

Sunset Canal

Improvement Project

Assessment of Potential Environmental Impacts

Background

The proposed Sunset Canal Improvement Project is located near to and within Virden, New Mexico. The existing canal begins approximately 6.5 miles (mi) upstream of Virden and extends through town and into Arizona. The proposed project involves approximately 11 mi of the New Mexico section of the canal. Water is diverted from the Gila River and delivered to irrigated cropland within the Virden Valley north of the river along Highway 92. The Sunset Canal serves 2,236 acres in New Mexico and another 316 acres in Arizona.

The open unlined canal in current operation creates long-term concerns with maintenance (particularly in heavy vegetation), stability on slopes, sediment capture in areas below steep slopes, and loss of water due to infiltration, evaporation, and plant uptake.

The irrigation canal entrance appears to be well-protected from flood damage, including a concrete weir across the main river channel and a canal inlet tunneled through rock. Overflow structures that return excess water and flush sediments from the upper canal appear to be in working order.

The current (New Mexico) infrastructure includes a river diversion dam and headgate, seven blow-off (cleanout and river return) structures with gates, metering gages near the upper and lower ends, approximately 54,000 feet (10.2 miles) of unlined canal, approximately 3,000 feet of buried metal pipe, and multiple outlets.

Proposed Action and Alternatives

The proposed action (PA) is to install a water transmission pipeline within the existing canal, install sealed valves and water meters for individual users, and improving associated infrastructure. The burial depth for the pipe is estimated to be 2 feet (Portage 2014). Ditch liners were an initially proposed alternative that would also reduce water loss; however, a pipeline was preferred by the owners/operators to best meet long-term needs and goals.

Various combinations of pipe materials and sizes along the project's extent would result in a multitude of alternatives that could meet system rehabilitation and the owner's/operator's budget needs. From an environmental impacts perspective, the action alternatives to the PA would be use of three different pipeline sizes the owners/operators are considering (36-in., 42-in and 48-in diameter), which also could be made of various combinations of pipe materials (e.g., steel corrugated metal, high-density polyethylene, polyvinyl chloride).

The activities needed to improve the ditch, which are a direct contributor to environmental impacts under any action alternative, would be the same regardless as to the size of pipe or materials chosen (since materials being considered offer equivalent performance). As such, the PA appropriately bounds other possible action alternatives by assuming the action uses the largest pipe size along the entire ditch extent.

In addition, the PA also includes site preparation, trenching, stockpiling materials, backfilling, compaction and site reclamation activities.

The no action alternative (NAA) is to leave the existing system in place.

Affected Environment

The affected environment considered for the PA and alternatives included the following resource areas and uses: land use; geologic environment/soils resource; water and ecological resources; historical and cultural resources; air quality; noise; aesthetics; and socioeconomics.

Evaluation of Impacts – Assumptions and Methods

Environmental impacts were assumed to primarily result from operations activities associated with improving/rehabilitating the system. For analysis, the PA project area was defined as the ditch/piping infrastructure and a 100-ft buffer area, which is considered conservative, on either side of the ditch/pipe. The buffer area was chosen as an approximation of where project activities (e.g., pipe removal/installation, equipment/vehicle travel, materials staging) would likely take place and where impacts would have the highest likelihood of occurring. The PA project area is shown on Figure 1.

