

July 16, 2018



## Advanced Metering Infrastructure RFP

Truckee Meadows Water Authority is a not-for-profit, community-owned water utility,overseen by elected officials and citizen appointees from Reno, Sparks, and Washoe County 2018-021



Truckee Meadows Water Authority 1355 Capital Blvd Reno NV 89502 Request for Proposals: No. 2018-021 Date Issued: July 16<sup>th</sup>, 2018

#### REQUEST FOR PROPOSAL (RFP) ADVANCED METERING INFRASTRUCTURE (AMI) SYSTEM

Proposals Due: September 17<sup>th</sup>, 2018

#### AGREEMENT TO PARTICIPATE

I/We, the undersigned, certify and declare that I/We have read and understand the Request for Proposal. The information provided in this proposal, including documentation, is complete, current, and accurate and I/We agree to be bound by the statements and representations contained herein. I/We understand and acknowledge that any false, misleading, or fraudulent statements on the application will result in immediate disqualification. I/We authorize TMWA to contact any entity named herein for the purpose of verifying information provided, or to develop other information deemed relevant by TMWA. I/We understand and acknowledge that TMWA reserves the sole right to determine qualifications based on its evaluation criteria pursuant to the best interests of the company, its customers, and the general public.

Name of Firm:			
Preparer's Name:			
Title or Position:			
Signature:	 	 	
Date:	 		

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# Section 1 – AMI RFP Instructions

## 1 Introduction & Background

Truckee Meadows Water Authority (TMWA) intends to acquire an AMI system and related products, software and services (collectively, the "system"), for all of its approximately 130,000 water meters. The Truckee Meadows Water Authority (TMWA) is seeking qualified vendors to submit proposals to provide and install or oversee the installation by TMWA of an AMI System throughout its service area. The basic components of the AMI system sought by TMWA include the following:

- Endpoints (meter interface units, or "MIUs") capable of encoding, storing and transmitting meter reading and other data, such as tampering alerts.
- A communication network capable of collecting reads and alert information from the MIUs and transmitting it to a head-end computer system.
- Handheld devices and software necessary to program and/or initialize the endpoints and collect installation data.
- Head-end computer hardware and software required to collect, store, and manage the data which is transferred through the AMI system.
- A meter data management system.
- A customer web portal to display interval consumption data and other information.
- Cold water meters with AMI-compatible registers to replace some existing meters.
- The design, installation and testing of acceptable complete and working information interfaces between the system installation, head-end control, meter data management and presentation software/hardware and TMWA's CIS and other systems, such as its field work order system.
- All related documentation, including technical manuals and operating procedures.
- Training of TMWA's employees in endpoint installation, field maintenance, diagnosis and troubleshooting, and system use and operation and maintenance.
- Shipping and managing the inventory of this equipment during the course of project deployment. TMWA will designate a separate area in our warehouse for this project.
- Disposal of old meter reading equipment (AMR and AMI endpoints).
- Disposal of old meters.
- Installation of fixed data collection units, including the communications links between those collection units and the system control components.
- Provision of all necessary radio licenses, firmware, third party software or operating systems to ensure a complete and working system.



- Satisfactory testing of all software, hardware and procedures prior to the deployment of the system according to the system testing and acceptance process set forth in the contract, and satisfactory testing at the completion of the project or at major milestones.
- Installation of new meters, retrofit registers, and AMI endpoints. Note: TMWA may choose to have its own employees install the endpoint equipment for all or part of the project.
- Coordination, scheduling, communications and documentation for all installation services.
- Project management to ensure all products and services are coordinated.
- Optional Services. TMWA wishes to consider the following optional services:
  - Hosting of the meter data management system and customer web portals.
  - Monitoring of the data collection network and endpoints.
  - Operation and maintenance of the data collection network.

Vendors of meter data management systems and customer consumption web portals are invited to submit proposals for products and services covering only those parts of the system. However, such proposals must comply with all relevant sections of the Technical Requirements portion of this RFP and all of the requirements of all of the other sections.

TMWA will entertain independent proposals from water meter manufacturers for meters and replacement registers. However, such proposals must comply with all relevant sections of the Technical Requirements portion of this RFP and all of the requirements of all of the other sections.

## 1.1 Background

TMWA provides water service to about 130,000 residential and commercial customers in Reno, Sparks and Washoe County, Nevada. The service area is shown in Figure 1. It currently uses an Itron drive-by Automatic Meter Reading (AMR) system to read over 100,000 Badger meters. In addition, due to the consolidation with the Washoe County Department of Water Resources and South Truckee Meadows General Improvement District water systems, it also uses a Sensus drive-by AMR system to read approximately 11,500 Sensus meters, as well as a Sensus fixed radio Advanced Metering Infrastructure (AMI) system incorporating three mountaintop data collection units to read approximately 16,000 Sensus meters.

TMWA pairs Badger meters with Itron endpoints or transmitters of varying ages. The points below are listed from the oldest to the newest endpoints in the system and all accompany Badger meters. All current endpoints are AMR enabled for drive by reading and data collection only. TMWA uses Itron MC3 vehicle mounted collectors to read 20 separate billing cycles per month and utilizes Itron FC300 handhelds for programming endpoints in the field.

- Qty. 937 Itron 40W Endpoints (AMR no data)
- Qty. 44,835 Itron 50W Endpoints (AMR no data)
- Qty. 10,884 Itron 60W Endpoints (AMR no data)
- Qty. 42,251 Itron 100WP and WP+ Endpoints (AMR w/ data)
- Qty. 1,589 Itron unknown Endpoint type



TMWA system also utilizes Sensus water meters with Sensus transmitters which vary in age and ability. The points below are listed from the oldest to the newest transmitters in the system and whether they are AMR or AMI (remote read and data collection through leased mountain top towers). The older, drive by or AMR meters and transmitters are read monthly by Sensus vehicle mounted VXU collectors. The AMI meters and transmitters (FLEX) are read monthly and data is collected by local towers and repeaters. These Sensus FLEX transmitters are programmed in the field with Trimble blue tooth enabled handhelds paired with Sensus Command Link units.

- Qty. 11,585 Sensus Transmitters Drive by AMR only (no data)
- Qty. 6,539 Sensus FLEX AMI Transmitters One-Way Radio Communication only (w/ data)
- Qty. 9,536 Sensus FLEX AMI Transmitters Two-Way Radio Communication (w/ data)
- Qty. 24 Sensus unknown Radio type

## 2 Instructions to Proposers

TMWA assumes no responsibility for any costs incurred by any respondent to this RFP. All costs are entirely the responsibility of the respondent. Your good faith response to the requested information is solicited without the creation of any obligation between parties, explicit or implied. TMWA will make a thorough investigation and evaluation of all responses.

#### 2.1 Proposal Submission

Proposals must be received no later than September 17<sup>th</sup>, 2018 at 3:00 PM PDT. Proposals may be submitted in person or by mail to the following address:

Laura Rader, CPPB Purchasing and Contracts Administrator Truckee Meadows Water Authority 1355 Capital Blvd Reno, NV 89502

No late proposals will be considered. Proposals received prior to the advertised hour of opening will be kept secured and sealed. The officer whose duty it is to open them will decide when the specified time has arrived, and no Proposal received after 3:00 PM will be considered by TMWA. Submitted proposals shall be date stamped upon receipt by a representative of TMWA's Purchasing and Contracts Department. Only those proposals that are received by the Office of Purchasing and Contracts and date stamped prior to the deadline noted above will be considered. Delivery to any other TMWA Department does not constitute proper or adequate delivery. The Contractor assumes the risk of their method of delivery.

The right is reserved to reject any Proposal or to accept the Proposal which is deemed by TMWA to be in the best interest of TMWA. TMWA reserves the right to waive any irregularities and/or informalities in the proposal process.



Upon submission, all proposals become the property of TMWA, and are subject to public record laws.

## 2.2 Pre-Proposal Conference

A non-mandatory Pre-Proposal Conference will be held on July 31<sup>st</sup>, 2018 at 9:00 AM PDT at the office of Truckee Meadows Water Authority, 1355 Capital Blvd, Reno NV 89502. Representatives from TMWA departments, including Field & Meters Services, Customer Service, Business Information Systems and Finance, will be available for discussions at this meeting. The purpose of the pre-proposal conference is to provide assistance to interested contractors in the interpretation of the Request for Proposal (RFP), Scope of Services, Sample Contract, and other technical and contractual matters.

Proposers shall submit an email notification of their intention to attend this Pre-Proposal Conference no later than July 23<sup>rd</sup>, 2018. The written request should also include the names of those planning to attend. The written request should be sent to the following:

Laura Rader; Lrader@TMWA.com

In-person attendance is highly encouraged; requests to participate via telephone must be submitted ahead of the Pre-Proposal Conference date to the email list above.

It should be emphasized, however, that nothing stated or discussed during the course of this Pre-Proposal Conference shall be considered to modify, alter or change the requirements of the RFP, unless it shall be subsequently incorporated into an addendum to the RFP.

## 2.3 Tentative Proposal Selection Schedule

<u>Activity</u>	<u>Date</u>
Issue RFP	July 16 <sup>th</sup> , 2018
Pre-proposal Conference	July 31 <sup>st</sup> , 2018 at 9:00 AM PDT
RFP Questions to TMWA – Deadline	August 13 <sup>th</sup> , 2018
Proposals Due	September 17 <sup>th</sup> , 2018, 3:00 PM PDT
Short-listed Proposers Notified	October 15 <sup>th</sup> , 2018
Presentations by Short-listed Proposers	Week of October 29 <sup>th</sup> , 2018
Finalize Preferred Proposal	On or about November 19 <sup>th</sup> , 2018
On-site Contract Negotiation	On or about December 3 <sup>rd</sup> , 2018
Contract Finalized	On or about January 14 <sup>th</sup> , 2019

## 2.4 Preparation of Proposals

Proposals shall be submitted in two (2) parts, bound separately:

"Request for Proposal for Advanced Meter Infrastructure System, Technical Proposal"

"Request for Proposal for Advanced Meter Infrastructure System, Cost Proposal"



All proposals shall be submitted as a set of [five (5), one (1) original and four (4) copies] signed by Proposer's authorized representative(s). Proposers shall also submit one electronic version of its Technical Proposal and one electronic version of its Project Cost Proposal, each on a USB drive. The pricing and warranty tables included in the Project Cost Proposal must be submitted in Excel format on the same USB drive as the Cost Proposal. These electronic files must be in conformance with the criteria outlined in this RFP. Failure to conform to this requirement may be grounds for disqualification.

## 2.5 Multiple Proposals

For alternative proposals, such as an alternate technology or an AMI system based on collaboration with other area utilities, submit the technical and pricing information under separate covers, and these in a separate envelope as a stand-alone complete proposal.

### 2.6 Addenda, Questions and Interpretations

TMWA reserves the right to amend this RFP, by an addendum or addenda, at any time and/or a multiple number of times prior to the date set for receipt of the submission of proposals. Addenda or amendments will be posted on TMWA's website, Bidding Opportunities page. Parties that registered to attend the Pre-proposal Conference shall be notified by email; however, it shall be the Proposer's responsibility to ascertain if addenda have been issued. All such addenda shall become part of the RFP and all Proposers shall be bound by such addenda. Addenda, including postponement of the date for receipt of proposals, may be issued up to 3 days prior to the date the proposals are due. Parties obtaining bid information from other sources do so understanding that their information may be incomplete, inaccurate, or out of date and therefore wholly unreliable from a commercial perspective.

All questions by Proposer(s) as to the interpretations of the RFP must be received no later than August 13<sup>th</sup>, 2018 in writing via email to:

Laura Rader, CPPB Purchasing and Contracts Administrator Truckee Meadows Water Authority 1355 Capital Blvd Reno, NV 89502 Lrader@tmwa.com

Proposing firms shall promptly notify TMWA of any omission, ambiguity, inconsistency or error that they may discover upon examination of the RFP.

It is the sole responsibility of the Proposer to ensure timely receipt of questions by TMWA. If the Proposer has not received responses to its questions within a reasonable period after submission, the Proposer shall make all reasonable attempts to follow up with TMWA within the prescribed period for submission of questions. Every response made to a Proposer will be in the form of an addendum to the RFP.



TMWA will not be bound by any information, explanation, clarification, or any interpretation, oral or written, by whomsoever made, that is not incorporated into an addendum to the RFP. No response will be made to inquiries received after the RFP Questions Deadline.

Any formal protest which is to be made by an aggrieved Proposer concerning the Proposal solicitation must be in accordance with NRS 332.068, and submitted in writing to:

Laura Rader, CPPB Purchasing and Contracts Administrator Truckee Meadows Water Authority 1355 Capital Blvd Reno, NV 89502

The protest must be received within five (5) business days after such Proposer knows or should have known of the facts giving rise thereto. The protest shall include a clear and detailed statement of the basis upon which it is filed (refer to NRS 332.068). The failure of the Proposer to file any protest within the time limits prescribed herein shall be deemed a material prejudice to the interests of TMWA and shall constitute an absolute waiver of the protest and the right to thereafter prosecute same.

## 2.7 Modification and Withdrawal of Proposals

Proposals may be withdrawn after they have been submitted, but only before the deadline established for receipt of Proposals. Withdrawn Proposals may be resubmitted, but only in the manner in which the Proposal was originally submitted. Withdrawals must be signed by the Proposer(s) and must be received by TMWA no later than the deadline.

## 2.8 Rejection of Proposals

TMWA reserves the right to reject any and all responses to the RFP and/or to waive any informality in evaluating the RFP responses if it deems this to be in the best interest of TMWA and its customers, and the general public. TMWA reserves the right to qualify contractors as it deems in its best interest.

It is the purpose of Truckee Meadows Water Authority not to award this contract to a vendor who does not furnish evidence satisfactory to TMWA that it has the ability, equipment, and experience in furnishing the kind and quality of materials and services required, that it has furnished materials and services of similar character, magnitude and importance and that it has sufficient capital and plant to enable it to prosecute the same successfully within the time limit given for this contract. Intending vendors who cannot fully satisfy these requirements are requested not to submit a proposal. Failure to qualify in this respect may be considered sufficient cause to reject any proposal whatsoever.

## 2.9 Proposal Contents

Each proposal shall be submitted in a sealed envelope and prominently marked as follows:

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RFP No.: Opening Date: Company Name:

The Advanced Meter Infrastructure, Technical Proposal shall include the following:

- Title Page List the RFP title, the name of the Proposer, managing office address, telephone number, name and email address of contact person and date.
- Table of Contents Include a clear identification of the material included in the proposal by page number.
- Letter of Interest Limit response to two (2) pages. Indicate understanding of scope of work. Make a positive commitment to perform the required work within the time period requested. Identify the AMI system being proposed by the Proposer. Also, give the name(s) of the person(s) who will be authorized to make representation for your organization, their title, telephone number, and e-mail address.
- Management Section Limit response to six (6) pages. Indicate specific committed project team, percent dedication to the project, onsite personnel, and any other pertinent data, relative to the unique capabilities of the Proposer to meet TMWA's needs. Provide project management organization chart showing those functions (including individuals where possible) which make up the project team. Provide a description of the Proposer's approach and understanding of the work required, specific to TMWA. Include proposed project schedule.
- Responses to AMI Technical Requirements. No more than 100 pages.
- Summary of Exceptions to Technical and Performance Requirements. List all exceptions and "Do Not Comply" responses as defined above. Language such as "[the Proposer] would like to discuss" may be considered an exception by TMWA.
- Exceptions to Contract Provisions. Language such as "[the Proposer] would like to discuss" may be considered an exception by TMWA. Proposer shall briefly state the reason for the exception and provide alternative language in the case of an exception.
- References.
- Attestation regarding disputes (see Section 2.16).
- Financial Data (see Section 2.15).

The Advanced Meter Infrastructure Cost Proposal shall include the following:

- Title Page List the RFP title, the name of the Proposer, managing office address, telephone number, name and email address of contact person and date.
- Textual response, including annotations, to Pricing section of this RFP.
  - Cost to supply and install endpoint components of the AMI system and dispose of existing equipment (Tables A1-A6).
  - Cost to supply and install AMI network components, system software and server hardware, and provide training and support, as well as annual licensing and maintenance contracts (Table B)



- If Proposer proposes software hosting and managed services or network management options, they shall be included on Table C, which will supplant Table B in its entirety, to avoid misinterpretations or double-counting.
- Cost of additional services (Table D).
- Component failure rate information (Tables F1-F3).

Also include in the pricing proposal filled out Excel tables on electronic media, per the instructions in the Pricing section of this RFP.

To facilitate the comparative analysis and comprehensive evaluation of all proposals, proposal content must be submitted in a manner consistent with the requirements of this RFP.

## 2.10 Confidentiality

TMWA is a public entity as defined by state law and, as such, it is subject to the Nevada Public Record Law (Chapter 239 of the Nevada Revised Statutes). Under said law, all TMWA records are public (unless otherwise declared by law to be confidential), subject to inspection and may be copied by any person. Any privileged or confidential information in the Proposer's proposal shall be specifically identified as such by the Proposer. If any information is considered to be confidential, the Proposer shall agree to indemnify TMWA for any and all attorney fees TMWA may incur in defending the withholding of such information. Should TMWA receive a request for the release of any information in the Proposer's proposal in accordance with the open records law, TMWA will review the Proposer's proposal, giving consideration to the portions that the Proposer indicated contained trade secrets, privileged information, or confidential commercial or financial data, and may release only that information which has not been identified as confidential. Proposers will be notified of any open records requests prior to the release of such information. If, in the opinion of TMWA's legal counsel, TMWA is nonetheless compelled to disclose any portion of such information to anyone or else stand liable for contempt or suffer censure or penalty, TMWA may disclose such information without liability.

## 2.11 Evaluation of Proposers' Responses and Proposals

After the Proposal Packages have been opened, TMWA's Evaluation Committee will evaluate the Proposers' responses, including financial data, Proposers' references, Proposers' experience and other data relating to the Proposers' responsibility and qualifications to perform the Project satisfactorily. Proposers may be required to submit additional or supplemental information to TMWA, if necessary, for TMWA to determine whether the Proposer(s) meet all of the standards outlined.

## 2.12 Completeness of Answers

All questions and requests for specificity must be answered. All specifications incorporating "shall," "must," etc., are requirements, and failure to comply with these must be specifically noted as exceptions. All specifications incorporating "may," should," "desires," etc., are highly desirable features. In the case of a specific requirement not followed by a request for an



explanation, Proposer must explicitly affirm that the system or component meets that requirement. Simply taking exception to a requirement without providing an explanation, and where appropriate alternative specifications and language, shall be deemed non-responsive, and may result in rejection of the proposal.

Requesting a discussion of a requirement or provision of this RFP without providing explicit alternative language may also be deemed non-responsive, and may result in rejection of the proposal.

Proposers shall be required to submit, in writing, the names, addresses and telephone numbers of any proposed major subcontractors or equipment manufacturers, and to submit other material information relative to proposed major subcontractors or equipment manufacturers.

TMWA reserves the right to cancel the Request for Proposal or to reject any or all responses to the Request for Proposal, or parts thereof, if it determines, in its sole discretion, that such cancellation or rejection is in the best interest of TMWA.

The Evaluation Committee will determine which Proposers are responsive to the material terms and conditions of the Request for Proposal. TMWA will then determine who is technically, financially and otherwise responsible to perform the Project satisfactorily and who has the capacity to meet all other requirements of the proposed Project. Any response may be rejected if it is determined by TMWA to be nonresponsive, provided, however, that TMWA reserves the right to waive any irregularities or technicalities which it determines, within its sole discretion, to be minor in nature and in the best interest of the public. Furthermore, any response may be rejected if it is determined by TMWA, in its sole discretion, that the Proposer is not capable of performing the proposed Project satisfactorily based upon review of its experience and technical and financial capabilities or the failure of such to provide information requested relating to such determination. Additionally, TMWA reserves the right to disqualify Proposers, before and after the Opening of Proposals, upon evidence of collusion with intent to defraud or other illegal practices upon the part of any Proposer(s).

## 2.13 Evaluation Criteria

This describes the evaluation process that will be used to determine which proposal provides the greatest benefits to TMWA. Discussions may be conducted with respondents determined to be reasonably qualified, and TMWA reserves the right to reject any and all proposals. As part of the evaluation process, the Evaluation Committee will interview Proposer references and other parties to confirm Proposer's performance on previous projects.

TMWA reserves the right to terminate this process at any time, and no guarantee is expressed or implied that obligates TMWA to contract for the proposed project. TMWA will negotiate a contract with the highest evaluated respondent, as determined by the Evaluation Committee.



Proposers shall be treated fairly and equally with respect to any opportunity for discussion and revision of their offer. To obtain the best and final value offers, revisions may be requested after submissions and before award of the Contract.

The evaluation criteria (Table 1) will be used to determine which proposal is the most advantageous to TMWA. Each member of TMWA's Evaluation Committee will score each technical proposal against the weighted criteria on a scale of 0-10. The average score for each criterion will be multiplied by the weight shown in the table. The full Evaluation Committee will then convene to review and discuss these evaluations and to combine the individual scores to arrive at a composite qualification/technical score and ranking for each respondent. At this point, respondents with an unacceptably low qualification/technical score will be eliminated from further consideration.

After the technical and cost proposals have been reviewed and scored by the Evaluation Committee, a short list of the top respondents will be created. The short-listed proposers will be invited to present their qualifications to and answer questions from the Evaluation Committee. The Evaluation Committee will then discuss the presentation results and rescore each short-listed proposal. TMWA may choose to waive the short list step in the evaluation process.

Weights	Evaluation Criteria
15	<b>Total life cycle cost</b> : total present value of initial and ongoing costs to acquire, install, operate, repair and maintain the system (including DCU site costs and backhaul communications) over 15 years, discounting uniformly at TMWA's inflation–adjusted cost of capital. Lowest life-cycle cost
25	<b>Meets or exceeds technical requirements</b> : Degree to which proposed system addresses technical specifications, performance requirements, and desirable features (exclusive of IT integration).
10	<b>Project/Implementation Plan</b> : proposed procedures and policies for project management, QA/QC, security, safety, training of installers, customer contact, scheduling appointments, troubleshooting and problem solving. Ability to keep to schedule.
10	<b>IT integration</b> : plans for integration between AMI system, MDMS, customer portal and TMWA's information systems; minimization of customization; configuration procedures and testing; and functionality. The ability of the system to manage and maintain data integrity, security, accessibility, flexibility, and nonproprietary interfaces. The Contractor's ability to develop, document, and

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	support interfaces with TMWA's billing system and other IT systems.
10	Warranties and Support: period and extent of warranty coverage on meter reading system components. Overall system performance guarantees. Protection in the event of excessive failures. How the Proposer will deliver maintenance and operational support, as well as training. Response modes and times.
10	<b>Ease of Operation and Maintenance</b> : The ease of ongoing use and maintenance of the system's hardware components, including component installation, programming, software upgrades and repair, effective use of the software, and diagnostic and reporting capabilities.
10	<b>Experience of Proposed Staff</b> : Relevant, related experience of the proposed Project Managers and staff proposed for this Project, including sub-contractors.
10	<b>Experience with Proposed System</b> : History of deployment of proposed system, including number of units installed, number of systems and their sizes, and ages of deployments. Experience in the industry (with prior systems). History of adherence to proposed budgets.

## 2.14 References

Recent AMI Projects. Proposer shall provide a list of water utility projects of size comparable to TMWA of the AMI Equipment it is proposing that have commenced within the last three years. This list shall contain the total number of units; percentage completed to date; and contact information, including contact names, phone numbers, and email addresses.

