Border Environment Cooperation Commission
Hidalgo County Irrigation District No. 16 (Mission, Texas)
Water Conservation Improvement Project

General Criteria

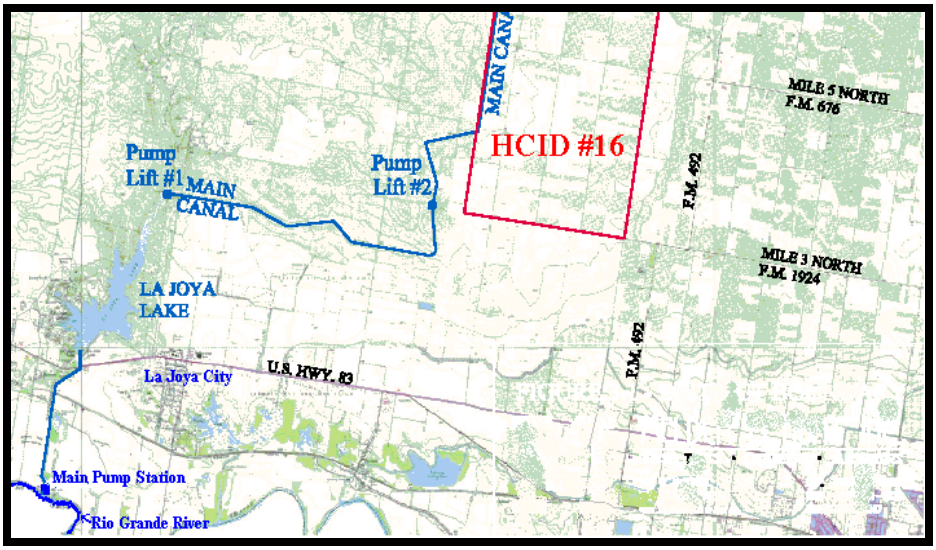
1. Project Type

The proposed project falls under the Border Environment Cooperation Commission (BECC) priority area of water conservation. The project consists of the upgrading of re-lift pump stations No. 1 & 2, the re-lining of 5 miles of the existing concrete-lined main canal with a membrane and installation of a computerized pump control system of the Hidalgo County Irrigation District No. 16 (HCID#16) water conveyance system. The Rio Grande is the District's only water source, the proposed activities will improve management and conservation of water, reduce seepage losses and operation and maintenance costs, as well as the conservation of energy.

2. Project Location

HCID#16 was established in 1946 and is located in Hidalgo County, TX within 20 miles of the US-Mexico border. The District is approximately eleven miles long and four miles wide, in a generally north-south configuration beginning at FM 1924 and continuing north, lying generally northeast of the city of La Joya. The District has about 26 miles of lined canals and 60 miles of pipelines. It covers an area of 13,580 acres, of which about 12,800 acres are under irrigation. In addition to irrigation water serving 1,452 accounts, the District supplies raw water to the water treatment plants of the La Joya Water Supply Corporation (WSC) and the City of La Joya. The District diverts raw water directly from the Rio Grande River and conveys it through a pipeline and concrete lined canal system to the 3,800 acre-foot La Joya Lake Reservoir having a surface area of 500 acres. The reservoir is maintained by the District and is located just northwest of the City of La Joya, outside the District boundaries. The La Joya WSC and the City of La Joya obtain water from the reservoir and the District also draws water from the reservoir and conveys using two off-District re-lift pump stations (Re-lift Pump Stations No. 1 and 2) to the District boundary.

The District has an authorized annual municipal water right of 1,500 acre-feet and an annual irrigation water right of 30,798 acre-feet. The District sells 1,000 acre-feet of its municipal allotment to the La Joya Water Supply Corporation and 500 acre-feet to the City of La Joya for their use during the year. Based on recent Texas A&M ponding tests, annual water diverted is estimated at 15,360 acre-feet, with total losses of about 29%. Two general location maps of the District, the main pump stations and La Joya Lake are shown below.