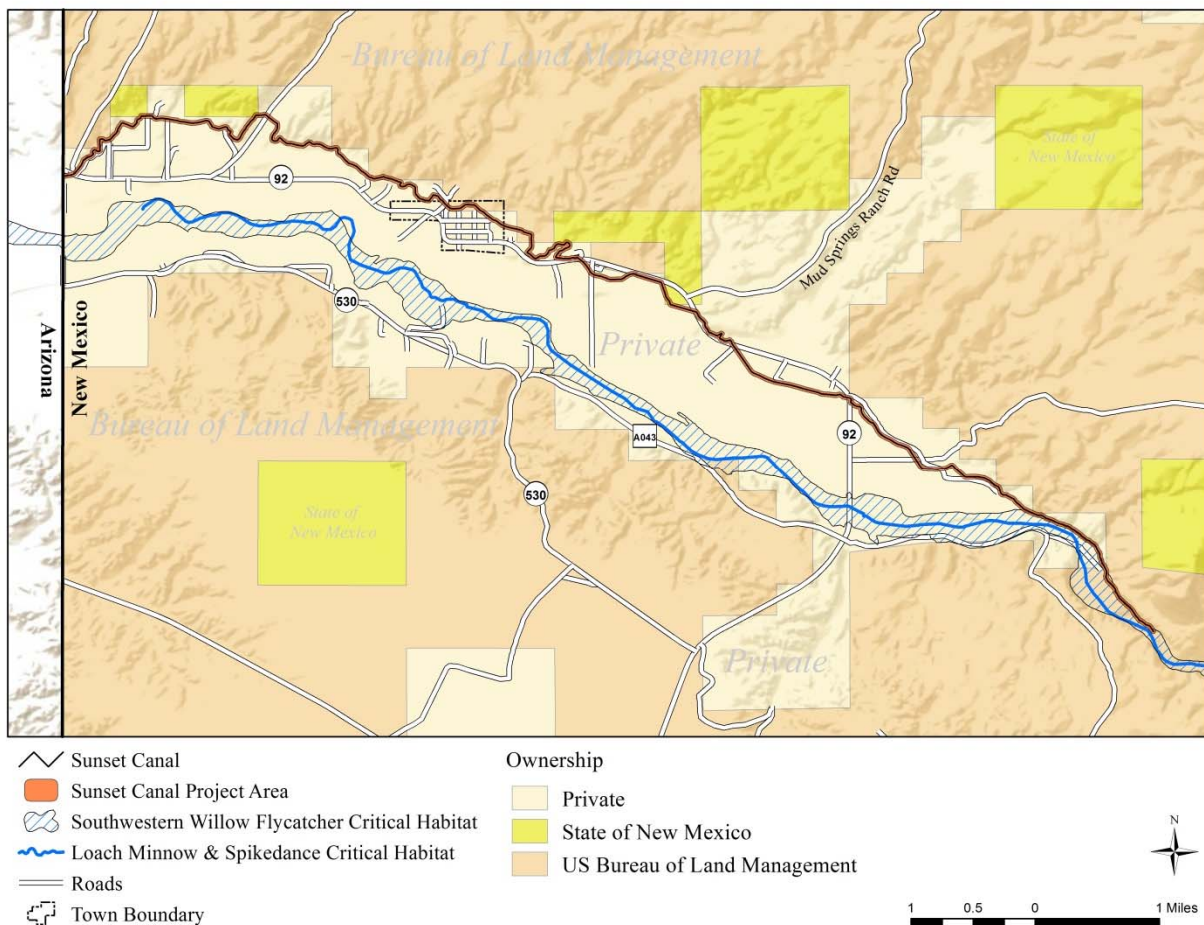


Figure 1. Sunset Canal Improvement Project Area.

When determining impacts, the analysts assumed that industry standard design features and best management practices (BMPs) typically associated with ditch rehabilitation/improvement work, such as storm water and sediment management, would be implemented with the chosen alternative. Other assumptions made, as needed, are noted in the impact determination discussions in the next section.

Impact Determinations

The impact determination discussions that follow include: brief descriptions of the affected resource/environment, criterion/criteria used to evaluate impacts, impact discussions for the PA and NAA, with impact determination statements for both the PA and the NAA.

Land Use

Affected Environment: The existing canal begins approximately 6.5 miles (mi) upstream of Virden and extends through town. The project area is approximately 11 mi long and lies on 50 acres of Bureau of Land Management-managed public land, 7 acres of State of New Mexico-managed public land, and 291 acres of privately-owned land. The project area lies within the Virden Valley, which is a rural agriculture area.

The *Hidalgo County 2011 Comprehensive Plan Update*, and various county ordinances, guide land use and growth within the County and encourage supporting, maintaining and preserving the county’s rural, cultural and agricultural land uses, and promoting and supporting the expansion of agricultural-based businesses (Community ByDesign 2011).

Evaluation Criterion: *The PA and NAA would be considered to have potentially significant impacts if implementing either would be inconsistent with land use plans and ordinances.*

Impacts: After review of applicable plans and ordinances available via Hidalgo County’s website (<http://www.hidalgocounty.org>), for the PA, replacing an existing owner/operator’s ditch infrastructure with a similar system, does not require or result in property acquisition, change in ownership/management, or change how the land is currently used. Water collected by the system would continue to be conveyed to current users. Because structures may need to be placed, and/or other work performed, on public land that is managed by the Forest Service and Bureau of Land Management, their approvals may be required.

Under the NAA, the ditch infrastructure would not be replaced.

