November
2020

Final

Environmental Stewardship Plan

Fence Construction and Replacement Projects in Cochise, Pima, and Santa Cruz Counties, Tucson Sector, Arizona

Department of Homeland Security
U.S. Customs and Border Protection

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Cover Sheet

Final Environmental Stewardship Plan
Fence Construction and Replacement Projects in Cochise, Pima, and Santa Cruz Counties, Tucson Sector, Arizona

Responsible Agencies: Department of Homeland Security (DHS), United States (U.S.) Customs and Border Protection (CBP), and U.S. Border Patrol (USBP).

Parties Consulted: Department of the Interior, including the Bureau of Land Management (BLM), Bureau of Reclamation, and U.S. Fish Wildlife Service; National Park Service; U.S. Forest Service; U.S. Environmental Protection Agency; U.S. Army Corps of Engineers; United States Section, International Boundary and Water Commission; Arizona State Historic Preservation Office; Arizona Game and Fish Department; state and local governments; local tribes; and local landowners.

Affected Location: U.S./Mexico international border in Cochise, Pima, and Santa Cruz counties, Tucson Sector, Arizona.

Project Description: CBP will improve and maintain approximately 34 miles of primary and secondary pedestrian fence along the U.S./Mexico international border in Arizona. Additionally, CBP will install and maintain tactical infrastructure consisting of approximately 40 miles of new primary pedestrian fence and associated staging yards within USBP's Tucson Sector within Cochise, Pima, and Santa Cruz counties, Arizona. The project area is split into 13 separate segments across southern Arizona within Pima, Santa Cruz, and Cochise counties (Segments 28-3, 28-1, 28-4, 10-3, 10-1, 10-4, 10-5, 10-6, 9-1, 9-4, 9-2, 9-3, 9-5).

The westernmost segments of the project area include Segments 28-3, 28-1, 28-4, 10-3, 10-1, 10-4, 10-5, which occur within Pima and Santa Cruz counties. Segment 28-3 begins approximately 2.5 miles west of the Sasabe Port of Entry (POE) and continues west for approximately 2.4 miles. Segment 28-1 begins approximately 2.5 west of the Sasabe POE and ends approximately 4.5 east of the Sasabe POE, running adjacent to Buenos Aires National Wildlife Refuge (BANWR). Segment 28-4 runs adjacent both to BANWR and the Coronado National Forest (CNF) and is comprised of three sections: Section 28-4A begins approximately 4.7 miles east of the Sasabe POE and continues east for approximately 1.2 miles. Section 28-4B begins approximately 0.7 miles east of the end of Section 28-4A and continues east for approximately 1.8 miles. Section 28-4C begins approximately 0.7 miles east of the end of Section 28-4B and continues east for approximately 2.7 miles. Segment 10-3 begins approximately 6.5 west of the Nogales/Mariposa POE and continues west for approximately 21 miles. The entire segment runs adjacent to CNF. Segment 10-1 begins approximately 0.7 miles west of the Nogales/Mariposa POE and continues west for approximately 2 miles. Segment 10-4 begins approximately 5.5 miles east of the Nogales Station and continues east for approximately 0.2 miles. Segment 10-5 begins approximately 10 miles east of the Nogales Station and continues east for approximately 4.2 miles. The entire segment runs adjacent to CNF. Segments 28-3, 28-4, 10-3 and 10-5 are all new primary pedestrian fence, while Segments 28-1, 10-1, and 10-4 are all replacing primary pedestrian fence.

The easternmost segments of the project area include Segments 10-6, 9-1, 9-4, 9-2, 9-3, 9-5, which occur within Cochise County. Segment 10-6 begins approximately 18 miles west of the Naco POE and continues west for approximately 2.1 miles. The segment runs adjacent to CNF. Segment 9-1 begins approximately 3 miles west of the Naco POE and continues west for approximately 9 miles. Segment 9-4 starts approximately 0.3 miles west of the Naco POE and continues east through Naco for approximately 1 mile. Segment 9-2 starts approximately 4.5 east of the Naco POE and continues east toward Douglas for approximately 14 miles. Segment 9-3 starts approximately 5.5 miles east of the Douglas POE and continues east for 1 mile. Finally, Segment 9-5 begins on the western border with New Mexico and continues west toward Douglas for approximately 4.7 miles. Segments 10-6 and 9-5 are new primary pedestrian fence, Segments 9-1, 9-2, and 9-3 are replacing primary pedestrian fence, and 9-4 is replacing secondary pedestrian fence.

Report Designation: Environmental Stewardship Plan (ESP).

Abstract: CBP is constructing approximately 74 miles of border barrier, including in areas where the existing barrier no longer meets the USBP's operational needs. The project area lies within the USBP Tucson Sector. This ESP evaluates potential environmental impacts associated with the project. Protections and best management practices (BMPs) for factors such as air quality, noise, land use and recreation, geological resources and soils, hydrology and water management, biological resources, cultural resources, socioeconomics, and hazardous materials and waste have been incorporated into the project design.

FINAL

ENVIRONMENTAL STEWARDSHIP PLAN

FENCE CONSTRUCTION AND REPLACEMENT PROJECTS IN COCHISE, PIMA, AND SANTA CRUZ COUNTIES, TUCSON SECTOR, ARIZONA

DEPARTMENT OF HOMELAND SECURITY
U.S. CUSTOMS AND BORDER PROTECTION
U.S. BORDER PATROL

NOVEMBER 2020

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Executive Summary

BACKGROUND

On March 16, 2020, the Secretary of the Department of Homeland Security (DHS), pursuant to Section 102(c) of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996, as amended, issued a waver to ensure the expeditious construction of barriers and roads in the United States (U.S.) Border Patrol's (USBP) Tucson Sector. Although the Secretary's waiver means that U.S. Customs and Border Protection (CBP) no longer has any specific legal obligations under the laws set aside by the waiver, DHS and CBP recognize the importance of responsible environmental stewardship. To that end, CBP has prepared this Environmental Stewardship Plan (ESP), which presents the analysis of potential environmental impacts associated with construction of tactical infrastructure in USBP's Tucson Sector. The ESP also discusses CBP's plans as to how it can mitigate potential environmental impacts.

This report has been prepared from data collected prior to and during the initial phases of project construction. The data was compiled through field surveys, photo interpretation with ground truthing and use of data from prior surveys and other sources, as referenced. The report is an analysis of potential impacts on the resources discussed based on the initially planned project footprint. This is intended to be viewed as a baseline document and is not intended to capture all impacts during construction. Upon completion of the project, an additional report, called an Environmental Stewardship Summary Report (ESSR), will be prepared summarizing the observed actual impacts. This ESSR will review the baseline information provided in this ESP and be used to compare anticipated to actual impacts, so that a final new baseline of impacts is established for any potential future actions, including maintenance and repair activities. The ESSR will document the success of BMPs and any changes or improvements that could be required for the future. Additionally, the ESSR will summarize any significant modifications during construction that increased or reduced environmental impacts.

As it moves forward with the project described in this ESP, CBP will continue to work in a collaborative manner with local governments, state and Federal land managers, and the interested public to identify environmentally sensitive resources and develop appropriate best management practices (BMPs) to avoid or minimize adverse impacts resulting from the installation of tactical infrastructure.

GOALS AND OBJECTIVES OF THE PROJECT

The project will allow USBP agents to strengthen control of the U.S. border between ports of entry (POE) in the USBP Tucson Sector. The project will help deter illegal entries within the USBP Tucson Sector by improving enforcement efficiency, thus preventing terrorists and terrorist weapons, cross-border violators (CBVs), drugs, and other contraband from entering the U.S., while contributing to a safer work environment for USBP agents and the public.

OUTREACH AND AGENCY COORDINATION

CBP coordinates with numerous government agencies and tribes regarding potential project impacts. Stakeholders with interests in the region include the Department of the Interior, Bureau

of Land Management, Bureau of Reclamation, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Section of the International Boundary and Water Commission, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, state and local governments, as well as various local tribes and local landowners.

DESCRIPTION OF THE PROJECT

CBP will construct approximately 74 miles of border barrier, including in areas where the existing barrier no longer meets the USBP's operational needs. This will include the replacement of 24 miles of existing primary pedestrian barrier, construction of approximately 7 miles of new steel bollard wall, and replacement of 1 mile of existing secondary barrier with new steel bollard wall in Cochise County; the replacement of seven miles of existing primary pedestrian barrier and construction of approximately eight miles of new steel bollard wall in Pima County; and the construction of approximately 25 miles of new steel bollard wall and replacement of approximately two miles of primary pedestrian barrier and vehicle barrier in Santa Cruz County (the Project).

The existing pedestrian fence no longer meets USBP's operational needs; it will be replaced with a new bollard wall that will improve both operational efficiency and safety for those USBP agents who work in the area. The Secretary's waiver means that CBP does not have any specific legal obligations under the laws that were included in the waiver, but just as was the case with past projects covered by a waiver, DHS and CBP recognize the importance of responsible environmental stewardship of our valuable natural and cultural resources.

ENVIRONMENTAL IMPACTS AND BEST MANAGEMENT PRACTICES

The Project has the potential to result in impacts on several resource categories; however, BMPs are recommended to minimize or eliminate impacts on the discussed resources. Specific BMPs would be implemented to ensure minimal disturbance to the resources within the Project Area.

Table ES-1 provides an overview of potential environmental impacts by specific resource area and a brief summary of associated BMPs. **Chapter 3** through **12** of this ESP provide the evaluation for these impacts and expand upon the BMPs.

Table ES-1. Summary of Environmental Impacts, Mitigation, and BMPs

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
Air Quality	Minor and temporary impacts on air quality have the potential to occur during construction; all calculated air emissions, except for particulate matter less than or equal to 10 microns in diameter (PM_{10}), will remain below *de minimis* levels (emissions threshold levels that trigger Federal action).	Bare soil will be wetted to suppress dust, and equipment will be maintained according to specifications.
Noise	Moderate temporary increases to ambient noise during construction	Equipment will be operated on an as-needed basis. Mufflers and other

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
	activities have the potential to occur. Noise impacts have the potential to be greatest during pile-driving activities.	equipment will be properly maintained to reduce noise. All generators will be in baffle boxes, have an attached muffler, or use other noise-abatement methods in accordance with industry standards.
Land Use, Recreation, and Aesthetics	Impacts on land use have the potential to occur as a result of the Project in areas where the Project extends beyond the Roosevelt Reservation. Minimal impacts on visual resources and character of the land are expected. The Project has the potential to have minimal, temporary impacts on recreation at Buenos Aires National Wildlife Refuge, Coronado National Forest, and Coronado National Memorial.	Environmental monitors will be present during construction to ensure construction activities remain within the Project footprint and impacts on the National Memorial, National Wildlife Refuge, and National Forest lands are minimized.
Geologic Resources and Soils	Moderate, short- and long-term impacts on the regional geology have the potential to occur as a result of the Project. Approximately 538 acres of soils within the fence footprint have the potential to be permanently disturbed.	A Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention, Control, and Countermeasure Plan (SPCCP) will be implemented as part of the Project.
Groundwater	The Project has the potential to have moderate to major adverse impacts on the availability of water resources in the region. There is also potential for groundwater contamination as a result of a petroleum-based product spills.	A SPCCP and SWPPP will be implemented as part of the Project.
Surface Waters and Waters of the United States	Some ephemeral surface waters, including potential Waters of the U.S. jurisdictional waters, have the potential to experience both short- and long-term, minor, impacts.	Construction activities will stop during heavy rains. All fuels, oils, and solvents will be collected and stored. Stream crossings will not be located at bends to protect channel stability. Equipment maintenance, staging, laydown, or fuel dispensing will occur upland to prevent runoff. A SPCCP and SWPPP will be implemented as part of the Project.
Floodplains	The Project has the potential to impact 9 acres of floodplains and 1 acre of regulatory floodways. The Project has the potential to have short- and long-term, moderate permanent impacts from sedimentation, erosion, and accidental spills or leaks caused by construction.	Fence maintenance will include removing any accumulated debris on the fence after a rain event to avoid potential future flooding.

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
Vegetation	Disturbed habitat has the potential to be temporarily impacted by the staging areas and permanently impacted by the fence replacement and construction.	A monitor will be on site during construction to ensure that construction activities remain within the Project footprint.
Wildlife and Aquatic Resources	The Project has the potential to have negligible to minor impacts on wildlife. Potential loss of small mammals and reptiles during construction could occur. No impacts on aquatic habitat is expected to occur.	Surveys of nesting migratory birds will be conducted, and migratory bird nests will be flagged and avoided if construction occurs during breeding/nesting season. Use of lights during construction will be minimized.
Protected Species and Critical Habitat	Various special-status species and critical habitat for five different species have the potential to be impacted through the implementation of the Project.	A monitor will be on site during construction to survey for state-listed species within the active construction footprint. State-listed species would be relocated as needed.
Cultural Resources	One National Register of Historic Places-eligible cultural resource site has the potential to be impacted by the Project.	All construction will be restricted to previously surveyed areas. If any cultural material is discovered during construction, all activities within the vicinity of the discovery will be halted until receipt of clearance to resume work by a qualified archaeologist.
Socioeconomics	Short-term, beneficial impacts on the local economy have the potential to occur.	None required.
Hazardous Materials and Waste	Soils have the potential to be impacted by hazardous or toxic materials in the event of an accidental spill, which could lead to groundwater contamination. However, no hazards to the public are expected through the transport, use, or disposal of unregulated solid waste. The proper permits would be obtained by the licensed contractor tasked to handle any unregulated solid waste and all of the unregulated solid waste being handled in the proper manner.	A SPCCP will be implemented as part of the Project.

CBP followed specially developed design criteria to reduce adverse environmental impacts. Design criteria to reduce adverse environmental impacts included consulting with Federal and state agencies and other stakeholders to develop appropriate BMPs and minimizing physical disturbance where practicable. BMPs will include implementation of a Spill Prevention, Control, and Countermeasure Plan (SPCCP), Storm Water Pollution Prevention Plan (SWPPP), Environmental Protection Plan, Dust Control Plan, and Fire Prevention and Suppression Plan. CBP will have environmental monitors on site and impacts will be documented during construction to determine

the extent and scope of mitigation measures necessary to reduce or offset adverse environmental impacts.

In addition to the design criteria and BMPs, CBP may implement mitigation measures. The scope or extent of CBP's mitigation will be based on the actual impacts from the Project and available funding. CBP will assess the actual impacts from the Project upon completion. CBP's assessment will be based on, among other things, feedback from environmental monitors and the final construction footprint. To the extent mitigation is warranted and funding is available, CBP will work with stakeholders to identify and implement appropriate mitigation measures.

The following definitions describe various impact characteristics:

- *Short-term or long-term.* These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term impacts are those that occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term impacts are those that are more likely to be persistent and chronic.

- *Direct or indirect.* A direct impact is caused by an action and occurs contemporaneously at or near the location of the action. An indirect impact is caused by an action and might occur later in time or be farther removed in distance but is still a reasonably foreseeable outcome of the action.

- *Negligible, minor, moderate, or major.* These relative terms are used to characterize the magnitude or intensity of an adverse or beneficial impact. Negligible impacts are generally those that might be perceptible but are at the lower level of detection. A minor impact is slight, but detectable. A moderate impact is readily apparent. A major impact is severe.

  Adverse or beneficial. An adverse impact is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. A single act might result in adverse impacts on one environmental resource and beneficial impacts on another resource.

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1. GENERAL PROJECT DESCRIPTION

1.1 INTRODUCTION TO THE ENVIRONMENTAL STEWARDSHIP PLAN

The United States (U.S.) Customs and Border Protection (CBP) will construct approximately 74 miles of border barrier, including in areas where the existing barrier no longer meets the U.S. Border Patrol (USBP)'s operational needs. This will include the construction of approximately 40 miles of new primary pedestrian fence and the replacement of approximately 33 miles of primary fence and approximately 1 mile of secondary fence in the USBP Tucson Sector (the Project). This new bollard wall design is critical to the Tucson Sector's ability to prevent illegal entries and to achieve operational control of the border commensurate with Executive Order (EO) 13767. Under this EO, CBP is directed to "…secure the southern border of the United States through the immediate construction of a physical wall on the southern border, monitored and supported by adequate personnel so as to prevent illegal immigration, drug and human trafficking, and acts of terrorism."

Section 102(b) of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) mandates the Department of Homeland Security (DHS) to install and improve fencing, barriers, and roads along the U.S. border. In 2020, the Secretary of DHS, pursuant to Section 102(c), determined that it is necessary to waive certain laws, regulations, and other legal requirements to ensure expeditious construction of the barriers and roads along the border. Although the Secretary's waiver means that CBP no longer has any specific legal obligations to do so, DHS and CBP are committed to continue to protect valuable natural and cultural resources through responsible environmental stewardship.

This Environmental Stewardship Plan (ESP) presents the analysis for the potential environmental impacts associated with replacement and construction activities for tactical infrastructure in the USBP Tucson Sector. This ESP also includes a summary of best management practices (BMPs) that have been developed to help CBP avoid, minimize, and mitigate for potential environmental impacts, and will guide the planning and execution of the Project.

This ESP is organized into 14 chapters plus appendices. **Chapter 1** provides a general description of the Project, discusses the background of USBP, identifies the goals and objectives of the Project, explains the stakeholder outreach process, and provides an overview of BMPs. **Chapter 2** provides a detailed description of the Project. **Chapters 3** through **11** identify potential environmental impacts that could occur within each resource area. **Chapter 12** contains an analysis of related projects and potential effects. **Chapter 13** provides a list of references used to develop the ESP, and **Chapter 14** provides a list of abbreviations and acronyms used in the ESP. Finally, the appendices include other information pertinent to the development of the ESP.

Going forward, this ESP will guide CBP's efforts in the USBP Tucson Sector, as well as demonstrate CBP's commitment to environmental stewardship during the construction and replacement of the international border fence between the U.S. and Mexico.

This report has been prepared from data collected prior to and during the initial phases of project construction. The data was compiled through field surveys, photo interpretation with ground

truthing and use of data from prior surveys and other sources, as referenced. The report is an analysis of potential impacts on the resources discussed based on the initially planned project footprint. This is intended to be viewed as a baseline document and is not intended to capture all impacts during construction. Upon completion of the project, an additional report, called an Environmental Stewardship Summary Report (ESSR), will be prepared summarizing the observed actual impacts. This ESSR will review the baseline information provided in this ESP and be used to compare anticipated to actual impacts, so that a final new baseline of impacts is established for any potential future actions, including maintenance and repair activities. The ESSR will document the success of BMPs and any changes or improvements that could be required for the future. Additionally, the ESSR will summarize any significant modifications during construction that increased or reduced environmental impacts.