3. Project Description and Work Tasks

The proposed project is designed to address water delivery problems of the District.

- HCID#16 is a highly pumped district, thus flow management is necessary to reduce water losses. The District does not have oversized canals for storage, thus pumping and variable flow management is more critical than systems with storage.
- Improvements in the efficiency of the existing pump systems can result in significant savings in energy and water conservation.
- There are large water losses due to seepage in the main canal.

The proposed project focuses on the deficiencies of the District's main delivery system, which requires combined hydraulic lifts of 190 feet from the Rio Grande River. Water is

pumped often and the pumping stations operate in series, thus the management and the cost of the transfer of water to the District is critical. Using the existing manual system of management, irrigation water often cannot be delivered to the fields at the right time, which leads to water spills. The three main off-district pump stations, the main pump station located at the Rio Grande River, Re-lift Station No. 1 located at the north end of the lake, and Re-lift Station No. 2 located near the District boundary, lift the full irrigation demand of the District. The pump stations are currently a constant source of maintenance and inefficiency. The situation is serious because the high maintenance and power costs add significantly to the cost of irrigation; currently about twice as much other Rio Grande Valley irrigation districts. Due to funding constraints, no work is proposed for the main river pump station at this time since that pump station delivers water to La Joya Lake and water management for this pump station is not as critical.

In addition to the above, the main canal system used for water delivery both outside and within the District is in need of improvements since the hydraulic head on the canal causes excessive seepage. While the District has completed a project to replace most of the main canal that serves La Joya Lake, there are various additional main canal concrete-lined sections that require re-lining to reduce losses due to seepage.

The activities proposed to be undertaken to address the above problems include:

- Upgrading Re-lift Pump Stations No. 1 and No. 2.
- Installation of modern instrumentation and pump controls to improve management of the constantly varying irrigation demand and pumping requirements.
- Re-lining of 5 miles of concrete-lined canal with a geomembrane liner.

Without this project, HCID#16 cannot efficiently supply water to District lands at the rate required to meet the demands of crop growth. The major soils within the District are classified as fine sandy loams (McAllen, Hidalgo, and Brennan), which are highly suitable for the growth of citrus, thus the District provides water primarily for citrus crops.

With Certification of the project in March 2004, bids for construction are planned to be let in June 2004, with contracting by October 2004 and completion of all construction work in February 2006 (overall 23 months from the proposed March 2004 certification of the project).

4. Conformance with International Treaties and Agreements

The International Boundary and Water Commission (IBWC) is an independent bi-national public organization that ensures implementation of the 1944 Water Treaty between the United States and Mexico related to water and boundary issues. The project does not violate the allocation of water rights. The District will continue to meet all state surface water diversions from the Rio Grande in accordance with the agreements in place and the restrictions of the Treaty.

The Texas Commission of Environmental Quality (TCEQ) and the International Boundary and Water Commission (IBWC) are the authorities for allocation of water to the District. The 1944 Water Treaty between the United States and Mexico applies.

HCID#16 diverts water from the Rio Grande River in accordance with a Permit issued by TCEQ, governed by Chapters 49 and 58 of the Texas Water Code and Article XVI, Section 59 of the Texas Constitution. TCEQ's Rio Grande Watermaster Office in Harlingen is responsible for allocating, monitoring, and controlling the use of surface water by the District in coordination with IBWC. The State Watermaster also cooperates with IBWC and its Mexican counterpart to monitor U.S. and Mexican compliance with the U.S.-Mexico Treaty of 1944. There is no reported non-compliance by the District under the TCEQ permit.

Human Health and Environmental

1. Human Health and Environmental Need

The proposed project addresses one of the most pressing problems facing the Lower Rio Grande Valley of Texas, i.e., water shortages due to drought over the last seven years and an increasing demand due to population growth. Water conservation reduces the impact of drought conditions and makes available additional water resources that would otherwise be lost to meet both domestic and agriculture demands. The future health, social and economic well being of the population in the Rio Grande Valley are highly dependent on conservation and maximizing beneficial use of available water to meet domestic and agricultural needs. The project addresses the critical water shortages by reducing water losses and providing for more efficient delivery of water, thus enhancing availability of water both domestic and agriculture use.