AMI References. Proposer shall provide additional information for three (3) references, if available, from utilities of size and circumstances most comparable to TMWA, including contact names, phone numbers, and email addresses. To the greatest extent possible, cite projects using the AMI equipment, meters and installation contractors proposed in this proposal, and where the implementation has been substantially completed within the last three (3) years. Include the following contract information: project beginning and ending dates, major subcontractors and suppliers, total number of units contracted, and percentage of total units that have been installed to date. Include description of Proposer's scope of work on each project.



Installation References. Proposer shall provide the names, titles, addresses, e-mail addresses, and telephone numbers of three (3) references, if available, from utilities of size and circumstances most comparable to TMWA where it, or its proposed installation subcontractor, if different, has installed AMI Equipment and where the installation contract has been substantially completed within the past three (3) years. Proposer does not need to duplicate references if AMI references and installation references are the same.

Meter References. Proposer shall provide a list of utilities which have purchased at least 15,000 of the same make and model of meter that it is proposing for TMWA within the last three years, including contact names, phone numbers, and email addresses, and the number of meters purchased.

### 2.15 Financial Information

Proposer must provide a minimum of <u>one</u> of the following in support of the financial stability of the firm as a separate document:

- a) A statement regarding the firm's financial stability, including information as to any current or prior bankruptcy proceedings.
- b) A Dun & Bradstreet (D&B) Supplier Evaluation Report (SER), or similar type report. All costs associated with this report shall be borne by the Proposer.
- c) A copy of a certified financial statement for each of the last three years prepared by an independent certified public accounting firm or Federal Tax Return for previous years.

## 2.16 Loss of Agreement and/or Inability to Fulfill Requirements

If Proposer has had an agreement terminated, or has a pending termination, or a settlement to avoid litigation or termination for default during the past five (5) years, all such incidents must be described.

Termination for default is defined as notice to stop performance due to Proposer's nonperformance or poor performance, and the issue was either: (a) not litigated; or (b) litigated and such litigation determined Proposer to be in default.

Proposer shall submit full details of all terminations for default, settlements, or pending terminations experienced in the past five (5) years including the other party's name, address, and telephone number. Proposer shall also present its position on the matter.

TMWA shall evaluate the facts and at its sole discretion may reject the Proposer's response if the facts discovered indicate that completion of an agreement resulting from this RFP may be jeopardized by selection of Proposer.

If Proposer has experienced no such settlement or termination for default in the past five (5) years, and has no pending terminations, it must affirmatively declare to be so.

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## **3** Contractual Requirements

The prevailing Proposer shall be required to enter a comprehensive contract for the performance of the services with TMWA in such form and substance to be mutually agreed upon by the parties following bid award. The following terms and conditions shall be made a part of the final contract, which will also include the addition of General Terms and Conditions. Exceptions or clarifications to these terms shall be specifically noted in Proposer's proposal, under the section entitled Exceptions to Contract Provisions, with suggested substitute language.

## 3.1 Competence to Perform Services

Proposer represents that it and/or the persons it may employ possess all skills and training necessary to perform the Services described herein and required hereunder. Proposer shall perform the Services faithfully, diligently, in a timely and professional manner, and to the best of its ability, and in such a manner as is customarily performed by a person who is in the business of providing such services in similar circumstances. Proposer represents that neither the execution and delivery of an Agreement, nor the rendering of services by the Proposer hereunder, will violate the provisions of, or constitute a default under, any other contract or agreement to which the Proposer is a party or by which the Proposer is bound, or which would preclude the Proposer from performing the services required of the Proposer hereunder, or which would impose any liability or obligation upon TMWA for accepting such services. Proposer shall be responsible for the professional quality and technical accuracy of all Services furnished by Proposer to TMWA.

## 3.2 Regulatory Compliance

The successful Proposer shall provide all required, necessary, and reasonably implied services, reports, analyses, correspondence, applications, meetings, and other preparation of documents and communications necessary to obtain approvals and cooperation of agencies such as the Occupational Safety and Health Administration (OSHA), Federal Communications Commission (FCC), Federal Aviation Administration (FAA), U.S. Army Corps of Engineers (USACE), railroads, utilities, cellular providers, and various municipalities, for all activities related to the Project. All correspondence, applications, responses to agencies, and other reports and communications shall be prepared by the successful Proposer and reviewed by TMWA. The successful Proposer shall be responsible for establishing working relationships with agencies and municipalities to expedite approvals and mitigate negative impacts, and shall hand-deliver items when necessary. Applications to agencies shall be signed by TMWA, and any fees or fines shall be paid by the successful Proposer.

In order to perform public work, the Proposer and any subcontractors, prior to award, shall hold or obtain such licenses as required by Nevada State Statues, and federal and local Laws and Regulations. 2018-021



## 3.3 Public Relations Support

The successful Proposer shall provide TMWA with public relations assistance, as required. This assistance shall include, but is not limited to, providing charts, brochures, materials for public meetings or media distribution, photographs for news releases, and materials for technical articles or presentations. All contacts by the media related to the Project, both general and trade press, shall be referred to TMWA. Any reference to TMWA in successful Proposer's outreach materials will require approval from TMWA.

### 3.4 Insurance Requirements

See Attachment C – Insurance Requirements.

## 3.5 Performance and Payment Bonds

Proposers shall furnish performance and payment (labor and material) bonds in an amount of the final Contract Price (consisting of the total cost of equipment, software and integration services, installation, project management and all other goods and services supplied), as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. This bond will remain in effect until one year after the date of final project acceptance. These bonds must be secured prior to or at contract signing.

All bonds shall be in the form prescribed by Attachment F except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements stated above, the Contractor shall promptly notify TMWA and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the same requirements stated above.

All bonds and insurance required by this Contract shall be purchased and maintained by the successful Proposer and shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required.

Bonds shall meet the requirements of applicable Nevada Revised Statutes (NRS), including but not limited to Sections 339.025 with regard to the Payment Bond and Section 339.025 with regard to the Performance and Payment Bonds. Each Proposer shall familiarize himself with the requirements of NRS Section 339.025 and shall be responsible for compliance with this Act.



Surety and insurance companies from which the bonds and insurance for this Project are purchased shall have a Best's rating of no less than A: FSC VII, in addition to the other requirements specified herein.

At its discretion, TMWA may reduce the amount of bond required based on successful project progress.

#### 3.6 Inspection & Audit

**Books and Records.** Proposer agrees to keep and maintain under general accepted accounting principles (GAAP) full, true and complete records, contracts, books, and documents as are necessary to fully disclose to TMWA, the State of Nevada or United States Government, or their authorized representatives, upon audits or reviews, sufficient information to determine compliance with all state and federal regulations and statutes.

**Inspection & Audit.** Proposer agrees that the relevant books, records (written, electronic, computer related or otherwise), papers, including, without limitation, relevant accounting procedures and practices of Proposer or its subcontractors, financial statements and supporting documentation, and documentation related to the work product shall be subject, at any reasonable time, to inspection, examination, review, audit, and copying at any office or location of Proposer where such records may be found, with or without notice by TMWA Auditor, or its contracted examiners, representatives of Washoe County, or any of their authorized representatives. Such records shall include, but not be limited to, those records necessary to evaluate and verify direct and indirect costs (including overhead allocations) as they may apply to costs associated with this Agreement. Proposer shall require all subcontractors, insurance agents, and material suppliers to comply with the provisions of this Section. Proposer will cooperate fully and will cause all of Proposer's subcontractors to cooperate fully in furnishing or in making available to TMWA from time to time all such information, materials and data whenever requested. All subcontracts shall reflect requirements of this paragraph.

**Recovery of Costs.** If an audit inspection or examination in accordance with this section, discloses overcharges of any nature by the Proposer to TMWA in excess of one-half of one percent (0.5%) of the total contract billings, the reasonable actual cost of TMWA's audit shall be reimbursed to TMWA by the Proposer. Any adjustments and/or payments which must be made as a result of any such audit or inspection of the Proposer's invoices and/or records shall be made within a reasonable amount of time (not to exceed 90 days) from presentation of TMWA's findings to Proposer.

**Period of Retention.** All books, records, reports, and statements relevant to this Agreement must be retained a minimum three years. The retention period runs from the date of payment for the relevant goods or services by TMWA, or from the date of termination of the Agreement, whichever is later. Retention time shall be extended when an audit is scheduled or in progress for a period reasonably necessary to complete an audit and/or to complete any administrative and judicial litigation which may ensure.



## 3.7 Indemnification

The successful proposer shall defend, indemnify, and hold harmless TMWA, its officers, directors, agents and employees from and against all claims, damages, losses, and expenses, including attorneys' fees, arising out of negligent acts, errors or omissions or willful misconduct in the performance of this project and those of its agents or employees. The successful proposer is not obligated to indemnify TMWA in any manner whatsoever for TMWA's own negligence.

## 3.8 Limited Liability

TMWA will not waive and intends to assert available NRS chapter 41 liability limitations and other liability limitations available at law in all cases. Contract liability of both parties shall not be subject to punitive damages. Liquidated damages shall not apply unless otherwise specified in the Agreement or any incorporated attachments. Damages for any TMWA breach shall never exceed the amount of funds appropriated for payment under the Agreement, but not yet paid to Proposer, for the fiscal year budget in existence at the time of the breach. Contract damages for any Proposer breach shall not exceed 150% of the contract maximum "not to exceed" value. Proposer's tort liability shall not be limited. Neither party shall be responsible for the negligent acts of the other party in the performance of the Agreement.

## 3.9 State Taxes

Proposer shall be required to pay all applicable state taxes, and shall include the cost of taxes in its price proposal.

## 3.10 Governing Law

Should there be any contract/agreement acquired, Proposer agrees that it shall be governed by and construed in accordance with the laws of Nevada. No action involving this contract agreement may be brought except in the district and federal courts located in Washoe County.

## 3.11 Funding Out Clause

Should the funding authority of TMWA fail to appropriate funds to continue payment on a resultant agreement, TMWA shall cancel said agreement without termination charge or penalty. Written notice shall be made should this occur.

## 3.12 Termination of Contract

The contract may be terminated in whole or in part by TMWA for its convenience, but only after the Proposer is given:

- Not less than thirty (30) calendar days' written notice of intent to terminate.
- An opportunity for consultation with the GM of TMWA prior to termination.



A default or breach may be declared with or without termination. The contract may be terminated immediately by either party upon written notice of default or breach to the other party.

## 3.13 Assignment

Any attempt by Proposer to assign or otherwise transfer any interest in this agreement without the prior written consent of TMWA shall be void.

## 3.14 Compliance with Law

Proposer shall comply with all applicable federal, state and local statutes, regulations, ordinances, or other legal requirements which apply. Before commencing with the performance of any work under this RFP, the Proposer shall obtain all necessary permits and licenses as may be necessary. Before and during the progress of work under this RFP, the Proposer shall give all notice and comply with all the laws, ordinances, rules and regulations of every kind and nature now or hereafter in effect promulgated by any Federal, State, County, or other Governmental Authority, relating to the performance of work under this RFP. If the Proposer performs any work that is contrary to any such law, ordinance, rule or regulation, he shall bear all the costs arising therefrom. Proposer agrees to obtain all appropriate business licenses and provide a copy to TMWA prior to commencing work.

### 3.15 Covenant

Proposer covenants that it presently has no interest and that it will not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required under this agreement. Further, Proposer covenants to its knowledge and ability that in performance of said services no person having any such interest shall be employed.

#### 3.16 Dispute Resolution

Any controversy or claim arising out of or related to the agreement or breach thereof shall be settled by arbitration unless TMWA, at its sole option, rejects arbitration by so notifying Proposer.

If TMWA rejects arbitration, Proposer shall have thirty (30) days from the date of receipt of rejection to send notice to commence litigation by the service of a summons and complaint upon TMWA.

Failure to effect service upon TMWA within said time period shall act as a bar to litigation of the claim, which was the subject of the request for arbitration.

If the matter is arbitrated, TMWA shall designate whether the rules of the American Arbitration Association or the rules of the Nevada Arbitration Association shall apply. Nevada courts may enter judgement on such awards.



The parties agree that any arbitrator may not award attorney's fees in any case.

Unless specifically stated herein, if there exists any conflicts or inconsistency between terms set forth in this proposal, the awarded Proposer's response, and any agreement submitted by the awarded Proposer, the language in this proposal shall take precedence.

The parties agree that in the event of a dispute, each party will bear its own costs of litigation and attorney's fees.

### 3.17 Force Majeure

Neither party shall be liable for failure or delay in performance under any agreement anticipated by this order in whole or in part to an act of God, strike, lockout or other labor dispute, civil commotion, sabotage, fire, flood, explosion, acts of any government, unforeseen shortages or unavailability of fuel, power, transportation, raw materials or supplies, inability to obtain or delay in obtaining governmental approvals, permits, licenses or allocations, and any other causes which are not within such party's reasonable control, whether or not the kind is specifically enumerated above. During any period of Proposer's inability to perform, TMWA may acquire from others said goods or services without incurring liability to Proposer.

### 3.18 Patent Indemnity

Proposer agrees to indemnify and hold TMWA harmless from any claim involving patent infringement or copyrights on good supplied.

#### 3.19 Penalties

In case of default by Proposer, TMWA may procure the products and/or services from other sources and may deduct from any unpaid balance due Proposer or collect against the bond, security, or surety for the amount of excess costs so paid.

#### 3.20 Intellectual Property

Any drawings, written reports or other works made by Proposer shall be considered works for hire and become the property of TMWA. Any such works shall not be stamped with the Proposer's proprietary markings.

#### 3.21 No Third-Party Rights

This agreement is made for the benefit of TMWA and Proposer, not for any outside party.

#### 3.22 Non-Endorsement

As a result of the selection of a Proposer to supply services, TMWA is neither endorsing nor suggesting that the Proposer's services are the best or only solution. Proposer agrees to make no reference to TMWA in any literature, promotional material, brochures, sales presentations, or the like, without the express written consent of TMWA.



## 3.23 Severability

If a competent court or arbitrator holds any of the terms, covenants, provisions and agreements contained herein invalid, illegal or unenforceable, this agreement shall be interpreted as if such invalid terms, covenants, provisions, or agreements were not contained herein and the remaining provisions shall be valid and enforceable.



# **Section 2 – Technical Requirements**

All questions and requests for specificity must be answered in accordance with AMI RFP Instructions, Section 2.12 Completeness of Answers. All questions and requests for specificity must be answered. All specifications incorporating "shall," "must," etc., are requirements, and failure to comply with these must be specifically noted as exceptions. All specifications incorporating "may," should," "desires," etc., are highly desirable features. In the case of a specific requirement not followed by a request for an explanation, Proposer must explicitly affirm that the system or component meets that requirement. Simply taking exception to a requirement without providing an explanation, and where appropriate alternative specifications and language, shall be deemed non-responsive, and may result in rejection of the proposal.

Exceptions shall be listed in the following format: Exception No., RFP Part and Section Number, Page No. Exception and Explanation.

Responses shall carry the title to the technical requirements topic. Answer questions specifically. To avoid repetition, if an answer has already been provided in response to an earlier question, make reference to it. Do not repeat text.

## **1** Terms & Definitions

The following terms and definitions are used herein:

AMI Compatible Meter– A meter that requires a change of register to an encoder type register with a connector ready to connect to an MIU.

AMI Ready Meter - A meter that has a register and connector ready to connect to an MIU. All AMI-Ready meter registers will be of the dial position (absolute) encoder type.

ANSI – American National Standards Institute

CIS – the eCIS+ billing system developed and maintained for TMWA by Vertex

DCU – Data collection unit

FDCU – Fixed Network Data Collection Unit

GIS – Geographical Information System

GPS – Global Positioning System

HMRCC – Handheld Meter Reading Control Computer

HMRU – Handheld Meter Reading Unit



Installation Period - The period that begins on the Commencement Date stated in the TMWA's issued Notice to Proceed and ends upon the certification of Substantial Completion.

Latency – the total elapsed time from an event (e.g., meter interrogation or tamper) occurring until the event is available on the head-end control computer

MDCU – Mobile Data Collection Unit

MDMS - Meter Data Management System

MIU – Meter Interface Unit (Endpoint)

Proposer – The firm or team (under the direction of the firm that would serve as prime contractor) responding to this Request for Proposal.

PFPTU – Portable Field Programming and Testing Unit

PSI – Pounds per Square Inch

Portable Interrogator - An AMI-capable handheld meter reading device supplied by Proposer designed and used to obtain meter readings, program MIUs or perform diagnostics.

TMWA – Truckee Meadows Water Authority

## 2 Overall System Characteristics

TMWA recognizes that AMI system features, characteristics, and performance result from the interaction of components, and are to be addressed in this section. Individual component requirements and characteristics are to be addressed in response to the appropriate sections following this one.

#### 2.1 Description of System

Provide a schematic depicting the system's components and configuration. Provide a brief overview of the architecture and normal functioning of the system.

#### 2.2 Time Synchronization and System Commands

Indicate if meter readings from Meter Interface Units (MIUs) are time-synchronized (e.g., meters are all read at the top of the hour). If so, explain how this is achieved and clock in MIU is set. Indicate the accuracy of the synchronization (e.g., +/-15 seconds).

In addition to time-synchronization, describe other commands or information that may be sent to the MIU from the head-end control computer or data collection unit in the course of the normal operation and maintenance of the system.

#### 2.3 Meter Reading Interval

Indicate the default interval at which the MIU interrogates the meter, and whether the interval can be changed for individual meters. If so, indicate the settable range of this interval. Describe the procedure required to change the interval, and reset it. Indicate if changing the interval can



be accomplished over-the-air from the head-end software. Indicate if this can be done for a selected group of MIUs at the same time.

If changing the interval will change the expected MIU battery life, provide specific parameters or examples (e.g., "15-minute interval will reduce expected battery life by X").

## 2.4 Transmitting Interval

Indicate the default interval for transmitting readings from the MIU to the data collector, and whether the interval can be changed. If so, indicate the settable range of this interval. Describe the procedure required to change the interval, and reset it. If changing the interval will change the expected MIU battery life, provide specific parameters or examples (e.g., "15-minute interval will reduce expected battery life by X").

Indicate how many full meter register readings and how many increment count reads are transmitted by the MIU at one time.

## 2.5 Elapsed Time (Latency)

Indicate the longest elapsed time from a when a meter is read by the MIU to when that meter reading is available at the AMI control computer. For example, if the meter is read every hour and the data is transmitted every 4 hours to the data collector, and every hour to the control computer, then the longest elapsed time (latency) would be 6 hours.

## 2.6 Read on Demand

Indicate if the system can obtain a real-time read on demand "over-the-air" from the MIU/meter by sending the MIU a signal. Describe how readings are taken on demand from a particular meter. Indicate the expected time interval between a user's on-demand reading request and the response.

#### 2.7 Radio Communication Band and Licenses

Indicate what radio frequencies are used for interactions between the MIUs and DCUs. Indicate what FCC license(s), if any, the system will require. Include the cost of licenses in the price schedule as part of the Price Proposal.

Indicate the expected length of time to acquire such licenses. Proposer shall be responsible for obtaining all necessary licenses on behalf of TMWA and in TMWA's name. Local frequency licenses shall be assigned to TMWA.

For national frequencies, TMWA must be provided an irrevocable right to use the license for its System, so long as the system is in service. Indicate the separate charges, if any, for this right in the pricing proposal.

## 2.8 Protection from Interference

Describe procedures that will be used use to regularly check for, identify and remove interlopers on its licensed frequency(ies) or overpowered signals on unlicensed frequencies.



Indicate who will be responsible for this effort. If TMWA, describe provisions offered by Proposer or its system to assist in this effort.

## 2.9 System Capacity

Describe the memory capacity of each system component in terms of the number of meter readings and usage intervals stored (in total and per endpoint) and/or the number of meter readings that can be transmitted/received in a given time interval.

Describe what happens as capacity is approached. Describe what happens when capacity is exceeded. For example, does new data overwrite old data?

Describe any provisions in the system for archiving old meter reading data at the data center on either physical or virtual servers.

## 2.10 Data Transmission Accuracy, Integrity and Security

Describe measures, such as encryption and error checking, used to transmit data from MIU to DCU, and DCU to control computer, to ensure data accuracy, integrity and security.

Describe how missing reads may be recovered/retransmitted from the endpoint including the ability to automatically backfill missing interval data on a daily basis.

Describe any security certifications currently held related to the proposed solution.

Indicate the frequency of security penetration tests conducted.

#### 2.11 Tamper Detection

Provide a list of the tamper conditions that will be provided to the system operator (e.g., cut wire, meter register separation, tilting of meter). For each, indicate whether the alarm is transmitted instantly or with the next MIU transmission. Indicate the number of times or over what period of time will a tamper indication be provided to the system operator before it is automatically cancelled. Indicate whether the tamper indication can or must be reset or reprogrammed by the system operator or field service technician, and how this is accomplished.

#### 2.12 Leak and High Flow Detection

Briefly describe the system's approach to detecting (a) continuous flow (that is, consecutive non-zero intervals), (b) low flow leaks (many but not all consecutive intervals non-zero), and (c) abnormally high flow ("broken pipe"). Indicate if the threshold levels for reporting of these anomalies are definable by TMWA, and if so, for individual customers or groups of meters.

#### 2.13 Other Detection Features

List other conditions (for example, reverse flow) the system can detect. Describe how these are accomplished, and how they are reported.



## 2.14 Additional Features

Describe any additional capabilities of the proposed system not already described above, such as remote shut-off or turn-on, pressure monitoring, temperature monitoring, chemical concentration monitoring, smart city applications, etc. Describe specific third-party sensors or controllers that are supported (such as Acoustic Leak Detection) and their capabilities. Include any deployments of such devices, including the number of units installed, in the References section of the proposal.

Describe the system's ability to add instrumentation (pressure, temperature, chemical, leak, etc.) and to collect distribution system performance information and transmit the information from such endpoints. Indicate whether additional software would be required for any additional feature listed.

### 2.15 Planned/Future Capability

Indicate any planned future capabilities for the equipment being proposed, the anticipated development and availability schedule, and the expected procedures for upgrading the Authority's system, if applicable. Include a product roadmap of planned future capabilities.

#### 2.16 Interoperability

Indicate Proposer's willingness to transmit data from third party or competitive meters or products from companies not related to Proposer that monitor acoustic leak detection, pressure, temperature and water quality, and shut-off valve operation. Describe conditions under which this would be enabled.

#### 2.17 Read Success Rate

For a system using DCUs, Proposer shall install a sufficient number of network devices (i.e., data collectors, repeaters, boosters, etc.) to obtain:

- At least one register reading for each meter on which an MIU within a three-day interval from at least 99.5 percent of all meters on which the system is installed;
- At least one meter register read per day from at least 97.5 percent of meters on which the system is installed; and
- At least 95 percent of all readings taken hourly or at more frequent intervals

except for meters from which transmissions are blocked by readily identifiable temporary physical barriers beyond the control of TMWA or Proposer.

Within the requirements above, meters from which readings are not received shall not be geographically clustered.



## 2.18 Redundancy

For a system using DCUs, Proposer shall install a sufficient number of network devices (i.e., data collectors, repeaters, boosters, etc.) to ensure that at least 70% of all the transmissions from MIUs installed on meters in connection with this project are received by two or more different data collectors (or, alternatively, via two or more distinct pathways back to the control computer).

## 2.19 Hard-to-Read Meters

Indicate how the system will obtain readings from meters in basements, ravines, vaults, and other transmission constraining settings. Proposer's approach may include the use of repeaters, remote antennas, etc.

