

US EPA ARCHIVE DOCUMENT

**Drinking Water Quality Improvements
For the Pomerene Domestic Water Improvement District,
Pomerene, Arizona**

October 31, 2014

U.S. Environmental Protection Agency | Region 9
75 Hawthorne Street
San Francisco, CA 94105

1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) administers the Border Environment Infrastructure Fund (BEIF), which provides grant funding for water and wastewater infrastructure projects located within 62 miles (mi) (100 kilometers [km]) of the international boundary between the United States (U.S.) and Mexico.

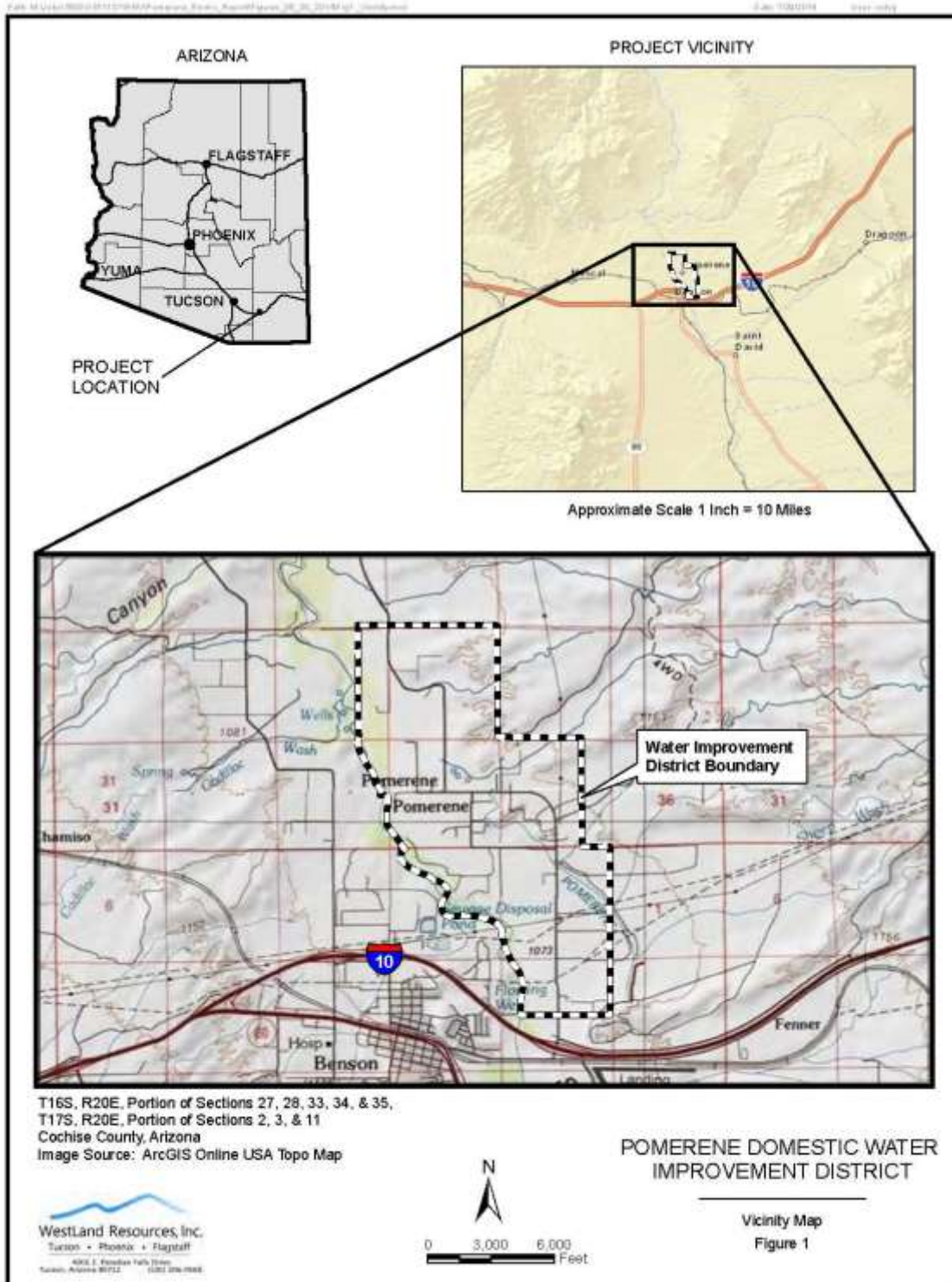
EPA policy for use of BEIF funds requires planning and design and certification of projects by the joint Border Environment Cooperation Commission (BECC)-North American Development Bank (NADB) Board as a condition for receiving a BEIF award for construction. The EPA requires that a proposed project comply with the National Environmental Policy Act (NEPA) before BEIF funds can be authorized.

In accordance with the U.S. Council of Environmental Quality (CEQ) regulations, 40 CFR Parts 1500-1508, and EPA regulations (40 CFR Part 6) as guidance, this EA documents the environmental consequences in the U.S. of the proposed federal action. The purpose of this document is to comply with NEPA documentation requirements for the proposed federal action under consideration, which consists of the Drinking Water Quality Improvements for the Pomerene Domestic Water Improvement District (PDWID) in Pomerene, Arizona. This EA incorporates by reference the September 2014 Environmental Information Document for PDWID's Drinking Water Quality Improvements project.

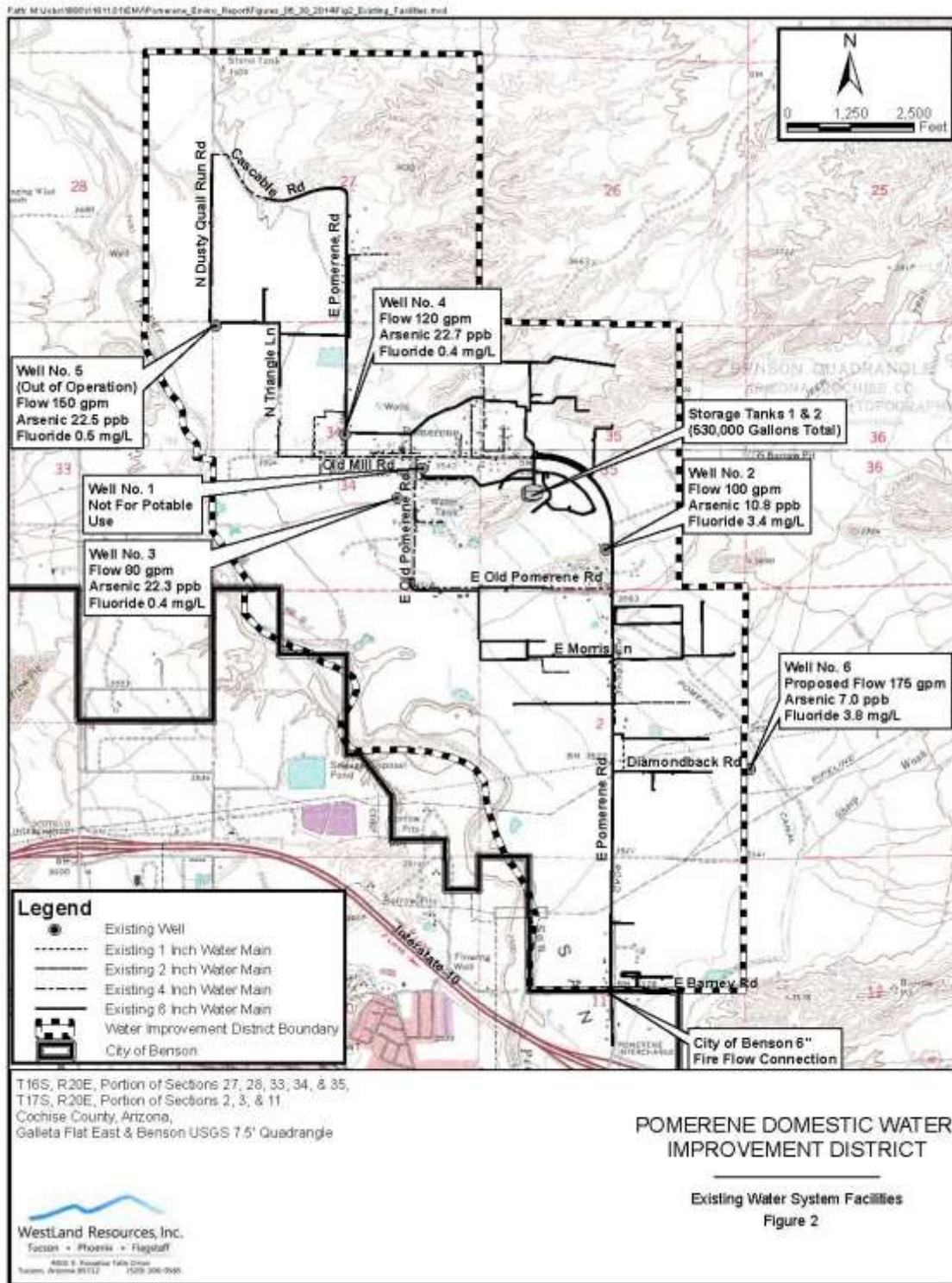
1.1 STUDY LOCATION

PDWID provides water service for approximately 370 connections within the unincorporated community of Pomerene in Cochise County, Arizona. Below is Figure 1 - Vicinity Map - depicting the PDWID water service area. Pomerene is located approximately two miles north of Benson, Arizona.

The footprint for disturbance for all seven action alternatives is referred to collectively herein as the "project area". The project area encompasses potential construction impacts that could occur during implementation of any of the project alternatives, although only the preferred alternative, Alternative 6, will be carried forward. A map depicting the existing water system facilities is provided in Figure 2.



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1.2 PURPOSE AND NEED

The purpose and need for water quality improvements to the PDWID system relate mainly to consistently and reliably achieving long-term compliance with arsenic and fluoride drinking water quality standards. Since 2009, PDWID has installed and operated arsenic treatment systems at existing wells in an effort to meet the new standard for arsenic in drinking water at 10 parts per billion (ppb), pursuant to EPA's *Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring Final Rule* published in the Federal Register on January 22, 2001 (66 FR 6976), and under Arizona Department of Environmental Quality (ADEQ)'s delegated authority to enforce this rule.

