INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

Sunland Park, New Mexico
April 20, 2021

MINUTE NO. 326

REHABILITATION OF THE INTERNATIONAL TRUNKLINE AND INTERNATIONAL OUTFALL INTERCEPTOR (IOI) IN NOGALES, ARIZONA

The Commission met at 10 a.m. on April 20, 2021 in Sunland Park, New Mexico near International Monument No. 1 to consider the operational conditions of the International Trunkline and the International Outfall Interceptor (IOI), which collect wastewater from the towns of Nogales, Arizona and Nogales, Sonora, and convey them to the Nogales International Wastewater Treatment Plant (NIWTP) located in Rio Rico, Arizona. The International Trunkline has a length of 8,146 feet (2,483 meters) in U.S. territory, from the international border to the site where the NIWTP was originally located. The IOI extends from that site to where the NIWTP is currently located at a distance of approximately 8.8 miles (14 km) north of the international border.

The Commissioners noted the information provided by the U.S. Section in the sense that the results of the inspections performed on the International Trunkline and the IOI indicate these structures are in deteriorated conditions making their rehabilitation necessary.

The Commissioners made note of the Joint Report by Principal Engineers Jose A. Núñez of the U.S. Section and Luis Antonio Rascón Mendoza of the Mexican Section entitled "Joint Report of the Principal Engineers on the Rehabilitation of the International Trunkline and International Outfall Interceptor (IOI) in Nogales, Arizona," signed on December 19, 2019, which describes the deteriorated conditions of the referenced structures based on the inspections carried out, and presents a breakdown of the cost distribution between the two countries for the rehabilitation of these structures, considering the criteria and agreements established in Minute 227 of the Commission entitled "Enlargement of the International Facilities for the Treatment of Nogales, Arizona and Nogales, Sonora Sewage," dated September 5, 1967.

The Commissioners agreed that the rehabilitation of the International Trunkline and the IOI is necessary, and that the distribution between the two countries of the costs for said rehabilitation be carried out in the manner proposed in the aforementioned Principal Engineers Report, in accordance with the criteria and agreements established in Minute 227 of the Commission, such that Mexico participates with a total of $1.361 million dollars in said rehabilitation.

Based on the above, the Commissioners submit the following Resolutions for the approval of both Governments:

1. The Joint Report by Principal Engineers Jose A. Nuñez of the U.S. Section and Luis Antonio Rascon Mendoza of the Mexican Section entitled "Joint Report of the Principal Engineers on the Rehabilitation of the International Trunkline and International Outfall Interceptor (IOI) in

Nogales, Arizona," signed on December 19, 2019, which is attached and forms a part of this Minute, is approved.

2. In accordance with the criteria and agreements established in Minute 227, Mexico will only participate in the cost for rehabilitation of the 8,146 feet (2,483 meters) of the International Trunkline, with an amount of $1.361 million dollars.

3. The construction will be performed under the supervision of the U.S. Section with joint inspection visits to the works in the segment corresponding to the International Trunkline.

4. All activities undertaken pursuant to the provisions of this Minute shall be subject to the availability of funds, resources, and corresponding personnel, as well as to applicable laws and regulations in each country.

5. This Minute shall enter into force upon notification of approval by the Government of the United States of America and the Government of the United Mexican States through the respective Section of the Commission.

The meeting was adjourned.

Daniel Avila
Acting U.S. Commissioner

Humberto Marengo Mogollón
Mexican Commissioner

Sally E. Spener
U.S. Section Secretary

José de Jesús Luévano Grano
Mexican Section Secretary

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

El Paso, Texas
December 19, 2019

JOINT REPORT OF THE PRINCIPAL ENGINEERS ON THE REHABILITATION OF THE INTERNATIONAL TRUNKLINE AND INTERNATIONAL OUTFALL INTERCEPTOR (IOI) IN NOGALES, ARIZONA

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

Madam and Sir:

In accordance with your instructions, we respectfully submit for your consideration this Joint Report recommending distribution between the two countries of the costs for the rehabilitation of the International Trunkline and International Outfall Interceptor (IOI) in Nogales, Arizona, based on the provisions of Commission Minute 206, entitled "Joint Operation and Maintenance of the Nogales International Sanitation Project," dated January 13, 1958, and in accordance with the provisions of Minute 227, entitled "Enlargement of the International Facilities for the Treatment of Nogales, Arizona and Nogales, Sonora Sewage," dated September 5, 1967.

Background

The Nogales International Sanitation Project was originally constructed in 1951 to serve the communities of Nogales, Arizona, United States and Nogales, Sonora, Mexico. The project consisted of an International Trunkline with a distance of 7,200 feet (2,200 meters) in Mexican territory and 8,146 feet (2,483 meters) in United States' territory, and a joint secondary wastewater treatment facility situated approximately 1.5 miles (2.5 kilometers [km]) north of the border, referred to as the "Nogales International Wastewater Treatment Plant" (NIWTP). The 1951 facilities were designed to convey 1.6 million gallons per day (mgd) (6,050 cubic meters per day) of wastewater from the communities of Nogales, Arizona and Nogales, Sonora to the NIWTP for treatment.