Because no changes to land use are needed or being made under either alternative, and because the PA and NAA would not be inconsistent with Hidalgo County’s land plan and ordinances, **no impacts** to land use would be anticipated under either the PA or NAA.

Geologic Environment/Soils Resource

Affected Environment: The project area is composed of several soil types: anamite, chamberino, chiricahua, cloverdale, comore, eba, eicks, hawkeye, lehman, pima and stellar (USDA 2006). The Virden Valley is better described as containing gravelly and sandy loam soils along the upper perimeter areas next to rough broken land, and silty clay loam in low-lying areas. Sunset Canal is positioned along the north side of the valley and passes through several areas containing relatively permeable (gravelly or sandy) soils. Geotechnical information (complete surveying/mapping) regarding the soil, subsurface conditions, and groundwater in the collection areas is currently not known.

At one time families made their living almost exclusively from the land in the valley, however, in recent years land ownership patterns have changed and now only a few families own most of the land and make their living exclusively or primarily from farming and ranching. Many households still maintain smaller (100-200 acres or smaller) family farms (Community ByDesign 2011).

Evaluation Criteria: The PA and NAA would be considered to have potentially significant impacts if either would result in changes to the geologic landscape, and/or diminish/deplete area soils, and/or be inconsistent with county values regarding use of its soils.

Impacts: The PA would be conducted during the irrigation off-season, when surface water and groundwater levels are low and the chance of a flood event is minimal. Under the PA, there would be excavation, displacement, and compaction of soils, and structure placement/replacement activities, which would all generate dust within the project area. Activities involving use of concrete for structure placement could also generate dust. Dust is a local and temporary impact that is reducible through application of BMPs. The area was subject to similar activities with placement of the original system. After the ditch infrastructure is replaced, the site would be reclaimed.

Construction of temporary holding/dewatering areas may be necessary to perform structure placements at various points along the ditch. When this work is completed, water in temporary holding areas should have either evaporated or infiltrated to the ground, or may need to be released to adjoining agricultural fields. If released, water is not expected to be of sufficient volume to carry sediment through farm fields and back to source water. The Gila River is critical habitat for the Loach minnow (See Ecological Resources section). If in-stream work is required to place any structures, an informal Section 7 consultation, as outlined by the USFWS, would be recommended (USFWS 2013).

Overall, the soils in the area are not expected to be reduced, depleted, or significantly impacted by these activities. Replacing the ditch/pipe system and reclaiming the site is consistent with county policy on soils because agricultural activities, even on small scales, are valued. Because there will be minor impacts to soils during implementation of the PA, primarily dust generation, a **less-than-significant** impact determination was made for the geologic environment/soils resource.

Under the NAA, the open unlined canal is creating long-term concerns with maintenance (particularly in heavy vegetation), stability on slopes, sediment capture in areas below steep slopes, and loss of water due to infiltration, evaporation, and plant uptake. This situation is not an immediate threat that results in significant changes to the existing soil or geologic landscape. However, continued decline of the system could begin to result in more significant consequences, such as disturbance of the soils resource in the immediate area and sediment/soils buildup and deposition throughout the system.

While the current situation is not an immediate threat, it would be expected to trend toward increasingly significant changes to the existing soil and geologic landscape. Thus, a **less-than-significant** impact determination was concluded for the NAA.

Water Resources

Affected Environment: The water table in Hidalgo County is better than average for the southwestern part of the United States. The area's water supply comes from an aquifer that is relatively independent of other communities. The water table ranges from 100 feet in the lower areas to 1000 feet in the mountainous and hill areas of the county. Most of the farmers do not have the funds to secure more sophisticated watering methods to handle their crops. Therefore, most of the crop watering is the flood irrigation system (Community ByDesign 2011).

The ditch system diverts water from the Gila River and conveys it for irrigation. The unlined ditch system has created long-term maintenance, slope stability, and sediment capture concerns, and diminished water flow from infiltration, evaporation and plant uptake is expected to continue. Conversely, lost water from the system is used by vegetation that grows alongside the ditch way and recharges groundwater.

The *Hidalgo County 2011 Comprehensive Plan Update*'s main land and water goals are to secure, protect and maintain safe and sustainable water quality and quantity through effective and coordinated watershed and aquifer management, as well as to support, maintain and preserve the county's rural, cultural and agricultural land uses. Additionally the comprehensive plan lays out the strategy for county officials to coordinate with local farmers to improve watering systems for more crop productivity (Community ByDesign 2011).

