U.S. Customs and Border Protection

DRAFT

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT FOR INTEGRATED FIXED TOWERS

PROPOSED HIGH-WATER CROSSING IN THE CASA GRANDE STATION'S AREA OF RESPONSIBILITY

TUCSON SECTOR, ARIZONA

Document Number

[April 2021]

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1 Revision Summary

Version	Date	Reference	Description
n/a	09/24/2019		Original draft from PDF
v01	10/01/2019		Preliminary Tech Edit – minor formatting, grammar, adding figures
v02	11/20/2019		LMI Internal Review/Government Review
v03	01/28/2020		LMI Internal Review
v04	11/02/2020		Government (Sector & EEMD-PMOD ENV) Review
v05	03/22/2021		NRI Tech Edit – minor formatting, grammar, adding figures, response to comments
v06	04/01/2021		Government (Sector & EEMD-PMOD ENV) Review

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1 Project Summary

The United States (U.S.) Customs and Border Protection (CBP) is proposing to construct and maintain a High-Water Crossing at the Vamori Wash in Pima County, Arizona in the lands of the Tohono O'odham Nation.

This Supplemental Environmental Assessment (SEA) evaluates a no action alternative (Alternative 1) as well as one action alternative, which after consideration of alternatives considered but not analyzed in detail, Alternative 2 is the preferred alternative carried through for analysis. This SEA supplements the *Final Environmental Assessment for Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol, Tucson Sector, Arizona, and Finding of No Significant Impact, (2017 EA),* approved March 28, 2017 (CBP 2017). The 2017 EA did not evaluate improvements to Vamori Wash, but limited actions to maintenance and repair of the Traditional Northern Road. The preferred alternative in the 2017 EA now serves as the baseline for the No Action Alternative in this SEA. The 2017 EA preferred alternative is not meeting the purpose and need of the project as the wash is frequently flooded during monsoon season, leaving it impassible for part of the year. The Preferred Alternative (Alternative 2) in this SEA is a new alternative from those considered in the 2017 EA and would include: construction of a one-lane high-water crossing (approximately 182 feet long and 13 feet wide) with box culverts through the main channel of Vamori Wash; construction of a one-lane high-water crossing (approximately 47 feet long and 13 feet wide) with box culverts through the east channel of Vamori Wash; improvements to the existing east side and west side approach roads to two-lane unpaved approach roads (16 feet wide with 2-foot shoulders); installation of culverts beneath the approach roads; installation of a concrete swale in west channel of Vamori Wash; installation of box culverts in southwest channel of Vamori Wash; and installation and replacement of riprap[1] on upstream and downstream sides of fills. The existing footprint of Traditional Northern Road within Vamori Wash would be scarified and allowed to revegetate naturally. Alternative 2 would require obtaining a right-of-way from the Bureau of Indian Affairs and the Tohono O'odham Nation.

[1] Loose stone used to form a foundation for a breakwater or other structure.

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1 Introduction

1.1 Background

The Department of Homeland Security (DHS), United States (U.S.) Customs and Border Protection (CBP), is preparing this Supplemental Environmental Assessment (SEA) to evaluate the potential environmental impacts of the proposed construction, maintenance, and repair of a High-Water Crossing through Vamori Wash along the Traditional Northern Road within the Tohono O'odham Nation. This SEA supplements the *Final Environmental Assessment for Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol, Tucson Sector, Arizona, and Finding of No Significant Impact* approved on March 28, 2017 (CBP 2017). In the 2017 EA CBP selected Alternative 2 of that analysis to implement an IFT system in the USBP's Ajo and Casa Grande Stations' Area of Responsibility (AOR). This system provides long-range, persistent surveillance, enabling USBP personnel to detect, track, identify, and classify illegal entries through a series of integrated sensors and tower-based surveillance equipment. Although the High-Water Crossing at Vamori Wash was discussed in the 2017 EA, it was not carried forward as an approved action in the Preferred Alternative, and it was decided to leave it as the current low water crossing. CBP determined to leave the low water crossing at that time due to funding issues and other time sensitive concerns that would have delayed the larger project. Subsequently, operations were continuously being impeded in the wash for days and weeks at a time during wet seasons as the delay issues were resolved. Thus, it was determined that a high-water crossing at Vamori Wash was needed to more completely meet Purpose and Need of the 2017 EA, and the need to "Supplement" the EA with the Vamori Wash High-Water Crossing EA was determined.

CBP is the law enforcement component of DHS responsible for securing the border and facilitating lawful international trade and travel. U.S. Border Patrol (USBP) is the uniformed law enforcement subcomponent of CBP responsible for patrolling and securing the border between the land ports of entry. CBP is the lead agency in this effort and is responsible for preparing this SEA. The Bureau of Indian Affairs (BIA) and the Tohono O'odham Nation have agreed to continue their roles as cooperating agencies in this SEA which supplements the 2017 EA in which they also served as cooperating agencies.

On October 10, 2020 the Chukut Kuk District Council passed a resolution supporting the construction of a High-Water Crossing across Vamori Wash along the International Boundary, located within the Chukut Kuk District of the Tohono O'odham Nation. On February 9, 2021 the Tohono O'odham Legislative Council passed Resolution No. 21-048 approving construction of the Vamori Wash High-Water Crossing, including approval for use of the staging area known as the San Miguel staging area. Both of these proclamation documents are located in the project record and in Appendix B.

Vamori Wash is an ephemeral wash (i.e., inundated over a very short time period) located in the San Simon Basin in the Baboquivari Valley of the Tohono O'odham Nation. The wash flows north into the U.S. from Mexico (Figure 2-1) where it flows into the San Simon Wash. It drains approximately 239 square miles of watershed. The highest stream flows occur in the summer (July through September) with very low to zero flow in the spring

(April through June) or the balance of the year (U.S. Army Corps of Engineers [USACE] 2016).

The Traditional Northern Road is a gravel/dirt road within the Tohono O'odham Nation that generally runs parallel to the U.S.-Mexico border. The road is typically 20 feet wide. Where the Traditional Northern Road and the Border Road overlap the road is referred to as the "Border Fence Road". Immigration and Naturalization Services (INS) constructed the road in the mid-1990s as part of a Joint Task Force Six project with the USACE. CBP primarily uses the Traditional Northern Road (TNR) for routine border patrol operations[2]. The TNR is also available for public use. The TNR currently has a path through the Vamori Wash. The wash has four channels that are proposed for crossing improvements. A high-water crossing in the main channel, which is approximately 170 feet wide, a high water crossing in the east channel, which is approximately 40 feet wide. A third wash, the west channel of Vamori Wash, would have a concrete swale installed to harden the channel where the road crosses; and a fourth wash, the southwest channel of Vamori Wash, there would be installation of box culverts in. Although in the past CBP installed a soil-binding agent on the crossing, there are no permanent structures and the crossing remains impassable during much of Arizona's summer monsoon season. CBP completed the *Final Environmental Assessment for Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol Tucson Sector, Arizona;* an environmental assessment (EA) in March 2017 to construct, maintain, and operate new IFTs within the Gu-Vo and Chukut Kuk districts of the Tohono O'odham Nation (CBP 2017). The 2017 EA includes performing maintenance and repair of the existing Vamori Wash crossing in order to access the proposed IFT sites; however, the 2017 EA does not include the construction of a high-water crossing through the wash (CBP 2017). This SEA evaluates the construction, maintenance, and repair of the high-water crossing and supplements the 2017 EA.

1.2 Project Location

The project is located in Pima County, Arizona (AZ), in the USBP Casa Grande Stations' Area of Responsibility (AOR), Tucson Sector, AZ (Figure 1-1). Figure 1-1 represents the vicinity of the project site represented with a red dot and the staging area represented by a blue plus. In the top right corner of Figure 1-1 shows the Tohono O'odham Nation land in a cream color.

[2] RESOLUTION OF THE TOHONO O'ODHAM I,EGISLATIVE COUNCII, (Authorizing United States Customs and Border Protection to Perform Emergency Maintenance and Repair work on "Border Fence Road" and "Traditional Northern Road") Resolution No 11472 other than areas where the improved road along the enforcement barrier jogs northward and merges into the pre-existing road, the two roads closely parallel each other, and both roads have formerly been referred to as the "All Weather Road"; that for clarification, the Nation agrees that the improved road along the enforcement barrier shall be referred to as the "Border Fence Road," and the pre-existing road to the north shall be referred to as the "Traditional Northern Road," and those portions of the road where the Border Fence Road overlaps the Traditional Northern Road shall be considered part of the Border Fence Road;"…

The Preferred Alternative would occur within the Chukut Kuk District of the Tohono O'odham Nation, along the Traditional Northern Road, approximately 1 mile west of Indian Reservation Road (IRR) 19. An existing staging area at the San Miguel Gate previously utilized for the construction of the border fence would be used during construction of the high-water crossing.

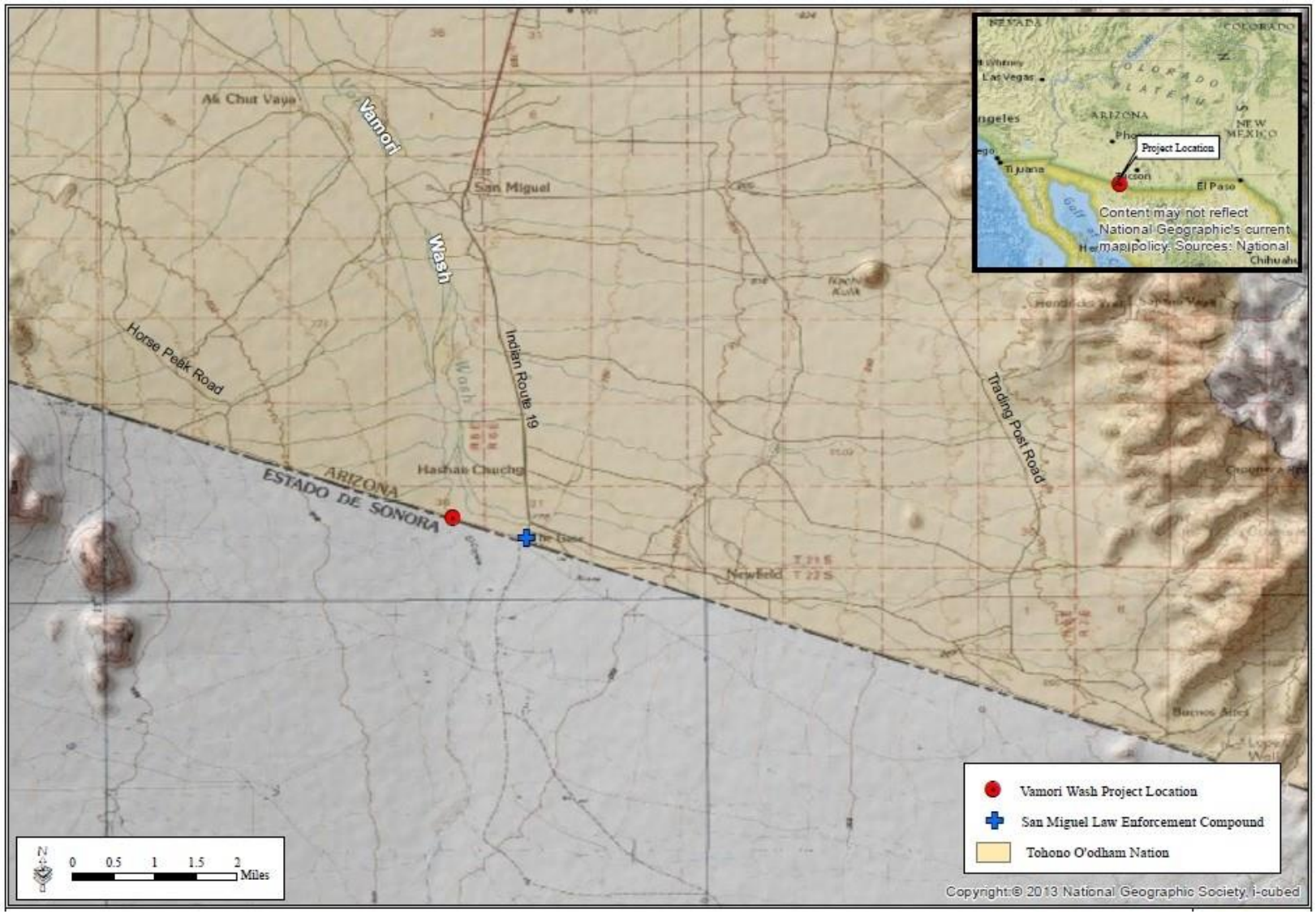


Figure 1-1. Vicinity Map

1.3 Purpose and Need

The purpose of the project is to provide sustained surveillance, enhance USBP operations, and support capabilities along the Traditional Northern Road by providing an all-weather road crossing through Vamori Wash.

The Traditional Northern Road is an existing road that transects Vamori Wash along the U.S.-Mexico Border. There is an existing low-water crossing where the Traditional Northern Road crosses the wash. This low-water crossing is impassable during much of Arizona's monsoon season (typically July through September). In addition, soils within the wash remain saturated after this season, potentially making the road impassable for an additional 3 to 6 weeks following the monsoon season. Upon completion of the 2017 EA, coupled with the passing of Resolution No. 21-048, the need for improvements to Vamori Wash was required to further support the activities outlined in the 2017 EA.

1.4 Public Involvement and Agency Coordination

In accordance with 40 C.F.R. Parts 1501.7, 1503, and 1506.6, CBP has initiated public involvement and agency scoping to identify significant issues related to the Preferred Alternative. CBP invited the Tohono O'odham Nation and the Bureau of Indian Affairs (BIA) to participate as cooperating agencies in the development of the SEA to ensure that the analysis meets their needs. Under the Proposed Action, BIA would issue rights-of-way (ROW) to CBP for proposed activities on Tohono O'odham Nation land after the Tohono O'odham Nation has consented to the ROW.

CBP is consulting and will continue to consult with appropriate Federal, state, and local government agencies and the Tohono O'odham Nation throughout the SEA process. CBP is coordinating this activity with the following agencies:

- U.S. Department of the Interior (DOI)
    - U.S. Fish and Wildlife Service (USFWS)
    - Bureau of Indian Affairs (BIA)
    - Bureau of Land Management (BLM)
- U.S. Environmental Protection Agency (EPA)
- U.S. Army Corps of Engineers (USACE)
- State of Arizona
    - Arizona Game and Fish Department (AGFD)
    - Arizona Department of Environmental Quality (ADEQ)
- Tohono O'odham Nation
    - Tohono O'odham Nation Department of Natural Resources
    - Tohono O'odham Nation Tribal Historic Preservation Office (THPO)
- Pima County

The Draft SEA and Draft Finding of No Significant Impact (FONSI) will be available for review for 30 days at the Tohono O'odham Community College Library and the Venito

Garcia Library and Archives in Sells, and the Pima County Public Library in Tucson, and will be available electronically at http://www.cbp.gov/about/environmental-cultural-stewardship/nepa-documents/docs-review. Appendix A includes correspondence sent or received during the preparation of this document. CBP will provide copies of the Draft EA to all coordinating Federal and state agencies for review and comment.

This EA is being prepared as follows:

1. Conduct Interagency and Intergovernmental Coordination for Environmental Planning. The first step in this National Environmental Policy Act (NEPA) process was to solicit comments about the Proposed Action from Federal, state, and local agencies and Federally recognized tribes to ensure that their concerns are included in the analysis.

