E9.2 Scope of Work

1. Review of the treated water production meter installation configurations at the three (3) Regional Pumping Stations.
 - (a) Review as-built information for each treated water production meter at the three (3) Regional Pumping Stations; and
 - (b) Perform site visits to the three (3) Regional Pumping Stations to verify the as-built information for each treated water production meter and to gather other information that is discussed in E9.2.
2. Provide recommendations as to the appropriateness of each treated water production meter installation and type at the three (3) Regional Pumping Stations. As a minimum consider the:
 - (a) Information obtained from E9.2.1;

- (b) Applicable industrial design practices, regulations and manuals for large meters including:
 - (i) American Society of Mechanical Engineers (ASME);
 - (ii) AWWA;
 - (iii) International Organization for Standardization (ISO);
 - (iv) National Institute of Standards and Technology (NIST); and
 - (v) Measurement Canada.
 - (c) Size of each treated water production meter;
 - (d) Current and future water demands and flow ranges including both minimum and peak flow patterns for each treated water production meter; and
 - (e) Anticipated accuracy of each treated water production meter through the entire estimated flow range.
3. Provide recommendations for replacement or refurbishment of each treated water production meter at the three (3) Regional Pumping Stations. As a minimum consider the:
- (a) Information obtained from E9.2.1 and E9.2.2;
 - (b) Age and condition of each existing treated water production meter including their external electronics;
 - (c) Availability of spare parts for each treated water production meter; and
 - (d) Accessibility of each treated water production meter.
4. Provide a preliminary design for the replacement of the treated water production meters at the G.C. MacLean Pumping Station and the McPhillips Pumping Station and provide a preliminary design for the provision of a secondary means of flow measurement at all three (3) Regional Pumping Stations to verify the accuracy of the treated water production meters.
- (a) Review data obtained from E9.2.1 through E9.2.3;
 - (b) When evaluating different options for the replacement of treated water production meters as a minimum consider the following factors:
 - (i) Suitability of the technology for monitoring and control of the Regional Pumping Stations;
 - (ii) Accuracy and repeatability of the device;
 - (iii) Ease of maintenance and replacement (i.e. shutdown requirements);
 - (iv) Cost; and
 - (v) Redundancy.
 - (c) When evaluating different options for secondary means of flow measurement to verify the accuracy of the treated water production meters, as a minimum consider the following options:
 - (i) Removable external pipe magnetic flowmeter;
 - (ii) Direct tap pitot gauge;
 - (iii) Fixed orifice plate including dual chamber designs;
 - (iv) Venturi meter; and
 - (v) Secondary in-line magnetic flowmeters.
 - (d) The evaluation of the different options for secondary means of flow measurement indicated in E9.2(c) to include at a minimum:
 - (i) Suitability of installation that may be limited by the existing piping systems (i.e. 10 pipe diameters of straight pipe required before and after the device);
 - (ii) Accuracy and repeatability of device in relation to the treated water production meters;
 - (iii) Ease of installation, maintenance, and replacement (i.e. shutdown requirements);
 - (iv) Cost;

- (v) Suitability of system to provide live online monitoring versus intermittent “manual” monitoring of the treated water production meters;
 - (vi) Required modifications to the piping and the facility; and
 - (vii) Impacts to the operation of the pumping system (i.e. additional pressure drop or increased pump energy).
- (e) Provide the system design requirements for the recommended treated water production meters including but not limited to the:
- (i) Sizing of all major equipment and level of redundancy;
 - (ii) System layout, process flow and instrumentation loop diagrams;
 - (iii) Operating conditions of the systems (i.e. flow ranges);
 - (iv) Required modifications to pipe systems to accommodate the installation of the meters and all associated devices;
 - (v) Additional system pressure drops or additional pump energy requirements for the proposed changes;
 - (vi) Major structural upgrades required to support new equipment/systems, major openings of roofs, floors and walls;
 - (vii) Required modifications to the building envelopes (if any);
 - (viii) Listing of systems to be demolished;
 - (ix) Confirmation of the capacity of the existing electrical systems (i.e. MCC’s, back-up generators, UPS, grounding, etc.) relative to the installation of new flow meters to replace the existing meters;
 - (x) Confirmation of the capacity of the existing Programmable Logic Controller (PLC) system relative to the installation of new flow meters to replace the existing meters;
 - (xi) Determination of required upgrades to achieve code compliance; and
 - (xii) Recommended installation method.
- (f) Provide the system design requirements for the recommended secondary flow measurement system including but not limited to the:
- (i) Instrument type and size;
 - (ii) System layout, process flow and instrumentation loop diagrams;
 - (iii) Required modifications to pipe systems to accommodate the installation of the meters and all associated devices;
 - (iv) Additional system pressure drops or additional pump energy requirements for the proposed changes;
 - (v) Major structural upgrades required to support new equipment/systems, major openings of roofs, floors and walls;
 - (vi) Required modifications to the building envelopes (if any);
 - (vii) Listing of systems to be demolished;
 - (viii) Confirmation of the capacity of the existing electrical systems and upgrades that are required (i.e. MCC’s, back-up generators, UPS, grounding, etc.);
 - (ix) Confirmation of the capacity of the existing PLC system relative to the installation of new secondary flow measurement systems;
 - (x) Determination of required upgrades to achieve code compliance; and
 - (xi) Recommended installation method.
- (g) Develop a preliminary instrumentation I/O index for the new treated water production meters and the secondary measurement system;
- (h) Develop a preliminary control strategy;
- (i) Identify all permits required for construction;
- (j) Provide all associated calculations to support the design recommendations as an appendix in the final report; and

