



CERTIFICATION AND FINANCING PROPOSAL

PEÑA BLANCA WASTEWATER SYSTEM IMPROVEMENTS AT POTRERO CREEK IN NOGALES, ARIZONA

Revised: November 2, 2018



CONTENTS

EXECUTIVE SUMMARY	1
1. PROJECT OBJECTIVE AND EXPECTED OUTCOMES	3
2. ELIGIBILITY	3
2.1. Project Type.....	3
2.2. Project Location.....	3
2.3. Project Sponsor and Legal Authority.....	4
3. CERTIFICATION CRITERIA	4
3.1. Technical Criteria	4
3.1.1. General Community Profile	4
3.1.2. Project Scope.....	7
3.1.3. Technical Feasibility.....	8
3.1.4. Land Acquisition and Right-of-way Requirements	9
3.1.5. Project Milestones.....	9
3.1.6. Management and Operation.....	9
3.2. Environmental Criteria	10
3.2.1. Environmental and Health Effects/Impacts	10
A. Existing Conditions.....	10
B. Project Impacts	12
C. Transboundary Impacts	12
3.2.2. Compliance with Applicable Environmental Laws and Regulations.....	12
A. Environmental Clearance.....	13
B. Mitigation Measures.....	13
C. Pending Environmental Tasks and Authorizations	13
3.3. Financial Criteria	13
4. PUBLIC ACCESS TO INFORMATION	14
4.1. Public Consultation.....	14
4.2. Outreach Activities	14

EXECUTIVE SUMMARY

PEÑA BLANCA WASTEWATER SYSTEM IMPROVEMENTS AT POTRERO CREEK IN NOGALES, ARIZONA

- Project:** The proposed project consists of the relocation of approximately 764 lineal feet of a sanitary sewer force main below Potrero Creek and improvements at the Peña Blanca Pump Station on the northwest side of the city of Nogales, Arizona (the “Project”).
- Objective:** The purpose of the Project is to eliminate the risk of untreated or inadequately treated wastewater discharges to Potrero Creek, thereby contributing to the protection of natural water resources and reducing the risk of waterborne disease. Additionally, improvements to the pump station will improve the operational efficiency of the wastewater system.
- Expected Outcomes:** The Project is expected to generate environmental and human health benefits related to the following Project outcomes:
- Improve wastewater services to 75 existing residential connections and two public schools.
 - Eliminate the risk of line failures that could result in approximately 84,000 gallons per day (gpd) of untreated or inadequately treated wastewater discharges.
 - Achieve full compliance with applicable regulations.
 - Increase operational efficiency of the wastewater system, which will reduce energy costs and maintenance requirements.
- Population Benefitted:** 1,262 residents of Nogales, AZ.¹
- Sponsor:** City of Nogales, Arizona.
- Project Cost:** US\$500,000.
- NADB Grant:** US\$450,000 from the Community Assistance Program (CAP).

¹ Based on the number of residential connections (75) multiplied by the number persons (3.14) per household, according to the U.S. Census QuickFacts 2012-2016, as well as the student population of the two schools located in the Project area.

**Uses and Sources of
 Funds:**
 (US\$ Dollars)

Uses	Amount	%
Construction*	\$ 500,000	100.0
TOTAL	\$ 500,000	100.0
Sources	Amount	%
City of Nogales	\$ 50,000	10.0
NADB CAP grant	450,000	90.0
TOTAL	\$ 500,000	100.0

* Estimated costs include construction and 10% for contingencies.

Project Status:

Key Milestones	Status
Final design	Completed in March 2018
ADEQ construction authorization*	Issued in October 2018
Procurement	Anticipated in 1st quarter of 2019
Construction period	Estimated period of 6 months

* Arizona Department of Environmental Quality.