## 2.20 Component Firmware

Proposer shall provide any available upgrades or patches to endpoint firmware for a minimum of 15 years, at no additional cost, including installation.

Proposer shall provide any available upgrades or patches to other DCU, repeater and other component firmware for a minimum of 15 years, at no additional cost beyond annual maintenance fees for this equipment.

Indicate if and how firmware patches or upgrades to correct problems, add new standard features, and ensure system compatibility would be applied to each system component.

## 3 Meter Interface Unit (MIU)

If Proposer is proposing more than one version of the MIU (e.g., one with more advanced features or memory and one with less, single-port versus multi-port, etc.), Proposer must provide responses to the requirements in this section for each version for those features that are different, clearly specifying which version they apply to and which apply to the base price listed in the Price Proposal.

## **3.1 Specifications and Physical Characteristics**

Provide specifications of the proposed MIU(s). Describe the physical characteristics of the proposed MIUs, including dimensions and weight. Indicate environmental tolerances, including temperature and humidity ranges. Indicate if there are different models of MIUs for indoor, outdoor wall-mounted, and vault installations. TMWA prefers a single model with appropriate mounting brackets for different situations.

Describe features of the MIU that prevent corrosion or degradation of mechanical or electrical performance (e.g., encapsulation or coating). The MIU shall be provided in a waterproof casing rated IP8 or better (submersion up to 1 meter of depth) in accordance with the IP code, IEC standard 60529. The MIU enclosure should be composed of ultraviolet (UV)-inhibiting ABS or



similar material. All materials used in the MIU must be non-hazardous under normal conditions.

## **3.2** Transmission Characteristics

Proposer shall indicate the interval, duration and strength of radio signals from the MIU in normal or default mode.

## **3.3 Mobile Operation**

Indicate whether the MIU can be read in both mobile and fixed mode, and if so, whether it needs to be programmed from one to the other mode. If so, describe the procedures for converting the MIU from one mode to the other.

## 3.4 Data Storage

Indicate how many meter readings at what intervals are normally stored in the MIU (e.g., 120 days of one hour reads).

## **3.5 Multiple Meters/Registers**

Describe any special provisions of the MIU to handle dual-register compound meters, or multiple meters in close proximity. Indicate if there are multi-port versions of the MIU. TMWA would prefer dual-port MIUs for compound meters, meters sharing vaults, and the use of acoustic leak detectors at meter locations. Indicate the number of ports for meter registers or other devices for each model of MIU being proposed. Describe any restrictions on installing MIUs in close proximity. Include pricing for dual-port MIUs, if available, in the pricing proposal.

## 3.6 Battery Life

Describe the expected MIU battery life as a range of years within two standard deviations of the average expected life under normal or default MIU meter interrogation and transmission settings and the climate in Reno, Nevada. Describe the MIU's low battery warning system, the warning time in months provided before failure under normal conditions, and how this is accomplished (e.g., based on battery voltage or the number of transmissions). Indicate the differences in expected MIU battery life, if any, when reading different types and makes of meter registers.

If the MIU can be read in a mobile configuration as well as fixed, indicate if there is a different expected battery life for each reading method.

Proposer shall clearly indicate to what extent battery use can be shortened by extracting 5 minute reads for a one week period (as part of use study or evaluation of meter sizing).

## 3.7 ID Number and Labeling

Each MIU shall have a unique, permanent ID number that is transmitted with the meter readings. Indicate the number of digits. The MIU shall be permanently labeled on the outside



with the manufacturer's name, model number, MIU identification or serial number, bar-code of this number, required FCC labeling, input/output connections, and date of manufacture. The label should be weatherproof and attached to the MIU where normal installation will not obscure it. TMWA requires that the MIU be shipped with one permanent bar code label and one removable adhesive bar code label for installation control purposes.

### 3.8 Programmability

Describe MIU programming requirements, options, features and procedures.

#### 3.9 Tampering

Describe features, including physical characteristics (seals, tamper resistant bolts, etc.) to minimize, detect, and report tampering with the MIU.

#### 3.10 Connection to Meter Registers

Describe the proposed normal wiring connection between the MIU and the meter, and any options. The TMWA requires a tamper-resistant, weatherproof connection that is immune to submergence in water as well as to oils and salts.

Indicate whether the MIUs are to be installed with in-line waterproof connectors between the MIU and meter. If so, TMWA prefers that each end of the connector be factory potted to the wire leads from the meter and MIU, respectively.

Describe any proposed method (such as a wire connection designed to release under tension) for connecting registers to endpoints attached to a vault lid that might prevent damage to the meter reading equipment or wires if vault lids are removed abruptly.

Describe any provisions to prevent miswiring, such as in the event of manual splicing or gelcaps.

#### 3.11 Meter Register Number

Indicate whether the MIU can store a meter register number, if this number is transmitted with the meter reading data, and if this number can be captured automatically by the MIU or can be programmed into the MIU from a field programming unit based on information downloaded from an installation work order database.

#### 3.12 Mounting and Installation

TMWA desires to obtain maximum signal strength, within reason, from MIUs in vaults and boxes. Indicate whether concrete or metal meter box or vault lids, respectively, are to be drilled, replaced, and/or left alone in order for the Proposer's system to operate to the specified performance criteria.

For large meters in vaults, the endpoint shall not be mounted on the underside of the lid.



Describe provisions and requirements for mounting MIUs (elevation, orientation, etc.). Describe mounting brackets provided for different installations. Provide photographs and diagrams of any brackets or lid assemblies used to mount the endpoint in vault applications.

Prices for mounting brackets, if separate from lids, must be included in the prices for the MIUs in the Price Proposal. Briefly describe installation procedures, including connection to meters, programming and provisions to avoid installer's mistakes in installation.

Indicate if any remote antennae will be used (where the portion protruding through the lid relays the signal to an endpoint below the lid), the specifications around such device, and whether such device is traffic rated.

## 3.13 Interoperability with Different Meter Registers

Provide a table showing the degree of compatibility of Proposer's MIUs with all makes and models of water meters currently available in the U.S. market, including, at a minimum, the information requested in table below. The proposed solution must be compatible with at least three registers listed in the MIU Meter Compatibility Table. More compatibility is desirable.

Complete the table using the following numbers:

Compatibility: 1-No programming req'd 2-Routine programming of MIU or meter req'd 3-Different MIU req'd 4-Technically feasible, non-routine modification (describe) 5-Unfeasible Functionality 1-All features operational 2-Some functions inoperable (describe) Support

1-Cross-licensed

2-Not licensed or supported, no effect on warranties

3-Warranties voided

MIU Meter Compatibility Table (to be updated)

Table 2

Manufac.	Register model	Degree of compatibility (enter 1,2,3,4, or 5)	Functionality (enter 1 or 2)	Support (enter 1,2, or 3)
Badger	ADE			
Badger	E-Series			
Hersey	Translator			



MasterMeter	AccuLinx		
Metron	Innov-8		
Neptune	E-coder		
Neptune	Pro-read		
Performance	ETR		
Sensus	ICE		
Sensus	iPERL		
Other	Other		

## 3.14 Manufacturing Facilities

List the manufacturing facility, facility location (country and state/province), ISO9000 certifications and expiration dates for the endpoint manufacturing facilities.

## 4 Meter Box or Vault Lids

All non-ferrous lids must have sufficient weight or a locking mechanism that prevents them from being dislodged or from floating. All non-ferrous lids must have a ferrous element (e.g. section of rebar) that enables them to be discovered by a metal detector when buried. TMWA prefers that no part of the MIU or remote antenna be higher than the plane of the top of the lid.

If any replacement lids are needed, the replacement lid shall not rest higher than the existing one.

In the case of Bilco-style vault doors or steel plates, Proposal shall provide a proven option that does not compromise the integrity and safety of the door or plate. Provide a diagram indicating vault lid mounting configuration, with dimensions, including any mounting brackets or lid assemblies, and indicating any protrusion of any part of the MIU above the top plane of the lid.

The cost of any lid replacements or modifications, mounting hardware or remote antennas must be included in Proposer's pricing.

## 4.1 Lids in Traffic Areas

Any replacement lid or remote antenna mounted above the lid or otherwise exposed in a paved area where there is a reasonable chance that it could be exposed to vehicular traffic or parked on by a heavy vehicle must be heavy duty AASHTO H-20/HS-20 rated. Any replacement lid or remote antenna mounted above the lid or otherwise exposed and installed in residential sidewalks separated by a parkway from the street must be rated as least medium duty.

Describe how lids located in streets and other areas of traffic will be addressed. Describe the proposed solution for large sized (or odd sized) cast-iron lids that may not be economical to replace with traffic rated composite lids.



## 5 Data Collection Units, Repeaters and Other Network Devices

Proposer must respond separately to all of the relevant requirements of this section for each type of network data collection or repeater device proposed. If the requirement is not relevant (e.g., for a cellular-based system or for a repeater), Proposer must so indicate.

Proposer must provide in Pricing Proposal estimates for the installation, operation (including electric service, if required, and backhaul communications) and maintenance costs of the device. For sites where TMWA has no facilities, estimates must include tower or roof leasing costs.

Contractor shall perform a radio frequency (RF) propagation study and determine the installation locations for any and all data collection units and repeaters. If communication equipment is to be installed on third-party sites, the Proposer shall obtain 20-year rights for installing and operating that equipment; these rights will be transferred to TMWA at no additional cost at the time of successful system acceptance testing.

## 5.1 Mode of Operation and Communication to Control Computer

Describe the method and schedule by which the DCU/repeater captures, stores, and retransmits data received from MIUs back to the AMI control computer. Indicate available options (cellular, Wi-Fi, Ethernet, etc.) and the preferred or recommended method for communicating with the control computer. Described what is involved in switching from one WAN technology to another.

## 5.2 Number of Units, Redundancy

Proposer is solely responsible for determining the mix of data collectors and repeaters (if relevant), MIU placement strategies, and MIU communication configuration needed to meet or exceed the performance requirements of paragraphs 2.17 and 2.18.

Indicate the proposed number of data collection units and repeaters to achieve the levels of system performance described in response to paragraphs 2.17 and 2.18.

Indicate the percentage of MIUs from which transmissions are expected to be received by only 1 collector, 2 collectors, and 3 or more data collectors in the proposed system.

If repeaters are used, indicate, based on the propagation study, the average number of MIUs from which signals would no longer be received if a repeater failed.

## 5.3 Locations

A list of TMWA facilities at which data collectors may be located is included in this RFP as Attachment E.

TMWA takes no responsibility for network coverage or design by providing potential sites to the Proposer.



## 5.4 Mounting

Indicate proposed options for mounting DCUs/repeaters. Indicate minimum and maximum required and recommended heights for antennae. Provide specifications with photographs and dimensions of mountings. DCUs/repeaters must not interfere with access by TMWA personnel to any part of the building or structure on which they are mounted, nor in any way compromise the structural integrity. Device mountings, support system, cabling, etc., must be pre-approved, as well as inspected and accepted, by a TMWA engineer.

## 5.5 Power Supply

Describe the proposed primary power source for DCUs/repeaters. If solar, provide specifications for solar panel. If electrical, indicate expected kilowatt-hours per month of electrical consumption, and expected maximum watts per device. Describe DCU device battery, and recommended preventive maintenance battery change interval. Describe any backup power supply for devices. Describe provisions for electrical isolation and protection against static discharge and indirect lightning strikes.

## 5.6 Programming

Describe the default transmission interval for sending data from the DCU to the control computer.

Describe any programmable features, such as data reporting schedules, for DCUs, and procedures for programming or configuring.

Briefly describe the procedures by which a DCU/repeater is installed onto the network.

## 5.7 Diagnostics, Maintenance and Repair

Describe the diagnostic information that is recorded and transmitted by the DCUs and repeaters. Describe the DCU diagnostic information that is monitored by the head-end system.

Describe recommended device preventive maintenance intervals and procedures. Indicate in terms of FTEs the level of effort required to maintain the proposed network solution. Describe the type of work expected if TMWA performs the maintenance internally.

Briefly describe maintenance procedures in the event of a device malfunction or damage. Describe tamper and other alarms that are produced by the network devices.

## 5.8 Data Retention

How many days of meter readings, or how many reads per meter, how many MIUs, will the DCU normally store?

## **5.9 Other Applications**

Describe other applications that may use the system's radio frequency network and data collectors, such as communications for field work automation systems.



## 5.10 Site Costs

Proposer shall include in the cost proposal the estimated monthly lease cost for collectors or repeaters that are not proposed to be installed on TMWA-owned facilities.

## 6 Mobile (Vehicle-Mounted) Collection System

TMWA is interested in mobile data collection units for areas where fixed data collection unit coverage is uneconomical and for backup should all or parts of the fixed data collection network be unavailable for extended periods of time. If Proposer's system includes an option for vehicle-mounted mobile meter reading of the endpoints proposed above, provide responses to this section. If mobile reading capability is provided by a portable-handheld device, even though it can be operated from a vehicle (for example, with a roof antenna), do not respond to this section, but include the relevant information in response to Section 7 below.

## **6.1 General Operation**

Describe the proposed solution for collecting meter reads in a mobile system, specifically describing the collection of both daily and hourly meter reads.

Describe the process for loading routes to and from the mobile system. If data can be transmitted wirelessly please describe this process and requirements.

#### **6.2 Hardware Components**

Describe the hardware components of the mobile solution.

Indicate which components are ruggedize and/or in weatherproof enclosures.

Indicate any vehicle specific requirement for the successful operation of the mobile solution.

#### **6.3 Mobile Data Collection Software**

Describe the software for the mobile solution. Provide screen shots.

Indicate what map based features are included (such as navigation, ability to identify new meters identified, and audio/visual indicators during the collection of meter reads).

Indicate whether the software has the ability to accept a manual reading and/or notes in the account record.

#### 6.4 Capacity

Indicate the maximum vehicle speed for the normal collection of meter readings.

Indicate the capacity of the mobile solution (number of meter reads) that can be stored.

Indicate the average time required to collect a meter read (both daily and hourly) using the proposed mobile system.

Describe any events that would require the driver to stop the vehicle to collect data.



### **6.5 Communications Protocol**

Describe how the mobile network communication protocol is similar to and different from the communications protocol used on the fixed network system.

### 6.6 Accessories

What connecting hardware and software, including cables, modem, cradle, battery, charger, etc., are required for the unit to be fully functional?

## 7 Portable Interrogation, Field Programming, and Testing Devices

Portable interrogators may be required to capture readings from MIUs that are in radio "dead" spots, or for other special reading situations. Portable programming units may be required to program MIUs or meter registers. Portable field test units may be required to diagnose problems with meter registers, MIUs, or the system. The possible functions are aggregated in this section. Proposer shall respond to this subsection separately for each separate device if there is more than one, denoting the responses 7.#a, 7.#b, etc.

### 7.1 Number of Units

Proposer shall supply all units required for Proposer and its installers. An additional 10 units are required for System maintenance by TMWA employees. Pricing and totals for these latter units, including extra batteries, cradles, car chargers, cables, etc., shall be included in the price proposal. TMWA may purchase additional units for no more than the unit prices included in the pricing proposal.

#### 7.2 Physical Characteristics

Describe the dimensions, weight, environmental tolerances, resistance to dropping and submergence, and other physical characteristics of the unit. Provide pictures.

## 7.3 Functions/Modes of Operation

Describe the functions of the unit. Describe the capabilities of the unit's software for programming, testing and portable interrogation of meters and MIUs. Indicate the options and exception codes for each of these operations. Provide representative screen shots.

#### 7.4 Portable Interrogation

Indicate if the unit is capable of alerting (if necessary) and receiving the signals from MIUs. Indicate if the unit is capable of downloading all the consumption profile data stored in an MIU, if that is a capability of the MIU.

#### 7.5 Field Programming and Installation

The unit shall be capable of capturing, at a minimum, the new meter reading, register number, old meter reading and address manually. TMWA prefers that the new meter reading and


register number be captured automatically through the MIU and visually displayed. Indicate if the unit is capable of programming the MIU with any information required for operation that was not factory pre-programmed into the MIU.

### 7.6 Field Testing and Diagnostics

The unit shall be able to diagnose problems with a meter register or MIU, unless the system incorporates an alternate way to make such diagnoses. TMWA desires that the unit be able to ascertain the remaining life of the battery in an MIU.

#### 7.7 Capacity

Identify how much data, or how many work orders, each unit can accommodate, and how many meter readings a portable interrogator can accommodate.

#### 7.8 Accessories

Indicate what connecting hardware and software, including cables, modem, cradle, battery, charger, etc., are required.

#### 7.9 Bar Code Reader

The unit shall include or be capable of capturing and recognizing bar codes to capture meter or MIU identification numbers from bar code labels on these components.

#### 7.10 GPS Receiver

The unit shall be capable of capturing GPS coordinates within two-meter accuracy.

#### 7.11 Camera

The unit shall be equipped with a digital camera, including flash, for capturing mediumresolution images of meter registers, meters, site conditions, etc., in conjunction with installation, maintenance and troubleshooting.

#### 7.12 Batteries

Provide the unit operation life in hours on a fully charged battery when the unit is involved in installation and programming, including taking up to 3 pictures of each installation. Provide time it takes to fully recharge the unit's battery after a full day of normal use. Indicate if the battery can be recharged outside of the unit and/or from a 12-volt vehicle system. Explain how the unit ensures against accidental data loss in case of a dead battery.

#### 7.13 User Interface

Indicate the angular range of readability.

Describe any audible tones used by the unit (e.g., confirming a reading or successful programming, warning of an out-of-limits condition, low battery, etc.).



### 7.14 Manual Entry

Indicate whether the unit permits manual entry of meter readings and other information (for example, the information necessary to complete a meter or MIU investigation or repair work order). Provide screen shots for this other information, including notes or comments.

### 7.15 Portable Interrogator Vehicle Mounting

Describe any provisions for mounting and operating the unit within a vehicle. Provide specifications.

# 8 Installation/Field Testing Control Hardware and Software

A separate software application and/or server or control computer may be used to manage field installations of MIUs, and manage portable field test units/interrogators/programmers. If so, provide details of this software and hardware in this section. Otherwise, respond to the subsections below in the response to Section 10.8. Indicate if third-party tablets or other devices may be used, and if so, the minimum hardware requirements.

# 8.1 System Overall Description

Include a detailed description of any hardware (e.g., cradles) or software needed to support portable programmer/reader/ field test units. Describe in detail the functions of the software used to manage this operation, and the reports produced.

### 8.2 Interface to AMI Head-End Computer

Describe the mechanism and procedure for downloading and uploading data from the portable field unit control computer to the AMI head-end system and/or any other information system (e.g., a work order management system) normally used in the maintenance of the AMI system.

### 8.3 Interface to TMWA CIS

Describe the mechanism and procedure for downloading and uploading data from the AMI control computer and/or any other information system (e.g., a work order management system) normally used in the maintenance of the AMI system to TMWA's Vertex eCIS+ customer information system and/or its Mobile Up/Mobile Field work order management systems.

# 9 AMI Head-End Hardware, Network Configuration and Software

### 9.1 Head-End Hardware

Provide detailed specifications of all the computer hardware and software needed for a complete and working system. In addition to the production system, Proposer shall provide a development/quality assurance non-production environment on which to test and configure system software changes. (Include the separate cost, if any, of the non-production system in the pricing proposal.) Required servers, network switches, hubs or additional infrastructure



changes must be proposed. Describe the proposed system architecture. Indicate which components can run in a virtual environment. All estimated costs must be reflected in the cost proposal. Indicate the proposed hardware configuration (include a diagram) and software needed to properly operate the AMI system.

While TMWA prefers to purchase its own hardware components, Proposer may provide pricing for a hosted configuration of the head-end software. For a hosted head-end environment, indicate the minimum expected availability time of the system as a percentage. Describe proposed measures (e.g., uninterruptible power supply, fail-over to backup system, etc.) to ensure the constant availability of the system's data.

#### 9.2 AMI System Head-End Software

The software shall enable TMWA to effectively obtain all of the meter readings generated by the system, monitor and manage the AMI system, including underperforming or nonperforming MIUs, repeaters, data collection units and backhaul communications, and determine remediation measures. The software shall perform the following functions:

- Manage the database of meter readings and other related information (service point information, meter data, tamper data, etc.) about the meters and the AMI system
- Interface with the MDMS and TMWA's CIS

Indicate normal modes of operation of the AMI system software, including batch processing and single meter reading query processing. Describe the steps a system operator must perform to obtain meter readings from the meters at the customers' premises, if the functions are not totally automated. TMWA prefers that meter readings for billing are provided automatically in response to an automated request from billing system following a billing calendar. TMWA prefers that database synchronization also be automated.

If these functions are performed by the meter data management system instead of the system control/head-end software, then so indicate and DO NOT DUPLICATE responses.

#### 9.3 Operating System and Database

Indicate which operating systems and versions the head-end system requires if the system is installed at TMWA. TMWA prefers a Microsoft Windows Server with Microsoft SQL Server if hosted at TMWA. The database should be directly accessible by TMWA (read-only, replication or placement in a data warehouse). Indicate procedures for correcting misinterpreted or misassigned data.

Any database file structure used to store and manage meter readings at the AMI head-end should be non-proprietary, ODBC-compliant and SQL-compliant, and provided by a standard commercial database supplier.



Indicate if the data structure of the head-end database allows new data elements. Changes in database table structures shall be transparent to TMWA from one revision of the AMI head-end to another.

#### 9.4 Event Data Storage

Indicate what data is stored in the head-end system and database. How much data, in terms of number of months of data, number of meters, and number of reads per day are stored?

#### 9.5 Backup and Failover

Describe the back-up capabilities and procedures to ensure that the AMI head-end system and consumption data is not corrupted or lost.

The system software and functions should be quickly and easily accessible to users even in the event of a failure of a computer or server. Describe how this could be accomplished.

#### 9.6 Access

Indicate if the system enables secure remote access to AMI system functions, reports and data from other workstations on the TMWA's network. Describe how this access is provided.

Can the system be accessed by a web-browser interface for system administration and diagnostic troubleshooting?

How many users can simultaneously access the system for queries and for data entry?

#### 9.7 Interface to CIS and MDMS

The AMI system head-end software shall automatically transfer appropriate data to the MDMS in a standard, nonproprietary format (e.g., fixed field ASCII) compatible with TMWA's existing formats. Each record provided to the MDMS shall contain at a minimum: account number, MIU ID number, port number (if the MIU is multi-port), meter ID number and/or meter register number, meter readings, date and time for each meter reading, and tamper indications.

#### 9.8 Alerts

Describe any provisions for the system to trigger e-mail or electronic message notification to subscribed users of certain alarms or conditions.

#### 9.9 System Administration and Security

Describe normal procedures for system administration.

Describe the security infrastructure of the proposed head-end software; how security is implemented at the presentation, application, database, and network levels; logging of system access and database transactions for all actions, and items captured as part of the security log attributes.



The AMI head-end system shall authenticate and authorize users of the system through user login names and encrypted and masked passwords, configurable role and function-based controls to limit access to data, limit access to software functions and features of the system, and provide traceability and thorough user audit logging. Describe the process for establishing user access privileges. Describe support for secure access and authentication, role-based security and permission-based functionality for internal and external users and Application Programming Interfaces (APIs), and the level to which security is granted (e.g., function, user, data element). Describe control of administrative or super user access over the Internet.