1.2 U. S. BORDER PATROL BACKGROUND

The mission of the USBP is to detect and prevent cross-border violators (CBVs), terrorists, and terrorist weapons from entering the U.S. and prevent illegal trafficking of people and contraband. To achieve effective control of our nation's borders, CBP uses a multi-prong approach including a combination of personnel, technology, and infrastructure, the mobilization and rapid deployment of people and resources, and the fostering of partnerships with other law enforcement agencies. CBP must ensure that tactical infrastructure functions as intended, which includes meeting the following mission requirements:

- Establishing substantial probability of apprehending terrorists and their weapons as they attempt to illegally enter between ports of entry (POE);
- Deterring illegal entries through improved enforcement; and
- Detecting, apprehending, and deterring smugglers of humans, drugs, and other contraband.

CBP's USBP administration is divided into nine different sectors, each responsible for border operations between the U.S. and Mexico within their respective Areas of Responsibilities (AORs). The Project falls within the USBP Tucson Sector AOR.

1.3 GOALS AND OBJECTIVES OF THE PROJECT

The purpose of the Project is to ensure CBP is able to fulfill its mission to detect and prevent CBVs, terrorists, and terrorist weapons from entering the U.S. and therefore achieve effective control of our nation's borders. The Project will help to deter illegal entries within the USBP Tucson Sector by improving enforcement efficiency, thus preventing terrorists and terrorist weapons, CBVs, drugs, and other contraband from entering the U.S., while also contributing to a safer work environment for USBP agents and the public.

1.4 STAKEHOLDER OUTREACH

CBP has notified numerous tribes, agencies, and non-profit organizations regarding the Project. Stakeholders with interest in the region include the following:

- ***Department of the Interior***. CBP has coordinated with the Department of the Interior (DOI) regarding design features, potential impacts from the Project, and potential conflicts with DOI's planning goals.

- ***Bureau of Reclamation.*** CBP has coordinated with the Bureau of Reclamation (BOR) regarding design features and potential conflicts with BOR's planning goals.

- ***Bureau of Land Management***. CBP has coordinated with the Bureau of Land Management (BLM) regarding design features and potential conflicts with BLM's planning goals.

- ***National Park Service***. CBP has coordinated with the National Park Service (NPS) to evaluate the potential impacts on NPS land, including Coronado National Memorial (CNM).

- ***U.S. Fish and Wildlife Service***. CBP has coordinated with the U.S. Fish and Wildlife Service (USFWS) to identify listed species that have the potential to occur in the Project area, as well as to evaluate potential impacts on USFWS land, including Buenos Aires National Wildlife Refuge (BANWR).

- ***U.S. Forest Service***. CBP has coordinated with the U.S. Forest Service (USFS) to evaluate potential impacts on land in the Coronado National Forest (CNF).

- ***U.S. Section of the International Boundary and Water Commission***. CBP has notified the U.S. Section of the International Boundary and Water Commission (USIBWC) and has worked to ensure that any construction along the U.S./Mexico international border does not adversely affect International Boundary Monuments or substantially impede floodwater conveyance within international drainages.

- ***U.S. Environmental Protection Agency***. CBP has coordinated with the U.S. Environmental Protection Agency (USEPA) to obtain feedback regarding potential mitigation opportunities for unavoidable impacts, should mitigation be necessary, and to ensure appropriate Storm Water Pollution Prevention Plan (SWPPP) guidelines are implemented.

- ***U.S. Army Corps of Engineers***. CBP has coordinated all activities with the U.S. Army Corps of Engineers (USACE) to identify potential jurisdictional Waters of the U.S., including wetlands, and to develop measures to avoid and minimize impacts on such resources.

- ***Arizona Game and Fish Department***. CBP has coordinated with the Arizona Game and Fish Department (AGFD) regarding potential impacts on species within their jurisdiction.

- ***Arizona State Historic Preservation Office***. CBP has coordinated with the Arizona State Historic Preservation Office (AZSHPO) regarding the protection and preservation of Arizona's historic resources.

- ***State and Local Governments***. CBP has notified various state and local government officials to alert them of the Project.

- ***Tribes***. CBP has notified and coordinated with the various tribes to alert them of the Project. Tribes on the notification list include the Ak-Chin Indian Community, Cocopah Tribe, Gila River Indian Community, Pascua Yaqui Tribe, Quechan Tribe, San Carlos Apache Tribe, and Tohono O'odham Nation.

- ***Landowners***. CBP has coordinated with various local landowners and ranchers to alert them of the Project.

1.5 BEST MANAGEMENT PRACTICES

It is CBP's policy to reduce impacts through the sequence of avoidance, minimization, and mitigation. BMPs vary based on location and resource type. Both general BMPs and species-specific BMPs have been developed during the preparation of this ESP. CBP may also implement mitigation measures. The scope or extent of CBP's mitigation will be based on the actual impacts from the Project and available funding. Project impacts will be documented during construction and assessed through monitoring after Project construction has been completed. CBP's assessment of mitigation will be based on, among other things, feedback from environmental monitors and the final construction footprint.

The following sections describe those measures that may be implemented to reduce or eliminate potential adverse impacts on specific aspects of the human and natural environment. Many of these measures have been incorporated by CBP as standard operating procedures based on past projects. Below is a summary of BMPs for each resource category that will be potentially affected. The BMPs have been coordinated with the appropriate agencies and land managers or administrators.

1.5.1 General Design BMPs

The design-build contracts will include design performance measures aimed at avoiding impacts prior to any construction. Designs will be evaluated on their ability to avoid and otherwise minimize environmental impacts by incorporating the following design BMPs:

- Maximum use of existing roads for construction access.
- Lands and roads disturbed by temporary impacts repaired/returned to pre-construction conditions.
- Early identification and protection of sensitive resource areas to be avoided.
- Restoration of grades, soils, and vegetation in temporarily disturbed areas.
- On-site retention of stormwater and runoff.

1.5.2 Air Quality

Measures will be incorporated to ensure that emissions of particulate matter less than or equal to 10 microns in diameter (PM_{10}) do not significantly impact the environment. Such measures include dust suppression methods to minimize airborne particulate matter generated during

construction activities. Standard construction BMPs, such as minimized diesel idling and routine watering of the construction site and access roads, will be used to control fugitive dust emissions during the construction phases of the Project. Additionally, all construction equipment and vehicles will be maintained in good operating condition to minimize exhaust emissions.

1.5.3 Noise

All Occupational Safety and Health Administration (OSHA) requirements will be followed by the contractor. The blasting contractor will provide further analysis of blasting techniques and measures to be taken to ensure negligible impacts from the blasting. Construction equipment will possess properly working mufflers and will be properly tuned to reduce backfires.

1.5.4 Geological Resources

Vehicular traffic associated with the construction, maintenance, and repair activities will remain on established roads to the maximum extent practicable. A SWPPP will be prepared prior to construction activities, and BMPs described in the SWPPP will be implemented to reduce erosion. Areas with highly erodible soils will be given special consideration when designing the Project to ensure incorporation of various BMPs, such as silt fences, straw bales, aggregate materials, wetting compounds, and rehabilitation, where possible, to decrease erosion. Materials such as gravel or topsoil will be obtained from existing developed or previously used sources and not from undisturbed areas adjacent to the Project corridor.

Erosion-control measures, such as water bars, gabions, straw bales, and revegetation, will be implemented during and after construction activities. Revegetation efforts will be needed to ensure long-term recovery of the area and to prevent soil erosion problems.

1.5.5 Water Resources

To address stormwater runoff issues, CBP will address the potential for sedimentation and erosion with appropriate BMPs. A SWPPP will be adopted and implemented by contractors performing work on the Project, which will also include BMPs to reduce potential stormwater erosion and sedimentation effects on local drainages.

All work will be suspended during heavy rains and not resumed until conditions are suitable for the movement of equipment.

The changing of oil, refueling, and other actions that could result in a release of a hazardous substance should be restricted to designated staging areas that are a minimum of 100 feet from any surface drainage. Such designated areas should be surrounded with berms, sandbags, or other barriers to further prevent the accidental spill of fuel, oil, or chemicals. Any accidental spills should be immediately contained, cleaned up, and properly disposed.

Recycled water will be used for dust suppression to the maximum extent possible. Water tankers will not discard unused water where it has the potential to enter any aquatic or marsh habitat. Water storage within the Project Area should be maintained in secured, on-ground containers in upland areas, not in washes. Pumps, hoses, tanks, and other water storage devices will be cleaned and disinfected.

All engineering designs and subsequent hydrology reports will be reviewed by USIBWC prior to the start of construction activities so that the results of those activities do not increase, concentrate, or relocate overland surface flows into the U.S. or Mexico.

Groundwater extraction can occur with written approval by CBP, with groundwater wells metered. Wells will be located within the Roosevelt Reservation at a minimum of five miles away from ponds or springs to minimize the effects of diminished artesian water levels. The use of wells at a distance less than five miles from ponds or springs must be approved by CBP prior to use.

1.5.6 Biological Resources

The following summary of general and species-specific biological BMPs will be implemented, which are referenced in more detail in the Biological Survey Report (BSR) prepared for the Project (see **Appendix A**). This list has been ordered to follow a typical construction sequence and discusses species- and habitat- specific BMPs at the end. BMPs were developed in coordination with USFWS.

1.5.6.1 Biology General Measures Prior to Construction

Contractors will mark designated travel corridors with high visibility, removable or biodegradable markers, and minimize construction traffic through the corridor. No activities, ground disturbance, vegetation removal, or trimming will occur outside of the marked designated work area.

1.5.6.2 General Biology Measures During Construction

Protection of cacti and suitable habitat must be stressed in environmental education for contractors involved in the construction or maintenance of facilities.

If construction or clearing activities are scheduled during the nesting season (typically February 15-September 15), the government will perform a pre-construction survey for migratory bird species to identify active nests prior to the start of any construction or clearing activity. If construction activities will result in the disturbance or harm of a migratory bird, coordination with USFWS and AFGD will be required. Buffer zones around active nests will be established until nestlings have fledged and abandoned the nest.

Within the Project Area in the San Pedro Riparian National Conservation Area (NCA), contractors will install yellow rope to designate work areas associated with construction that must be maintained in good repair until work is completed within the drainages. For all in-water work in streams, sediment barriers must be used to avoid downstream effects of turbidity and sedimentation.

The USBP will provide monitors for environmental and cultural resources throughout the duration of the construction contract.

1.5.6.3 Measures for Wildlife and Aquatic Resources

Areas that are hydro-seeded for temporary erosion-control measures must use only native plant species appropriate to surrounding habitat types. Removal of trees and brush in federally listed species habitats will be limited to the smallest amount needed to meet contract requirements.

Transmission of disease vectors and invasive non-native aquatic species can occur via vehicle contamination (e.g., seeds brought into the area on truck tires). To prevent this, crossing of streams or marsh areas with flowing or standing water must be avoided, and when unavoidable, the vehicle will be sprayed with a 10% bleach solution after the crossing and before entering a new watershed.

Light poles and other pole-like structures will be designed to discourage roosting by birds, particularly ravens or other raptors.

To prevent wildlife species entrapment during construction, all excavated, steep-walled holes or trenches more than two feet deep must be covered by plywood at the close of each working day or provided with one or more escape ramp. Each morning before the start of construction and before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. Any animals discovered must be allowed to escape voluntarily, without harassment, before construction activities resume, or removed from the trench or hole by the government biologist. Additionally, all vertical bollards that are hollow must be covered to prevent wildlife entrapment. Bollards should be covered from the time they are erected to the time they are filled.

1.5.6.4 Measures for Protected Species and Critical Habitats

Prior to ground-disturbing activities or vegetation removal or trimming, a qualified biologist will present an environmental awareness program to all personnel who will be on site. The program will contain, at a minimum, information regarding migratory bird species, Southwestern Willow Flycatcher, the Yellow-billed Cuckoo, the Northern Mexican gartersnake, the Chiricahua Leopard frog, Sonora Tiger Salamander, the Beautiful Shiner, the Yaqui Catfish, the Yaqui Chub, the Mexican Spotted owl, the Jaguar, Ocelot, the Sonoran Desert Tortoise, Huachuca Water-umbel, and the Wright's March Thistle. This will include general species identification, habitat description, species sensitivity to human activity, and measures to avoid and protect the species during construction. Following the education program, photographs of the species must be posted in the office of the contractor and resident engineer, where they will remain throughout the duration of the Project. The contractor is responsible for ensuring that employees are aware of the listed species.

To eliminate attraction of predators to protected animals, all food-related trash items such as wrappers, cans, bottles, and food scraps must be disposed in closed containers and removed daily from the Project site. In areas of riparian vegetation, the size of the Project work area must be minimized to the extent possible. Vegetation within critical habitat or sensitive areas identified for removal and preservation must be clearly marked both in the field and on design plans, and otherwise communicated in the field to all workers.

A qualified biologist must be present at all times while work is ongoing within the San Pedro Riparian NCA. In the event flows enter the active construction area, the qualified biologist will determine if additional exclusionary measures or species relocations need to take place.

When an individual of a federally listed species is found within the Project limits, work must cease in the area of the species. Any threatened and endangered species or species of concern must not be harmed, harassed, or disturbed to the extent possible by Project activities. Work may resume when the individual moves away on its own, or when a government biologist safely removes the individual. Individuals of federally listed species found in the Project Area and requiring relocation will be relocated by the government biologist.

All on-site workers must check under their parked vehicles and equipment prior to driving to ensure there is not a desert tortoise sheltering underneath the vehicle or equipment. If found, the desert tortoise must be allowed to move out from under the vehicle or equipment on its own or a biological monitor must be contacted to relocate the individual before the vehicle or equipment can be moved.

1.5.7 Cultural Resources

All construction will be restricted to previously surveyed areas. Any known cultural resources must be clearly flagged for avoidance during construction. CBP will be contacted to complete any necessary flagging efforts for cultural resource avoidance prior to ground-disturbing activities taking place. Should any archaeological artifacts or human remains be found during construction, all ground-disturbing activities in the vicinity of the discovery must stop, and the contractor must immediately notify the contracting officer. Work will not resume until receipt of clearance by a qualified archaeologist.

1.5.8 Hazardous Materials and Wastes

All fuels, waste oils, and solvents will be collected in tanks or drums within a secondary containment system. The refueling of machinery will be completed following accepted guidelines, and all vehicles will have drip pans during storage. All spills will be contained immediately using an absorbent (e.g., granular, pillow, sock) to absorb and contain the spill. Any spill of a hazardous or regulated substance will be immediately recorded by the contractor and reported to the monitor onsite. A Spill Prevention, Control, and Countermeasure Plan (SPCCP) will be implemented as part of the Project.

1.5.9 Potential Avoidance and Mitigation for Unavoidable Impacts

If unavoidable impacts result from Project construction, CBP may implement mitigation measures. The scope or extent of CBP's mitigation will be based on the actual impacts from the Project and available funding. CBP will assess the actual impacts from the Project after it is complete. CBP's assessment will be based on, among other things, feedback from environmental monitors and the final construction footprint.

2. DESCRIPTION OF THE PROJECT

2.1 LOCATION

CBP will improve and maintain approximately 34 miles of primary and secondary pedestrian fence along the U.S./Mexico international border in Arizona. Additionally, CBP will install and maintain tactical infrastructure consisting of approximately 40 miles of new primary pedestrian fence and associated staging yards within USBP's Tucson Sector within Cochise, Pima, and Santa Cruz counties, Arizona. The Project area is split into 13 separate segments across southern Arizona within Pima, Santa Cruz, and Cochise counties (the Project Area) (Segments 28-3, 28-1, 28-4, 10-3, 10-1, 10-4, 10-5, 10-6, 9-1, 9-4, 9-2, 9-3, 9-5). **Table 2-1** lists location data for each segment and section and **Figures 2-2** through **2-4** show each segment.

The westernmost segments of the Project Area include Segments 28-3, 28-1, 28-4, 10-3, 10-1, 10-4, 10-5, which occur within Pima and Santa Cruz counties. Segment 28-3 begins approximately 2.5 miles west of the Sasabe POE and continues west for approximately 2.4 miles. Segment 28-1 begins approximately 2.5 miles west of the Sasabe POE and ends approximately 4.5 miles east of the Sasabe POE, running adjacent to BANWR. Segment 28-4 runs adjacent both to BANWR and CNF and is comprised of three sections: Section 28-4A begins approximately 4.7 miles east of the Sasabe POE and continues east for approximately 1.2 miles. Section 28-4B begins approximately 0.7 miles east of the end of Section 28-4A and continues east for approximately 1.8 miles. Section 28-4C begins approximately 0.7 miles east of the end of Section 28-4B and continues east for approximately 2.7 miles. Segment 10-3 begins approximately 6.5 miles west of the Nogales/Mariposa POE and continues west for approximately 21 miles. The entire segment runs adjacent to CNF. Segment 10-1 begins approximately 0.7 miles west of the Nogales/Mariposa POE and continues west for approximately 2 miles. Segment 10-4 begins approximately 5.5 miles east of the Nogales Station and continues east for approximately 0.2 miles. Segment 10-5 begins approximately 10 miles east of the Nogales Station and continues east for approximately 4.2 miles. The entire segment runs adjacent to CNF. Segments 28-3, 28-4, 10-3 and 10-5 are all new primary pedestrian fence, while Segments 28-1, 10-1, and 10-4 are all replacing primary pedestrian fence.

The easternmost segments of the Project Area include Segments 10-6, 9-1, 9-4, 9-2, 9-3, 9-5, which occur within Cochise County. Segment 10-6 begins approximately 18 miles west of the Naco POE and continues west for approximately 2.1 miles. The segment runs adjacent to CNF. Segment 9-1 begins approximately 3 miles west of the Naco POE and continues west for approximately 9 miles. Segment 9-4 starts approximately 0.3 miles west of the Naco POE and continues east through Naco for approximately 1 mile. Segment 9-2 starts approximately 4.5 east of the Naco POE and continues east toward Douglas for approximately 14 miles. Segment 9-3 starts approximately 5.5 miles east of the Douglas POE and continues east for 1 mile. Finally, Segment 9-5 begins on the western border with New Mexico and continues west toward Douglas for approximately 4.7 miles. Segments 10-6 and 9-5 are new primary pedestrian fence, Segments 9-1, 9-2, and 9-3 are replacing primary pedestrian fence, and 9-4 is replacing secondary pedestrian fence.