2. Environmental Assessment

An Environmental Report (Environmental Summary – ES) for the project was completed by the engineering firm of Melden and Hunt, Inc. The ES resulted in the following conclusions:

- There are no direct or indirect detrimental impacts on prime farmland from the project.
- There are no wetlands affected by the project.
- There are no known archeological or cultural resources affected by the project, and measures will be undertaken during construction to address any unforeseen findings in accordance with State historical resource protection requirements.
- No short or long term detrimental socioeconomic effects are expected as a result of the project. Socioeconomic impacts are expected to be wholly positive.
- Short-term wildlife habitat disturbance associated with the project will be moderate, and construction will be avoided during peak nesting periods (March thru August). Long-term disturbance of wildlife habitat is expected to be minimal to none.
- No significant, long-term air, water or vegetative impacts are anticipated.
- The project is expected to have a positive impact from environmental and conservation perspectives.

The ES was submitted by Melden and Hunt to the Texas Parks and Wildlife Department, Texas Historical Commission, U.S. Army Corps of Engineers and the United States Fish and Wildlife Service for review. The Texas Historical Commission reviewed the project under Section 106 of the National Historic Preservation Act of 1966 and the Antiquities

Code of Texas and determined that the project does not affect any known historical properties and the project may proceed. The Corps. of Engineers reviewed the ES and responded that a permit from the Department of the Army was not required.

Construction drawings for the project will include specifications requiring the contractor to protect existing waterways, vegetation and wildlife from unnecessary disruptions during construction. In addition, the District will file the required Notice of Intent with the Texas Commission on Environmental Quality (TCEQ) and prepare a Storm Water Pollution Prevention Plan prior to construction.

The construction of the proposed water conservation measures will have an overall sustained positive environmental impact, enhancing the prospects for continued economic growth of the region, as well as the improved health and social well being of the region's growing population.

3. Compliance with Environmental and Cultural Resource Laws and Regulations

The environmental review of the project and the proposed mitigation measures comply with all environmental and cultural resource laws and regulations. All required permit conditions necessary for the construction or operation of the proposed project will be acquired and complied with. The District has the required water rights and is fully compliant with the terms of its water use permit.

Technical Feasibility

1. Appropriate Technology

The project was developed by the engineering firm of Melden and Hunt, Inc., in accordance with USBOR guidelines, funded by the Texas Water Development Board (TWDB) State Energy Conservation Office (SECO) funds. Each of the project activities was analyzed with consideration of the appropriate technical and least-cost alternative to improve water flow management and maximize water savings, as further described below.

Upgrading Re-lift Pump Stations No. 1 and No. 2

The principle alternatives to upgrade the pumps were 1) pump stations without variable frequency drives (VFD) and canal re-lining, and 2) pump stations with VFD and canal re-lining.

Alternative w/o VFD

Re-Lift Pump Station No. 1: For the non-VFD alternate, the two existing pumps at Re-lift Pump Station No. 1 would be used with the addition of two smaller pumps rated at 20 cfs each to provide flexibility. A new pump structure would be required for the two smaller pumps, combined with the two existing pumps each with a capacity of 35 cfs. With the addition of the two smaller pumps, pump station output could be tailored output needs of 20, 40, 55, 75, 95 or 110 cfs, with 110 cfs being the main canal capacity. All pumps, including the existing pumps, are vertical pumps and would not require priming. In addition, the existing 60-inch steel discharge line will be replaced with a 5' x 6' box conduit (or equivalent

pipe). No redundant pumping is required because of the cost and because maintenance down time can be scheduled without serious interruption to the District operation.