- (k) Provide the opinion of probable cost for the recommended treated water production meters at each of the three (3) Regional Pumping Stations for detailed design and construction as an appendix of the final report.
 - (i) Opinion of probable cost to be an AACE Class 4;
 - (ii) Provide a breakdown of the costs in accordance with the National Master Specification; and
 - (iii) Summarize operating and capital costs in the City of Winnipeg BOE document. The Consultant will be provided with a sample BOE to demonstrate the format and level of detail required.
- 5. Provision of Standard Operating Procedures (SOPs) to verify the accuracy of the treated water production meters at each of the three (3) Regional Pumping Stations.
 - (a) This will include three (3) separate documents, one for each Regional Pumping Station. The Consultant shall be provided with the current SOPs for volumetric drop testing of the treated water production meters and the associated results for review.
 - (b) Different methods of meter verification should be considered and the method most suitable to the current installation should be pursued.
 - (c) The new SOPs to include step by step instructions on how to perform the treated water production meter accuracy verifications. The Consultant will be provided with a sample SOP to demonstrate the format and level of detail required.
 - (d) The new SOPs to include recommendation on frequency of accuracy verification for treated water production meters.
 - (e) The new SOPs to define allowable tolerances and recommend reconciliation methods in the case where the treated water production meter and the treated water production meter accuracy verifications do not agree within defined tolerances.
 - (f) If volumetric drop testing is recommended, as-built information pertaining to the configurations of the reservoirs will be provided to the Consultant by the City.
 - (g) The Consultant to use the information obtained from E9.2.1(a).
 - (h) A meeting shall be held with City Operations and Maintenance staff to go over the current SOPs used for volumetric drop testing and to discuss alternate testing procedures.
 - (i) The Consultant shall allow for a training session with City Operations and Maintenance staff on the new SOPs for treated water production meters accuracy verification.

E9.3 Deliverables

- 1. A draft and final Preliminary Design Report that summarizes all items in E9.2.1 through E9.2.4. These will be subject to City review and acceptance.
- 2. Three (3) SOPs for treated water production meters accuracy verification as detailed in E9.2.5, one (1) for each of the three (3) Regional Pumping Stations. These will be subject to City review and acceptance.

E9.4 Site Visits, Interviews and Meetings

- 1. Schedule a site visit to each of the three (3) Regional Pumping Stations to verify the as-built information for each treated water production meter and to gather other information as required (as per E9.2.1(b)).
- 2. Schedule and lead one (1) meeting with City to go over the current SOPs and to discuss alternate testing procedures (as per E9.2.5(h)).
- 3. Schedule and lead one (1) training session with City to go over the new SOPs (as per E9.2.5(i)).
- 4. Schedule and lead one (1) draft review meeting after the submission of the draft Preliminary Design Report to discuss the City's comments.

