

**WaterSMART: Development of Feasibility Studies under the Title XVI
Water Reclamation and Reuse Program**

for

**McAllen Public Utility
Water Reuse Feasibility Study**



Applicant

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Technical Proposal

Executive Summary

Date: March 3, 2015
Applicant Name: City of McAllen- McAllen Public Utility
Service Area: City of McAllen
County: Hidalgo
State: Texas

Project Summary:

McAllen Public Utility (MPU) owned and operated by the City of McAllen and governed by the Public Utility Board of Trustees provides the public with water and sewer services within a 48.7 square mile area located in Hidalgo County Texas in the Lower Rio Grande Valley, approximately ten miles from the border of Mexico (see Figure 1). The service area includes an estimated population of 162,936, with the population having grown 2.16 percent annually over the past decade and projected to continue to grow another three percent through 2016. The Rio Grande currently supplies approximately 97% percent of water supply via water delivery contracts with four raw water supply districts.

McAllen has been exploring various aspects of developing reclaimed water supplies for a number of years. Two pilot study efforts supported by the Bureau of Reclamation's Water Treatment Technology Program were carried out in the late 1990's. These studies evaluated several advanced treatment processes for application to potable reuse for McAllen Public Utility (MPU). The MPU has also participated in a study to evaluate regional development of potable reuse with the City of Edinburg and studies to evaluate the feasibility of implementing projects to provide reclaimed water for irrigation and other non-potable uses. In 2010, a non-potable reuse implementation master plan was developed which assessed opportunities to use reclaimed water for irrigation, cooling water and other non-potable uses. MPU has also recently been exploring opportunities to pursue development of brackish groundwater supplies. Locally, only limited site-specific studies of brackish groundwater development at the City's water treatment plant sites have been performed to date. However, a regional basin study, supported in part by the Bureau of Reclamation, also did an appraisal-level evaluation of developing a regional brackish water treatment and supply system.

The 2011 Rio Grande Water Plan (Region M) projected that McAllen would experience a water supply deficit between 2010 and 2020. Since this plan was published, MPU has developed one groundwater well and is in the process of adding another one. Potable reuse and development of brackish groundwater supplies have been identified as the most viable water supply alternatives to meet future needs.

The purpose of this project is to perform a comprehensive feasibility evaluation of these sources of supply and to develop a strategic plan that provides the best and highest use of the available water sources for MPU. The study will build on the previous efforts identified above and will consider indirect potable reuse via surface water and groundwater augmentation, direct potable reuse, and use of brackish groundwater. As appropriate, this study would coordinate with regional water supply studies and initiatives.

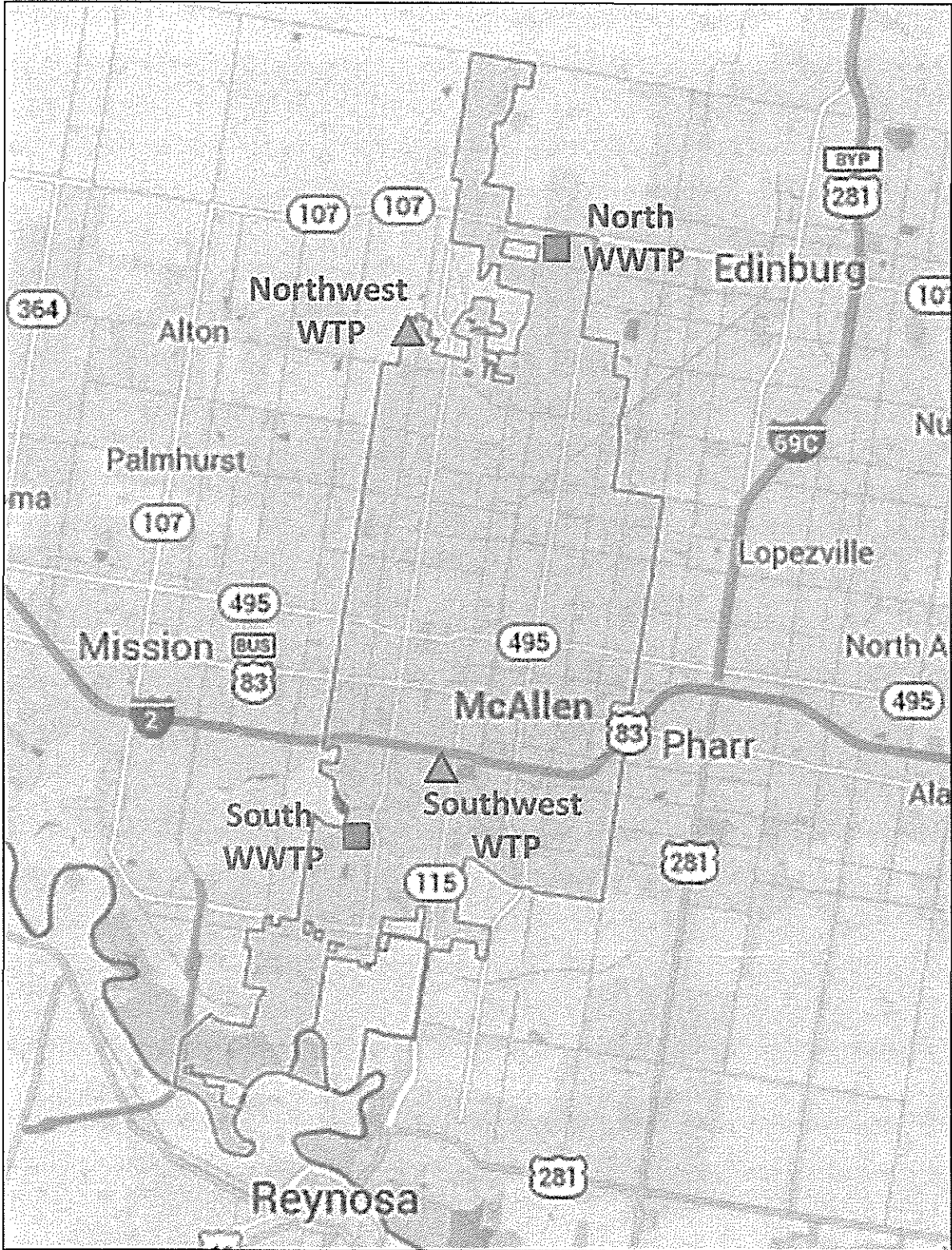


Figure 1: MPU Service Area

Technical Study Description

Task 1. Introduce the Project

This task will identify the non-Federal project sponsor as McAllen Public Utility (MPU) and:

- (1) Describe the MPU in terms of population served, geographic area, and institutional history;
- (2) Provide a map of the service area;
- (3) Provide a summary of completed studies related to alternative water supplies and their conclusions; and
- (4) Provide a map summarizing the proposed study area and the major project components.

Task 2. Identify Needs and Challenges

This task serves to identify the need for the reuse project in terms of MPU's water supply and develop a case for implementing a reclamation project over other supply projects.

Task 2a. Identify the Current Water Supply Gap

- (1) Evaluate previous studies on population growth and demand projections. Define water supply needs through 2060.
- (2) Evaluate current and historical water supplies, with a focus on drought and curtailment conditions.
- (3) Define the need for additional water supplies.

Task 2b. Description of Current and Projected Water Supplies

- (1) Evaluate previous studies done on water supply alternatives.
- (2) Describe current water supplies and options for additional local and regional water supplies, not including water reclamation projects. Existing water supplies include:
 - a. Water rights from Falcon and Amistad Reservoirs (on the Rio Grande),
 - b. Groundwater, and
 - c. Nonpotable reuse (irrigation/cooling water makeup).
- (3) Potential future water supply options (not including reclamation options) include:
 - a. Additional local groundwater,
 - b. Contracting for additional surface water, and
 - c. Importing groundwater from other basins.
- (4) Identify potential reclamation alternatives, including
 - a. Potable water reuse: Potential options for potable reuse that will be considered include indirect potable reuse via discharge to surface water, indirect potable reuse via aquifer storage and recovery, and direct potable reuse.
 - b. Brackish groundwater: evaluation of this alternative will use and build on two sources of existing information including the *Lower Rio Grande Basin Study* (Bureau of Reclamation, December 2013) which provided an appraisal-level assessment of several regional brackish groundwater supply alternatives in the Lower Rio Grande Valley and a hydrogeologic study for MPU that provided estimates of yields and water quality of local brackish supplies.

Task 2c. Description of Current and Projected Water Demands

This task will document current and projected water demands.

- (1) Summarize historical and current water demands.
- (2) Summarize projected water demands through 2060 based on the most recent water supply planning study completed by MPU.