CERTIFICATION AND FINANCING PROPOSAL

PEÑA BLANCA WASTEWATER SYSTEM IMPROVEMENTS AT POTRERO CREEK IN NOGALES, ARIZONA

1. PROJECT OBJECTIVE AND EXPECTED OUTCOMES

The proposed project consists of the relocation of approximately 764 lineal feet of a sanitary sewer force main below Potrero Creek and improvements at the Peña Blanca Pump Station on the northwest side of the city of Nogales, Arizona (the “Project”). The purpose of the Project is to eliminate the risk of untreated or inadequately treated wastewater discharges to Potrero Creek, contributing to the protection of natural water resources and reducing the risk of waterborne disease. The pipeline is currently uncovered as a result of erosion of the creek and will be reconstructed below the creek bed in accordance with applicable state and federal design standards. Additionally, improvements to the pump station will improve the operational efficiency of the wastewater system. System improvements will benefit 75 existing residential connections and two public schools.

2. ELIGIBILITY

2.1. Project Type

The Project falls within the eligible category of wastewater.

2.2. Project Location

The Project will be implemented within the service area of the city of Nogales in Santa Cruz County in the southeastern region of Arizona. The Project site is approximately six miles from the U.S.-Mexico border. The nearest major cross streets to the Project are the I-10 frontage road and Boulevard Del Rey David at the following geographical coordinates: 31°24'38.8"N and 110°57'32.4"W.

Figure 1 shows the approximate location of the Project.

**Figure 1
LOCATION MAP**



2.3. Project Sponsor and Legal Authority

The public-sector project sponsor is the City of Nogales, AZ (the “Sponsor” or the “City”). Pursuant to Arizona Revised Statutes (A.R.S.) 9-511 and 9-514, the City of Nogales has the legal authority to operate and maintain water treatment, storage and distribution systems, as well as wastewater collection and treatment systems. The Public Works Department of the City of Nogales is authorized to provide water and sewer services to the community and is responsible for developing infrastructure improvement projects.

3. CERTIFICATION CRITERIA

3.1. Technical Criteria

3.1.1. General Community Profile

According to the population projections of the U.S. Census Bureau, the city had 20,076 residents in 2017, having decreased by 3.7% since 2010.²

The city's economic activities are based primarily on trade, particularly winter produce imports. The unemployment rate is approximately 12%.³ The poverty level for Nogales is estimated at 30.7%, more than double the 14.9% poverty level estimated for the state.⁴ The median household income (MHI) is estimated at US\$27,929, which is 45% less than the state MHI of US\$51,340.⁵

² Source: U.S. Census Bureau, QuickFacts, October 8, 2018.

³ Source: U.S. Census Bureau, 2006-2012 projections.

⁴ Source: Ibid.

⁵ Source: Ibid.

The status of public services and infrastructure in Nogales, Arizona, is described in the following table.

**Table 1
 BASIC PUBLIC SERVICES AND INFRASTRUCTURE***

Water System			
Coverage	90% (10% Valle Verde Water Co. – private)		
Supply source	Groundwater (14 wells)		
Number of hookups	5,807 (5,112 residential; 695 commercial)		
Wastewater Collection			
Coverage	90% within city limits (remainder on septic systems)		
Number of connections**	5,068 (4,540 residential; 528 commercial)		
Wastewater Treatment			
Coverage	100%		
Treatment facility	Plant	Type	Capacity
	Nogales International Wastewater Treatment Plant	Modified Ludzack – Ettinger process	17.2 mgd
Solid Waste			
Collection coverage	100% city garbage collection, with approximately 12% diverted for recycling		
Final disposal	Santa Cruz County Landfill		
Street Paving			
Coverage	98%		

* Source: City of Nogales, Arizona.

** Some commercial sewer connections serve multiple users, and service areas outside city limits are not included (i.e. Peña Blanca, Highlands, and Rio Rico).