Table 2-1. Segment Location Data

Segment	Section	Latitude	Longitude	Length	Barrier Type
Segment 28-3	Section 28-3 Start	31.508027	-111.622979	2.5 miles	New Primary
	Section 28-3 End	31.495542	-111.584274		
Segment 28-1	Section 28-1 Start	31.49554	-111.584274	7 miles	Replacement Primary
	Section 28-1 End	31.46018	-111.473182		
Segment 28-4	Section 28-4A Start	31.459248	-111.470251	1.2 miles	New Primary
	Section 28-4A End	31.453096	-111.45097		
	Section 28-4B Start	31.449638	-111.440143	1.8 miles	New Primary
	Section 28-4B End	31.440687	-111.412065		
	Section 28-4C Start	31.437356	-111.401691	2.7 miles	New Primary
	Section 28-4C End	31.423476	-111.358347		
Segment 10-3	Section 10-3 Start	31.421325	-111.351619	21 miles	New Primary
	Section 10-3 End	31.332535	-111.012341		
Segment 10-1	Section 10-1 Start	31.33256	-111.01133	2.1 miles	Replacement Primary
	Section 10-End	31.332654	-110.976597		
Segment 10-4	Section 10-4 Start	31.333702	-110.851153	0.2 miles	Replacement Primary
	Section 10-4 End	31.333758	-110.847792		
Segment 10-5	Section 10-5 Start	31.33351	-110.775333	4.2 miles	New Primary
	Section 10-5 End	31.33328	-110.70545		
Segment 10-6	Section 10-6 Start	31.333602	-110.288665	2.1 miles	New Primary
	Section 10-6 End	31.333754	-110.253863		
Segment 9-1	Section 9-1 Start	31.3342902	-110.1474490	9 miles	Replacement Primary
	Section 9-1 End	31.3342554	-110.0003427		
Segment 9-4	Section 9-4 Start	31.334239	-109.954224	1 mile	Replacement Secondary
	Section 9-4 End	31.334228	-109.937492		
Segment 9-2	Section 9-2 Start	31.3342073	-109.8742874	14 miles	Replacement Primary
	Section 9-2 End	31.3341871	-109.6298149		
Segment 9-3	Section 9-1 Start	31.333994	-109.46753	1 mile	Replacement Primary
	Section 9-1 End	31.333995	-109.453305		
Segment 9-5	Section 9-5 Start	31.332759	-109.129344	4.7 miles	New Primary
	Section 9-5 End	31.33235	-109.050042		

The construction corridor is the width of the Roosevelt Reservation, the 60-foot-wide strip of land owned by the Federal Government along the U.S. side of the U.S./Mexico international border in California, New Mexico, and Arizona. In some areas of difficult terrain, the corridor will be extended to 100 feet wide to provide additional room for construction equipment.

2.2 DESIGN

The preliminary design meets the Project goals and has been informed by numerous technical studies such as engineering, constructability, and environmental evaluations, which included biological and cultural resource assessments. Streams and stormwater also flow through the site, and improved drainage management has been incorporated into the design.

The current design features a 30-foot, bollard-style fence composed of 6-inch diameter steel bollards spaced center to center 10 inches apart, forming a 4-inch gap between each bollard. The

design also includes small animal wildlife passages, approximately 8 inches by 11 inches with locations to be determined in coordination with USFWS, USFS, and BLM. The construction corridor will be 60 feet wide with some exceptions up to 100 feet wide in areas of difficult terrain. Approximately half of the corridor has previously been disturbed. The Project also includes construction, repairs and improvements to patrol roads, and installation of a fiber-optic cable for communications, LED lighting, and electrical utilities to supply power to the communications cable and lighting. Border security lighting will light the Project Area at night both during and after construction. In those areas where border security lighting is not present, mobile light poles will be used during nighttime construction.

Where the pedestrian fence is being replaced, it is anticipated that existing access roads will be used for the Project. The access roads were previously used in 2008 when the vehicle and pedestrian fencing was constructed under a previous DHS secretarial waiver. An ESP and an ESSR were completed in 2008 to support vehicle and pedestrian fence construction. Access roads have the potential to be built in Project Areas where no previous barrier exists. The construction of these access roads may require drill-and-shoot excavation, as well as blade and cut-and fill grading.

2.3 CONSTRUCTION ACCESS, MATERIALS DELIVERY, AND STAGING

The new bollards will be delivered to fabrication yards as well as to laydown areas adjacent to the Roosevelt Reservation and fabricated prior to installation. Each panel will be 8- to 10-feet-wide and composed of eight to 10, 6-inch-square (5/16-inch thick) Core-10 steel bollards filled with cement and welded in place by a horizontal steel bar on the bottom and an approximately 5-foot-wide steel sheet across the top. The steel bollards will be spaced 4 inches apart to allow for cross-border visibility. Each panel is estimated to weigh approximately 3,500 pounds, excluding any below ground materials or concrete.

To facilitate construction activities, temporary staging areas have been identified along the Project corridor. These staging areas will store large equipment, house construction materials, establish batch plants for mixing concrete, and act as fabrication yards for panel assembly. Access to the Project corridor will use existing roads within the Project Area wherever possible, including Federal, state, county, and local roads.

2.4 SITE PREPARATION

Site preparation primarily consists of grading staging areas, which will be located in previously disturbed areas whenever possible, including areas previously used for pedestrian fence construction. Erosion-control measures will be necessary, as will biological surveys if construction takes place during the nesting season (from February 15 through September 15 every year); both biological and cultural resource surveys will be required in areas of new construction. BMPs will limit impacts on all resources including wildlife, botanical, cultural, and other resources. Specific BMPs will be implemented prior to and during construction activities to ensure minimal disturbance within the Project Area.

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Figure 2-1. Project Overview Map

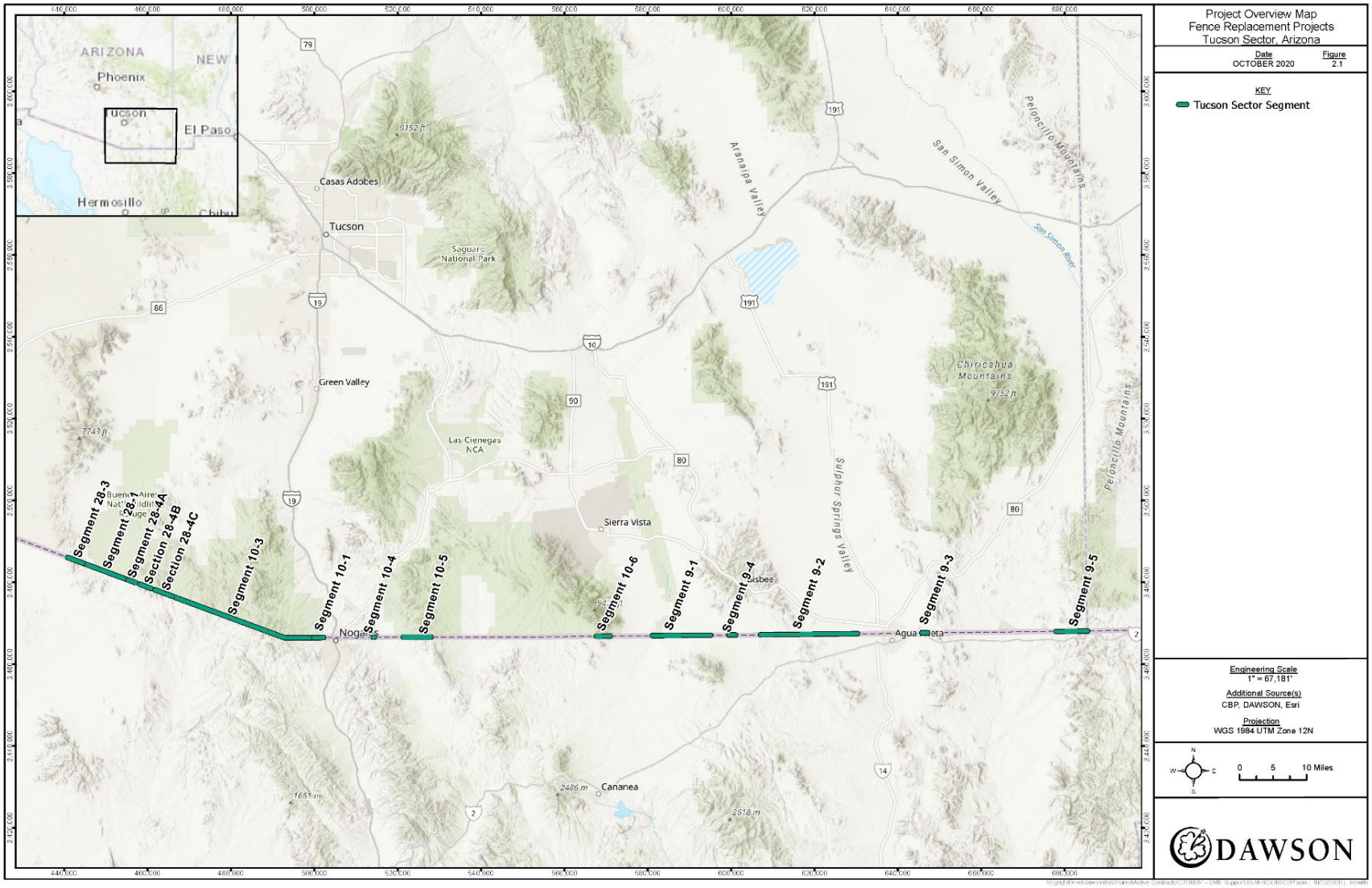

Figure 2-2. Project Map - Western Segments

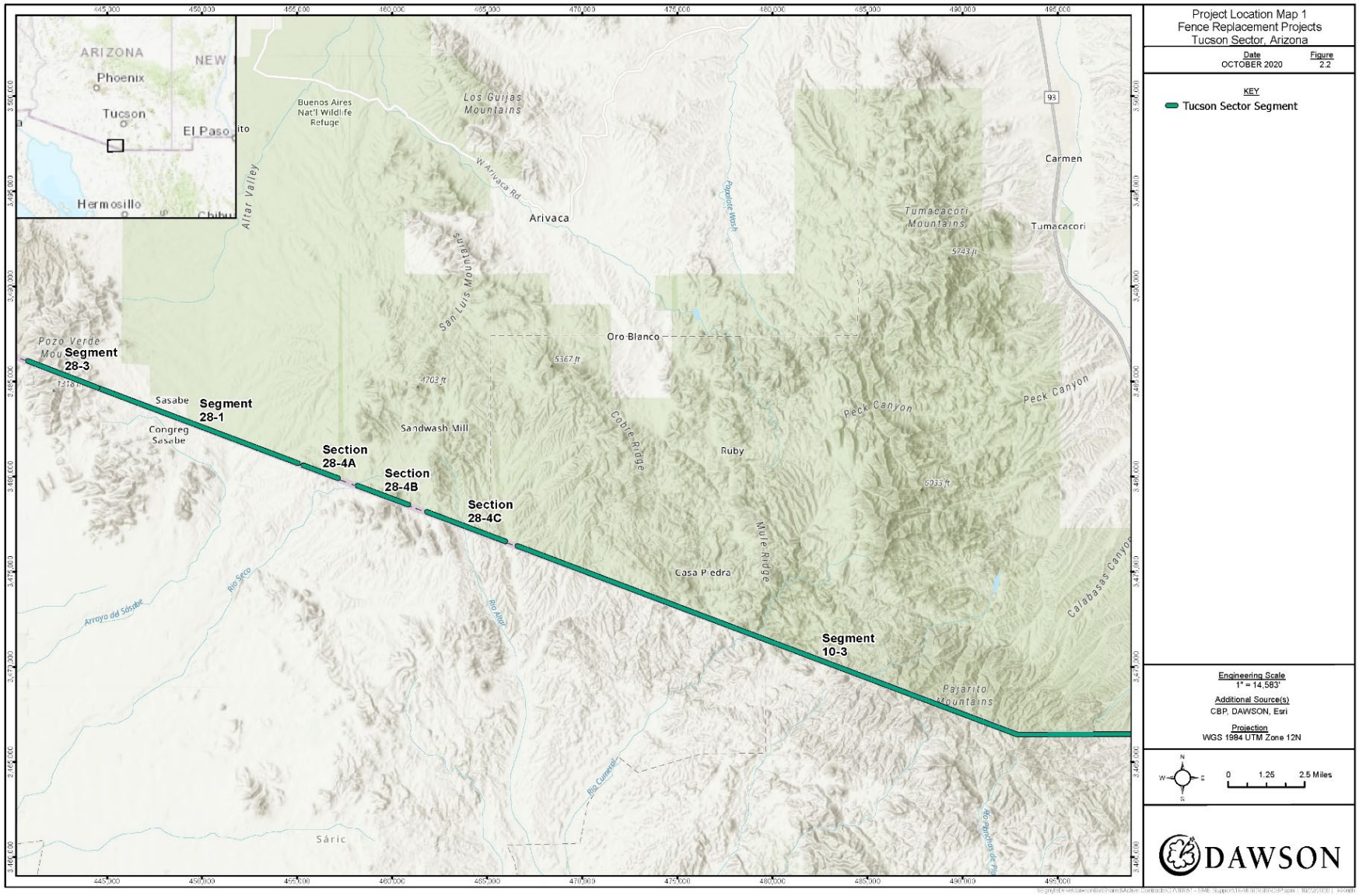

Figure 2-3. Project Map - Central Segments

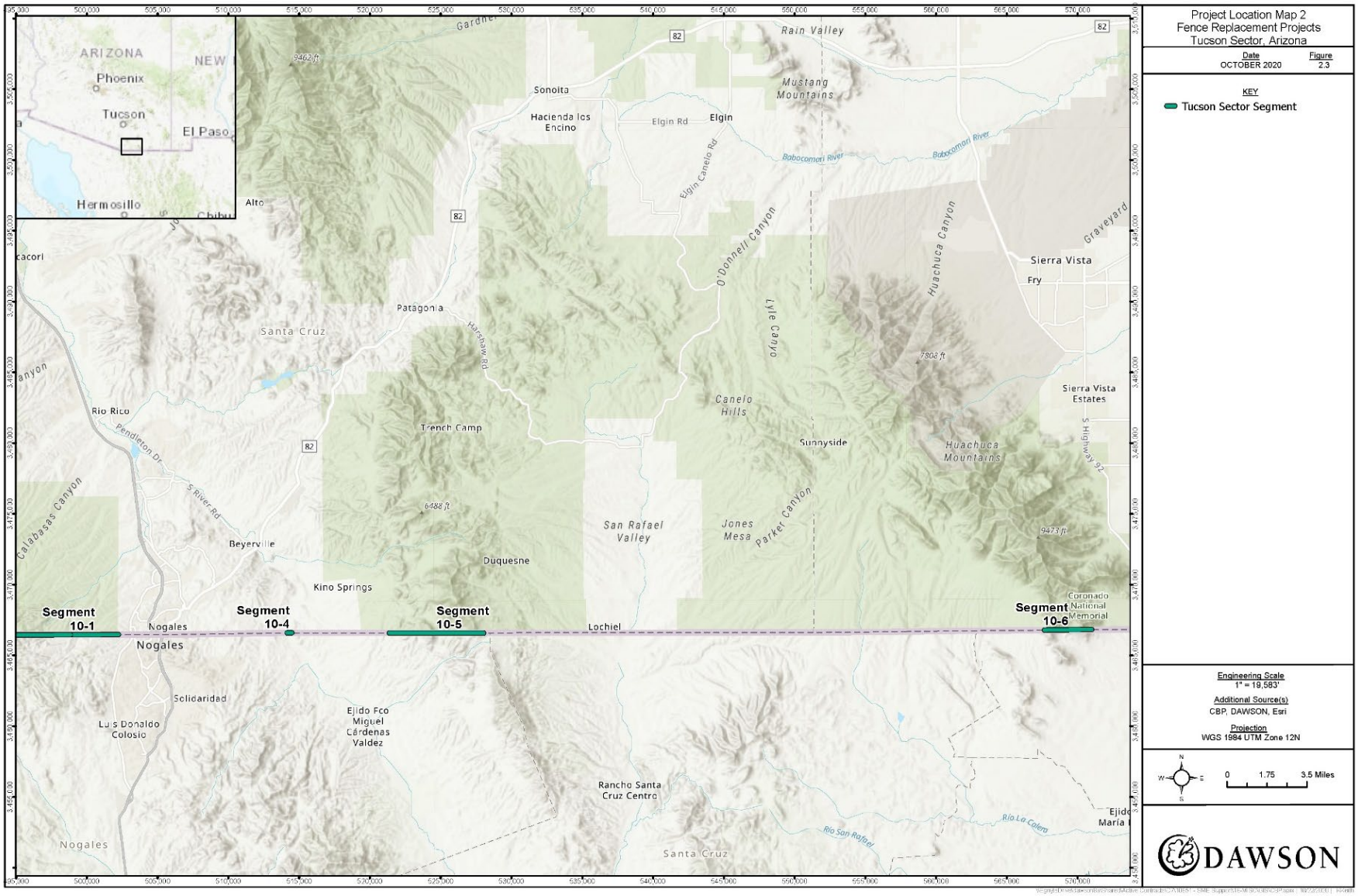

Figure 2-4. Project Map - Eastern Segments

At least seven wells have been or are planned to be drilled along the 74-mile construction site. Well water is to be used for dust suppression and for concrete development at nearby batch plants.

All activities associated with implementation of the Project have been designed pursuant to the constraints identified in the BSR (see **Appendix A**) prepared for the Project. These constraints to on-site preparation and construction ensure impacts on the biological resources present are minimized to the extent practicable.

2.5 REMOVAL AND REPLACEMENT OF LEGACY FENCE WITH BOLLARD WALL

The removal of the legacy fence and installation of the new bollard wall will be conducted in sections. As each section of the existing legacy fence is removed, a new section of bollard wall will be installed. Each new section of bollard wall will be placed into position and secured below ground. Heavy equipment anticipated to be used during wall replacement and new bollard wall construction consists of water trucks, impact pile driver, loader, bulldozer, excavator, and a crane. Disposal or recycling of the existing legacy fence will be the responsibility of the construction contractor. Once the new bollard wall is installed, the Project Area will be returned to conditions similar to those currently existing.

2.6 CONSTRUCTION SCHEDULE

Construction of the easternmost segments of the Project Area (Segments 10-6, 9-1, 9-4, 9-2, 9-3, 9-5) is expected to last from May 18, 2020, to September 7, 2021. The total construction duration for these project sections is 405 days. For the westernmost segments of the Project Area (Segments 28-3, 28-1, 28-4, 10-3, 10-1, 10-4, 10-5), construction is expected to last from July 8, 2020, to January 29, 2022. The total construction duration for these project sections is 481 days. It is anticipated that construction will occur seven days per week from 7:00 a.m. to 7:00 p.m., with some exceptions where work may be scheduled 24 hours per day.

2.7 ENVIRONMENTAL CONSIDERATIONS

Chapters 3 through **11** address numerous environmental factors to be considered during final design and implementation of the Project.

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3. AIR QUALITY

3.1 AFFECTED ENVIRONMENT

Pursuant to the DHS Secretary's waiver, CBP no longer has any specific legal obligations under the Clean Air Act (CAA). However, CBP recognizes the importance of environmental stewardship and has applied the appropriate standards and guidelines associated with the CAA as the basis for evaluating potential environmental impacts and implementing appropriate BMPs regarding air quality.

Air quality is defined by the concentration of various pollutants in the atmosphere at a given location. Under the CAA, the six principal pollutants defining air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter (PM) (measured less than or equal to 10 microns in diameter [PM_{10}] and less than or equal to 2.5 microns in diameter [$PM_{2.5}$]), and lead. CO, SO_2, lead, and some particulates are emitted directly into the atmosphere from emissions sources. O_3, NO_2, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Volatile organic compounds (VOCs) and nitrogen oxides (NO_x) emissions are used to represent O_3 generation because they are precursors of O_3.