Task 2d. Identify Water Quality Concerns

The primary goal of any reclamation project is to ensure that the finished water produced meets all drinking water quality requirements and is protective of public health. This task will:

- (1) Define water quality requirements for potable reuse, determined by TCEQ on a case-by-case basis in accordance with the 30 TAC 290 - "Public Drinking Water" Innovative/alternate treatment clause, which allows permitting of any treatment process that does not have specific design requirements in 290.42(a) – (f) of this title;"
- (2) For indirect potable reuse to surface water, define expected Texas Pollutant Discharge Elimination System (TPDES) permitting requirements based on surface water quality standards of the receiving stream;
- (3) For direct potable reuse, define project water quality performance targets based on information from the Texas Water Development Board Direct Potable Reuse Resource Document (to be finalized March 2015) and site-specific MPU goals; and
- (4) Define water quality targets for reclamation of brackish groundwater based on compliance with drinking water standards and MPU goals.

Task 2e. Description of Wastewater and Disposal Options under Non-Title XVI Alternative

This task will summarize wastewater flows, disposal options and plans for expanded or new wastewater facilities.

- (1) Define projected wastewater flows through 2060.
- (2) Define current discharge locations and permit conditions and any projected future changes.
- (3) Describe any plans for expansion to provide projected wastewater capacity.

Task 3. Identify Water Reclamation and Reuse Opportunities

Task 3a. Identify Uses of Reclaimed Water

The primary use of reclaimed water to be considered in this study is potable supply augmentation. This task will document this use and summarize any associated water quality and treatment requirements.

Task 3b. Description of Water Market

This task will address the opportunities for water reuse in the MPU service area.

- (1) For potable reuse, the market is all customers of the MPU water system and is determined by existing projections and demands, as will be defined in Task 2.

Task 3c. Identify and Address Potential Hurdles Associated with Reclaimed Water Uses

This task will identify considerations that may prevent implementation of water reuse.

- (1) For potable use, the primary issues that could impact implementation are cost, operational complexity and public perception.
 - a. Define potential barriers to implementation of potable reuse.

- b. Identify strategies to address these barriers
 - i. Provide recommendations for public outreach strategies to address public concerns with potable reuse
 - ii. Provide recommendations to address potential concerns related to operations, monitoring and failure response protocols for potable reuse treatment systems.
- (2) For brackish desalination, the primary issues that could impact implementation are cost and the availability and reliability of groundwater supplies. These issues will be evaluated in other project tasks.

Task 3d. Identify Jurisdictional Issues

This task will identify jurisdictional issues associated with each of the potential reclamation alternatives.

Task 3e. Describe Potential Sources of Reclaimed Water

Potential sources of reclaimed water for MPU include the North Wastewater Treatment Plant (NWWTP) and the South Wastewater Treatment Plant (SWWTP). Satellite plants may also be considered. In addition, MPU will be evaluating the use of brackish groundwater. This task will provide a description of these sources.

Task 3f. Describe Source Water Facilities

This task will describe each of the source water facilities.

- (1) Describe the NWWTP and SWWTP using information from previous studies and available data.
 - a. Define capacities, existing flows, treatment processes, and plans for future facilities.
 - b. Define the amount of reclaimed water available to meet new demands.
- (2) Evaluate the potential supply from brackish groundwater
 - a. Building on information developed in the *Lower Rio Grande Basin Study* and preliminary hydrogeologic assessments performed for MPU, evaluate the availability of brackish groundwater in terms of location, depth of formation, water quality characteristics and yield.
 - b. Evaluate the potential for using geopressed/geothermal (GP/GT) resources for water supply
 - i. This alternative was investigated in the 1990's through a research grant from the Texas Water Development Board and has recently been re-examined by MPU. Information from this recent study will be used to develop estimates of energy recovery and evaluate the potential role of GP/GT in development of a brackish groundwater supply.

Task 3g. Describe Current Reuse Practices

MPU currently provides reclaimed water to a City golf course for irrigation and two power plants for cooling water make-up. This task will

- (1) Describe these current reuse projects with respect to the users served and the volumes of water delivered and
- (2) Provide maps to supplement the above description.

Task 3h. Summarize Current Water Reclamation Technology

This task will supplement the descriptions provided in Task 3g, as follows:

- (1) Describe the current reuse projects with respect to treatment technologies currently in use and
- (2) Consider the impacts of proposed technologies for implementing potable reuse on the current or potential future non-potable uses of reclaimed water.

Task 4. Description of Alternatives

Task 4a. Describe Non-Federal Funding Condition

This task will describe the “no project” option, i.e. what actions MPU would take if Federal funding were not provided for the proposed reuse project.

Task 4b. Define Objectives of the Project

The objective of this project is to determine the highest and best use of reclaimed water and brackish groundwater for MPU, in conjunction with the use of existing supplies. The evaluation of the highest and best use will be determined through consideration of the following factors:

- (1) Cost per volume of water delivered;
- (2) Ability of the alternative to delay the need for additional water supply;
- (3) Reliability of water supply offset / augmentation (e.g., drought resistance, demand hardening);
- (4) Project risk (e.g., associated with permitting and public acceptance uncertainties); and
- (5) Energy efficiency.

Task 4c. Description of Non-Title XVI Alternatives

If the water reclamation supply options were not implemented, the other options available to MPU include acquisition of additional water rights through contract and/or purchase, development of additional local groundwater supplies, or importation of groundwater from other basins.

- (1) Describe the non-Title XVI alternatives, including treatment and conveyance facilities.
- (2) Include maps illustrating the proposed alternatives.
- (3) Prepare estimates of life cycle cost based on available information in the most recent Rio Grande Regional Water Plan (Region M) and other available water supply studies. Present the costs in terms of dollars per acre-foot and dollars per thousand gallons.

Task 4d. Development of Reclamation Project Alternatives with Cost Estimates

Note: This task will be preceded by Tasks 4e and 4f but has been placed in this location to follow the flow of the Directives and Standards Publication No. WTR 11-01.

- (1) Develop three to five project alternatives that augment the potable supply with reclaimed water, brackish groundwater, or a combination of the two. Elements that vary between the alternatives will be identified as part of Task 4f.
- (2) Develop detailed cost estimates for the selected alternatives, including capital costs, annual operation, maintenance and replacement costs, life cycle costs and unit cost of water in terms of dollars per acre-foot and dollars per thousand gallons.
- (3) Update and summarize cost estimates from the 2010 nonpotable reuse implementation plan study.

Task 4e. Determine Waste Discharge Requirements

Describe waste-stream discharge treatment and disposal water quality requirements for each of the alternatives.

- (1) Evaluate alternatives for disposal of concentrate for treatment schemes that generate concentrate streams (such as reverse osmosis)
 - a. Determine expected concentrate water quality based on available data.
 - b. Evaluate the feasibility of a surface discharge of concentrate
 - i. Define receiving water quality requirements
 - ii. Define any additional treatment needed to meet receiving water quality goals
 - c. Evaluate other strategies for disposal, as needed, which may include:
 - i. Deep well injection
 - ii. Evaporation ponds/mechanical evaporators
 - iii. Additional advanced treatment to reduce volume of concentrate stream or achieve zero liquid discharge
- (2) Define strategies for discharge treatment or disposal of other waste-stream residuals generated by each treatment scheme.

Task 4f. Describe Potential Project Elements

Note: This task will precede Tasks 4d and 4e but has been placed in this location to follow the flow of the Directives and Standards Publication No. WTR 11-01.

This task will identify project elements that, when assembled into project alternatives, will achieve water quality and water quantity goals. These project elements may consist of any of the following:

- (1) Treatment technologies employed to achieve water quality performance goals
 - a. For potable reuse, advanced treatment technologies, including filtration, RO, and advanced oxidation processes (AOP) will be considered. Alternative treatment technologies, such as nanofiltration or ozonation and biofiltration, will also be considered.
 - b. For brackish groundwater, blending or side-stream treatment for salt removal will be considered.
- (2) Location of the advanced treatment facilities
- (3) Conveyance infrastructure
- (4) For all of the above, consider measures that can increase energy efficiency, such as
 - a. Evaluate use of variable frequency drives for large equipment
 - b. Evaluate energy efficiency of treatment process alternatives (e.g., ozone and biofiltration versus reverse osmosis)
 - c. Evaluate the potential for local generation of renewable power (e.g. wind, solar, GT/GP)

Task 5. Economic Analysis

This task will summarize results of the cost and benefit analysis. Costs for the reuse/brackish groundwater alternatives will be developed in Task 4d. Costs for the non-reuse alternatives will be developed in Task 4c. In addition, this task will compare the cost of potable reuse options with cost of nonpotable reuse alternatives developed in previous studies to evaluate the relative economic value of implementing potable reuse only or a combination of potable and nonpotable

reuse options.