2. Prepare a Preliminary Draft SEA. CBP examined the environmental impacts of the alternatives and prepared a Preliminary Draft SEA in February 2020, which was available for the Tohono O'odham Nation and BIA to review for 30 days, and a revised Preliminary Draft EA on December 8, 2020, which was available for the Tohono O'odham Nation and BIA to review for 30 days.

3. Prepare a Draft EA. CBP has incorporated relevant comments and concerns received from the Tohono O'odham Nation and BIA and prepared a Draft EA (this document) for public review.

4. Announce that the Draft EA has been prepared. A Notice of Availability (NOA) will be published in the Tohono O'odham Nation's The Runner, Ajo Copper News, and Arizona Daily Star newspapers to announce the public comment period and the availability of the Draft EA and Draft FONSI. Exhibit 1 presents the NOA that will be published.

5. Provide a public comment period. A public comment period allows interested parties to review the analysis presented in the Draft SEA and provide feedback. The Draft SEA will be available to the public for a 30-day review at the Tohono O'odham Community College Library in Sells, the Venito Garcia Library and Archives in Sells, and the Pima County Public Library in Tucson as well as electronically at http://www.cbp.gov/about/environmental-cultural-stewardship/nepa-documents/docs-review.

6. Prepare a Final SEA. A Final SEA will be prepared following the public comment period. The Final SEA will incorporate relevant comments and concerns received from all interested parties during the public comment period.

7. Issue a Decision Document. The final step in the NEPA process is the signature of a FONSI, if the environmental analysis supports the conclusion that impacts on the quality of the human and natural environments from implementing the selected alternative will not be significant. If the environmental impacts of the selected alternative could be considered significant, a Notice of Intent for the preparation of an Environmental Impact Statement (EIS) would be published, or CBP would decide not to proceed with the Preferred Alternative.

1.5 Framework for Analysis

The scope of this SEA includes the direct, indirect, and cumulative effects on the natural, social, economic, and physical environments resulting from the assessed alternatives. The

SEA does not include an assessment of the normal, day-to-day operations conducted in the field by CBP agents. The information provided in this SEA will assist CBP, BIA, and the Tohono O'odham Nation in determining whether the alternatives analyzed would have a significant impact(s) on the environment and whether it would achieve the objectives of its purpose and need. The SEA also provides the status of compliance with applicable environmental statutes, such as the Endangered Species Act (ESA) of 1973 (16 United States Code [U.S.C.] § 1531 et seq.), as amended, and the National Historic Preservation Act (NHPA) of 1966 (54 U.S.C. § 300101 et seq.), as amended. CBP developed this SEA in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. §§ 4321-4347); regulations issued by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulation [CFR] Parts 1500-1508); DHS Instruction 023-01-001-01, Revision 01, *Implementation of the NEPA*; and other pertinent environmental statutes, regulations, and compliance requirements. CBP has determined that the Preferred Alternative requires the preparation of an SEA because the action is not addressed in CBP's *Final Environmental Assessment for Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol Tucson Sector, Arizona* (CBP 2017).

Recent changes to the Council on Environmental Quality (CEQ) regulations implementing the NEPA (40 CFR §§ 1500–1508) became effective on September 14, 2020. 85 Fed. R. 43304-76 (July 16, 2020). As stated in 40 C.F.R. § 1506.13, the new regulatory changes apply to any NEPA process begun after September 14, 2020. This SEA substantively commenced prior to that date, as shown by the scoping letters sent to stakeholders on February 21, 2020. Therefore, this SEA conforms to the CEQ NEPA implementing regulations that were in place prior to September 14, 2020.

Exhibit 1

NOTICE OF AVAILABILITY

Draft Supplemental Environmental Assessment for
Integrated Fixed Towers – Proposed High-Water Crossing
in the Casa Grande Station's Area of Responsibility
Tucson Sector, Arizona

The public is hereby notified of the availability of U.S. Custom and Border Protection's (CBP) Draft Supplemental Environmental Assessment (SEA) and Draft Finding of No Significant Impact (FONSI) for the proposed high-water crossing on the Tohono O'odham Nation. This SEA evaluates a no action alternative (Alternative 1) as well as one action alternative. This SEA supplements the *Final Environmental Assessment for Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol, Tucson Sector, Arizona*, and Finding of No Significant Impact approved March 28, 2017 (CBP 2017). The Proposed Action (Alternative 2) is for the construction, maintenance, and repair of a high water crossing through Vamori Wash. The Proposed Action would include construction of a one-lane high-water crossing (approximately 182 feet long and 13 feet wide) with box culverts through the main channel of Vamori Wash; construction of a one-lane high-water crossing (approximately 47 feet long and 13 feet wide) with box culverts through the east channel of Vamori Wash; improvements to the existing east side and west side approach roads to two-lane unpaved approach roads (16 feet wide with 2-foot shoulders); installation of culverts beneath the approach roads: installation of a concrete swale in the west channel of Vamori Wash; installation of box culverts in the southwest channel of Vamori Wash; and installation and replacement of riprap on upstream and downstream sides of fills. Alternative 2 would require obtaining a right-of-way from the Bureau of Indian Affairs and the Tohono O'odham Nation. Comments concerning the Draft SEA and Draft FONSI will be accepted for a period of 30 days from April 17, 2021 to May 17, 2021. Copies of the Draft SEA and Draft FONSI will be available during this period at the Tohono O'odham Community College Library, Highway 86, Milepost 125.5 North, Sells, Arizona; the Venito Garcia Library and Archives, Main Street-Tribal Building, Sells, Arizona; and the Joel D. Valdez Main Library, 101 N. Stone Avenue, Tucson, Arizona. The Draft SEA and Draft FONSI are also available electronically at the following URL address: http://www.cbp.gov/about/environmental-cultural-stewardship/nepa-documents/docs-review.

Due to the ongoing COVID-19 pandemic, which is impacting access to Federal facilities, comments will not be received by mail. To ensure your comments are received in a timely manner and able to be considered in agency decision making, please submit all comments via email. All comments should use *Vamori Wash SEA* in the subject line. Comments should be received by May 17, 2021 and sent to Michelle Barnes at TucsonComments@cbp.dhs.gov.

2 Alternatives

CBP is analyzing two alternatives in this SEA. This chapter provides information about the No Action Alternative (Alternative 1) and the Proposed Action, which is the CBP Preferred Alternative – High-Water Crossing (Alternative 2). This chapter also describes the selection factors that were used to identify the preferred alternative and summarizes alternatives that were considered but eliminated from further consideration.

2.1 Selection Factors for Alternatives

CEQ's Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500 - 1508) require that agencies rigorously explore and objectively evaluate reasonable alternatives. Only those alternatives determined to be reasonable (i.e., practical or feasible from a technical and economic standpoint) and that meet the project's purpose and need, require detailed analysis.

As such, this SEA evaluates and compares these alternatives in relation to meeting the Purpose and Need:

- To maintain access to Integrated Fixed Tower (IFT) sites and their approach and access roads;
- To perform maintenance and repair of the existing vehicle barrier fence and improve access to the vehicle barrier fence along the U.S.-Mexico border;
- To improve law enforcement operations along the Traditional Northern Road and at San Miguel Gate;
- To improve the safety of USBP agents and the public who traverse the Traditional Northern Road; and
- To facilitate access of Tribal members along the Traditional Northern Road.

Figure 2-1 illustrates the full project area, the flow of water through the project area, as well as where the project is located on the Tohono O'odham Nation Land.

Alternative 2, hereto also referred to as the Preferred Alternative was carried forward for full analysis from a range of alternatives that were considered but eliminated from further analysis by evaluating the ability of each alternative to meet the purpose of and need for the Proposed Action and the following screening factors:

- Constructability of structures and roads;
- Accessibility of the project area from existing roads;
- Ability to avoid known archaeological resources of significance or traditional cultural properties;
- Ability to maintain the natural flow of Vamori Wash; and
- Ability to meet USBP's mission.

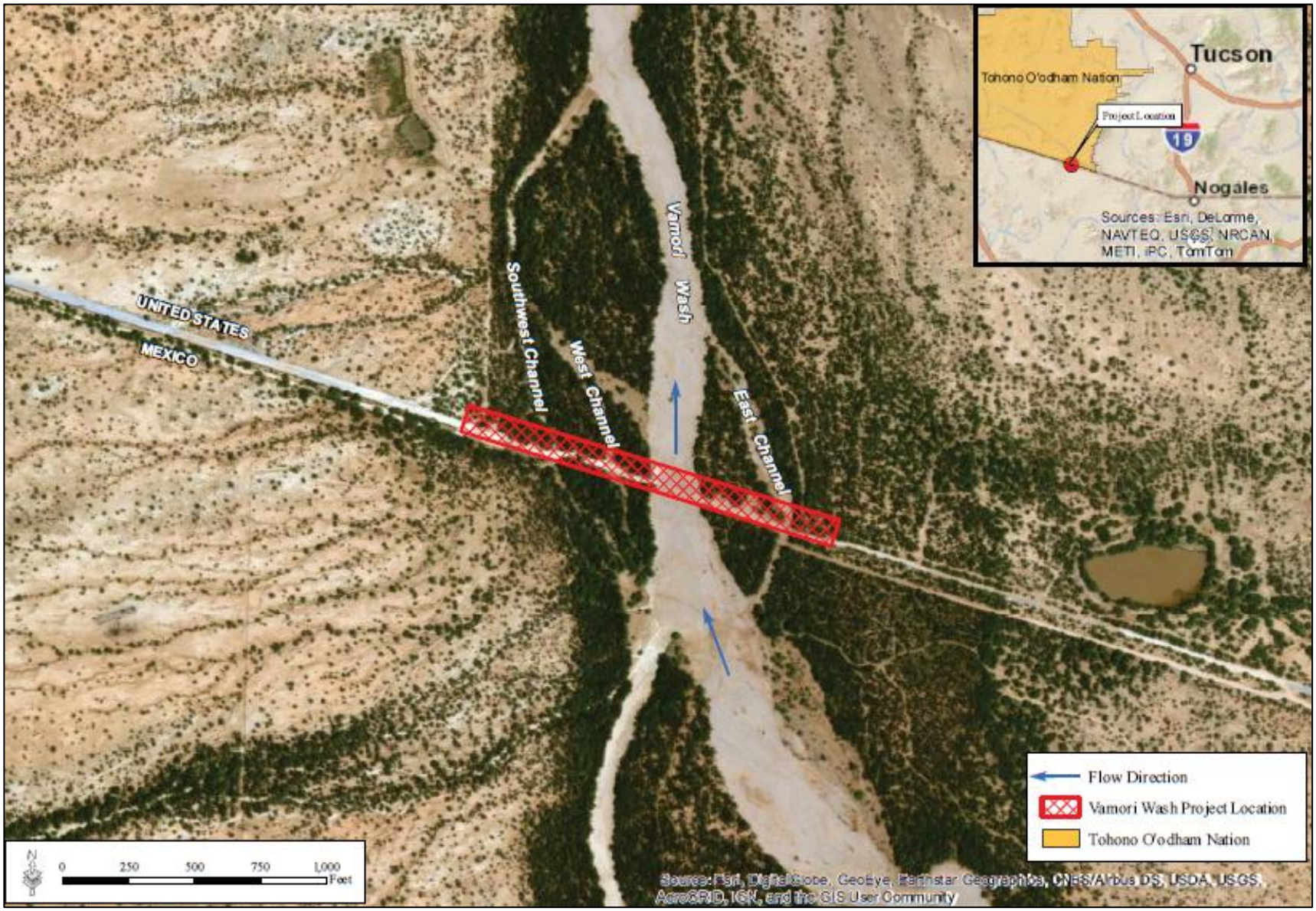


Figure 2-1. Project Location and Area of Disturbance Map

CBP carried forward Alternative 2 as the action alternative for further evaluation because it meets the purpose of and need for the Proposed Action, as well as the screening factors. The No Action Alternative does not meet the purpose of or need for the Proposed Action, but is carried forward for analysis as required under the CEQ regulations (40 CFR § 1502.14[d]) to provide for a baseline comparison. A number of other alternatives were also considered but dismissed from detailed analysis as described in Section 2.6.

2.2 Alternative 1 – No Action Alternative

Under the 2017 EA, activities at the Vamori Wash crossing would not be improved, but would continue to be maintained and repaired. However, CBP's ability to use the Traditional Northern Road through this area would be significantly hampered during Arizona's monsoon season. Alternative 1 is carried forward in this SEA for analysis as a baseline from which to compare the impacts of the Proposed Action. Maintenance and repair of the existing crossing currently occurs as needed, approximately five to seven times per year, but even this activity is hampered for numerous periods of the year when the wash is too wet to repair.

2.3 Alternative 2 – High-Water Crossing Alternative (Preferred Alternative)

Under Alternative 2, the construction, maintenance, and repair of a high-water crossing through Vamori Wash, a multi-channel system that qualifies as a waters of the US, would occur (Figures 2-2, 2-3, and 2-4). The Preferred Alternative includes the following activities:

- Construction of a one-lane high-water crossing (approximately 182 feet long and 13 feet wide) with 36-inch box culverts that would either be segmented pre-cast, or cast in place, through the main channel of Vamori Wash. All cast in place box culverts would follow the Arizona Department of Transportation standards and requirements for box culverts;
- Construction of a one-lane high-water crossing (approximately 47 feet long and 13 feet wide) with box culverts through the east channel of Vamori Wash;
- Construction of two-lane unpaved approach roads (16 feet wide with 2-foot shoulders);
- Installation of a concrete swale in west channel of Vamori Wash to harden the channel where the road crosses;
- Installation of box culverts in southwest channel of Vamori Wash;
- Overtopping of all crossing structures with compacted earthen fill material and stone aggregate;
- Installation and replacement of riprap on upstream and downstream sides of fills;

- Relocation of the existing vehicle barrier south of its current location but within the Roosevelt Easement[3];
- Following construction of the high-water crossing and removal of vehicle barriers, abandonment of existing low water crossing, which would be allowed to naturally seed in following decompaction and scarification.
- Reroute of the existing road and build up road elevations to meet the high-water crossing;
- Perform post-construction maintenance and repair of the new crossing (Section 2.3.2); and
- Obtain Right-of-Way (ROW) from BIA and the Tohono O'odham Nation (Section 2.3.3)

In summary, Alternative 2 would include approximately 1,700 feet of road improvements. It is anticipated that Alternative 2 would permanently impact up to 4.8 acres associated with the new concrete and roadway structures, and approximately 1.3 acres would be temporarily impacted. Of the 4.8 permanently impacted acres, 2.4 acres are on Tohono O'odham Nation lands, and 2.4 acres are within the Roosevelt Easement. Of the 4.8 acres, 3.85 acres are currently disturbed. Only 0.95 acres of vegetated habitat would be permanently removed as part of Alternative 2. Figures 2-2, 2-3, and 2-4 provide conceptual design drawings for Alternative 2. No utility transmission lines, water lines, or fiber-optic cables are known to occur parallel to or transecting this segment of the Traditional Northern Road.