Evaluation Criteria: The PA and NAA would be considered to have potentially significant impacts if either would be inconsistent with county plans or ordinances, result in impacts to uses of the water, or results in changes to water that make it unavailable for use.

Impacts: The PA would be conducted during the irrigation off-season, when surface water and groundwater levels are low and the chance of a flood event is minimal. Under the PA, the improved ditch system would secure water availability to users. The PA would result in improved performance of the system and reduce maintenance needs.

Construction of temporary holding/dewatering areas may be necessary to perform structure placements at various points along the ditch. When this work is completed, water in temporary holding areas should have either evaporated or infiltrated to the ground, or may need to be released to adjoining agricultural fields. If released, water is not expected to be of sufficient volume to carry sediment through farm fields and back to source water. The Gila River is critical habitat for the Loach minnow (See Ecological Resources section). If in-stream work is required to place any structures, an informal Section 7 consultation, as outlined by the USFWS, would be recommended (USFWS 2013).

Implementing the PA would not result in depositing any foreign material or discharging any substance into a waterway such that land or water is degraded or made unavailable for habitat and downstream uses. Replacing the ditch system would not be inconsistent with county plans and ordinances. Thus, implementation of the PA is anticipated to result in **less-than-significant** impacts to water resources.

Under the NAA, water that has been lost from the system to the surrounding environment has been used by vegetation or seeped into the soils/groundwater. No shortages have been reported. However, continued decline of the system would be expected to result in increasing impacts to the water users, particularly if the ditch completely failed in the near term. Thus, implementation of the NAA was concluded to result in **potentially significant** impacts to water resources.

Ecological Resources

Affected Environment: The Low Mountains and Bajadas of the Chihuahuan Desert ecoregion include several disjunct hilly areas that have a mixed geology. The mountainous terrain has shallow soil, exposed bedrock, and coarse rocky substrates. Alluvial fans of rubble, sand, and gravel build at the base of the mountains and often coalesce to form bajadas. Vegetation includes mostly desert shrubs, such as sotol, lechuguilla, yucca, ocotillo, lotebush, tarbush, and pricklypear, with a sparse intervening cover of black grama and other grasses. At higher elevations, there may be scattered one-seeded juniper and pinyon pine. Strips of gray oak, velvet ash, and little walnut etch the patterns of intermittent and ephemeral drainages, and oaks may spread up north-facing slopes from the riparian zones. The varied habitats provide cover for

mule deer, bobcat, javelina, and Montezuma quail (Griffith et al 2006). The project area lies within a section of Chihuahuan Desert Shrub (Dick-Peddie 1991).

The U.S. Fish and Wildlife Service’s (USFWS’) Information, Planning, and Conservation System (IPaC) was used to identify federally-designated threatened and endangered (T&E) flora and fauna species. No T&E flora species were identified or anticipated to be found within the project area (USFWS 2014).

Five species, the Loach minnow (*Tiaroga cobitis*), Southwestern Willow flycatcher (*Empidonax traillii extimus*), Spikedace (*Meda fulgida*), Narrow-headed garter snake (*Thamnophis rufipunctatus*), and the Northern Mexican garter snake (*Thamnophis eques megalops*) are likely to be found within the project area (USFWS 2014). Their status and habitat requirements are shown in Table 1. Both the Loach minnow and the Southwestern Willow flycatcher have designated critical habitats adjacent to the PA project area, and within the project area for the flycatcher, along a small section of the project at its eastern extent, as shown on Figure 1.

Table 1. T&E animal species likely to be found in the project area presented in order of listing status (USFWS 2014).

Common Name	Scientific Name	Status	Habitat Requirements	Occurrence in Project Areas
Loach minnow	<i>Tiaroga cobitis</i>	Endangered	Turbulent, rocky riffles of mainstream rivers and tributaries at or less than 2,200 meters in elevations	Likely
Southwestern Willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Dense riparian habitats with microclimatic conditions dictated by the local surroundings. Located in the US during the summer, migrates to wintering areas in Central America.	Likely
Spikedace	<i>Meda fulgida</i>	Endangered	Midwater habitats of runs and pools especially in the downstream ends of rivers	Likely
Narrow-headed garter snake	<i>Thamnophis rufipunctatus</i>	Proposed Threatened	Found near river banks or streams	Likely
Northern Mexican garter snake	<i>Thamnophis eques megalops</i>	Proposed Threatened	Found near river banks or streams	Likely

Evaluation Criteria: *The PA and NAA would be considered to have potentially significant impacts if either would result in “take” of T&E species within federally-designated critical habitat, which includes killing, harming, harassing, pursuing, hunting, capturing, collecting or attempting to engage in any such conduct; or result in habitat reduction for T&E species.*

Impacts: Under the PA, project activities are assumed to require a small crew of workers and a few pieces of construction equipment, over a period of approximately three months, depending on weather conditions.