Task 5a. Describe Existing and Future Condition

- (1) Summarize the water supply conditions and justification of need, as developed in Task 2. Describe projected future water supply and economic impacts with and without the recommended project.

Task 5b/5c. Prepare Cost Comparison

- (1) Compare cost of project alternatives developed in Tasks 4c and 4d. The basis for this comparison will be
 - a. Cost of water on a unit basis (\$/acre-foot)
 - b. Project capital cost and the availability of funding to meet the needed expenditure
- (2) All comparisons will be made on the basis of the same interest rates and period of analysis.

Task 5d. Compare Other Benefits between Non-Title XVI Project Alternatives and Proposed Title XVI Alternatives

- (1) Identify and analyze potential benefits, including but not limited to, the following:
 - a. Reduction, postponement, or elimination of development of new or expanded water supplies;
 - b. Reduction or elimination of the use of existing diversions from natural watercourses, or withdrawals from aquifers;
 - c. Reduction of demand on existing Federal or other water supply facilities; and
 - d. Reduction, postponement, or elimination of new or expanded wastewater facilities.
 - e. Improvements in water quality over existing supplies
- (2) Where sufficient information is available, develop quantitative benefit estimates for the alternatives.
- (3) For benefits that are difficult to quantify (e.g., a drought tolerant water supply, reduced water importation, and other social or environmental benefits), provide qualitative descriptions of the benefits.

Task 6. Selection of the Title XVI Project

Selection of the Title XVI project will be determined based on the objectives and evaluation criteria of the project, as identified in Task 4b. The following steps will be taken to select the Title XVI Project:

- (1) Evaluate alternatives based on the criteria identified in Task 4b and quantified in Task 5.
- (2) Determine the relative importance (weighting) of financial and non-financial criteria.
- (3) Based on the results of (1) and (2), compare the alternatives using a multi-criterion decision analysis (MCDA) approach.

Task 7. Energy Evaluation and Environmental Considerations

This task includes evaluation of energy requirements and potential environmental issues that could result in additional costs to comply with NEPA requirements. This task will not include a full NEPA-compliant evaluation.

- (1) Energy Evaluation
 - a. Evaluate the energy requirements of the proposed treatment facilities and

- conveyance facilities
 - b. Evaluate energy saving measures, including
 - i. Evaluate energy saving measures at existing treatment facilities that would be incorporated into the recommended project.
 - ii. Evaluate potential energy saving measures in the design of new reclaimed water treatment facilities (including brackish groundwater treatment if applicable), such as energy recovery devices and variable frequency drives on large equipment.
 - c. Evaluate the availability of renewable energy, including
 - i. Evaluate purchasing energy produced renewably from local utilities
 - ii. Evaluate construction of a local renewable energy project, such as solar collectors or wind turbines.
 - d. For the brackish groundwater supply option, evaluate the potential of using geothermal energy to help offset the energy requirements of desalination. .
- (2) Environmental Considerations and Potential Impacts
- a. Describe potentially significant impacts on endangered or threatened species, public health or safety, natural resources, regulated waters of the United States, or cultural resources.
 - b. Describe potentially significant environmental effects or unique or undefined environmental risks.
 - c. Describe the status of required Federal, state, tribal, and/or local environmental compliance measures, including copies of any documents that have been prepared, or results of any relevant studies.
 - d. Describe other available information that would assist with assessing the measures that may be necessary to comply with the NEPA and other applicable Federal, state, or local environmental laws such as the Endangered Species Act or the Clean Water Act.
 - e. Describe how the proposed potable reuse alternatives will affect water supply and water quality from the perspective of a regional, watershed, aquifer, or river basin condition.
 - f. Describe the extent of public involvement in the feasibility study and summarize comments received, if any.
 - g. Describe the potential effects the project may have on historic properties. Include potential mitigation measures, the potential for adaptive reuse of facilities, an analysis of historic preservation costs, and the potential for heritage education, if necessary.

Task 8. Legal and Institutional Requirements

This task will identify potential legal and institutional requirements, or other barriers to implementing the proposed Title XVI project.

Task 8a. Analyze Water Rights

Any water rights issues associated with the recommended project will be summarized.

Task 8b. Analyze Institutional and Legal requirements

Other institutional and legal requirements will be identified and summarized. These may include contractual agreements, settlement agreement or other obligations related to the recommended project.

Task 8c. Analyze Multi-Jurisdictional and Interagency Aspects

Any multi-jurisdictional or interagency agreements associated with the proposed project will be summarized in this task.

Task 8d. Analyze Permitting Requirements

This task will describe permitting requirements for project implementation and recommendations for strategies to help streamline the permitting process.

Task 8e. Discuss Any Unresolved Issues Pertaining to Implementing the Proposed Project

Any other unresolved legal or regulatory issues that may impact project implementation will be addressed in this task.

Task 9. Implementation and Funding Plan

Develop an implementation and funding plan, including the following information:

- (1) A plan for implementing the preferred alternative:
 - a. Describe the treatment and infrastructure requirements based on information developed in previous tasks.
 - b. Describe the extent to which the proposed alternative will use proven technologies and conventional system components.
 - c. Define any recommended future public outreach initiatives needed to address public concerns related to implementation of a potable reuse project.
 - d. Identify basic research needs, if any.
 - i. Describe research needs associated with the proposed Title XVI project, including the objectives to be accomplished through research. Depending on treatment schemes identified, pilot- and/or bench-scale testing of treatment processes will likely be necessary to obtain TCEQ approval. Research related to concentrate disposal strategies may also be identified.
 1. Describe the basis for Reclamation participation in the identified research.
 2. Identify the parties who will administer and conduct necessary research.
 - e. Develop a schedule for implementation of the preferred alternative, including basic research, pilot-testing, design and construction, customer contracts, permitting, and other necessary elements.
- (2) A plan for funding the proposed project construction, operation, maintenance, and replacement costs:
 - a. Describe the willingness of MPU to pay for its share of capital costs and the full operation, maintenance, and replacement costs.

- b. Describe how MPU will pay construction, annual operation and maintenance, and replacement costs. Identify the potential sources of revenue, including grants and/or loans that may be available to fund design and construction of the preferred alternative.
- c. Describe all Federal and non-Federal sources of funding and any restrictions on such sources, for example, minimum or maximum cost-share limitations.
- d. Describe the reasonably foreseeable future actions that MPU would take if Federal funding were not provided for the proposed water reclamation and reuse project, including estimated costs.

Task 10. Report

Prepare a Title XVI feasibility report that organizes and describes the work performed in the previous tasks and meets applicable requirements of RM Directives & Standards WTR 11-01.

Task 11. Project Administration

Monitor the project staffing, budget and schedule during the project. Provide semi-annual financial and program performance reports to the Bureau of Reclamation.

Evaluation Criteria

Evaluation Criterion 1: Statement of Problems and Needs – 10 Points

Points will be awarded based on the presence of watershed-based water resource management problems and needs for which water reclamation and reuse may provide a solution. Describe in detail the water resource management problems and needs in the area and explain how water reclamation and reuse may address those problems and needs. Additional consideration will be given to proposals that explain how the problems and needs in the area may be impacted by climate change, and/or if the feasibility study will include climate change information in the supply and demand projections used.

McAllen is located in the Lower Rio Grande Valley and obtains the majority of its water supply through contracts with irrigation districts for Rio Grande water rights. Through these contracts, McAllen currently has approximately 36,000 acre-feet per year of water rights from the Rio Grande. The delivery system is primarily through open canals and a significant portion of this water is lost to evaporation, seepage losses and leakage prior to reaching the customers. In addition, Rio Grande water rights are subject to curtailment and their reliability is tied to upstream water availability as well as the enforcement of complex treaties between the United States and Mexico.

McAllen is a part of the Rio Grande Water Planning Group (Region M). According to the 2011 Region M Water Supply Plan, McAllen will have a water supply deficit beginning between 2010 and 2020, and increasing to almost 30,000 acre-feet per year by 2060 (Figure 1).

