



Funding for the Rio Grande River Low Water Weir Project

Situation Assessment

In order to meet the water availability and quality requirements for the next 100 years, the City of Laredo is planning the construction of a Low Water Weir on the Rio Grande River. Two proposed locations were identified: Location one is approximately one mile upstream from the World Trade Bridge or in the Northwest section of the City; the other location is 2.8 miles upstream of World Trade Bridge. This project will also provide the generation of electrical power as well as flood control benefits for the community. Federal funding is currently being sought to fund the development of this project.

Background

Article 5 of the 1944 Water Treaty between the United States and Mexico allows for construction of a third dam on the Rio Grande River/Rio Bravo. The third dam was identified to be constructed between Falcon and Amistad Dams. This Low Water Weir Project will provide an environmental improvement along the border, improve the raw water quality, serve as a security barrier and provide additional water supply to the City of Laredo and Webb County. It will also provide flood control benefits to downstream of the proposed project to the upstream of Falcon Dam.

If such a Low Water Weir were considered for the production and sale of hydro-electric power, then the revenue created would be advantageous to project financing. Dannenbaum Engineering determined that it was feasible to produce hydropower at a rate that would be beneficial to both the City of Laredo as well as the City of Nuevo Laredo, Tamps., Mexico.

Work Done to Date

The work that has been completed to date is:

- USGS maps of the Rio Grande River were obtained for some 20 miles both upstream and downstream of the proposed weir site.
- Flow data was obtained from the IBWC.
- The profile of the river was reviewed.

- Flows were developed from 1976 to 1993 using the Laredo gage data. This data was analyzed by a range of distribution methodologies and an acceptable minimum flow number was established. Maximum day flows were reviewed, especially with regard to the height of water over the weir in instances of extreme flow conditions.
- The maximum flow water height was established to determine that there would be no interference with bridges. This set the preliminary height of the weir which was used for the preliminary calculations of available hydropower generation.
- Power calculations were computed which identified the range of power production possibilities based on flow and weir height.
- Power output was also calculated using the low head generation curves and a possible array of machine layouts were considered to produce power both from the base flows and a range of higher flows.
- A variety of hydro purchase prices were obtained and a conservative revenue estimate was generated from that data.
- The limits of the reservoir created by the weir were identified on the U.S. side where contours were available.
- Options for the weir heights were studied for the flood benefits of the proposed weir.

The Preliminary Engineering Feasibility Study was completed in July 2010 at a cost of \$294,000.00. Also an addendum was issued to the final report on November 4, 2014 to include the flood benefits of the proposed weir project.

The location of the two proposed sites are upstream of the World Trade Bridge; the height of the weir is between 30 to 40 feet. The proposed elevations will generate enough power to pay for the cost of construction reasonably within the 25 year life of the power generating equipment. The lake created by a weir of this modest height will be approximately nine miles long and flood few areas outside of the existing river floodplain on the U.S. side where the river banks are not so steep. The weir height will also be established to permit the maximum flood flow over the weir so that the top water level will not cause serious flooding up the river banks.

This project is designed to allow the waters of the Rio Grande River to flow over it once the weir is full. The storage capacity is estimated to be 20,000 to 30,000 acre feet depending on the height of the weir and could be obtained from purchasing irrigation water from an Irrigation District of the Lower Rio Grande River. This project will also assist the process of water treatment by allowing the suspended solids to settle and therefore decrease the turbidity of the water.

A conservatively low sale price for the power has been applied, and the result is that the power plant should be able to provide revenue of approximately \$2,000,000 per annum after an allowance for operation and maintenance has been deducted.

The addendum report has identified three different (44, 65 or 85 foot) weir options to allow a daily flow of 2,419 cfs, which is the median flow during spring season as established in the final report.

To fully realize the potential of the project, the City of Laredo needs federal funds to perform the following;

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| 1. Final Feasibility Study & Schematics ----- | \$2,500,000.00 |
| 2. Presidential Permit ----- | \$3,000,000.00 |
| 3. Hydroelectric Power Permit ----- | \$3,500,000.00 |
| 4. Preliminary Design ----- | \$2,200,000.00 |
| 5. Final Design ----- | \$2,750,000.00 |

Target Agencies

U.S. Army Corp of Engineers
U.S. Coast Guard
Department of Homeland Security
U.S. Department of Transportation
U.S. Department of Agriculture
Texas Parks & Wildlife Department
U.S. Department of State

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