With the population increasing over the years, the contributions of wastewater exceeded the original capacity of the NIWTP. As a result, the governments of the United States and Mexico in 1967 approved the expansion and relocation of the NIWTP under Minute 227. However, it was agreed that Mexico would not contribute toward the relocation of the plant but would cost-share based on what it would have cost to expand the original plant at the original site and to replace and enlarge the 8,146 foot (2,483 meter) International Trunkline. Additionally, it was agreed that Mexico would not be responsible to cost-participate in the operation and maintenance of the section of the sewer line from the site of the original plant to the new plant. This new extended section of sewer line became known as the International Outfall Interceptor (IOI) and the original 8,146 feet (2,483 meters) of sewer line is known as the International Trunkline.

A new, larger plant with a capacity of 8.2 mgd (359 liters per second [lps]) was constructed in Rio Rico, Arizona, located approximately 8.8 miles (14 km) north of the international border, where the Nogales Wash and the Santa Cruz River converge. Construction of the new NIWTP, the enlarged International Trunkline, and the IOI began in 1970 and was completed in 1972. A subsequent expansion of the NIWTP to a capacity of 15.75 mgd (690 lps), as agreed under Minute 276, was completed in 1992. Further technological treatment improvements as well as a plant capacity reduction to 14.74 mgd (646 lps) were completed in 2009. Under Minute 276, Mexico's allotted capacity in the NIWTP was set at 9.9 mgd (434 lps).

Purpose

The purpose of the International Trunkline and IOI rehabilitation project proposed in this Joint Report is to avert a sewage spill from the pipeline and to safeguard the health and welfare of the communities of Nogales, Arizona and Nogales, Sonora as well as the downstream communities along the Nogales Wash and Santa Cruz River in Arizona.

Currently, domestic and industrial wastewater generated in Nogales, Sonora crosses the international border from Nogales, Sonora into Nogales, Arizona and is conveyed north by gravity through the International Trunkline and IOI. These flows from Mexico are combined in the pipeline with wastewater flows from Nogales, Arizona and Rio Rico, Arizona. The combined wastewater flows from both

countries are conveyed northward via the International Trunkline and the IOI, which extends along the Nogales Wash, to the NIWTP, where they are treated prior to being discharged into the Santa Cruz River. The International Trunkline and IOI are also impacted by increased flow volumes from combined sanitary sewer/storm sewer practices in Nogales, Sonora.

Project Description

The International Trunkline and IOI combined comprise a pipeline approximately 8.8 miles (14 km) long with over 100 manholes within its alignment. The pipeline ranges in size between 24 inches (61 centimeters) and 42 inches (107 centimeters) in diameter and is comprised of reinforced and unreinforced concrete sections.

A comprehensive evaluation of the pipeline was performed by Brown and Caldwell and completed in 2005. The purpose of this evaluation was to assess the condition of the pipeline infrastructure and offer recommendations for its rehabilitation and/or replacement. The evaluation recommended the rehabilitation of the pipeline.

Implementing this rehabilitation project will extend the service life of the pipeline by rehabilitating the manholes and the pipeline itself. The manhole rehabilitation will repair any structural damage, eliminate inflow and infiltration, and establish pipeline access. This rehabilitation includes grout repair at the manholes, application of a coating system used specifically for the lining of manholes, and debris removal within the manholes.

The pipeline rehabilitation will repair structural damage and eliminate inflows into the pipeline. This rehabilitation includes utilizing the Cured-in-Place Pipe (CIPP) process which consists of a resin-filled polyester felt tube, or liner, that is inserted or inverted into an existing pipe, inflated with water or steam and cured in place. The resulting pipe inside of a pipe is a structural replacement of the host pipe. CIPP generally is considered to be a trenchless technology with little or no disruption to the existing ground conditions.

Project Justification

The lack of an adequate maintenance system over the decades, the increased wastewater flow inputs from Nogales, Arizona and Nogales, Sonora, and the decrease in the remaining service life of the pipeline require deteriorating portions of its infrastructure to be rehabilitated and/or possibly replaced. The 2005 evaluation included visual inspections, closed-circuit television inspections, and sonar inspections of the pipeline and manholes. These inspections identified operational and structural defects.

The operational defects included the accumulation of debris, groundwater inflow and infiltration, and root intrusion in manholes and the pipeline throughout its length. The structural defects included corrosion, cracks, wall penetrations, and invert erosion.