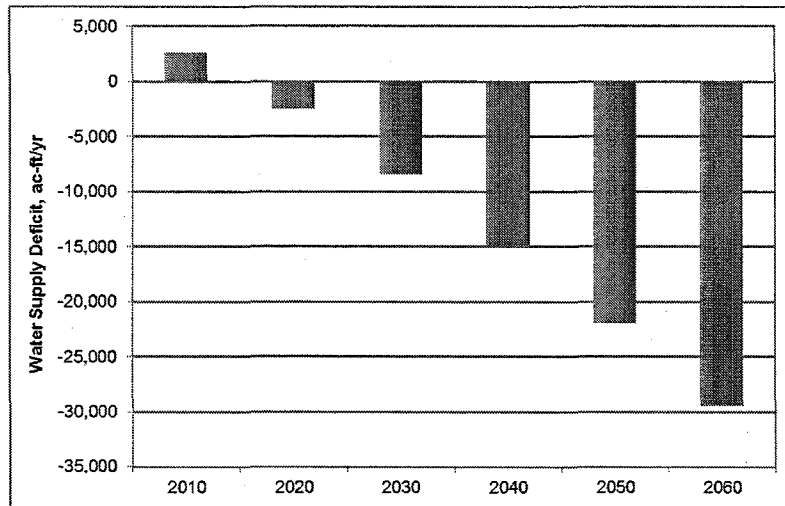


Figure 1: Projected Water Supply Deficit for McAllen (2011 Region M Water Plan)

In addition to its Rio Grande supply, MPU provides reclaimed water to two Calpine power plants from its North Wastewater Treatment Plant and to the City's Palm View Golf Course from the South Wastewater Treatment Plant. Elevated levels of dissolved solids in the treated effluent have presented challenges for using the water for irrigation, particularly during drought periods.

In order to supplement its surface water supplies, MPU drilled one groundwater well that became operational in April 2013. The capacity of the well is approximately 1.5 mgd (~1,680 ac-ft/yr), although the City is currently using only about 1 mgd. The concentration of TDS in the well water is approximately 1200 mg/L. The well water is blended at a ratio of approximately 1:10 with surface water in order to control blended TDS concentrations. MPU is currently in the process of developing a second well.

In addition to acquiring supplemental supplies to eliminate the projected water supply deficit, diversification of supply is also desirable to MPU. With its current supply, MPU is almost entirely dependent on the Rio Grande for water. Not only does this expose MPU to the risk of curtailments and other water shortage conditions, but it also exposes MPU to the risk of other more acute issues associated with relying on a single source of supply. For example, a recent precautionary notification (dated April 30, 2014) from the TCEQ indicated a release of an unknown material on the Mexican side of the Lower Rio Grande watershed that was causing fish kills and was expected to migrate into the Falcon reservoir and from there downstream to all the Texas users on the river. For these reasons, relying on the Rio Grande for additional water supply is not considered to be a viable alternative for MPU.

The impact of climate change on water supply in the Lower Rio Grande Basin was considered in the Bureau of Reclamation Lower Rio Grande Basin Study, completed in December 2013. The study found that climate change is likely to result in increased temperatures, decreased precipitation, and increased evapotranspiration in the Lower Rio Grande Basin. These changes will result in the need for an additional 86,438 ac-ft/yr of supply in the basin by 2060, in addition to the deficits projected in the Region M Water Supply Plan. These projected climate change

impacts further emphasize the need to develop diverse and sustainable supplies in the region. The proposed reclamation projects to be evaluated in this study will clearly help to meet this need.

Evaluation Criterion 2: Water Reclamation and Reuse Opportunities – 15 points

Points will be awarded based on the extent to which the proposal demonstrates that the Title XVI feasibility study will explore opportunities for water reclamation and reuse in the study area.

This feasibility study will focus on evaluating the best use of MPU's treated wastewater effluent for augmenting existing potable water supplies and evaluating the potential for using local brackish groundwater sources. Potable reuse options will consider indirect potable reuse through surface water augmentation or groundwater augmentation, as well as direct potable reuse. With its current reclaimed water deliveries to the Calpine power plants and the Palm View Golf Course, MPU has approximately 9,000 ac-ft/yr of additional water from its North and South WWTPs that could be directed towards augmentation of potable supplies. Brackish groundwater options will consider blending with existing supplies or the use of advanced treatment to manage dissolved solids levels. A regional supply option, as discussed in the Lower Rio Grande Basin Study, will also be considered.

(1) Describe how the feasibility study will investigate potential uses for reclaimed water (e.g., environmental restoration, fish and wildlife, groundwater recharge, municipal, domestic, industrial, agricultural, power generation, and recreation).

The use of reclaimed water for this study is augmentation of potable water supplies through surface water augmentation, groundwater recharge or direct potable reuse. All options will serve municipal, domestic and industrial users through augmentation of the potable water system. The supply will help to address the projected water supply deficit illustrated in Figure 1 (Evaluation Criterion 1).

(2) Describe the potential water market available to use any recycled water that might be produced upon completion of a Title XVI project, as well as methods to stimulate recycled water demand and methods to eliminate obstacles to the use of reclaimed water.

Because the focus of the study is on augmentation of potable water supplies, the market for reclaimed water will be determined by the demand for these potable supplies within MPU's service area. However, the biggest challenge in marketing potable reuse is the public perception that the water may not be safe. This issue will be addressed through development of a public outreach plan, as described in Task 9 of the Technical Study Description.

(3) Describe the sources of water that will be investigated for potential reclamation, including impaired surface and ground waters.

Three existing sources of water will be considered for potential reclamation. Each of these is described below.

South WWTP:

The McAllen South Wastewater Treatment Plant was constructed in 1985 with several modifications during that time. However, generally the plant is at the end of its useful life. Construction is currently underway to replace the extended air plant with a conventional activated sludge facility with nutrient removal capability. Permitted annual average daily capacity of the existing plant is 10 mgd. The replacement facilities do not increase the permitted capacity. Current influent flow is approximately 7 mgd. Current influent quality is 240 mg/L CBOD, 190 mg/L TSS, and 28 mg/L ammonia. Projected effluent quality for the new facilities is 10 mg/L CBOD, 15 mg/L TSS, and 2 mg/L ammonia.

The new facilities include a new headworks structure with mechanical bar screens and grit removal, four activated sludge basins, three secondary clarifiers, a UV disinfection facility, and two post aeration basins. Hypochlorite disinfection is provided for 2 mgd of non-potable reuse and on-site plant water. A reuse pump station will also be constructed, but the reuse water distribution pipeline is not currently scheduled for construction. Sludge from the treatment process will be treated in an aerobic digester, mechanically dewatered, and hauled to a land disposal operation by a commercial contractor. The new facilities will be completed in 2017.

North WWTP:

The North Wastewater Treatment Plant was upgraded in 2011. The plant is an extended air facility with a permitted capacity of 11.25 mgd. Current influent flow is approximately 6.5 mgd. Current influent quality is 210 mg/L CBOD, 200 mg/L TSS, and 35 mg/L ammonia. In 2014, the average effluent quality was 1.36 mg/L CBOD, 3.21 mg/L TSS, and 0.08 mg/L ammonia nitrogen.

The plant consists of a headworks structure with mechanical bar screens and grit removal, four extended air aeration basins, four secondary clarifiers, and UV disinfection. Aerobic digesters and mechanical dewatering are provided for handling the sludge.

The plant effluent is pumped to a pond that is used to supply water to two Calpine power plants. The City has a contract with Calpine that allows the power plants to take up to one hundred percent of the plant effluent. During the winter the power plants take only about 70-80 percent of the effluent. During the summer they take the entire discharge.

Brackish groundwater

As noted in under Criterion 1, MPU currently operates one ground water well, which is of marginal quality with respect to TDS. As desalination will be a portion of any of the proposed reclamation project alternatives, this will serve to decrease salinity levels in the water supply as a whole, allowing for additional blending with this water source, and potentially allowing for greater use of brackish supplies.

A hydrogeologic study commissioned by MPU in 2009 evaluated the potential yield and water quality characteristics of brackish groundwater supplies if wells were to be drilled on existing MPU property at the Southwest Water Treatment Plant site. Depending on the depth, TDS levels in the aquifer ranged between about 1,400 mg/L and 4,800 mg/L. The study found that the yields on the Southwest WTP site would likely be lower than other areas in the Lower Rio Grande area

and recommended that MPU carry out a broader evaluation of potential well locations before drilling on this site. Further hydrogeologic studies in the area are planned as part of this feasibility study.

In addition to the above sources, the study will also consider the potential of locating satellite treatment facilities at key locations in the collection system. In this case the source water will be raw wastewater. The cost benefit of using decentralized treatment to reduce conveyance costs will be evaluated.

Evaluation Criterion 3: Description of Potential Alternatives – 15 points

Points will be awarded based on the extent to which the proposal demonstrates that the Title XVI feasibility study will develop descriptions of water supply alternatives, including a proposed Title XVI project and other water supply alternatives.

(1) Describe the objectives all alternatives will be designed to meet. What other water supply alternatives will be investigated as part of the Title XVI feasibility study?

The objective of this project is to determine the highest and best use of impaired water sources for MPU, including reclaimed water and brackish groundwater, in conjunction with use of existing supplies. This use will be evaluated based on the objectives defined in Task 4b, which include the cost of water, the ability of the reuse project to delay the need for additional water supplies, reliability of the water supply offset or augmentation, project risk, and energy efficiency.

(2) Provide a general description of the proposed project that will be the subject of a Title XVI feasibility study.