Federal Air Quality Standards. The USEPA established National Ambient Air Quality Standards (NAAQS) for specific pollutants determined to be of concern with respect to the health and welfare of the general public. Ambient air quality standards are classified as either primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare. The NAAQS are included in **Table 3-1**.

Table 3-1. National Ambient Air Quality Standards

Pollutant	Primary Standard Level	Primary Averaging Time	Secondary Standard Level	Secondary Standard Averaging Time
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour (1)	-	-
	35 ppm (40 mg/m^3)	1-hour (1)	-	-
Lead	0.15 µg/m^3 (2)	Rolling 3-month Average	Same as Primary	Same as Primary
	1.5 µg/m^3	Quarterly Average	Same as Primary	Same as Primary
Nitrogen Dioxide	53 ppb (3)	Annual (Arithmetic Average)	Same as Primary	Same as Primary
	100 ppb	1-hour (4)	-	-

Particulate Matter (PM10)	150 µg/m^3	24-hour (5)	Same as Primary	Same as Primary
Particulate Matter (PM2.5)	12 µg/m^3	Annual (Arithmetic Average) (6)	15 µg/m^3	Annual (Arithmetic Average) (6)
	35 µg/m^3	24-hour (7)	Same as Primary	Same as Primary
Ozone	0.07 ppm (2015 std)	8-hour (8)	Same as Primary	Same as Primary
	0.070 ppm (2015 std)	8-hour (9)	Same as Primary	Same as Primary
	-	1-hour (10)	-	Same as Primary
Sulfur Dioxide	75 ppb (11)	1-hour	-	3-hour

Source: USEPA 2019a.
Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb – 1 part in 1,000,000,000) by volume, milligrams per cubic meter of air (mg/m3), and micrograms per cubic meter of air (µg/m3).
(1) Not to be exceeded more than once per year.
(2) Final rule signed October 15, 2008.
(3) The official level of the annual NO2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard
(4) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
(5) Not to be exceeded more than once per year on average over 3 years.
(6) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
(7) 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 (effective December 17, 2006).
(8) 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 0.075 ppm (effective May 27, 2008).
(9) 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 0.070 ppm (effective December 28, 2015).
(10) (a) USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
(b)The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(11)(a) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Areas that are and have historically been in compliance with NAAQS or have not been evaluated for NAAQS compliance are designated as attainment areas. Areas that violate a Federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. The USEPA General Conformity Rule applies to Federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis (the process used to determine whether a Federal action meets the requirements of the general conformity rule) are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

The USEPA designates portions of Cochise, Pima, and Santa Cruz, counties as moderate non-attainment areas for criteria pollutants. The Project is located within designated non-attainment

portions for PM_{10} – the Ajo area in Pima County, the Nogales area in Santa Cruz County, and the Douglas area in Cochise County. The Project is also located within a non-attainment portion for $PM_{2.5}$ – Nogales area in Santa Cruz County.

3.2 ENVIRONMENTAL CONSEQUENCES

Temporary and minor increases in air pollution have the potential to occur during construction. The construction phase has the potential to generate air pollutant emissions as a result of transporting materials, grading, compacting, trenching, pouring concrete, and other various activities. Soil disturbance has the potential to contribute to increased fugitive dust emissions and could be greatest during the initial site preparation. Increased PM emissions from vehicles and other activities also have the potential to contribute to increased air pollution. Levels of fugitive dust have the potential to vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions (e.g., wind speed and direction, precipitation). The following paragraphs describe the air calculation methodologies used to estimate air emissions produced by the Project.

USEPA's Motor Vehicle Emission Simulator (MOVES) model was used to calculate emissions from construction equipment. Combustion emission calculations were made for standard construction equipment, such as front-end loaders, excavators, bulldozers, cranes, and cement trucks. Assumptions were made regarding the total number of days each piece of equipment will be used and the number of hours or miles per day each type of equipment will be used. Fugitive dust emissions were calculated using the emission factor of 0.22 ton per acre per month (Air Force Civil Engineer Center 2018). The MOVES model calculations did not account for any dust control measures the contractor implements throughout the duration of the Project.

Construction workers have the potential to temporarily increase combustion emissions in the airshed during their commute to and from the Project Area. Emissions from delivery trucks also have the potential to contribute to the overall air emission budget. Emissions from delivery trucks and construction worker commuters traveling to the job site were also calculated using the MOVES model.

Per 40 Code of Federal Regulations (CFR) Part 93, Chapter 153, a conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions from the criteria pollutant or precursors in a nonattainment or maintenance area caused by a Federal action will equal or exceed specified *de minimis* levels.

Table 3-2 provides a summary of emissions from the Project and a determination of their significance. The total emissions from construction activity has the potential to be below the significance threshold levels of all emissions except for PM_{10}. The working assumption for calculating emissions is that all construction activity is to be completed within a single year. In reality, the construction timeline is anticipated to span approximately 1.5-2 years, which would result in lower emissions values. Therefore, the Project is determined to have minor significant impacts on ambient air quality. Construction personnel will continue to implement dust control measures, including watering roads, to maintain appropriate fugitive dust and air quality levels. Air emissions calculations are provided in **Appendix B**.

Table 3-2. Total Air Emissions from the Project versus the *de minimis* Threshold Levels

Type of Emission	VOCs	CO	NO_x	SO_2	$PM_{2.5}$	PM_{10}
Project Emissions (tpy)	1.33633	3.89151	3.64066	0.01012	20.80786	205.04223
Significance Threshold (tpy)	50	100	100	100	Moderate: 100 Serious: 70	Moderate: 100 Serious: 70

4. NOISE

4.1 AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as unwanted sound, which can be based on objective effects (i.e., hearing loss, damage to structures, etc.) or subjective judgments (e.g., community annoyance). Human response to increased sound levels varies according to the type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day (for noise impacts on wildlife see Section 8.2.2). How an organism responds to the sound source determines whether the sound is judged as pleasing or as an annoying noise, or if it disturbs a normal behavior. Sound is usually represented on a logarithmic scale quantified in decibel (dB) units. Sound on the dB scale is referred to as a sound level. The threshold of human hearing is near 0 dB, and the threshold of discomfort or pain is around 120 dB.

Nighttime noise levels are generally viewed as a greater community annoyance than the same levels occurring during the day. It is generally given that people perceive a nighttime noise at 10 A-weighted decibels (dBA) louder than when that same noise is experience during the day. This perception occurs largely because background environmental sound levels at night, in most areas, are also approximately 10 dBA lower than those during the day. As such, nighttime noise levels are often perceived as intrusive more often than the same noise level during the day. Below is a summary and definition of noise levels based on the U.S. Department of Housing and Urban Development noise program.

> **Acceptable** (not exceeding 65 dB) – This noise exposure may be of some concern, but common building construction will make the indoor environment acceptable and the outdoor environment reasonably pleasant for recreation and play.
>
> **Normally Unacceptable** (above 65 but not greater than 75 dB) – The noise exposure is significantly more severe; barriers may be necessary between the site and prominent noise sources to make the outdoor environment acceptable; special building constructions may be necessary to ensure that people indoors are sufficiently protected from outdoor noise.
>
> **Unacceptable** (greater than 75 dB) – The noise exposure at the site is so severe that the construction costs to make the indoor noise environment acceptable may be prohibitive and the outdoor environment will still be unacceptable.

Generally, noise generated by a stationary noise source, or "point source," will decrease by approximately 6 dBA over hard surfaces and 9 dBA over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 85 dBA at a reference distance of 50 feet over a hard surface, that noise level will be 79 dBA at a distance of 100 feet from the noise source, 73 dBA at a distance of 200 feet, and so on.

Table 4-1 depicts noise emissions levels for construction equipment, which range from 68 dBA to 104 dBA at 100 feet from the source (FHWA 2007).

Table 4-1. A-Weighted Sound Levels of Construction Equipment and Modeled Attenuation at Various Distances from Source

Noise Source	100 feet	200 feet	500 feet	1,000 feet	2,000 feet	3,000 feet
	dBA	dBA	dBA	dBA	dBA	dBA
Backhoe	72	66	58	52	46	43
Crane	75	69	61	55	49	46
Dump truck	70	64	56	50	44	41
Excavator	75	69	61	55	51	48
Front-end loader	73	67	59	53	47	44
Concrete mixer truck	73	67	59	53	47	44
Pneumatic tools	75	69	61	55	49	46
Auger drill rig	78	72	64	58	52	49
Bulldozer	76	70	62	56	50	47
Generator	75	69	61	55	49	46
Impact pile driver	104	98	90	84	78	75
Flatbed truck	68	62	54	48	42	39

Source: FHWA 2007 and CBP 2019
Notes: The dBA at 50 feet is a measured noise emission (FHWA 2007).

Under the Noise Control Act of 1972, OSHA established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period (OSHA 2018). The highest allowable sound level to which workers can be constantly exposed is 115 dBA; exposure to this level must not exceed 15 minutes within an 8-hour period (OSHA 2018) The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that reduce sound levels to acceptable limits.

For open space areas, the Federal Highway Administration (FHWA) noise regulations define a *de minimis* threshold. This regulation defines open space lands as "land on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose." The open space areas, as defined, have a *de minimis* threshold of 57 dBA (23 CFR 722, Table 1).

The Project Area is divided into 13 segments that span 74 miles across southern Arizona. The Project Area is located in a primarily rural area with portions within 1,000 feet of recognized conservation areas and national monuments, such as CNM, CNF, and BANWR. The majority of the Project will occur in a remote area, consisting of open desert and mountains. Some construction will occur near residential towns, such as the City of Nogales and City of Sasabe, and some sensitive noise receptors are present within 3,000 feet of Project Area.

4.2 ENVIRONMENTAL CONSEQUENCES

Noise within the Project Area has the potential to be created during the transportation of construction materials, operation of construction equipment, and numerous construction activities. Noise also has the potential to be created during intermittent nighttime activity. Noise levels to receptors vary widely depending on several factors, such as climatic and soil conditions, topography, the equipment condition, and current ambient noise levels. Open space areas that are less developed have a lesser ambient noise level than developed areas, making it much easier for an adverse noise impact to result in an open space area.

Installation of the replacement bollard wall and construction of the all-weather road are anticipated to be completed in segments; therefore, construction noise has the potential to be temporary and only occur near work being performed. Using a worst-case scenario of 104 dBA, the noise model predicts that noise emissions from the impact pile driver (proposed construction equipment) will have to travel 3,000 feet before attenuating to levels below 75 dBA. The area encompassed within the 3,000 feet noise contour does include sensitive receptors, as the nearest residential area begins 35 feet north of the Project Area. Thus, the noise generated by the construction and maintenance of Project infrastructure has the potential to have a moderate adverse effect. Sensitive noise receptors have the potential to experience noise emissions greater than 78 dBA, which are normally unacceptable on days that the pile driver is operational within the Project Area. This level of noise has the potential to only be exposed during the construction phase of Segment 9-4 and only during pile driver operations. When the pile driver is not operational, noise levels fall within acceptable limits, (less than 65 dBA) for all sensitive receptors. It is anticipated the impact pile drive will only be used intermittently. Noise will return to ambient levels post-construction.

The Project Area is unlikely to experience long term impacts from traffic as the roads will likely be used only for border patrol. Routine maintenance of the fence and roads by USBP has the potential to result in slight temporary increases in noise levels that could continue to sporadically occur over the long-term within the Project Area.

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5. LAND USE, RECREATION, AND AESTHETICS

5.1 AFFECTED ENVIRONMENT

5.1.1 Land Use and Recreation

The majority of the Project will occur within the Roosevelt Reservation, a 60-foot-wide reservation immediately north of the U.S./Mexico international border that was set aside for border security uses. Therefore, CBP operations and tactical infrastructure construction within the Roosevelt Reservation is consistent with the purpose of the Reservation. The Project traverses the Sasabe and Naco POEs, as well as various rural areas of Cochise, Pima, and Santa Cruz counties, including ranch land and wilderness. The landscape within the Project Area is generally undisturbed, consisting of open desert and mountains, with the exception of the existing barrier fence and patrol roads. A small portion of the Project Area is also identified for recreational use, including but not limited to hiking, hunting, camping, horseback riding, wildlife viewing, and biking.

Additionally, portions of the Project Area are federally owned by BLM, NPS, USFWS, USFS, and the Federal Government (USGS 2020). Other portions of the Project Area are owned by the State of Arizona and private landowners. **Table 5-1** summarizes land ownership within the Project Area.

Table 5-1. Land Ownership within Project Area

Owner	Project Acreage (in acres)	Agency	Designation Type	Name
Bureau of Land Management	7.0	Federal	National Conservation Area	San Pedro Riparian National Conservation Area
Bureau of Land Management	7.0	Federal	Not Specified	N/A
National Park Service	8.8	Federal	National Memorial	Coronado National Memorial
U.S. Fish and Wildlife Service	29.3	Federal	National Wildlife Refuge	Buenos Aires National Wildlife Refuge
U.S. Forest Service	136.7	Federal	National Forest	Coronado National Forest
U.S. Federal Government	533.0	Federal	Federal Land	Roosevelt Reservation
State of Arizona	38.3	State	State Trust Land	N/A
Private	71.7	Private	Private Land	N/A

Source: USGS 2020

The San Pedro Riparian NCA, containing approximately 40 miles of the upper San Pedro River, was designated by Congress as an NCA on November 18, 1988, to protect and enhance the desert riparian ecosystem. Areas providing recreational opportunities are available within the NCA, such as Murray Springs, the Spanish Presidio Santa Cruz de Terrenate, and San Pedro House (BLM 2020). The NCA is managed by BLM.

CNM, which is managed by NPS, commemorates Francisco Vásquez de Coronado's expedition of 1540–1542, the first organized expedition by Europeans into the U.S. Coronado entered what is now Arizona along the San Pedro River Valley, a few miles east of the memorial, then continued north along a route marked today as the Coronado Trail (NPS 2020). The memorial site offers several hiking trails through the foothills of the Huachuca Mountains. The Arizona National Scenic Trail, which stretches 800 miles across Arizona from Mexico to Utah, also begins at the CNM near the U.S/Mexico border (ATA 2020).

BANWR, which is managed by USFWS, spans more than 117,000 acres in Southern Arizona. Originally a private ranch, it was established as a national wildlife refuge for the endangered masked bobwhite in 1985. Since then, a team of refuge staff, biologists, volunteers, and other partners have collaborated to return BANWR to its original landscape of open, semidesert grasslands (USFWS 2020a).

CNF, which is managed by USFS, includes approximately 1.78 million acres spread across southeastern Arizona and southwestern New Mexico. CNF's mission is to sustain the unique biodiversity of the sky island ecosystems and provide a variety of high quality visitor opportunities and services within these ecosystems. Common activities include hiking, horseback riding, camping, hunting, and fishing (USFS 2020a).

5.1.2 Aesthetics

Aesthetic resources consist of natural and man-made landscape features that give a particular environment its visual characteristics. Some portions of the Project segments are within areas previously disturbed by prior fence and road construction and USBP law enforcement activities, while other segments are undisturbed. Very little natural vegetation is present within the Project corridor; only 20 special-status plant species have been documented to occur within three miles of the surveyed area (see **Chapter 8** for details on species surveys).

5.2 ENVIRONMENTAL CONSEQUENCES

5.2.1 Land Use and Recreation

Land use will remain the same for all replacement and new fence that will be constructed within the footprint of existing barrier fence and/or within the Roosevelt Reservation. Land use has the potential to change, however, in areas where the Project extends beyond the Reservation, which ends 60 feet from the border. For such areas, land will be disturbed for the border barrier and associated infrastructure, resulting in substantial impacts. Staging areas will also be temporarily impacted; however, these areas will be rehabilitated upon completion of construction activities, so associated impacts to these areas have the potential to be temporary and minimal.

Potential impacts on recreation have the potential to occur within BANWR, CNF, and CNM. Such impacts could potentially include the temporary closure of certain areas that the public could use for recreational purposes. Temporary closures of these areas have the potential to result in decreased public access to land for activities such as hiking, hunting, camping, horseback riding, wildlife viewing, and biking.

5.2.2 Aesthetics

The current barrier fence consists of vehicle and pedestrian fence. Vehicle fence stands 3- to 4-feet high in the form of either Normandy fences, metal posts that resemble large X's cabled together, or picket fences, vertical metal posts just tall enough to keep out a car. The existing pedestrian fence is made of landing mat, which is a solid metal, and stands 12- to 18- feet high.

The existing pedestrian fence is solid, but the replacement bollard wall will include small gaps, allowing for individuals to see through to the other side, thus potentially having a beneficial impact on the appearance of the landscape. The transparent qualities of the bollard wall also allow for USBP agents to see through the fence, which has the potential to be beneficial in an operational sense and for anyone else wishing to view the broader landscape across the border. Additionally, the bollard wall will be 18- to 30- feet tall, which is four to eight feet taller than the current 12-foot pedestrian fence and 15- to 27-feet taller than the current 3-foot vehicle fence. While the bollard wall has the potential to be significantly more visually obstructive than the existing pedestrian and vehicle fences, it could potentially be considered less of a visual impediment than the existing pedestrian fence, which is solid metal.

Installation of new bollard wall and construction of new access roads has the potential to have major, adverse impacts on the surrounding landscape. The Project occurs in remote areas of rugged terrain, which would only be accessible and visible from the immediate border area; however, the visual impact of a new bollard wall and associated infrastructure on an otherwise pristine area has the potential to be conspicuous. The presence of construction equipment and use of portable lighting has the potential to have a minimal impact on the appearance of the landscape during construction. The Project has the potential to degrade the existing visual character of the region; thus, impacts will be considered moderate.

Approximately 2.06 miles of primary pedestrian barrier will be built near the Arizona Trail, resulting in moderate impacts to the viewshed from the Trail’s vantage point. To minimize aesthetic impacts, CBP will implement the following BMPs (1) construction switchbacks will be kept 50 feet from the Arizona Trail, (2) the final road will be approximately 100 feet from the trailhead, and (3) some remediation will take place upon completion of construction activities.

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6. GEOLOGICAL RESOURCES AND SOILS

6.1 AFFECTED ENVIRONMENT

Geology is the study of Earth's composition and provides information on the structure and configuration of surface and subsurface features. Soils are the unconsolidated materials overlying bedrock or other parent material. Differences among soil types in terms of their structure, elasticity, strength, water absorption potential, and erosion potential affect the ability to support certain applications or uses.

Regional Geology. The Project Area is in the Basin and Range Province of the southwestern U.S. The region was formed approximately 20 million years ago when the crust stretched and faulted into mountains and was uplifted by pressure from the mantle. The topography of the Province consists of steep north-to-south-oriented ranges that alternate with flat lying valleys (Scott 2012). The Sonoran Desert, which encompasses southwestern Arizona, is similarly characterized by broad, low-elevation valleys rimmed by long, thin, parallel mountain ranges (Arizona-Sonora Desert Museum 2020). Mountaintops range from 3,000 feet in the west to 10,000 feet in the east. The elevations of valley bottoms rise from sea level in the southwest to 5,000 feet in southeastern Arizona, where deserts are replaced by grassland valleys (Arizona-Sonora Desert Museum 2020).