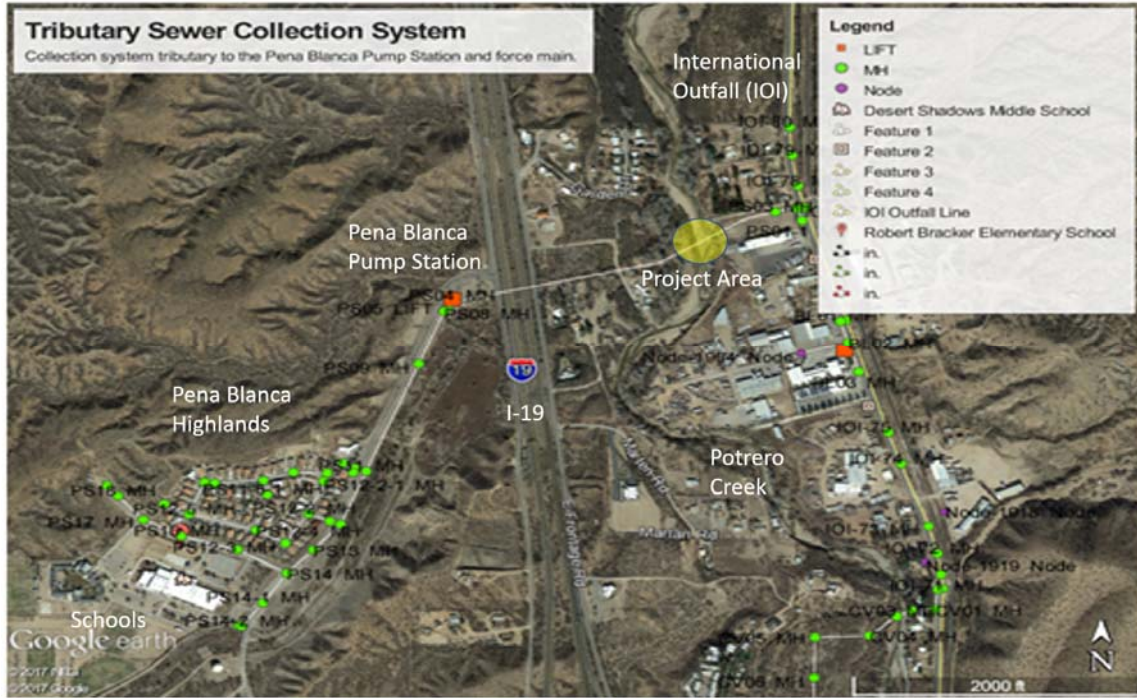
mgd = million gallons a day

Local Wastewater Collection System

The City of Nogales provides drinking water, wastewater collection and wastewater treatment services to city residents, as well as to three subdivisions outside the city limits. Coverage for both drinking water and wastewater are at or above 90%. The existing wastewater treatment plant serves both Nogales, Arizona and Nogales, Sonora. The facility has a total capacity of 17.2 million gallons a day (mgd), which already includes the flows generated in the Project area.

The Project site is located 1.4 miles southeast of the Interstate 19 interchange with Highway 289 (Ruby Road). The Peña Blanca Pump Station conveys flows from Peña Blanca sewer system to the International Outfall Interceptor (IOI). The gravity collection system serves a 50-acre development located 0.5 miles southwest of the pump station. The development includes 75 houses, a middle school and an elementary school. The area map, below, illustrates the sewer collection system serving the Peña Blanca subdivision (Figure 2).

Figure 2
SEWER COLLECTION SYSTEM



The Peña Blanca Pump Station currently functions adequately. It was originally constructed to serve a much larger residential population that has been slow to develop; therefore, the facility and equipment are oversized for current flows. Additionally, the system does not have telemetry technology, which prevents the utility from effectively managing the equipment in accordance with changes in demand, resulting in unnecessary pumping at the station. Furthermore, the force main from the Peña Blanca Pump Station to the interconnection point at the IOI has been exposed by erosion at the Potrero Creek crossing, which has led to multiple line breaks resulting in wastewater spills. Figure 3 shows the current condition of the exposed force main passing through Potrero Creek.

Figure 3
EXPOSED FORCE MAIN AT POTRERO CREEK



Although these pipe conditions are not caused by a lack of maintenance, the system does not currently comply with applicable regulations. According to the Arizona Department of Environmental Quality (ADEQ) rules, the current situation must be mitigated (i.e., repair the exposed force system within the creek) for the system to continue to be used by the City.