The history of arsenic compliance in Pomerene indicates certain instances of arsenic primary maximum contaminant level (MCL) standard violations. In addition, no treatment or systematic blending is currently implemented for fluoride. Historically, fluoride has been "incidentally" blended in the storage tanks with water from the other wells delivered via the distribution system. This is not an effective blending and compliance strategy, due to the possibility of exceeding secondary MCL fluoride levels if well sources with high fluoride concentrations are in operation for an extended period of time. Given the historic water quality challenges in this system, drinking water quality compliance is a key concern for the PDWID system. All existing wells comprising the PDWID system, except one (Well No. 6), currently exceed the arsenic maximum containment level (MCL) and two wells (Well Nos. 2 and 6) exceed the fluoride secondary MCL and are above 80% of the primary fluoride MCL. Well No. 6 is a new well drilled by PDWID. It would be developed as a water supply well and connected to the PDWID water system as part of the proposed project.

1.3 SCOPE OF ANALYSIS

The scope of this EA includes the evaluation of the impact to the relevant environmental resources within the defined area of concern in the U.S. As defined in the CEQ regulations (§1508.25), the scope consists of the range of actions, alternatives, and impacts to be considered in a NEPA-compliant document.

2.0 PROJECT DESCRIPTION AND ALTERNATIVES

In accordance with CEQ regulations (§1502.14), this section of the EA: 1) presents and objectively evaluates seven alternatives, including the No Action alternative; 2) presents EPA's detailed evaluation of each alternative, so the reviewers may evaluate comparative merits; and 3) includes appropriate mitigation measures.

2.1 PROPOSED ACTION.

The proposed project entails design and construction of new infrastructure and changes to operational treatment and controls to address compliance with federal and state arsenic and fluoride drinking water quality standards. There are six action alternatives being considered in addition to a "No Action" alternative. The Action Alternatives have been identified to ensure the water system's long term compliance with arsenic and fluoride drinking water standards (both secondary and

primary MCLs for fluoride). Preferred Alternative 6 – Deliver and Blend Well Numbers 2, 3, 4 and 6 at the Storage Tank - is identified as the preferred alternative for the project.

Preferred Alternative 6, includes transmission pipeline alignments from Well 6 to Well 2 after treatment along the southeast boundary of the Pomerene Domestic Water Improvement District as well as an alternate alignment along public road rights of way. Similarly, transmission pipelines to combine Well Nos. 3 and 4 and convey them to the storage tanks have a preferred route along private easements and alternate alignments along public road rights-of-way.

2.2 EXISTING WATER DISTRIBUTION SYSTEM

PDWID owns and operates a drinking water system to provide for domestic use and fire protection for the residents of the community of Pomerene. The community of Pomerene has been actively pursuing water system improvements for many years. The original water association was formed in 1950 following the installation of Well No. 1 in 1948. Since then the district has added four more well sites, storage capacity, distribution mains, and finally arsenic adsorption treatment systems in 2009. In 2003, the association was converted to a domestic water improvement district to enable the community to have more control over decisions regarding the water system, without the processes requiring approvals through the Arizona Corporation Commission (ACC). In addition, to the distribution lines, PDWID maintains drinking water infrastructure as described below:

Storage Tanks

PDWID has a total of 530,000 gallons of water storage available in 250,000-gallon and 280,000-gallon storage tanks. PDWID's first water storage tank was installed in 1977, followed by a second, parallel tank at the same site installed in 2006. The tanks "float" on the water system, meaning that they sit at a higher elevation than the water system and provide pressure by gravity due to the elevation difference between the water level in the tank (the highwater elevation) and the elevation of the water services. Storage tanks are filled by Well No. 2 (direct transmission from Well No. 2 to the storage tanks) and from the distribution system with water delivered from Well No. 3 and 4. Excess water that is not consumed by the residents fills the storage tanks from the distribution system for use at a later time.

The two tanks have separate inlet/outlets which allow the tanks to float the system, and also allow the tanks to fill from the system. The storage tanks are situated on a hill centrally located within the PDWID service area. The hill is located at an approximate elevation of 3,620 feet above mean sea level, and the 28-foot-tall tanks result in an approximate tank highwater elevation of 3,646 ft. The base of the hill is at an approximate elevation of 3,550 feet and ground surface elevations tend to decrease towards the west and closer to the San Pedro River.

The tanks include water level probes and a control system with radio telemetry that allows the level in the storage tanks to control the operation of the wells in the water system that fill the tank. The control system was installed in 1998. The control system provides for automatic rotation of the wells in the start cycle, but does not provide PDWID with the ability to control or modify which wells operate or to control the wells remotely.

Groundwater Wells

PDWID owns and operates three domestic water supply wells (Well Nos. 2, 3, and 4), one irrigation well that was once used for domestic supply (Well No. 1), and one well (Well No. 5) that was previously used for domestic supply and is now disconnected from the distribution system. Well No. 2 pumps through a 6-inch transmission main directly to the storage tanks. Well Nos. 3 and 4 pump directly into the distribution system, and fill the tank indirectly (i.e., if the total volume of water pumping from Well Nos. 3 and 4 at any given time is greater than the demand in the water system, the excess water will fill the tanks). As such, the Entry Point to the Distribution System (EPDS) location for Well No. 2 is at the outlet of the storage tanks, while the EPDS for the other Wells 3 and 4 are located at each well after the arsenic treatment and prior to leaving the well site and entering the water system.

In pursuit of finding low-arsenic water that would meet compliance without treatment, PDWID passed a resolution to drill a new well in the east portion of the service area (farther east of Well No. 2 which has the lowest arsenic levels). This well was drilled using PDWID funds in July 2013. Water quality samples were collected during well drilling. Subsequently, PDWID has been working with BECC and stakeholders to perform pump testing and water quality testing as part of the alternatives evaluation. The capacities and arsenic and fluoride concentration levels for the wells are listed in Figure 2, Existing Water System Facilities.

Arsenic Treatment

Wells Nos. 2, 3 and 4 have arsenic treatment installed and housed at each well site. The arsenic treatment systems consist of fiberglass reinforced plastic (FRP) vessels equipped with Siemens granular ferric hydroxide (GFH) adsorption media. Well No. 2 has one 48-inch diameter vessel that treats 100 gpm. Well No. 3 has one 42-inch vessel that treat 80 gpm. Well No. 4 has one 36-inch vessel and one 48-inch vessel installed in parallel configuration that treat 120 gpm.

The existing treatment systems at Well Nos. 2, 3, and 4 utilize a parallel, split-stream treatment configuration. Under this treatment configuration, a portion of the well flow is bypassed (untreated) and blended with treated water from the treatment system. However, as the treated arsenic levels increase and start to break through the media, bypass flows are reduced considerably to ensure proper blending for an acceptable arsenic level. Further, as the media reaches its capacity, it becomes essential to treat the entire well flow.

None of existing wells is equipped with two FRP treatment vessels installed in series (water flows through the first vessel and then through the second vessel) which would allow treatment vessels to be operated in a lead/lag configuration, as opposed to single-vessel or parallel configuration operation. The lead/lag alternate treatment configuration is being proposed as part of the project improvements. The lead/lag configuration utilizes the lag vessel (second vessel) as a redundant barrier against arsenic breakthrough during treatment. In the event that arsenic levels have broken through the lead vessel (first vessel), the lag vessel can still remove arsenic and help eliminate any MCL exceedances. The presence of a lag vessel allows for complete exhaustion of the lead vessel, running the lead vessel until effluent arsenic levels equal the influent water levels; therefore maximizing use of the media. After the lead vessel reaches exhaustion, the media in that vessel

can be replaced, and the vessel is used in the lag position with the previous lag vessel becoming the lead vessel. The media change out in the lead and lag vessels is typically staggered and not performed concurrently. This approach maximizes the use of the media, protects the water system against rising arsenic levels as the media is exhausted and reduces the risk of MCL violations.

Existing Water System Operation

The water system is operated using a control system which automatically rotates well operation to cycle the wells. This control system does not allow the operator to prioritize which wells to run, but simply turns on the next well in sequence as water is demanded by the storage tank. All wells turn on and off based on the levels in the storage tank. Well No. 2 delivers directly to the storage tank via a dedicated transmission main, whereas Wells 3 and 4 pump into the distribution system and indirectly fill the storage tank through the distribution system. When all wells are off, the storage tanks serve the distribution system demands via gravity.

2.3 ALTERNATIVES CONSIDERED

The Project alternatives are:

- Alternative 1 – No Action (no change)
- Alternative 2 – Direct Delivery of Water from Well No. 6 to the Distribution System
- Alternative 3 – Deliver and Blend Water from Well No. 6 with Well No. 2
- Alternative 4 – Deliver and Blend Water from Well Nos. 2, 3, and 6 at the Storage Tank
- Alternative 5 – Deliver and Blend Water from Well Nos. 2, 4, and 6 at the Storage Tank
- Alternative 6 – Deliver and Blend Water from Well Nos. 2, 3, 4 and 6 at the Storage Tank (Preferred Alternative)
- Alternative 7 – Deliver and Blend Water from Well No. 6 at Well No. 2 and Install New Fluoride Treatment

Alternative 1 – No Action

The No Action Alternative is intended to be used as the baseline alternative to compare all viable options. If the project is not implemented, PDWID will be unable to ensure compliance with current drinking water quality standards and episodic violations of the arsenic MCL and fluoride secondary MCL are expected. The No Action Alternative does not protect public health or ensure that the water meets drinking water quality standards.

Action Alternatives

In selecting the action alternatives, several criteria were utilized:

- All alternatives must meet system-wide compliance with the arsenic primary MCL of 10 ppb;

- All alternatives must meet system-wide compliance with the fluoride primary MCL of 4.0 mg/L;
- System-wide blending and fluoride treatment alternatives should be identified to meet the fluoride secondary MCL of 2.0 mg/L; and
- Consistency and reliability of long-term compliance must be considered in identifying and selecting alternatives.