The terrain in southeastern Arizona is characterized by large amounts of normal faulting and many alluvial fans. The arid climate in the region prevents runoff from transporting sediment far distances, which results in the formation of the alluvial fans. Western portions of Arizona, especially near Yuma County, are near existing active faults in southern California and experience high seismic potential. Central and eastern areas along the border are seismically quiet (AZGS 2020).

Soils. Arizona has a diverse assortment of soil types throughout the state, with variations in depth, texture, chemical properties, and appropriate land uses. This diversity is directly related to regional differences in climate, parent material, topography, and erosion actions. The Project Area consists primarily of well-drained soils that range from very fine sandy loam to gravelly loam to clay loam (see **Table 6-1**). There are five soils classifications that are classified as "prime farmland if irrigated:" Tenneco fine sandy loam (Segment 9-1, 9-4), Riveroad and Comoro soils (Segment 28-1), Comoro soils (Segments 28-4, 10-3, 10-4), Grabe-Comoro complex (Segment 10-1), Pima soils (Segment 28-4). All other soils in the Project Area are classified as "not prime farmland" (NRCS Undated).

Soil runoff potential is determined by a number of different soil properties and site characteristics, which can be generalized by saturated hydraulic conductivity and slope. The soil in the Project Area has varied hydraulic conductivity values. In areas where the soil type possesses moderate to high hydraulic conductivity properties, runoff potential is primarily determined by the slope. Therefore, areas with flatter slopes — ranging between 0% and 5% — experience lower runoff potential. Areas with steeper slopes experience higher runoff potential.

Table 6-1. Soil Characteristics of Project Area

Project Segment	Soil Type	Profile	Slope	Runoff Potential
Segment 28-3	Cellar-Lampshire-Rock outcrop complex	Well drained, very gravelly sandy loam	15 to 60%	Low
Segment 28-1	Cellar-Lampshire-Rock outcrop complex	Well drained, very gravelly sandy loam	15 to 60%	Low
	Chiricahua-Lampshire complex	Well drained, clay/very gravelly loam	5 to 15%	High
	Lampshire-Romero-Rock outcrop complex	Well drained, very gravelly loam/very gravely fine sandy loam	10 to 65%	Very high
	Comoro sandy loam	Well drained, sandy loam	0 to 2%	Low
	Riveroad and Comoro soils	Well drained, clay loam/sandy loam	0 to 2%	Low
	Nolam-Tombstone complex	Well drained, very gravelly sandy clay loam	8 to 30%	Medium
Segment 28-4	Chiricahua-Lampshire complex	Well drained, clay/very gravelly loam	5 to 15%	High
	Courtland-Sasabe-Diaspar complex	Well drained, sandy loam/clay	1 to 8%	Very low
	Chiricahua-Lampshire association	Well drained, cobbly sandy loam, clay/very cobbly loam	10 to 45%	Medium
	Lampshire-Chiricahua association	Well drained, very cobbly loam	30 to 50%	Medium/ High
	Rock outcrop-Lithic Haplustolls association	None provided	15 to 60%	None provided
	Graham soils	Well drained, gravelly loam, clay	5 to 20%	Medium
	White House-Caralampi complex	Well drained, clay/very gravelly sandy clay loam	20 to 35%	Medium
	Comoro soils*	Well drained, sandy loam/gravelly sandy loam	0 to 5%	Low
	White house-Hathaway association	Well drained, gravelly loam, clay/gravelly sandy loam	5 to 45%	Medium/ High
	Caralampi gravelly sandy loam	Well drained, very gravelly sandy clay loam	10 to 60%	High
	Pima soils*	Well drained, clay loam/silt loam	0 to 3%	Low
Segment 10-3	Comoro soils*	Well drained, sandy loam/gravelly sandy loam	0 to 5%	Low
	Caralampi gravelly sandy loam	Well drained, very gravelly sandy clay loam	10 to 60%	High
	White House-Caralampi complex	Well drained, clay/very gravelly sandy clay loam	20 to 35%	Medium
	Lampshire-Chiricahua association	Well drained, very cobbly loam	30 to 50%	Medium/ High
	Chiricahua-Lampshire association	Well drained, cobbly sandy loam, clay/very cobbly loam	10 to 45%	Medium
	Lampshire very gravelly sandy loam	Well drained, very gravelly sandy loam	25 to 50%	High
	Rock outcrop-Lithic Haplustolls association	None provided	15 to 60%	None provided

	Lampshire-Chiricahua association	Well drained, very cobbly loam	30 to 50%	Medium/ High
Segment 10-1	Caralampi gravelly sandy loam	Well drained, very gravelly sandy clay loam	10 to 40%	Medium
	Grabe-Comoro complex*	Well drained, sandy loam	0 to 5%	Low
	Caralampi gravelly sandy loam	Well drained, gravelly sandy clay loam	10 to 60%	High
Segment 10-4	Comoro soils*	Well drained, sandy loam/gravelly sandy loam	0 to 5%	Low
Segment 10-5	Lampshire-Chiricahua association	Well drained, very cobbly loam	30 to 50%	Medium/ High
	Barkerville-Gaddes complex	Well drained, cobbly sandy loam/sandy loam	10 to 30%	Medium
	Barkerville-Gaddes association	Well drained, cobbly sandy loam	30 to 60%	High
Segment 10-6	Rock outcrop-Lithic Haplustolls association	None provided	15 to 60%	None provided
	Barkerville-Gaddes association	Well drained, cobbly sandy loam	30 to 60%	High
Segment 9-1	Guest-Riveroad association	Well drained, clay loam/ fine sandy loam	0 to 1%	Low
	Tenneco fine sandy loam*	Well drained, sandy clay loam	0 to 2%	Low
	Libby-Gulch complex	Well drained, clay/sandy loam/ sandy clay loam	0 to 10%	Medium
	Nolam-Libby-Buntline complex	Well drained, very cobbly sandy clay loam/loam/sandy loam	1 to 10%	Medium
	Riveroad and Ubik soils	Well drained, silt loam/loam	0 to 5%	Low
	Eloma-Caralampi-White House complex	Well drained, very gravelly clay loam	1 to 15%	Medium
	White House complex	Well drained, gravelly loam, clay	1 to 30%	High
Segment 9-4	Libby-Gulch complex	Well drained, clay/sandy loam/ sandy clay loam	0 to 10%	Medium
	Tenneco fine sandy loam*	Well drained, sandy clay loam	0 to 2%	Low
	Courtland-Sasabe-Diaspar complex	Well drained, sandy loam	1 to 8%	Very low
	Riveroad and Ubik soils	Well drained, silt loam/loam	0 to 5%	Low
Segment 9-2	Mabray-Rock outcrop complex	Well drained, extremely cobbly loam	3 to 45%	Very high
	Sutherland-Mule complex	Well drained, gravely fine sandy loam	3 to 15%	High
	Riveroad and Ubik soils	Well drained, silt loam/loam	0 to 5%	Low
	Nolam-Libby-Buntline complex	Well drained, very cobbly sandy clay loam/loam/sandy loam	1 to 10%	Medium
	Eloma-Caralampi-White House complex	Well drained, very gravelly clay loam	1 to 15%	Medium
	Altar-Mallet complex	Well drained, sandy loam	0 to 8%	Medium
	Blakeney-Luckyhills complex	Well drained, fine sandy loam	3 to 15%	Medium to High
	Luckyhills-McNeal complex	Well drained, gravelly sandy loam/clay loam	3 to 15%	Medium
	Bodecker-Riverwash complex	Excessively drained, very gravelly coarse sand	0 to 5%	Negligible

	Brunkcow-Chiricahua-Andrada complex	Well drained, coarse sandy loam/sandy loam/clay loam/gravelly sandy loam	3 to 20%	Very low
	Eloma sandy loam	Well drained, gravelly loam	1 to 10%	Medium
	Libby-Gulch complex	Well drained, clay/sandy loam/ sandy clay loam	0 to 10%	Medium
	Guest-Riveroad association	Well drained, clay loam/ fine sandy loam	0 to 1%	Low
Segment 9-3	Sutherland-Mule complex	Well drained, gravely fine sandy loam	3 to 15%	High
	Riveroad and Ubik soils	Well drained, silt loam/loam	0 to 5%	Low
	Brunkcow-Chiricahua-Andrada complex	Well drained, coarse sandy loam/sandy loam/clay loam/gravelly sandy loam	3 to 20%	Very low
	Luckyhills-McNeal complex	Well drained, gravelly sandy loam/clay loam	3 to 15%	Medium
Segment 9-5	Sutherland-Mule complex	Well drained, gravely fine sandy loam	3 to 15%	High
	Mabray-Rock outcrop complex	Well drained, extremely cobbly loam	3 to 45%	Very high
	Hayhollow-Rafter-Riverwash	Well drained, sand/gravelly fine sandy loam	0 to 5%	Low
	Cherrycow-Magoffin-Rock outcrop complex	Moderately well drained to well drained, sandy loam, clay	15 to 65%	Very high
	Rough broken land and rock land	Bedrock	25 to 75%	Very high

Source: NRCS Undated
*Soils that are classified as "prime farmland if irrigated."

6.2 ENVIRONMENTAL CONSEQUENCES

Impacts on geology and soils are considered adverse if they alter the lithology (i.e., the character of a rock formation), stratigraphy (i.e., the layering of sedimentary rocks), and geological structures that dictate groundwater systems, change the soil composition, structure, or function within the environment, or increase the risk of geological hazards.

Regional Geology. Short- and long-term, moderate, adverse impacts on topography has the potential to occur from earthmoving and grading activities during construction. Topography has the potential to be altered using drill-and-shoot excavation and other ground-leveling techniques to provide flat surfaces for the construction of the pedestrian and vehicle barriers, ancillary support facilities and structures, and access roads.

Soils. Approximately 538 acres of soil (length of Project Area within the 60-foot Roosevelt Reservation) have the potential to be permanently affected, of which 247 acres have been previously disturbed. Short-term, minor, adverse impacts on soils have the potential to result from disturbance of ground surfaces, earthmoving activities, and grading within the proposed disturbance area during construction. These activities would excavate soils and expose rock materials, temporarily remove vegetation in some areas, and expose soils to erosion.

In general, accelerated erosion of soils has the potential to be short-term during construction activities and minimized by appropriately siting and designing facilities to take into account soil limitations, employing construction and stabilization techniques appropriate for the soil and

climate, and implementing BMPs and erosion control measures. BMPs include the installation of silt fencing and sediment traps, application of water to disturbed soil to reduce dust, grading of staging areas, and re-vegetation of disturbed areas as soon as possible following ground disturbance, as appropriate. Pre- and post-construction BMPs have been developed and will be implemented to reduce or eliminate erosion and potential downstream sedimentation.

The potential exists for petroleum, oil, and lubricants (POLs) to be spilled during refueling of the construction equipment, adversely impacting soils; however, drip pans will be placed under all staged equipment, and secondary containment will be used when refueling equipment. A SWPPP and SPCCP have been prepared prior to construction activities and BMPs described in these plans will be implemented to reduce potential erosion and contamination.

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7. HYDROLOGY AND WATER MANAGEMENT

7.1 AFFECTED ENVIRONMENT

Hydrology and water management relate to natural and man-made water resources that are available for use by, and for the benefit of, humans and the environment. Evaluation of hydrology and water resources examines the quantity and quality of the resource and its demand for various purposes.

Hydrology concerns the distribution of water-to-water resources, including surface waters and groundwater, through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow. Groundwater consists of subsurface hydrologic resources and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater features include depth from land surface, aquifer or well capacity, quality, recharge rate, and surrounding geologic formations. Surface water includes natural, modified, and constructed water confinement and conveyance features located above groundwater that could have a defined channel and discernable water flows. These features are generally classified as streams, springs, wetlands, natural and artificial impoundments (e.g., ponds, lakes), and constructed drainage canals and ditches.

7.1.1 Groundwater

The Project overlies multiple groundwater basins in Arizona – the San Simon Wash, San Rafael, Upper San Pedro, Douglas, and San Bernardino Valley (see **Figure 7-1**).

Segment 28-3 spans the San Simon Wash groundwater basin. Little information is known about the features of the San Simon Wash groundwater basin. Arizona Department of Water Resources does not have available testing and sampling data for waters located on Native American lands.

Segments 10-5 and 10-4 span the San Rafael groundwater basin. The San Rafael groundwater basin is approximately 172 square miles, of which the majority is in Santa Cruz County, with the extreme eastern portion in Cochise County (ADEQ 2003). Groundwater depth averages at 10-25 feet below land surface near major waterways to over 100 feet below land surface in other parts of the basin. The groundwater in the basin moves from the mountains toward the Santa Cruz River and then south into Mexico.

Segments 10-6, 9-1, and 9-4 span the Upper San Pedro groundwater basin. The Upper San Pedro groundwater basin spans 1,825 square miles primarily across Cochise County in southeastern Arizona and extends into northern Mexico. The groundwater within the basin is generally unconfined and is found above land surface (flowing wells) to more than 500 feet below surface at basin perimeter (ADEQ 2012). The basin receives inflows from mountain-front recharge and stream infiltration with minor underflow.

Segments 9-2 and 9-3 overly the Douglas groundwater basin. The Douglas groundwater basin covers 950 square miles in southeastern Arizona and northern Mexico. Groundwater within the aquifer generally flows toward the center of the valley and then south toward Mexico (ADEQ

1999). The main drainage is Whitewater Draw. The Douglas basin shares many similar characteristics with the Upper San Pedro basin, as the groundwater is also unconfined and could be up to 500 feet below surface. Mountain-front recharge could contribute up to 20,000 acre-feet of inflow per year. Approximately 90% of groundwater pumping in the basin is for agriculture (USGS 2006).

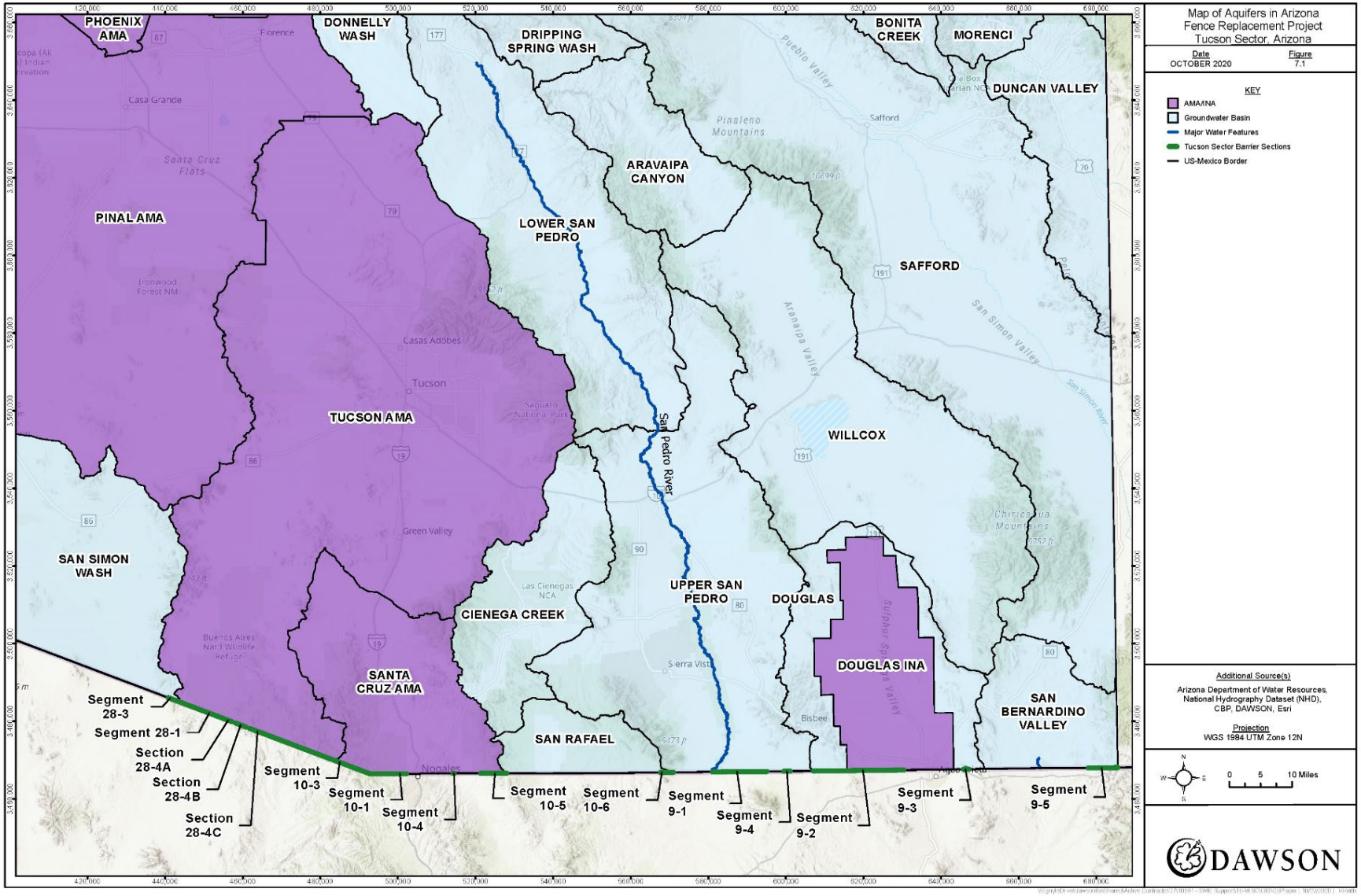
Segment 9-5 spans the San Bernardino Valley groundwater basin. The San Bernardino Valley groundwater basin includes approximately 387 square miles in the extreme southeastern corner of Arizona within Cochise County. The basin extends about 35 square miles into New Mexico and about 400 square miles into Mexico. The basin is generally unconfined and is characterized by thin layers of sand and gravel interbedded with basalt flows. Groundwater flows from the mountains toward the center of the valley and then to Mexico. Annual transboundary discharge is approximately 5,545 acre-feet. Groundwater depths range from less than 200 feet to more than 600 feet below surface (ADEQ 2011).

Arizona Water Management. In 1980, Arizona implemented the Groundwater Management Code (the Code) to aggressively manage the state's groundwater resources to support the growing economy. The goals of the Code are to control severe overdrafting, efficiently allocate the state's current resources, and augment water supply development. The Code designated areas that require moderate water management provisions as Irrigation Non-Expansion Areas (INAs). There are three recognized INAs in Arizona: Douglas, Joseph City, Harquahala. Areas that experienced severe overdrafting were designated as Active Management Areas (AMAs). The Code recognized five AMAs in Arizona: Prescott, Phoenix, Pinal, Tucson, and Santa Cruz. The AMAs include 80% of Arizona's population and 70% of the state's groundwater overdraft (ADWR Undated). Each AMA carries out its programs in a manner consistent with the goals of the Code while considering and incorporating the unique character of each AMA. The Project transverses the Tucson AMA, the Santa Cruz AMA, and the Douglas INA (see **Figure 7-1**).