2.3.1 Construction Activities

Alternative 2 includes the construction of a high-water crossing using 36-inch box culverts over Vamori Wash, south of the existing low-water crossing (see Figures 2-2, 2-3, and 2-4). The proposed road alignment is located south of the existing road alignment to take advantage of higher ground and to move it away from the existing road, which has become a wash (USACE 2016a). All drainage crossings would be protected by appropriate measures, such as, but not limited to, riprap articulated concrete mat or concrete/asphalt pavement, culverts, roadside ditches, or a combination thereof. The all-weather roads, roadside ditches, and riprap are designed for a 50-year storm event. The road structures within the main channels of Vamori Wash are designed for a 100-year storm event, allowing for overtopping of the box culverts (USACE 2016a). A 100-year storm event is a rainfall event that has a 1 percent chance of occurring per year. The all-weather road, roadside ditches, low-water crossings, box culverts, and riprap are designed for a 50-year storm event. A 50-year storm event is a rainfall event that has a 2 percent chance of occurring per year. For storm events equal to or greater than 5-year events (including 50-

[3] In 1907, President Theodore Roosevelt reserved from entry and set aside public reservation of all public lands within 60 feet of the U.S. - Mexico border. Known as the "Roosevelt Reservation" this land withdrawal was found "necessary for the public welfare ... as a protection against the smuggling of goods" 35 Stat. 2136. This reservation includes all public lands under Federal ownership in California, Arizona, and New Mexico at the time of the proclamation.

and 100-year events), the culverts for Alternative 2 would be designed to be overtopped by water and to withstand the forces exerted by that water flow for up to a 100-year storm event.

Minor earthwork (cuts and fills less than approximately 10 feet) and vegetation clearing would be required for the construction of the crossing. Areas excavated for fill would be cleared, stripped, and compacted. Where the soils at the bottom of the excavation preclude compaction, the soils would be excavated to a sufficient depth such that a firm and unyielding surface would be achieved at the planned bottom of excavation or the base of fill, typically 1 to 3 feet below the ground surface. The on-site granular soil may be used for fill; however, the encountered clay soils would not be suitable for compaction, therefore the geotechnical engineer of record would approve all imported material prior to the material being placed at the site. Excavated areas will be de-compacted and scarified to allow for natural vegetation regeneration.

As a guideline, temporary construction excavations greater than 3 feet but less than 15 feet deep in alluvial soils would be planned, with slopes no steeper than 1.5 feet horizontal to 1 foot vertical. For steeper, temporary construction slopes or deeper excavations in alluvium, shoring would be provided for stability and protection. Permanent compacted fill slopes would be planned to be no steeper than 2 feet horizontal to 1 foot vertical and would be protected with riprap to reduce surface erosion. The ground surface would be graded so that water drains rapidly away from structures without ponding. CBP's contractors would strictly adhere to the 42 grading requirements of Pima County and applicable health and safety regulations, including those of the Occupational Safety and Health Administration (OSHA). Water, fuel, and material used during construction would be purchased and delivered from nearby towns. An existing staging area outside the OHWM, used in the last border wall project, is located near the project area. This staging area has had all necessary clearances and is readily available to the project. Standard Best Management Practices (BMPs) for fuels and refueling, and other hazardous materials will be applied to the staging area. The road would be constructed from aggregate obtained from regional sources. In addition, riprap would have to be obtained off-site because no source is readily available at the project site. The riprap may be partially grouted to provide further stability and protection. CBP also proposes using articulated concrete block mats as a road surface in the main and east channel, which would stabilize the channels on either side of the high-water crossing. These mats are pre-assembled and would be designed and installed by specialty contractors and consultants. In addition, three of the existing 24-inch culverts would be replaced with two 36-inch culverts. These box culverts would be either segmented pre-cast or cast-in-place. Cast-in-place box culverts would follow the Arizona Department of Transportation (ADOT) standards and requirements for box culverts.

The project has been determined to be a Non-notifying Nationwide 14 Permit and a Section 404 and Section 401 Permit will not be required. The construction contractor will prepare a stormwater pollution prevention plan (SWPPP) for this action. The SWPPP may be obtained from the Arizona Department of Environmental Quality. The SWPPP will describe the BMPs that will be used and maintained during construction and over the entire life of the project. CBP anticipates that the total time for construction would be approximately 9 to 12 months. CBP anticipates construction occurring from September until May; however, construction could occur beyond May if required in accordance with

BMP provisions. All work would be performed during daylight hours. CBP does not anticipate that any nighttime or weekend work would be required. The following is a list of heavy equipment and vehicles that may be used throughout the construction of the crossing:

- Front-end loader or equivalent
- Drill rig
- Excavator
- Post hole digger
- Water truck
- Crane
- Bulldozer
- Concrete trucks
- Dump trucks
- Flatbed delivery truck
- Crew trucks

A staging area at the San Miguel Gate that was previously used for construction of the border fence would be used for staging of equipment and materials for this alternative (see Figure 1-1.)

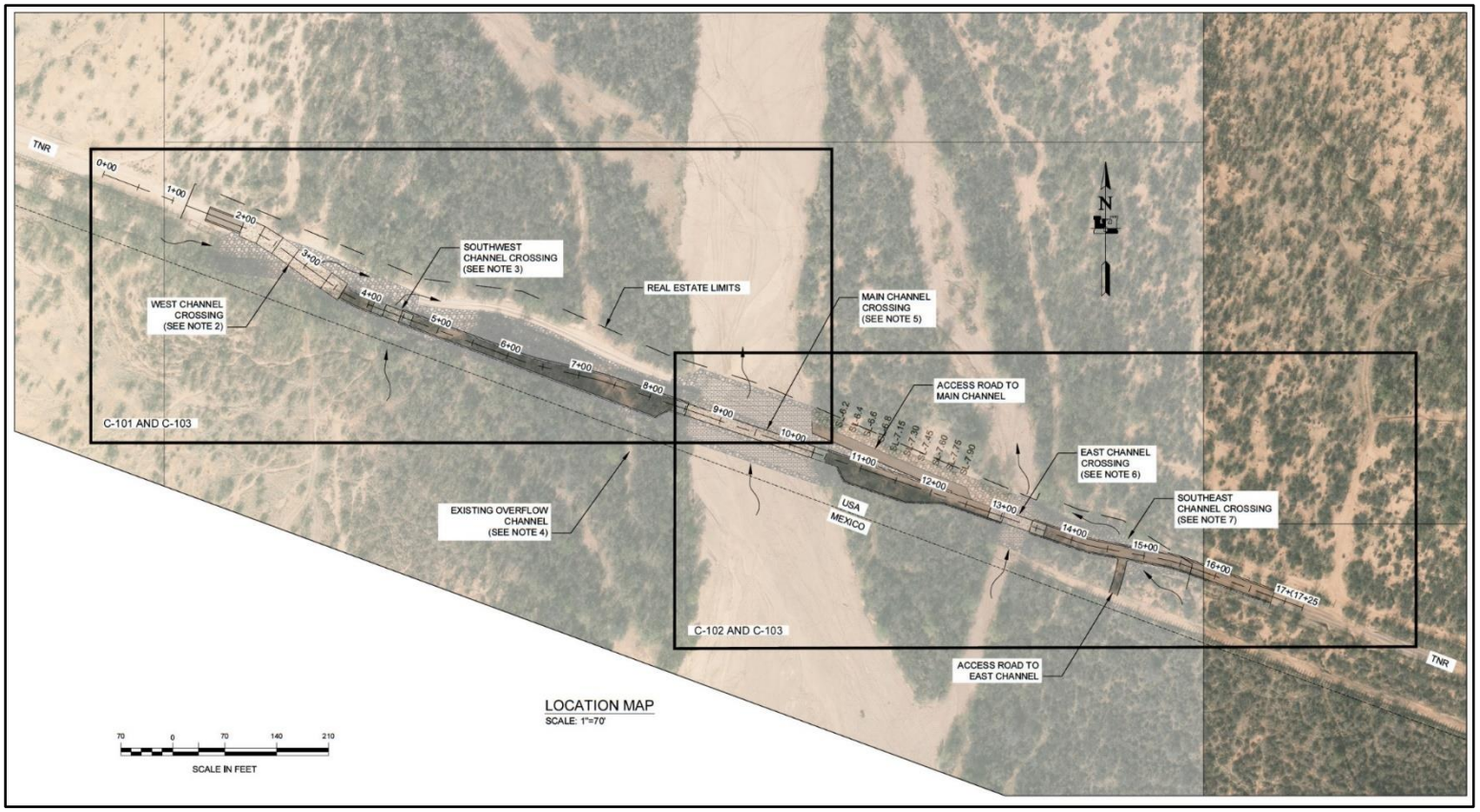


Figure 2-2. Proposed Vamori Wash High-Water Crossing – Overview.

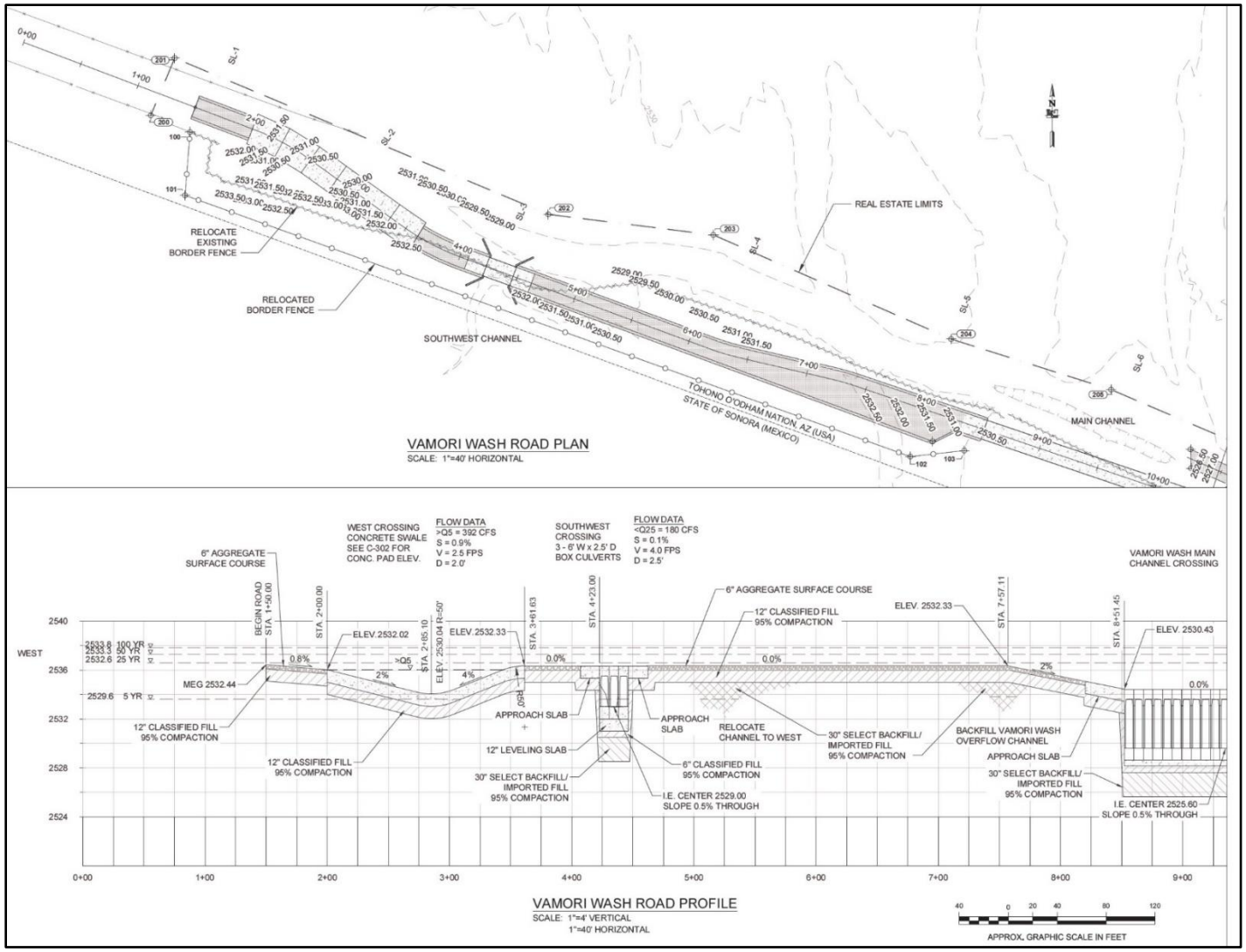


Figure 2-3. Proposed Vamori Wash High-Water Crossing – Road Profile 1.

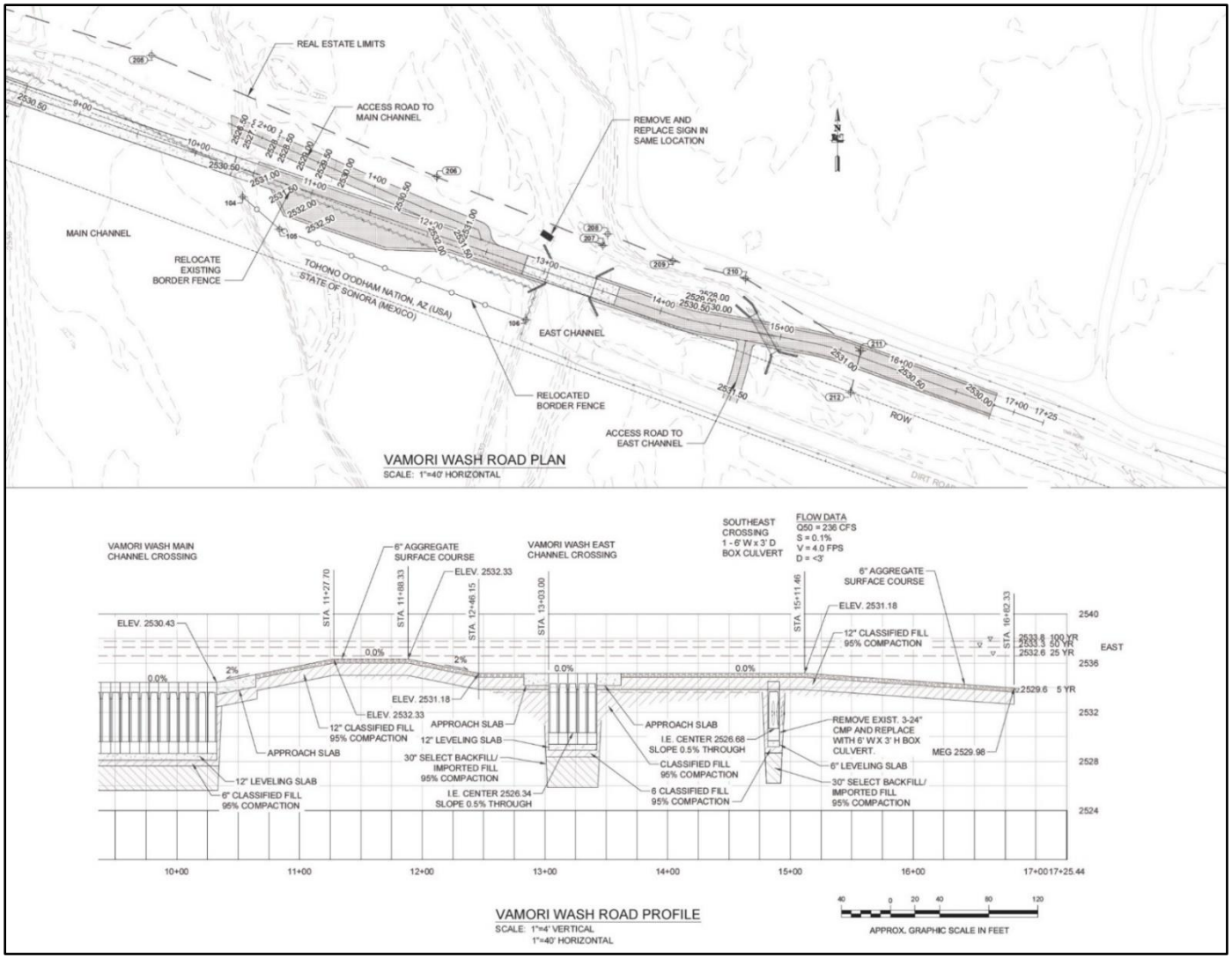


Figure 2-4. Proposed Vamori Wash High-Water Crossing – Road Profile 2.