- **Species.** PA activities at the point of diversion within the Gila River may occur within Loach minnow designated-critical habitat. In-stream activities could cause temporary soil, water, and vibrational disturbance within the stream in the immediate area of activities. If present during operations, Loach minnow (and Spikedace) and other aquatic species would likely relocate to a nearby area in the stream away from disturbance and would return to the area when disturbance ceases. PA activities do not involve any foreign material discharge to the creek.

The Southwestern Willow flycatcher, the Narrow-headed and Northern Mexican garter snakes, and other terrestrial species could be present in the project area. For these areas, construction activities would generate ground vibration and noise. Fauna species and human activity have been studied extensively in the literature. An umbrella study of the topic was conducted by Whittaker and Knight (1998) who found that species will be attracted to, habituate to, or avoid an activity and that, in most cases, wildlife habituate to an activity as long as its habitat needs (e.g., food, water, cover) are met. During operations, noise and vibration would occur during daylight hours, would be somewhat constant at low levels (e.g., idling equipment/vehicles) for longer periods and/or intermittent at more intense levels (e.g., digging, earth moving), depending on the specific activity and equipment used, and would cease at the end of each day. Terrestrial species may temporarily leave the immediate area of the noise and vibration and return to it when operations diminish or cease. They are not expected to permanently leave or abandon the area. The area's wildlife is habituated to existing rural noise of humans, farming operations, and local traffic. When the PA is completed, which is estimated to be over the course of a few months, noise levels would return to current noise and ambient background levels.

- **Habitat.** Activities to improve the ditch system require moving soil and may consequently impact native vegetation in the area immediately around ditch infrastructure. Vegetation in this area may be untouched, disturbed, or removed during the course of construction activities. When improvement activities cease, areas that require re-vegetation would be reclaimed. Until vegetation regrows, reclaimed areas may appear barren. Installing piping would reduce seepage water that some vegetation species are using along the ditch. In these areas, less vegetation may recover, which may temporarily affect Southwestern Willow flycatcher. As shown on Figure 1, very few areas of critical habitat intersect with project activities. The vast majority of flycatcher habitat would be unaffected and any affected areas would be expected to recover in the short-term and not permanently/significantly reduced. Because flycatcher habitat may be temporarily affected, Section 7 informal consultation is advised. No aquatic habitat/aquatic vegetation, including critical habitat, is expected to be permanently reduced as a result of implementing the PA.

Under the PA, no take of T&E species is anticipated and no permanent reduction in terrestrial or aquatic habitats is expected. If project activities occur within Loach minnow and Southwestern Willow flycatcher designated-critical habitats, authorizations from appropriate public-land/water management agencies may be required. Because noise and vibration would be generated under the PA, but would be temporary, and because vegetation may be removed in the short-term, but recover, a **less-than-significant** determination was concluded for ecological resources.

Under the NAA, because the ditch infrastructure would not be replaced, **no impacts** to ecological resources are anticipated.

Historical and Cultural Resources

Affected Environment: Section 106 of the National Historic Preservation Act (NHPA) requires government agencies to take into account the effects of their actions on historic properties. These

properties are listed on the National Register of Historic Places. New Mexico’s Cultural Properties Act (Sections 18-6 through 18-6-23, NMSA 1978), among other things, requires that state agencies provide the state historic preservation office (SHPO) with an opportunity to participate in planning for activities that will affect properties that are on the State Register of Cultural Properties or the National Register of Historic Places.

The Prehistoric and Historic Sites Preservation Act of 1989 (Sections 18-8-1 through 18-8-8, New Mexico Statutes Annotated 1978), among other things, prohibits the use of state funds for projects or programs that would adversely affect sites on the State or National Registers unless the state agency or local government demonstrates that there is no feasible and prudent alternative and that all possible planning has been done to minimize the harm to the register site.

The National Register shows 24 properties within Hidalgo County; none of which are within the project area. The nearest properties are located in Animas and Lordsburg, approximately 55 and 33 mi away, respectively. The New Mexico Historic Preservation Division State Register of Cultural Properties shows no properties near to Virden or the project area (State of New Mexico 2012).