E9.5 Relevant Reports and Supporting Documents

The following is a list of relevant City of Winnipeg documents and data that will be provided to the Consultant:

- (a) As-built and shop drawings for the treated water production meters at all the locations;
- (b) Typical and design flow information for the treated water production meters;
- (c) 2015 Water audit workbook (v5.0) and supporting workbooks; and
- (d) Water Treatment Plant and Regional Pumping Stations technical information, including but not limited to:
 - (i) as-built and shop drawings;
 - (ii) maintenance records;
 - (iii) SOPs for volumetric drop testing;
 - (iv) historic volumetric drop testing results; and
 - (v) related information on SCADA and PLC equipment.

The following is a list of available relevant supporting documents for consideration by the Consultant:

- (a) AWWA Water Loss Control Resource Community web page:
 - (i) M33 Manual – Flowmeters in Water Supply, 2nd Edition (2006);
 - (ii) M6 Manual – Water Meters–Selection, Installation, Testing and Maintenance, 5th Edition (2012);
 - (iii) M36 Manual – Water Audits and Loss Control Programs, 4th Edition (2016); and
 - (iv) White Paper – The State of Water Loss Control in Drinking Water Utilities (2016).
- (b) WRF Projects:
 - (i) 4639a – Level 1 Water Audit Validation: Guidance Manual (2016); and
 - (ii) 4639b – Utility Water Audit Validation: Principles and Programs (2017).

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

- F1.1 Each individual proposed to perform Work under this Contract and within the Winnipeg Drinking Water Treatment Plant and Regional Pumping Stations - G.C. MacLean, McPhillips and W.D. Hurst shall be required to obtain a Police Information Check and a Public Safety Verification. The Police Information Check may be obtained from one of the following:
- (a) police service having jurisdiction at his/her place of residence; or
 - (b) Sterling Talent Solutions forms to be completed can be found on the website at: <https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>; or
 - (c) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: <https://www.commissionaires.ca/en/manitoba/home>.
- F1.2 The original Police Information Check (Form P-612) will be provided by the Winnipeg Police Service to the individual applicant. The original has a validation sticker from the Winnipeg Police Service in the top right hand corner. The applicant shall:
- (a) Provide the original Police Information Check (Form P-612) to the Project Manager.
- F1.3 A Sterling Talent Solutions account must be setup prior to requesting individual background checks for any individual. This process should be done 72 hours prior to requesting the first check. The account can be setup using the following link. <https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity> . The Police Information Check must be received by the City directly through Sterling Talent Solutions;
- (a) Bidders shall set up an account with Sterling Talent Solutions under their company name and grant Sterling Talent Solutions permission to share the Police Information Check with the City of Winnipeg.
 - (i) Bidders will then be contacted by Sterling Talent Solutions with instructions on how to complete the Police Information Check; and
 - (ii) if additional assistance is required to obtain the Police Information Check, the Bidder may contact the following Sterling Talent Solutions representative:
Linda Ferens;
email: linda.ferens@sterlingts.com
phone: (204) 999-0912; or
 - (b) Public Safety Verification Checks can be obtained from Sterling Talent Solutions.
 - (i) Bidders will need to setup an account with Sterling Talent Solutions prior to requesting individual background checks.
 - This process should be done 72hrs prior to requesting the first check. Accounts can be setup using the following link. <https://forms.sterlingbackcheck.com/partners/platform2-en.php?&partner=winnipegcity>.
 - Results of the Public Safety Verification Check must be received by the City directly through Sterling Talent Solutions.
 - Bidders shall set up an account with Sterling Talent Solutions using their company name and grant Sterling Talent Solutions permission to share the Public Safety Verification Check with the City of Winnipeg;
 - (ii) Bidders will then be contacted by Sterling Talent Solutions with instructions on how to complete the Public Safety Verification Check; and
 - (iii) if additional assistance is required to obtain the Public Safety Verification Check, the Bidder may contact the following Sterling Talent Solutions Representative:
Linda Ferens;

email: linda.ferens@sterlingts.com;
phone: (204) 999-0912.

- F1.4 Prior to the award of Contract, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Project Manager with a Police Information Check and a Public Safety Verification Check obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform the Work.
- F1.5 Any individual for whom a Police Information Check and/or a Public Safety Verification Check is not provided, or for whom a Police Information Check indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work.
- F1.6 Any Police Information Check and a Public Safety Verification Check obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.
- F1.7 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated Police Information Check and/or a Public Safety Verification Check. Any individual who fails to provide a satisfactory Police Information Check and/or Public Safety Verification Check as a result of a repeated Police Information Check will not be permitted to continue to perform any Work as specified in F1.1.