2.3.2 Post-Construction Activities

CBP and its contractors would avoid performing post-construction maintenance and repair to the extent practicable within the crossing from May 15 through September 30 (yellow-billed cuckoo [YBC] breeding season; see BMP 5, SEA Section 5). Any emergency maintenance or repair activities during YBC breeding season will occur in coordination with the Tohono O'odham Nation.

Post-construction maintenance and repair of the crossing would depend on the duration and severity of overtopping of the roadbed with soil and stone aggregate. For example, minor overtopping (less than 1 foot above road level with duration less than 1 hour) might result in minor repairs and maintenance, whereas major overtopping (several feet above road level for several hours) might result in greater damage to the crossing. Maintenance activities include removing sediment and debris from the top of and inside the culverts, and replacing backfill material as necessary. For the purposes of this SEA, it is anticipated that maintenance and repair would be needed once annually and would include crew trucks, a front-end loader (or equivalent), and dump trucks. In addition, inspections of the crossing would occur bi-annually and after major storm events. It is anticipated that inspections would require crew trucks and would occur up to four times per year.

2.3.3 Real Estate

CBP would seek a long-term ROW from BIA after the Tohono O'odham Nation has consented to the issuance of the ROW for any area that is outside the Roosevelt Easement. CBP currently estimates that up to 2.4 acres would require a long-term ROW with BIA and the Tohono O'odham Nation.

2.4 Alternatives Considered but Eliminated from Further Consideration

Other alternatives that were considered for this action but were eliminated from further analysis because they would not meet the purpose of and need for the Proposed Action, would not meet the screening factors identified in section 2.2, or are not otherwise reasonable, are described in Table 2-1 below.

Table 2-1. Other Alternatives Considered but Eliminated

Other Alternatives Considered	Rationale for Elimination
Construct and maintain a 540-foot bridge.	Not economically feasible or practical and would affect sensitive archaeological resources.
Construct and maintain a 240-foot bridge.	Not economically feasible or practical and would affect sensitive archaeological resources.
Low Water Crossing - improvement, maintenance, and repair of a low-water crossing through Vamori Wash along the existing road. The improved low-water crossing would be within the same footprint of the existing crossing. The existing road would be improved to the design standard	Would not be passable when the Wash is flowing, cutting off access to a large area of the AOR, creating safety and response time concerns (adding a minimum of 90 minutes one way to reach AOR area on the other sides of the wash). CBP's mission to observe and apprehend trespassers would not be being met during closure events.

Other Alternatives Considered	Rationale for Elimination
for an all-weather road, a graded-earth road, or a hybrid of the two. Conveyance limited to what the main channel and east channel naturally carry.	Reduced access to IFT roads. Maintenance of equipment at IFT's would be delayed during high-water closure events. Would need to be cleared after every high-water event. It's estimated that maintenance would be required a minimum of six times/year, essentially making this alternative economically infeasible. Essentially a weir in the middle of the channel – scour would be of most concern just downstream of the crossing.
Use or improve an existing low-water crossing approximately 1.5 miles downstream of the Traditional Northern Road	CBP is not able to obtain Tohono O'odham Nation approval to use this crossing to support the IFT project. Crossing is not passable during the monsoon season and would require an additional five miles of road construction and road improvements.
Use or improve an existing low-water crossing approximately 4.1 miles downstream of the Traditional Northern Road, near the village of San Miguel	CBP is not able to obtain Tohono O'odham approval to use this crossing to support the IFT project. Crossing is not passable during the monsoon season and would require an additional two miles of road construction and road improvements.
Approach the towers from the north using IRR 2, which has an existing bridge over Vamori Wash.	CBP is not able to obtain Tohono O'odham Nation approval to use this crossing to support the IFT project.
Approach the towers from the west using IRR 21	CBP is not able to obtain Tohono O'odham Nation approval to use the roads from IRR 21.
Use of Dip Crossing Stabilizer Soil Cement at an existing low-water crossing	Crossing would not be passable during the monsoon season.

2.5 Summary of Assessed Alternatives

CBP has selected two alternatives for further analysis. Alternative 2 meets the purpose and need; Alternative 1 does not meet the purpose and need.

Alternative 1 uses the Preferred Alternative from the 2017 EA, which allows for maintenance and repair of the current Traditional Northern Road, as the No Action alternative for this SEA. Alternative 2 is the agency's current Preferred Alternative. Under this alternative, CBP would be able to access the proposed IFT sites and other USBP infrastructure along the U.S.-Mexico Border during the monsoon season. Alternative 2 would also improve the safety of USBP agents and the safety of the public traveling on the Traditional Northern Road.

3 Affected Environment and Consequences

This section of the SEA describes the natural and human environments that exist within the region of influence (ROI) and the potential impacts of the alternatives outlined in Section 2.0. The ROI for this project is the San Simon Wash Basin in the Baboquivari Valley of the Tohono O'odham Nation, though a more defined ROI will have been defined for different resources. Only those issues that have the potential to be affected by any of the alternatives are described, per CEQ guidance (40 CFR § 1501.7). Some topics are limited in scope due to the lack of direct effect from the Proposed Action on the resource or because that particular resource is not located within the project corridor.

Impacts (consequence or effect) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8[a]). Indirect effects are caused by the action and occur later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8[b]). As discussed in this section, the alternatives may create temporary (lasting the duration of the project), short-term (up to 3 years), long-term (3 to 10 years following construction), or permanent effects.

Whether an impact is significant depends on the context in which the impact occurs and the intensity of the impact (40 CFR § 1508.27). The context refers to the setting in which the impact occurs and may include society as a whole, the affected region, the affected interests, and the locality. Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts are classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious and long-term and would have substantial consequences on a regional scale. Mitigation measures to offset the adverse effects would be required and extensive. The success of the mitigation measures would not be guaranteed.

3.1 Resources and Impacts Eliminated from Further Discussion

Some resource discussions are limited in scope due to the lack of direct effect from the Proposed Action under any of the alternatives analyzed on the resource or because that particular resource is not located within the ROI.

Impacts on resources evaluated in the 2017 EA are not evaluated in this SEA unless the impacts have changed (CBP 2017). Resources eliminated from further discussion include the following:

Wild and Scenic Rivers

The proposed project would not affect any reach of river designated as wild and scenic, as none are located in the vicinity of the proposed project.

Geology

The Proposed Action would not disturb the regional geologic resources of the area under any of the alternatives analyzed, since only near-surface modifications would be implemented and the geotechnical setting would support the Proposed Action.

Prime and Unique Farmlands

No soils designated as prime or unique farmlands (7 U.S.C. § 4201 et seq.) occur within or near the project corridor.

Aesthetic and Visual Resources

As assessed in the 2017 EA, a negligible impact on aesthetic and visual resources would occur. No change from impacts addressed in the 2017 EA is anticipated (CBP 2017).

Unique and Sensitive Areas

No lands classified as unique or sensitive (i.e., Wilderness Area [16 U.S.C. §§ 1131-1136, 78 Stat. 890]) are located within the ROI.

Utilities and Infrastructure

The 2017 EA assessed the impacts on utilities and infrastructure (CBP 2017). No additional utilities or infrastructure are required for the construction or post-construction activities associated with the Proposed Action. As discussed in Section 2.4, no utility transmission lines, water lines, or fiber-optic cables are known parallel to or transecting this segment of the Traditional Northern Road.

Socioeconomics

The Proposed Action would have no adverse effect on socioeconomic conditions in the region, as the ROI is located in a remote area under any of the alternatives analyzed. Minor beneficial impacts may occur if Tribal monitors are used; water, fuel, or materials are purchased from nearby towns; or if local workers are hired to construct the high-water crossing.

Environmental Justice and Protection of Children

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs Federal agencies to make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high adverse human health, environmental, economic, and social effects of their programs, policies, and activities on minority or low-income populations. The ROI is extremely remote, undeveloped and unpopulated. The nearest town is San Miguel with a population of approximately 3,600 people, located 60 mile north of the project area. The project would have no effect on minorities or low-income

populations, nor would it affect valued resources used by minority or low-income populations.

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires each Federal agency to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. The project area is unpopulated and no children live in proximity to the project; therefore, the project would not adversely affect any children.

3.2 Land Use

Land use was discussed in the 2017 EA and is incorporated herein by reference (CBP 2017). Historically, the O'odham inhabited a large area of land in the southwestern United States, extending south to Sonora, Mexico, north to central Arizona, west to the Gulf of California, and east to the San Pedro River (Tohono O'odham Nation 2014). In 1853, through the Gadsden Purchase or Treaty of La Mesilla, O'odham land was divided almost in half between the United States and Mexico. According to the terms of the Gadsden Purchase, the United States agreed to honor all land rights of the area held by the O'odham. However, the demand for land for settlement escalated with the development of mining and the transcontinental railroad, and the demand resulted in the loss of O'odham land on both sides of the U.S.-Mexico border. On the United States side of the border, the Gadsden Purchase had little effect on the O'odham initially because they were not informed that a purchase of their land had been made and the new border between the U.S. and Mexico was not strictly enforced.

The Tohono O'odham Nation is a Federally-recognized tribe that includes approximately 28,000 members occupying tribal land in Arizona. Tohono O'odham who reside on reservation land live on one of the four separate pieces of land that compose the Tohono O'odham Nation. These pieces of land are the "main" reservation, Florence Village, San Xavier, and San Lucy. The project area, as well as the Traditional Northern Road, are located within the Chukut Kuk District of the Tohono O'odham Nation. Land use in the vicinity of the project site is undeveloped rangeland and areas used for border enforcement operations.

3.2.1 Alternative 1: No Action Alternative

Under the No Action Alternative, no direct impacts on land use would occur because the Vamori Wash area would not be improved. The No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. CBP's ability to use the Traditional Northern Road through this area would continue to be significantly hampered during Arizona's monsoon season.

3.2.2 Alternative 2: Preferred Alternative

Alternative 2 would have a permanent, minor impact on land use in the project area. Alternative 2 would include approximately 1,700 feet of road improvements. It is anticipated that Alternative 2 would permanently impact 4.8 acres, and temporarily impact 1.3 acres. CBP would obtain a ROW for 2.4 acres from the Tohono O'odham Nation. Land use in the ROW would change to border enforcement.

3.3 Soils

Soils were discussed in the 2017 EA and are incorporated herein by reference (CBP 2017). There are three soils associated with Vamori Wash area (Natural Resources Conservation Services [NRCS] 1999) (Figure 3-1). These soils include the Bucklebar-Hayhook-Tubac Complex, Glendale clay loam, and Tubac Complex. The majority (approximately 98 percent) of the soils in the project corridor are Glendale clay loam, and the remaining percentage of soils on the western end of the project corridor is the Bucklebar-Hayhook-Tubac Complex. The Proposed Action would only impact these two soils. A description of the soil types is presented in Table 3-1.

Table 3-1. Characteristics of Soils at the Vamori Wash Site

Soils	Slope percent	Permeability	Runoff Rate	Erosion Hazard for Wind/Water for Undisturbed Soils	Limitations for Development
Bucklebar-Hayhook-Tubac Complex	0-3	Slow to moderate	Slow to medium	Slight by water and moderately high by wind	Care should be taken to prevent excessive dust and soil loss due to erosion; shrinking and swelling of the soils has potential to damage roads and foundations
Glendale clay loam	0-2	Moderately slow	Slow	Slight by water and moderate by wind	Care should be taken to prevent excessive dust and soil loss due to erosion
Tubac Complex	0-2	Slow	Medium	Slight by water and moderate to moderately high by wind	Care should be taken to prevent excessive dust and soil loss due to erosion; shrinking and swelling of the soils has potential to damage roads and foundations

Source: NRCS 1999

3.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no modification of soils from construction activities since the Vamori Wash area road improvements would not be constructed, maintained, or repaired and only current maintenance and repair of the current Traditional Northern Road would be allowed.

Erosion would continue to occur along the wash without the proposed improvements. The existing low-water crossing is unstable and would continue to erode at the current rate in the absence of any proposed improvements.

3.3.2 Alternative 2: Preferred Alternative

Alternative 2 would have a direct, minor impact on soils in the ROI. Alternative 2 would permanently impact up to 4.8 acres and temporarily impact 1.3 acres. All impacted soils are locally and regionally common. Alternative 2 would not result in the loss of any soils classified as unique.

Design features (e.g., riprap embankment, concrete or articulate mat road surface, and riprap shoulders) associated with high-water crossing would minimize erosion of the channel and crossing. To prevent soil loss the contractor will be required to implement BMPs, which would be detailed in the SWPPP, would be implemented during and following construction activities to avoid significant soil loss. As part of the BMPs, the construction area would be watered during construction activities to reduce fugitive dust. To further minimize potential erosion, impact areas would be revegetated with a mixture of native plant seeds and/or allowed to revegetate naturally following construction.

3.4 Groundwater

Groundwater was discussed in the 2017 EA and is incorporated herein by reference (CBP 2017). The major aquifer in the San Simon Wash Basin in the vicinity of Vamori Wash consists of consolidated crystalline and sedimentary rocks and unconsolidated sediments, and groundwater flow direction is generally from the east and north to the south. Groundwater storage for the San Simon Wash Basin ranges from 6.7 million to 45 million acre-feet to a depth of 1,200 feet with a natural recharge estimated at over 11,000 acre-feet (approximately 4 billion gallons) per year (Arizona Department of Water Resources [ADWR] 2014).

3.4.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no additional impacts on groundwater resources, as the existing road through Vamori Wash crossing would not be improved and per the Preferred Alternative of the 2017 EA, only current activity levels which is limited to maintenance and repair of the current Traditional Northern Road would occur. Water usage to repair and maintain the existing road would remain the same as present and sourced from off-site. It is estimated that maintenance activities would occur eight to ten times per year.

3.4.2 Alternative 2: Preferred Alternative

Alternative 2 would have a temporary, minor adverse impact on groundwater resources. The Preferred Alternative would slightly increase demands on water supplies during the construction period. Water would be needed for a variety of construction activities, including, but not limited to, wetting construction sites for dust suppression, and concrete mixing. Water for construction activities would be obtained from an existing fire hydrant located in proximity to the border. CBP would contract with Tohono O'odham Utility Authority for the installation of a water meter on the fire hydrant. The water used during construction activities to control dust would equal approximately 400 acre-feet (approximately 130 million gallons) and would not affect the water supply for the Tohono O'odham Nation." In the long-term water use would be higher under Alternatives 1 due to repeated annual maintenance of six to eight events per year.

