INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

Cuidad Juarez, Chihuahua
October 9, 1984

JOINT REPORT OF THE PRINCIPAL ENGINEERS
CONCERNING THE NEED TO REPLACE
EXISTING PUMPS IN THE EL MORILLO DRAIN PUMPING PLANT

To the Honorable Commissioners
International Boundary and Water Commission
United States and Mexico
El Paso, Texas and Cuidad Juarez, Chihuahua

Sirs:

Pursuant to your instructions, we respectfully submit for your consideration this joint report which evaluates the need for replacement of two of the existing pumps at the Morillo Drain Pumping Plant in Mexico and contains our recommendations for replacement.

The stipulations of Minute 223, "Measures for Solution of the Lower Rio Grande Salinity Problem" and Minute 224, "Recommendations Concerning the Lower Rio Grande Salinity Problem," contemplated a diversion structure, a pumping plant and a canal, all located in Mexico, capable of diverting 106 cubic feet per second (3 cubic meters per second) of highly saline drain waters from the El Morillo Drain to the Gulf of Mexico to alleviate the problem of salinity of the waters in the Lower Rio Grande.

The plant was constructed and placed into operation in 1969, essentially in accordance with Minute 224 with the United States and Mexico sharing equally in the cost of the construction. The pumping plant contains two Fairbanks Morse ½-c.m.s. turbine pumps, model no. XLL6717, with Emerson Electric 60 hp, 700 rpm motors and two Fairbanks Morse 1-c.m.s. turbine pumps, model no. XLL6720, with Emerson Electric 125 hp, 585 rpm motors. The effect of the project has been to materially reduce the salinities in the Lower Grande thereby benefiting downstream irrigation and domestic users in both countries.

We reviewed the report submitted by field engineers J. J. Tucker and Humberto Gonzalez B. of the United States and Mexican Sections of the Commission, respectively, and made a study of the referenced resident engineers' proposal that consists of replacing the two ½-c.m.s. pumps with two 1-c.m.s. pumps. They report that the pumps have now been in operation for 16 years and because of its long use, resulting in frequent breakdowns and increased repairs, the total capacity is decreased by 16% to 33% when any of the pumps are out of service thereby causing an adverse impact on the quality of waters of the Rio Grande. Replacement of the two 0.5 M^3/sec pumps with two 1.0 M^3/sec capacity pumps will provide a total pumping capacity of 4.0 M^3/sec which will permit a minimum pumping capacity of 3 M^3/sec.

We find that by increasing the total pumping capacity to 4 c.m.s. by replacement of the two smaller pumps as proposed by the Field Engineers, the plant will be able to function more efficiently and with a greater reliability. Also, the added standby capacity will provide longer pump life by enabling rotation of pump use. We also find that it is possible to purchase pumps of a 1-c.m.s. capacity, of standard manufacture, that can be installed on the existing ½-c.m.s. pump bases without modifications to either the intake system or discharge lines of the pumping plant. The details and configuration of such pumps are shown on Exhibit 1.

Estimated Costs:

The required new pumps of 1-c.m.s. (16,000 gpm) capacity will be a single stage Aurora Pump 24P24 series, impellers rated at 900 rpm with 125 hp, 460v, 3 phase, Type I General Electric VHS motors with pumping heads ranging from 19 feet (5.8 meters) to 27 feet (8.2 meters) and minimum submergence of 5.2 feet

(1.6 meters) and RTE-Delta control panels. Current estimates of cost for two complete pumping units consisting of pump, electrical control panels and other electrical equipment needed for installation the cost is $79,622 (U.S. currency) for replacement of two pumps plus the estimated cost of $19,600 (U.S. currency) for removal of the old equipment and installation of the new equipment.

To facilitate the division of costs between the two Sections, we find that the division of costs should be made on the basis of actual costs based on U.S. currency converting the Mexican costs made in pesos to U.S. currency at a rate of exchange established at the time the costs would be incurred.

Payment of Costs:

Since the project began operations in accordance with Minutes 223 and 224, each country has equally shared in the operation and maintenance of the project in the same proportion as was the cost of construction, with the United States paying to Mexico its share of such actual costs on an annual basis. In the period through 1980, the United States Section also paid to the Mexican Section a total amount of $41,088.00 (U.S. currency) to provide a fund for the purpose of replacing the equipment as needed. In addition the Commissioners have agreed that the U.S. Section would hold back its share of payments for the operation and maintenance for the years 1982 and 1983 amounting to $65,292 (U.S. currency) in order to accumulate credit for Mexico's share of the pump purchase costs which would be made in U. S. dollars.

A table of costs for replacement of the pumps is shown on Exhibit II.

Recommendations:

1. The Commission replace the two $\frac{1}{2}$-c.m.s. pumps at the El Morillo Drain Pumping Plant with two 1-c.m.s. pumps.

2. Each country equally share in such costs.

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