Segments 28-3, 28-1, 28-4, and 10-3 span the Tucson AMA. The Tucson AMA cover 3,866 square miles in southern Arizona. The AMA covers two groundwater sub-basins – the Avra Valley sub-basin and Upper Santa Cruz sub-basin. Groundwater pumping for agricultural, municipal, and industrial purposes is largest source of water withdrawal from the Tucson AMA. Between 1940 and 2010, water level declines of 100 feet to 250 feet occurred in both the sub-basins. During that time, water level declines reduced aquifer storage by six to eight million acre-feet (ADWR 2016). Some of the storage has since recovered. The long-term average of mountain-front recharge, the largest source of recharge in the AMA, is estimated to be 28,100 acre-feet per year. The statutory management goal for the AMA is to attain safe-yield (the long-term balancing of groundwater withdrawals with the amount of water naturally and artificially recharged to AMA aquifers) by the year 2025. The primary tool to achieve the AMA's goal is the Assured Water Supply Program that requires every person proposing to subdivide land within the AMA to demonstrate the availability of a 100-year water supply. The management plan includes other strategies to reach safe yield, including the establishment of the Arizona Water Banking Authority and Groundwater Saving Facilities and a requirement for water right holders who pump groundwater from non-exempt wells to measure and report their water use (ADWR 2016).

Segments 10-3, 10-5, 10-1, 10-4, and 10-6 span the Santa Cruz AMA. The Santa Cruz AMA covers 716 square miles and is primarily concentrated around the Santa Cruz River. The AMA

Figure 7-1. Map of Groundwater Basins near the Project Area



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overlies three aquifer units: Nogales Formation, the Older Alluvium, and the Younger Alluvium. The alluvial units are generally unconfined and hydraulically connected, while the Nogales Formation is hydrologic bedrock that doesn't yield water in most places (ADWR 2020a). The region's groundwater and surface water has historically supported local agriculture, which, in addition to downcutting and channelization, contributed to declining water tables in the mid-20th century. Today, all demand sectors (municipal, industrial, agricultural) rely on groundwater. The statutory management goal of the AMA is to maintain safe-yield conditions and prevent long-term local water table declines. Maintenance of safe yield requires that AMA water users monitor water withdrawals, develop and maintain plans for increased conservation/curtailment in times of reduced natural flows, explore ways to increase use of reclaimed water, and identify and pursue additional water supplies (ADWR 2020a). Unlike the Tucson AMA, the Santa Cruz AMA has not yet adopted the Assured Water Supply program, nor has it implemented groundwater recharge initiatives.

Segment 9-2 spans the Douglas INA, which overlies part of the Douglas groundwater basin. According to the Code, INAs can be established if there is insufficient groundwater to provide reasonably safe supply for irrigation and if the establishment of an AMA is considered not necessary. INAs do not generally allow irrigation of new acres and also require all owners of groundwater withdrawal authorities to report water use to the state.

7.1.2 Surface Water and Waters of the United States

The Project is in an arid climate characterized by high air and soil temperatures and high evaporation rates. The primary source of water inflow into the basin is runoff from adjacent lands, occasional precipitation in the spring, and monsoonal rainfall during the summer and fall. Precipitation across the entire span of the Project Area can range between eight and 23 inches annually. Minimal groundcover and steep topography can lead to heavy runoff and high erosion during the infrequent precipitation events.

The Project Area is characterized by the presence of ephemeral streams, which are episodic channels that convey water flow during and immediately after precipitation events. The streams are generally shallow-bottomed narrow channels; however, some braided systems that stretch across alluvial fan and flood plain systems were also observed. Although the channels appear larger due to surrounding topography, their single flow channels remain shallow and flows were not considered to be intermittent.

Waters of the United States. USACE regulates "Waters of the United States" under Section 404 of the Clean Water Act (CWA). Waters of the U.S. are defined in the CFR as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, as defined in the Corp of Engineers Wetlands Delineation Manual, are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as "non-wetland waters" and are often characterized by an ordinary high water mark (OHWM). Non-wetland waters generally include lakes, rivers, streams, and other open-water habitats.

The evaluation of wetland and waters indicators to determine the presence of water subject to jurisdiction was conducted between March and April 2020. The Survey Area for the delineation consisted of a 100-foot boundary north of the International Boundary Line along each of the Project segments.

The Survey Area contains 2.78 acres of potentially jurisdictional non-wetland waters. All waters are identified as ephemeral. The ephemeral streams are not considered to be connected to traditional navigable waters that flow year-round or seasonally up to a period of three months. The Project Area does not contain any jurisdictional wetland waters. The complete WOUS jurisdictional assessment is provided in **Appendix C**.

Impaired Surface Waters. Water quality standards are regulated by USEPA, under the Safe Drinking Water Act and the CWA. Section 303(d) of the CWA requires states to identify and develop a list of impaired water bodies where technology-based and other required controls have not provided attainment of water quality standards. Section 305(b) of the CWA requires states to assess and report the quality of their water bodies. Arizona Department of Environmental Quality (ADEQ) uses monitoring data to assess whether lake and stream uses are protected by the CWA and can be used for recreation, drinking, agriculture, wildlife and fish consumption.

The Project is not located near any USEPA-designated impaired water bodies (ADEQ 2020).

7.1.3 Floodplains

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body.

Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as the area that has a 1 percent chance of inundation by a flood event each year. Certain facilities, such as hospitals, schools, or storage buildings for irreplaceable records, inherently pose too great a risk to be in either the 100- or 500-year floodplain. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

Floodplains are protected under EO 11988, Floodplain Management, which requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of appropriate FEMA Flood Insurance Rate Maps (FIRMs), which contain enough general information to determine the relationship of the Project Area to nearby floodplains. If a Federal agency action encroaches within the floodplain and alters the flood hazards designated on a FIRM (e.g., changes to the floodplain boundary), an analysis reflecting any changes must be submitted to the FEMA. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988 outlined in the FEMA document Further Advice on EO 11988 Floodplain Management.

All construction activities near the floodplain should be coordinated with the Floodplain Manager for the area FEMA office.

Floodplains in the Project Area. A review of the FIRMs for Cochise, Pima, and Santa Cruz counties in Arizona shows that parts of the Project Area occur within a regulatory floodway (see **Figure 7-2).** A regulatory floodway is defined as the channel of a river or other watercourse and the adjacent land area that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. (FEMA 2019). Parts of the Project Area also occur within Zone A, which is defined by FEMA as a Special Flood Hazard Area subject to inundation by the 1 percent annual chance flood (FEMA 2020). Other parts are mapped as Zone X, which is defined as an area determined to be outside the 0.2 percent annual chance floodplain (FEMA 2020).

7.2 ENVIRONMENTAL CONSEQUENCES

The Project is not bound by Section 404 of the CWA and therefore CBP is not required to abide by its rules and regulations. Nevertheless, CBP recognizes the importance of environmental stewardship and will provide post-construction determinations of impacts to determine if and where additional stewardship may be necessary, given the availability of appropriate funds.

7.2.1 Groundwater

The Project has the potential to have moderate to major, temporary adverse impacts on the availability of water resources in the region. The Project requires water from the local supply for road construction, including pouring concrete, cut-and-fill operations, and fugitive dust suppression during construction activities.

This temporary demand is unlikely to have a permanent impact on the local water supply, which is drawn from a diverse set of water sources. If local groundwater pumping is found to have an adverse effect to aquatic, marsh, or riparian dwelling threatened and endangered species, treated water from outside the immediate area must be utilized.

Prior to drilling new wells or using existing ones, the contractor is required to receive approval for all proposed well locations from CBP. To use private wells, the contractor must receive permission from the individual landowner.

Groundwater contamination due to road improvements or fence installation is likely to be negligible due to the implementation of SWPPP measures and the natural filtration of soils overlying the aquifers in the Project corridor. Groundwater quality does not have the potential to be permanently impacted as a result of the Project.

7.2.2 Surface Water and Waters of the United States

Construction of the new barrier system has the potential to result in permanent and temporary, minor, adverse impacts on ephemeral surface waters, including the 2.78 acres of potentially jurisdictional waters within the Survey Area. The Project has the potential to increase impervious surfaces, which could redirect surface flows and result in adverse impacts on surface waters if

these flows cause scour or introduce sediment or other contaminants not already occurring in the drainages.

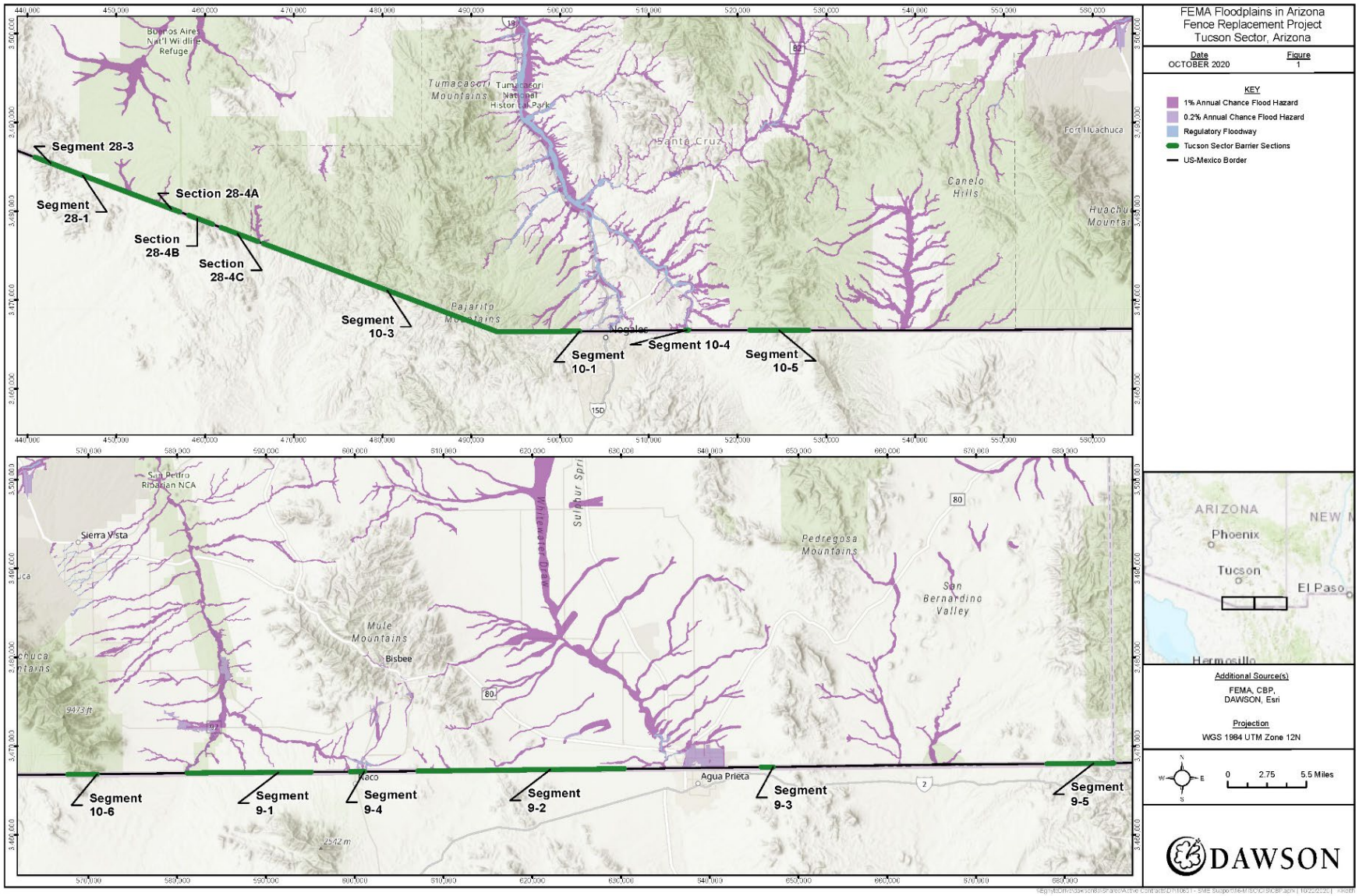
During construction, there is a potential for sediment and other contaminants to be introduced to surface waters and ultimately impact downstream water quality. Chemical or petroleum spills have the potential to result in short-term, direct impacts on surface waters. However, implementation of typical stormwater protection BMPs and spill prevention and management plans have the potential to reduce or eliminate permanent, adverse impacts on the water quality of surface waters.

7.2.3 Floodplains

The Project has the potential to result in moderate, short- and long-term permanent impacts on regulatory floodways and Zone A floodplains that are subject to inundation by the 1 percent annual chance flood. There are approximately 9 acres of Zone A floodplains in the Project Area and 1 acre of regulatory floodways.

Some potential impacts of the border fence include increased risk of flooding due to increased runoff velocities from additional hard surfaces, potentially obstructed waterways, slightly reduced infiltration, and possibly minimal reductions in groundwater recharge. CBP will coordinate with the construction contractor to consider these impacts and develop a barrier design that includes footings flush with ground, as well as culverts and gates in drainages to maintain continuous water flow and minimize debris build-up during flood events. Erosion and sediment control and storm water management practices will be implemented during and after construction.

Figure 7-2. Floodplain Map of the Project Area



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8. BIOLOGICAL RESOURCES (VEGETATION, WILDLIFE, SPECIAL-STATUS SPECIES)

8.1 AFFECTED ENVIRONMENT

The Project is situated in USBP's Tucson Sector region of the international boundary between the U.S. and Mexico. A selection of Project segments was surveyed during this effort during March, April, and July 2020. The designated survey area for the effort was 100 feet north of the international border (the Survey Area). The southern boundary of the Survey Area was delineated by Normandy fencing, barbed wire, and border monuments. For segments with no physical indication to delineate the international border biologists used aerial maps and global positioning units to navigate the Survey Area.

The Survey Area falls within two Level III Ecoregions, the Sonoran Basin and Range and the Madrean Archipelago. The Level IV Ecoregion associated with the Sonoran Basin and Range is the Arizona Upland/Eastern Sonoran Basins, while the following three Level IV Ecoregions are associated with the Madrean Archipelago: Apachian Valley and Low Hills, Lower Madrean Woodlands, and Madrean Basin Grasslands (Griffith et al. 2016). Ecoregions are areas where ecosystems (and the type, quality, and quantity of environmental resources) are generally similar. The regional climate for the Sonoran Basin and Range include hot, arid summers, and variable summer precipitation ranging from 8 to 23 inches annually. Monsoonal activity is extremely variable spatially and year to year. Annual low temperatures range between 45 degrees Fahrenheit (°F) and 75°F with high temperatures range between 65°F and 105°F. The regional climate for the Madrean Archipelago includes hot, arid summers leading into late summer monsoonal (precipitation average of 14 inches annually) activity. This is followed by a moderate winter season with most of the annual precipitation falling as snow at higher elevations. Southeastern Arizona receives the highest precipitation rates across the state due to its proximity to the core of monsoonal region in Mexico. Annual low temperatures range between 32°F and 68°F with high temperatures range between 65°F and 100°F (ADWR 2020b; U.S. Climate Data 2020). Overall, elevations across Project segments range between 3,500 to 6,100 feet above mean sea level (Google Earth 2020).

A literature search identified 148 special-status species whose potential occurrence needed to be evaluated within the Survey Area. General biological surveys for all segments were conducted between April and July 2020 by biologists to identify suitable habitat for special-status species. Habitat conditions observed in the Survey Area were used to evaluate the potential for occurrence of special-status species based on these surveys and the professional expertise of the investigating biologists. The following sources were reviewed to determine which special-status plant and wildlife species have been previously documented to occur near the Survey Area:

- AGFD HabiMap Arizona environmental review online tool (AZGFD 2020; HabiMap Arizona),
- USFWS Endangered Species by County Database (USFWS 2020b),
- Arizona Rare Plant Advisory Group Sensitive Plant List (ANPS 2014),

- NatureServe (NatureServe 2020),
- Natural Resources Conservation Service, U.S. Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Cochise, Pima, and Santa Cruz Counties, Arizona (Soil Survey Staff 2020),
- USGS 7.5-minute quadrangles Presumido Peak, Old Glory, Nogales, Hereford, and Perilla (USGS 1972),
- USFS Region 3 Regional Forester's Sensitive Species: Animals – 2013 (USFS 2020b; USFS 2020c), and;
- BLM California Special-Status Animal Species and Sensitive Species List (BLM 2017).

8.1.1 Vegetation Communities

Vegetation types across the Survey Area were mapped using the U.S. National Vegetation Classifications Database (USNVC 2020) and habitats were mapped to the association level when possible. Vegetation mapping was conducted with the use of a global positioning system and aerial photographs. Vegetation communities across all Project segments are as follows:

- Segment 28-3: *Fouquieria splendens* - *Calliandra eriophylla- Parthenium incanum* Desert Scrub Alliance.
- Segment 28-4A: *Calliandra eriophylla*/Mixed Desert Grasses Shrubland, *Dodonaea angustifolia – Dasylirion wheeleri* Desert Scrub, *Fouquieria splendens – Prosopis velutina* Shrubland, *Mimosa aculeaticarpa* - *Dasylirion wheeleri* /Mixed Desert Grasses Shrubland, *Prosopis velutina – Dodonaea viscosa* Desert Scrub, *Prosopis velutina* Ruderal Foothill Shrubland, *Prosopis glandulosa-Prosopis velutina-Prosopis pubescens* Wet Scrub Alliance, *Quercus oblongifolia* Scrub Woodland Alliance, *Quercus oblongifolia* Scrub Woodland Alliance, and *Quercus turbinella* Chaparral Alliance.
- Segment 10-3: *Arctostaphylos pungens-Arctostaphylos pringlei-Ceanothus greggii* Chaparral Alliance, *Dasylirion ssp./Bouteloua curtipendula-Muhlenbergia setifolia* Foothill Desert Grassland Alliance, *Prosopis velutina* Ruderal Desert Scrub Alliance, and *Quercus oblongifolia* Scrub Woodland Alliance..
- Portions of Segment 10-1: *Pinus cembroides* - *Pinus discolor* - *Pinus edulis* / Shrub Understory Woodland Alliance and *Prosopis velutina Ruderal* Desert Scrub Alliance.
- Portions of Segment 10-5: *Pinus cembroides* - *Pinus discolor* - *Pinus edulis* / Shrub Understory Woodland Alliance and *Prosopis velutina Ruderal* Desert Scrub Alliance.
- Portions of Segment 10-6: *Acacia constricta – Acacia neovemicosa*/ Thornscrub Alliance, *Quercus arizonica* - *Quercus emoryi* - *Quercus grisea* Scrub Woodland Alliance, and *Pleuraphis mutica –Sporobolus airoides – Panicum obtusum*/ Semi-Desert Lowland Grassland Group.

- Segment 9-5: *Fouquieria splendens - Calliandra eriophylla - Parthenium incanum* Desert Scrub Alliance and *Platanus wrightii* Riparian Forest Alliance.