Re-lift Pump Station No. 2

For this pump station, a new pump structure with four new vertical pumps would be required. The four new vertical pumps would replace two older/existing centrifugal pumps that require priming at start-up. Three of the new pumps would have outputs of 30 cfs each, with one rated at 20 cfs. This pumping arrangement would also provide outputs of 20, 30, 50, 80 or 110 cfs. The existing 60-inch steel discharge line would be replaced with a 5 x 6 foot box conduit (or equivalent pipe). Again, no redundant pumping is required because of the cost and because maintenance down time can be scheduled without serious interruption to the District operation.

Alternative with VFD

Re-Lift Pump Station No. 1: For this alternate, one existing 35 cfs vertical pump at Re-lift Pump Station No. 1 would remain, with replacement of the gear drive of the other 35 cfs vertical pump and the addition of a new vertical pump with a variable frequency drive pump speed controller. This pump arrangement would provide a variable pump output from about 30 cfs to 110 cfs (main canal capacity). No pump priming would be required with this alternate. The existing, corroded 60-inch steel discharge line will be replaced with a 5' x 6' box conduit (or equivalent pipe). Again, no redundant pumping would be required because of the cost and because maintenance down time can be scheduled without serious interruption to the District operation.

Re-lift Pump Station No. 2

This alternate would require a new pump structure with two new vertical pumps. One of the new vertical pumps would be incorporated with a variable frequency drive (VFD) pump speed controller. The new vertical pumps would replace two older centrifugal pumps that require priming at start-up. The pump station would have a variable output that ranges from 30 cfs to 110 cfs. The existing corroded 60-inch steel discharge line will be replaced with a 5' x 6' box conduit (or equivalent pipe). Again, no redundant pumping would be needed because of the cost and because maintenance down time can be scheduled without serious interruption to the District operation.

A life-cycle cost analysis of the two above alternatives completed by Melden and Hunt concluded that the two alternatives were similar in relation to seepage reduction, pump efficiency and pump control, but the VFD pump alternative was considered better in its elimination of spillage, and also had the lowest net present value. Thus the alternative with VFD pumps is proposed for the project.

Installation of system computerized control system

Pump control instrumentation is proposed for any pump alternative. Intra-canal flow meters with depth indication are proposed to be installed in the main canal downstream of

Re-lift Pump Station 1 and Re-lift Pump Station 2. The Sontek device, commonly used for this purpose, is proposed to be used. The intra-canal instrumentation will be used to transmit flow data to the District office for pump monitoring and control. Supervisory Control and Data Acquisition (SCADA) software will be installed to facilitate the control function.

Re-lining of 5 miles of concrete-lined canal

The re-lining an existing canal to reduce seepage losses included consideration of traditional technologies. Impenetrable barrier liners were considered to be the best means to reduce seepage losses to acceptable levels, and the selected alternative was the application of polyurethane coated material to the existing canal surface. Melden and Hunt presented existing examples of this type of construction.

2. Compliance with Applicable Design Standards and Regulations

The design and construction requirements will adhere to USBOR requirements under the "Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects under Public Law 106-576." Construction technical specifications will follow the Construction Specification Institute standards, along with USBOR design standards and criteria. USBOR quality control procedures will be applied during construction.

Financial Feasibility and Project Management

1. Financial Feasibility

The firm of Brown and Caldwell completed a financial analysis of project and the District's financial ability to provide matching funds for proposed funding structure of the project and the operation and maintenance of the system. The estimated project costs based on the design information are as follows:

PROJECT COSTS

ITEM	FUNDING SOURCE	TOTAL
Planning/Design/Construction Administration	HCID#16 & SECO	$331,800
Estimated Construction Cost	HCID#16 & NADB	$2,865,080
Contingencies	-------	$286,500
TOTALS		**$3,483,380**

Cost in U.S. Dollars. August 2003

The funding sources for the project are summarized in the table below. Based on the WCIF Guidelines, the WCIF grant may support 50% of the project costs up to or a maximum of $4,000,000. In this case, the WCIF contribution is about 40% of the project costs, or $1,376,697.