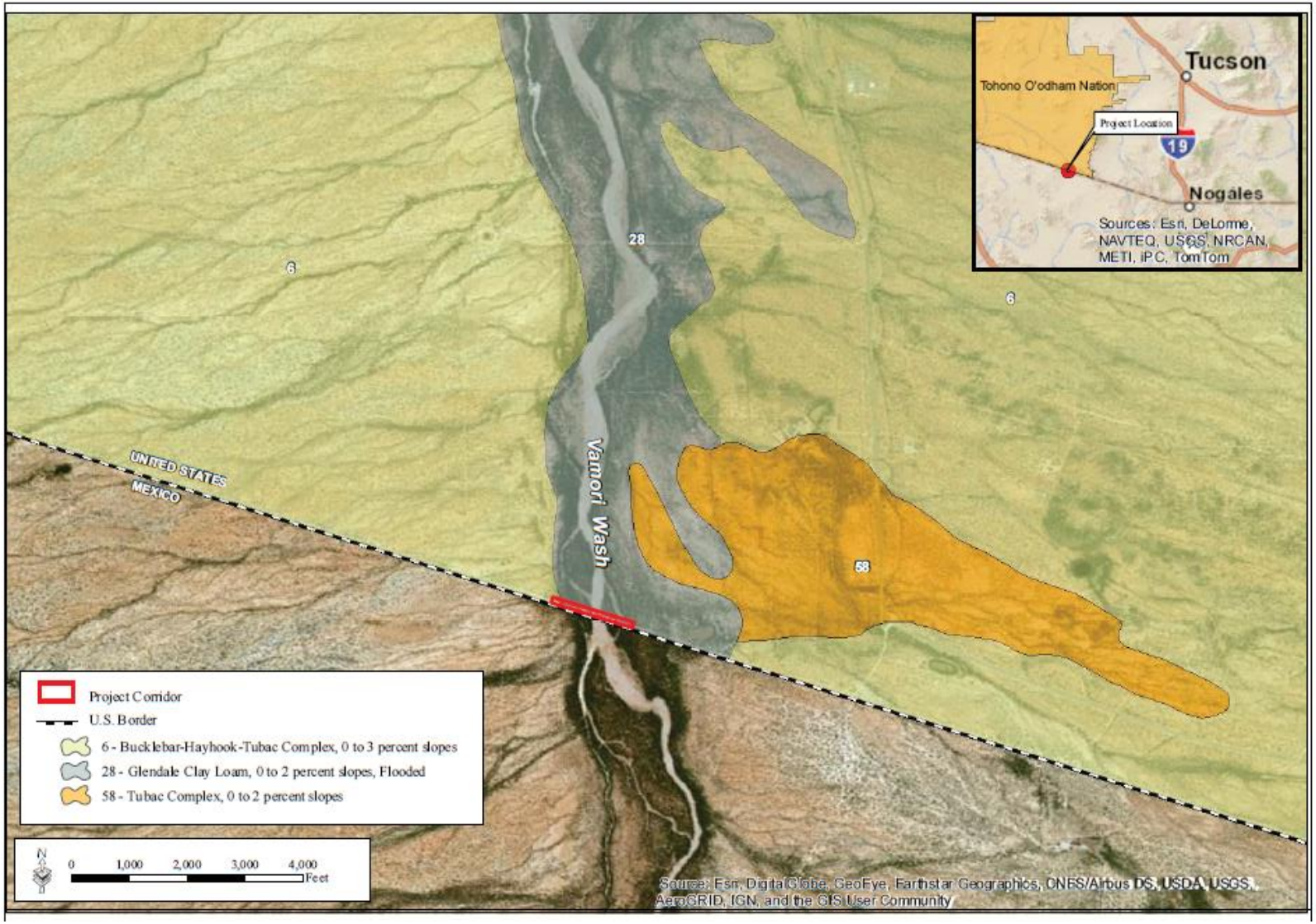


Figure 3-1. Soils Map.

3.5 Surface Waters and Waters of the United States

Surface waters and waters of the U.S. were discussed in the 2017 EA and are incorporated herein by reference (CBP 2017). Waters of the United States are defined within the Clean Water Act (CWA), and jurisdiction is addressed by the USACE and U.S. Environmental Protection Agency (USEPA). Washes observed are classified as ephemeral streams and are considered potential waters of the United States.

Vamori Wash drains an approximately 239-square-mile watershed and flows northwest to the San Simon Wash. The majority of the drainage area is located in Mexico (USACE 2016a). This area has the highest amount of rainfall between July and September. It is prone to flooding after significant rain events, which have the potential to make the Traditional Northern Road unpassable for up to six weeks (USACE 2016a).

Activities that result in the dredging and/or filling of waters of the United States, including wetlands, are regulated under Sections 404 and 401 of the CWA.

The construction of the Vamori Wash High-Water Crossing would be a Non-Notifying Nationwide Permit 14 project.

3.5.1 Alternative 1: No Action Alternative

Under the No Action Alternative, no additional impacts on surface waters or waters of the United States would occur as there would be no construction in the vicinity of Vamori Wash. However, erosion and sedimentation would continue to occur without road improvements, thus affecting water quality as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road.

3.5.2 Alternative 2: Preferred Alternative

Alternative 2 could have temporary, minor impacts on surface water as a result of increases in erosion and sedimentation associated with project construction. Disturbed soils and hazardous substances (i.e., anti-freeze, fuels, oils, and lubricants) could directly affect water quality during a rain event. These effects would be minimized through the use of BMPs. Applicable BMPs are provided in Section 5.0 of this SEA. A Construction Stormwater General Permit would be obtained prior to construction, and this would require approval of a site-specific SWPPP, developed by the construction contractor. A site-specific spill response plan would also be in place prior to the start of construction. BMPs outlined in these plans would reduce potential migration of soils, oil and grease, and construction debris into local surface waters. Once the construction project is complete, the construction footprint would be revegetated with native vegetation, as outlined in the SWPPPs, which would reduce the potential for non-point source pollution to enter local surface waters. Therefore, there would be negligible to minor impacts on surface waters or waters of the U.S. caused by soil erosion or sedimentation. The construction of the Vamori Wash High-Water Crossing would be a Non-Notifying Nationwide Permit 14 project.

3.6 Floodplains

Floodplains were discussed in the 2017 EA and are incorporated herein by reference (CBP 2017). The Vamori Wash area is included on Federal Emergency Management Agency

(FEMA) Flood Insurance Rate Map (FIRM) Panel Number 04019C4550L. This panel is in Zone D, which is areas where there are possible but undetermined flood hazards and where no FEMA analysis of flood hazards has been conducted (USACE 2016a).

3.6.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no construction as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road so there would be no direct impacts on floodplains. However, indirect impacts such as erosion and sedimentation would continue to occur without road improvements, and potential effects on floodplain would remain status quo.

3.6.2 Alternative 2: Preferred Alternative

The box culverts to be installed in the main channels of Vamori Wash are designed for a 100-year storm event, with overtopping of the box culverts expected during events that exceed the 5-year storm. The high-water crossing will be capable of withstanding damages associated with a 100-year storm event. While some repairs may be required after a storm event, the system would be designed to have minimal impact on the conditions in the area. Hydraulic analysis predicts that water surface elevations at the U.S.-Mexico border could increase about 9 inches during the 10-year flood as the result of water flow being impeded by the guard rails (USACE 2016a). Debris flows can be generated during heavy rainstorms, especially in steep, mountainous topography with abundant poorly consolidated alluvial materials. This type of topography and deposits are not generally present in the ROI, thus the debris flow potential is considered low (USACE 2016b). However, hydraulic models predict that debris blockage could result in the 5-year storm event overtopping the structure and predict an approximately 2.1-foot increase in surface water elevation at the U.S.-Mexico border for a debris blocked structure. A debris blocked structure in a 100-year storm event would result in a lesser increase in water surface elevation, as the surface area is spread-out more laterally in these larger events. Models predict an approximately 0.40 feet increase in water surface elevation for the 100-year storm event (USACE 2016a). It is anticipated that any debris buildup would be removed during the anticipated annual maintenance. There will be some increased area of impervious surface, however the area of impervious surface is not expected to be great enough to contribute to increasing the flood risk. Therefore, the implementation of Alternative 2 would have minor impacts on floodplains.

3.7 Vegetative Habitat

Vegetative habitat was discussed in the 2017 EA and are incorporated herein by reference (CBP 2017). The Vamori Wash site is located in the Arizona Upland subdivision of the Sonoran Desert scrub biotic community (Brown and Lowe 1994) and exhibits a well-defined xeroriparian community. The Arizona Upland subdivision receives on average a higher amount of precipitation during the summer and is capable of supporting a landscape with greater plant densities and increased species diversity compared to other desert environments (Brown and Lowe 1994, Turner and Brown 1982).

A pedestrian biological resource survey was completed on the proposed project area during daylight hours on February 21, 2017. The pedestrian survey consisted of a series of parallel

transects that provided 100 percent visual coverage within a 250-foot radius of the Vamori Wash site within the U.S. The biologist searched for listed and sensitive species, signs of their presence, and unique biological features (e.g., rocky outcrops, burrows, rock shelters, bird nests) at and in the vicinity of the site. Observations of vegetative habitat and floral communities were recorded, along with species diversity and any wildlife species or signs of wildlife observed. Locations of sensitive natural resources were recorded using a Trimble Geo XT Global Positioning System unit with sub-meter accuracy (GSRC 2017). The vegetative community at the proposed project area can be classified as Arizona upland subdivision of the Sonoran Desert with a well-defined xeroriparian community. In areas where canopy cover reaches 70 to 100 percent, the dominant tree and shrub species are velvet mesquite (*Prosopis velutina*), catclaw acacia (*Senegalia greggeii*), and paloverde (*Parkinsonia* spp.). Small thickets of western soapberry (*Sapindus saponaria*) and netleaf hackberry (*Celtis reticulata*) were observed north of the ROI. There were no saguaros (*Carnegiea gigantean*), barrel cacti (*Ferocactus wislizenii*), or willow (*Salix* spp.) or cottonwood trees (*Populus fremontii*) observed within the ROI. Table 3-2 lists all vegetative species observed during the biological survey. No wetlands were located during this survey.

Table 3-2. Plant Species Observed During the Biological Surveys.

Species Common Name	Species Scientific Name
Arizona bristlegrass	Setaria arizonica
Arizona lupine	Lupinus arizonicus
Blue paloverde	Parkinsonia floridia
Broom snakeweed	Gutierrezia sarothrae
Burrow weed	Isocoma tenuisecta
California poppy	Eschscholzia californica
Catclaw acacia	Senegalia greggii
Christmas cholla	Cylindropuntia leptocaulis
Common fiddleneck	Amsinckia menziesii
Coyote melon	Cucurbita palmata
Desert broom	Baccharis sarothroides
Desert hackberry	Celtis ehrenbergiana
Desert honeysuckle	Anisacanthus thurberi
Desert indianwheat	Plantago ovata
Hoary bowlesia	Bowlesia incana
Johnson grass	Sorghum halepense
Lambsquarters	Chenopodium album
London rocket	Sisymbrium irio

Species Common Name	Species Scientific Name
Mexican paloverde	Parkinsonia aculeata
Netleaf hackberry	Celtis reticulata
Sandmat	Chamaesyce sp.
Schismus grass	Schismus barbatus
Snakeweed	Gutierrezia sarothrae
Velvet mesquite	Prosopis velutina
Virgins bower	Clemetas sp.
Wolf berry	Lycium sp.
White-thorn acacia	Vachellia constricta

Source: GSRC 2017

3.7.1 Alternative 1: No Action Alternative

Under the No Action Alternative, no vegetative habitat would be disturbed or removed because the Vamori Wash area road improvements would not be constructed as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road

However, erosion and sedimentation would continue to occur without road improvements, thus affecting adjacent habitat.

3.7.2 Alternative 2: Preferred Alternative

Alternative 2 would have a permanent, minor, direct impact on vegetation in the ROI. Alternative 2 would include approximately 1,700 feet of road improvements and permanently impact 4.8 acres, of which 3.85 is currently disturbed. Only 0.95 acres of vegetated habitat would be permanently removed as part of Alternative 2. These impacts would be considered permanent as the area would be maintained as void of vegetation. There would not be vegetation rehabilitation on these acres which would stay as permanently cleared. There would be temporary impacts to 1.3 acres of vegetation.

The plant community associated with the construction of a high-water crossing is both locally and regionally common, and the permanent loss of vegetation would not adversely affect the population viability of any plant species in the region. Project disturbances could result in conditions suitable for the establishment of non-native plant species. In order to ensure that Alternative 2 does not actively promote the establishment of non-native and invasive species in the area, BMPs would be implemented to minimize the spread and reestablishment of non-native vegetation. Temporary impact areas would be revegetated using native plant seeds or allowed to regenerate naturally. Removal of non-native vegetation would be done in coordination with the Tohono O'odham Nation Wildlife and Vegetation Management Program (WVMP). All plant material would be disposed of in accordance with Tohono O'odham Nation requirements. Per the direction of the Tohono O'odham Nation, CBP would salvage all removed mesquite with a diameter of 4 inches or

more. These BMPs, as well as measures protecting vegetation in general, would reduce potential impacts from non-native invasive species to a negligible amount.

3.8 Wildlife Resources

Wildlife Resources were discussed in the 2017 EA and are incorporated herein by reference (CBP 2017). As described in Section 3.7 (Vegetative Habitat), the proposed Vamori Wash High-Water Crossing is within the Arizona Upland subdivision of the Sonoran Desertscrub biotic community (Brown et al. 1994). Several mammals, birds, and reptiles associated with the Sonoran Desertscrub community were observed at Vamori Wash during the biological survey conducted on February 21, 2017. One gray hawk (*Buteo plagiatus*) nest, observed previously during surveys for a separate project, was observed at Vamori Wash; however, it was extremely degraded and not active.

The following pictures are useful in providing a snapshot of existing conditions in the project area, (see Figures 3-2 to 3-5).

Figure 3-2. Photo of Project Area. Facing south, eastern end of project location.

Figure 3-3. Photo of Project Area. Facing west, eastern end of project location.

Figure 3-4. Photo of Project Area. Facing west, western end of project location.

Figure 3-5. Photo of Project Area. Facing north, western end of project location.

The species observed during the biological survey are listed in the Table 3-3.

Table 3-3. Wildlife Species Observed During the Biological Survey.

Species Common Name	Species Scientific Name
Mammals	
Desert cottontail	Sylvilagus audubonii
Pocket gopher	Thomomys bottae
Round-tailed ground squirrel	Spermophilus tereticaudus
White-throated woodrat	Neotoma albigula
Birds	
Abert's towhee	Pipilo aberti
Black-tailed gnatcatcher	Polioptila melanura
Black-throated sparrow	Amphispiza bilineata
Brewer's sparrow	Spizella breweri
Common raven	Corvus corax
Curve-billed thrasher	Toxostoma curvirostre
Mourning dove	Zenaida macroura

Species Common Name	Species Scientific Name
Phainopepla	Phainopepla nitens
Roadrunner	Geococcyx californianus
Savannah sparrow	Passerculus sandwichensis
Verdin	Auriparus flaviceps
Reptiles	
Ornate tree lizard	Urosaurus ornatus
Side-blotched lizard	Uta stansburiana

3.8.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no direct impacts on wildlife or wildlife habitat, since the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road, and the Vamori Wash High-Water Crossing would not be constructed.