The proposed Title XVI project is the reclamation and beneficial use of impaired water sources, including wastewater effluent and brackish groundwater, to augment or offset potable water supplies for the City of McAllen.

(3) Describe alternative measures or technologies for water reclamation, distribution, and reuse that will be investigated as part of the Title XVI feasibility study.

Three to five project alternatives will be developed and evaluated that have the potential to augment potable supply with reclaimed wastewater, brackish groundwater, or a combination of the two. The potential sources of water include treated wastewater effluent from the North and South WWTPs, untreated wastewater processed at one or more decentralized “satellite” treatment facilities, and brackish groundwater.

Reclamation Alternatives

The study will consider three main categories of reclamation, which may be combined to produce between three and five project alternatives:

(1) Indirect potable reuse, via aquifer storage and recovery or surface water augmentation.

- a. The surface water augmentation option will explore the potential of exchanging discharge of reclaimed water from the South WWTP to the Rio Grande for rights to use more Rio Grande water from the current diversion locations.
 - b. The groundwater augmentation option will explore the feasibility of augmenting groundwater supplies by injecting reclaimed water from one or both WWTPs into the local groundwater aquifer.
- (2) Direct potable reuse, with advanced treatment and blending with existing Rio Grande water sources and/or groundwater, and
- (3) Brackish groundwater blending and/or desalination.

Treatment Technologies

The TDS levels in the raw water drawn from the Rio Grande range between 400 – 1200 mg/L and TDS concentrations in the wastewater range between 700 and 1500 mg/L. Higher levels occur during periods of drought. The higher ranges necessitate desalination for many end uses, including most industrial applications, irrigation uses, and potable water production. By definition, reclamation of brackish water for potable uses also involves desalination, unless sufficient fresh water supplies are available to dilute the TDS through blending. Therefore, for any of the reclamation options to be considered in this study, the treatment technology will likely include the use of reverse osmosis (RO) membranes for desalination. Depending on options for concentrate disposal and detailed salinity goals, the use of nanofiltration (NF) membranes may be considered in place of RO membranes. The study will also evaluate the use of alternative advanced treatment processes, such as ozone and biologically activated filters, in parallel with RO in order to maximize water recovery, reduce the amount of concentrate and minimize energy usage.

The water quality requirements for direct potable reuse (DPR) and indirect potable reuse (IPR) via groundwater augmentation (i.e., ASR) are anticipated to be similar. Both would require that treatment meet Texas Commission on Environmental Quality (TCEQ) standards for pathogen inactivation in DPR. Based on recommendations in the TWDB Direct Potable Reuse Resource Document (in press), and potable end goals for pathogens promulgated by TCEQ in its case-by-case reviews of prior DPR projects, it is anticipated that the total log removal requirements for pathogens (following wastewater treatment) will be approximately 9-log virus, 9-log *Giardia*, and 8-log *Cryptosporidium*. MPU's existing surface water treatment plant(s) can provide a minimum of 4-log virus, and 3-log each *Giardia* and *Cryptosporidium* treatment, leaving approximately 5-log virus, 6-log *Giardia*, and 5-log *Cryptosporidium* treatment to be achieved by advanced treatment. Ultraviolet disinfection could accomplish much of this inactivation, and would be supplemented by the protozoa (*Giardia* and *Cryptosporidium*) removals achieved by any low-pressure membranes used as a pre-treatment step for RO. Any alternatives involving direct injection into the potable water distribution system would likely require additional treatment.

Treatment requirements for IPR via surface water augmentation would depend on the specific scenario, but would be a function of blending and detention time within the surface water body as well as maintaining compliance with the Texas Surface Water Quality Standards and associated discharge permitting requirements.

Geothermal Energy Recovery

As part of a separate feasibility study already contracted by MPU, the potential to recover energy from the temperature and pressure of geothermal groundwater found in deep formations under the Texas Gulf Coast region is being evaluated. One potential option to be evaluated includes the use of the energy embedded in the geothermal source water to desalinate that same water for potable use; another option would be to use the energy recovered to support the desalination of more shallow (and lower salinity) brackish water sources for potable consumption. A combination of these options could also be considered. Results from this study will be incorporated into the Title XVI Feasibility Study.

Evaluation Criterion 4: Stretching Water Supplies – 15 points

Points will be awarded based on the extent to which the proposal demonstrates that the Title XVI feasibility study will address activities that will help to secure and stretch water supplies.

(1) Describe the potential for the project to reduce, postpone, or eliminate the development of new or expanded water supplies. Include description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

As described in Criterion 1, in the 2011 Region M water supply plan, MPU is projected to experience a water supply deficit within the current decade. The water reclamation alternatives to be addressed in this study would help to address this deficit and reduce or defer the need to develop other new water supplies.

As part of this feasibility study, a more detailed analysis of the total water supply potential available from the reclamation of impaired waters will be conducted. For reuse, this includes analysis of WWTP effluent flow projections and how much of that flow may be already allocated to existing reclaimed water customers (and what the contractual duration and flexibility of those allocations are). For brackish groundwater desalination, this includes the evaluation of brackish sources, as recommended in the preliminary evaluation cited above.

(2) Describe the potential for the project to reduce or eliminate the use of existing diversions from natural watercourses or withdrawals from aquifers. Include description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

MPU does not currently use groundwater to a significant extent because fresh groundwater resources are limited in the vicinity. However, one of the non-reuse strategies to be evaluated includes importing fresh groundwater from another basin. Implementation of a reclamation project could eliminate the need to pursue this option and thus help to preserve that fresh groundwater source.

Please see below for additional information on reduced diversions from natural watercourses.

(3) Describe the potential for the project to reduce the demand on existing Federal water supply facilities. Include description of any specific issues that will be investigated information that will be developed as part of the Title XVI feasibility study.

Beyond the existing groundwater well, MPU's only current source of water supply is the Rio Grande, which is both a natural watercourse and host to Federal water supply facilities in the form of the Amistad and Falcon reservoirs. The Rio Grande is operated under federal jurisdiction between the United States and Mexico Sections of the International Boundary and Water Commission (IBWC). The Treaty of February 3, 1944, for the Utilization of Water of the Colorado and Tijuana Rivers and of the Rio Grande, distributed the water in the international segment of the Rio Grande from Fort Quitman, Texas to the Gulf of Mexico. This treaty also authorized the two countries to construct, operate, and maintain dams on the main channel of the Rio Grande. Water rights in the Lower Rio Grande are served by the Falcon-Amistad system.

The primary purpose of this feasibility study is to identify additional potable supplies available to MPU through the reclamation of impaired sources, which are the only local alternatives to the Rio Grande currently identified as available to MPU. Any water supply options identified and evaluated through this feasibility study will thus reduce diversions from the Rio Grande. Beyond potential habitat improvements described below, the reduction in municipal pumping would also provide surplus water for agriculture and result in a reduction of crop losses during drought conditions when irrigation allocations are curtailed.

Evaluation Criterion 5: Environment and Water Quality – 15 points

Points will be awarded based on the extent to which the proposal demonstrates that the feasibility study will address the potential for a water reclamation and reuse project to improve surface, groundwater, or effluent discharge quality; restore or enhance habitat for non-listed species; or provide water or critical habitat for federally-listed threatened or endangered species.

(1) Describe the potential for the project to improve the quality of surface or groundwater, including description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

For the potable reuse options that involve discharge to surface water or groundwater injection, the goal would be to treat the water to a level that would, at a minimum, not degrade the existing water quality and would meet all regulatory requirements for the discharge or injection. However, with the anticipated treatment that would be needed to protect public health and address public concern with a potable reuse project, it is likely that the reclaimed water would significantly improve the quality of the receiving surface or groundwater if an IPR option were implemented.

(2) Describe the potential for the project to improve flow conditions in a natural stream channel, including description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

MPU's primary source of water supply is the Lower Rio Grande. The Environmental Flows Recommendations Report published by TCEQ notes that the Texas Rio Grande system is significantly over-appropriated. Therefore, any water left in the Rio Grande is available to serve the environmental flow requirements of the river, meeting a critical environmental need, especially during drought conditions. In addition, surface water IPR options that discharge to a natural stream could result in increased flows in the receiving stream and would provide recreational and aquatic life benefits within the reach receiving the discharge.

(3) Describe the potential for the project to provide water or habitat for federally listed threatened or endangered species, including description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

The Rio Grande flows to the Gulf of Mexico via the Las Palomas Wildlife Management Area, which, according to the Texas Parks and Wildlife Department, provides habitat to approximately 19 threatened and endangered species including bald eagles, American peregrine falcons, brown pelicans, jaguarondis, ocelots and several kinds of sea turtles. The US Fish and Wildlife Service also lists this area as critical habitat for the Piping Plover. Any water that can be left in the Rio Grande will help to preserve habitat for these species.