FINANCIAL STRUCTURE FOR THE PROJECT

Source	Type	Amount USD	% Project Cost
NADB	WCIF-Grant	$1,376,697	40%
State of Texas	SECO Grant	$254,180	7%
HCID#16	Operations Funds	$29,199	2%
	In-Kind Contributions	$1,173,304	34%
	Short Term Loans	$650,000	17%
	Total HCID#16	$1,852,503	53%
TOTAL		**$3,483,380**	**100%**

2. Rate Model

The table below summarizes the existing structure.

Existing Assessment Fee Structure

Fees	Per Acre
Annual Flat Rate (per irrigable acre)	$22.50
Water Assessment (per acre irrigated)	$32.00

The proposed projects and funding source structures do not require an adjustment to the current Fee and Assessment Structure implemented by the District.

3. Project Management

United Irrigation District (UID) of Mission Texas provides management and operational services for HCID#16 under a 1997 Interlocal cooperation agreement. The UID provides the services to HCID#16 out of the UID office, located ¾ mile west on Mile 2 Road in Mission, Texas. The UID services include, among other things, managing the day-to-day activities of HCID#16, including accepting orders for water, ordering water from the TCEQ Water Master's office, accepting payments for water, preparing tax statements and collecting any tax payments, purchasing supplies, paying bills, providing accounting services, and operating and maintaining the river pumping operations and water delivery system, drainage system and equipment of HCID#16. UID staff basically manages HCID#16 to the same standards UID operates its own district. Decisions pertaining to the investment of funds of HCID#16 are reserved to the Board of Directors, subject to adequate provision of unrestricted current revenue funds to reimburse UID for maintenance and operation expense as provided in the Agreement. The UID staff, consisting of 42 staff, of which 5 are administrative, conduct O&M on both districts.

The UID management services will construct the project with the use of a combination of

contracted services and in-kind services. UID has managed construction activities of similar magnitude. In-kind services will largely include all the work required using its own labor and equipment, in conjunction with contract services for specialized work. For example, UID management forces will do canal cleaning and polyurethane fabric installation, with contract forces performing the heat treatment of the installed fabric, and UID management forces will build canal instrumentation sections of known configuration, but the instrumentation will be installed by contract.

The UID management staff is considered to be experienced with concrete construction and pipe installation, and is considered to have the equipment required for the construction. Operation and maintenance manuals will be provided by suppliers of new equipment installations, including training of operators of the equipment. Melden & Hunt, Inc., will provide the necessary technical and management support for project administration.

Prior to Certification, the District Board of Directors will be required to issue a Resolution committing $1,202,503 of their own resources and will provide a Letter of Credit for $650,000 for the short-term loans to cover the District's contribution to the project, including confirmation of projections in the financial analysis. In addition, HCID#16 is required to provide UID agreement with the use of UID management staff for the force-account construction work.

Community Participation

1. Comprehensive Public Participation Plan

BECC certification, a public participation process to promote community understanding of and support for the proposed project is required. The Public Participation Plan (Plan) was developed per certification requirements and was designed to provide a framework for the sponsor and steering committee to conduct public participation in the areas served by HCID#16. The Plan was submitted and approved in December 2003.

2. Steering Committee

The steering committee was made up of Xavier Ornelas, Paul Heller, Saul Sosa, Donato Venecia, and David Buchanan Board Members; Mike Alaniz, City Administrator of the City of La Joya; and Lucrecio Flores, General Manager of La Joya Water Supply Corporation. Assisting the committee were Tito Nieto and Stephen Dunn of the Irrigation District and Melden & Hunt, consulting engineers were represented by Larry Smith. The steering committee collectively contacted more than 150 individuals from the district who voiced their support and stated that it should proceed with the project.

3. Local Organizations

The following organizations approved resolutions of support for the project: the Lower Rio Grande Managers Association; the Lower Rio Grande Authority; the City of La Joya and the La Joya Water Supply Corporation

4. Public Information

The Project Plan and Environmental Information Summary were made available for public viewing thirty days prior to the first BECC public meeting that was held on January 14, 2004. The documents were available for viewing during normal business hours at the District office. For after hours the documents were available by contacting the District. In addition, notices of availability of project information were included in public meeting notice that was published in the McAllen Monitor 30-days prior to the first public meeting.