3.8.2 Alternative 2: Preferred Alternative

Alternative 2 would have permanent, minor, direct impacts on wildlife and wildlife habitat in the ROI. The project area is characterized by Arizona upland subdivision of the Sonoran Desert with a well-defined xeroriparian community composed of mesquite bosque, upland scrub, and barren desert wash (CBP 2015) habitat. The habitat at the project site is non-contiguous and lacks a complex understory. Alternative 2 would include approximately 1,700 feet of road improvements. It is anticipated that Alternative 2 construction would permanently impact 4.8 acres, as well as temporarily impact 1.3 acres, however only 0.95 acre of the 4.8 acres to be permanently impacted is currently vegetated (see Figure 2-1: Project Location and Area of Disturbance).

Soil disturbance and operation of heavy equipment could result in the direct loss of less mobile individuals, such as lizards, snakes, and ground-dwelling species such as rodents. However, most wildlife would likely avoid any direct harm by escaping to surrounding habitat. The direct degradation and loss of habitat could also impact burrows and nests, as well as cover, forage, and other wildlife resources. BMPs to minimize impacts on migratory birds are presented in Section 5.0 of this SEA.

The loss of these resources might result in the displacement of individuals that would then be forced to compete with other wildlife for the remaining resources. Although this competition for resources could result in a reduction of total population size, such a reduction would be extremely minimal in relation to total population size and would not result in long-term effects on the sustainability of any wildlife species.

Noise associated with the construction and maintenance of a high-water crossing would result in temporary, minor impacts on wildlife. Elevated noise levels associated with the construction and maintenance activities would only occur during these activities. The effects of this disturbance would include temporary avoidance of work areas and

competition for unaffected resources. BMPs would reduce noise associated with construction of Alternative 2. BMPs implemented to reduce disturbance and loss of wildlife habitats would include: conducting construction and maintenance activities during daylight hours only; if construction or maintenance must occur during nighttime hours, the frequency and duration of these activities will be minimized to the greatest extent possible; and maintaining equipment in proper running condition.

It is anticipated that vehicle trips on an annual basis will increase as a result of constructing the high-water crossing. Local users and USBP agents will be able to utilize the high-water crossing during the monsoon season, thus increasing vehicle trips and noise. These increased vehicle trips and elevated noise levels would be intermittent and minor. Wildlife inhabiting the project area and surround habitat are habituated to traffic noise on the Traditional Northern Road. Thus, noise levels associated with increased traffic would have a permanent, minor impact on wildlife.

3.9 Threatened and Endangered Species

Threatened and Endangered Species were discussed in the 2017 EA and are incorporated herein by reference (CBP 2017). Additionally, as part of the analysis in the 2017 EA CBP determined that that Preferred Alternative may affect, but not likely to adversely effect, the following Federally listed species: Sonoran pronghorn (*Antilocapra Americana conoriensis*), jaguar (*Panthera onca*), lesser long-nose bat (*Leptonycteris yerbabuenae*)[4], and Yellow billed cuckoo (*Coccyzus americanus*). CBP has also determined that the Preferred Alternative would not adversely modify designated critical habitat for the jaguar or the YBC. The U.S. Fish and Wildlife Service (USFWS) concurred with these determinations in accordance with Section 7 of the Endangered Species Act (CBP 2017). No change from impacts addressed in the 2017 EA would be anticipated in the SEA. The ROI for the SEA is usually the same as the ROI for the 2017 EA for Threatened and Endangered Species. CBP is currently consulting with USFWS for this SEA, a copy of the determination will be included in Appendix C in the final SEA.

Federally Listed and Candidate Species

The Endangered Species Act (ESA) of 1973 (16 U.S.C. § 1531 et seq., as amended) defines an endangered species as a species "in danger of extinction throughout all or a significant portion of its range." A threatened species is a species "likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Species may be considered endangered or threatened "because of any of the following factors: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purpose; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural or human-induced factors affecting continued existence." Proposed species are those that have been proposed in the Federal Register (FR) to be listed as threatened or endangered under Section 4 of the ESA. USFWS has identified species that are candidates for listing

[4] 1. Lesser long-nosed bat – Federally Listed Status – Delisted due to recovery 0418 2018, Federal Register at https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0AD.

because of identified threats to their continued existence. The candidate designation includes those species for which USFWS and the U.S. National Marine Fisheries Service (NMFS) has sufficient information to support proposals to list as endangered or threatened under the ESA (USFWS and NMFS 1998).

There are 13 endangered and 5 threatened species that occur within Pima County, Arizona. Additionally, one species is listed as Endangered Experimental, and one is listed as proposed endangered. One species, the lesser long nosed bat has been delisted and is noted as Recovered (Table 3-4). Seven of these species have designated critical habitat. In the Biological Opinion prepared for the 2017 EA, the USFWS concurred with CBP's determination that the proposed project "may affect but is not likely to adversely affect" the threatened YBC in its proposed habitat, the endangered jaguar and its critical habitat, and the endangered lesser long-nosed bat (see footnote 1, page 33). The project location for the SEA is outside of critical habitat for these species (Figures 3-2 and 3-3). Of the 20 Federally listed and proposed species, there would be only 2 species with the potential to occur within the ROI; the jaguar (*Panthera onca*) and yellow-billed cuckoo (*Coccyzus americanus*, YBC).

Jaguar

The jaguar is the largest and most robust of the North American cats. The southwestern United States and Sonora, Mexico, are the extreme northern limits of the jaguar's range, which extends through southern Mexico, into Central and South America to northern Argentina (Hatten et al. 2005). The jaguar's home range is highly variable and is dependent on topography, prey abundance, and the population density of resident jaguars (Brown and Gonzalez 2001). The jaguar's potential range in Arizona includes mountain ranges and rugged terrain along the southeast border. A closed vegetative structure is the major habitat requirement for the jaguar. The open, dry areas in the southwestern United States are considered marginal habitat in terms of water, cover, and prey densities. Jaguars typically avoid open country like grassland and Sonoran desertscrub (USFWS 2012). Jaguar distribution patterns over the last 50 years and recent observations of individuals suggest that southeast Arizona is the most likely area for jaguar occurrence in the United States (Hatten et al. 2003).

In 2001, the Borderlands Jaguar Detection Project was initiated to systematically survey for jaguars in southeastern Arizona. During this project, Childs and Childs (2008) reported that two male jaguars and a possible third were documented in southeastern Arizona between March 2001 and July 2007. One of the two male jaguars was previously photographed in 1996 in the Baboquivari Mountains (USFWS 2012). This jaguar, subsequently referred to as "Macho B," was documented moving between the Atascosa Mountain complex and the Baboquivari Mountain complex between 2004 and 2007 (McCain and Childs 2008) and was euthanized in 2009.

A wildlife trail camera study conducted by the University of Arizona revealed the presence of a single adult male jaguar, nicknamed "El Jefe," in the eastern Santa Rita Mountains, Pima County, Arizona, between 2012 and 2015 (Davis 2016). The area where El Jefe was documented is over 55 miles northeast of the Tohono O'odham Nation. The last photographic documentation of El Jefe occurred in September 2015 (Davis 2016).

In 2018, experts identified a male jaguar named Yo'oko's pelt in a photograph and believed he was killed either accidentally by hunters seeking mountain lions or poachers (LiveScience 2018). Other recent sightings of jaguars include an adult documented by a trail camera in 2017 deployed by the University of Arizona in the Chiricahua Mountains (approximately 150 miles east of the ROI [KGUN 2019]), a trail cameral deployed by the Bureau of Land Management (BLM), within the Dos Cabezas Mountains, Cochise County, AZ on November 16, 2016 (approximately 170 miles east of the ROI) (USFWS 2017). Another adult jaguar was photographed in the Huachuca Mountains, Cochise County, Arizona, on December 1, 2016 (approximately 119 miles east of the ROI), by a trail camera managed by Fort Huachuca (Davis 2016). Subunit 1b includes approximately 21,000 acres and was not considered occupied at the time of listing (79 FR 12572). In 2007, a single male jaguar (Macho B) was confirmed in the area now identified as designated critical habitat Subunit 1a (Baboquivari-Coyote Subunit); however, Macho B was euthanized in 2009. The most recent confirmed jaguar sightings have occurred at distances greater than 50 miles east of the Tohono O'odham Nation in the eastern Santa Rita Mountains (Pima County, Arizona), Dos Cabezas Mountains (Cochise County, Arizona), and Huachuca Mountains (Cochise County, Arizona) (Davis 2016, USFWS 2017). Most of the recent confirmed jaguar observations in Arizona have been from Madrean oak woodland and semidesert grassland habitats (77 FR 50214). The Preferred Alternative occurs in Arizona upland Sonoran desertscrub. Although jaguars have been known to move through Sonoran desertscrub habitats, there is no evidence of jaguars occupying this habitat type

USFWS determined that the following physical or biological features are essential to the conservation of the jaguar: expansive open spaces in the southwestern United States with adequate connectivity to Mexico that contains a sufficient native prey base; available surface water within 12.4 miles; suitable vegetative cover and rugged topography below 6,562 feet above mean sea level (amsl); and minimal to no human population density. In March 2014, USFWS designated 764,207 acres of critical habitat for the jaguar, including areas along and near the international border in Pima, Santa Cruz, and Cochise Counties, Arizona, and Hidalgo County, New Mexico (79 FR 12571) (Figure 3-6). The Tohono O'odham lands were excluded from the critical habitat designation.

Table 3-4. List of Federally Protected Species within Pima County, Arizona.

Common and Scientific Name	Status	Critical Habitat	Habitat	Determination
Flowering Plants				
Acuña cactus (Echinomastus erectocentrus var. acunensis)	E	Y	Upland subdivision of Sonoran Desert scrub; valleys and small knolls and gravel ridges of up to 30 percent slope; on soil overlying various bedrock types	No effect
Canelo Hills ladies'-tresses (*Spiranthes delitescens)*	E	N	Fine-grained, highly organic but well-drained moist soils near springs, seeps, cienegas, and small streams	No effect
Huachuca water-umbel (Lilaeopsis schaffneriana var. recurva)	E	Y	Cienegas, rivers, streams, springs, and muddy or silty substrates near permanent water bodies	No effect
Kearney's blue-star (*Amsonia kearneyana)*	E	N	Open woodland on unconsolidated slopes of over 20 degrees; canyon bottoms with full sun to partial shade	No effect
Nichol's Turk's head cactus (Echinocactus horizonthalonius var. nicholii)	E	N	Limestone substrates, along dissected alluvial fans, inclined terraces and saddles, bajadas, and debris flows	No effect
Pima pineapple cactus (Coryphantha scheeri var. robustispina)	E	N	Alluvial basins and hillsides of desert scrubland or ecotones between desert scrubland and desert grassland	No effect
Fish				
Desert pupfish (Cyprinodon macularius)	E	N	Cienegas, springs, streams, and margins of larger lakes and rivers	No effect
Gila chub (Gila intermedia)	E	Y	Pools, high-order streams, and cienegas throughout the Gila River Basin	No effect

Common and Scientific Name	Status	Critical Habitat	Habitat	Determination
Gila topminnow (Poeciliopsis occidentalis)	E	N	Rivers, streams, and marshes of Gila River Basin	No effect
Sonora chub (Gila ditaenia)	T	Y	Pools created by cliffs or boulders in the Río de la Concepción drainage	No effect
Amphibians				
Chiricahua leopard frog (Lithobates chiricahuensis)	T	N	Cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers	No effect
Reptiles				
Northern Mexican gartersnake (Thamnophis eques megalops)	T	Proposed	Ponds and cienegas, lowland river riparian forests and woodlands, and upland stream gallery forests	No effect
Sonoyta mud turtle (Kinosternon sonoriense longifemorale)	PE	N	Perennial sources of water with aquatic vegetation and riparian areas with moist soil such as stream channels and natural or manmade ponds	No determination
Birds				
California least tern (*Sterna antillarum browni*)	E	N	Open sandy beaches free of vegetation, sandbars, gravel pits, or exposed flats along shorelines of inland rivers lakes, reservoirs, and drainage systems; large lakes, recharge basins, or wetland areas in different parts of Arizona	No effect
Masked bobwhite (Colinus virginianus ridgwayi)	E	N	Semi-arid environments with patches of higher canopy coverage of woody plants, typically 20-100% cover in Arizona	No effect

Common and Scientific Name	Status	Critical Habitat	Habitat	Determination
Mexican spotted owl (Strix occidentalis lucida)	T	Y	Mixed conifer, Madrean pine-oak, Arizona cypress, encinal oak woodlands, and associated riparian forests	No effect
Southwestern willow flycatcher (Empidonax traillii extimus)	E	Y	Cottonwood-willow forests along major rivers for breeding; potential habitat along most of Arizona's major watersheds	No effect
Yellow-billed cuckoo (Coccyzus americanus)	T	Y	Scrubby woodlands, overgrown orchards, abandoned farmlands, and dense riparian thickets	May affect, not likely to adversely effect
Mammals				
Sonoran pronghorn (Antilocapra americana sonoriensis)	E-EX	N	Inhabits broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations.	No effect.
Jaguar (Panthera onca)	E	Y	Tropical rainforests, thornscrub, desertscrub, lowland desert, mesquite grassland, Madrean oak woodland, and pine-oak woodland communities	No effect
Lesser long-nosed bat (Leptonycteris curasoae yerbabuenae)	R	N	Natural caves, abandoned mines, overhanging rocks, and other shelters. Status updated to Recovered, Fed Reg 0418 2018	No effect

USFWS 2017a
E – Endangered
T – Threatened
E-EX – Endangered Experimental
PE – Proposed Endangered; R - Recovered

Yellow-Billed Cuckoo (YBC)

USFWS lists the western distinct population segment of the YBC as threatened under the ESA, effective November 3, 2014 (79 FR 59992). The western population of this avian species is a secretive, insectivorous, neotropical migrant inhabiting North American riparian woodlands during the summer breeding season. Optimal habitat conditions include at least 200 acres of dense canopy riparian forest near a perennial river or stream, dominated by willow and cottonwood trees that provide prime feeding and nesting opportunities. Habitats dominated by mesquite are also known to support the YBC (USFWS 2014a). In the extreme southern portion of its range in the States of Sonora (southern quarter) and Sinaloa, Mexico, YBC also nests in upland thorn scrub and dry deciduous habitats away from the riparian zone (Russell and Monson 1998), though densities are lower in these habitats than they are in adjacent riparian areas. During the regional period of northern migration, which begins in May in Arizona, the YBC is known to roam widely, assessing the availability of food resources before selecting a nest site, and more than one nest site may be utilized during a single breeding season (mid-May through late September). During these movements, the species may frequent strips of woodland habitat that may not otherwise provide sufficient conditions for nesting. The YBC's home range averages approximately 100 acres but has been documented at up to 500 acres. USFWS has proposed critical habitat for this species (79 FR 48548) (USFWS 2014b). The project would not occur within proposed critical habitat for the species (Figure 3-7).

The project location for the proposed high-water crossing occurs in landscape that is 70 to100 percent vegetated and contains riparian characteristics where YBC may forage. The project area is characterized by mesquite bosque, upland scrub, and barren desert wash (CBP 2015) habitat. The vegetation communities in the project area provide marginal to unsuitable habitat for YBC. Approximately 4.8 acres will be permanently disturbed, of which 0.95 acre of vegetation will be permanently removed in Vamori Wash. A small area of potential nesting habitat occurs north of the proposed high-water crossing ROI. However, the habitat is non-contiguous and lacks a complex understory, thus making it marginal quality nesting habitat. More suitable and larger patches of potential nesting habitat are located outside and directly to the south of the project area, along the western side of Vamori Wash in Mexico (CBP 2015).