Alternative 2 – Direct Delivery of Water from Well No. 6 to the Distribution System

This alternative involves the equipping new Well No. 6 for production, and construction of a well delivery line from Well No. 6 directly to the distribution system by connecting to the existing 6-inch water line along Diamond Back Road at the southeastern edge of the water system. No changes to the existing operation and treatment at other wells are considered with this alternative.

In addition to the well and pipeline improvements, modifications are also recommended for the well control system at PDWID. Currently, the wells cycle sequentially in a set order that cannot be controlled or modified by the operator, which limits the operator’s ability to preferentially use certain wells to achieve any water quality or blending goals. The proposed control system modifications would include providing a new telemetry system for the wells and the storage tanks that provides for enhanced control of water system well operations. The wells would continue to operate based on the tank levels; however, the control system could be programmed to optimize the run times of each well based on arsenic and fluoride water quality parameters.

Absent any other modifications to the water system, the mode of operation in this alternative will not likely result in compliance with secondary standards for fluoride, although “incidental” blending in the storage tank may still provide some mitigation of fluoride levels. Therefore, PDWID would be required to provide public notices and likely perform enhanced sampling due to the secondary fluoride MCL violations.

The following infrastructure will be required for this alternative:

- Well No. 6 pumping equipment including new power supply (existing three phase power is approximately 500 feet away from the well site), electrical, controls and civil site work;
- 1,500 linear feet (lf) of 6-inch water line from Well No. 6 to the existing 6-inch along Diamond Back Road; and
- System-wide telemetry control system.

The following operational changes would be implemented under this alternative:

- Well No. 6 EPDS will be at the Well No. 6 site;
- Programming of the new well control system would likely be set for Well Nos. 3 and 4 to function as the primary wells, with operational cycling of the other wells;
- Well No. 2 would continue to be treated for arsenic; however, treated and bypass flows could be adjusted to better match the system conditions; and
- Interlocking of wells is not anticipated under this scenario; all wells would operate independent of each other.

Alternative 3 – Deliver and Blend Well No. 6 with Well No. 2

This alternative involves no changes to the existing operation of Well Nos. 3 and 4. However there will be blending of Well No. 6 with Well No. 2 (after Well No. 2 arsenic treatment). This alternative requires equipping new Well No. 6 for production, and a 6-inch transmission main from the Well No. 6 site to the Well No. 2 site. After blending, water from Well Nos. 2 and 6 will be delivered to the storage tank via the existing 6-inch transmission line. The Well No. 2 treatment configuration would be modified to provide two 48-inch FRP vessels installed in a lead/lag treatment configuration to treat 100 gpm.

The following infrastructure will be required for this alternative:

- Well No. 6 pumping equipment including new power supply (existing three phase power is approximately 500 feet away from the well site), electrical, controls and civil site work;
- Approximately 7,300 lf of 6-inch transmission line from Well No. 6 to Well No. 2. It is noted that there will not be any customers connected to this pipeline;
- Arsenic treatment modifications at Well No. 2 to allow for lead/lag operation; and
- System-wide telemetry control system.

The following operational changes would be implemented under this alternative:

- Well No. 2 and Well No. 6 will be combined into one entry point distribution system (EPDS) leaving the storage tanks;
- Programming of the new well control system would likely be set for Well Nos. 2 and 6 to function as the primary wells, with operational cycling of the other wells; and
- Interlocking of wells is not anticipated under this scenario and all wells would operate independent of each other.

Alternative 4 – Deliver and Blend Well Nos. 2, 3, and 6 at the Storage Tank

Delivery of treated water from Well No. 3 would discharge directly to the storage tank via a new transmission main, and blending Well No. 6 with treated water from Well No. 2 via a new transmission main and delivery to the storage tank similar to Alternative No. 3. Similar to Alternative 3, modifications to the arsenic treatment system at Well No. 2 would be performed, including installing an additional 48-inch FRP vessel and reconfiguring of the piping to allow for lead/lag configuration to treat 100 mgd. Additionally, the Well No. 3 treatment configuration would be modified to provide two 48-inch FRP vessels installed in a lead/lag treatment configuration to treat 80 gpm. The existing concrete pad and enclosure would be extended to accommodate the additional vessel. Similar to the other alternatives, a new system-wide telemetry control system would be provided. This alternative involves no changes to the existing operation of Well No. 4.

The following infrastructure will be required for this alternative:

- Well No. 6 pumping equipment including new power supply (existing three phase power is approximately 500 feet away from the well site), electrical, controls and civil site work;
- Approximately 7,300 linear feet (lf) of 6-inch transmission line from Well No. 6 to Well No. 2;
- Approximately 3,700 lf of 4-inch transmission line from Well No. 3 to the storage tank;
- Arsenic treatment modifications at Well Nos. 2 and 3 to allow for lead/lag operation; and
- System-wide telemetry control system.

The following operational changes would be implemented under this alternative:

- Blending with Well No. 6 and treatment modifications at Well No. 2 will be similar to Alternative 3; and
- Well Nos. 2, 3, and 6 will be combined into one EPDS leaving the storage tanks.

There are no well combinations utilizing Well No. 6 that meet the secondary fluoride MCL due to the high levels of fluoride in Well No. 6. Many of the scenarios meet the compliance goal of 80 percent of the primary fluoride MCL. Scenarios that provide sufficient flow to meet the peak daily demand (PDD) do not meet the secondary fluoride MCL. It is noted that arsenic levels under this alternative are below the arsenic MCL due to treatment employed at Well Nos. 2 and 3.

Alternative 5 – Deliver and Blend Well Nos. 2, 4, and 6 at the Storage Tank

This alternative involves performing no changes to the existing operation of Well No. 3. Delivery of treated water from Well No. 4 would discharge directly to the storage tank via a new transmission main, and blending Well No. 6 with treated water from Well No. 2 via a new transmission main and delivery to the storage tank similar to Alternatives 3 and 4. Modifications to the arsenic treatment system at Well No. 2 would be performed, including installing one additional 48-inch vessel and reconfiguring the piping to allow for lead/lag. Additionally, the existing vessels at Well No. 4 would be replaced with two new 60-inch steel vessels installed in a lead/lag configuration to treat 120 gpm. New piping and valves would be provided to allow for lead/lag operation; although it is assumed that a new concrete pad would be installed to accommodate the vessels but the steel vessels would not be enclosed. Similar to the other alternatives, a new system-wide telemetry control system would be provided.

The following infrastructure will be required for this alternative:

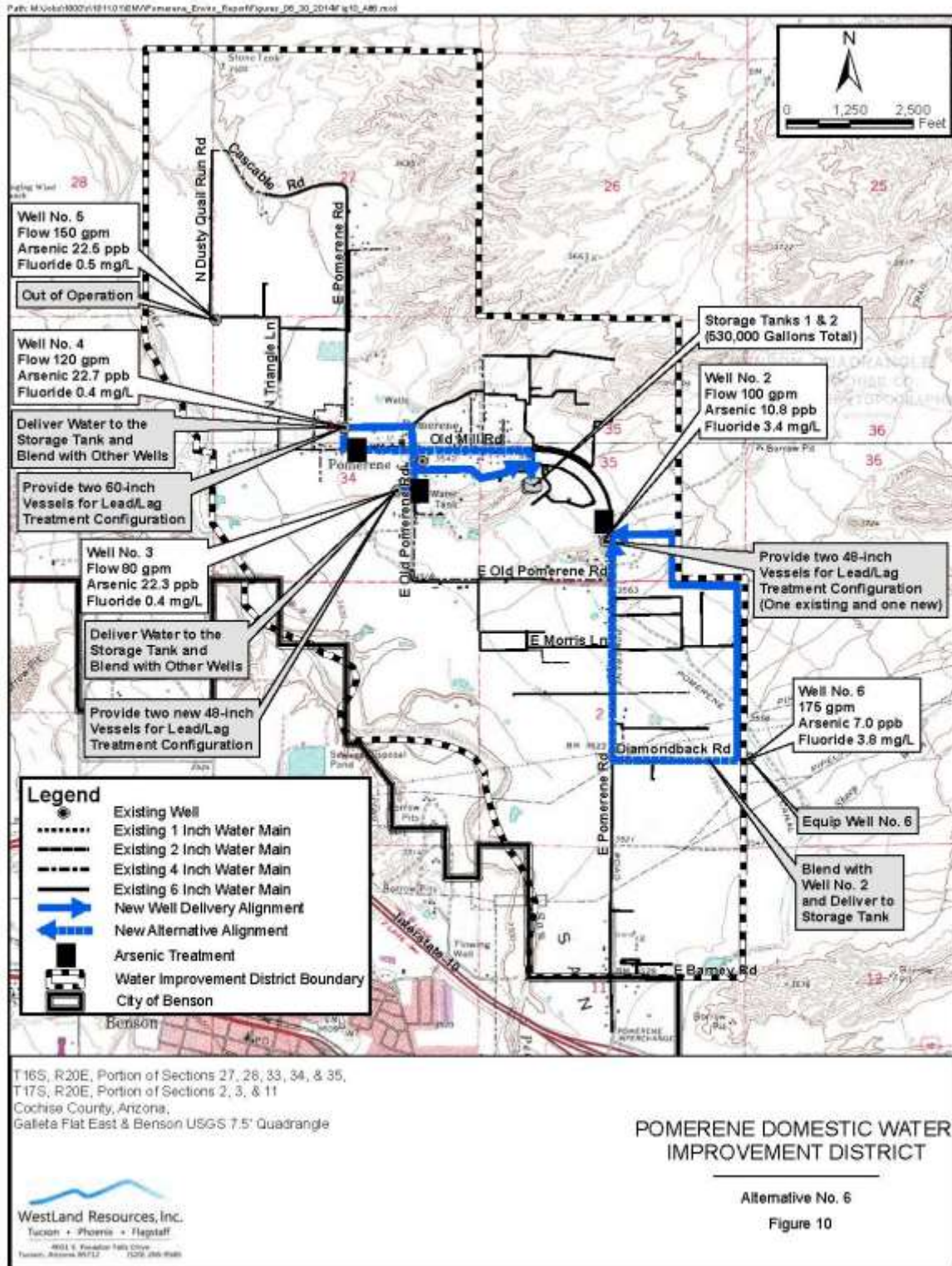
- Well No. 6 pumping equipment including new power supply (existing three phase power is approximately 500 feet away from the well site), electrical, controls and civil site work;
- Approximately 7,300 linear feet (lf) of 6-inch transmission line from Well No. 6 to Well No. 2;
- Approximately 5,400 lf of 4-inch transmission line from Well No. 4 to the storage tank;
- Arsenic treatment modifications at Well Nos. 2 and 4 to allow for lead/lag operation; and
- System-wide telemetry control system.