Fact sheets were developed that include basic information on the project such as, technical, environmental, financial and public participation components. District staff distributed the fact sheet with water tickets at time of purchase. Unfortunately, due to the excessive rainfall during the latter part of 2003, no new irrigation tickets were sold. The McAllen Monitor was scheduled to interview the general manager for an article on the project.

5. Public Meetings

The first BECC public meeting held was a general information meeting to provide the public with an update of the proposed water conservation improvements. The first public meeting was held Wednesday, January 14, 2004 to present the technical aspects of the project with 11 people attending. The second BECC public meeting focused on the financial aspects of the project, such as the NADB financial analysis and impact to the District. The meeting was held Wednesday, January 21, 2004 and 10 people attended. Exit surveys collected indicate there was no opposition and they indicated to proceed with the project.

Sustainable Development

1. Definition and Principles

Sustainable Development Criteria is defined as conservation oriented social and economic protection and sustainable use of resources, while addressing both current and future needs, and present and future impacts of human actions. This definition is based on the Rio de Janeiro Declaration on Environment and Development, which states that development should meet the needs of the present without compromising the ability of future generations to meet their own needs.

Water conservation is critical to quality and life and economic growth in the Rio Grande Valley. The project complies with the definitions and principles of Sustainable Development in that they positively impact the area and sustainable life of the area's residents through the conservation of water. The Project will help eliminate water losses due to canal seepage and due to spillage that comes from inadequate flow management and will substantially reduce energy requirements because of the water savings and because of improved pump efficiency. With the improved delivery system, the residents of the District will achieve more water savings from water conservation by improved on-farm water deliveries.

2. Institutional and Human Capacity Building

The Rio Grande Regional Water Plan, in support for the implementation of agricultural water conservation strategies, includes the following actions for reduction of irrigation shortages:

- Expanded technical assistance should be available from local, state and federal sources to assist irrigation districts with more detailed systematic evaluations of district facilities and management policies to identify cost effective water efficiency improvements.

- The State of Texas and the federal government should assist with the financing of irrigation water improvements through the provision of low interest loans and grants

Accordingly, due to the limited financial capacity if irrigation districts, the State of Texas through the State Energy Conservation Office (SECO) and the Texas Water Development Board (TWDB) provided financial assistance to the District for the preparation of the project plan and the necessary documentation required to meet the federally appropriated funds.

The project plans for the proposed projects were completed under the Lower Rio Grande Valley Water Resources Conservation and Improvement Act of 2000 (Act), Public Law 106-576. The Act also provides limited funding availability for engineering work, infrastructure construction and improvements. An amendment to the Act (H.R. 2990/S.1577) authorized funds provided by the for conservation projects, including the Reservoir Renovation, Canal Seepage Recovery, Telemetry and Flow Measurements Sites, and Canal Rehabilitation projects.

The project plans for the four projects were prepared in accordance with the Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects, associated with the Act. Public Law 106-576. The project plan was prepared to partially fulfill the requirements in an agreement between the TWDB and the HCID#16. The District entered into a contract with the TWDB, whereby the TWDB will reimburse the District, with grant funds, for the cost of preparing the project plan, project report, plans and specifications and monitoring reports for the proposed project.

The North American Development Bank (NADB) Water Conservation Infrastructure Fund (WCIF) will complement, with grant funds, the capital investments required by the District for construction of these projects. The use of WCIF grant funds allows the District to fully finance its infrastructure in order to reduce water conveyance losses.

The projects will be managed by the District and will be constructed and operated in conformance with Federal, State and NADB requirements. The process for the development of the projects has followed a planning and public participation process that developed alternatives and associated costs, solicited public input, established priorities based on the input of the stakeholders and proceeded according to the priorities established in the planning process.