8.1.2 Wildlife

A total of 128 special-status wildlife and 20 special-status plant species have been documented to occur within three miles of the Survey Area. All special-status plant and wildlife species listed in **Appendix A** have potential to occur in the Survey Area due to suitable soil, topographical, and/or vegetation communities observed during surveys.

Designated critical habitat has been identified for two special-status species within the Project Area: jaguar (*Panthera onca*) and Mexican spotted owl (*Strix occidentalis lucida*). Proposed critical habitat has been identified for three special-status species within the Project Area: Northern Mexican gartersnake (*Thamnophis eques megalops*), yellow-billed cuckoo (*Coccyzus americanus*), and beardless chinchweed (*Pectis imberbis*). The above critical habitat designations occur within the following Project segments listed in **Table 8-1**.

Table 8-1. Critical Habitat Designations in the Project Area

Plant or Wildlife Species Listed	Project Segment	Critical Habitat Designation
Jaguar (*Panthera onca*)	28-3, 28-1, 10-3, 10-5, and 10-6	Designated
Mexican spotted owl (*Strix occidentalis lucida*)	10-3, 10-5, and 10-6	Designated
Yellow-billed cuckoo (*Coccyzus americanus*)	10-5	Proposed
Northern Mexican gartersnake (*Thamnophis eques megalops*)	10-5	Proposed
Beardless chinchweed (*Pectis imberbis*)	10-6	Proposed

8.2 ENVIRONMENTAL CONSEQUENCES

8.2.1 Vegetation Communities

The Project has the potential to have minimal impacts on native vegetation communities. The majority of permanent and temporary impacts have the potential to take place on previously disturbed or developed areas, primarily existing dirt or all-weather access roads. Construction of the fence has the potential to cause both temporary and permanent impacts. Permanent impacts have the potential to take place in the 60-foot-wide area that will be occupied by the replacement bollard-style fencing and the adjacent all-weather road; in some areas of difficult terrain, this corridor could potentially be 100 feet wide. Temporary construction impact areas also have the potential to be within the Roosevelt Reservation and be areas used by equipment along the fence, platforms for cranes, staging areas, and other access routes from existing roads to the work areas. The Project has the potential to result in long-term degradation of vegetation communities as a result of soil erosion on the extreme slopes in the Project Area. However, following construction, restoration of disturbed areas will take place using native plants and have the potential to assist in

the minimization of erosion. Any topsoil removed from the work areas will be stockpiled and stored on-site for revegetation activities.

To minimize soil disturbance and erosion, general BMPs will be implemented. Additionally, the anticipated reduction in illegal border traffic from the deterrence provided by the bollard-style fence has the potential to result in a beneficial impact on vegetation communities in the region. Fewer border crossings have the potential to result in fewer opportunities for vegetation to be disturbed by foot traffic, litter, and other human activities.

8.2.2 Wildlife

Mobile wildlife such as birds and larger mammals have the potential to move away from the construction area toward nearby areas of similar habitat, while smaller, slow, or sedentary species such as reptiles, amphibians, and smaller mammals have the potential to be lost during construction. Therefore, direct negligible to minor, negative impacts on wildlife within the Project Area have the potential to occur. However, because construction will be temporary and much of the habitat will be restored, the potential for this Project to result in long-term or significant decreases in most wildlife populations in the region is unlikely. Migratory birds have the potential to be impacted through direct loss of habitat, including foraging, roosting, nesting, and escape cover. Adverse impacts on nesting birds within the Project footprint have the potential to be mitigated by avoidance or relocation by a qualified biologist. BMPs will be implemented to minimize potential impacts on migratory birds. Larger mammals, such as jaguars, whose migratory patterns have the potential to be disrupted by the inability to traverse through the bollard-style fencing could also experience the loss of genetic diversity when populations across the border are no longer able to mate.

Designated critical habitat has been identified for two special-status species within the Project Area including the jaguar and Mexican spotted owl. Proposed critical habitat has been identified for three special-status species within the Project Area including the Northern Mexican gartersnake, yellow-billed cuckoo, and beardless chinchweed. Construction within segments 28-3, 28-1, 10-3, 10-5, and 10-6 have the potential to impact both designated and proposed critical habitat for these species. However, these impacts have the potential to be minimized through implementation of appropriate BMPs for the protection of these species as well as for general plants, wildlife, and habitats. The scope and extent of any mitigation required will be based on a final assessment of impacts and available funding.

Construction-related noise has the potential to have short-term impacts on wildlife species within the Project Area. Anthropogenic noise has been found to increase physiological stress, compromise predator/prey detection, affect mating signals and territorial defense, decrease foraging efficiency, and alter temporal or movement patterns in wildlife, although the intensity of behavioral responses due to noise varies among species as well as individuals within a species (Francis and Barber 2013). Because construction activities could take place 24 hours a day and the most active periods for most wildlife are between dusk and dawn, the Project noise-related impacts during construction have the potential to be moderate.

The use of portable construction lighting has the potential to impact foraging, reproduction, and communication of various wildlife species such as bats and insects. Light pollution can cause

disorientation to wildlife by extending diurnal and crepuscular behaviors into the night. Some species have the potential to benefit from this, as it increases foraging potential for predators but decreases benefits for prey (Longcore and Rich 2004). Conversely, animals that forage at night have the potential to be negatively influenced due to the shortened nighttime hours or could move away from the area altogether.

Reproduction in certain species also has the potential to be affected; frogs, for example, have been documented to stop mating activity in the presence of nighttime light. The Project Area will be illuminated at night by permanent lighting for border enforcement activities, which has the potential to have a moderate impact on wildlife activities. However, all lighting will be shielded and directed down to minimize impacts on wildlife.

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9. CULTURAL RESOURCES

9.1 AFFECTED ENVIRONMENT

"Cultural resources" is an umbrella term for many heritage-related resources defined in several federal laws and executive orders, including the National Historic Preservation Act (NHPA), the Archeological and Historic Preservation Act, the American Indian Religious Freedom Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act (NAGPRA). NHPA focuses on cultural resources such as prehistoric and historic sites, buildings and structures, districts, and other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Such resources might provide insight into the cultural practices of previous civilizations or retain cultural and religious significance to modern groups. Resources judged important under criteria established in NHPA are considered eligible for listing in NRHP. These resources are termed "historic properties" and protected under NHPA.

9.1.1 Project Location and Setting

A cultural resources survey was conducted of 275.90 acres in 20 survey areas including six border wall segments, one batch plant, nine staging areas, and four access roads associated with the Project along the U.S./Mexico international border in the Tucson Sector, in Cochise, Pima, and Santa Cruz counties, Arizona. Surveyed areas are on lands administered by USFS (CNF), NPS (CNM), BLM, as well as private interests.

The Project Area is located in the Basin and Range physiographic province in southern and southeastern Arizona (Hendricks 1985), which is characterized by northwest to southeast trending fault block mountain ranges separated by broad alluvial valleys. The survey areas are located discontinuously along a stretch of approximately 155 miles of Arizona's southern border, from the Baboquivari Mountains on the west to the New Mexico border on the east. Project topography is highly variable, ranging from flat, alluvial valleys to rugged mountain terrain. Elevations within the overall survey area range from about 3,400 feet above mean sea level (amsl) near the town of Sasabe to about 6,250 feet amsl in the Huachuca Mountains.

9.1.2 Records Check and Survey Results

Records of previous cultural resources investigations and previously recorded archaeological sites on file at CBP, BLM, CNF, the CNM, and AZSITE (Arizona's online database) were consulted prior to survey. The records searched showed 20 previous archaeological surveys and 12 previously recorded archaeological sites within one-quarter mile of, or intersecting with, the current survey areas. **Table 9-1** summarizes previous cultural resources investigations within the current survey area. **Table 9-2** summarizes the previously recorded archaeological sites with within one-quarter mile of the survey area.

Archeologists conducted pedestrian surveys of 275.90 acres of proposed roads, a batch plant, staging areas, and border segments associated with the Project on June 4, June 29-30, July 1-2, July 7-8, and August 12, 2020. Pedestrian surveys were completed via equally spaced transects at

Table 9-1. Summary of Previous Surveys within ¼-Mile of the Survey Area

Project Name	Reference
Border Replacement Ajo to Douglas Survey	Billstrand and Cox 2019
Proposed D-5 Fence Segment	Carpenter 2008
DV-6, DV-7, DV-8 Fence and Access Road	Carpenter and Hart 2009
Project E-2A	Dosh 2008
Project CV-1B	Dosh and Hart 2008
San Bernardino Valley Survey	Douglas and Brown 1984
Temporary Vehicle Barriers near Flood Gates	Farrell and Gillespie 2006
Montana Allotment Management Plan	Gillespie and Thwaits 1999
FV-1B Vehicle Fence Corridor	Grant et al. 2008
Sonoita Road Improvements	Hart 2005
18 Miles of Road Improvements near Nogales	Lindemuth and Welch 2006
Nogales Ranger District on Coronado National Forest	Mehalic 2008
Coronado Access Roads	Marshall 2010
Fresnal Mine Road and Drill Pad	Randall 1990
Fresnal Mine Road and Drill Pad (amendment)	Randall 1991
58.4 Mile International Border Survey near Douglas and Naco	Rieder and Slawson 2002
Fischer Watt Gold Claims	South 1988
Acquired Lands, USFS-Coronado National Memorial Land Exchange	Stewart and Purvis 1975a
A Series of Small YACC Project, Coronado Nat'l Monument	Stewart and Purvis 1975b
02354 Site Relocation (Douglas-Naco)	Yost et al. 2001

Table 9-2. Summary of Previously Recorded Sites within ¼-Mile of the Survey Area

Site Number	Site Name or Description	Source
AZ DD:11:22(ASM)	Prehistoric artifact scatter and habitation site	Carpenter and Hart 2009; Mehalic 2008
AZ DD:12:44(ASM)	International Boundary Monument 127	Carpenter 2008
AZ DD:12:45(ASM)*	International Boundary Monument 128	Carpenter 2008
AZ DD:12:54(ASM)/ AR-03-05-02-00497*	California Gulch Middle Archaic Site	Carpenter and Hart 2009
AZ EE:9:236(ASM)*	International Boundary Monument 116	Lindemuth and Welch 2006
AZ EE:12:26(ASM)	Semi-circular rock alignment and possible hearth	AZSITE, Coronado National Monument
AZ FF:9:10(ASM)*	Christiansen Border Village	Rieder and Slawson 2002
AZ FF:9:16(ASM)	Artifact scatter (prehistoric)	Rieder and Slawson 2002
AR-03-05-02-00594	Cerro del Fresnal - rock shelters/caves	Coronado National Forest

AR-03-05-02-00613	International Boundary Monument 136	Coronado National Forest; Carpenter and Hart 2009
AR 03-05-02-00748	Artifact scatter (ceramics, flaked stone)	Carpenter and Hart 2009
AR 03-05-03-00069	Yaqui Springs, prehistoric artifact scatter	Coronado National Forest
AR 03-05-03-00070	Yaqui Springs, prehistoric artifact scatter and features	Coronado National Forest

*Site reported to intersect current surveyed areas.
Key: ASM = Arizona State Museum

30-50-foot intervals covering surveyed areas. Photographs were taken and notes recorded about the environment and condition of each location. Identified cultural resources were plotted with a handheld global positioning system, and all previously recorded archaeological sites within the survey areas were revisited during the current survey. Extremely steep areas (i.e., slopes with greater than 20-percent grades) were surveyed remotely with the use of high-power binoculars.

The current survey relocated six previously recorded cultural resource sites (AZ DD:12:54[ASM] and International Boundary Monuments 100, 101, 102, 116 (AZ EE:9:236[ASM]), and 128 (AZ DD:12:45[ASM]), two Isolated Occurrences (IOs) (artifacts), and two Isolated Features (IFs). One previously documented site (AZ FF:9:10[ASM]) was not observed in the survey area. Two additional sites were identified and recorded as field sites. The IOs were identified as the remains of a 55-gallon steel drum and a flaked stone scraper crafted from dark gray fine-grained volcanic rock. IF 1 is a collapsed rock cairn thought likely to be a historic mining claim. The feature measures about 4 feet in diameter and was constructed of locally available cobble and boulders. A highly deteriorated wood fragment, perhaps the remains of a claim post, is present within the feature. IF 2 is a rock cairn of unknown age and function measuring approximately 1 meter in diameter and 0.5 meters tall (see **Appendix D**).

AZ DD:12:54(ASM)/AR03-05-02-497 contains a total of 12 features and numerous artifacts. Features 1 through 10 consist of rock piles of local cobbles and range in size from 0.9 to 3.5 m in diameter. These rock piles are concentrated in the eastern half of the site. Feature 11 is a rock ring measuring 0.7 m in diameter; it contains a small chert biface, one small white bead, one hand stone fragment, and one basalt Chiricahua point all located near the feature. A low mound and associated artifacts constitute Feature 12—a possible historic structure. The possible structure measures approximately 15 ft by 10 ft. Feature 12 is located in the southeastern portion of the site, and historic artifacts associated with it include tin cans, fragments of clear, aqua, olive, brown, and sun-colored amethyst glass, harmonica fragments, cartridge casings, and one sherd of Papago Red Ware.

Field Site 1 is a lithic scatter, most of which is located outside of the current survey area and remains unrecorded. The small portion of the site documented during the current Project is located along a downslope margin of the site; it is believed that subsurface features are unlikely in this portion of the site and that current documentation of that portion of the site has exhausted its research potential.

9.2 ENVIRONMENTAL CONSEQUENCES

Although the Secretary's waiver means that CBP does not have any specific obligations under the NHPA, DHS and CBP recognize the importance of responsible environmental stewardship. CBP has therefore applied the general standards and guidelines associated with the NHPA as the basis for evaluating potential environmental impacts and appropriate BMPs.

The Isolated Occurrences (IO 1 and IO 2) and Isolated Features (IF 1 and IF 2) identified during the current survey are not considered significant nor are they eligible under any NRHP criterion. No further work is necessary at these locations.

Site AZ DD:12:54(ASM) (prehistoric/historic) is considered eligible to the National Register of Historic Places (NRHP) under Criterion D and should be avoided or monitored during any ground disturbing activities within site boundaries to mitigate impacts to the site. International Boundary Monuments 100, 101, 102, 116 (AZ EE:9:236[ASM]), and 128 (AZ DD:12:45[ASM]), also eligible for the NRHP (Criteria A and C), will be avoided during Project construction; as a result, no impacts are expected.

Field Site 1 remains unevaluated for NRHP inclusion. Therefore, it is recommended that the portion of the site within the current survey area is not eligible/noncontributing to the potential NRHP eligibility of Field Site 1. No further work is necessary at this location.

Field Site 2 also remains unevaluated for NRHP inclusion. The only site component located within the current survey area is a rock retaining wall. This feature is an unremarkable example of a common feature type and it is considered non-contributing to the potential eligibility of Field Site 2. No further work is necessary at this location.

As discussed previously, portions of certain areas were not surveyed due to accessibility constraints resulting from the steepness of slopes and the lack of suitable vehicular travel routes. It is recommended that a monitor be present during pioneering in these areas so they may be subject to intensive survey when steeper areas are more accessible. Impacts to cultural resources have the potential to occur, should additional sites, IOs, or IFs be identified.

Furthermore, certain steep Project portions were surveyed remotely with the use of high-power binoculars, rather than via intensive pedestrian survey; it is recommended that a monitor be present during pioneering in these areas so that more intensive survey may take place when these areas are more accessible.

In the event of any unanticipated cultural resource discoveries during the current undertaking, all finds should be immediately reported to CBP personnel for further evaluation and mitigation responses. If human remains are encountered during construction activity, construction should stop, and the proper authorities from CBP must also be notified per NAGPRA. With the implementation of these recommendations, in conjunction with the BMPs listed in **Section 1.5.7**, the Project does not have the potential to have any direct or indirect adverse impact on known cultural resources.

10. SOCIOECONOMICS

10.1 AFFECTED ENVIRONMENT

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. While population and demographic data are relatively straightforward and maintained by the U.S. Census Bureau, there are many factors that can be used as indicators of economic conditions for a geographic area, such as employment and unemployment rates, employment by business sector, and median household income.

The region of influence for the Project includes Yuma, Pima, Santa Cruz, and Cochise counties—four of the 15 counties in Arizona—which account for 20.2% of the state's total population. The demographics of the counties are listed in Table 10-1. Of these, Pima has the largest population (over 1 million in 2018), while Santa Cruz has the smallest (46,584). The racial mix of all four counties is mainly composed of Caucasians (ranging from 75–85%). For three of the counties, this is followed by people claiming to be some race other than Caucasian, African American, Native American, Asian, Native Hawaiian, or other Pacific Islander (for Cochise County, the next largest population is people of two or more races). All four counties have larger populations of Hispanic origin than the state average; Santa Cruz's Hispanic population is the largest at 83.5% (U.S. Census Bureau 2020a).

Table 10-1. Demographics by County

County	Total Population, 2018	Caucasian (%)	Some Other Race	Black/ African American	American Indian/ Native Alaskan	Asian	Native Hawaiian/ Pacific Island	2+ Races	Hispanic/ Latino*
Yuma	207,829	75%	17.5%	2.2%	1.3%	1.3%	0.1%	2.7%	63.4%
Pima	1,019,722	76.2%	8.7%	3.5%	3.7%	2.9%	0.2%	4.7%	37%
Santa Cruz	46,584	85.1%	11.5%	0.5%	0.8%	0.9%	0%	1.1%	83.5%
Cochise County	126,279	84.9%	3.2%	3.7%	1.3%	1.9%	0.4%	4.5%	35.3%
Arizona	6,946,685	77.2%	6.8%	4.4%	4.5%	3.3%	0.2%	3.6%	31.1%

*Percentage not included as part of demographic total.
Source: U.S. Census Bureau 2020a.

The estimated number of citizens employed in the four counties in 2018 was 440,596 for Pima; 75,912 for Yuma; 43,097 for Cochise; and 17,233 for Santa Cruz. Educational service, health care, and social assistance was the top industry for all four counties, as well as for the state as a whole. This was followed by retail trade for Yuma and Santa Cruz; professional, scientific, and management, and administrative and waste management services for Pima; and public administration for Cochise. In 2018, the unemployment rate for all four counties was higher than Arizona's (6.5%) and ranged from 7.2% for Cochise to 9.9% for Yuma (U.S. Census Bureau 2020b). The employment data for the four counties is listed in **Table 10-2**.

Table 10-2. Employment Data

County	Civilians Employed in County	Top Industries	Unemployment Rate
Yuma	75,912	Educational services, and health care and social assistance (20.3%) Retail trade (11.9%) Agriculture, forestry, fishing and hunting, and mining (11.8%)	9.9%
Santa Cruz	17,233	Educational services, and health care and social assistance (20.7%) Retail trade (14.1%) Transportation and warehousing, and utilities (9.5%)	8.3%
Pima	440,596	Educational services, and health care and social assistance (25%) Professional, scientific, and management, and administrative and waste management services (12.8%) Retail trade (11.8%)	7.6%
Cochise	43,097	Educational services, and health care and social assistance (21.6%) Public administration (16.4%) Professional, scientific, and management, and administrative and waste management services (12.6%)	7.2%
Arizona	3,045,978	Educational services, and health care and social assistance (21.9%) Professional, scientific, and management, and administrative and waste management services (12.3%) Retail trade (12.2%)	6.5%

Source: U.S. Census Bureau 2020b.