Evaluation Criterion 6: Legal and Institutional Requirements – 10 Points

Points will be awarded based on the extent to which the proposal demonstrates that the feasibility study will address legal or institutional requirements or barriers to implementing a project, including water rights issues and any unresolved issues associated with implementation of a water reclamation and reuse project.

Several legal and institutional issues will need to be addressed as part of this study:

- **Surface Water Rights:** For surface water IPR options, MPU must have a water right permit to divert reclaimed water (or surface water exchanged for reclaimed water) from the surface water body.
- **Groundwater Rights:** McAllen and Hidalgo County are located with Groundwater Management Area #16. The majority of the county is not located within a groundwater conservation district. However, for the groundwater IPR option, it will need to be confirmed that groundwater usage is not subject to any groundwater conservation district oversight.
- **Discharge Permits:** Compliance with TPDES discharge permitting requirements must be maintained. If changes to quantity or location of the discharge or treatment processes is included as part of the recommended project, amended permits will be required.
- **Water Quality Requirements:** Texas does not have any specific regulations that address potable reuse. Currently, potable reuse projects are addressed on a case-by-case basis at the TCEQ. The City would need to meet with the TCEQ to discuss the water quality goals and proposed treatment to ensure that the project could be supported and permitted by the TCEQ.
- **Concentrate Disposal:** For options that require disposal of concentrate, disposal of these residuals will likely require some form of permitting, depending on the disposal option selected. Surface discharge, injection wells and evaporation ponds will all require permits from the TCEQ.

- Other Regulatory Issues: Project alternatives will also consider permitting issues related to construction, such as Section 404 permitting, as well as property and easement acquisition requirements.

Evaluation Criterion 7: Renewable Energy and Energy Efficiency – 10 points

Points will be awarded based on the extent to which the proposal demonstrates that the Title XVI feasibility study will address methods to incorporate the use of renewable energy or will otherwise address energy efficiency aspects of the water reclamation and reuse project being investigated.

The significant energy consumed by operation of advanced water treatment facilities for water reclamation must be acknowledged. Therefore, energy considerations are one of the evaluation criteria for the project alternatives. As part of this study a number of measures to decrease the energy impact of the project alternatives will be considered. Elements that will be included as part of this analysis include:

- Energy efficiency of the treatment processes, for example:
 - energy recovery devices for RO systems
 - variable frequency drives to optimize energy consumption at lower capacities
- Renewable energy sources, for example:
 - geothermal energy, as described above
 - solar energy
 - wind energy
- Energy usage offsets, for example:
 - reduced electrical usage for avoided pumping from Rio Grande

Evaluation Criterion 8: Watershed Perspective – 10 points

Points will be awarded based on the extent to which the proposal demonstrates that the Title XVI feasibility study will address alternatives that promote and apply a regional or watershed perspective to water resource management.

MPU is a member of the Rio Grande Regional Water Authority (RGRWA), and actively participates in regionalization efforts. In November 2013, RGRWA and Reclamation completed a Lower Rio Grande Basin Study that determined the magnitude and frequency of water supply shortages in the area are severe. Population in the eight-county region is expected to grow from 1.7 million in 2010 to 4.0 million in 2060, resulting in the need for an additional 592,000 ac-ft/yr of total water demand. The Study determined that climate change may likely increase the shortage by an additional 86,438 ac-ft/yr. Any supplies identified by the proposed feasibility study will go towards addressing this projected regional shortfall.

In addition, the successful implementation of a cost-effective reclamation project in the Rio Grande Valley could provide leadership for other neighboring utilities to pursue this alternative instead of continuing to rely on the dwindling water resources of the Rio Grande.

Required Permits or Approvals

No additional permits or approvals are required to perform the feasibility study.

Funding Plan

Non-federal funds will be provided by MPU. The cash portion of the contribution will be supplied from Capital Improvement Program funds.

Table 1: Summary of Non-Federal and Federal Funding Sources

Funding Sources	Funding Amount
Non-Federal Entities	
1. McAllen Public Utility	\$ 289,213
2.	
3.	
Non-Federal Subtotal:	\$ 289,213
Other Federal Entities	
1.	
2.	
3.	
Other Federal Subtotal:	
Requested Reclamation Funding	\$ 150,000
Total Project Funding	\$ 439,213

Official Resolution

Official resolutions from McAllen Public Utility Board of Trustees and the City of McAllen Board of Commission are attached.

Project Budget Proposal

Summary

The total proposed project budget cost is \$. The following sections describe details of the budget proposal.

Budget Narrative

Salaries and Wages

Three MPU employees will be involved in the project management and coordination of the Feasibility Study. Tim Skoglund, Utility Engineer for MPU, is projected to spend approximately 240 hours of time managing the project. Susan Schane, Grant Writer and Compliance Officer for MPU, is projected to spend approximately 50 hours of time on general administration and grant reporting tasks. Mark Vega is anticipated to spend 10 hours attending meetings and providing project guidance.

Fringe Benefits

The fringe benefits are fixed rates used for billing purposes.

Travel

The costs associated with travel are minimal and are not part of this proposal.

Equipment

The costs associated with equipment are minimal and are not part of this proposal.

Supplies/Materials

The costs associated with supplies/materials were determined on engineering estimates for reporting on the status of the project.

Contractual/Construction

A consultant will be contracted to provide consulting and engineering work for the project. A breakdown of all tasks to be completed and a detailed budget estimate of labor and rates for each task is provided. However, a final project value and budget will not be known until after selection of the consultant.

Other

Not Applicable.

Reporting

The budgeted hours for Susan Schane (in the salaries and wages section) include the costs associated with quarterly reports, a final report and the necessary financial reporting.

Table 2: Budget Proposal

Budget Item Description	Computation		Recipient Funding	Reclamation Funding	Total Cost
	\$/Unit and Unit	Quantity			
Salaries and Wages*					
Tim Skoglund (Project Manager)	\$46/hr	240	\$ 11,040		\$ 11,040
Susan Schane (Grant Admin.)	\$25/hr	50	\$ 1,250		\$ 1,250
Mark Vega (General Manager)	\$67/hr	10	\$ 670		\$ 670
Fringe Benefits*					
Tim Skoglund (Project Manager)	\$9.2/hr	240	\$ 2,208		\$ 2,208
Susan Schane (Grant Admin.)	\$5/hr	50	\$ 250		\$ 250
Mark Vega (General Manager)	\$13.5/hr	10	\$ 135		\$ 135
Travel					
Trip 1					
Trip 2					
Trip 3					
Equipment					
Item A					
Item B					
Item C					
Supplies/Materials					
Office Supplies					
Construction					
Contractual/Construction					
Engineering Consultant			\$273,660	\$150,000	\$423,660
Item 2					
Other					
Final Reporting (Salaries)					
Final Reporting (Fringe Benefits)					
Total Direct Costs			\$289,213	\$150,000	\$439,213
Indirect Costs - 0 %					
Total Project Costs					\$439,213

*In-kind contribution, McAllen Public Utility

Table 3: Funding Sources Summary

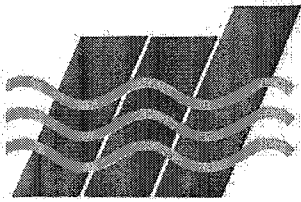
Funding Sources	Total Cost by Source	% of Total Study Cost
Recipient Funding	\$289,213	66%
Reclamation Funding	\$150,000	34%
Other Federal Funding	\$0	0%
Totals	\$439,213	100%