The HCID#16 has an annual operating budget of approximately $1.0 million. The District

has funds and staff capable of meeting the obligations of the District for the proposed projects. Contractors will be selected by competitive bidding pursuant to the requirements of Texas water Code Section 49.273.

A monitoring program will be established for a two-year period to evaluate and quantify the actual water and energy savings following construction of the Project. This program will serve as a step-by-step outline for documenting the successes of the project. The program will include, at a minimum, sufficient information to allow for completion of the following tasks:

- Designation of a construction inspector not affiliated with the primary construction contractor (District staff construction) to inspect and administer construction quality control documentation for the Project.
- The District, or Texas A & M, will conduct hydrostatic seepage tests of the installed pipe and leakage tests of all structures.
- Inspection of the pipelines one and two years after the initial installation.
- Inspection should check structural integrity, cracking and leakage.
- Photographs should be taken of the inspected portions and a letter from the project engineer should be prepared summarizing the condition of the liner and if any repairs are warranted by the contractor pursuant to the construction contract documents.
- Preparation of an annual report containing the monthly reports and any other data collected.
- The electrical use per acre-foot of water pumped will be determined on a monthly basis and submitted annually. The annual report will include the historic electrical costs per acre-foot for comparison.
- The amount of water pumped will be measured and compared with the water delivered on a monthly basis and submitted annually. The annual report will include historic water pumped and water delivered volumes for comparison.

3. Conformance with Applicable Local and Regional Conservation and Development Plans

The Project complies with all local and regional conservation and development plans. In particular, the Project complies with the "Rio Grande Regional Water Plan", which recommends agricultural water conservation and on-farm water use efficiency in order to reduce irrigation shortages.

The Project Report has been prepared in accordance with the "Guidelines for Preparing and Reviewing Proposals for Water Conservation and Improvement Projects Under Public Law 106-576" issued by the U.S. Department of Interior, Bureau of Reclamation, June 2001.

The Project is in conformance with local conservation efforts already developed by the District and served communities. Conservation of water is stressed and penalties are assessed for overuse of water. The municipalities served by the District have their own water conservation plans. A water allocation plan (Drought Contingency Plan), goes into effect for irrigation when the irrigation water account storage balance amounts to a

maximum of three irrigations per acre. This program remains in effect until the water is restored to the District's irrigation account.

A monitoring program will be established for a two-year period to evaluate and quantify the actual water and energy savings following construction of the projects. This program will serve as a step-by-step outline for documenting the successes of the project. The program will include, at a minimum, sufficient information to allow for completion of the following tasks:

- Designation of a construction inspector not affiliated with the primary construction contractor to inspect and administer construction quality control documentation for the proposed projects.

- Hydrostatic seepage tests of the installed canal liners by the District or Texas A&M. Hydrostatic leakage tests of all structures.

- Inspection of the lined canal reaches one and two years after the initial installation. Inspection should check structural integrity, cracking and leakage. Photographs should be taken of the inspected portions and a letter from the project engineer should be prepared summarizing the condition of the liner and if any repairs are warranted by the contractor pursuant to the construction contract documents.

- Preparation of an annual report containing the monthly reports and any other data collected.

- The electrical use per acre-foot of water pumped will be determined on a monthly basis and submitted annually. The annual report will include the historic electrical costs per acre-foot for comparison.

- The amount of water pumped will be measured and compared with the water delivered on a monthly basis and submitted annually. The annual report will include historic water pumped and water delivered volumes for comparison.

4. Natural Resources Conservation

The Engineer presented the Project to the TCEQ, Texas Parks and Wildlife Service, U.S. Fish and Wildlife Service, USDA National Resource Conservation Services, United States Corps of Engineers, Hidalgo County Historical Commission, Texas Historical Commission, and local governmental agencies. All of these agencies have concurred with District plans for Natural and Cultural Resources Conservation Plans as presented in the Environmental Summary Report for this project.

The above referenced agencies have indicated there will no degenerating effects to the local fauna, inhabiting wildlife species, cultural and archeological resources, wetlands, and migratory patterns of free roaming wildlife.