3.1.2. Project Scope

This Project will replace a damaged section of the 10-inch force main that runs across Potrero Creek and improve operations at the Peña Blanca Pump Station, which is oversized for current demand. The proposed force main replacement will include only the segment located in the floodway. The new force main segment, approximately 764 lineal feet, will be sized to match the existing 10-inch system and will be placed below the scour depth. The force main will be installed using a horizontal directional drilling (HDD) construction method.

The pump station was designed to manage the anticipated flows from a subdivision plotted to include 1,000 homes. It has the capacity to pump 1,800 gallons per minute (gpm), using three submersible sewage pumps simultaneously pumping about 600 gpm each and about 900 gpm when only one pump is operational. However, since the subdivision currently has only 75 homes and two schools, the pump station will be improved to operate under current flow conditions. The scope includes modifying pump and pumping configurations, upgrading electrical systems and installing new telemetry and Supervisory Control and Data Acquisition (SCADA) equipment, which offer remote monitoring and management capabilities to achieve better energy efficiency and lower operation and maintenance costs.

3.1.3. Technical Feasibility

A pipe wall stress analysis and hydro-fracture analysis were performed to determine the best material and construction method to replace the force main. Based on the results of the analyses, it was determined that 10" high density polyethylene (HDPE) 4710 pipe with a dimension ratio equal to, or less than, 13.5 is suitable for the force main and horizontal directional drilling (HDD). Furthermore, based on the results of the hydro-fracture analysis, the alignment of the proposed drilling across Potrero Creek will place the centerline of the pilot bore approximately 17 feet (at an elevation of 3,537 ft) below the creek bottom. According to scour and erosion studies, by constructing the pipe at this depth, the probability of the force main being exposed in the future will be null and future damage to the pipe will be prevented.

Pump station improvements have been determined based on best management practices. Telemetry and SCADA equipment specifications have been developed to accommodate the proposed pump configuration and capacities in order to serve the community properly.

The final design for the proposed Project was completed in accordance with the minimum design criteria established by ADEQ, as outlined in the Arizona Administrative Code (ACC). The ACC requires that the Project be constructed in accordance with the following regulations:

- Arizona Revised Statutes A.R.S. 49-104.B10, which establishes construction requirements per ADEQ;
- Arizona Administrative Code, Section R18-9-E301, regarding general permit requirements for building or expanding a sewer system; and
- ADEQ Bulletin 11, regarding minimum requirements for design, submission of plans and specifications of sewage works.

Table 2 lists the required construction permits for the Project.

Table 2
REQUIRED CONSTRUCTION PERMITS

Permitting Agency	Permit	Project Stage Required
Arizona Department of Environmental Quality (ADEQ)	Construction Authorization for a Sewage Collection System, Type 4.01 General Permit (CA)	Pre-construction final design (by owner)
	Discharge Authorization for a Sewage Collection System, Type 4.01 General Permit	Post-construction record drawings (by owner)
Santa Cruz County Flood Control District	Floodplain Use Permit	Final design and construction documents (by contractor)

Because Potrero Creek is classified as waters of the United States as defined under the Clean Water Act, an open-cut construction method would likely have required a Section 404 permit to be issued by the U.S. Army Corps of Engineers; however, by using the HDD construction method, this permit is not necessary.

To comply with the requirements for the construction permit, the channel scour and lateral migration analysis, along with construction drawings, were provided to ADEQ, which authorized construction of the Project in October 2018.

3.1.4. Land Acquisition and Right-of-way Requirements

Rehabilitation of the pump station and construction to replace the force main will be completed within existing property and rights-of-way owned by the City. No additional easements are required to implement the Project.

3.1.5. Project Milestones

Once the notice to proceed is issued, construction is expected take approximately six months to complete. Table 3 provides a summary of the critical Project milestones and their respective status.