**McAllen Public Utility
USBR Title XVI Feasibility Study**

Level 2 (Phase) No. and Description <i>Level 3 (Task) No. and Description</i>	Total Labor		Percent of Total Fee
	Hours	Fee (\$\$\$)	
Feasibility Study	1,726	\$ 293,420	100.0%
1 Introduce the project	26	\$ 4,420	1.5%
<i>a Introduce the project</i>	26	\$ 4,420	1.5%
2 Identify Needs and Challenges	60	\$ 10,200	3.5%
<i>a Identify current water supply gap</i>	8	\$ 1,360	0.5%
<i>b Description of current and projected water supplies</i>	8	\$ 1,360	0.5%
<i>c Description of current and projected water demands</i>	8	\$ 1,360	0.5%
<i>d Identify water quality concerns</i>	24	\$ 4,080	1.4%
<i>e Description of wastewater and disposal options</i>	12	\$ 2,040	0.7%
3 Identify Water Reclamation and Reuse Opportunities	90	\$ 15,300	5.2%
<i>a Identify uses of reclaimed water</i>	6	\$ 1,020	0.3%
<i>b Description of water market</i>	8	\$ 1,360	0.5%
<i>c Identify/address potential hurdles</i>	16	\$ 2,720	0.9%
<i>d Identify jurisdictional issues</i>	8	\$ 1,360	0.5%
<i>e Describe potential sources of reclaimed water</i>	16	\$ 2,720	0.9%
<i>f Describe source water facilities</i>	24	\$ 4,080	1.4%
<i>g Describe current reuse practices</i>	6	\$ 1,020	0.3%
<i>h Summarize current water reclamation technology</i>	6	\$ 1,020	0.3%
4 Description of Alternatives	640	\$ 108,800	37.1%
<i>a Describe non-federal funding condition</i>	6	\$ 1,020	0.3%
<i>b Define project objectives</i>	6	\$ 1,020	0.3%
<i>c Description of non-Title XVI alternatives with costs</i>	88	\$ 14,960	5.1%
<i>d Development of reclamation project alternatives with costs</i>	280	\$ 47,600	16.2%
<i>e Determine waste discharge requirements</i>	120	\$ 20,400	7.0%
<i>f Describe potential project elements</i>	140	\$ 23,800	8.1%
5 Economic Analysis	76	\$ 12,920	4.4%
<i>a Describe existing and future condition</i>	16	\$ 2,720	0.9%
<i>b/c Prepare cost comparison</i>	32	\$ 5,440	1.9%
<i>d Compare other benefits</i>	28	\$ 4,760	1.6%
6 Selection of Title XVI Project	38	\$ 6,460	2.2%
<i>a Selection of Title XVI Project</i>	38	\$ 6,460	2.2%
7 Energy Evaluation and Environmental Considerations	202	\$ 34,340	11.7%
<i>a Energy evaluation</i>	108	\$ 18,360	6.3%
<i>b Environmental impacts</i>	94	\$ 15,980	5.4%

**McAllen Public Utility
USBR Title XVI Feasibility Study**

Level 2 (Phase) No. and Description <i>Level 3 (Task) No. and Description</i>	Total Labor		Percent of Total Fee
	Hours	Fee (\$\$\$)	
Feasibility Study	1,726	\$ 293,420	100.0%
8 Legal and Institutional Requirements	46	\$ 7,820	2.7%
<i>a Analyze water rights</i>	12	\$ 2,040	0.7%
<i>b Analyze institutional and legal requirements</i>	6	\$ 1,020	0.3%
<i>c Analyze multi-jurisdictional and interagency aspects</i>	6	\$ 1,020	0.3%
<i>d Analyze permitting requirements</i>	16	\$ 2,720	0.9%
<i>e Discuss unresolved issues</i>	6	\$ 1,020	0.3%
9 Implementation and Funding Plan	80	\$ 13,600	4.6%
<i>a Develop implementation plan</i>	68	\$ 11,560	3.9%
<i>b Describe funding plan</i>	12	\$ 2,040	0.7%
10 Report	212	\$ 36,040	12.3%
<i>a Draft report</i>	180	\$ 30,600	10.4%
<i>b Final report</i>	32	\$ 5,440	1.9%
11 Project Administration	256	\$ 43,520	14.8%
<i>a Project Management</i>	160	\$ 27,200	9.3%
<i>b Meetings (3)</i>	96	\$ 16,320	5.6%
TOTAL LABOR			
Total Labor Hours	1,726		
Total Labor Amount		\$ 293,420	100.0%
TOTAL EXPENSES			
Total Subconsultants		\$ 121,000	
Total Reimbursables		\$ 9,240	
Total Expenses		\$ 130,240	
GRAND TOTAL - Feasibility Study		\$ 423,660	



McALLEN

PUBLIC UTILITY

CHARLES E. AMOS, Chairman
ERNEST R. WILLIAMS, Vice-Chairman
TONY AGUIRRE, JR., Trustee
ALBERT CARDENAS, Trustee
VERONICA V. WHITACRE, Ex-Officio/
Commissioner

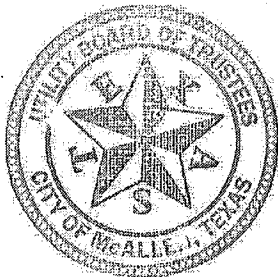
MARCO A. VEGA, P.E., General Manager

CERTIFICATION

STATE OF TEXAS
COUNTY OF HIDALGO
CITY OF McALLEN

I, Nyla L. Flatau, Utility Board Secretary of the McAllen Public Utility, do hereby certify that the following is a true and correct copy of Resolution 2015-02 which was approved by the McAllen Public Utility Board at the Regular Meeting held February 24, 2015.

IN WITNESS WHEREOF, I have hereunto subscribed my signature and impressed the official seal of the McAllen Public Utility Board of Trustees, City of McAllen, Texas, this 27th day of February, 2015.



Nyla L. Flatau
Nyla L. Flatau, TRMC/CMC, CPM
Utility Board Secretary

RESOLUTION NO 2015- 02

AUTHORIZING THE SUBMISSION OF A GRANT APPLICATION REQUESTING FINANCIAL ASSISTANCE FROM THE UNITED STATES DEPARTMENT OF INTERIOR, BUREAU OF RECLAMATION, WATERSMART: DEVELOPMENT OF FEASIBILITY STUDIES UNDER THE TITLE XVI WATER RECLAMATION AND REUSE PROGRAM FOR FISCAL YEAR 2015 AND DESIGNATING AN AUTHORIZED REPRESENTATIVE TO ACT ON BEHALF OF THE CITY OF MCALLEN AND MCALLEN PUBLIC UTILITY TO CARRY OUT THE IMPLEMENTATION OF THIS PROJECT

**STATE OF TEXAS
COUNTY OF HIDALGO
CITY OF MCALLEN**

WHEREAS the United States Department of Interior, Bureau of Reclamation makes financial support available to local municipalities through the Title XVI Water Reclamation and Reuse Program

WHEREAS the City of McAllen and McAllen Public Utility has a project which is eligible for financial assistance through the Bureau of Reclamation Title XVI Water Reclamation and Reuse Program for the development of new water reuse feasibility studies.

WHEREAS if financial assistance is awarded through the Title XVI Water Reclamation and Reuse Program, the City of McAllen and McAllen Public Utility is required to provide fifty percent of the project costs as a local match.

NOW THEREFORE BE IT RESOLVED BY THE BOARD OF COMMISSION OF THE CITY OF MCALLEN TEXAS THAT

1. McAllen Public Utility is hereby authorized and instructed to develop and submit a grant application to Bureau of Reclamation WaterSmart Program for funding in an amount not to exceed \$150,000 to provide for the development of a new water reuse feasibility study for impaired, brackish, groundwater and treated wastewater effluent.
2. That Marco A. Vega, P. E., General Manager of McAllen Public Utility be and is hereby designated the authorized representative of the City of McAllen and McAllen Public Utility for the purposes of furnishing such information and executing such documents as may be required in connection with the preparation and filing of such application for financial assistance and the rules of the Bureau of Reclamation and in all matters pertaining to this application including appearing before the Bureau of Reclamation and submitting other documentation as may be required by the Executive Administrator or the Bureau of Reclamation Board.
3. Upon the approval of this application, the General Manager of McAllen Public Utility is authorized to execute all legal documents necessary and to perform any acts necessary to implement the Project. McAllen Public Utility is requesting an amount not to exceed \$150,000 from the Bureau of Reclamation WaterSmart program.

CONSIDERED PASSED APPROVED AND SIGNED this 24th day of February 2015 at a regular meeting of the Board of Commission of the City of McAllen Texas at which a quorum was present and which was held in accordance with Chapter 551 Texas Government Code.

Attest

McAllen Public Utility



Charles Amos
Chairman Board of Trustees

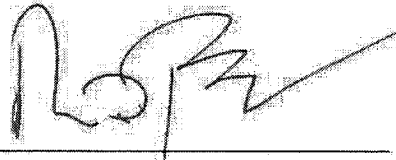


Marco A. Vega, P. E.
General Manager

Approved as to form:



Nyla L. Flatau, TRMC, CPM
Utility Board Secretary



Kevin D. Pagan
City Attorney

Application Resolution - Certificate of Secretary

THE STATE OF TEXAS
COUNTY OF HIDALGO

I, the undersigned, Secretary of the City of McAllen, Texas, DO HEREBY CERTIFY as follows:

1. That on the 24th day of February, 2015, a regular/special meeting of the Board of Trustees was held at a meeting place within the City; the duly constituted members of the Board being as follows:

Charles Amos, Chairman Place A
Ernest Williams, Vice Chairman Place D
Tony Aguirre, Trustee Place B

and all of said persons were present at said meeting, except the following:

Albert Cardenas, Trustee Place C
Veronica Vela Whitacre, Trustee/Ex-Officio Member

Among other business considered at said meeting, the attached resolution entitled:

"RESOLUTION 2015- 02 Authorizing The Submission Of A Grant Application Requesting Financial Assistance From The United States Department Of Interior, Bureau Of Reclamation, WaterSmart: Development Of Feasibility Studies Under The Title XVI Water Reclamation And Reuse Program For Fiscal Year 2015 And Designating An Authorized Representative To Act On Behalf Of The City Of McAllen And McAllen Public Utility To Carry Out The Implementation Of This Project."

was introduced and submitted to the McAllen Public Utility Board for passage and adoption. After presentation and due consideration of the resolution, and upon a motion made by Vice-Chairman Williams and seconded by Trustee Aguirre, the resolution was duly passed and adopted by the Board of Trustees by the following vote:

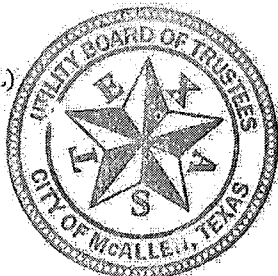
3 voted "For" 0 voted "Against" 0 abstained

all as shown in the official Minutes of the McAllen Public Utility Board for the meeting held on the aforesaid date.