One of the goals of the *Hidalgo County 2011 Comprehensive Plan Update* is to encourage preservation and restoration of historical and traditional buildings (Community ByDesign 2011).

Evaluation Criteria: The PA and NAA would be considered to have potentially significant impacts if either would result in violations to the NHPA or be inconsistent with Hidalgo County’s values for its culture and customs.

Impacts: Under the PA, replacing ditch infrastructure that serves agricultural uses is consistent with the county’s culture and customs. Because no national or state historic properties or religious sites are located within or near to the project area, there would be no impacts to historical and cultural resources, or subsequent violation to the NHPA. Additionally, under the PA, no impacts to historical and traditional buildings would be anticipated.

Under the NAA, the ditch infrastructure would not be replaced and **no impacts** to historical and cultural resources would be anticipated.

Air Quality

Affected Environment: The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for criteria pollutants (ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, suspended particulate matter, and lead). New Mexico also has standards that are more stringent than federal standards. Both sets of standards are shown in Table 2. The EPA lists only one area in the entire state that is not in attainment with criteria pollutants: Anthony, located in Dona Ana County approximately 175 miles southeast of Virden, is in non-compliance for PM-10.

Evaluation Criteria: The PA and NAA would be considered to have potentially significant impacts if implementing either would result in a NAAQS non-compliance violation.

Impacts: Under the PA, activities that could affect air quality result from digging, compacting, and moving soil, all which release small particulate/dust to the atmosphere. Activities involving concrete repair could also generate dust. Construction equipment, such as small to mid-size front-end loaders, bulldozers, forklifts and electrical generators, release fuel emissions that could also affect air quality.

Table 2. National and New Mexico Ambient Air Quality Standards.

Air Pollutant	Measure	National AAQS	New Mexico AAQS	PSD Increment Class I
Carbon monoxide	1-hr average	35 ppm ^a	13.1 ppm	
	8-hr average	9 ppm ^a	8.7 ppm	
Nitrogen dioxide	1-hr average	100 ppb		
	24 hr		0.10 ppm	
	Annual average	53 ppb	0.05 ppm	2.5 µg/m ³
PM ₁₀	24-hr block average	150 µg/m ^{3a}	150 µg/m ³	8 µg/m ³
	Annual average		50 µg/m ³	4 µg/m ³
PM _{2.5}	24-hr block average	35 µg/m ^{3b}		
	Annual average	12 µg/m ^{3c}		
Ozone	1-hour	0.12		
	8-hr rolling average	0.075 ppm ^d		
Sulfur dioxide	1-hr average	75 ppb		2 µg/m ³
	3-hr block average	0.50 ppm		25 µg/m ³
	24-hr block average	0.14 ppm	0.10 ppm	5 µg/m ³
	Annual average	0.03 ppm	0.02 ppm	
Lead	Rolling 3-month average	0.15 µg/m ³		
Hydrogen sulfide	1 hr		0.025 ppm	

Table Notes:

- Not to be exceeded more than once per year.
- To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³.
- To attain this standard, the 3-year average of the annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.
- To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

General Notes:

ppb = parts per billion, ppm = parts per million

Data Sources:

40 CFR § 50, 2013, “National Primary and Secondary Ambient Air Quality Standards,” *Code of Federal Regulations*, Office of the Federal Register, June 13, 2013.

New Mexico Administrative Code 20.2.3: Title 20, Environmental Protection, Chapter 2, Air Quality (Statewide), Part 3, Ambient Air Quality Standards, December 30, 2013.

Implementing the PA is a short-term, temporary, small-scale construction operation that would generate dust and equipment emissions in small quantities. These impacts are reduced through implementation of BMPs. It is highly unlikely that either dust or emissions would be of sufficient quantity during operations to result in local or regional non-compliances. Most dust and emissions would be localized to the project area itself. Dust generated during project activities within Virden may be perceived as a temporary nuisance to residential or business activities, but is not expected to hinder activities or result in non-

compliances. Project dust/emissions also would not contribute to air quality non-compliance in Anthony. As such, **less-than-significant** impacts to air quality are anticipated to result from implementing the PA.

Under the NAA, the ditch/piping system would not be replaced. No construction activities would be conducted, and **no impacts** to air quality would be anticipated.