The following operational changes would be implemented under this alternative:

- Blending with Well No. 6 treatment modifications at Well No. 2 will be similar to Alternatives 2 and 3; and
- Wells Nos. 2, 4 and 6 will be combined into one EPDS leaving the storage tanks.

There are no well combinations utilizing Well No. 6 that meet the secondary fluoride MCL due to the high levels of fluoride in Well No 6. Many of the scenarios meet the compliance goal of 80 percent of the primary fluoride MCL. Scenarios that provide for the PDD do not meet the secondary fluoride MCL. It is noted that arsenic levels under all scenarios are below the arsenic MCL due to treatment employed at Well Nos. 2 and 3.

Similar to Alternative 4, the rationale behind the well utilization is to maximize operation of Well Nos. 2, 4, and 6 to achieve some level of fluoride blending to reduce system-wide fluoride levels; Well No. 3 would be used as a backup. Under the proposed well operational scenario, if Well No. 2 supplies 25% of the flow, Well No. 3 - 15% of the flow , Well No. 4 – 30% of the flow and Well



No. 6 – 30% of the flow, on average, over time the weighted, blended fluoride level in the overall system is estimated to be approximately 2.4 mg/L.

Alternative 6 – Preferred Alternative - Deliver and Blend Well Nos. 2, 3, 4, and 6 at the Storage Tank

This alternative involves constructing new well transmission mains to combine and deliver Well Nos. 3 and 4 to the storage tank, and blending Well No. 6 with treated water from Well No. 2 via a new transmission main and delivery to the storage tank similar to Alternatives 3, 4, and 5. There will be several well operational constraints if this alternative is implemented, but this option would allow for maximum flexibility in blending low-fluoride water from Well Nos. 3 and 4 with high-fluoride water from Well Nos. 2 and 6. See *Figure 10* from the Pomerene EID for a map of Preferred Alternative 6.

Similar to Alternatives 3, 4, and 5, modifications to arsenic treatment systems at Well Nos. 2, 3, and 4 would be performed to allow for lead/lag configuration. As with the other options, a new system-wide telemetry control system would be provided.

The following infrastructure will be required for this alternative:

- Well No. 6 pumping equipment including new power supply (existing three phase power is approximately 500 feet away from the well site), electrical, controls and civil site work;
- Approximately 7,300 lf of 6-inch water line from Well No. 6 to Well No. 2;
- Approximately 2,400 lf of 4-inch water line to deliver from Well No. 4 across Tumbleweed Lane to Old Pomerene Road and Whiskey Road;
- Approximately 700 lf of 4-inch water line to deliver from Well No. 3 to Old Pomerene Road and Whiskey Road;
- Approximately 3,000 lf of 4-inch water line to deliver from Old Pomerene Road and Whiskey Road across Whiskey Road and Sonora Verde Drive to the storage tank site;
- Arsenic treatment modifications at Well Nos. 2, 3, and 4 to allow for lead/lag operation; and
- System-wide telemetry control system.

The following operational changes would be implemented under this alternative:

- Well Nos. 2, 3, 4, and 6 will be combined into one EPDS leaving the storage tank;
- All wells will feed the storage tanks, and the tanks will float the system to meet water system demand; and
- An ADEQ-approved blending plan would be required which will be incorporated into the new telemetry control system to ensure operation of well combinations per the blending plan requirements.
- Out of 15 well operational scenarios possible under this alternative, seven scenarios meet the secondary fluoride standard, and 12 scenarios meet the compliance goal of 80 percent of the primary fluoride MCL. There are two scenarios that provide for the PDD while complying with secondary fluoride MCL; one well combination utilizing Well No. 6 meets the secondary fluoride MCL. It is noted that arsenic levels under all operational scenarios are below the arsenic MCL. Under the proposed well operational scenario, if Well No. 2

supplies 20% of the flow, Well No. 3- 30% of the flow, Well No. 4 - 30% of the flow and Well No. 6 – 25% of the flow, on average, over time the weighted, blended fluoride level in the overall system is estimated to be approximately 2.0 mg/L.

Alternative 7 – Deliver and Blend Well No. 6 at Well No. 2 and Install New Fluoride Treatment

This alternative relies on treatment for Well Nos. 2 and 6 to ensure compliance with the fluoride secondary and arsenic standards, and continues to utilize the existing facilities at Well Nos. 3 and 4 for arsenic compliance. A 6-inch well transmission line will be constructed to deliver water from Well No. 6 to Well No. 2. Similar to the other alternatives, a new well telemetry control system would be provided.

The following systems and constraints for fluoride treatment were considered:

- Absorption treatment using activated alumina (AA) – This is an adsorption-based technology to 6.5). Chemical media regeneration is performed in-situ after media is exhausted. Treatment system operation will require onsite chemical storage and hauling spent chemicals after media regeneration. For budgetary purposes, it is estimated that a 200 gpm treatment system will be installed to treat Well Nos. 2 and 6 and reduce fluoride levels to less than 2.0 mg/L. Although trace levels of iron are detected in the water, it is assumed that removal of iron prior to fluoride treatment will not be required and can be handled by a micron pre-filtration system;
- Reverse Osmosis (RO) – This technology utilizes membrane-based RO technology to treat well flows. Both wells will discharge into a new treatment feed storage tank and will be pumped at high pressures through the RO system and delivered to the existing 530,000-gallon storage tanks. For budgetary purposes, it is estimated at a 150 gpm RO system will be provided to reduce fluoride levels at Well Nos. 2 and 6 to less than 2.0 mg/L. Although trace levels of iron are detected in the water, it is assumed that removal of iron prior to fluoride treatment will not be required and can be handled by a micron pre-filtration system;
- It is assumed that if fluoride treatment is implemented, the arsenic treatment at Well No. 2 will not be required; the fluoride treatment process will also treat for arsenic; and
- It is recommended that a detailed evaluation of treatment alternatives including waste disposal alternatives be performed prior to implementing this alternative.

The following infrastructure will be required for this alternative:

- Well No. 6 pumping equipment including new power supply (existing three phase power is approximately 500 feet away from the well site), electrical, controls and civil site work;
- Approximately 7,300 lf of 6-inch water line from Well No. 6 to Well No. 2;
- Fluoride treatment system for Well No. 2 and 6 installed at Well No. 2; and
- System-wide telemetry control system.

2.4 OTHER ALTERNATIVES CONSIDERED BUT NOT EVALUATED

This section presents other alternatives that were considered but were not evaluated due to cost considerations or feasibility.

Utilize Existing Interconnect with the City of Benson

This alternative considers the opportunity to utilize the existing 6-inch interconnect with the City of Benson for water delivery. The 6-inch interconnect, located near Pomerene Road and Via Estaca Road, is in the south portion of the water system. Based on the information obtained from PDWID, the interconnection was primarily installed under an agreement with the City of Benson to provide additional fire flow capacity for the nearby church property, if required. The water pressure in the City of Benson water system at this location is reported to be approximately 60 psi. Based on the water system model analysis, this pressure would be sufficient to serve the PDWID system.

However, a comparison of the City of Benson's and PDWID's tariff reveals that utilizing the interconnect with city of Benson would not be a favorable financial decision for the PDWID, unless PDWID is able to negotiate a discounted rate and enter in a legal agreement with city of Benson. In addition to the tariff rates, it should be noted that the actual cost of operation of an individual well in the PDWID is lower than PDWID's tariff rate, further indicating that replacing well capacity with city of Benson capacity would not be financially favorable.

Isolate the Dairy Farm from the Potable Water System

A single dairy farm customer (with multiple meters) constitutes approximately 12 to 14 percent of the PDWID water system demand on an annual basis. Since dairy farms typically do not require potable water for cattle feed and operations, consideration was given to isolating the dairy from the potable water system. Under such an alternative, a non-potable water line would be constructed to serve the dairy's nonpotable water needs. This could be achieved by connecting discharge from one of the Pomerene wells directly to the dairy farm. However, due to following reasons, this alternative was not evaluated further:

- Due to the cost of water line construction (approximately 4,000 feet of 2-inch water line and hydropneumatic tank for well control at a cost of approximately \$150,000) compared to the potential operating cost savings (up to approximately \$4,000 per year for reduced arsenic treatment media usage), this alternative did not appear to warrant further consideration;
- Relying on only one well for service to the dairy farm does not allow the water system to have redundancy of service to this customer if the well is out of service, and would likely require some sort of manual switchover to a backup supply from the drinking water system during outages;
- It is not considered a good long-term well pump operating scenario to have the pump turning on and off based on pressure control to serve the demands of the dairy. Frequent on and off operation of well pumps can shorten pump lifespan;
- Control and operation of well would be fairly complicated if the scenario also attempted

to maintain well availability to the drinking water system through the arsenic treatment plant, as there would be multiple inputs controlling the well starts and stops, and automated control valves would likely be required to ensure water was being sent to the correct demand; and

- This alternative fundamentally assumes that the dairy farm can operate on non-potable water. However, there may be unknown stipulations from dairy's clients that the dairy is required to meet, which could prohibit implementation of this alternative.