Table 3
PROJECT MILESTONES

Key Milestones	Status
Final design	Completed in March 2018
Approval to Construct from ADEQ	Issued October 2018
Procurement	Anticipated in 1st quarter of 2019
Construction period	Estimated period of 6 months

3.1.6. Management and Operation

The Nogales Public Works Department consists of three sub-areas: Planning & Zoning, Engineering, and Utilities (Sanitary Sewer & Water Divisions). The Department serves approximately 5,807 water hookups and 5,068 wastewater connections and has certified operators for both water and wastewater services.

Management of the proposed Project will be the responsibility of this Department, which has sufficient resources and experienced technical staff available for these purposes. Procurement for construction will be conducted by the City's Procurement Office, which has experience in competitive bidding activities for infrastructure projects.

The Project Sponsor has an Operation and Maintenance (O&M) manual that includes the primary tasks needed to ensure proper operation of the new infrastructure. The Sewer Division has established procedures that identify routine operation and maintenance tasks for the sewer line and pump station. The utility staff currently operates the systems with the support of SCADA technology. The proposed improvements to the pump station will provide more flexibility in its operation, including the capability to monitor and manage pumping requirements remotely based

on flow volume, as well as to detect problems with its operation quickly. As a result of the increased efficiency, operation costs for this facility should be positively impacted by a reduction in energy costs and maintenance requirements. The Sponsor estimates that the Project will result in cost savings of approximately US\$32,000 per year. An adjustment in user rates is not required as a result of the Project.