The YBC is a late spring migrant. In Arizona and California, a few individuals occasionally arrive in mid- to late May; however, the majority do not arrive until mid-June, with late migrants continuing into July (CBP 2015). Nesting typically occurs between late June and late July, but may occasionally begin as early as late May, and continue into September. In southeastern Arizona (and possibly in other parts of the Southwest), nesting may regularly continue into September. In 2015, five USFWS protocol surveys for YBC were conducted in the project area. A total of 12 detections occurred during the protocol surveys. Eight of the detections occurred during the third and fourth survey periods. The third and fourth surveys occurred on July 14 and July 30, 2015 during the height of breeding season. All eight detections were unsolicited. The USFWS survey protocols indicates that three or more detections, separated by 10 or more days over at least three survey periods are necessary to support a probable breeding determination (CBP 2015). Consequently, the ROI is considered to be probable breeding territory (CBP 2015). Nine of the detections identified YBC calling from near or south of the U.S.-Mexico border and

within the western side of the mesquite bosque habitat. Based on the detection pattern, if YBC breeding activity is occurring in the area, it most likely is occurring near or south of the U.S.-Mexico border and within the western mesquite bosque (CBP 2015).

State-Listed Species

The Arizona Natural Heritage Program (ANHP) maintains a list of species with special status in Arizona. The ANHP list includes flora and fauna whose occurrence in Arizona is or may be in jeopardy or that have known or perceived threats or population declines (AGFD 2017). The ANHP list for Pima County is provided in Appendix C. These species are not necessarily the same as those protected under the ESA.

Tohono O'odham Nation Sensitive Species

A complete listing of the Tohono O'odham Nation Endangered and Culturally Sensitive Species is not included in this SEA at the request of the Tohono O'odham Nation.

3.9.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no direct impacts on threatened or endangered species or their habitats, as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road, and no construction activities would occur. The efficiency of USBP operations would not be improved, and the indirect and long-term impacts of illegal border activities throughout the project area and surrounding areas could continue to disturb threatened or endangered species and their habitats (USFWS 2015). These activities have an indirect adverse impact on threatened and endangered species by causing harm to individuals and degrading habitats occupied by these species.

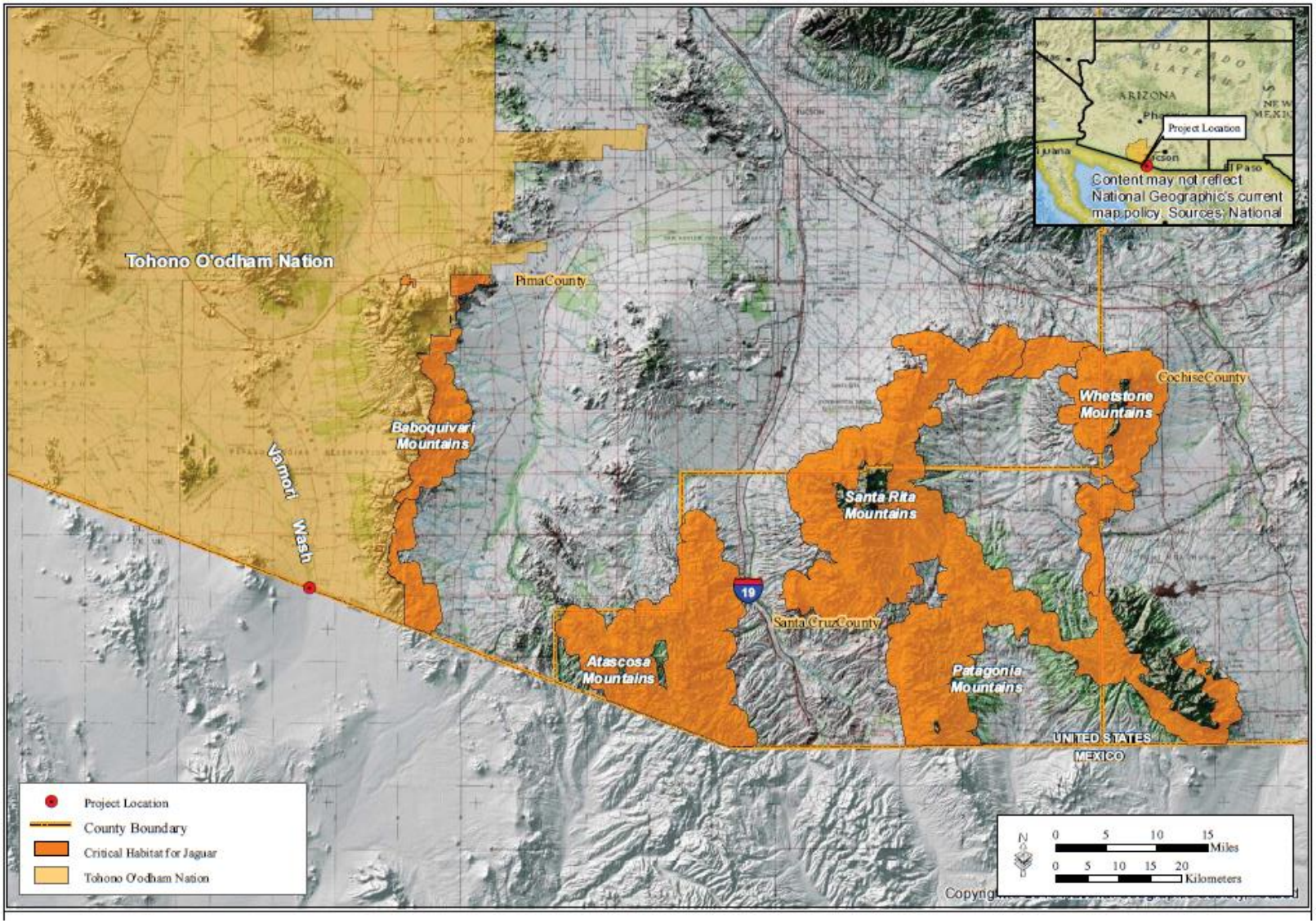


Figure 3-6. Critical Habitat for Jaguar in the Vicinity of the Project Area.

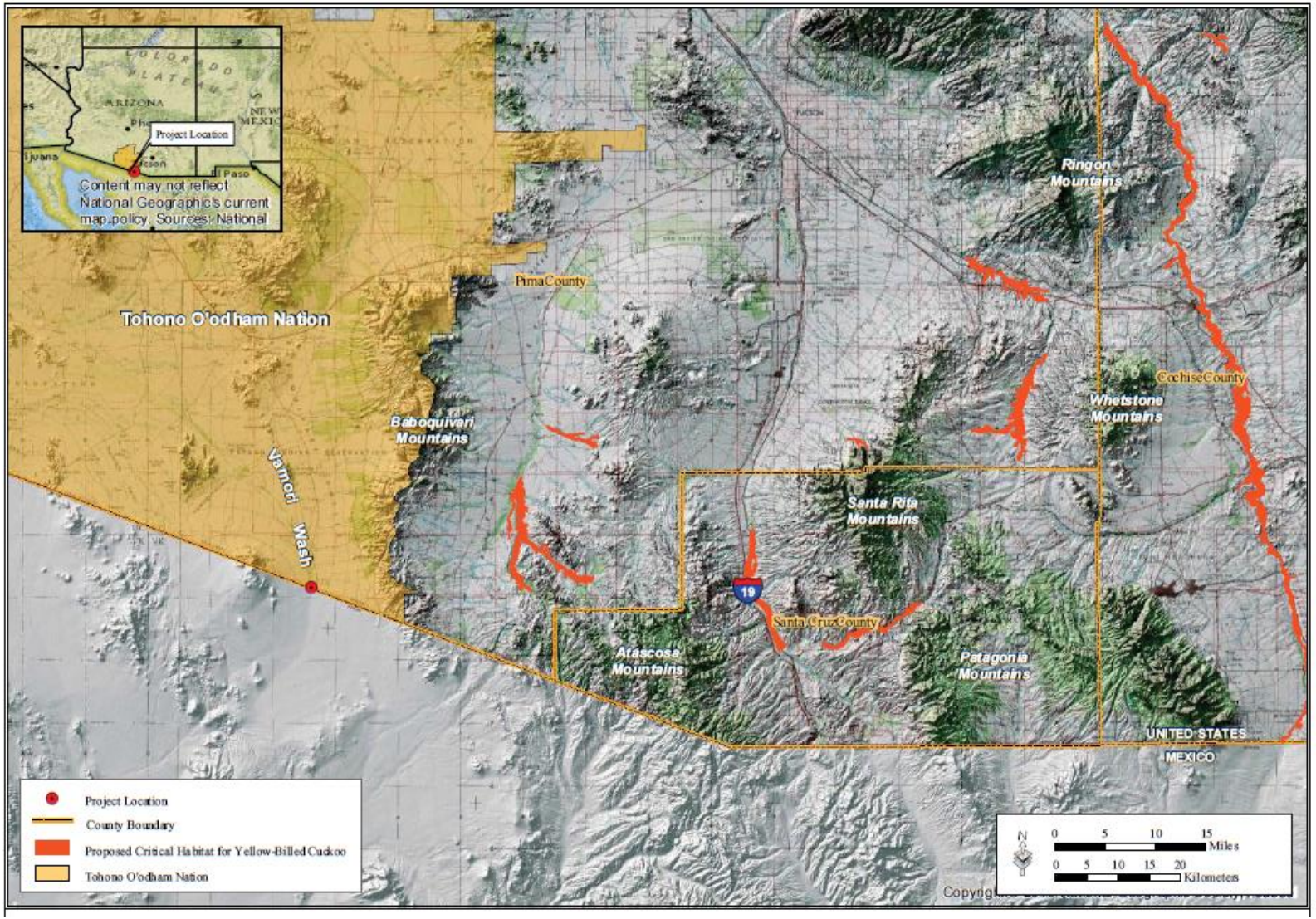


Figure 3-7. Critical Habitat for Yellow-Billed Cuckoo in the Vicinity of Project Area.

3.9.2 Alternative 2: Preferred Alternative

CBP has completed a Biological Assessment to analyze the effects of Alternative 2 on protected species and is currently consulting with USFWS under ESA Section 7 on the potential affects to the species discussed below. Biological surveyors observed several state-listed and culturally-sensitive species within the project area. These species would be avoided during construction or transplanted prior to construction, if the species is suitable for relocation. CBP is consulting with the Tohono O'odham Nation WVMP regarding impacts on these and other sensitive species.

Jaguar

The Preferred Alternative is not located within designated critical habitat for the jaguar. The Proposed Vamori Wash High-Water Crossing is located approximately 10 miles west of the boundary for Subunit 1b: Southern Baboquivari Subunit

Construction of the proposed Vamori Wash high-water crossing and improvements to approach roads would result in a temporary increase in noise and human-related activity. Due to the limited duration and limited area over which these effects would occur relative to the assumed range of the jaguar, the potential for adverse effects to occur would be negligible. Construction-related noise effects would not extend more than 1,000 feet from construction activities (Figure 3-8 and 3-9). Due to the vast amount of equally suitable habitat surrounding the Preferred Alternative, any noise-related effects would not be likely to result in changes in behavior such that the health of individual jaguars would be affected and are thus considered negligible.

It is anticipated that vehicle trips on an annual basis would increase as a result of constructing the high-water crossing. Local users and USBP agents would be able to utilize the high-water crossing during the monsoon season, thus increasing vehicle trips and noise. These increased vehicle trips and elevated noise levels would be intermittent and minor. Due to the vast amount of equally suitable habitat surrounding the Preferred Alternative, and noise-related effects would not be likely to result in changes in behavior such that the health of individual jaguars would be affected and are thus considered negligible.

Maintenance and post-construction monitoring would be limited in extent and duration and would be less in magnitude than construction-related noise effects, and it is highly unlikely that a jaguar would be present during these activities. Implementation of BMPs would further minimize the effects of noise, light, and human presence during construction and operation. Given the distance of the most recent sightings, the marginal jaguar habitat in the Preferred Alternative area, and the relatively small area of impact, Preferred Alternative would have no effect on the jaguar.

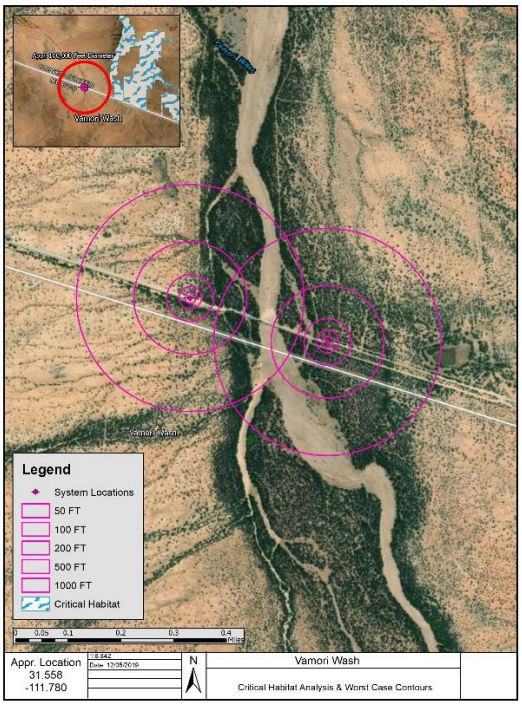


Figure 3-8. Vamori Wash Noise Contours.

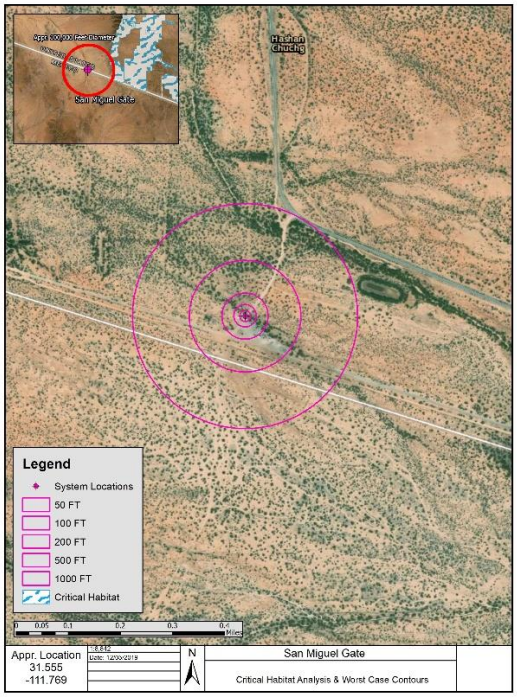


Figure 3-9. San Miguel Gate Noise Contours.