3.0 AFFECTED ENVIRONMENT

The purpose of this section is to describe the environmental resources that could potentially be impacted by the project alternatives described in Section 2.0. The descriptions of the affected environment focus on environmental resources located within the proposed project area and adjacent areas.

Pomerene is a small unincorporated community in Cochise County, Arizona, United States. Pomerene is 2 miles (3.2 km) north of Benson. PDWID estimates that they currently provide domestic water to 900 customers.

The Pomerene area has a semi-arid climate with hot summer days, moderate winter days, and low humidity. Average monthly temperature range from 30 degrees Fahrenheit in January to 97 degree Fahrenheit in June. Average rainfall is 11.3 inches per year and snowfall is 1.8 inches per year.

3.1 LAND USE

Existing land uses within the project area include utility and transportation (paved and unpaved roads) infrastructure. Adjoining land use includes residential development, churches and public services, limited open space, and agricultural lands. According to land use designations mapped for the Cochise County Comprehensive Plan, the project area is mainly within a Category B Growth Area, which is defined as an area that is in transition from a rural environment to a more urban environment.

Existing utilities occur in several roadways included in the project area. Formal roads include Pomerene Road, Old Pomerene Road, Sonoita Verde, and Diamondback Drive. The west half of Diamondback Drive is not paved and the east half of Diamondback Drive is not developed as a road. One corridor occurs along land without existing right-of-way or improved roads (runs along the east side of the PDWID boundary) then runs across undeveloped land to an existing well site. Portions of this segment have an existing, informal road.

3.2 PHYSIOGRAPHY, TOPOGRAPHY, GEOLOGY AND SOILS

The project area is located in southeastern Arizona within San Pedro River valley. This portion of the valley is flanked by the Rincon Mountains on the west and the Little Dragoon Mountains on the east. It encompasses three major environmental zones: mountains, bajadas, and river floodplains and terraces. The Project area is east of the San Pedro River at the interface of the floodplain and the distal bajada emanating from the Little Dragoon Mountains in an area of gently sloping floodplain terraces dissected by shallow drainages.

Most of the project area is mapped as Late Holocene alluvium that formed on low terraces, alluvial fans, and small channels in association with the modern drainage system (Youberg *et al.* 2009). In lower piedmont areas, such as the Project area, this unit is predominantly moderately sorted sand and silt, with some pebbles and cobbles in channels. Some small hills in the Pomerene vicinity are comprised of erosional remnants of older Quaternary to Tertiary basin fill alluvium, including the Pliocene St. David formation and Pliocene to Pleistocene conglomerate and sandstone. These units may include sandstone, conglomerate, mudstone, marl, tuff, and lacustrine limestone.

Elevations in the project area range between 3,530 and 3,590 feet above sea level. The natural landscape has been altered from its original state. The area immediately surrounding the project area has been used historically and in recent times as an agricultural and residential area. Disturbances include roads, utilities, agricultural features, and structures. Portions of land surface along the project area have been previously developed and are now characterized by bituminous asphalt, gravel, and improved earthen roadways; utility installations, landscaping gravel; and non-native landscaped plants.

3.3 WATER RESOURCES

Addressing drinking water quality problems is the purpose of the proposed project. Water quality problems related to concerns beyond the public water system may be evaluated in connection to habitat and wildlife. However, there are no perennial or intermittent sources of water within the project area. Ephemeral drainages that cross the project area flow only in response to rainfall. PDWID relies on groundwater as their drinking water source. Water quality concerns in the PDWID have not been attributed to harming aquatic life.

ADEQ monitors and assesses surface water quality along selected reaches of the San Pedro River in relation to state water quality standards. The monitored reach of the San Pedro River nearest and down gradient from the project area is the 15.5-mile reach that occurs between the Dragoon Wash and Tres Alamos Wash. This reach has been designated in past years as an impaired water for nitrate concentrations but recent monitoring was inconclusive. It is no longer identified as impaired for nitrate. This portion of the San Pedro River is down gradient of Apache Nitrogen Products (formerly known as Apache Powder Company), which is listed on numerous government monitoring databases, including those related to CERCLA (“Superfund”) for potentially contributing to water quality concerns.

Management and conservation of water resources in Arizona is the responsibility of the Arizona Department of Water Resources (ADWR), which regulates water service providers in accordance with Arizona Revised Statutes (ARS). Providers located outside Arizona Active Management Areas, (such as PDWID) submit system water plans and annual water use reports to ADWR pursuant to A.R.S. §§ 45-342 and 343. While regional drought and long-term water availability is a concern for Arizona, based on the data provided by PDWID it appears that wells for the Project have adequate water supply. Pump testing for new wells (such as Well No. 6) and well system analysis indicate there is sufficient water available for the community.

Surface and Groundwater Hydrology

The project area generally slopes from the northeast to the southwest toward the San Pedro River. Regionally, water flows from the mountain slopes toward the central San Pedro valley then northward along the San Pedro River. Several minor ephemeral drainages cross the project area, generally flowing from north and east, southwest toward the San Pedro River. None of these drainages are named washes on the USGS topographic maps. No special aquatic resources as defined by the U.S. Army Corps of Engineers are present within the project area.

The project area is located in the western portion of the Upper San Pedro Watershed (hydrologic unit code [HUC] 15050202) where basin fill is the principal aquifer with some areas utilizing stream alluvium. Groundwater flow is assumed to generally follow surface gradient. Groundwater in the basin fill aquifer is found in both unconfined and confined conditions, and artesian conditions exist near Benson and Saint David. Based on ADWR records from 1990 to 1991 and 2003 to 2004, water levels declined in most wells in the basin but groundwater levels in some wells have risen up to 0.6 feet per year in the Pomerene area north of Benson. Drillers' logs from ADWR and Groundwater Site Inventory (GWSI) databases indicate that wells in the general vicinity of Pomerene are screened in either a shallow, unconfined aquifer or a deeper, basin fill aquifer. The shallow aquifer can be highly productive (greater than 1,000 gpm). The deep aquifer in Pomerene is confined below a thick (approximately 200 to 500-plus feet) interval of red clay. PDWID Well Nos. 2, 3, 4, 5, and 6 are screened in this deep aquifer. Artesian conditions are present at Well No. 5, according to the driller's log. Confined groundwater conditions (but not artesian) are present in Well Nos. 2, 3, 4, and 6.

There are well-known public concerns related to water resources for the San Pedro River watershed. Portions of the river are perennial; however, the relevant reach of the San Pedro River adjacent to the project area is designated by ADWR as an intermittent stream, and other sources report the stream as frequently dry.

Wetlands

The USFWS hosts an interactive mapping service that depicts mapped "wetlands" for the United States from a biological context. The wetland inventory map does not report any wetlands within the project area. However, several ephemeral drainages cross the project area. Based on review of aerial and topographic maps and observations during the site visit, there is potential that some ephemeral drainage features that cross the project area would be considered jurisdictional wetlands (i.e. waters of the United States) by the EPA and Corps. Specifically, there are several drainage features that exhibit ordinary high water mark (OHWM) indications. The Pomerene Canal intercepts several washes in the vicinity of the project area but it is breached in several locations and does not appear to convey water where it crosses the project area. It is unlikely that the Corps would assert jurisdiction over the Pomerene Canal for this project but it is likely that other ephemeral drainage features within the project area may be considered waters of the United States.

Floodplains

The Federal Emergency Management Agency (FEMA) has mapped flood zones on their Flood

Insurance Rate Maps (FIRMs) that cover the project area. The FIRM (Panel number 0400120563B) depicts the varying levels of flood risk mapped for the project area. The project area occurs mainly in Zone X outside the 500-year floodplain, a minimal risk designation (outside the 1-percent and .2-percent-annual-chance floodplain). No base flood elevations or depths are shown in these zones. A portion of one corridor (along the east PCWID boundary) crosses land with Zone A designation; area within the 100-year floodplain. Zone A is defined as a special flood hazard area inundated by 100-year flood (subject to inundation only during the 1-percent-annual-chance flood event). No detailed analysis is performed for Zone A; therefore, no base level flood elevations have been determined.

3.4 VEGETATION

The project area is highly disturbed by formal and informal roadways. Undeveloped portions of the project area have native vegetation dominated by mesquite, acacia, prickly pear, and native and non-native intrusive grasses. The project area and surrounding lands are consistent with the Chihuahuan desertscrub biotic community. Vegetation on undeveloped portions of the Project area was consistent with Chihuahuan desertscrub vegetation: dominated by creosotebush (*Larrea tridentata*), tarbush (*Fourensia cernua*), whitethorn acacia (*Acacia neovernicosa*), catclaw (*Acacia greggii*), ocotillo, allthorn, and mesquite. Major understory species include various species of agave (*Agave lechuguilla*, *A. scabra*, *A. falcata*, *A. neomexicana*, *A. parryi*, *A. striata*), yuccas (*Yucca elata*, *Y. rostrata*, *Y. thompsoniana*, *Y. filifera*, *Y. carnerosana*, *Y. torreyi*), sotols (*Dasyllirion leiophyllum*, *D. wheeleri*), and nolinias (*Nolina microcarpa*, *N. erumpens*, *N. texana*), along with a variety of small cacti.

3.5 WILDLIFE RESOURCES

Fish and Wildlife

The project area is limited and comprised primarily of plants and animals with no special status protection occurring along roads, in yards, and along adjacent farm plots. Trenching and laying pipes would occur at sites and properties that are already disturbed, thus largely avoiding disturbance of wildlife habitat. There is no fish habitat occurring within the project area.

Federally Endangered & Threatened Species

A screening analysis was conducted to evaluate the potential for occurrence of federally threatened and endangered species at the project area. The methods and result of this evaluation are presented below.

Screening Analysis Methods

The list of Special-status Species evaluated for the project was obtained from the Arizona Ecological Field Office of the U.S. Fish and Wildlife Service (USFWS) website using the PDWID district boundary. A screening analysis was then conducted to evaluate the potential for occurrence of Special-status Species and the presence of proposed or designated critical habitat for listed species within the project area. Special-status species are those that are listed as endangered or

threatened, proposed for listing, or candidate for listing by the USFWS. Determinations of the potential for Special-status Species to be present and to utilize habitats within the project area were based on: 1) field observations and habitat assessments of the project area; 2) review of the natural history of the Special-status Species; 3) evaluation of the known ranges and distributions for the Special-status Species; 4) comparisons of this information with habitats present in the Project area; and, in some cases, 5) review of records of occurrences in published or gray literature.