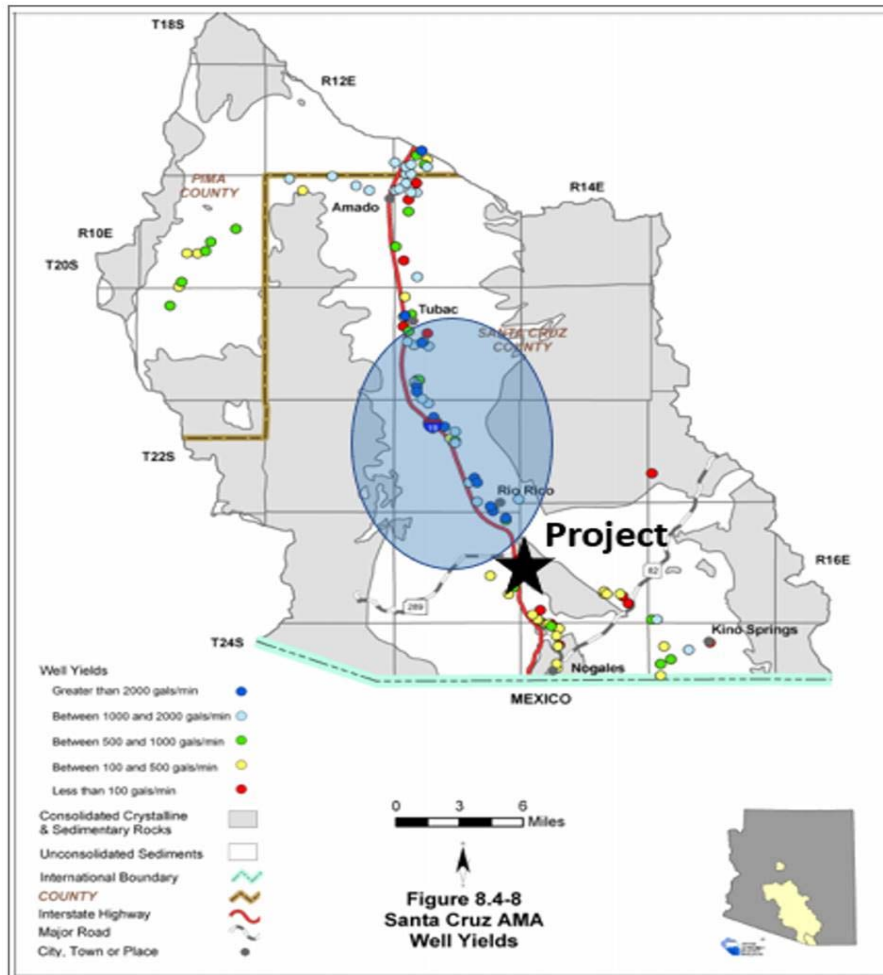
3.2. Environmental Criteria

3.2.1. Environmental and Health Effects/Impacts

A. Existing Conditions

The force main conveying flows from the pump station to the IOI was originally buried under the creek bed; however, storm events and other weather conditions have eroded the wash bed, leaving the pipeline exposed at the Potrero Creek crossing. This situation makes the pipeline more vulnerable to failure during storm events. Emergency repairs have been required twice since 2014. Discharges of untreated wastewater to the creek increase environmental and human health risks related to potential human contact and surface or groundwater contamination. As shown in Figure 4, the nearby wells in the community of Rio Rico, which provide drinking water to approximately 19,000 residents, are located downstream of the Peña Blanca force main at Potrero Creek.

Figure 4
SANTA CRUZ WELL LOCATIONS AND PRODUCTION YIELDS



The Peña Blanca Pump Station facility and equipment are oversized for current wastewater flows, and the system does not have telemetry technology. Operating under these conditions results in an inefficient use of energy and unnecessary maintenance problems for equipment that is not being utilized as intended.

The no-action alternative was not considered viable, since the current situation does not comply with state or federal standards. The City is subject to fines if the force main is not reconstructed according to mandated state design standards. Storm events threaten the integrity of the pipe, which has already shown a vulnerability for failure and uncontrolled wastewater discharges. Additionally, current operating conditions at the pump station are inefficient and affect the sustainability of the infrastructure. Therefore, the Project is considered a high priority.

B. Project Impacts

The Project is expected to generate environmental and human health benefits related to the following outcomes:

- Improve wastewater services to 75 existing residential connections and two public schools.
- Eliminate the risk of approximately 84,000 gpd of untreated or inadequately treated wastewater discharges.
- Achieve full compliance with applicable regulations.
- Increase operational efficiency of the wastewater system, which will reduce energy costs and maintenance requirements.

The Project will help prevent health problems by ensuring reliable wastewater collection services to a residential area, eliminating the potential for untreated discharges to an open creek bed and avoiding potential risks for human contact and surface or groundwater contamination.

As a reference for existing health statistics in the area, Table 4 shows the incidence of waterborne diseases in Santa Cruz County, Arizona.

**Table 4
WATERBORNE STATISTICS FOR SANTA CRUZ COUNTY, ARIZONA**

Disease	Number of Cases per Year				
	2013	2014	2015	2016	2017
Amebiasis	4	0	4	5	5
Campylobacteriosis	53	57	88	75	87
Cryptosporidiosis	1	5	4	9	11
Giardiasis	19	19	17	21	29
Shigellosis	10	9	11	20	11
Vibriosis	0	4	4	2	2

Source: Santa Cruz County, Health Services Agency.

C. Transboundary Impacts

Potrero Creek flows north, away from the border. Therefore, no negative transboundary impacts are anticipated.

3.2.2. Compliance with Applicable Environmental Laws and Regulations

The Project will comply with the following regulations of ADEQ:

- *Arizona Revised Statutes (A.R.S.), Title 49, Chapter 2*, aquifer protection; and
- *Arizona Administrative Code (A.A.C.), Title 18, Chapter 9 (ACC R18-9)*, relating to sewage collection system regulations.

Potrero Creek is classified as Waters of the United States as defined under the Clean Water Act. Due to the HDD construction method selected for the Project, no disturbances to the waterway are expected; therefore, a Section 404 permit from the U.S. Army Corps of Engineers is not required.

A. Environmental Clearance

There are no formal environmental clearance laws applicable to the Project.

The City of Nogales obtained Construction Authorization from ADEQ. This certificate gives the City permission to improve the sanitary sewer system, as long as notice is given to ADEQ as required under A.R.S. Section 49-104.B.10. In accordance with ADEQ regulations, once the reconstructed pipe is ready for operation, the Sponsor must apply for Discharge Authorization by providing the post-construction record drawings of the Project.