In 2018, all four counties had a per capita personal income (PCPI) lower than the state average of $44,329 and ranged from $35,682 for Yuma County (9th in the state), to $44,028 for Pima County (3rd in the state). These are all significantly lower than the national PCPI of $54,446 (BEA 2019). Total personal income (TPI) of an area is the income that is received by, or on behalf of, all the individuals who live in that area. In 2018, the TPI for these four counties ranged from $1.8 billion for Santa Cruz County to $45.7 billion for Pima County (BEA 2019). The income for each of the four counties is listed in **Table 10-3**.

Table 10-3. County Income Comparison

Location	PCPI[1]	TPI[1]	Median Household Income[2]
Yuma County	$35,682	$7.6 billion	$44,058
Pima County	$44,028	$45.7 billion	$51,037
Santa Cruz County	$39,057	$1.8 billion	$40,467
Cochise County	$40,308	$5.1 billion	$48,649
Arizona	$44,329	$317.9 billion	$56,213
United States	$54,446		$60,293

[1]Source: BEA 2019.
[2]Source: U.S. Census Bureau 2020b.

10.2 ENVIRONMENTAL CONSEQUENCES

The Project is not anticipated to have impacts, direct or indirect, on long-term population or employment. There is the potential for temporary beneficial effects on the local economy due to the additional employment for Project construction and additional income and sales tax from the purchase of goods and materials. No potential long-term, beneficial effects on socioeconomic factors are anticipated.

Yuma, Pima, Santa Cruz, and Cochise counties have the potential to benefit from the Project in the long term, since the replacement of the primary fence and installation of complimentary security facilities will provide additional protection from illegal traffic across the border.

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11. HAZARDOUS MATERIALS AND WASTE

11.1 AFFECTED ENVIRONMENT

Hazardous materials or wastes have a chemical composition or other properties that make them toxic or otherwise capable of causing illness, death, or some other harmful effect on humans or the environment when mismanaged or released.

USEPA maintains a list of hazardous waste sites, particularly waste storage/treatment facilities or former industrial manufacturing sites in the U.S. The chemical contaminants released into the environment (e.g., air, soil, groundwater) from hazardous waste sites could include heavy materials, organic compounds, solvents, and other chemicals. The potential adverse impact of hazardous waste sites on human health is a considerable source of concern to the general public, as well as government agencies and health professionals.

Solid and hazardous wastes are regulated in Arizona by a combination of mandated laws promulgated by the Federal, state, and regional Councils of Government. A search of USEPA's Envirofacts Data Warehouse showed no superfund sites near the Project Area (USEPA 2019b).

In addition to the laws and regulations mentioned earlier, EO 12088, Federal Compliance with Pollution Control Standards, as amended, directs Federal agencies to (1) comply with "applicable pollution control standards," in the prevention, control, and abatement of environmental pollution; and (2) consult with USEPA, state, and local agencies concerning the best techniques and methods available for the prevention, control, and abatement of environmental pollution.

11.2 ENVIRONMENTAL CONSEQUENCES

Soils in the Project Area have the potential to be impacted by hazardous or toxic materials in the event of an accidental spill, which could lead to groundwater contamination. To minimize the potential for release of hazardous materials into the environment, BMPs will be implemented during construction activities to avoid a release to the environment and to anticipate capture requirements in advance of any potential release. To prevent contamination of the Project Area, care will be taken to avoid impacting the Project Area with hazardous substances (e.g., anti-freeze, fuels, oils, lubricants) used during construction. POLs will be stored at designated temporary staging areas to maintain and refuel construction equipment. These activities include primary and secondary containment measures; a SPCCP will be in place prior to the start of construction, and all personnel will be briefed on the implementation and responsibilities of this plan.

Cleanup materials (e.g., oil mops), in accordance with the Project's SPCCP, will also be maintained at the site to allow immediate action in case an accidental spill occurs. Drip pans will be provided for the power generators and other stationary equipment to capture any POLs accidentally spilled during maintenance activities or leaks from the equipment. A concrete washout containment system will be established to ensure concrete washout is safely managed and disposed of properly.

Sanitation facilities will be provided during construction activities, and waste products will be collected and disposed of by licensed contractors. No gray water will be discharged to the ground.

Disposal contractors will use only established roads to transport equipment and supplies; all waste will be disposed of in strict compliance with Federal, state, and local regulations, in accordance with the contractor's permits. All construction waste will be disposed in compliance with Federal, state, and local regulations. Due to the proper permits being obtained by the licensed contractor tasked to handle any unregulated solid waste, and because all of the unregulated solid waste will be handled in the proper manner, no hazards to the public have the potential to occur through the transport, use, or disposal of unregulated solid waste.

12. RELATED PROJECTS AND POTENTIAL EFFECTS

12.1 CUMULATIVE AFFECTED ENVIRONMENT

This chapter of the ESP addresses the potential combined impacts associated with the implementation of the Project and other projects/programs that are planned for the region. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time by various agencies (Federal, state, and local) or individuals. Informed decision making is served by consideration of cumulative impacts resulting from projects that are planned, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

This cumulative impacts analysis summarizes expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future projects. The geographic scope of the analysis varies by resource area. For example, the geographic scope of cumulative impacts on resources such as soils and vegetation is very narrow and focused on the location of the resource. The scope of air quality, wildlife and sensitive species, visual resources, and socioeconomics is much broader and considers more county or region-wide activities. Projects that were considered for this analysis were identified by reviewing USBP documents, news releases, and published media reports, as well as through coordination with planning and engineering departments of local governments and state and Federal agencies, although only projects on the U.S. side of the border were possible to evaluate. Projects that do not occur in close proximity (i.e., within several miles) to the Project will not contribute to a cumulative impact (or are not possible to evaluate if they are south of the border) and are generally not evaluated further.

USBP has been conducting law enforcement actions along the border since its inception in 1924 and has continually transformed its methods as new missions, CBV modes of operation, agent needs, and National enforcement strategies have evolved. Development and maintenance of training ranges, station and sector facilities, detention facilities, and roads and fences have affected thousands of acres, with synergistic and cumulative impacts on soil, wildlife habitats, water quality, and noise. Beneficial effects have resulted from the construction and use of these roads and fences as well, including but not limited to: increased employment and income for border regions and surrounding communities, protection and enhancement of sensitive resources north of the border, reduction in crime within urban areas near the border, increased land value in areas where border security has increased, and increased knowledge of the biological communities and pre-history of the region through numerous biological and cultural resource surveys and studies.

With continued funding and implementation of CBP's environmental conservation measures, including environmental education and training of its agents, use of biological and archaeological monitors, and restoration of wildlife water systems and other habitats, adverse impacts from ongoing and future projects will be prevented or minimized. However, recent, ongoing, and reasonably foreseeable proposed projects will result in cumulative impacts. General descriptions of these types of activities are discussed in the following paragraphs.

12.2 CUMULATIVE FENCING ALONG THE SOUTHWESTERN BORDER

As of September 25, 2020, CBP has constructed approximately 341 miles of new border wall system in place of dilapidated and/or outdated designs and in locations where no barriers previously existed (CBP 2020). A summary of past, present, and reasonably foreseeable future actions near the Project Area are presented below.

12.3 PAST ACTIONS

Past actions are those in the relatively recent past that are within the cumulative effects analysis areas of this ESP. The effects of these past actions are generally described throughout the previous sections. For example, the existing vehicle and pedestrian fence, the Sasabe, Nogales/Mariposa, Naco, and Douglas POEs, the existing access roads, and the previously developed border infrastructure system have all contributed to the existing environmental conditions of the area.

12.4 PRESENT ACTIONS

Present actions include current or funded construction projects, USBP or other agency actions in close proximity to the fence locations, and current resource management programs and land use activities within the cumulative effects analysis area. Ongoing actions considered in the cumulative effects analysis include the following:

- **Tucson Sector Fence Replacement Project -** CBP is improving and maintaining 63 miles of fence along the U.S./Mexico international border in Arizona. Additionally, CBP is installing and maintaining tactical infrastructure consisting of new primary pedestrian fence and associated staging yards within USBP's Tucson Sector along Cochise and Pima counties, Arizona.

- **Revegetation Projects** - A variety of revegetation projects have recently been completed as part of previous construction projects (such as Comprehensive Tactical Infrastructure Maintenance and Repair and tower installations) and additional work is planned to minimize project-related impacts and to restore habitat along the border.

- A**rizona Department of Transportation Engineering and Environmental Study**: The Arizona Department of Transportation and the Federal Highway Administration have completed an engineering and environmental study for SR 189 (Mariposa Road). A "design-build" team has been selected to improve the roadway from the International border with Mexico to Grand Avenue in Nogales. The purpose of the project is to improve traffic flow and safety. The project will include widening three miles of highway, constructing a new roundabout, constructing new flyover ramps connecting SR 190 to Interstate 19, improving drainage, and installing new traffic signals (ADOT 2020).

A review of the Planning and Zoning websites of the three affected counties did not yield any results for additional construction projects to consider.

12.5 REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions consist of activities that have been approved and can be evaluated with respect to their effects. The following projects are reasonable foreseeable actions that are likely to occur in the Tucson Sector:

- **Border Wall**: As part of this or future administrations, DHS/CBP could construct additional border walls in the USBP Tucson Sector AOR.

USBP might be required to implement other activities and operations that are currently not foreseen or mentioned in this document. These actions could be in response to National emergencies or security events, or to changes in the mode of operations of CBVs.

Plans by other agencies that will also affect the region's natural and human environment include various road improvements by Arizona Department of Transportation and Cochise, Pima, and Santa Cruz Counties. The majority of these projects will be expected to occur along existing corridors and within previously disturbed areas. The magnitude of the impacts depends upon the length and width of the road right-of-way and the conditions within and adjacent to the right-of-way. However, currently no large state or county projects are ongoing or near completion within the vicinity of the Project Area.

Other organizations, such as the Tohono O'odham Nation, BLM, USFS, and Barry M. Goldwater Air Force Range, routinely prepare or update Resource Management Plans for the resources they manage. A summary of the anticipated cumulative impacts relative to the Project (i.e., construction of the all-weather road and installation of the secondary fence) is presented below. These discussions are presented for each of the resources previously described.

12.6 ENVIRONMENTAL CONSEQUENCES

12.6.1 Air Quality

The emissions generated during and after the construction of new pedestrian fence and the replacement of the legacy pedestrian and vehicle fence have the potential to be short-term and minor. There is a potential for cumulative adverse construction impacts on air quality from the current or foreseeable wall replacement projects discussed above. The emissions associated with these actions also have the potential to result in short-term and minor impacts on the airshed, even when combined with the other proposed developments in the border region. CBP will minimize air quality impacts by implementing standard BMPs, such as dust suppression, during construction. Deterrence of and improved response time to illegal border crossings created by the construction of infrastructure has the potential to lead to improved control of the border. A potential result of this improved control could be a reduction in the number of off-road enforcement actions that are currently necessary by USBP agents, thus potentially reducing dust generation and serving to benefit overall air quality as well.

12.6.2 Noise

Most of the noise generated by the Project has the potential to occur during construction and thus is not likely to contribute to cumulative impacts of ambient noise levels. Routine maintenance of the primary pedestrian fence and roads has the potential to result in slight temporary increases in noise levels that could sporadically occur over the long-term and have the potential to be similar to those of ongoing road maintenance within the Project Area. Potential sources of noise from other projects are not significant enough (temporally or spatially) to increase ambient noise levels above 75 dBA at the Project sites. Thus, the noise generated by the construction and maintenance of Project infrastructure, when considered with the other existing and proposed projects in the region, has the potential to have minor cumulative adverse effects.

12.6.3 Land Use, Recreation, and Aesthetics

The Project has the potential to primarily affect lands in the Roosevelt Reservation, which was set aside specifically for border control actions. This Project is therefore consistent with the authorized land use and, when considered with other potential alterations of land use, does not have the potential to have a major cumulative adverse impact. Similarly, the open space opportunities they provide would not likely be affected by the Project and do not have the potential to be negatively impacted when considered with other present and foreseeable projects in the region.

There is a potential for visually apparent changes within the Project viewsheds, particularly where primary fence did not previously exist. For sections of the Project Area where the border barrier is being replaced, the addition of a new, larger fence has the potential to cause an adverse visual effect in some areas but does not constitute a major impact on visual resources. However, in the locations where fencing did not previously exist, there will be a more adverse impact to the viewshed. Additionally, when considered with other USBP projects, it has the potential to degrade the existing visual character of the region; thus, cumulative impacts have the potential to be considered moderate and CBP will minimize impacts on resources to the maximum extent feasible.

Areas north of the border within the construction corridors have the potential to experience beneficial, indirect cumulative impacts on aesthetics and habitat through the reduction of trash, soil erosion, and creation of trails by illegal pedestrian traffic.

12.6.4 Geological Resources and Soils

The Project does not have the potential to create any dangerous or unstable conditions within any geologic unit, nor expose people or structures to potential substantial adverse effects. Furthermore, no geologic resource is exclusively within the Project Area. The Project impact on previously disturbed lands, when combined with past and proposed projects in the region, will have the potential to have minor, cumulative adverse impacts on geological resources.

The Project, when combined with other USBP projects, will not have the potential to permanently reduce prime farmland soils or agricultural production. Pre- and post-construction SWPPP measures will be implemented to control soil erosion. The permanent impact of the installation of

approximately 538 acres of new and replacement fence, combined with the other USBP projects, has the potential to constitute a moderate cumulative adverse impact.

12.6.5 Hydrology and Water Management

As a result of the Project, when combined with other USBP projects, increased temporary erosion during construction has the potential to occur. Pre- and post-construction SWPPP measures for this and other projects will be implemented to control erosion. Water withdrawal from private water supplies or regional groundwater basins for dust suppression and other construction/maintenance activities, for this and other related projects in the region, have the potential to result in cumulatively considerable impacts. Additionally, these short-term activities have the potential to affect long-term water supplies or the quantity of groundwater in the region. Although the volume of water withdrawn is not expected to affect the public drinking water supplies, it could indirectly contribute to aquifer contamination from surface runoff. With the implementation of appropriate BMPs, it is unlikely that the Project will have the potential to substantially affect water quality.

12.6.6 Biological Resources (Vegetation, Wildlife, Aquatic Species, Special Status Species)

The Project has the potential to have minimal cumulative impacts on native vegetation communities, due to the vast amount of similar habitat contained within and surrounding the Project Area and the juxtaposition of the Project Area with other disturbed and developed areas. As discussed in **Chapter 8**, some direct negative impacts on wildlife within the Project Area have the potential to occur due to erosion, noise, lighting, or conflict with construction equipment. Although construction will be temporary, as a result of past and planned projects within Tucson Sector, cumulative impacts due to fragmentation of habitat have the potential to be moderate to substantial. Most of the U.S./Mexico international border within the Tucson Sector will have physical barrier installed once all planned projects are complete. Impacts will be minimized through the implementation of appropriate BMPs for the protection of general plants and wildlife.

12.6.7 Cultural Resources

Construction of the Project has the potential to impact two NRHP-eligible cultural resource sites; however, with the implementation of monitoring and other avoidance measures, as described in **Chapter 9**, the Project has the potential to result in minimal, if any, adverse impacts. Therefore, this action, when combined with other existing and proposed projects in the region, has the potential to have negligible cumulative impacts on cultural resources.

12.6.8 Socioeconomics

Construction of the Project, when combined with other USBP projects, has the potential to result in temporary, minor, and beneficial impacts on the region's economy. No impacts on populations, minorities, or low-income families are likely to occur. When practicable, materials and other Project expenditures will predominantly be obtained through merchants in the local community. Local construction crews will also be employed to complete the Project. Safety buffer zones will be designated around all construction sites to ensure public health and safety. Long-term, cumulative effects of the projects on the regional economy have the potential to be beneficial by

reducing smuggling and other illegal activity in the area. Legal border crossings and international trade have the potential to continue unaffected by the Project. When combined with other ongoing or currently planned projects within the region, there is the potential for minor cumulative, temporary beneficial impacts on the region's socioeconomics.

12.6.9 Hazardous Materials and Waste

The use of hazardous substances will be required in small amounts within the Project Area during the construction phase. With the inclusion of BMPs listed in **Section 1.5.8**, impacts resulting from the use of hazardous materials during this phase have the potential to be avoided or minimized. Similarly, only minor temporary increases in the use of hazardous materials would potentially be experienced from construction associated with other projects in the region. Removal of the existing fence could generate waste, but most of the existing steel plate and mesh material is valuable as a recyclable material. Therefore, the Project, when combined with other ongoing and proposed projects in the region, does not have the potential to have a major cumulative impact on the generation of waste nor the potential for release of hazardous materials.

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14. ABBREVIATIONS AND ACRONYMS

ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AMA	Active Management Area
AMSL	Above mean sea level
ANPS	Arizona Native Plant Society
AOR	Area of Responsibility
ASM	Arizona State Museum
AZGS	Arizona Geological Survey
AZSHPO	Arizona State Historic Preservation Office
BANWR	Buenos Aires National Wildlife Refuge
BEA	Bureau of Economic Analysis
BIS	Border Infrastructure System
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	Bureau of Reclamation
BSR	Biological Survey Report
CAA	Clean Air Act
CBP	U.S. Customs and Border Protection
CBV	cross-border violator
CFR	Code of Federal Regulations
CNF	Coronado National Forest
CNM	Coronado National Memorial
CO	Carbon monoxide
CWA	Clean Water Act
dB	Decibels
dBA	A-Weighted decibel
DHS	Department of Homeland Security
DOI	Department of the Interior
EO	Executive Order
ESP	Environmental Stewardship Plan

ESSR	Environmental Stewardship Summary Report
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
IF	Isolated Feature
IIRIRA	Illegal Immigration Reform and Immigrant Responsibility Act
INA	Irrigation Non-Expansion Area
IO	Isolated Occurrence
mg/m^3	Milligram per cubic meter
MOVES	Motor Vehicle Emission Simulator
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCA	National Conservation Area
NHPA	National Historic Preservation Act
NO_2	Nitrogen dioxide
NO_x	Total nitrogen oxides
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
PCPI	Per capita personal income
PM	Particulate matter
PM_{10}	Particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in diameter
POE	Port of Entry
POLs	petroleum, oil, and lubricants
ppb	Parts per billion
ppm	Parts per million
SO_2	Sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasure Plan
SWPPP	Storm Water Pollution Prevention Plan

TPI	Total personal income
tpy	Tons per year
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USIBWC	U.S. Section of the International Boundary and Water Commission
VOC	Volatile organic compound
$\mu g/m^3$	Micrograms per cubic meter
°F	Degrees Fahrenheit

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