Aesthetics

Affected Environment: The visual character of an area is defined in terms water, landform, vegetation, and cultural modifications. These components are characterized or perceived in terms of the design elements' form, line, color, texture, and scale. Visual components also may be described as being distinct (unique or special), average (common or not unique), or minimal (a liability) elements of the visual field and in terms of the degree to which they are visible to surrounding viewers (e.g., foreground, middle ground, and background).

The visual quality of an area is defined in terms of the visual character and the degree to which these features combine to create a landscape that has the following qualities: vividness (memorable quality), intactness (visual integrity of environment), and unity (compositional quality). An area of high visual quality usually possesses all three of these characteristics. The visual quality of an area also is defined in

terms of the visual sensitivity within the view shed of the project area. Locations of visual sensitivity are defined in general terms as areas where high concentrations of people may be present or areas that are readily accessible to large numbers of people. Visual quality is negatively impacted by atmospheric particulate resulting from human activities (e.g., construction, prescribed fires) and natural events such as dust storms and lightning-caused wildfires.

Clean Air Act amendments protect particulate matter and sulfur dioxide emissions into federal Class I (e.g., wilderness, large national memorial parks), Class II (e.g., national monuments, national recreation areas, national wild and scenic rivers, national wildlife refuges) and III (areas less protected than Class I and II areas). There are no protected classes within or adjacent to the project area. The nearest Class I areas to Virden are the Gila Wilderness, approximately 50 mi northwest, and in Arizona, the Chiricahua National Monument, 50 miles southwest, and the Mount Baldy Wilderness, 70 mi west.

Evaluation Criteria: *The PA and NAA would be considered to have potentially significant impacts to aesthetics if implementing either would result in changes to/degradation of visual quality, views, and the aesthetic landscape.*

Impacts: Under the PA, and as presented in the air quality and geologic environment/soils sections, it is unlikely that sufficient dust would be generated from construction activities to hinder visual quality or exceed any of the Prevention of Significant Deterioration standards in Table 2, which apply to visibility, or impact any of the three Class I areas. There may be dust that temporarily obscures localized visibility at the project site during construction activities.

The visual sensitivity associated with replacing ditch infrastructure would not be impacted, because the project area is not identified as an area of high scenic quality and not readily used by large numbers of people. Replacing an unlined/lined ditch system with a pipe that is subsequently buried, would alter a small portion of the landscape from a casual viewer's perspective as the ditch would not continue to look like a ditch. To viewers accustomed to seeing the unlined/lined ditch as a "stream" the improvement may not be positive. To viewers who see the ditch as a manmade structure, the reclaimed land could appear more natural, particularly when the area's vegetation re-establishes.

There would be temporary minor aesthetic changes to the landscape during project activities, with the presence of laborers and equipment on site for a few days. After PA implementation, some areas around the ditch-line may appear barren until vegetation re-establishes. Additionally, with less water seepage occurring in the piped areas, vegetation may not establish, at least not to the degree it had existed in the area before. Overall, impacts to visual and aesthetic resources were concluded to be **less than significant** under the PA.

Under the NAA, the ditch/pipe system would not be replaced and visual quality and sensitivity would not be changed from the current condition. **No impacts** to aesthetic resources would result from the NAA.

Noise

Affected Environment: Noise is unwanted sound. Noise-control for aircraft and airports, interstate motor carriers and railroads, workplace activities, trucks, motorcycles, and portable air compressors, etc., is regulated through various federal and state standards and local ordinances. For environmental noise, the EPA is the agency that enforces the Noise Control Act. For occupational noise, the federal Occupational Health and Safety Administration (OSHA) is the agency that enforces noise standards for workers. Towns and municipalities have local ordinances to control residential/community noise levels. BMPs exist to reduce noise levels to workers and the environment if noise is expected to reach levels of concern.

Ambient noise sources in the project area consist of birds, insects, wildlife, wind and water. Sources that generate noise above background levels are generally associated with humans in and around the area, farming operations, and vehicular traffic on nearby roads. The project area does not lie within a noise abatement area. Wildlife and noise is discussed in the Ecological Resources section; this section addresses noise and the human environment.