The AMI head-end system shall provide automated methods of preventing cross-site scripting (XSS) attacks or SQL injection attacks from compromising the databases or software functions of the AMI head-end system

#### 9.10 Reports

Provide a list, with brief descriptions and screen shots or sample pages, of all the standard reports provided for system and component performance; missing or late data; errors, anomalies, tampering, and alarm conditions; and data transfer, management, and administration.

Reports must be able to be directed to a printer, screen, or data file. The system should be able to export data from analyses and reports in standard CSV format.

Applications for the AMI head-end system shall be interoperable with .NET, SOAP and XML standards.

The standard reports should include, as a minimum:

- Received signal strength from MIUs
- Number/percentage of reads received from MIUs
- A list of meters (including address or identifying information) that are being interrogated at a higher than normal rate (e.g., every 15 minutes instead of hourly)
- MIUs from which no transmissions have been received, and the ability to sort them by the number of missing days
- MIUs from which there are cut-wire alarms, and the ability to sort them by the number of days the condition has persisted
- Any other flags created by meters and MIUs, such as reverse flow or magnetic tamper
- Redundancy in coverage of MIUs by collectors
- MIU density per collector
- Duplicate MIU or meter serial numbers
- "Orphan" MIUs; that is, MIUs transmitting but not associated with an account



- Detailed call records of every cellular call initiated by the Proposer's cellular-enabled network components
- Data retrieval times/data latency
- Remaining battery life in MIUs and other network components, or low battery life alarms, including the ability to sort by the number of days the unit has been in alarm status
- Network component status, including communication retires, memory errors, connection errors, and whether the network components pass or fail the Proposer's operating specifications
- A listing of current AMI control system hardware, software and firmware versions and configurations for routine maintenance purposes
- A list of components that required time synchronization within specified dates

### 9.11 Ad-Hoc Reports and Export

The software should support ad hoc queries and custom reports, using a built-in report writer or a third-party commercially available report writer that is included with the control computer software. Permissible customization shall not void any software product warranties, nor prevent any overlay of future software releases.

# 10 Meter Data Management System

Software is required to manage the database of meter readings and other information created by the AMI system. This software may be distinct from the control computer software used to manage the AMI system. Meter reading data management capabilities shall be described in response to this section.

### **10.1** System Architecture

Provide a software architecture diagram and a description of all of the proposed software, including all third-party middleware, database engine, report generator, etc. Descriptions shall include version numbers of all products.

### **10.2** Mode of Operation

The software shall collect and maintain historical meter read data including at a minimum: meter identification number, meter attributes, meter location, account and premise identification, meter reads, read dates and times, failures to read, tampering alerts, and leak detection, for each meter in the system.

The MDM software shall provide the user with reports of the current status and reading history of individual accounts and selectable groups of accounts. The software shall be able to sort and list accounts and their meter reading data. The software shall also be able to create user-defined account groups and aggregate consumption profiles.



Indicate normal modes of operation of the AMI system software, including batch processing and single meter reading query processing. TMWA prefers that meters readings for billing are provided automatically in response to an automated request from billing system following a billing calendar. TMWA prefers that database synchronization also be automated. Describe the steps a system operator must perform to obtain meter readings from the meters at the customers' premises for billing purposes, if the functions are not totally automated.

#### 10.3 On-line Storage

The system shall provide the capability for maintaining at least one year of "live" (that is, instantly accessible) data assuming meter reads with at least one-hour intervals, and an additional two years' of "live" daily reads for all the TMWA's meters. Additional data shall be available on a retrieval basis.

The MDMS shall be able to support future seamless growth up to a total of 200,000 meters, with live storage of data as defined above.

#### 10.4 Interface to CIS

The MDMS must interface to TMWA's CIS system to provide monthly or on demand meter readings both individually and in batch upon request by the system; synchronize data related to meters, service locations and customers; and provide status reports of alerts for accounts.

Customer information shared and synchronized with the CIS should include billing cycle, rate class, customer account-premise-meter relationship, meter type, etc.

Describe the process by which the MDMS would be synchronized with TMWA's CIS. Indicate the recommended synchronization frequency.

#### 10.5 Meter Reads/General

Describe the functions provided by the system "out of the box," including:

- Input, process, store, and analyze consumption, and interval data from multiple AMI technology collection systems, field tools, and TMWA's existing meter reading data transfer systems.
- Input, process, store, and analyze consumption pressure and other sensor measurements, if available.
- Identify and report tamper flags and missing or incomplete meter data.
- Support scheduled and on-demand meter readings.

#### 10.6 Validation, Estimation, and Editing

Describe the system's capability, if available, for verifying, estimating and editing (VEE) missing or invalid meter readings, including providing a complete audit history of any data modified or added as a result of the VEE process.



#### 10.7 Meter, Meter Register and Meter Interface Unit Asset Management

Describe meter configuration data and the process for changing it. Describe how an MIU is assigned to a premise ID, customer ID, meter ID, and geographic location. Show how the software maintains asset data, including installation date, model number, etc.

#### 10.8 AMI Installation Support

Describe any functionality for managing installations of meters, meter register retrofits, and MIU-only installations, by manual entry and interfacing with Proposer/Installer's installation system; or interfacing with another vendor's installation management system to track installations or retrofits.

Can the software associate old MIU and new MIU identification numbers with a service address, customer account and unique premise ID? Can it associate old meter ID, old meter final reading, and new meter ID and read from meter install or exchange process with a service address or customer account and unique premise ID? If so, describe the processes.

#### 10.9 Customer Service Representative Interface

A TMWA Customer Service Representative (CSR) or other employee shall be able to access an account by at least the following fields: account number, name, address, premise ID number, meter serial number, MIU serial number. Indicate available customer search parameters.

A TMWA CSR or other employee shall be able to view latest or current reading (with time of read), consumption history over a selectable date range, meter information, usage statistics (e.g., max flow rate, usage by day of week, etc.), historical events (tampers, alerts, etc.). He or she shall be able to view consumption with selectable granularity (e.g., hourly, daily), compare usage to same period last year, or to comparable meters, and display data both in bar graph and table form. Describe the process by which a TMWA customer service employee will view or generate a file of this information. DO NOT duplicate descriptions here with responses to Section 10.10 below.

Indicate the ability of the MDMS to display consumption data minimum hourly flows in each 24-hour period, and display consumption data in conjunction with "external" data such as temperature.

Indicate if the CSR can see a screen identical to what a customer might see through the customer portal.

Describe any other features available to a TMWA CSR or other employee.

Describe the process by which a TMWA employee would input a meter or MIU change in the MDMS, maintaining the continuous consumption history for an account while keeping track of the point of change-out.

# 10.10 Analysis of Usage

Describe how potential leaks, high consumption, misuse and water theft are identified by the software from the data, and what analysis reports are generated, including:

- Identification of possible low flow rate leaks (e.g., extended periods when interval reads are always above zero or consumption anomalies above user defined thresholds by account.
- Identification of possible continuous high consumption events at individual customers' premises.
- Monitoring "usage on inactive" (registered reads above configurable thresholds without an active customer account) and automatically generate alerts and notifications.
- Water theft analysis, use after shut off, and reverse flow.
- Identification of intermittent backflow situations.
- Identification of any meter with little or no change in registration (zero or low consumption) for a configurable number of days.
- Identification of accounts where usage violates temporary restrictions (e.g., apparent outdoor irrigation usage during non-allowed times or days).
- Consumption profiles by season and day type (weekday, weekend, month, holiday, etc.) and by rate class, customer type, and/or any user-specified collection of meters.
- Combining consumption from two registers of a compound meter, including handling the scaling of different registers.
- Identification of potentially underperforming meters.
- Consumption histograms to help right size meters.

# **10.11** Analytics Capabilities

Describe any capabilities of the software to provide customer, consumption and meter analytics, such as: meter underperformance, unauthorized consumption, non-revenue water analysis, etc.

# **10.12** Grouping of Meters

The software shall be capable of generating consumption profiles for groups of meters ("virtual meter"). Indicate by what parameters or data fields meters may be grouped for this purpose. Describe the procedure for assigning meters in the MDMS to district metered areas (DMAs).

The system shall enable the comparison of consumption between an individual meter and a group of meters, or between two or more groups of meters.





The system shall enable the comparison of consumption from all of the meters within a demand management area and the master meter(s). Describe the options for obtaining and synchronizing the appropriate master meter data.

Describe the options for reporting this data, including graphical and tabular, and maps.

#### **10.13** System Event Reporting and Tamper Management

Describe how the MDMS can be used to track and report on potential system status issues, including:

- A normal meter change out, authorized by a work order (including a meter with higher resolution than the meter it is replacing).
- Identification of a meter that has been changed without a work order.
- Missing reads. Show how the system can triage or prioritize recommended work orders based on number of missing reads, proximity to read-for-billing dates, severity of the problem, etc.

Describe how the proposed system analyzes meter or MIU tampering flags and automatically generates alerts and notifications, including: logging event messages, and changes, and reporting status of logged event messages (i.e. ignored, fixed, etc.); storing all collected event and alarm data; and performing trending analytics and correlating failures with a variety of attributes and time frames.

The MDMS shall enable the users to set start and end date report filters for the above.

The system shall provide a list of accounts with one or more of the above conditions.

Provide sample reports for these cases. Indicate how information may be pushed to or requested by CSRs.

#### 10.14 Reporting

Describe the standard reports and trend analysis to be provided by the proposed system. [DO NOT duplicate responses to the above three sections.]

Describe how reports are to be generated on demand.

Describe how reports are to be generated via a scheduled process.

Describe how system generated reports are sent to predetermined email addresses and predetermined storage file locations.

Describe end user custom reporting capability with ability to save as reporting templates.

Reports shall be able to be set up or changed without modifying source program code and without any proprietary language skills.

Describe how reports can be exported to standard file formats (ex: .csv, .xls, .mdb, .html, etc.).



The database should be directly accessible by TMWA (read-only, replication or placement in a data warehouse). Indicate procedures for correcting misinterpreted or misassigned data.

List all supported reporting tools (i.e. Hyperion, Crystal, Cognos, Obvient, etc.).

Describe (if available) consumption projection analysis.

#### **10.15** Notification Support and Administration

Describe capabilities of the software to provide data files to generate field service order requests based on configurable settings.

[DO NOT ANSWER HERE if capability is provided by customer portal.] Describe capabilities of the software to provide data files to CIS and/or outbound dialing IVR with messages concerning possible leaks, high consumption, unauthorized irrigation, etc. Describe capabilities to generate letters, emails or text messages for customers. Indicate data required from CIS to provide this capability. Describe ability to provide flags to account records in CIS of conditions or messages created.

[DO NOT ANSWER HERE if capability is provided by customer portal.] Describe capabilities to keep track of notifications (e.g., about continuous flow) that have been sent and whether they have been received, and to schedule subsequent notifications if the condition still persists.

#### 10.16 Data Validation and Exception Handling

Describe detection and prevention of logical data errors when the data is input by user, including:

How the system prevents data errors from affecting system functions that are not directly associated with it.

The error codes and descriptions which can be used to help facilitate debugging end user problems. Error codes must reference the specific exception.

Describe detection and prevention and reporting of logical data errors when data files are imported from other systems.

#### 10.17 Database

Describe need and responsibilities if a TMWA Database Administrator (DBA) is required.

Describe backups, either incremental or full, without stopping any operational processes.

Describe automated data archiving, purging, and restoration.

#### **10.18 User Environment**

Identify web browser options for proposed system.

Describe support for a session logout that will terminate the user session with a configurable session timeout value.



Describe support for session kill on both browser away and browser close.

Describe context sensitive online help.

#### **10.19** System Configurability

Describe the types of configuration changes that would require a system restart.

Describe functionality to allow TMWA to set up and change data validation and estimation rules, user screens, and alarm/event notifications without modifying source program code and without any proprietary language skills.

Describe functionality and process to make configuration changes to reflect new business rules for data validation and estimation.

Describe functionality and tools to change format, content or functionality of user screens and online help contents.

#### 10.20 System Administration and Security

Describe the security infrastructure of the proposed software system; how security is implemented at the presentation, application, database, and network levels; logging of system access and database transactions for all actions, and items captured as part of the security log attributes.

Describe procedures for system administration.

Describe the process for establishing user access privileges. Describe support for secure access and authentication, role-based security and permission-based functionality for internal and external users and Application Programming Interfaces (APIs), and the level to which security is granted (e.g., function, customer, data element). Describe control of administrative or super user access over the Internet.

#### **10.21** Information Protection and Encryption

Describe the system's data encryption capabilities. For presentation to external end users (e.g., the online presentment application), describe how the proposed system will support masking and/or encryption of sensitive data as identified by TMWA.

#### 10.22 System Backup

Describe data storage, backup, restoration, and disaster recovery, including but not limited to clustering, redundant servers, hot standby, etc.

Proposer should provide separate development/test, training and production environments.

#### **10.23** Support and Maintenance

Describe Proposer Help Desk availability (e.g., hours, time zone, etc.) and escalation procedure.

Describe upgrade frequency and notification process.



Can upgrades be implemented by TMWA staff or is Proposer assistance required?

Describe any plans for sun-setting the proposed system.

Describe prior version support.

#### **10.24** Hardware/Software/Operating System Requirements:

Provide minimum and recommended hardware/software and operating system requirements and any other non-responder proposed software required.

List any other proposed system environmental requirements (i.e. climate control, power requirements, surge protection, system backup, emergency power backup, LAN, network, etc.)

#### **11 Customer Web Portal**

The proposed solution shall include a web portal for consumers to access detailed data from their meters. The data must be presented in simple charts and graphs that are easily understood by most users. Describe and show (with screen shots) how the software provides the following capabilities.

#### **11.1** Log in and Passwords

The platform should have a configurable interface that can be presented as a seamless extension of TMWA's own web site.

The software shall be accessible to customers using web browsers and phone operating systems from major manufacturers.

The software shall allow the customer to initialize an account for access using address and account number. Initializing a customer account shall require no involvement of TMWA staff. Account initiation should be completed using an emailed authorization code.

The software should provide support for utility account file import and account and password authentication. Alternatively, the software shall allow the customer to set up an e-mail, user name and a password. Describe password requirements.

Indicate if the customer portal can be accessed by a customer from TMWA's website or e-billing page with token passing.

The software shall allow the customer to retrieve or re-set a forgotten password via the previously established email.

The software should provide for backdoor support for TMWA to manage forgotten usernames and passwords.

The consumer presentment solution should include a mobile application.



#### 11.2 Multiple Meters and Accounts

The software shall allow customers to access and view all meters or accounts they are responsible for in a single logged on session.

Where a meter has more than one register, the software shall be able to aggregate the consumption into a single view.

#### 11.3 Customer Display

The software's main customer display screen shall have TMWA's logo and branding on it.

The display will provide all account, address, and meter information relating to that particular customer.

The software shall not display private information about the meter or account.

The software will display the customer consumption history in a graph that can be configured to a customer specified start and end date. The default period should be the customer's latest complete billing period.

The software shall be able to display daily and hourly usage up to the most recent data available in the MDMS.

The graph shall allow the customer to compare consumption history for different time periods on a single graph (e.g., consumption by month this year versus last year).

The customer shall be able to select the resolution of the consumption interval displayed (hourly, daily, monthly, and yearly). Indicate the number of data that can be displayed for each interval (e.g., 6 months, 31 days, 24 hours).

Describe capacity to overlay data streams for comparison purposes such as comparing monthly consumption with pre-defined factors (i.e. temperature, occupancy, etc.). Provide examples.

Describe the capability to show cost data for individual consumption profiles based on the customer's rates, or total estimated cost and consumption for the current (unbilled) billing period.

Describe the capability to provide a customer a graph of his consumption history against the average consumption of similar customers.

#### 11.4 Alerts

Describe from where (head-end system for alarms, MDMS for consumption profiles, etc.) and how (e.g., FTP interface) the customer portal gets its information.

Indicate the alarms that can be provided to the customer through outbound notification, such as persistent consumption indicative of a leak, excessive consumption, usage over a settable threshold for a specific period of time (e.g., when the premises are vacant).

Indicate whether the consumer can set thresholds for these alarms.



Describe the provisions for the consumer to designate emails, cellphone numbers (for text message), or other communications for various alarms. Can the consumer enable multiple contact emails or phone numbers, or contact emails or phone numbers for different conditions?

Indicate if the software has provisions to allow consumers to opt in or opt out of notifications.

The software should be able to inform a customer of a violation of certain TMWA-defined usage restrictions (such as excessive flow rates or volumes indicative of outdoor water use on certain days or at certain times)

Describe capabilities of the software to provide data files to CIS and/or outbound dialing IVR with messages concerning possible leaks, unauthorized irrigation, etc. Describe capabilities to generate letters, emails or text messages for customers. Indicate data required from CIS to provide this capability. Describe ability to provide flags to account records in CIS of conditions or messages created.

Describe capabilities to keep track of notifications (e.g., about continuous flow) that have been sent and whether they have been received, and to schedule subsequent notifications if the condition still persists.

#### 11.5 Reporting

The software shall allow the customer to download both graphical and chart based reports of their consumption. The downloaded reports shall be available in PDF or Excel.

The Proposer shall be responsible for developing up to five custom reports at TMWA's direction that the customer will be able to view and download.

Describe the Customer Portal's ability to integrate with on-line bill presentment and payment.

Describe how missing data points are managed and displayed for the capabilities described in Section 11.3.

### **12 AMI System and Component Acceptance**

#### 12.1 Software and Integration Testing and Acceptance

AMI head-end software acceptance testing shall include testing functionality of features described in the proposal, testing of all interfaces to TMWA's IT systems developed by Proposer in conjunction with TMWA, testing capacity of systems to perform when processing large quantities of data and transactions, and testing capacity of the system to detect and reject input data that would fail reasonableness checks (i.e., reading dates in the future, or non-numeric meter readings).

Acceptance testing should be conducted in stages as follows:

• Head-end system and network management hardware and software, which will capture meter readings and other data from endpoints installed at customers' meters and make



them accessible in SQL format for billing and reporting purposes, as well as provide reports on the performance of the network components, redundancy, endpoint battery life, etc.

- DCU network communications (i.e., point-to-point from MIU to/from DCU and DCU to/from control computer).
- MDMS and customer portal software.
- Interfaces to TMWA's CIS and other information systems specified in the RFP or proposed by the Proposer, which will enable the system to synchronize data with these systems for work orders, asset management, etc.
- Software used to control and manage the Proposer's installations of endpoint to ensure that all installation data is captured correctly. This includes integration to any handheld devices used in the installation.
- Acceptance testing shall be performed at TMWA's facilities in the presence of designated TMWA employees unless the parties agree otherwise.

Describe your testing and acceptance plan, if different from this.

Progress payments will be tied to successful testing of these components.

Prior to any work being performed, the Proposer shall submit to TMWA for approval a system testing plan covering functional requirements of each software component; integration between network components, AMI software and hardware, the MDMS and customer portal, the installation control system, and TMWA's CIS; and end-to-end performance. Proposer shall detail the testing approach, testing schedule, test data, test cycles, test scripts, and failover/repair/restore process for functional test, integration tests and end-to-end tests. The plan shall include stress testing (volume, bad data, etc.)

The testing plan shall be specified in detail in the provided schedule of work to TMWA at the beginning of the project. Schedule shall reflect time provided to TMWA for required verifications.

Software and integration acceptance testing shall take place prior to the acceptance by TMWA of any DCUs or repeaters.

Proposer will perform the functional tests of installed software. TMWA will review test results and provide written notice of acceptance upon successful completion.

Proposer's engineers together with TMWA representatives shall perform the integration tests to test data flow between endpoints, data collectors and/or repeaters, the head-end software, MDMS, customer portal and TMWA's CIS. TMWA will provide Proposer written notice of acceptance upon successful completion.

TMWA or its designated agent shall perform the end-to-end tests.



TMWA will provide Proposer written notice of acceptance of each test set. For individual failed tests that require fixing, TMWA may require retesting the entire components if it reasonably expects that the fix could compromise other functions. TMWA may reasonably require retesting of any tests for which it determines the test results are unclear.

The testing protocol shall be followed regardless of whether TMWA opts to purchase and install the software and servers or have the software hosted and managed.

### 12.2 Network Device Acceptance

At least 75% of the DCUs needed to provide complete coverage of TMWA's service territory shall be installed, tested and operational for 20 days prior to starting MIU deployment.

Within 15 business days of being notified of the installation of a network device, TMWA will physically inspect the installation site for proper installation; will attempt to obtain confirming readings from endpoints through the Network device; and will confirm that the correct information for the installation has been captured in the AMI network control system database and/or TMWA's project management database.

Should TMWA fail to inspect the network device within 15 business days of being notified of its installation, TMWA will conditionally accept and pay for the device. However, such conditional acceptance shall not relieve the Proposer of any responsibilities for curing defects in the installation or performance of the device during the warranty period.

The testing protocol shall be followed regardless of whether TMWA opts to operate and maintain the network itself or have the network managed by the Proposer.

# 12.3 Installation Procedures Testing

Prior to the commencement of full-scale installation of all endpoints, but after Proposer shall have installed the AMI head-end and a sufficient quantity of data collection units, TMWA employees, after proper training by Proposer and/or Proposer's installation subcontractor, shall install endpoints on approximately 400 meters following the Proposer's proposed procedures, and operate them for eight weeks.

During this test and a period not longer than fifteen (15) working days following it, TMWA and Proposer shall evaluate the procedures for public notification, scheduling installations, endpoint installation, inspections and inspection reporting, exception processing, installation data management and project control, and problem resolution, to ensure they are working and effective. Proposer shall suspend any further installation work during this evaluation period.

If TMWA reasonably determines that any of Proposer's procedures are deficient or ineffective, it shall notify Proposer within the evaluation period. No additional installation shall be conducted until any deficient or ineffective procedures that are the Proposer's responsibility have been cured by Proposer, and installation procedures have been approved by TMWA in writing to Proposer.



#### 12.4 Meter and MIU Installation Acceptance

If installed by a subcontractor, meters and MIUs will be accepted and the installation paid for as they are installed and confirmed to be operational, in accordance with Section 16.7, or if Proposer prefers, by meter reading route or other geographic area, provided the successful installations meet or exceed the route saturation criteria (Section 16.1).

#### 12.5 Overall System Acceptance

TMWA and Proposer will conduct a final System Acceptance Test when all endpoint installation work orders provided to Proposer are completed and endpoints accepted by TMWA. Final System Acceptance criteria shall include:

- Uniform System Performance The System must provide performance that is substantially uniform throughout TMWA's service territory, defined as: within 0.25 miles of any MIU from which a standard consumption message was not received, there are not more than 5 other MIUs from which a standard consumption message was also not received.
- Billing Read Performance The system shall on the day of system acceptance testing provide meter register readings not more than 3 days old from at least 99.5% of the endpoints determined to be **available** on that day.
- Daily Read Performance The system shall on the day of system acceptance testing provide meter register readings not more than 1 day old from at least 97.5% of the endpoints determined to be **available** on that day.
- Interval Read Performance The system shall on the day of system acceptance testing
  provide not less than 95% of all the hourly interval readings from all of the endpoints
  determined to be **available** on that day, and not less than 80% of the interval reads from
  any one endpoint.
- Network Device redundancy. Not less than 70% of the available endpoint devices shall be recognized by two or more network devices, as reported by the control computer.

An endpoint shall be deemed **available** if it has been: (1) accepted by TMWA; (2) not damaged or vandalized by a third party; (3) mounted according to agreed-upon installation procedures; (4) not subject to a pending investigation or maintenance work order, and (5) its signal is not subject to unanticipated blocking (e.g., permanent or semi-permanent structure installed after endpoint installation and acceptance).