Field reconnaissance was conducted on May 28 and July 18, 2014, to identify habitat types in the area and evaluate the potential for any Special-status Species to be present in the project area. During these field visits, biologists recorded plant and wildlife species observations and took photographs in the project area. No species-specific surveys were conducted during the site visits. Occurrence records were obtained through a query of Arizona Game and Fish Department (AGFD) records, searching for known occurrences of species tracked by the Heritage Data Management System (HDMS). The HDMS includes records for, but is not necessarily limited to, USFWS species of concern, species considered sensitive by the Bureau of Land Management's (BLM) Arizona State Office, species considered sensitive by the Regional Forester, species listed by the Arizona Department of Agriculture as Salvage Restricted, and species listed by the AGFD as Wildlife of Special Concern in Arizona. These species are not necessarily afforded protection under the ESA. On June 18, 2014, the AGFD conducted a query of the HDMS for the PDWID district. The HDMS search results included occurrences of Special-status Species as well as other species of conservation concern that have been reported within 3 miles of the PDWID district. Based on the results of the background research and field reconnaissance described above, species were eliminated from further consideration if published habitat requirements were determined to not be present within the project area or if the known range or distribution of the species was outside the project area.

Screening Analysis Results

The USFWS identified 13 Special-status Species for the project area (four endangered, one threatened, two proposed threatened, five candidate, and one experimental population) and designated critical habitat for one species that should be considered for an effects analysis for the project. One plant, one invertebrate, one amphibian, two reptile, five bird, and three mammal species are listed. A screening analysis of these Special-status Species was performed to determine which species have the potential to be present in the project area (See *Table 1 in the Appendix*). Species with more than a limited potential to be present within the project area or its immediate vicinity are highlighted in bold in *Table 1*.

The AGFD HDMS Environmental Review Tool reported no USFWS species with listed federal status within 3 miles of the district. It did report two USFWS species that are given special consideration for future listing within 3 miles (4.8 km): the Sonoran desert tortoise (*Gopherus morafkai*), which is considered a USFWS candidate species, and the Needle-spine pineapple cactus, which is considered a USFWS Species of Concern. These species are not currently afforded protection under the ESA; however, the Sonoran desert tortoise was considered in this evaluation for its likely potential to be listed in the future.

The criteria used to classify the potential for occurrence of the 13 species included in this screening

analysis are defined as follows:

Present – The species has been observed to occur in the project area during the site visit or pursuant to the AGFD records or other reliable source; the project area is within the current known range of the species; and habitat characteristics required by the species are known to be currently present.

Possible – The species has not been documented in the project area, but the known, current distribution of the species includes the project area and the required habitat characteristics of the species appear to be present in the project area.

Limited Potential – Generally, the known, current distribution of the species does not include the Project area, but the distribution of the species is close enough such that the Project area may be within the dispersal distance of the species. The habitat characteristics required by the species may be present in the project area. In general, the potential for occurrence of these species is considered insignificant to the point that detailed discussion is not warranted.

No Potential – The project area is outside the known distribution of the species and the habitat characteristics required by the species are not present.

Based on the screening analysis, one of the 13 Special-status Species is considered to have more than limited potential to occur at the project area and was evaluated further. There are no federally listed species (species with threatened and endangered status) with more than limited potential to occur in the project area. It is possible that the Sonoran desert tortoise will be present in the project area but as explained below, considering that habitat for the desert tortoise is marginal in the project area and that records for Sonoran desert tortoise east of the San Pedro River in Cochise County are sparse, the Sonoran desert tortoise is considered to have a low probability of occurrence in the project area. Adverse impacts to the Sonoran desert tortoise are not expected, though dispersing individuals cannot be completely discounted from having any potential to occur in the project area. The Sonoran desert tortoise is not yet afforded protection under the ESA. The project is not expected to result in a trend toward a federal listing of the Sonoran desert tortoise. Additional discussion for Sonoran desert tortoise is provided below. *Table 1* provides justification for the determination for whether a species are likely to occur in the project area and subsequent determination for the project's potential to impacts these species if they have potential to occur in the project area

Sonoran Desert Tortoise

The Sonoran desert tortoise is currently a candidate for listing. It was petitioned for listing as a Distinct Population Segment with critical habitat on October 9, 2008). On August 28, 2009, the USFWS published its 90-day finding announcing that they were initiating a status review for the Sonoran desert tortoise. On December 14, 2010, the USFWS announced that the listing of the Sonoran desert tortoise was warranted but precluded by higher priority listing actions (USFWS 2010b). The May 10, 2011, *WildEarth Guardians v. Salazar* court settlement requires the USFWS to submit a Proposed Rule or a not-warranted finding to the *Federal Register* for the Sonoran desert tortoise no later than the end of FY 2015 (September 30, 2015). The Sonoran desert tortoise is also designated Arizona State Wildlife of Special Concern, Forest Service Sensitive, and BLM sensitive. The Sonoran desert tortoise is not currently afforded protection under the ESA, but it is considered in this report due to the potential for listing.

The desert tortoise requires adequate shelter to escape extreme winter and summer temperatures. The Sonoran population typically excavates or modifies burrows under rocks and boulders, but also excavates under shrubs or open ground and uses rock crevices and caliche caves along dry arroyos for shelter. Sonoran desert tortoises are observed most commonly on steep, rocky slopes and bajadas at elevations between 510 and 5,300 feet. The project area was surveyed by a biologist familiar with the habitat requirements for this species. The project area lacks rocky slopes with the exception of the small hill where the water towers are located. No appropriate shelter sites (rocky slopes, caliche dens, other hard cover) were observed. Additionally, no sign, tracks or individual tortoise were observed during the site visit. The potential for occurrence of desert tortoise is expected to be low.

As indicated above, records for Sonoran desert tortoise east of the San Pedro River in Cochise County are sparse. There is a record for this species within three miles of the project area, but records of isolated occurrences in uncharacteristic environments have led to the suspicion that observed Sonoran desert tortoise were captive-release tortoises or misidentified desert box turtles (*Terrapene ornata luteola*). However, these records could represent locally present populations of desert tortoise. Population cores are typically on mountain slopes, with tortoises radiating out from these slopes, often along washes that offer caliche or conglomerate cave shelter opportunities. Core populations remain throughout their Arizona range. Concerns about population genetics have arisen due to habitat fragmentation and increased barriers to tortoise movement across the valleys between mountain ranges as a result of the construction of roads, canals, and railroads and urban development.

In summary, the project area generally lacks the suitable habitat characteristics preferred by the Sonoran desert tortoise. Adverse impacts to the Sonoran desert tortoise are not expected, though dispersing individuals have the potential to occur in the project area.

Migratory Birds

Migratory birds and their occupied nests or eggs are protected by the Migratory Bird Treaty Act (MBTA). The MBTA is administered by USFWS and, in part, prohibits harming protected birds or destroying their eggs or occupied nests. It subjects violators to liability with the potential for penalties including fines and imprisonment for such activity. There are hundreds of migratory bird species protected by the MBTA. Within the project area, suitable habitat is relatively minor when compared to the surrounding area

3.6 CULTURAL RESOURCES

A Cultural Resource Inventory was conducted for the project, which identified one new archeological site, AZ EE:3:255(ASM)—The Pomerene Road Network—and two isolated occurrences. Two previously recorded sites, AZ EE:13:85(ASM)—The Pomerene Canal—and AZ CC:13:80(ASM)/AZBB:13:760(ASM)—The Tucson-Apache Transmission Line—are located within the proposed alignment Corridors. The Pomerene Canal is a historic property determined eligible for inclusion in the National Register of Historic Places (NRHP) and it crosses all proposed alignment corridors. The Tucson-Apache Transmission Line crosses portions of the proposed

corridor; however, this site has been determined ineligible for inclusion in the NRHP. Newly recorded site, the Pomerene Road Network, AZ EE:3:255, is recommended as ineligible for inclusion in the NRHP since it does not have distinctive characteristics that distinguish it from innumerable rural community road networks across Arizona and the United States.

3.7 AIR QUALITY

The Clean Air Act (CAA) requires EPA to establish primary and secondary National Ambient Air Quality Standards (NAAQS) for criteria pollutants, and states are required to develop State Implementation Plans (SIPs) describing how NAAQs will be met. Geographic areas that do not meet the NAAQs are designated as Nonattainment areas for relevant pollutants. Air emissions are regulated under the CAA in the context of NAAQs, and authority to enforce the CAA may be delegated by the EPA to state or county agencies. Air emissions are generally regulated through permitting requirements, emission standards for mobile and stationary sources, performance standards for new or modified existing stationary sources, emission standards for hazardous air pollutants, air toxic standards, and restrictions to prevent significant deterioration of clean air areas. The CAA also ensures the preservation of air quality and visibility in our national parks and wilderness areas.

Involvement of a federal agency can expand air pollution prevention efforts for certain activities. Federal agencies must demonstrate that their actions conform to any SIP approved under Section 110 of the CAA (42 USC §7506(c)). A conformity determination may be required for a federal action that occurs in a non-attainment or maintenance area. In accordance with the Clean Air Act (CAA), the EPA sets National Ambient Air Quality Standards (40 CFR part 50) for six criteria pollutants that are deemed harmful to public health and safety. These six criteria pollutants are carbon monoxide (CO), lead (Pb), particulate matter less than 10 and 2.5 microns in aerodynamic diameter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), ozone (O₃), and sulfur dioxide (SO₂). The project area is not within or adjoining a Nonattainment Area. The closest Nonattainment Area is the Paul Spur/Douglas Planning Area (PM₁₀ Nonattainment Area), which is approximately 43 miles southeast of the project area in south central Cochise County. There are two areas near the project area that have been redesignated to Attainment Areas and are now under Maintenance Plans: Tucson (CO Attainment with Maintenance Plan) and San Manuel (SO₂ Attainment with Maintenance Plan) located 22 miles west of and 37 miles northwest of the project area, respectively.