B. Mitigation Measures

The Project, itself, will mitigate the environmental and human health risks associated with exposure to untreated wastewater discharges. The HDD construction method will allow the force main to continue operating without interruption. Once the new pipe is constructed, operations at the pump station can be temporarily interrupted to connect the new pipe to the existing pipe on either side of the creek, avoiding any discharges from the conveyance infrastructure during the transition to the new pipeline.

No other environmental impacts are anticipated during construction of the Project, provided that the tasks are implemented in accordance with best management practices. Typical mitigation measures to be practiced during the implementation phase include:

- Application of water to reduce fugitive dust emissions;
- Vehicle tune ups to reduce emissions; and
- Placement of warning signs to prevent potentially hazardous situations.

C. Pending Environmental Tasks and Authorizations

There are no environmental authorizations pending.

3.3 Financial Criteria

The total estimated cost of the Project is US\$500,000, which includes construction and contingencies. The Sponsor requested a US\$450,000 grant from NADB through its Community Assistance Program (CAP) to support implementation of the Project. Table 5 presents a breakdown of the sources of funding.

Table 5
USES AND SOURCES OF FUNDS
(US\$)

Uses	Amount	%
Construction*	\$ 500,000	100.0
TOTAL	\$ 500,000	100.0
Sources	Amount	%
City of Nogales	\$ 50,000	10.0
NADB CAP grant	450,000	90.0
TOTAL	\$ 500,000	100.0

* Estimated costs include construction and 10% for contingencies.

The proposed Project complies with all CAP criteria. It is located within the U.S.-Mexico border region served by NADB, is being sponsored by a public-sector entity and is in an environmental sector eligible for NADB financing. Additionally, as a wastewater project, it is considered a priority under the CAP program. As shown in the above table, the Project Sponsor has agreed to cover 10% of the project costs, as required under the program.

Additionally, all necessary pre-procurement permits and authorizations have been obtained, and the Project Sponsor is ready to initiate bidding for construction once funding has been approved.

4. PUBLIC ACCESS TO INFORMATION

4.1 Public Consultation

NADB published the draft Certification and Financing Proposal for a 14-day public comment period beginning October 17, 2018. The following Project documents were available upon request for public access:

- City of Nogales, Peña Blanca Outfall Sewer Force Main Repair Project, prepared by Stantec Consulting Services Inc., of Tucson, AZ, dated March 31, 2018.
- Construction Authorization, Arizona Department of Environmental Quality, dated October 2018.

The public comment period ended on November 1, 2018, with no comments received.

4.2 Outreach Activities

The Public Works Department provided Project information to the Mayor and City Council during regular monthly council meetings, keeping the Mayor and Council members up-to-date on Project progress. The meetings were open to the general public, and meeting agendas were made

available at least 24-hours prior to the meetings. There were no public comments related to the proposed Project documented during these regular public forums.

Additionally, NADB conducted a media search for news articles related to the Project, and the following articles were found:

- *Nogales International* (January 20, 2017) – “City getting closer to repairing exposed Potrero Creek pipe.” The article describes the Sponsor’s approval to use \$80,000 from the city’s contingency fund for final design. It includes a comment from the council regarding paying for improvements outside the city limits.
https://www.nogalesinternational.com/news/city-getting-closer-to-repairing-exposed-potrero-creek-pipe/article_78b457ac-de9e-11e6-b093-3b27cf2e5a40.html
- *Nogales International* (February 13, 2018) “Grant could help fix problem sewer line.” The article describes the Sponsor’s efforts to obtain a grant to address the Project.
https://www.nogalesinternational.com/news/grant-could-help-fix-problem-sewer-line/article_a4c126ca-1059-11e8-ba04-c72f00b89abb.html

The Project was also discussed at the Southeast Arizona Citizens Forum on September 15, 2016, hosted by the U.S. Section of the International Boundary and Water Commission. Overall, the reaction to the Project has been positive.