Except for the redundancy criteria above, final system acceptance may be by zones or groups of routes, to be agreed upon by TMWA.

This performance shall be sustained for 30 days. Performance measures shall be averaged over this 30-day period. Overall system performance measurement for System Acceptance shall commence upon notification from the Proposer, and will be concluded the first time the average performance measures over any consecutive 30 days meets or exceeds the



performance measures. Should Final System Acceptance fail, Proposer shall fix all defects and reinitiate Final System Acceptance Test.

However, if TMWA finds discrepancies in the conditions of acceptance for 12 months after the date it was notified of installation, and TMWA validates cause of the problem was attributed to Proposer during the installation process, TMWA shall remand the work to Proposer for correction.

# **13** System Documentation

All system documentation and manuals shall be provided by the commencement of training of TMWA employees.

Proposer shall provide one hard copy and one copy in electronic portable media (CD/DVD, etc.) of all standard manuals and additional customized (for TMWA) written procedures sufficient for complete operation and maintenance – including:

- Technical architecture
- Functional and technical specifications
- MIU Installation instructions
- Data collection unit and repeater installation instructions
- Hardware Configuration
- System administrative operation, performance monitoring, diagnostics and maintenance
- Backup and recovery procedures
- MIU field diagnostics and repair
- Network component diagnostics and repair

The electronic versions shall be indexed, searchable, and printable. Proposer shall make standard manuals available online to TMWA employees.

#### 13.1 Third-party Software Manuals

Manuals for any third-party software components incorporated into the system shall be available online or on CD/DVD in searchable and printable format.

#### 13.2 Updates and Revisions

Proposer shall promptly update online documents whenever there are any revisions or additions to the manuals. Describe notification and update procedure. Proposer shall provide a method to track and monitor all changes to software, hardware, operation, and maintenance procedures and equipment.



# 14 Training

# 14.1 Prerequisite to Installation

Proposer must provide proper training to designated TMWA staff prior to the commencement of installations.

# 14.2 Training Location and Equipment

All training shall be performed at TMWA's offices and facilities, or in the field in TMWA's service territory. Proposer shall provide all additional training on TMWA's AMI system equipment (including the control computer and database) after it is installed, tested, and accepted by TMWA. Training should use real data from TMWA's own system. Proposer shall restore, repair, or replace any TMWA equipment damaged in training, and restore any hardware or software modified in training.

# 14.3 Training Curriculum

Proposer shall provide thorough training of TMWA employees in all areas required to install, operate and maintain the system and obtain data from it. This shall include, but not be limited to training in the following areas for the designated number of people. Proposer shall specify teaching method and duration for each of these training sessions.

All aspects of the AMI system's operation, including obtaining reads and consumption data from the system, transferring reads and other information between the AMI system and the CIS; creating, analyzing, and customizing performance reports, diagnosing potential problems with system components, and changing or adding customer accounts/MIUs/ meters to the system, for a minimum of 25 TMWA employees or agents.

Meter reading database management, shall provide thorough training in the use of the AMI system data repository for a minimum of 25 TMWA employees or agents.

Use of the Proposer's installation management and project control software in association with proposer's handheld programming devices for a minimum of 25 TMWA employees or agents.

Field installation of MIUs, as well as MIU field diagnostics and maintenance, for a minimum of 25 TMWA employees or agents.

AMI system operation and management, including the use of system management and diagnostic software, and server and control computer hardware management, for a minimum of 25 TMWA employees or agents.

Network component (including data collection units and repeaters, if used) installation and field maintenance, for a minimum of 10 TMWA employees or agents.



# 14.4 Testing

Proposer's training shall include an evaluation of trainees to ensure that they have learned the course content and can perform all necessary functions on the system. Evaluation criteria and testing shall be approved in advance by TMWA. Proposer shall notify TMWA of any employees who fail this evaluation, and provide them additional training as required. Proposer shall repeat a training session at no additional cost to TMWA if a majority of the trainees in a particular subject have not attained the skills from the training session or fail the evaluation at the end of the training.

### 14.5 Training Objectives and Outline

Proposer shall provide a detailed outline of each training session's objectives and content at least 2 weeks prior to the training session to TMWA for review and approval.

# 14.6 Training Aids

Proposer shall provide trainees' workbooks, training aids (including software and video), and system technical manuals prior to or during the training session at no additional cost. Proposer shall provide copies of workbooks for the number of employees trained for each type of training plus five (5) extra copies. If training aids include the technical manuals (Section 13 System Documentation), then Proposer shall provide the appropriate manual for each trainee in the training class that the manual covers.

### 14.7 Supplemental Training

Proposer shall provide a schedule of costs for additional training beyond the initial training proposed. List each training type and provide the cost for each. These costs shall be submitted per Section 3 in separate envelopes from the Technical Proposals.

### 14.8 Instructors

Proposer shall provide trained and experienced instructor(s), and ensure that they do not perform other duties during the training period that will interrupt instruction. Provide resumes and certification of trainers for TMWA approval.

Instructor will provide a checklist to trainees to evaluate presentation of course materials for effective feedback from TMWA.

# **15 Support**

### **15.1 Support Periods**

Proposer shall provide onsite support commencing when System Software is delivered to and continuing through TMWA's issuance of Notice of Completion following System Acceptance. Price for this support shall be included as part of an itemized bid item in cost proposal.



Proposer shall include in this proposal an itemized schedule of hardware and software annual support costs.

Support shall be provided during any warranty periods for the equipment covered by the support service and during continuous active maintenance agreement terms.

### 15.2 Support Severity Levels

Proposer shall provide a schedule of maximum response times based on severity of system problems. Severity rating should be comparable to the following:

Level 1. A problem for which there is no work-around or failover that causes the software or system to be unavailable.

Level 2. A problem for which there is no work-around that results in a severe loss of access to the Software or system or that causes essential features of the Software or system to not work.

Level 3. A problem that has a material impact on the functionality of the Software or system, but for which a work-around is available and significant business functions are not materially impaired.

Level 4. A non-critical problem in the Software or the system.

Level 5. A request for an enhancement.

During normal business hours (Monday through Friday 08:00 – 17:00 Pacific), response time to Level 1 or 2 problems shall be within one hour of TMWA reporting an inability to use the system. Outside of normal business hours, response time shall be within four hours TMWA reporting an inability to use the system.

For a Level 3 problem, these response times shall be 2 hours and 1 business day, respectively.

Response to Level 1, 2 and 3 problems that cause the software or system to be unavailable shall be provided on a 24x7 basis until the problem is cured.

Reponses shall consist of telephone support, remote access to address system problems, and on-site service, depending on the severity of the problem.

Proposer shall provide in its Pricing Proposal a schedule of any incremental increase in license, maintenance and support fees charged to TMWA if TMWA increases the number of installed endpoints.

### **15.3** Telephone Support.

Proposer shall provide trained persons to answer technical questions and guide TMWA employees through the use or diagnosis of the system through a toll-free number.

Telephone support shall be available at a minimum from 7:00 a.m. through 6:00 p.m. Pacific time Monday through Friday and at any time for Level 1 and Level 2 problems as defined in



Section 15.2 above. Indicate telephone support hours proposed. Response time to a TMWA telephone query shall be within 30 minutes.

Describe Proposer's current support operations (number of persons, location, hours, etc.) and any planned additions as a result of this project.

### 15.4 Remote Access Monitoring and Support

TMWA shall control all remote access to computer resources. Proposer shall be able to remote connect to the control computer or database server to monitor performance, diagnose problems, load patches and upgrades, etc.

### 15.5 Supplemental Onsite Support

Proposer shall provide onsite assistance at the request of TMWA. Onsite support should be rendered within two (2) business days of receiving a request for support. Proposer shall provide a schedule of minimum response times for onsite support, and a schedule of costs.

#### 15.6 Preventive Maintenance Provisions.

Describe recommendations and requirements for AMI system preventive maintenance, backup, archiving, etc.

#### **15.7** Support Groups

Describe any user groups, users' conferences or any other collaborative communities of the Proposer's users.

### **16 Endpoint Installation by Contractors**

The following provisions will apply to work performed by Proposer's installation subcontractor(s).

Proposer shall manage installation of AMI equipment. The Proposer shall:

- Specify the installation methods
- Train the installation service providers
- Manage the installation performance
- Be responsible for the quality control and quality assurance of the AMI network and system installations
- Be responsible for the overall performance of the completed AMI system

Describe the proposed installation approach to managing the network, meter and endpoint installations. Provide a complete workflow for end to end installation process including the handheld track.



### 16.1 Installation Sequence.

Proposer shall conduct installations by group of TMWA meter reading routes, zip code, or other group based on geographic proximity and logistics, to be determined by TMWA in discussion with the Proposer. TMWA will retain the right to prioritize other groups, or to reorganize priorities, both before the project begins and during the project. Unless approved in writing by TMWA, the Proposer shall complete at least 90 percent of the installations in one group before commencing installation on the next group. Exceptions to completion may be granted by TMWA; for example, if a property is vacant or abandoned, has piping or plumbing deteriorated or in fragile condition, has inoperable control valves or curb stops, the Proposer has been denied access after following the contact procedures outlined in this RFP, or other factors as determined by TMWA.

### 16.2 Installation Schedule

TMWA and the Proposer shall establish an overall schedule for installation of the entire project. On the first work day of each week, the Proposer will provide TMWA an updated schedule of where work is planned for the next 3 weeks.

By 7:30 AM PST on the first business day of each week, Proposer will provide TMWA a schedule of where work is planned for that day and each subsequent day of that week, to enable coordination and communication between TMWA and Proposer for the work. If the schedule changes for whatever reason, an updated daily schedule shall be forwarded to TMWA within 24 hours.

### 16.3 Work Hours

Propose normal work hours, which must be approved by TMWA. Installers must be available for evening (until at least 8:00 PM) and Saturday installations, as well as for installations that must be conducted at other times because of special needs. Indicate the number of installers proposed for all installation periods, including those that will be allocated to evenings and weekend times.

### 16.4 Daily Reports

A listing of all installation appointments to be visited by Proposer's installers each day shall be electronically transmitted to TMWA each work day prior to 7:30 a.m. At the end of each day, the Proposer shall transmit electronically to TMWA information on work orders performed in a TMWA-approved file format.

### 16.5 Twenty-Four (24) Hour Customer Access

For 30 days after the installation has been accepted by TMWA and TMWA has been notified of a given installation, Proposer must respond on a 24 hour-per-day basis to calls from the customer associated with that installation or from TMWA, concerning leaks, loss of service, low pressure, and other problems associated with installation.



Should the Proposer receive a call or complaint from a customer or TMWA regarding installation, the Proposer/Installer shall immediately log the call, including caller's name, address, account number if available, date and time of call, nature of problem and the action taken. Copies of all call logs shall be forwarded to a designated TMWA Customer Service Manager not less than once per day.

Proposer must respond within one (1) hour of receiving the call and arrive at customer's premises ready to correct any problems within three (3) hours of receiving the call.

If Proposer fails to respond within these time limits, TMWA may at its option assess liquidated damages of \$300 plus \$100 per hour until Proposer responds or TMWA makes repairs, plus TMWA's direct costs to make repairs. Such penalties and costs shall be deducted from the amount owed to Proposer in the next billing cycle.

Proposer shall maintain a log of all such calls and their resolution, and provide to TMWA a copy of the log daily, using e-mail or another mutually acceptable electronic means. Describe the procedures for response to customer problems.

# 16.6 TMWA Project Manager

TMWA will designate an employee or agent who will manage the project on behalf of TMWA. The function of this Project Manager is to coordinate with the Proposer and ensure compliance by the Proposer with the specifications. The designation of a Project Manager shall not relieve the Proposer of its full responsibility to comply with the terms of the Contract and all plans and specifications.

### 16.7 Installation Acceptance and Payment

Each installation will be accepted by TMWA conditioned upon:

- Electronic submission of a list of completed installations containing for that installation the premise identification number, address, meter serial number, meter reading, MIU serial number, MIU and meter GPS coordinates or location description, installer's name, Proposer's inspector's name, and all other information relevant to the installation;
- Receipt or access to required digital photographs taken before and after installation;
- Satisfactory inspection by Proposer and TMWA in the case of anomalies or if part of inspection sample;
- Confirmation that MIU ID numbers, meter register numbers, and other information have been correctly captured in the AMI control system database and/or TMWA's project management database for each customer's premises; and,
- Successful capture of 95 percent of the scheduled readings over 2 days for meters being read hourly or more frequently, or 95 percent of the scheduled readings over 5 days for



meters being read less frequently. The readings shall be gathered by TMWA operating the AMI system in a normal way.

• However, if TMWA finds discrepancies in the conditions of acceptance for 12 months after the date it was notified of installation, TMWA shall notify the Proposer for corrective work which shall be completed by the Proposer at no cost to TMWA.

Payment for installation services shall be based upon completed routes. The routes vary in size from approximately 200 to 7,000 accounts and are divided into 20 cycles. After substantially completing a route or group of routes, proposer shall provide documentation to TMWA including the list of individual jobs completed, the unit price for each job, a date and time stamp showing endpoint coverage, overall route network coverage, and other details to be specified. The overall network coverage of the submitted routes is expected to meet or exceed the minimum network performance levels specified in Section 2.17. After meeting or exceeding these network performance levels, each installation submitted in the route or group of routes shall be eligible for payment by TMWA once the above conditions are met.

#### 16.7.1 Installation Conditional Acceptance

If TMWA does not inspect the installation within 7 calendar days of being notified of the installation, or if TMWA does not attempt to obtain confirming readings for the installation within 7 calendar days of being notified of the installation, or if TMWA does not confirm that the correct information for the installation has been captured in the AMI control system database and/or TMWA's project management database within 7 calendar days of being notified of the Proposer, then such installation shall be deemed by TMWA to be conditionally accepted; and TMWA shall pay the Proposer. However, if TMWA finds discrepancies in the conditions of acceptance for 12 months after the date it was notified of installation, TMWA shall debit the payments from any amounts owed the Proposer, and remand the work to the Proposer for correction.

#### 16.7.2 Payments

Proposer shall provide to TMWA electronically on a weekly basis its list of newly completed installations and any authorized additional work in an itemized format.

This list shall be attached to an electronic draft invoice. TMWA shall notify the Proposer of any listed items that do not meet the conditions of this section above, so that the Proposer may resolve any discrepancies. TMWA may at its discretion reject the entirety of any list on which there are discrepancies in more than 10 percent of the entries. TMWA shall process all other items as acceptable and arrange payment for these. Payments will be based on the price schedules submitted by the Proposer.



### 16.8 Automated Project Control Process

Proposer should utilize an automated installation control and information management process, so that little or no information has to be captured or entered manually. The system should use electronic tags, bar coding, or similar means to capture equipment identification numbers. The system shall have a redundant backup process, so that all information is preserved in the event of a breakdown in the primary system. The system should enable the correction of any incorrect information pertaining to meter or service size, meter type, meter location, address, etc. Proposer shall describe in detail its installation control system in the Qualifications Statement, including flow charts.

### 16.9 No Solicitation

No contractor, or its employees or agents, may solicit business from TMWA's customers while engaged on any contract associated with this project.

### 16.10 Proposer Staff

Proposer will designate a Contract Manager, who shall have the authority to handle and resolve any disputes or contract issues with TMWA. Disputes that cannot be resolved at this level must be resolved in accordance with the dispute section of this Contract.

Proposer will designate an Installation Manager, who shall be responsible for managing the entire installation project on a day-to-day basis on behalf of the Proposer and for seeing that all installations are carried out in a professional manner and in compliance with the procedures required by the AMI system manufacturer, TMWA, and all other applicable local, state, and federal regulations. The Installation Manager should be onsite continuously throughout the duration of the project, except for holidays and vacations, during which the Proposer shall provide a qualified substitute. The Installation Manager shall be experienced in supervising water meter installation contracts, and familiar with applicable regulations and safe and proper installation Manager. Proposer shall approve the Installation Manager or a change in the Installation Manager.

All of Proposer's employees or subcontractors shall be fully trained by the Proposer in the removal of existing meters and the installation of new meters and MIUs. They shall also be trained in retrofitting newer meters as requested by TMWA with AMI-compatible registers and MIUs, regardless of size. Proposer's employees or subcontractors are not permitted to engage any TMWA customer in an argumentative way. Should those conditions evolve, Proposer's employee shall immediately call a TMWA Field Representative to defuse the situation. TMWA reserves the right to require Proposer to retrain, reassign, or remove from the project any employee or subcontractor who fails to perform workmanlike and competent work.

Proposer shall engage by employment or subcontract at least one person at all times who shall maintain a valid and current Nevada P1 Plumber's License. More than one P1 licensed plumber



shall be provided by the Proposer if the work volume warrants it. This person(s) shall be responsible for supervising the work of all Installers, and inspecting and correcting any problems or damage to plumbing occasioned by the changing of meters or registers or the installation of the AMI equipment under this contract. Proposer shall provide references for each such person. TMWA reserves the right to approve licensed plumbers for work on this project.

#### 16.10.1 Bonding, Background Checks

Proposer shall bond all Licensed Plumbers and Installers. Proposer shall subject all employees to a criminal offense background check and drug and alcohol testing as directed by TMWA. Proposer shall not employ as an Installer any person who fails to meet the requirements of TMWA. TMWA shall be entitled to review the background check before the prospective employee is engaged, and prevent any person who fails to meet requirements from working on TMWA projects. Describe ongoing random testing programs for drugs and alcohol.

#### 16.10.2 Training and Inspection of Employees

Describe training and inspection procedures, and probation provisions for new employees.

### 16.11 Uniforms and Identification

Proposer's field personnel shall wear easily recognizable uniforms containing the Proposer's name, as well as prominently displayed picture identification badges containing Proposer's name, employee name, title and signature, employee picture, and employee I.D. number at all times when performing Contract work. Employees shall also be issued and carry identification cards issued by TMWA. Proposer's employees who are no longer employed by the Proposer shall be required to return their uniforms and identification cards immediately upon termination of employment, and the Proposer shall immediately notify TMWA of all such terminations and if identification cards were received from terminated employee.

### 16.12 Items to Be Supplied by Proposer

Proposer will supply the following components and aspects of installation: overall project management; training and direct supervision of installers; appointment scheduling; problem solving and complaint handling; and inspection, testing, and quality control.

Proposer shall furnish all supplies, materials, tools, and equipment necessary for the successful and timely completion of all meter and AMI installations as specified herein. This includes wiring and waterproof connectors between the meter and MIU in situations where the meter and/or wiring has to be replaced, and meter seal wires and seals where the meter has to be replaced.



# 16.13 Vehicles

Proposer shall be responsible for all vehicles it uses on the project. Proposer should provide service vehicles onsite stocked with common fittings and supplies needed for normal service restoration and/or replacement. Proposer's vehicles shall be uniform in appearance and shall have the company logo prominently displayed on both sides of the vehicle. Temporary signs must be adhesive, not magnetic. Any employee of the Proposer or its subcontractors who drives a vehicle in connection with this project must have a valid driver's license for the class of vehicle being driven, and must be insured as set forth in Attachment C – Insurance Requirements.

### 16.14 Parking

TMWA requires that Proposer deploy vehicles to minimize parking problems and avoid blocking any streets. Proposer is required to follow all parking laws. Proposer shall be responsible for all parking violations.

# 16.15 Local Office and Warehousing

If Proposer or its subcontractors are performing endpoint installations, Proposer shall maintain an insured, staffed office within TMWA's service territory.

TMWA will provide space in its warehouse for Proposer's equipment and inventory. Describe procedures for cross-docking and inventory control and audit.

### 16.16 Call Center

Proposer should provide a call center, web site, and a toll-free number that customers can call to schedule installation appointments, to ask questions concerning the project, or to report problems concerning installations. The call center should incorporate an automatic call distribution (ACD) system capable of receiving and queuing calls; routing calls to waiting agents; and collecting and reporting data on call volumes, waiting times, abandoned rates, and durations. Proposer must answer at least 85 percent of all calls within one minute. No more than 1% of customers' calls may be abandoned after 2 minutes. The call center must be staffed at least between the hours of 7:00 a.m. and 8:00 p.m. Pacific Time, Monday through Saturday. Indicate proposed call center hours and availability of web access for scheduling appointments and questions. TMWA prefers a call center physically located within the United States of America.

### 16.17 Field Communications

TMWA requires that all the Proposer's installers, plumbers, inspectors, and supervisory personnel be equipped with cellular phones or radios so that problems or questions can be addressed immediately and the Installation Manager or TMWA can be contacted immediately, if needed.



### 16.18 Account Data File

Prior to the start of the installations, the TMWA Project Manager will provide the Proposer with an electronic file containing the information necessary to create work orders for meter/AMI installation. TMWA will provide the Proposer with weekly updates to this file for routes where the AMI system has not yet been installed. For each meter, the data file will indicate the meter size, make and serial number, whether or not the meter shall be replaced, the meter location (inside, outside, or unknown), access notes to the meter, and the name and phone number that may be listed on the account.

#### **16.19** Customer Notification

Between 4 and 5 weeks prior to the commencement of installations for a particular group of customers, Proposer shall send TMWA-approved letters informing customers of the project. At least 2 weeks prior to the commencement of installations for a particular group of customers, Proposer shall send TMWA-approved notices to those customers indicating the time when installations will occur and requesting that customers call the Proposer for appointments if the meter is to be replaced and the customer has special needs regarding the momentary disruption of water service. The text of all Proposer letters, door hangers, and other communications with customers must be submitted to TMWA Project Manager for approval at least 2 weeks prior to use. Proposer shall also develop and submit to TMWA the scripts for any telephone conversations with customers for approval by the TMWA Project Manager at least 1 week prior to use.

#### 16.19.1 Notification of Owners

Proposer must notify the owner of a building of its intent to install the AMI system at a particular customer's premises requirements. The owner may authorize the Proposer to make an appointment with an adult (age 18 or over) tenant or the owner's adult (age 18 or over) representative. Proposer shall document such authorization. Customers who have multiple meters shall be given the opportunity to schedule the installation of MIUs on all of those meters in a short period of time, provided those meters are located near each other.

#### 16.19.2 Appointment Scheduling

Appointments shall not be required if the meter is not designated for replacement, and the meter is readily accessible. However, customer notification is still required. Proposer shall be responsible for scheduling and handling all installation appointments. TMWA desires that installation appointments be made with 2-hour precision. Whenever possible, Proposer shall notify customers of any changes in schedule at least 1 day in advance of the original appointment. TMWA reserves the right to impose a penalty of \$50 for each instance where the Proposer has failed to properly notify the customer at least 24 hours in advance of the appointment time of the need to reschedule for another day. TMWA reserves the right to impose a penalty of \$25 for each instance where the Proposer has failed to properly notify the



customer at least 2 hours in advance of the appointment time of a late arrival. TMWA reserves the right to impose a penalty of \$200 for each instance where the installer has completely failed to show up for an appointment.

#### 16.20 Inaccessible Meter and/or MIU

In the event a meter is obstructed or is not accessible, the Proposer will make at least three different types of attempts at any reasonable time within 30 days of encountering the inaccessible meter to notify the customer to remove the obstruction or provide access to the meter. These attempts must be documented on the work order. After three documented attempts to change the meter, the Installation Manager may request the TMWA Project Manager schedule the meter change-out. The Proposer shall only be paid for completed installations and is expected to provide all reasonable support in resolving difficult installation situations.

Proposer will be responsible for installation if TMWA secures an appointment or access to the meter within 30 days of receiving written or electronic notice from Proposer.