The Project was developed with the intent of conserving water. The Districts has authorized irrigation water rights are 30,798 acre-feet per year. The water rights are on an "as available" basis and the actual water available to the District may vary from year-to-year. In addition to the irrigation water rights, the District is authorized to divert 1500 acre-feet of water to municipalities. The Texas A&M extension service conducted ponding tests on the Hidalgo County Irrigation District No. 16 main canal system, and it was determined that the average seepage is 192.37 acre-feet/year/mile of main canal. In addition. Based on District records of water diverted compared to water applied for irrigation, the Taxes A&M seepage tests other data and information on the system, Melden & Hunt, Inc. estimated that 75% of the spillage would be eliminated with the project. In addition, Melden & Hunt conducted an assessment the overall economic savings from the project. The economic analysis showed an overall reduction in annual O&M costs of about $28,000. Annual water and energy saving were calculated as shown in the following table.

Project Component	Annual Water Savings (Acre-feet)	Annual Energy Savings (KWH)
Pump Upgrades reduced spillage	1,698	62,768
Canal Lining reduced seepage	673	-----
Totals	**2,371**	**62,768**

Based on the Melden & Hunt analysis, the value of water savings is $34.51 per acre-feet, real value. Considering that the economic value of water has been placed at $652 per acre-feet (Ellis, et. al. Texas A&M), the value of the saved water represents an approximate 19:1 cost benefit ratio, or one dollar of cost will bring nineteen (19) dollars of benefit. Also 2,371 acre-feet of annual saved water can support a community of approximately 21,000 residents, if the water is transferred as leased water, thus approximately 10,000 residents could be served if that water was transferred as a water right.

The construction of the proposed improvements will conserve sufficient water to allow continued development of the City of La Joya and the La Joya WSC, depend on the Rio Grande for their water supply. The project enhances prospects for the City, WSC and the District to be able to manage sustainable growth within their available resources.

5. Community Development

The benefit obtained by modernization of the irrigation facilities should directly impact agricultural production and may result in increased income and an improved quality of

life for end users. The major soils within HCID No. 16 are classified as fine sandy loams (McAllen, Hidalgo, and Brennan), which are highly suitable for the growth of citrus, the highest agricultural use of the soils in the District. With an increased supply and a more efficient application of water, the land should be more readily used for its highest agricultural use.

HCID No. 16 supplies raw water to two utilities—the City of La Joya and the La Joya Water Supply Corporation (LJWSC)—via the La Joya reservoir. With improved financial strength, HCID No. 16 will have its water delivery capability stabilized to improve its ability to supply water to these water utilities.

Available Documents

- Melden & Hunt, Inc, *"BECC Certification Report, Hidalgo County Irrigation District No. 16, Main Pump Station and Main Canal Improvement," January 15, 2004.*

- Brown & Caldwell, *"Financial Feasibility Report, Hidalgo County Irrigation District No. 16,"* Final Report pending for February 2004.

- Melden & Hunt, Inc., *"Addendum Environmental Information Summary Environmental Report), Hidalgo County Irrigation District No. 16, Main Pump Station and Main Canal Improvement,"* January 19, 2004.

- Melden & Hunt, Inc., *"Environmental Report, Hidalgo County Irrigation District No. 16, Main Pup Station Project,"* February 2003.

- Melden & Hunt, Inc., "Sustainable Development Criteria Report, for H*idalgo County Irrigation District No. 16, Main Pup Station Project," January 2004*.

- Hidalgo County Irrigation District No. 16, *"Public Participation Report (Plan) for Main Pump Station Project."*

- Fipps, Guy, *"Potential Water Savings in Irrigated Agriculture for the Rio Grande Planning Region (Region M) Final Report"*, Texas Agricultural Extension Service, Texas Agricultural Experiment Station and Texas A&M University, December 22, 2000.

- Texas Water Development Board, "2001 Adopted Rio Grande Regional Water Plan (Region M)", January 2001.