2. That the attached resolution is a true and correct copy of the original on file in the official records of the McAllen Public Utility; the duly qualified and acting members of the Board of Trustees on the date of the aforesaid meeting are those persons shown above and, according to the records of my office, advance notice of the time, place and purpose of said meeting was given to each member of the Board; and that said meeting, and deliberation of the aforesaid public business, was open to the public and written notice of said meeting, including the subject of the above entitled resolution, was posted and given in advance thereof in compliance with the provisions of Chapter 551 of the Texas Government Code.

IN WITNESS WHEREOF, I have hereunto signed my name officially and affixed the seal of said City of McAllen this the 24th of February, 2015.

(SEAL)



Nyla L. Flatau
Nyla L. Flatau TRMC, CPM Board Secretary



JAMES E. DARLING, Mayor
HILDA SALINAS, Mayor Pro-Tem and Commissioner District 3
AIDA RAMIREZ, Mayor Pro-Tem and Commissioner District 4
SCOTT C. CRANE, Commissioner District 1
TREY PEBLEY, Commissioner District 2
JOHN J. INGRAM, Commissioner District 5
VERONICA VELA WHITACRE, Commissioner District 6

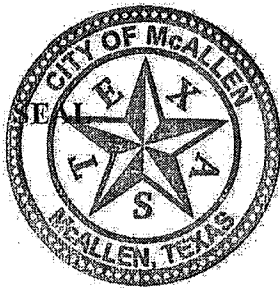
ROEL RODRIGUEZ, P.E., City Manager

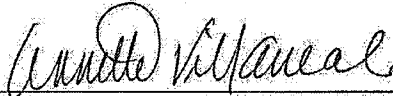
CERTIFICATION

STATE OF TEXAS
COUNTY OF HIDALGO
CITY OF McALLEN

I, Annette Villarreal, City Secretary of the City of McAllen, do hereby certify that the following is a true and correct copy of Resolution 2015-10 which was approved by the McAllen Board of Commissioners at the Regular Meeting held February 23, 2015.

IN WITNESS WHEREOF, I have hereunto subscribed my signature and impressed the official seal of the City of McAllen, Texas, this 26th day of February, 2015.




Annette Villarreal, TRMC/CMC, CPM
City Secretary

RESOLUTION NO. 2015 - 10

AUTHORIZING THE SUBMISSION OF A GRANT APPLICATION REQUESTING FINANCIAL ASSISTANCE FROM THE UNITED STATES DEPARTMENT OF INTERIOR, BUREAU OF RECLAMATION, WATERSMART: DEVELOPMENT OF FEASIBILITY STUDIES UNDER THE TITLE XVI WATER RECLAMATION AND REUSE PROGRAM FOR FISCAL YEAR 2015 AND DESIGNATING AN AUTHORIZED REPRESENTATIVE TO ACT ON BEHALF OF THE CITY OF MCALLEN AND MCALLEN PUBLIC UTILITY TO CARRY OUT THE IMPLEMENTATION OF THIS PROJECT

**STATE OF TEXAS
COUNTY OF HIDALGO
CITY OF MCALLEN**

WHEREAS the United States Department of Interior, Bureau of Reclamation makes financial support available to local municipalities through the Title XVI Water Reclamation and Reuse Program

WHEREAS the City of McAllen and McAllen Public Utility has a project which is eligible for financial assistance through the Bureau of Reclamation Title XVI Water Reclamation and Reuse Program for the development of new water reuse feasibility studies.

WHEREAS if financial assistance is awarded through the Title XVI Water Reclamation and Reuse Program, the City of McAllen and McAllen Public Utility is required to provide fifty percent of the project costs as a local match.

NOW THEREFORE BE IT RESOLVED BY THE BOARD OF COMMISSION OF THE CITY OF MCALLEN TEXAS THAT


1. McAllen Public Utility is hereby authorized and instructed to develop and submit a grant application to Bureau of Reclamation WaterSmart Program for funding in an amount not to exceed \$150,000 to provide for the development of a new water reuse feasibility study for impaired, brackish groundwater, and treated wastewater effluent.
2. That Marco A Vega, P. E., General Manager of McAllen Public Utility be and is hereby designated the authorized representative of the City of McAllen and McAllen Public Utility for the purposes of furnishing such information and executing such documents as may be required in connection with the preparation and filing of such application for financial assistance and the rules of the Bureau of Reclamation and in all matters pertaining to this application including appearing before the Bureau of Reclamation and submitting other documentation as may be required by the Executive Administrator or the Bureau of Reclamation Board.
3. Upon the approval of this application, the General Manager of McAllen Public Utility is authorized to execute all legal documents necessary and to perform any acts necessary to implement the Project. McAllen Public Utility is requesting an amount not to exceed \$150,000 from the Bureau of Reclamation WaterSmart program.


CONSIDERED PASSED APPROVED AND SIGNED this 23rd day of February 2015 at a regular meeting of the Board of Commission of the City of McAllen Texas at which a quorum was present and which was held in accordance with Chapter 551 Texas Government Code.

Attest



City of McAllen


Annette Villarreal, TRMC/CMC, CFM
City Secretary


Jim Darling, Mayor

Approved as to form:


Kevin D. Pagan, City Attorney

Application Resolution - Certificate of Secretary

THE STATE OF TEXAS
COUNTY OF HIDALGO

I, the undersigned, Secretary of the City of McAllen, Texas, DO HEREBY CERTIFY as follows:

1. That on the 23rd day of February, 2015, a regular/special meeting of the Board of Commission was held at a meeting place within the City; the duly constituted members of the Board being as follows:

James E. Darling, Mayor
Hilda Salinas, Mayor Pro Tem
Aida Ramirez, Mayor Pro Tem
Trey Pebley, Commissioner
John Ingram, Commissioner
Veronica Vela Whitacre, Commissioner

and all of said persons were present at said meeting, except the following:

Among other business considered at said meeting, the attached resolution entitled:

"RESOLUTION 2015-10 Authorizing The Submission Of A Grant Application Requesting Financial Assistance From The United States Department Of Interior, Bureau Of Reclamation, WaterSmart Development Of Feasibility Studies Under The Title XVI Water Reclamation And Reuse Program For Fiscal Year 2015 And Designating An Authorized Representative To Act On Behalf Of The City Of McAllen And McAllen Public Utility To Carry Out The Implementation Of This Project."

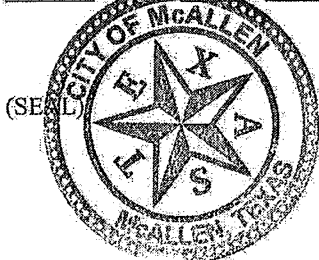
was introduced and submitted to the City of McAllen Board of Commission for passage and adoption. After presentation and due consideration of the resolution, and upon a motion made by Mayor Pro Tem Aida Ramirez and seconded by Mayor Pro Tem Salinas, the resolution was duly passed and adopted by the Board of Commission by the following vote:

6 voted "For" _____ voted "Against" _____ abstained

all as shown in the official Minutes of the City of McAllen Board of Commission for the meeting held on the aforesaid date.

2. That the attached resolution is a true and correct copy of the original on file in the official records of the City of McAllen; the duly qualified and acting members of the Board of Commission on the date of the aforesaid meeting are those persons shown above and, according to the records of my office, advance notice of the time, place and purpose of said meeting was given to each member of the Board; and that said meeting, and deliberation of the aforesaid public business, was open to the public and written notice of said meeting, including the subject of the above entitled resolution, was posted and given in advance thereof in compliance with the provisions of Chapter 551 of the Texas Government Code.

IN WITNESS WHEREOF, I have hereunto signed my name officially and affixed the seal of said City of McAllen this 23rd of February, 2015.




Annette Villarreal, City Secretary