#### 16.21 Procedures Approval and Testing

Proposer shall submit detailed scheduling and installation procedures to TMWA for approval within 30 days of Notice to Proceed. The procedures should be designed to optimize the work of the Installers, TMWA field inspectors, and all other staff working on the project.

If an installation subcontractor is to be used for installations, then prior to the commencement of full-scale installation by the installation contractor, but after the Proposer has installed the AMI system control computer, the MDMS and customer portal, the installation control software and a sufficient quantity of data collection units, and all of these components have been tested and accepted by TMWA according to Sections 12.1 and 12.2, the Proposer's installation subcontractor shall install the meters and meter reading equipment on approximately 400 meters following the agreed-to procedures. TMWA will determine which accounts will be included in this pilot.

During this test and a period of not less than twenty (20) business days following it, TMWA and the Proposer shall evaluate the procedures for customer notification, scheduling installations, meter and MIU installation, inspections, data transfer by the installers to TMWA's billing system, meter reading over the system, installation data management and project control, and problem resolution, to ensure they are working and effective. Proposer and TMWA shall develop a test and acceptance plan covering these areas. TMWA may require the Proposer to modify any procedures that it deems are deficient or ineffective or otherwise unacceptable to TMWA. No work will be started on other groups of meters until the AMI system equipment is determined to be working to performance requirements on the test meters, the project control procedures and systems are determined to be performing accurately, and the installation procedures have been approved by TMWA.



### 16.21.1 Work Order Processing

Proposer shall be responsible for ensuring that all data transfers to and from TMWA's information systems are properly working before commencing any installations. TMWA desires read-only access to the Proposer's database and reserves the right to audit the Proposer's database.

Each Proposer's work order issued to an installer will include, at a minimum, the customer's address, service address, premises identification number, meter location, MIU or remote location, designation of whether meter is to be replaced, existing meter number, existing register number, meter make, model and size, and most recent meter reading. All work orders shall be provided electronically.

Should the installer find any discrepancies in the information provided in the work order and what is observable at the installation site (e.g., different meter or MIU number, location or other characteristic), the Installation Manager shall immediately contact the TMWA Project Manager and shall not attempt the installation until the site is inspected by or shown (e.g., using cellphone camera) to a TMWA representative and given authorization.

#### 16.22 Site Conditions

If the meter is to be changed, before or at the time of installation, the Proposer shall inspect the existing water meter setting, including piping and control valves. If the Proposer determines that conditions are such that damage to the existing piping would result, the Installation Manager shall immediately contact the TMWA Project Manager and shall not attempt the installation until the site is inspected and given documented authorization by an authorized TMWA representative.

Additional field data may be requested to be collected and included in the returned work order data, such as premises type (residential, commercial, or industrial) and/or building use.

In the case of any installation anomalies or exceptions, such as rotten plumbing, evidence of tampering, unsafe conditions, etc., the installer or installation supervisor shall first notify a TMWA inspector, who shall approve the installation exception.

### 16.23 Digital Photographs

TMWA requires that digital photographs be taken before and after installation to provide documentation of pre-existing site conditions. Enough photographs shall be taken to clearly identify the condition of the existing meter and associated piping (if applicable) and MIU, and obstructions to the Work. The photograph(s) should have an accurate date and time stamp, and the file name of the photo shall include the applicable premise number. Digital photographs shall be available to TMWA in a database searchable by address, premises identification number, meter number, or account number.



### 16.24 Old Meter Reading

Proposer shall apply procedures to ensure that any meter being replaced is read properly. If the meter is to be changed, Proposer shall provide clearly readable digital photographs of the reading on the old meter register. Installer shall take pictures of the old equipment while it is still installed when this is practical, but must include alternative procedures, as needed, to ensure that pictures are taken in adequate light and from an appropriate angle to ensure that they legibly show the meter reading and are appropriately labeled with date, time, and premise information.

### 16.25 Repairs

At its option, TMWA may authorize the Proposer to make any valve or service line repairs necessary to install a meter to service lines or piping, order the customer to make such repairs, or undertake such repairs itself. Proposer will be compensated at the rates set forth in sections 16.32 and 16.35.

Old piping per se should not be grounds for the failure of the Installer to replace a meter designated for replacement. Only when old piping is leaking or deteriorated to a point that damage to it could reasonably be expected by changing the meter will poor piping be accepted as a reason for not replacing the meter. Unless TMWA's Project Manager remands the particular installation to TMWA for further action, the Proposer is still required to install the meter and AMI equipment after the piping has been repaired or replaced at any time during the installation period.

#### **16.26 Meter Replacement**

Installer should ensure he/she is at the correct location and meter, and check for running water prior to commencing meter change-out. Installer must turn off the water to the building after following TMWA approved notification procedures. Installer shall then replace the meter, using new gaskets or washers. Installer shall put plastic caps on the inlet and outlet of the old meter and handle the meter with care in order to facilitate post-removal testing by TMWA. All meter adapters, bushings, or other hardware necessary to install the new water meter in the consumer's existing meter setup must be furnished by the Proposer. Proposer is required to install standard connections (TMWA-approved meter couplings) for all ¾" thru 1" meters if none exist currently. The Installer shall remove the existing MIU from the customer's premises.

### 16.27 Wiring and Connections

If the meter at a customer's premises is designated for replacement, Proposer shall also replace the existing wire cable from the meter to the MIU with three-conductor vinyl shielded cable with not less than 22-gauge solid copper wires of colors red, green and black. Connectors used outside the premises must comply with UL-486D and IP68.



#### 16.28 Meter Salvage

Proposer shall scrap all replaced meters and credit TMWA for salvage value based on unit values submitted in the Pricing Proposal.

#### 16.29 Disposal of Existing MIUs

Proposer shall collect and arrange for the proper disposal of all removed MIUs. Include unit cost for this in the Pricing Proposal.

#### 16.30 Strainers

If there is a strainer at any installation, the Installer shall clean it and restore it. If the strainer cannot be cleaned, Installer shall replace it.

### 16.31 Verifying Service Working

Installer shall flush water line from the customer's outside spigot if reasonably accessible after installing a new meter to ensure the meter is registering properly and verify service restoration to the entire premises.

#### 16.32 Valves

If the Installer cannot shut off water using the street-side control valve (details must be documented on a work order), he shall call the TMWA Project Manager to arrange curb valve shut-off. If shutoff valves cannot be reopened, the Proposer shall replace such valves following TMWA rules, regulations and specifications, upon being authorized by TMWA. Valves provided by the Proposer must conform to TMWA's specifications and approved materials list. Proposer shall provide in its price proposal fixed unit pricing for valve replacement by size.

Installer should use a water meter base spreader tool to change  $\frac{3}{2}-1$  water meters not on a meter yoke.

#### 16.33 Meter Setting Irregularities

Proposer shall report to the TMWA Project Manager, prior to the installation of a meter, any meter or plumbing irregularities including but not limited to existing meters installed backwards and disconnected meters or any other indication of tampering, including meters removed and replaced with connecting pipes; registers disconnected from meters; illegal connections before a meter; unmetered connections of a customer's plumbing to a service lateral, fire pipe, or water main; or any other violations of TMWA's regulations. When such irregularities are found, Proposer shall not proceed with the installation until the TMWA Project Manager has authorized such installation in writing.

#### 16.34 Dirt or Water Around Meter

Proposer shall be responsible for removing and properly disposing of any dirt needed to access a meter in a meter vault. Dirt shall be removed such that there is a minimum of 2" clearance



below the valves at the meter. Proposer shall attempt to expose connection to the service line and any piping between the service line connection and the meter to ensure that they are in a condition that will not be damaged by changing the meter. If a water meter vault is flooded so that the meter is fully or partially submerged, the Installer must pump out the vault before changing the meter. The pumped-out water shall be disposed of in a safe and proper manner as to not cause harm to the surroundings or to others. Installer must ensure that the water service is not in any way contaminated, even intermittently, by standing water in the meter vault. All waste resulting from cleaning the meter vault as well as replacing the ring and lid must be cleaned up and disposed of properly by the Proposer. The existing ring and lid, if replaced, shall be disposed of by the Proposer. If grass or shrubbery is expected to impact the installation or may be damaged by the installation process, the Installer must notify the TMWA inspector. The Installer must return the property to the original condition to the satisfaction of the customer by replanting, resodding, reseeding or compensating customer. TMWA reserves the right to inspect any installation and cleanup work within 15 days before payment is made to the Proposer. TMWA reserves the right to inspect any installation and cleanup work within 90 days after installation in response to customer complaints of damage. Proposer shall be responsible for claims resulting from damage caused by installation.

### 16.35 Service Line Damage

Proposer shall be responsible for repairing any water service lines it damages at its sole cost and expense, unless the Installation Manager has reported, prior to commencement of installation, a condition of antiquated or inferior plumbing to the TMWA Project Manager and the TMWA Project Manager has authorized the Proposer to proceed with the work. In the event a service line fails during or after the installation procedure has been authorized to proceed, the Proposer's licensed plumber will oversee the repair work required to restore the water service line to working order. Proposer shall include in its proposal a schedule of compensation for service line repairs by foot of service line and size. The cost of this work will be reimbursed to the Proposer at the price set out in the schedule. This price will include site preparation, all labor, material, and permits as required. All work must comply with TMWA's standards for service repairs or replacement. TMWA personnel shall inspect all work, payment for which is subject to approval by TMWA.

Any damage done by the Proposer outside the area and scope of the work of the contract shall be repaired or replaced at the Proposer's sole cost and expense.

All plumbing work other than the replacement of a water meter must be authorized by TMWA and inspected by a TMWA field inspector and will be subject to TMWA approval.

#### 16.36 Completed Work Orders

Completed work orders that involve meter change-outs shall include: meter size and meter type, verification or correction of existing meter and account information, old meter serial number, final reading on old meter, new meter number, new meter register number, premises



identification number, MIU ID number, reading on new meter register, date and time of installation, name of installer, composition of water service line, inspection sign-offs and notice of any problems encountered or repairs made.

Completed work orders that involve only MIU installation shall include verification or correction of existing meter and account information, premises identification number, MIU ID number, reading from meter, date and time of installation, name of installer, inspection sign-offs and notice of any problems encountered or repairs made.

All information requested on the work order must be completely filled out for the installation to be considered complete and eligible for payment. An electronic copy of all the work order information must be provided to the TMWA Project Manager on a daily basis. Completed work orders will include, at a minimum, location information, MIU ID number, MIU location, new meter number and initial reading (if meter is to be changed), field inspection sign-offs, notes of any anomalies.

### 16.37 Quality Control

Proposer shall be responsible for replacing any meter, MIU, or appurtenances improperly set by its Installer at no additional cost to the TMWA. Proposer shall correct any damage to couplings, threads, unions, or meters by use of improper tools or cross threading by an Installer.

Proposer shall be responsible for correcting any leaks at the valves, couplings, or service lines that could reasonably be attributed to the meter installation if reported by TMWA or customers within 30 days of installation at no additional cost to TMWA.

Proposer shall describe its procedures and protocol for inspecting installations, including installation by new employees, recording and reporting inspection findings, and remediating any issues discovered through inspections.

### 16.38 Installation Data Control and Audit Procedures

Proposer shall describe in detail its proposed system for ensuring that all data pertaining to installation are correctly recorded during installation, and that all data transferred to the TMWA Customer Information System (CIS) are accurate. Proposer shall describe procedures for eliminating any opportunities for a meter or MIU to be associated in the head-end computer, MDMS or the CIS with the wrong address or account number.

# 17 Project Management, Meeting and Reports

Describe the proposed approach to project management including an organizational chart to show the relationships between Proposer staff and TMWA staff. Provide roles and responsibilities of key personnel including: Installation Manager, Contract Manager, TMWA Project Manager, Proposer field inspectors, and TMWA field inspectors.

Provide sample layouts of all anticipated reports for managing the project to ensure the contract is completed, on time, within budget, and meets all performance requirements.


# 17.1 Project Goals and Milestones

The successful Proposer shall propose detailed goals and milestones for deliveries or accomplishments within the Project schedule established by TMWA, and subject to approval of TMWA. Should the successful Proposer fail to meet a key milestone within a reasonable period of time, TMWA shall collect liquidated damages in the amount of \$1,000 per day until the milestone is met.

# 17.2 Project Management Meetings

Contract Manager shall meet with TMWA personnel periodically and not less than monthly to update them on progress against the installation schedule. Describe the proposed meeting plan including reporting requirements, expected participants, and expected topics of meetings.

Proposer's Project Manager and other personnel, as requested by TMWA, will meet with TMWA's Project Management staff not less than weekly from the point in time a Notice to Proceed is issued through the project closeout. Describe the proposed meeting plan including reporting requirements, expected participants, and expected topics of meetings.

# 17.3 Installation Management Meetings

Proposer Installation Manager and other personnel, as requested by TMWA, will meet with TMWA's Project Management staff not less than weekly from one month prior to the start of the procedural pilot through the installation period. Describe the proposed meeting plan including reporting requirements, expected participants, and expected topics of meetings to ensure timely, cost–effective, and high-quality installations and customer satisfaction assurance with the installations.

# **18 Water Meters**

# 18.1 General Meter Requirements

#### 18.1.1 Quality Control Statement

TMWA expects the manufacturer of meters submitted as part of the proposal to submit its meters to a vigorous quality control and testing procedure before shipping. If any shipment of meters exceeds a 0.5% failure rate, or if a manufacturer's meters exceed a 0.35% failure rate in aggregate, TMWA reserves the right, in addition to any legal remedies, to default the contract for a certain size meter or for all sizes of meters, and require the Proposer to obtain meters from another manufacturer.

#### 18.1.2 Latest Models

Meters shall be new, of the latest production model, with the latest standard equipment, including items specified.

#### 18.1.3 Applicable Documents



The following documents of the issue in effect on the date of this RFP, form a part of these requirements to the extent specified herein:

- American National Standards Institute (ANSI) B1.20.1 "Pipe Threads"
- ANSI B 16.1 "Cast Iron Flanges"
- AWWA C700, 701,702,703,704,706, 707 and 710, as applicable

#### 18.1.4 Unproven Designs

Parts or components not proven in service for a period of two (2) years, and experimental or untried equipment will be acceptable only with the identification of such parts and a written guarantee that such parts are totally replaceable by the meter vendor, including all labor incurred by TMWA, for a period of four (4) years from the date of purchase. TMWA requests that Proposers who wish to offer meters that are unproven and/or do not conform to existing AWWA standards, should clearly identify the proposal as an alternate to its primary proposal which incorporates proven and AWWA-compliant meters.

#### 18.1.5 Lead in Meters

All meters must conform to NSF 61 standard.

#### 18.1.6 Tools

Meter manufacturer shall furnish, at no cost, within ninety (90) days from the date of Notice to Proceed, all specialty tools required for meter maintenance, in reasonable quantities to be negotiated with TMWA.

#### 18.1.7 Serial Numbers and Labeling

The manufacturer's serial number shall be stamped on the main case of all meters, and shall be clearly visible when viewed from above. The serial number shall consist of all numeric digits. All meters shall have stamped or cast on them the size and model. The direction of the flow through the meter shall be properly indicated. The serial number must also be provided on two bar code labels attached to the meter, one of which shall be removed for transfer to a paper record. TMWA prefers that the serial number include digits representing the year of manufacture.

#### 18.1.8 Parts

A complete parts catalog, and pricing sheets showing list prices and discounts from list, must be supplied with the proposal for all meter models incorporated in the proposal. The model number of each item being proposed must be indicated and the appropriate literature, data sheets, and specifications must be attached to the proposal. All parts or interchangeable



equivalent parts shall be readily available from the meter manufacturer for a period of twenty (20) years from the date of purchase.

#### 18.1.9 Shipping Container Marking

Individual containers (if applicable) shall be marked to identify contents and quantity. TMWA desires that this information also be in the form of bar codes for scanning. Meter shipments shall be accompanied by a computer file of the meter serial numbers for TMWA's database.

#### 18.1.10 Technical Data

Proposer shall provide all manuals, diagrams, tolerance charts, exploded views, parts numbers, pricing, electronic diagrams, and any Safety Data Sheets (SDS) within thirty (30) days of the Notice to Proceed.

#### 18.1.11 Tamper Resistance

Meter and register shall be equipped with drilled holes for the installation of a security seal and wire to secure register, plumbing connections, bottom plate and cabling. Split case meters shall have 3/32" seal wire holes through two (2) aligned case bolts or one (1) 3/32" seal wire hole through both halves of case.

#### 18.1.12 Strainers

All meters shall contain removable non-corrosive strainer screens.

#### 18.1.13 External Case Bolts

All external case bolts, cap bolts, washers, and nuts shall be of sufficient strength for the purpose and must be of non-corrosive material designed for easy removal after long service.

#### 18.1.14 Updates

Manufacturer shall provide technical updates to TMWA and changes of technical information within thirty (30) days of publication.

#### 18.1.15 New Design Approval

Proposer shall notify TMWA in advance of all changes in design or material for meters that have been selected and approved by TMWA, and must submit these changes for TMWA approval prior to any shipments of meters involving these changes.

#### 18.1.16 Interchangeability

All meters of the same size or capability shall be manufactured so as to permit complete interchangeability of all parts (e.g., discs, pistons, chamber tops, chamber bottoms, registers, etc.).



# 18.1.17 Factory Accuracy Tests

All meter accuracy tests shall be conducted in accordance with AWWA test methods and meter standards. The manufacturer shall furnish to TMWA an electronic copy of the test results for each meter shipped. Specific information contained within the test results shall include the manufacturer serial number, flow rates, results of each flow rate test, the size of the meters being tested, the model number, the date, and the tester. TMWA also desires the test results be provided on a tag attached to the meter. Vendor shall indicate if test results obtained through the use of any register other than the actual register shipped with the meter.

#### 18.1.18 Lay Lengths

Fire protection meters, compound, and turbine meters shall include an external strainer if replacing existing installation with an external strainer. Proposers having meters of a lesser lay length shall provide a steel spacer, no greater than four (4) inches long, or a flanged spool. Spools must be constructed of class 55 cement lined ductile iron pipe with welded or threaded on flanges. Spools must be no shorter than four (4) inches face to face, and guaranteed not to leak. Flanges shall be made of no less than 125-pound class material. Proposals shall include the cost of spacers or spools needed to meet the required laying length and any necessary bolts, nuts or other appurtenances.

#### 18.1.19 Inspections

Equipment shall be subjected to inspection to ensure compliance with the specifications. Shipments of equipment shall be subject to sampling (according to ANSI/ASQ Z1.4) and testing for compliance with specifications. Shipments failing the sampling and testing protocol shall be rejected in their entirety and returned to the supplier. Any individual pieces of material which fail inspection shall also be rejected and returned to the supplier. All freight costs and any other costs incurred by the rejection will be borne by the supplier.

#### 18.1.20 Testing by TMWA

Proposer shall provide an opportunity for TMWA to remove a sample of the meters from each shipment for its own testing. All meters tested will be tested as a unit (i.e. meter and any attached register or attached reading device). If any part or portion of a unit does not function properly the entire unit will be considered defective.

#### 18.1.21 Rejection

Water meters that do not meet the requirements of this specification shall be rejected by TMWA, removed by the manufacturer at its own expense and replaced within the delivery date specified.



# 18.2 Meter Registers

18.2.1 Encoder

All meters shall be equipped with dial-position encoder registers that conform to the latest AWWA standards except as amended herein. TMWA requires replacement register be dial-position encoders or electronic, not pulsing "digital" registers.

18.2.2 Manual Readability

The meter reading and other information must be readable without the need for any special equipment.

18.2.3 Cap

Meter registers should have a flip cap to prevent dirt from interfering with the visual inspection of the register, its ID number, its indicators and other information.

#### 18.2.4 Resolution

Registers shall be capable of reporting not less than 10 gallon increments through the reading system. TMWA prefers 1 gallon transmitted resolution.

#### 18.2.5 Leak Detector

The meter register shall have a visible leak detector.

#### 18.2.6 Connectors

The register and wire connection shall be waterproof and corrosion proof. TMWA prefers factory-potted connections. Meters will be provided with Nicor or equivalent connectors on a 5-foot three-conductor 18 gauge cable potted to the meter register to protect the connection from water intrusion. Indicate the methods of manufacture and installation to ensure this.

18.2.7 Environmental Tolerance

Meter registers shall be sealed to withstand long-term and repeated submersion in water and wide variations in ambient temperature.

#### 18.2.8 Tamper Resistance

The meter registers as well as the terminals or wire connections, must be tamper resistant. Indicate how this is accomplished.

18.2.9 ID Number



Each encoder register shall have a unique identification number with a minimum of 8 digits that can be read electronically when the meter is interrogated and transmitted to or stored in the MIU. For new meters, this number shall be the same as the number stamped into the meter base. This register number shall also be visually readable on the register display or the cap. TMWA prefers that this number be permanently stamped into the cap. The register should be shipped with an attached bar code corresponding to the register number.

#### 18.2.10 Registration Display

The register(s) on the meter shall be odometer-style or digital display, with at least six recording dial wheels or digits, the information from which is transmitted to the meter interface unit. Static or non-transmitting digits shall be a different color. A visual leak detector indicator shall be included on sizes 5/8" through 2" registers.

#### 18.3 Small (3/4"-2") Meters

#### 18.3.1 Metrology

TMWA prefers meters of either positive displacement or no moving part design. If proposing more than one type of meter, Proposer shall provide responses and prices for each type separately.

#### 18.3.2 Longevity

Indicate expected life of the meter. Indicate if register can be replaced separately from measurement assembly. Indicate if meter uses a battery and whether or not battery can be changed to extend life of meter. Provide costs for this in the pricing proposal.

#### 18.3.3 Pressure Loss

The maximum pressure loss at safe maximum operating capacity shall be 10 psi.

#### 18.3.4 Meter Cases

All meters shall have an outer case with a separate removable measuring chamber in which the disc or piston operates.

#### 18.3.5 Pipe Connections

If a fully composite meter is proposed describe the approach to minimize the risk of cross threading.

Connections shall be meter casing spuds having external straight threads conforming to ANSI B1.20.1. Couplings shall conform to NSF 61 and ASTM B-62 specifications.



#### **18.4 Compound Meters**

18.4.1 Standard

All meters shall conform to the latest AWWA Standard C-702 for Cold Water Meters except as amended herein.

18.4.2 Meters – Interior Parts Removal

Meters shall be designed for easy removal of all interior parts without disturbing any connections to the pipeline.

18.4.3 Flanges

All meters shall be furnished with flanges on both ends. Flanges shall be of round type, faced and drilled, and shall conform to the American National Standards Institute case iron pipe flange, class 125, ANSI B 16.1 for diameter, drilling and thickness. All companion flanges shall be tapped American Standard internal taper pipe thread, ANSI B2.1.

18.4.4 Installation Supplies

Proposer must supply the necessary bolts, nuts, washers and gaskets for all meters 1-1/2 through 12".

18.4.5 Pressure

Meters shall be guaranteed to operate under a working pressure of 150 psi without leakage or damage to any part.

18.4.6 Strainers

Strainers shall be either an integral part of the meter or a separate flanged casting and shall be easily accessible for cleaning. Strainers shall be rigid, easily removed, and have an effective straining area at least double that of the main meter case inlet.

#### 18.5 Turbine Meters

18.5.1 Standard

All meters shall conform to the latest AWWA Standards C-701 for Cold Water Turbine Type, Class II, except as amended herein.

18.5.2 Flanges

All meters shall be furnished with round flanges on both ends. Oval flanges shall be furnished on 2" meters.