Evaluation Criteria: *The PA and NAA would be considered to have potentially significant impacts if implementing either would degrade the existing noise landscape or impact workers.*

Impacts: For the PA, a few pieces of construction equipment are required to move soils and to place pipe and other infrastructure. Noise would be generated during these operations, would occur during daylight hours, would be constant at low levels (i.e., idling equipment) for longer periods and/or intermittent at higher levels depending on the specific activity and equipment used, and would cease at the end of each day. When the PA is completed, which is estimated to be over the course of a few months, noise levels would return to current noise and ambient background levels. Because the PA is a relatively small-scale operation, noise generated from implementing the PA is not anticipated to result in noise levels above background sufficient to interrupt or impact farming operations or other activities in the area. Operational noise may be perceived as a nuisance, initially and possibly intermittently during operations, but is not expected to change the existing soundscape.

New Mexico operates its own occupational safety and health program under a plan approved by the U.S. Department of Labor. This program provides safety and health protections to most private sector workers and state and local government employees within the state. Workers implementing the PA, because the project area is located on state land, would fall under the rules and regulation of the State Plan (New Mexico Environment Department 2014), under the construction industry standard. In general, New Mexico has adopted the federal regulations for construction workers. As such, the State Plan addresses noise (and other health and safety protections) for construction workers, and no impacts to workers are anticipated. Because noise would be generated under the PA, a **less-than-significant** impact determination was concluded.

For the NAA, because the ditch/pipe system would not be replaced, there would be no noise introduced to the existing landscape. **No impacts** would result from implementing the NAA.

Socioeconomics

Affected Environment: Hidalgo County has been, by tradition, a farming, mining and ranching area (Community ByDesign 2011). Indicators used to describe the affected environment for socioeconomic resources typically include population size, economic health (e.g., impacts on local housing markets), employment/unemployment, and income.

The PA project area lies across 12 acres of Forest Service-managed public land and 104 acres of privately-owned land, within and near to Virden. Lordsburg is the nearest city to Virden, approximately 33 mi southeast. Virden is a rural community with a population of 152. The *Hidalgo County 2011 Comprehensive Plan Update* supports better management, and more effective methods, of water distribution to help in production, which would improve the livelihood of and improve the economic base (Community ByDesign 2011). Making improvements to the existing ditch system is not anticipated to affect the private owner's property value or private rights or water rights.

Evaluation Criteria: *The PA and NAA would be considered to have potentially significant impacts if implementing either could measurably change the existing socioeconomic environment.*

Impacts: Under the PA, it is estimated that one of two project construction scenarios would occur. There would be either a small crew of workers that would conduct activities over a period of a few months, or a larger crew of workers that would complete the work in less time. In either scenario, workers may be locally based or relocate temporarily to perform the work. It is unlikely non-local workers would be permanently relocated to the area as a result of the PA. Project personnel would spend some income locally for food, housing, transportation, recreation/leisure activities during the project duration. However, the type of project (infrastructure) and short-term nature of its implementation make it unlikely to result in any significant, measurable longer-term change to the local economy, housing, employment, or personal income. Thus, the PA was determined to have **less-than-significant** impacts.

The ditch system provides water for irrigation. Diminished flow has not been reported as an immediate threat to users; however, continued decline of the diversion system would be expected to result in continual reduction of water to water users.

Because implementing the NAA trends toward measurable change of the existing socioeconomic environment in this small town, a **potentially significant** determination was concluded.

Summary of Impacts and Significance

Table 3 provides a summary of the impacts identified in the analysis. For the PA, no impacts were found for land use and historical and cultural resources. Less-than-significant impacts were found for geologic environment/soils, water resources, ecological resources, air quality, aesthetics, noise, and socioeconomics. Less-than-significant impacts were generally found to be short-term, localized and directly related to project activities.

For the NAA, no impacts were found for land use, ecological resources, historical and cultural, air quality, aesthetics, and noise. Less-than-significant impacts were found for geologic environment/soils. Potentially significant impacts were found for geologic environment/soils resources, water resources, and

socioeconomics. The potentially significant findings were related to trends for continual loss of water from a declining system to farming operations that over time would be expected to increase in magnitude.

Because the proposed action is to improve a system that already exists, the PA is not anticipated to contribute additional incremental impacts (i.e., cumulative impacts) to either the environmental or human landscapes.

Table 3. Summary of impacts for the Sunset Canal Improvement PA.

Resource Area	No Action	Proposed Action
Land Use	NI	NI
Geologic Environment/Soils	LS	LS
Water Resources	PS	LS
Ecological Resources	NI	LS
Historical and Cultural Resources	NI	NI
Air Quality	NI	LS
Aesthetics	NI	LS
Noise	NI	LS
Socioeconomics	PS	LS
NI = No impact LS = Less than significant impact PS = Potentially significant impact		

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