Since the conclusion of the 2005 evaluation, several segments of the International Trunkline and IOI failed or were compromised. Localized repairs were made, including improvements for the care and protection of the IOI. Repairs to the pipeline are summarized below:

In 2010, an emergency repair was conducted to replace a section of broken pipe in the International Trunkline at the international boundary after the flows eroded away the bottom of the pipe, including soil beneath it, causing the International Trunkline to sink further below its designed grade. The total cost of the repair was approximately $1.4 million dollars.

In 2017, an emergency repair was performed at the IOI Manhole 89 after heavy rains in August caused significant erosion of the Nogales Wash natural bank where the manhole was located. These storm flows washed out the base material supporting the manhole and caused the manhole with its adjoining pipe to dislodge, break, and spill sewage into the Wash. The spill was stopped, bypass piping was installed to maintain the IOI operational, and approximately 50 feet of sewer pipeline and the entire Manhole 89 were replaced and encased in concrete for future protection. The total cost of the repair was $1,620,302.00 dollars.

Estimated Cost

In May 2014, the U.S. Section awarded an engineering and design contract to URS Corporation, now AECOM, for the rehabilitation of the International Trunkline and IOI. Currently, the design phase of this project is 100% complete.

The project will be subdivided into five (5) phases to facilitate its execution, based on anticipated annual funding levels available in the United States. Phase 1 includes the pipeline from Manhole 85 to the NIWTP; Phase 2 includes the pipeline from the international border to Manhole 37; Phase 3 includes the pipeline from Manhole 37 to Manhole 51; Phase 4 includes the pipeline from Manhole 51 to Manhole 66; and Phase 5 includes the pipeline from Manhole 66 to Manhole 85. The Mexican Section will only be cost-sharing on Phase 2 since this section includes the International Trunkline.

Estimated costs for design, construction, and construction management are estimated to be $37 to $41 million dollars for the total project.

Division of Costs and of Construction Work

To determine the distribution of costs between the two countries, the following agreements and criteria as set forth in Commission Minute 227 were considered:

- "Mexico shall have no responsibility for the operation and maintenance costs of the section of the sewer line from the site of the existing plant to the site of the new enlarged plant if the latter is constructed farther north." Therefore, Mexico only shares in the maintenance/rehabilitation of the 8,146 feet (2,483 meter) reach of the International Trunkline.

- The distribution of costs is proportional to the capacity assigned to each country in the International Trunkline in Minute 227, which is 60% for Mexico and 40% for the United States. This approach considers that the proportion in which the countries use the International Trunkline may vary over time, but that in the end, each country will only be able to use the capacity allotted to it so that the other can also use its corresponding share.

- Mexico's share of the operation and maintenance costs is determined based on the Mexican economy, which considers what it would have cost to carry out said work in Nogales, Sonora.

Based on these three criteria, to determine Mexico's cost participation, the Mexican Section prepared and submitted to the U.S. Section an estimate of what it would cost to undertake the works in Nogales, Sonora, considering the traditional construction systems that are currently implemented in Mexico. The total estimated cost was an amount of $41.969 million pesos for the different work items, including the project design costs, 30% for indirect costs, 12% for contingencies, and 16% for taxes, which, at the exchange rate of $18.50 pesos to the dollar from the date of the estimate, results in an amount of $2.269 million dollars. Finally, considering a capacity assigned to Mexico of 60%, Mexico's participation was calculated to be $1.361 million dollars.

With regard to the design costs beyond the Mexican Section's share, the U.S. Section agreed to provide the remaining funding up to $781,275.77 dollars for costs associated with the design related to the rehabilitation of the International Trunkline and IOI.

Oversight of the Works

Construction of the project will be performed under the supervision of the U.S. Section, once the construction documents have been developed, reviewed, and agreed upon. Entry and access to the right-of-way and the easements required for the project site will be obtained by authorities in the United States.

The U.S. Section field office in Nogales, Arizona will periodically inform the Mexican Section office in Nogales, Sonora regarding the progress of the construction work and will undertake joint inspection visits to the works in the segment corresponding to the International Trunkline.

Construction Procedures

On the basis of the Commission's experience in construction of international projects, it has been found that the most feasible method of carrying out the proposed construction is by contract in accordance with the specifications for the work agreed upon, issued, and approved by the Commission.

Since the project is divided into five phases, there will be five sets of plans with specifications, each covering the work allocated to it, and containing the legal and general provisions in accordance with all federal, state and local regulations.

Recommendations

Based on the above, we respectfully recommend:

1. That the Commission undertake the rehabilitation of the International Trunkline and International Outfall Interceptor in Nogales, Arizona utilizing Cured-in-Place Pipe technology.

2. That distribution of costs be as described in this Joint Report, with a cost share of $1.361 million dollars assigned to Mexico.

3. That construction be performed under the supervision of the U.S. Section with joint inspection visits to the works in the segment corresponding to the International Trunkline.

Respectfully,

Jose A. Nuñez
Principal Engineer
United States Section

Luis Antonio Rascón Mendoza
Principal Engineer
Mexican Section