18.5.3 Strainers



Strainers on 3" through 6" meters where required to replace an existing strainer shall be companion to meters and shall have all bronze cases, cover plates and screens. Strainers on 8" and 10" meters where required to replace an existing strainer shall be companion to meters and shall have cast iron (or bronze) cases and cover plates and bronze screens. Except for fire meters, the external strainer screen shall have a minimum net opening area of two (2) times the pipe diameter and shall be made of stainless steel. All strainers must provide a plug at the bottom area for the draining off of debris.

#### 18.5.4 Guarantee

The manufacturers shall guarantee the entire meter, including the register for a period of 15 years from the date of shipment against all defects in material and workmanship. Any other guarantee by the manufacturer shall be stated in its proposal.

#### **18.6** Fire Flow Meters

#### 18.6.1 Standards

All meters shall conform to the latest AWWA Standard C-703 for Cold Water Meters - Fire Service Type, except as amended herein. Fire Service meters and strainers shall have the Underwriter's Laboratories, Inc. (UL), and Fire Mutual (FM) approval for use on fire lines.

#### 18.6.2 Flanges

All meters shall be furnished with round flanges at both ends. Companion flanges are not required.

#### 18.6.3 Side Arm Meter

The side arm meter shall conform to the appropriate TMWA specification for that size.

#### 18.6.4 Warranties

The manufacturer shall guarantee the entire meter, including the register, for a period of fifteen (15) years from the date of shipment against all defects in material and workmanship. Any other guarantee by the manufacturer shall be stated in its proposal.

#### 18.6.5 Strainers

Fire service strainers where specified shall be companion to meters and shall have cast iron cases and cover plates and stainless steel screens.

# **19 Meter Vault Lids**

The AMI system should be configured to obtain the maximum signal strength from MIUs installed in meter vaults. Proposer shall replace or retrofit (e.g., by installing brackets or drilling) all meter vault lids. All replacement lids should be a non-ferrous composite to facilitate

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radio transmissions. All new meter lids must be non-floating and resist being dislodged by virtue of weight or features. All lid configurations must be submitted to and approved by TMWA before installation.

# **20** Warranties

TMWA shall have sole discretion to choose the applicable warranty should there be a conflict between warranties. All required warranties shall be submitted to TMWA as stipulated in the Contract Document Agreement.

#### 20.1 MIUs/Endpoints

All MIUs supplied in connection with this proposal shall be guaranteed to be free from defects in workmanship for a period of at least 10 years from the date of installation acceptance. Any MIU that fails during this period shall be repaired or replaced at manufacturer's sole cost and expense. MIUs shall be guaranteed against failure for an additional 10 years such that a failed component will be replaced on a pro-rated cost basis. Proposer shall provide a schedule of the pro-rata costs in its pricing tables. Pro rata costs to TMWA shall be based on the original purchase price adjusted for inflation, or the then currently available purchase price, whichever is less. These costs shall be submitted in the Price Proposal.

# 20.2 Fixed Data Collection Units and Repeaters

Mobile data collection units shall be guaranteed to be free from defects in workmanship for a minimum of twelve (12) months from date of delivery. Fixed data collection units and repeaters shall be guaranteed for a minimum of twelve (12) months from date of installation acceptance.

# 20.3 Handheld Meter Reading Equipment

The handheld units, data cradles or data transfer devices (including memory cards and memory card readers), and all accessories (including batteries, straps, cables and cases) shall be guaranteed for a minimum of twelve (12) months from date of delivery. Any handheld device or accessory found to be defective upon delivery must be exchanged for new and shall not be repaired or exchanged for a remanufactured device.

# 20.4 Maintenance Agreements

Proposer shall provide TMWA with equipment maintenance agreements, which may be renewed annually by TMWA for at least fifteen (15) years. Should handheld unit firmware updates require sending the devices to the factory or authorized repair center, Proposer shall provide a loaner device for each device being upgraded so that meter reading activities can continue.

For each piece of hardware or software, state any required or optional maintenance programs beyond the warranty period. Include program features and any additional charges such as hourly rate for on-site and/or remote support. State the location of and procedures for obtaining such support.



# 20.5 Repair Turnaround

Repairs to handheld units or data collectors shall be accomplished either locally, at TMWA facilities, or at the manufacturer's factory or authorized repair center, within ten (10) working days. Shipments from TMWA for out of warranty repairs will be at TMWA's cost and the return shipments will be at Proposer's cost. For repairs not completed and returned within ten (10) working days, Proposer shall provide a loaner HMRU or MDCU until the TMWA's unit is returned in working condition.

#### 20.6 Other System Components

All other system components not specifically noted above shall be guaranteed for one (1) year from the date of installation acceptance, including parts and labor.

#### 20.7 Installation

All installation work, including materials used in the installation performed under this contract, shall be guaranteed against defects in workmanship for a period of one (1) year from the date of installation acceptance.

#### 20.8 Software, Firmware

Proposer shall provide a written guarantee that no changes in the software, firmware, or hardware design of components of its MIUs, DCUs or Repeaters that it provides to TMWA for twenty (20) years from the Commencement Date will be made without prior testing and verification that such changes will result in no loss of functionality for the meters incorporated in TMWA's AMI system. In the event of such incompatibility or loss of full functionality, Proposer shall be responsible for repairing or replacing all of its equipment that is not working, including labor. Firmware updates for handheld devices shall be provided by Proposer at no additional cost to TMWA for twenty (20) years from the date of delivery of the unit.

Proposer warrants that any and all software provided as part of its system to TMWA does not contain any program code, virus, worm, trap door, back door, timer, or clock that would erase data or programming or otherwise cause the software to become inoperable, inaccessible, or incapable of being used in accordance with its user manuals, either automatically, upon the occurrence of Proposer-selected conditions, or manually on the command of Proposer, or upon occurrence of user-selected conditions.

# 20.9 General Nonperformance or Excessive Failures

The Proposer of the AMI equipment shall warrant the MIUs, DCUs and Repeaters against failures that exceed the guaranteed maximum failure rates as defined (by Proposer) in the Pricing Proposal. Should the failure rates exceed these levels, or should the system in its totality substantially fail to perform such that TMWA, in its sole and good faith discretion, cannot reliably use the system for billing, or should the occurrence of erroneous or inaccurate meter readings exceed 20 per thousand per year, then the TMWA may notify Proposer of this



condition, whereupon Proposer shall be responsible for promptly restoring the system to its normal level of reliability and accuracy at its sole cost and expense. These expenses will be subject to TMWA's discretion as to whether the vendor refunds TMWA's actual replacement costs or whether the vendor completes the replacement themselves.

# 21 Optional Hosting and Managed Services

In lieu of acquiring, deploying, operating and maintaining certain AMI-related hardware and software at its own facilities, TMWA may choose to procure hosted services covering the AMI head-end system hardware and software; Meter Data Management System, including interfaces to its CIS and other key IT systems (GIS, work order); and Customer Portal. Under this arrangement, Proposer would:

- Provide access by TMWA and its customers to TMWA's AMI generated data and related applications on production and test systems.
- Manage hardware and third party software compatibility, including version control and implementing and testing upgrades and patches as required.
- Ensure the continued integrity of the interfaces between the applications and TMWA's CIS when this latter software is patched, upgraded or replaced.
- Troubleshoot throughput and other issues impacting the system performance or accessibility.
- Maintain data and data center security.
- Backup and archive TMWA system data and restore it in the event of a system crash or failure.
- Provide application development services, including creating or assisting TMWA in creating customized reports, and application programming interfaces.

# 21.1 Term

Hosting services fees, if elected by TMWA, would commence following the acceptance of the Pilot and continue for a minimum of five years from the date of System acceptance. TMWA may at its sole option extend the contract annually for up to 15 additional years based on the price schedule provided in response to its this Request for Proposal for these services. These costs shall be submitted in the Price Proposal.

# 21.2 Data Centers and Communications

Proposer shall describe the proposed method of communications between TMWA workstations and Proposer's servers, including redundancy and security of those communications.

All data centers used to support TMWA's AMI system and data, including any disaster recovery data centers, shall be located in the United States.



Any third-party data centers used to support TMWA's system must comply with all of the requirements of this section. No third-party data centers shall be used without prior written permission of TMWA.

#### 21.3 Design Documents

Prior to the start of hosting service, Proposer shall submit interface and system design draft documents, as well as processes and procedures draft documents, in conformance with the requirements herein, for approval by TMWA. Documents shall cover access by TMWA and its customers. Documents shall cover proposed technical architecture, including servers, peripherals, communications devices, and the system that run on each, indicating which components would be dedicated to TMWA's project.

#### 21.4 Proposer Responsibility

Proposer shall:

- Configure and make available to TMWA production and test environments on virtual servers.
- Make all system features available to TMWA users through web access.
- Monitor and maintain the computing hardware required to run the applications.
- Acquire all licenses for third party products required to maintain the applications and ensure hardware and third-party software compatibility.
- Maintain version control for third party products and the applications. Maintain third party software on supported versions. Implement upgrades and patches as required in accordance with vendor recommended schedule.
- Monitor and ensure the integrity of the interfaces between the applications and TMWA's CIS. Provide TMWA with a draft test plan upon notification by TMWA of intended patches or upgrades to the CIS. Test all functionality when this software is patched or upgraded.
- Monitor access to hosted software by TMWA and its customers, and respond to and troubleshoot throughput and access issues identified by the system or user interface software, and by TMWA or its customers.
- Backup and archive TMWA system data, and restore the system and data in the event of a system crash or failure by using system backups or a disaster recovery program.
- Monitor and report Key Performance Indicators (KPIs) as defined herein.
- Provide application development services, including creating or assisting TMWA in creating customized reports and application programming interfaces.
- Provide support as defined herein to transition the System to a TMWA defined location in the event the TMWA opts to cancel the managed services agreement.



• Provide and maintain a secure file transfer (SFTP) site, which will be used to post system files and reports.

# 21.5 Interfaces and File Transfer

In response to a "From Host" file from the CIS requesting readings for billing, the MDMS shall generate a "To Host" file containing the meter readings and other information as specified in the technical architecture and interface documents.

In response to a CSV, XML or comparable configuration document generated daily by TMWA's CIS, the head-end system, MDMS and/or Customer Portal will synchronize endpoint and customer data and generate a confirmation report.

Proposer will deliver alert and tamper reports on a real-time continuous basis to a TMWA designated terminal or workstation.

Should Proposer's software be used to accept or manage field work orders related to MIU and/or installation, Proposer shall generate a daily file of work order information to be uploaded to TMWA's CIS and asset management systems, as defined in the technical architecture and interface documents.

#### 21.6 Database Maintenance

Proposer shall:

- Run routine diagnostics for data corruption and abnormalities, rebuild indexes, and remove duplicate records.
- Run routine checks for security flaws and other issues that could compromise database integrity.
- Run compacting and defragmentation procedures, and keep database statistics up to date.
- Monitor data and log file size to minimize response time to queries and file requests.
- Run these procedures on a schedule designed to minimize interference with user access.

# 21.7 System Availability

The head-end system and customer portal shall be available not less than 99.0% of the time, and the MDMS not less than 99.5% of the time, measured over any 30-day rolling period, except for scheduled upgrades and preventative maintenance. Any downtime required in order to fix problems with the software or hosting servers and devices shall not be considered to be scheduled maintenance and shall count as downtime. "Accessible" shall mean that all of TMWA's users can gain access to and use all of the modules and applications they are authorized to use on the hosted site. In the event that there is downtime in excess of the allowed downtime, Proposer shall provide a credit to TMWA on an hour-for-hour basis against all of the monthly fees associated with the Software, Hosting and Support for the first ten (10)



hours of downtime in the aggregate during the rolling 30-day period at issue. For hours 10-20 aggregate hours of downtime, Proposer shall provide two hours of credit per hour of downtime. For any aggregate hours of downtime in a rolling 30-day period in excess of 20 hours, Proposer shall provide a credit against all monthly fees on a three hours credit for each hour of downtime basis.

Credits shall be applied against the next invoice. In the event a Service Level Default occurs after a party has given notice of termination, or Customer has made final payment to Proposer for the Managed Services and no further invoices shall issue as a result, Proposer shall refund to Customer the amount of the appropriate Service Level Credit due for the period of Default.

Should System Availability fall below 90% over a 90-consecutive day rolling period, Proposer will provide TMWA support as needed to transition the System to a TMWA defined location at no cost to TMWA.

If any time, should System Availability fall below 75% over a 30-day rolling period, then the Proposer will provide TMWA support as needed to transition the System to a TMWA defined location at no cost to TMWA.

The cost of providing this level of service shall be incorporated in the Price Proposal. Proposer may at its option provide additional prices reflecting other levels of availability.

These credits shall be considered to be liquidated damages and not a penalty. Proposer shall acknowledge that in the event of downtime in breach of the warranty, TMWA will incur damages that, while significant, may be difficult to prove with particularly. Proposer acknowledges that the liquidated damages set forth above have been negotiated at arms' length and reflect the parties' reasonable expectation of damages that TMWA will likely incur given the circumstances known to the parties at the time this agreement was executed.

# 21.8 Security

Describe the data center physical security provisions.

Describe the firewall and application-level security proposed.

Proposer shall supply with its proposal [Qualifications Statement] its current Statement on Standards for Attestation Engagements (SSAE) No. 16.

#### 21.9 Response Times

During normal business hours (defined as Monday through Friday 08:00 am – 5:00 pm Pacific Time), response time shall be within one hour of TMWA reporting an inability to use the system.

Outside of normal business hours, response time shall be within four hours of TMWA reporting an inability to use the system.



# 21.10 Problem Analysis and Resolution

Proposer shall propose procedures to report on and deal with problem analysis and resolution based on extent and criticality of the problem using a systematic problem diagnosis and decision-making model or procedure, including root cause analysis, in accordance with Section 15.2. Problem resolution shall include immediate corrective measures and where appropriate, root cause analysis and long-term preventive measures to prevent reoccurrence. An interruption in services will be the highest priority.

TMWA will provide reasonable resources to assist Proposer in problem analysis.

Initial problem will be reported to TMWA's designated AMI system manager. Findings will be shared with TMWA.

#### 21.11 Scale

Initially, the system shall support 130,000 metered accounts and shall be scalable to at least 300,000.

The system should support simultaneous access by a minimum of 20 TMWA users.

Indicate the number of customers the Customer Web Portal can support simultaneously.

#### 21.12 Backup and Disaster Recovery

TMWA desires that Proposer maintain dual data centers so that one center shall provide secure backup for the other. On a not less than hourly basis, Proposer shall synchronize TMWA data to a disaster recovery database.

The recovery time requirement in the event of a system or database failures shall be 4 hours.

The recovery point requirement in the event of system or database failure shall not be more than 2 hours.

On a not less than daily basis, Proposer shall backup system and TMWA data to tape or other mass storage device.

On a not less than weekly basis, Proposer shall backup system and TMWA data to a secure offsite facility.

Proposer will schedule and perform a disaster recovery test not less than annually to ensure continuity of the disaster recovery process, and report the results to TMWA.

#### 21.13 Reports

Proposer shall generate reports of any software patches or upgrades, or updated anti-virus releases.

Proposer shall provide email notification to a list of staff provided by TMWA when reports are posted to the site.

# **21.14** Key Performance Indicators

Proposer will provide a monthly report of the following key performance indicators for each of the software components:

- Availability as percentage of uptime
- System, as well as software component, uptime
- Proposer will provide a monthly report of the following performance statistics for each of the following:
  - CPU Utilization
  - Disk I/O Performance
  - Memory Utilization
  - Database server long-running (that is, multitransactional, persistent state) processes
  - Database server dead locks

# 21.15 Opt-Out Provisions

Should TMWA decide to transition the System to a TMWA defined location by canceling the hosted services arrangement, Proposer will develop a Scope of Work that includes the activities to support the Opt-Out transition ("Opt-Out for Convenience"). TMWA will be responsible to secure all server hardware and third-party software required to implement the system software at a TMWA-defined location.

Proposer shall:

- Assign a Project Manager, a Business Consultant and a Technical Consultant for two to three months as outlined in the project plan at normal professional service rates assigned to those persons.
- Modify system design documents and processes and procedures documents, including test plans, to reflect the architectural and dataflow changes and include server hardware and third-party software requirements.
- Create a data migration plan to ensure the integrity of historical data.
- Install and configure the head-end, MDMS and customer portal software at the TMWAdefined location.
- Redirect communications of the Collectors to TMWA's head-end system.
- Train TMWA staff on proper system operations and maintenance.
  - $\circ$   $\;$  MDMS management for a minimum of 5 TMWA employees or agents.





- System software, hardware, configuration and all technical equipment maintenance for a minimum of 5 TMWA employees or agents.
- Provide TMWA with the System Acceptance documentation transferring operational and maintenance responsibilities.

# 22 Optional Network and System Endpoint Monitoring

In lieu of or as an adjunct to its own functions, TMWA may choose to procure AMI network and system monitoring services. Proposer would:

- Monitor network devices (data collectors and repeaters), and their backhaul communications (in terms both of contractual and operational performance), troubleshoot and investigate suspect components, and create work requests for field repairs.
- Monitor overall endpoint performance, and execute a triage protocol for creating work orders for field investigations and repairs.
- Deliver event and alarm reports to the appropriate TMWA department or resource.

# 22.1 Term

Network and system endpoint monitoring services, if elected, would commence following the acceptance of the Pilot and continue for a minimum of two years from the date of System acceptance. TMWA may at its sole option extend the contract annually for up to 18 additional years based on the price schedule provided in response to its request for quotation for these services. These prices shall be submitted as part of the Price Proposal in a separate envelope from the Technical Proposal.

# 22.2 Proposer Responsibility

Proposer shall:

- Monitor Network Devices (data collectors and repeaters), and their backhaul communications (in terms both of contractual and operational performance), as well as monitor for interference or poor signal to noise ratios on any licensed frequencies involved in AMI system communications, on a 24 hour x 365 day basis.
- Manage the contract with the backhaul communications provider(s) to secure the lowest possible backhaul cost while meeting the system performance requirements.
- Investigate and troubleshoot any unplanned network or communications outages, anomalies or performance problems, including office-based troubleshooting and investigations of suspect components, and the creation of work requests for field repairs. Proposer shall coordinate directly with backhaul communications supplier to resolve communications and performance problems. Proposer shall initiate trouble tickets with the responsible service provider and monitor the status until resolution.



- Conduct preventive and corrective maintenance activities for data collectors and other system components during normal business hours.
- Monitor overall endpoint performance, and the execution of a triage protocol for creating work orders for field investigations and repairs.
- Deliver events, alarms and reports to the appropriate TMWA department or resource.
- Monitor, manage and recommend changes as necessary for data collector communications schedules to ensure optimal system performance.
- Manage hardware and firmware upgrades to network components.
- Maintain an adequate quantity of spare network components in close proximity to TMWA's system to ensure rapid response to network problems or outages.
- Plan for and modify the network (such as adding data collectors) to maintain the system performance requirements, following change management procedures to ensure that modifications to the network are authorized by TMWA, tested, approved by TMWA, properly implemented, and documented.

# 22.3 Staffing

Provide an organization chart or listing of the staff that will support the managed services, and a brief description of their roles. These should include, but not be limited to, managed services manager, project manager, solution engineer, network engineer, database administrator, system engineer, operator, support technician.

Network infrastructure support shall be provided by Proposer's local technicians or authorized subcontractors that will be dispatched by Proposer.

# 22.4 Network Component Firmware and Software Updates

Proposer shall notify TMWA prior to and following any updates. Proposer shall be responsible for applying network component firmware and software updates to the equipment in TMWA's system.

Findings will be shared with TMWA as outlined in the Problem Analysis and Resolution section of this document.

# 22.5 Response Times

During normal business hours (as defined in Section 21.9), response time shall be within one hour of TMWA reporting an inability to use the system.

Outside of normal business hours, response time shall be within four hours of TMWA reporting an inability to use the system.

Exceptions to off hours support will be when conditions warrant a safety concern or a data collector or other network component site is not physically accessible.



Proposer shall propose a severity level scheme for issue resolution in accordance with Section 15.2.

#### 22.6 Key Performance Indicators

Proposer will provide a monthly report of the following key performance indicators the network as a whole, network devices, and endpoints:

- Availability as percentage of uptime
- System uptime
- Collector Availability as percentage of Uptime
- Backhaul Availability as percentage of Uptime
- Billing register read (72 hour) Performance Summary
- 24 Hour Register Read Performance Summary
- Interval Read Performance Summary
- On Demand Request Performance Total, Monthly Average
- Redundancy report: the number of endpoint transmissions received by 1, 2, 3 or more data collection devices
- Network Performance Statistics Reporting
- Endpoint performance, including number of endpoints not reporting versus number of days not reporting
- Number of failed communications and retries

#### 22.7 Opt-Out Provisions

Should TMWA decide to terminate the network and endpoint monitoring services, Proposer will develop a Scope of Work that includes the activities to support the Opt-Out transition ("Opt-Out for Convenience"). TMWA will be responsible to secure all server hardware and third party software required to manage and monitor the network at a TMWA-defined location.

Proposer shall:

- Assign a Project Manager, a Business Consultant and a Technical Consultant for one month as outlined in the project plan at normal professional service rates assigned to those persons.
- Modify system design documents and processes and procedures documents, including test plans, to reflect the architectural and dataflow changes and include server hardware and third-party software requirements.



• Train a minimum of 5 TMWA employees or agents in network component and endpoint monitoring functions, including office-based measures to correct problems.

# 23 Optional Network Maintenance Service

Proposer shall include in its technical and cost proposals a solution for on-call network maintenance services. These services shall be for both emergency and preventative maintenance for the entire data collection network system (collectors and repeaters) and shall have a response time within 24 to 48 hours, dependent upon the urgency.



# Attachment A – Acknowledgment and Execution

Please see separate attachment file:

Attachment A – Acknowledgment and Execution.pdf



# **Attachment B – General Conditions**

Please see separate attachment file:

Attachment B - DOCS-#377092-v4-MASTER\_FORM\_Nrs\_332\_General\_Conditions.pdf Please note that some of these Terms and Conditions may not be applicable.



# **Attachment C – Insurance Requirements**

Please see separate attachment file:

Attachment C – Insurance Requirements.pdf



# Attachment D – TMWA Service Area

Please see separate attachment file:

Attachment D – TMWA\_SERVICE\_AREA11x17.pdf



# Attachment E – TMWA Above Ground Facilities

Please see separate attachment file:

Attachment E – TMWA Above Ground Facilities WGS84.xlsx



# **Attachment F – TMWA Meter Locations**

Please see separate attachment file:

Attachment F – TMWA Meter Locations.xlsx



# Attachment G – Pricing Tables Instructions

# 1 General

Proposer shall supply unit prices and related annotations that will enable TMWA to reasonably determine the total life cycle cost of owning, operating, using and maintaining Proposer's system over a 20-year period from the date of Notice to Proceed. Proposer shall indicate explicitly if any of the recurring prices (e.g., for annual license fees or maintenance costs) shall be subject to an inflator, and if so, what that inflator will be.<sup>1</sup> Tables referenced below have been provided in Excel format in the RFP package as Attachment H. Information required includes:

- Cost to supply and install endpoint components of the AMI system and dispose of existing equipment (Tables A1-A6).
- Cost to supply and install AMI network components, system software and server hardware, and provide training and support, as well as annual licensing and maintenance contracts (Table B).
- If Proposer proposes software hosting and managed services or network management options, they shall be included on Table C, which will supplant Table B in its entirety, to avoid misinterpretations or double-counting.
- The cost to provide supplemental services during installation involving configuration, repair or upgrades to meter boxes, lids and appurtenances (Table D).
- Component failure rate information (Tables F1-F3).