Under Section 162(a) of the CAA, Class 1 federal lands or air sheds are granted special air quality protection. Class 1 federal air sheds include areas such as national parks, national wilderness areas, and national monuments. The 71,400-acre Saguaro Wilderness Area is the closest Class 1 federal air shed to the project area (40 CFR § 81.403). The project area is located more than 10 miles southeast of the Saguaro Wilderness Area.

3.8 NOISE

Noise is generally described as unwanted sound, which can be based either on objective effects such as hearing loss or damage to structures or subjective judgments such as community annoyance. Sound usually represented on logarithmic scale with a unit called the decibel (dB).

Sound on a decibel scale is referred to as sound level. The threshold of human hearing is approximately 3 dB, and the threshold of discomfort or pain is around 120 dB.

Noise levels occurring at night generally produce a greater annoyance than do the same levels occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 dBA.

Acceptable noise levels have been established by the U.S. Department of Housing and Urban Development for construction activities in residential areas: 1) Acceptable (not exceeding 65 dB); 2) Normally Unacceptable (above 65 but not greater than 75 dB); and 3) Unacceptable (greater than 75 dB).

3.9 ENERGY AND NATURAL RESOURCES

Pomerene purchased electricity from Sulphur Springs Valley Electric Cooperative (SSVEC). The electricity distribution system appears adequate for Pomerene's current needs as no evidence of brownouts or other forms of power shortages was identified. Southwestern Gas Corporation provides natural gas the Pomerene.

3.10 TRANSPORTATION

The majority of the project area is along developed roadways (Pomerene Road, Old Pomerene Road, Sonoita Verde, and Diamondback Drive) where other public utilities are already placed. The west half of Diamondback Drive is not paved and the east half of Diamondback Drive is not developed as a road. One corridor occurs along land without existing right-of-way or improved roads (along the east side of the PDWID boundary), then across undeveloped land to an existing well site. Construction of the project would mainly affect unpaved roadsides and cross under paved roadways.

The Federal Highway Administration Highway Functional Classification System identifies roads as interstates, freeways, principal arterials, minor arterials, and major and minor collectors. None of the roadways in Pomerene are classified.

3.11 HAZARDOUS MATERIALS

Hazardous materials and substances are regulated in Arizona by a combination of mandated laws promulgated by the EPA and the ADEQ. There are no hazardous waste sites, potential hazardous waste sites, and remedial activities, including sites that are on the National Priorities List or being considered for the list.

3.12 SOCIOECONOMICS

Pomerene is located approximately 50 miles southeast of Tucson, Arizona, the state's second largest populated city. Located in Cochise County, Arizona, Pomerene is two miles north of Benson, Arizona, and approximately 40 miles north of the military post Ft. Huachuca. Pomerene is primarily rural in character and sparsely populated. United States 2010 Census data was not

specifically available for the PDWID service study area; however, population for a larger area including Pomerene reports a population of 3,457. Out of the 3,457 individuals residing in that area, 823 persons are of working age (age 19 to 44), 1058 persons are nearing or at the earlier range of retirement age (ages 45 to 64), and there are 773 individuals over the age of 65.

The population of the Pomerene area is less racially diverse than the state of Arizona, with 92.2 percent of the population identifying as a white. Within Arizona, 73.0 percent of the population identifies as white and within Cochise County that value is 78.5 percent.

Approximately 900 customers are estimated to be in the PDWID service area.

3.13 ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations*, states that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” This action requires all Federal agencies to identify and address disproportionately high and adverse impacts of its programs, policies, and activities on minority and low-income populations.

EO 13045 requires each Federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children;” and “ensure that its policies, programs, and activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults.

3.14 SUSTAINABILITY AND GREENING

In accordance with EO 13423 – Strengthening Federal Environmental, Energy, and Transportation Management, Pomerene would incorporate practices in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner in support of their mission.

3.15 HUMAN HEALTH AND SAFETY

Current health concerns are associated with the Pomerene drinking water system not being in compliance with Federal and state arsenic and fluoride standards.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 LAND USE

Under the No Action Alternative, land use will remain the same.

Under the Action Alternatives, the project provides for upgrades, reliability improvements and water quality improvements and increases the PDWID system source capacity by only 5 percent. The existing water system and the water system with the proposed project improvements are both capable of supplying the existing connections including those connections not currently in service. The minor increase in system source capacity under the project accommodates minor infill growth, but does not induce growth.

4.2 PHYSIOGRAPHY, TOPOGRAPHY, GEOLOGY AND SOILS

Under the No Action Alternative, physiography, topography, geology, and soils would remain the same.

With the Action Alternatives, there will be some ground disturbance associated with the installation of the transmission water pipelines. However, the environmental effect is anticipated to be temporary in nature and limited to the physical footprint of disturbance during construction and the use of heavy machinery.

For the Preferred Alternative 6, surface disturbance related to construction is limited to connecting Well No. 6 to a power source, and the new small diameter water transmission lines from Well No. 6 to the Well No. 2, and from Well Nos. 3 and 4 to the storage tanks. This will involve removal of vegetation from either the corridor between Well No. 6 to the Well No. 2 transmission line along the east water district boundary or along Diamondback Drive and Pomerene Road as an alternative. Construction of the waterline along the western portion of Diamondback Road and/or along Pomerene Road would occur within cleared rights-of-way. Removal of vegetation will also occur along the alignments needed to connect Well No. 3 and Well No. 4 to the storage tanks including from Well No. 3 to the intersection of W. Pomerene Road and Old Pomerene Road, from Well No. 4 to the that same intersection and then from that intersection to the storage tanks. This includes an alternative route between Well No. 4 and the storage tanks along Tumbleweed Lane and between Whiskey Road and Sonora Verde Drive, along Tumbleweed Lane extended to Pomerene Road.

These alignments may cross the Pomerene Canal, an NRHP site, multiple times; however, the proposed waterline will avoid any impacts by boring under the canal for any crossings.

4.3 WATER RESOURCES

Under the No Action alternative, water resources will remain the same. PDWID will continue to be out of compliance with Federal and State drinking water quality standards for arsenic and fluoride.

None of the Action alternatives, including the Preferred Alternative, is anticipated to contribute to existing or new water quality concerns. Addressing drinking water quality problems is the purpose of the proposed project; and the proposed project is anticipated to directly improve drinking water quality in the PDWID public water system.

Surface and Groundwater Hydrology

Under the No Action alternative, surface and groundwater hydrology will remain the same.

With the Action Alternatives, any changes to the operation of the existing wells will not have an impact on the San Pedro River, since there is no hydrologic connection. The deep aquifer that PDWID accesses is confined below a thick clay layer. PDWID Well Nos. 2, 3, 4, 5, and 6 are screened in this deep aquifer.

PDWID has a total pumping capacity of approximately 450 gpm, including 150 gpm from Well No. 5. It is noted that Well No. 5 was taken out of operation in 2013. In essence, Well No. 6, with a pumping capacity of 175 gpm, will replace Well No. 5. This will result in a net pumping capacity increase of 25 gpm, which is a net five percent increase in PDWID's pumping capacity, which is not anticipated to negatively impact the groundwater conditions and San Pedro River basin in the area.

In accordance with the federal National Pollutant Discharge Elimination System (NPDES) requirements, a Storm Water Pollution Prevention Plan (SWPPP) will be developed to minimize the potential for the Project to cause adverse effects to existing downstream waters through the implementation of Best Management Practices. Periodic inspections would occur during construction activities in accordance with ADEQ requirements. This would minimize stormwater runoff and negative impacts to downstream waters. The Project will not violate a storm water permit or a wastewater discharge permit either for construction or on-going operations.

Wetlands

Under the No Action alternative, there will be no direct or indirect impacts to wetlands or waters of the U.S.

The U.S. Army Corps of Engineers (USACE) administers Section 404 of the Clean Water Act, governing the placement of dredged or fill material into wetland and other waters of the U.S. With any of the Action Alternatives, including the Preferred Alternative, it is PDWID's intention to avoid all aquatic resources. However, if avoidance can't be achieved, PDWID will install the new drinking water transmission pipelines by boring underneath the aquatic resource feature. New water transmission pipelines conveying water from the wells to the storage tanks are small diameter of 6-inches or less.

During detailed final design, the consultant will identify all aquatic resource features in the vicinity of the new transmission pipeline alignments. The ordinary high water level for each aquatic feature will be identified and an appropriate feature-specific setback distance(s) established. The setback will be identified and flagged for construction so as to avoid the discharge of dredge or fill material, or other pollutant into these aquatic resources. Grading activities will be prohibited within the setback limits. The pipeline alignments shall observe the setback distances and avoid the discharge of dredged or fill material into aquatic resources. Directional boring may entail staging but must observe the established setback distance.

If, for any reason, complexities are encountered during final design and avoidance and/or boring

cannot be implemented, then a preliminary jurisdictional determination will be prepared and submitted to the Corps for review and approval. If necessary, authorization under Clean Water Act (CWA) Section 404 will be obtained to discharge dredge and fill material into waters of the United States for construction.

Floodplains

The majority of the project area completely avoids the 500-year floodplain; however, one segment of the eastern option for Alternatives 3-7, would cross a mapped segment of Zone A floodplain. Although the Preferred Alternative could cross the mapped floodplain, these improvements would not modify the natural flows of floodwaters, and thus there would be no adverse impacts to the floodplain.

4.4 VEGETATION

See Section 4.2 Physiography, Topography, Geology and Soils for a description of impacts to vegetation.

4.5 WILDLIFE RESOURCES

Fish and Wildlife

Under the No Action Alternative, wildlife communities in the general area would not be directly or indirectly affected because construction would not occur. Operation of the existing on-site systems would remain the same. Direct and indirect long-term impacts would not occur to wildlife with the implementation of the No Action Alternative.