In its Price Proposal, Proposer shall take into consideration all labor. The price tables must be completed in their entirety, in accordance with the instructions below.

Prices shall include all material, labor, shipping, tools, equipment, hardware and software, taxes (TWMA suppliers must pay sales tax.), supervision, bonds, insurance, material, rental, parking, permitting, engineering certificates, indirect costs and profits to perform any unit of work. The price tables must be completed in their entirety, in accordance with the instructions below. TMWA is tax exempt and will provide necessary documentation upon request.

Proposer shall provide pricing information in Excel files on CD, DVD or USB memory device "thumb-drive" as well as in hard copy within its pricing proposal, as described in the

<sup>1</sup> In its life cycle cost evaluation, TMWA will discount future costs at 2% per annum.



Instructions to Proposers. All pricing proposals shall be provided under separate covers as part of the proposal package, as outlined in Section 1 of the RFP.

Proposer must respond to each line item listed; lump sum proposals will not be accepted. Indicate "NA" (Not Applicable) if the particular equipment described is not incorporated in Proposer's system. Proposer must include any additional equipment and services not listed in the tables below, that are required to provide a complete and working system in accordance with the technical and performance requirements of this RFP; Proposer shall modify the Excel tables of Appendix X by adding rows or columns to accommodate additional system components or unit costs. Proposer shall not delete any row or column from the tables; if one item is included in the cost of another, Proposer shall so note this in the table or in a footnote.

TMWA reserves the option of accepting or rejecting individual components of each proposal as needed to best serve the needs of the TMWA. Any price submittals may be subject to negotiation during contract negotiations.

# 2 Meters, Registers, MIUs, Lids – Supply and Installation

Proposer shall provide pricing for meters and MIUs for all meters in the pricing tables even if the indicated quantity is zero so that the price will be known in case a decision is made at a later time to replace or retrofit one of these meters.

Installation prices indicated shall be for normal installations, exclusive of repairs to or modification or replacement of service lines, meter boxes (other than the replacement of lids and rings), valves or customers' plumbing.

Standard size meter box lids present in significant quantities, if they are not composite, shall be replaced with composite lids conforming to the Technical Requirements. Metal nonstandard size meter box lids, or lids in TMWA's system in very small quantities, may be drilled provided they are not located areas where vehicles could travel over or park on top of them. Indicate the unit pricing for labor required to modify or replace lids; and the details of pricing and associated information for replacement lids. Metal lids removed will be scrapped by Proposer and a credit provided to TMWA.

#### Retrofitting Outside Set Meters with new MIUs , Including Lid Replacement

TMWA intends the Proposer remove the existing MIU and install a new MIU. If the existing MIU is relatively new, Proposer may propose leaving it in place. Some of these meters have cables potted on both ends (register and MIU), some have spliced cables, and some already have Nicor connectors. TMWA expects the Proposer to reconnect the cable coming from the meter to the new MIU using a waterproof, dust-proof and corrosion resistant connection (Nicor Hydroconn<sup>™</sup> AMR Series III or equivalent).

TMWA has approximately 6,737 B36 boxes with two small (3/4", 1" and 1½") Badger meters that should be equipped with new registers and AMI MIUs, approximately 2,190 B-36 boxes with Sensus meters only need to have new MIUs installed, and approximately 13,800 B-36

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boxes with two Badger or Sensus meters that need to be replaced, and new MIUs installed. Proposer shall include in Tables A1-A4 a unit price credit for two-port MIUs (if available) and installation in meter boxes containing two meters.



		Unit				Unit	То	tal		
	Badger	Register		Unit Cost	Total MIU	Installation	Instal	lation	Gr	and
Meter Size/Type	Meters	Cost*	Total Cost	New MIUs *	Cost	Cost**	Co	ost	Total	Cost
.75"	30,320		-		\$-		\$	-	\$	-
1"	7,695		-		\$-		\$	-	\$	-
1.5"	772		-		\$-		\$	-	\$	-
2"	1,195		-		\$-		\$	-	\$	-
2" turb	510		-		\$-		\$	-	\$	-
3" cmpd	85		-		\$-		\$	-	\$	-
3" turb	18		-		\$-		\$	-	\$	-
4" cmpd	60		-		\$-		\$	-	\$	-
4" fire	-		-		\$-		\$	-	\$	-
4" trbn	14		-		\$-		\$	-	\$	-
6" cmpd	15		-		\$-		\$	-	\$	-
6" fire	10		-		\$-		\$	-	\$	-
6" trbn	5		-		\$-		\$	-	\$	-
8" cmpd	3		-		\$-		\$	-	\$	-
8" fire	12		-		\$-		\$	-	\$	-
8" trbn	4		-		\$-		\$	-	\$	-
10"	3		-		\$-		\$	-	\$	-
10" Fire	1		-		\$-		\$	-	\$	-
12"	1		-		\$-		\$	-	\$	-
16"	-		-		\$-		\$	-	\$	-
Total	40,723		-		\$-		\$	-	\$	-
No. of instances where 2 mete	rs share meter	box	6,737		-					
Unit credit for dual port MIU, if	available****		\$-	Total credit	\$-					
Unit credit for dual port installat	tion		\$-			Total credit	\$	-		
Net Total Cost					\$ -		\$	-	\$	-

Table A1. Install new registers on Badger meters, install new MIUs, including labor for lid replacements/modifications

\*\*Proposer may propose total meter replacement in addition to or as alterntive to register replacement
\*\* Includes cost of connector and remote antenna, if needed.
\*\*\*\* Includes labor to replace lid.
\*\*\*\*\* (Unit price of 1-port MIU) x 2 - (Unit price of 2-port MIU).



					Unit		Total	-	
	Sensus		To	tal MIU	Installation	Inst	allation	Gran	d Total
Meter Size/Type	Meters	New MIUs		Cost	Cost		Cost	C	ost
.75"	9,902		\$	-		\$	-	\$	-
1"	395		\$	-		\$	-	\$	-
1.5"	93		\$	-		\$	-	\$	-
2"	186		\$	-		\$	-	\$	-
2" turb	8		\$	-		\$	-	\$	-
3" cmpd	7		\$	-		\$	-	\$	-
3" turb	1		\$	-		\$	-	\$	-
4" cmpd	16		\$	-		\$	-	\$	-
4" fire	-		\$	-		\$	-	\$	-
4" trbn	-		\$	-		\$	-	\$	-
6" cmpd	7		\$	-		\$	-	\$	-
6" fire	-		\$	-		\$	-	\$	-
6" trbn	-		\$	-		\$	-	\$	-
8" cmpd	2		\$	-		\$	-	\$	-
8" fire	-		\$	-		\$	-	\$	-
8" trbn	-		\$	-		\$	-	\$	-
10"	-		\$	-		\$	-	\$	-
10" Fire	-		\$	-		\$	-	\$	-
12"	-		\$	-		\$	-	\$	-
16"	-		\$	-		\$	-	\$	-
Total	10,617		\$	-		\$	-	\$	-
No. of instances where 2 meter	No. of instances where 2 meters share meter box			2,190					
Unit credit for dual port MIU, if a	available***		\$	-	Total credit	\$	-		
Unit credit for dual port installat	tion		\$	-	Total credit	\$	-		
Net Total Cost			\$	-		\$	-	\$	-

#### Table A2. Install new MIUs on Sensus meters with AMI-compatible registers, including labor for lid replacements/modifications

Includes cost of connector and remote antenna , if needed.



#### Replacing Outside Set Meters, Including Lid Replacement

TMWA intends that the Proposer remove the existing meter and meter reading device, if any. Proposer shall connect the cable to the MIU using waterproof, dustproof and corrosion resistant connection (Nicor Hydroconn<sup>™</sup> AMR Series III or equivalent).

	Badger	Sensus		Unit Meter	Unit Meter Scrap	Ttl Mtr Cost	Unit Cost	Total MIU	Unit Installation	Total Installation	Grand Total
Meter Size/Type	Meters	Meters	Total	Cost	Credit	(less credit)	New MIU <sup>*</sup>	Cost	Cost	Cost	Cost
.75"	44,307	16,692	60,999	\$ -	\$-	\$-	\$-	\$ -	\$ -	\$-	\$ -
1"	11,336	582	11,918	\$ -	\$-	\$-	\$-	\$-	\$ -	\$-	\$-
1.5"	1,710	144	1,854	\$ -	\$-	\$-	\$-	\$-	\$ -	\$-	\$-
2"	2,787	216	3,003	\$-	\$ -	\$-	\$-	\$ -	\$-	\$-	\$-
2" turb	316	-	316	\$-	\$ -	\$-	\$-	\$ -	\$-	\$-	\$-
3" cmpd	130	21	151	\$-	\$-	\$-	\$-	\$ -	\$-	\$-	\$-
3" turb	34	-	34	\$-	\$-	\$-	\$-	\$ -	\$-	\$-	\$-
4" cmpd	65	8	73	\$-	\$-	\$-	\$-	\$ -	\$-	\$-	\$-
4" fire	1	-	1	\$-	\$-	\$-	\$-	\$ -	\$-	\$-	\$-
4" trbn	22	-	22	\$-	\$ -	\$-	\$-	\$ -	\$-	\$-	\$-
6" cmpd	29	5	34	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
6" fire	6	-	6	\$-	\$-	\$-	\$-	\$ -	\$-	\$-	\$-
6" trbn	12	-	12	\$-	\$ -	\$-	\$-	\$ -	\$-	\$-	\$-
8" cmpd	6	-	6	\$-	\$-	\$-	\$-	\$ -	\$-	\$-	\$-
8" fire	15	-	15	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
8" trbn	5	-	5	\$-	\$ -	\$-	\$-	\$ -	\$-	\$-	\$-
10"	2	-	2	\$-	\$-	\$-	\$-	\$-	\$ -	\$-	\$-
10" Fire	2	-	2	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
12"	-	-	-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
16"	1	-	1	\$-	\$ -	\$-	\$-	\$-	\$-	\$-	\$ -
Total	60,786	17,668	78,454			\$-		\$-		\$-	\$-
No. of instances where 2 meter	s share meter	box	13,800								
Unit credit for dual port MIU, if a	available***		\$-				Total credit	\$-			
Unit credit for dual port installat	ion		\$ -						Total credit	\$ -	
Net Total Cost						\$ -		\$ -		\$ -	\$ -
* · · · · · · · · · · · · · · · · · · ·											-

Table A3 Replace outside set meters, replace MIUs, including lid replacement or modification

Includes cost of connector and remote antenna , if needed.

\*\* Includes labor to replace lid.

\*\*\* (Unit price of 1-port MIU) x 2 - (Unit price of 2-port MIU).

#### Credits for Existing MIUs

If Proposer is proposing to replace newer models of existing MIUs, and intends to offer a credit for any of these, Proposer should include Table A4.

Table A4	Credits for existing MIUs					
MIU Make and Model	Quantity	Unit Credit	Total Credit			
Itron 100W	40,723	-	\$-			
Sensus MXU2-I Port	3,118	-	\$-			
Sensus MXU2-2 Port	2,190	-	\$-			
Total			\$-			

#### **Disposal of Existing MIUs**

Proposer shall be responsible for properly disposing of all removed MIUs, including chain of custody documentation. As they contain lithium ion batteries, Proposer shall propose the cost per unit of disposing of these MIUs properly. The number of units to be disposed of will depend on the number to kept in service. Propose shall provide the cost of disposal in Table A5.



Table A5	Disposal of Existing MI				
	Unit	Total			
Number of MIUs (minimum to	Disposal	Disposal			
maximum)	Cost	Cost			
83000	\$-	\$-			
130000	\$ .	\$ -			

#### **Replacement Lids**

Virtually all of TMWA's existing meter vault lids have been configured for AMR or AMI MIUs. However, Proposer may propose replacing lids with locking lids as per the Technical Requirements. Proposer shall indicate whether it intends to modify or replace meter box and vault lids. Proposer shall be responsible for removal and scrapping of all replaced lids. Table A6 indicates approximate quantities of TMWA's principal meter box lid sizes. Approximately 3,000 meters are in vaults

Table A6	Composite Replacement Lids								
				Unit Scrap					
	Quantity to	Unit Cost	Total Lid	Credit for	Total Scrap	Grand Total			
Lid Sizes	be Replaced	per Lid	Cost	Existing Lid	Credit	Cost			
			\$-		\$-	\$ -			
			\$-		\$-	\$-			
			\$-		\$-	\$ -			
			\$-		\$-	\$ -			
Total			\$-		\$-	\$-			

# 3 Network, Software and Other Equipment and Services – Purchase Option

Proposer shall list and provide pricing in Table B for all other equipment and services required for a complete and working AMI system throughout TMWA's entire service territory in accordance with the technical and performance requirements outlined in this RFP.

TMWA prefers to have fixed network components (that is, data collectors and repeaters) deployed throughout its service territory before deployment of endpoints.

Proposer shall include estimates of the costs of mounting and any continuing site rental costs, including a "not to exceed value," in their Cost Proposal submission.

Annual costs shall also be entered as applicable in Table B. Annual costs shall include software licensing and maintenance fees, proposed annual equipment preventive maintenance agreement costs and/or actual preventive maintenance, and any other expected costs associated with normal system maintenance. Proposer shall include expected annual costs for rental of fixed DCU and repeater sites, and expected power and backhaul communication costs. Any costs that TMWA will incur to backhaul data from the AMI system to servers behind its firewall should be itemized. Proposer shall detail each cost item if necessary (adding additional rows to the table if necessary), rather than just presenting a summary in the cell in the table. Indicate if these costs are to begin at a time other than after the first year of TMWA ownership



or control. If Proposer is proposing costs that change from one year to the next because of inflation or other factors, Proposer shall explicitly state the annual adjustment factor as a percentage (e.g., 3% annual inflation rate) to be applied.

Include in this section a schedule of costs for additional training beyond the initial training required by the RFP.

Should additional units be required to achieve minimum required performance levels, Proposer shall be responsible for the cost of any additional DCUs and repeaters, including installation, backhaul, annual maintenance fees and any other cost associated with installation and long-term operation of these additional devices, for any quantity in excess of 10% of the quantity proposed in the table (not including spares).

Proposer shall indicate the number of spare parts of each system component TMWA should acquire and maintain on-hand.

,						1.0.1	
		Capital C	osts	Annual Unit License		Inflator for	
				or Maintenance	Annual Unit	Annual	
Equipment Description	Quantity	Unit Price	Total Cost	Contract Cost	Operating Costs	Costs	
Fixed data collection units (DCUs)		\$	\$	\$			
Recommended spare DCUs		\$	\$				
Fixed DCU installation		\$	\$	\$			
Site leases (if any) for DCUs							
Power costs for DCUs							
Annual backhaul communication							
costs							
Repeaters		\$	\$	\$			
Recommended spare repeaters		\$	\$				
Repeater installation.		\$	\$	\$			
Site leases (if any) for repeaters							
Power costs for repeaters							
Portable field test and programming	6	\$	\$	\$			
units, including cradles and							
accessories (add lines to detail as							
necessary)							
AMI head-end system hardware			\$	\$			
AMI head-end system software		\$	\$	\$			
Integration of AMI head-end software			\$	\$			
to CIS, other systems							
Installation Management system			\$	\$			
hardware/software							
Installation Mgt. software integration							
to CIS, other systems			<u>_</u>	¢			
Meter Data Management System			2	\$			
Meter Data Management System			¢.	¢			
software			Ŷ	Ŷ			
MDMS Integration to CIS, other							
systems							
Customer engagement (portal)							
hardware (e.g., servers)							
Customer engagement (portal)			\$	\$			
software							
Customer portal integration to other							
systems Training							
naming			<u> </u>				
Project Management			\$				
Other (describe).		\$	\$	\$			
Other (describe).		\$	\$	\$			

Table B. Network, Software and Other Equipment and Services

Notes

Proposer should indicate quantities if not otherwise indicated

Proposer may adjust table as needed to show additional equipment, services and incremental fees.

For software, indicate separate prices for production, test and backup environments

# 4 Network, Software and Other Equipment and Services – Hosting/Managed Services

TMWA requests that Proposers submit a Managed Services/Hosted option for the network devices and software applications. Table C is provided for Proposers to submit this option. The



cost of data collectors and other network components, hardware and software, and professional services that must still be purchased by TMWA under a managed services scenario shall be included in Table C so that this table constitutes a complete substitution for Table B. Proposer should accompany this table with a list of any services not included in its hosted and managed services and network monitoring pricing, including optional services, and specific prices for each item not included for which it intends to levy a separate charge.

	Capital Costs		Annual Unit							
				License or	Annual Unit					
			<b>T</b> . 10 .	Maintenance	Operating	Inflator for				
Equipment Description	Quantity	Unit Price	Total Cost	Contract Cost	Costs	Annual Costs				
Fixed data collection units		\$	\$	\$			-			
Recommended spare DCUs		\$	\$							
Fixed data collection unit		\$	\$	\$						
installation										
Site leases (if any) for DCUs										
Power costs for DCUs										
Repeaters		\$	\$	\$						
Recommended spare repeaters		\$	\$							
Repeater installation		\$	\$	\$			1			
Site leases (if any) for							1			
repeaters										
Power costs for repeaters							1			
Portable field test and	6	S	S	S						
programming units, including	-	-	-	-						
cradles and accessories (add										
lines to detail as necessary)										
Endpoints Installed by End of	135,000						1			
Year										
Avg Total Endpoints in Service							1			
									Total	
		Price per				Price per		Price per	Annual	Inflator for
	Set-up	Endpoint		Price per		Endpoint	Total	Endpoint	(years 4-	Annual
	Fee	(year 1)	Total Annual	Endpoint (year 2)	Total Annual	(year 3)	Annual	(yrs. 4-20)	20)	Costs
AMI Head-end system (servers										
and software)**										
MDMS (servers and software)**										
Customer engagement (portal)										
servers and software**										
Installation Management										
Control system**										
Communications hardware/										
installation for offsite hosting										
Communications cost for offsite										
Network Management and										
Endpoint Monitoring										
Integration of AMI software to			¢.	¢		¢.		s		
CIS other systems			۳	Ψ		۳		۲.		
Integration of MDMS to CIS			s	s		s		s		
other systems			ľ	Ť		Ť		ľ		
Integration of Consumer			s	s		s		s		
engagement to other system			ľ	-		Ť		ľ		
Training			\$							
Project Management			\$							
- reject management										
()ther (describe)		s	¢ ¢	s.		¢.		s		
Other (describe).		\$ c	\$ ¢	\$		\$ c		\$ c		

Table C. Network and Other Equipment and Services - Hosted/Managed Services, Network Monitoring Options

\*Include a not-to-exceed inflator or inflation index if prices are to increase

 $\ensuremath{^{**}\text{lnclude}}$  production and test environments, third party software (e.g., Oracle) licenses Notes

Proposer should indicate quantities if not otherwise indicated

Proposer may adjust table as needed to show additional equipment, services and incremental fees.
## 5 Additional Services

TMWA may request the Proposer perform the following work if the installation or retrofit requires. Provide pricing for each service and any conditions that may impact the price quoted.

Table D. Additional Services					
Service Provided	Unit Cost to Provide				
Meter Size	%"-1"	1½" - 2"	3"	4"	6"
Repair pre-existing service leak					
Replace meter yoke/setter (various sizes					
and configuration)					
Install lockable cutoff valve					
Install dual check					
Relocate service horizontally					
Drill Cast Iron Meter Lids					
Raise or lower service					
Install new service					
Replace meter box and lid					
Replace meter vault and lid					

## 6 Failure Rates

Proposer shall provide expected failure rates for various system components, and their associated warranty and repair costs, in Tables F1-F3. Proposer shall also provide (1) repair prices for MIUs, and (2) expected maintenance and repair costs for DCUs and repeaters in the case that TMWA does not avail itself of annual maintenance agreements for these components, that will give TMWA a true representation of expected operating and maintenance costs. Indicate battery change costs in the table. Specify whether the battery change cost estimate includes labor. These costs shall be included in TMWA's evaluation of total system costs.

Proposer shall indicate the expected life in service of the system components if other than 20 years, and modify the tables listed below accordingly. Proposer shall provide explanation of any underlying assumptions necessary to explain these numbers.

Please note that if any proposed costs refer to a "list" price, or "retail" price, Proposer shall explicitly state the current "list" or "retail" price.

Proposer should provide guaranteed maximum failure rates in terms of failures per thousand units per year. Should the guaranteed maximum failure rates be exceeded, TMWA will incur maintenance costs, loss of savings and productivity, loss of credibility and interruptions in cash flow in excess of reasonable expectations, may, at its option, declare the system to be non-functioning, and may exercise its rights and seek remedies under its contract with successful Proposer.





Table F1. Meter Interface Unit Failures					
Year After Unit is Installed & Accepted	Expected Failure Rate (Failures/100 units/yr)	Pro-Rata Replacement Cost Percentage <sup>1</sup>	Unit Repair or Replacement Cost)	Guaranteed Maximum Failure Rates (Failures/100 Units/Year)	
1	• /	0%			
2		0%			
3		0%			
4		0%			
5		0%			
6		0%			
7		0%			
8		0%			
9		0%			
10		0%			
11		10%			
12		20%			
13		30%			
14		40%			
15		50%			
16		60%			
17		70%			
18		80%			
19		90%			
20		100%			

<sup>1</sup> For example, an MIU that TMWA paid \$50.00 for that fails in the 11 <sup>th</sup> year after being installed and accepted will be replaced at a cost to TMWA of \$5.00.



	Bata Concetter offic	T analoo		
Year After Unit is Installed & Accepted	Expected Failure Rate (Failures/100 units/yr)	Pro-Rata Replacement Cost Percentage <sup>1</sup>	Unit Repair or Replacement Cost)	Guaranteed Maximum Failure Rates (Failures/100 Units/Year)
1	* /	0%	,	· · · · · · · · · · · · · · · · · · ·
2		0%		
3		0%		
4		0%		
5		0%		
6		0%		
7		0%		
8		0%		
9		0%		
10		0%		
11		10%		
12		20%		
13		30%		
14		40%		
15		50%		
16		60%		
17		70%		
18		80%		
19		90%		
20		100%		

## Table F2. Fixed Data Collection Unit Failures

<sup>1</sup> For example, a fixed data collection that TMWA paid \$5000.00 for that fails in the 11<sup>th</sup> year after being installed and accepted will be replaced at a cost to TMWA of \$500. These costs may be supplanted by an annual maintenance contract, the price for which shall be included in Tables B and C.



Table F3. Repeaters Failures				
Year After Unit is Installed & Accepted	Expected Failure Rate (Failures/100 units/yr)	Pro-Rata Replacement Cost Percentage <sup>1</sup>	Unit Repair or Replacement Cost)	Guaranteed Maximum Failure Rates (Failures/100 Units/Year)
1		0%		
2		0%		
3		0%		
4		0%		
5		0%		
6		0%		
7		0%		
8		0%		
9		0%		
10		0%		
11		10%		
12		20%		
13		30%		
14		40%		
15		50%		
16		60%		
17		70%		
18		80%		
19		90%		
20		100%		

<sup>1</sup>For example, a repeater that TMWA paid \$500.00 for that fails in the 11<sup>th</sup> year after being installed and accepted will be replaced at a cost to TMWA of \$50.00. These costs may be supplanted by an annual maintenance contract, the price for which shall be included in Tables B and C.



## **Attachment H – AMI Pricing Tables**

Please see separate attachment file:

Attachment H – AMI Pricing Tables v5.xlsx