It is not anticipated that any direct effects to wildlife communities or loss of wildlife habitat would occur during construction and operation activities for any of the Action Alternatives. Vegetation within the project area is generally disturbed. More suitable habitat occurs outside of the project area.

No fish habitat is within the project area; hence no fish species would be affected by any of the Action Alternatives.

Threatened and/or Endangered Species

The Endangered Species Act (ESA) manages risks posed to plants, fish, and wildlife, and requires that federal agencies ensure their actions are not likely to jeopardize the continued existence of listed threatened or endangered species or adversely modify the critical habitat essential to their survival (16 USC §§1531-1599).

Federally-listed threatened or endangered species (Special-status Species) potentially occurring within the project area were identified through the Ecological Field Office of the US Fish and Wildlife Service. A screening analysis was conducted to evaluate the potential for occurrence of Special-status Species and the presence of proposed or designated critical habitat for the species

within the project area. Based on the screening analysis, only one of the 13 Special-status Species evaluated has more than a limited potential to be present within the project area: the Sonoran desert tortoise. Impact determinations for each species evaluated is provided in the attached Table 1. In addition, the project area does not occur within proposed or designated critical habitat for any species.

The No Action alternative would not affect endangered and threatened species because no construction would not occur.

Implementation of any Action alternatives, including the Preferred Alternative, is not anticipated to impact any federally-listed species or proposed or designated critical habitat as no federally listed species are considered to have more than a limited potential to occur in the project area.

The potential for any impacts to the Sonoran desert tortoise (if present) for implementation of the Action alternatives are limited to temporary construction activities. Habitat for the tortoise within the project area is marginal. It lacks appropriate shelter sites (rocky slopes, caliche dens, other hard cover) and records for this species in the vicinity of the project area are sparse. The potential for occurrence of desert tortoise is considered low and adverse impacts to the Sonoran desert tortoise are not expected. The Sonoran desert tortoise is currently a candidate for listing and is not yet afforded protection under the ESA.

Migratory Birds

There will be no impacts to migratory birds from the No Action Alternative.

As for the Action Alternative, impacts from the proposed project are anticipated to be primarily limited to ground disturbance for installation of new pipeline with potential for limited vegetation clearance. Certain birds (such as burrowing owl) dwell underground and are particularly susceptible to impacts resulting from land development and construction. However, considering the project area is situated in a developed area and includes former agricultural fields where many such birds are associated, MBTA concerns are generally limited to direct impacts to birds and nests in trees or shrubs. Considering that a minimal amount of vegetation will be cleared, the potential for bird nests to be affected by the project is limited.

4.6 CULTURAL RESOURCES

A cultural resources inventory completed for the proposed project identified one new archeological site, AZ EE:3:255(ASM)—the Pomerene Road network—and two isolated occurrences. Two previously recorded sites, AZ EE:13:85(ASM)—the Pomerene Canal—and AZ CC:13:80(ASM)/AZ BB:13:760(ASM)—the Tucson-Apache Transmission Line—are located within the proposed alignment corridors. The Pomerene Canal is a Historic Property determined eligible for inclusion in the National Register of Historic Places (NRHP) and it crosses all segments of the project area. The Tucson-Apache Transmission Line crosses portions of the proposed corridor; however, this site has been determined ineligible for inclusion in the NRHP. Newly recorded site, the Pomerene Road network, AZ EE:3:255, is recommended as ineligible for inclusion in the NRHP.

No construction activities that have the potential to disturb surface/subsurface cultural resources would occur with the implementation of the No Action Alternative. As a result, cultural resources would not be affected with the selection of the No Action Alternative.

All Action Alternatives, excluding Alternative 2, will cross the Pomerene Canal, a Historic Property determined eligible for inclusion in the NRHP.

The Preferred Alternative will avoid determined NRHP-eligible site AZ EE:3:85(ASM), the Pomerene Canal, by boring under the canal. No heavy equipment and vehicles will be used to drive over the Pomerene Canal during construction. If avoidance is not possible for some unforeseen reason, an approved Historic Properties Treatment Plan will be developed and implemented to mitigate any adverse effects to the site.

In accordance with Section 106 of the NHPA, if previously unidentified cultural resources are discovered during construction, the contractor will stop work immediately at that location and take all reasonable steps to secure the preservation of those features and the SHPO will be notified. SHPO will, in turn, notify the appropriate agencies, when needed, to evaluate the significance of the resource. Additionally, any unearthened discoveries found during construction will be treated in accordance with Arizona Revised Statutes §41-844 and §41-865.

In October 2014, EPA consulted with the SHPO on the proposed project. SHPO made the determination that EPA's findings were correct and there would be no impacts to cultural resources from the proposed project.

4.7 AIR QUALITY

Under the No Action Alternative, construction and operational activities that result in particulate matter and any emissions would not occur.

The project area is not located in the vicinity of a Nonattainment or Maintenance area. Construction for the Action Alternatives would result in a temporary increase in emissions from vehicles and construction equipment and fugitive dust from trenching activities associated with waterline replacement would occur. After construction activities, vehicle and dust emissions in the project area would return to pre-construction levels. Minor short-term impacts to air resources during construction could include fugitive emissions will be produced by earthmoving equipment and vehicular traffic traveling throughout the construction site.

Any construction that would interrupt normal flow of traffic through, or around the project area (re-routing, stop-and-go traffic, lower speeds, stalled traffic, and idle engine emissions) would also increase the emission of carbon monoxide, hydrocarbons and nitrous oxides. Efficient traffic control measures will effectively control this temporary impact. The use of appropriate construction best management practices will minimize the generation of dust and fine particulate matter. Quantities of these emissions will also vary based upon the types and level of activities occurring during construction and the weather conditions.

Watering work surfaces where practical and approved by permits would likely be conducted to control dust. Dust permits would be obtained by contractors. Sufficient water would be applied to control particulate emissions outside of the permit area. Trenches will be backfilled as soon as possible to minimize loose dirt on the surface. The Preferred Alternative is not anticipated to adversely impact air quality in the region.

4.8 NOISE

The No Action Alternative would not result in any increased noise since no construction would occur with this option.

With the Action Alternatives, construction would occur within a rural area and would be temporary in nature during construction.

4.9 ENERGY AND NATURAL RESOURCES

The No Action Alternative would not result in any increased use of energy or natural resources.

The Preferred Alternative requires that Well No. 6 be equipped for operation. This includes providing a permanent source of power to the well site. A new power line is expected to be constructed by extending existing infrastructure along Diamondback Road to Well No. 6. Disturbance to equip the well will be limited to the area directly around the well site, power pole and under the conductor line.

4.10 TRANSPORTATION

The No Action Alternative would not result in any impact to traffic or roadways.

Under the Action Alternatives, traffic control will be managed in accordance with applicable Cochise County and Arizona Department of Transportation (ADOT) design and construction standards, including temporary signage requirements.

No road closures are anticipated to be required during construction activities. Traffic flow would be managed by contractor crew members during construction. Traffic-control signage would be posted to identify construction areas and controls. Construction would adhere to standard specifications and any applicable permits will be obtained prior to construction.

4.11 HAZARDOUS MATERIALS

The No Action Alternative and the Action Alternatives would not result in impacts to hazardous materials.

4.12 SOCIOECONOMICS

The No Action Alternative would not result in impacts to socioeconomic resources. There is potential for a detrimental impact to result if drinking water quality standards are not met for the

community.

The proposed upgrades to the PDWID system for the Action Alternatives would not cause any detrimental impact to the socioeconomic conditions within the project area. There are no specific impacts on general health or quality of life anticipated to impact the surrounding community. The proposed project is necessary to support existing potable water, safety, and emergency needs.

Any direct and indirect impacts to the local and regional economy as a result of the Action Alternatives for new employment opportunities or impacts to the local economy are anticipated to be negligible and temporary. Increased work force for construction and operation of the proposed project would be minimal. Any additional traffic during construction is not anticipated to generate increased income opportunities for commercial facilities in the vicinity. The proposed project would not cause an increased need for police, fire, medical or other community resources. Traffic flow would be managed by contractor crew members during project construction. Traffic-control signage would be posted when needed to identify construction areas.

4.13 ENVIRONMENTAL JUSTICE

There are no environmental justice populations based on race, ethnicity, or low income in the vicinity, therefore minority and low-income populations would not be impacted by the proposed project. There are no relevant demographic categories where the analysis population is greater than the reference populations of Cochise County, Arizona or the State of Arizona.

4.14 SUSTAINABILITY AND GREENING

Under the Action Alternatives, greenhouse gas emissions and energy consumption will be minimized to the maximum extent practicable. Under the Preferred Alternative, the useful life of the arsenic treatment media will be extended by the lead/lag configuration of the treatment vessels at Well Nos. 2, 3 and 4. The media in the lead vessel can be more fully utilized and completely spent before being disposed of since the lag vessel will remove any break-through arsenic and provide a barrier that protects the public from elevated arsenic levels.

4.15 HUMAN HEALTH AND SAFETY

Under the No Action Alternative, federal and state drinking water quality standards within PDWID would continue not to be consistently met. Under the Action Alternatives, water quality standards for arsenic and fluoride would be met.

4.16 CUMULATIVE EFFECT

The proposed project provides for upgrades, reliability improvements and water quality improvements. The existing water system and the water system with the proposed project improvements are both capable of supplying the existing connections including those connections not currently in service. The minor increase in system source capacity under the project accommodates minor infill growth, but does not induce growth.

Cumulative impacts result from the incremental impact of an action when added to other past,

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present, and reasonably foreseeable actions, regardless of what agency or person undertakes such other actions and are collective over a period of time (40 CFR 1508.7). Since the nature and limited geographic extent of the project area, we limited our review of past, present, and reasonably foreseeable future actions that have affected resources in the area including agricultural development and development within the unincorporated community of Pomerene. Considering that the increase in well source capacity of the water system will be minimal and that anticipated growth within the existing community will be through infill development, we do not anticipate that the project will contribute to significant cumulative impacts.