Yellow-Billed Cuckoo (YBC)

As previously mentioned, the Preferred Alternative would result in a temporary increase in noise and human-related activity. Construction-related noise effects could potentially disturb YBC during its breeding season since the project area is considered a probable breeding territory (CBP 2015); however, the majority of the YBC detections during the 2015 protocol surveys were identified south of the project area, at or south of the U.S.-Mexico border. In June 2017 CBP conducted a Biological Assessment for the Proposed Vamori Wash High-Water Crossing Project" that determine that the Proposed Action does not fall within critical habitat for any threatened and endangered species, and that the jaguar (Panthera onca) and yellow-billed cuckoo (YBC) (Coccyzus americanus) occur within the range of the potential direct or indirect effects resulting from the Proposed Action. The Biological Assessment concluded that the Proposed Action would have no effect on the Jaguar and that the Proposed Action may affect, but not likely to adversely affect, YBC, and will not adversely modify its designated critical habitat. Additionally, CBP anticipates initiating construction prior to the YBC breeding season; therefore, it is unlikely that individuals would nest near active construction. If an individual did nest near the project area during construction, it would have to be assumed that the construction activity is not disturbing to the individual. Thus, the probability of construction activities disturbing a nesting bird would be unlikely. The probability of slow-moving construction equipment striking an YBC is extremely unlikely. The removal of approximately 0.95 acre of vegetation would be discountable since the existing low-water crossing would be abandoned and the soil would be scarified to promote natural revegetation. Thus, the Preferred Alternative may affect, but is unlikely to adversely affect the YBC.

It is anticipated that vehicle trips on an annual basis will increase as a result of constructing the high-water crossing. Local users and USBP agents will be able to utilize the high-water crossing during the monsoon season, thus increasing vehicle trips and noise. These increased vehicle trips and elevated noise levels would be intermittent and minor. Wildlife inhabiting the project area and surrounding habitat are habituated to traffic noise on the Traditional Northern Road. Thus, noise levels associated with increased traffic would have a long-term, minor impact on wildlife.

CBP is continuing informal consultation with USFWS for this SEA and has requested their concurrence of "may affect, but not likely to adversely affect" the YBC. Based on CBP's coordination with the USFWS, CBP anticipates the USFWS's concurrence and will incorporate USFWS's response into the Final SEA and FONSI.

3.10 Historic Resources

Historic resources analyzed in this section include prehistoric and historic archaeological sites, buildings, structures, or objects, as well as sacred locations with importance to the Tohono O'odham (i.e., Traditional Cultural Properties [TCPs]). Archaeological resources can be classed as either sites or isolated occurrences and may be either prehistoric or historic in nature. A site is defined by the Arizona State Museum (ASM) and the Cultural Affairs Office of the Tohono O'odham Nation as the location of purposeful prehistoric or historic activity and should contain physical remains of past human activity that are at least 50 years old.

Additionally, sites should consist of at least one of the following:

- 30+ artifacts of a single class (e.g., 30 sherds, 30 lithics, 30 tin cans) within an area 15 meters (50 feet) in diameter, except when all pieces appear to originate from a single source (e.g., one ceramic pot, one core, one glass bottle);
- 20+ artifacts which include at least two classes of artifact types (e.g., sherds, groundstone, nails, glass) within an area 15 meters (50 feet) in diameter;
- One or more archaeological features in temporal association with any number of artifacts; or
- Two or more temporally associated archaeological features without artifacts.

Artifacts or features that do not meet the definition of a site are recorded as isolated occurrences. TCPs may include archaeological resources, locations of historic events, sacred areas, sources of raw materials, sacred objects, or traditional hunting and gathering areas, and provide a link to a Tohono O'odham community's past that helps to maintain cultural identity. Several previous historic resources inventories and evaluation of archaeological sites have been conducted in the proposed project area. Historic resources and locations have been recorded and evaluated by archaeologists that meet or exceed the Secretary of the Interior's standards for Archaeology and Architectural History.

Regulatory Requirements

The National Historic Preservation Act (NHPA) establishes the Federal government's policy to provide leadership in the preservation of historic properties and to administer Federally-owned or -controlled historic properties in a spirit of stewardship. The NHPA

established the Advisory Council on Historic Preservation (ACHP) to: advocate full consideration of historic values in Federal decision making; review Federal programs and policies to promote effectiveness, coordination, and consistency with National preservation policies; and recommend administrative and legislative improvements for protecting our Nation's heritage with due recognition of other national needs and priorities. The NHPA also established State Historic Preservation Officers (SHPOs) to administer National historic preservation programs on the state level and Tribal Historic Preservation Office (THPO) programs on tribal lands, where appropriate. The Tohono O'odham Nation THPO has authority under Section 106 for consultation on the proposed action. The NHPA also establishes the National Register of Historic Places, the Nation's official list of historic resources worthy of preservation. Properties listed in the National Register of Historic Places (NRHP) include districts, sites, buildings, structures, and objects that are significant in U.S. history, architecture, archaeology, engineering, and culture. Section 106 of the NHPA requires USBP to identify and assess the effects of its actions on historic resources. Federal agencies must consult with appropriate state and local officials, Native American tribes, and members of the public and consider their views and concerns about historic preservation issues when making final project decisions. ACHP has issued regulations that govern the implementation of the Section 106 process (36 CFR §800).

As part of the evaluation of impacts to historic properties, the regulations require the identification of an Area of Potential Effect (APE). The APE for this action is defined as the geographic area or areas within which an action may cause changes in the character or use of any historic properties. In some cases this may exceed the project boundaries. The affected environment for historic resources includes the area surrounding the Vamori Wash and north of the international boundary between the U.S. and Mexico where construction under the Proposed Action could have an adverse effect on cultural materials. Efforts to identify and evaluate historic resources for this project included a review of previous research, previously recorded archaeological sites, a field visit to an adjacent archaeological site, and an archaeological reconnaissance survey of the Proposed Action Area.

Cultural History

The cultural history of southern Arizona is often discussed in periods: Preceramic (circa 10,000 Before Christ [B.C.] to Anno Domini [A.D.] 150), Ceramic (circa A.D. 150 to 1500), Early Historic (circa A.D. 1500 to 1848), and Late Historic (circa A.D. 1848 to 1945). Both the Preceramic and Ceramic periods can be further subdivided based on differing cultural traditions. The Preceramic period is typically subdivided into Paleoindian (10,000 B.C. to 7,500 B.C.) and Archaic (7,500 B.C. to A.D. 150) periods, while the Ceramic period is typically subdivided into three complexes that include the Hohokam (A.D. 150 to 1450), Patayan (A.D. 700 to 1850), and Trinchereas (A.D. 150 to 1940). These complexes are based on varying ceramic traditions throughout the region that encompasses the project area.

Background Research and Records Review

As part of the archival background research and records review, the Tohono O'odham Nation THPO/Cultural Affairs Office, the AZSITE database, and internal records at the Tohono O'odham Nation THPO/Cultural Affairs Office were consulted for information

pertaining to previous investigations and known archaeological sites. The project area has been well documented by several investigations (Hart 2014; Hart and Lindemuth 2006; HDR 2015; Martynec et al. 1995). Two previously recorded sites within a 1-mile radius of Vamori Wash have been recommended NRHP eligible. The two archaeological sites, a deflated thermal feature composed of thermally-altered rocks and an artifact scatter (AZ DD:5:28(ASM)) and a sparse lithic scatter (AZ DD:5:29(ASM)), have been documented within a 1-mile radius of the Proposed Action Area. Both sites were originally recorded by Geomarine Inc. (Martynec et al. 1995) and were subsequently updated by two later investigations (Hart 2014; Hart and Lindemuth 2006). Given the distance between AZ DD:5:29(ASM) and the project area, the site will not be directly or indirectly affected by proposed construction activities.

Field Methods and Results

The project area has been surveyed twice, and a field visit was conducted to assess the current setting and conditions of the project area for historic and cultural resources within or adjacent to it. The reconnaissance-level visit consisted of an archaeologist walking transects spaced 20 meters apart across the project area and surface inspection of AZ DD:5:28 (ASM). No new cultural materials (sites or isolated occurrences) were observed within or adjacent to the project area.

The artifact scatter recorded at AZ DD:5:28(ASM) was extremely sparse when the site was revisited in 2005 and 2013 (Hart 2014; Hart and Lindemuth 2006). No artifacts or features were observed within the area of the site that overlaps a portion of the real estate limits, and very few artifacts were observed elsewhere across the site. The area is subject to bioturbation from sedimentation and scouring associated with sheetwash. The ground surface consists of loose, gravelly, silty sand. Given the active flow of surface water over the site, artifacts are likely to have been washed away during erosional events or may have been covered by depositional events. Despite the absence of surface artifacts or features, there remains limited potential for subsurface deposits that could be adversely affected by construction activities.

3.10.1 Alternative 1: No Action Alternative

The No Action Alternative would have no direct effect, either beneficial or adverse, on historic resources, since the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road and construction activities would not occur.

3.10.2 Alternative 2: Preferred Alternative

Two previously recorded sites within a 1-mile radius of Vamori Wash have been determined NRHP eligible. Given the absence of surface artifacts within or immediately adjacent to the project area, it is unlikely that historic resources would be adversely affected. To minimize potential effects, AZ DD:5:28 (ASM) should be avoided. Avoidance measures would include staking and flagging the site boundary, as well as having an archaeological and tribal monitor present during construction activities. Construction activities would be restricted to outside of the marked site boundary.

CBP and THPO Section 106 Consultation documentation are included in SEA Appendix B and in the project record of the SEA. The THPO concurred with CBP's determination of "no adverse effect on historic properties" on March 6, 2020.

3.11 Air Quality

Air quality was discussed in the 2017 EA and is incorporated herein by reference (CBP 2017). 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. NAAQS represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. Global climate change refers to a change in the average weather on the earth. Greenhouse gases (GHGs) are gases that trap heat in the atmosphere and are the primary cause of climate change. Air quality, GHG, and climate change were discussed in the 2017 EA and are incorporated herein by reference (CBP 2017). The proposed project area is in attainment for all NAAQS.

3.11.1 Alternative 1: No Action Alternative

The No Action Alternative would not result in any direct impacts on air quality because the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road, and there would be no construction activities. Intermittent, temporary adverse impacts on air quality would occur under this alternative as a result of fugitive dust emissions during maintenance activities.

3.11.2 Alternative 2: Preferred Alternative

Minor, temporary increases in air pollution would occur from the use of construction equipment (combustion emissions) and the disturbance of soils (fugitive dust) during construction of the high-water crossing and adjacent roads. Air calculation methodologies were utilized to estimate air emissions produced by the construction of the high-water crossing and adjacent roads. Fugitive dust emissions were calculated using the emission factor of 0.19 ton per acre per month (Midwest Research Institute 1996), which is a more current standard than the 1985 particulate matter less than 10 microns (PM-10) emission factor of 1.2 tons per acre-month presented in AP-42 Section 13 Miscellaneous Sources 13.2.3.3 (USEPA 2001).

USEPA's NONROAD2008a model was used, as recommended by USEPA's Procedures Document for National Emission Inventory, Criteria Air Pollutants 1985-1999 (USEPA 2001), to calculate emissions from construction equipment. Combustion emission calculations were made for standard construction equipment, such as front-end loaders, backhoes, cranes, and concrete trucks. Assumptions were made regarding the total number of days each piece of equipment would be used and the number of hours per day each type of equipment would be used.

Construction workers would temporarily increase the combustion emissions in the airshed during their commute to and from the project area. Emissions from delivery trucks would also contribute to the overall air emission budget. Emissions from delivery trucks and construction worker commuters traveling to the job site were calculated using USEPA's preferred on-road vehicle emission model MOVES2010a (USEPA 2009).

The total air quality emissions for the construction activities were calculated to compare to the de minimis threshold levels. Summaries of the total estimated emissions for Alternative 2 are presented in Table 3-5. Details of the analyses are presented in Appendix D. Several sources of air pollutants would contribute to the overall air impacts of the construction project. The air results in the Table 3-5 are included emissions from the following sources:

- Combustion engines of construction equipment;
- Construction workers commuting to and from work;
- Supply trucks delivering materials to the construction site; and
- Fugitive dust from job-site ground disturbances.

Table 3-5. Total Air Emissions from Alternative 2 Construction.

Pollutant	Total (tons/year)	de minimis Thresholds (tons/year) [5]
Carbon monoxide (CO)	12.73	100
Volatile organic compounds (VOC)	4.09	100
Nitrous oxides (NOx)	37.59	100
Particulate matter < 2.5 microns (PM-2.5)	2.65	100
Particulate matter <10 microns (PM-10)	3.36	100
Sulfur dioxide (SO_2)	4.98	100
Carbon dioxide (CO_2) and CO_2 equivalents	15,341	25,000

Source: 40 CFR § 51.853 and GSRC model projections (Appendix F).

Post-Construction Air Emissions

Intermittent, negligible impacts would result from post-construction activities associated with Alternative 2. Post-construction air emissions refer to air emissions that may occur after construction is complete, such as maintenance and repair of the high-water crossing and adjacent roads. Post-construction air emissions for the high-water crossing and roads would be limited to maintenance and repair of the crossing, which would usually be in response to overtopping of the crossing from rain events. Maintenance and repair needs would depend on the duration and severity of overtopping. Minor overtopping might result in localized repairs and maintenance, whereas major overtopping (several feet above road level for several hours) might result in greater damage and greater repair and maintenance

[5] Note that portions of Pima County are in non-attainment for CO (USEPA 2017).

needs. The total air quality emissions for the post construction activities were calculated to compare to the *de minimis* threshold levels (Table 3-6).

For the purposes of this SEA, it is anticipated that maintenance and repair would be needed once annually and would include crew trucks, a front-end loader (or equivalent), and dump trucks. In addition, inspections of the crossing would occur bi-annually and after major storm events. It is anticipated that inspections would require crew trucks and would occur up to four times per year.

Table 3-6. Post-Construction Air Emissions Activity Versus de minimis Threshold Levels.

Pollutant	Total (tons/year)	*de minimis* Thresholds (tons/year) [6]
CO	0.02	100
VOC	0.03	100
NOx	0.01	100
PM-2.5	0.00	100
PM-10	0.00	100
SO_2	0.00	100
CO_2 and CO_2 equivalents	2	25,000

Source: 40 CFR § 51.853 and GSRC model projections (Appendix F).

As can be seen from Tables 3-5 and 3-6, the proposed construction and post-construction activities do not exceed Federal de minimis thresholds for NAAQS and GHG and thus would not require a Conformity Determination. As there are no violations of air quality standards and no conflicts with the state implementation plans, the impacts on air quality from the implementation of Alternative 2 would be negligible and would not be expected to affect the climate.

BMPs to be incorporated to ensure that fugitive dust and other air quality constituent emission levels do not rise above the minimum threshold, as required per 40 CFR § 51.853(b)(1), include the following:

- Standard construction BMPs such as routine watering of the construction site, as well as access drives to the site, would be used to control fugitive dust and thereby will assist in limiting potential PM-10 excursions during the construction phase of Alternative 2; and
- All construction equipment and vehicles would be maintained in good operating condition to minimize exhaust emissions.

[6] Note that portions of Pima County are in non-attainment for CO (USEPA 2017).

3.12 Noise

Noise was discussed in the 2017 EA and is incorporated herein by reference (CBP 2017). The project area is located in a remote rural setting with limited vehicle traffic. Ambient noise levels would generally be expected to be less than 50 dBA (Leq) (EES Group, Inc. 2010). Noise levels increases above ambient levels when a vehicle travels on the Traditional Northern Road.

3.12.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no construction and no operational changes, as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road, so there would be no changes in noise in the vicinity of Vamori Wash.

3.12.2 Alternative 2: Preferred Alternative

There are no sensitive noise receptors (e.g., schools, residences) adjacent to the project area that would be impacted by construction noise. Construction noise associated with the Vamori Wash High-Water Crossing would result in temporary, minor impacts on wildlife, including protected species. However, local users and USBP agents would be able to utilize the high-water crossing during the monsoon season, thus increasing vehicle trips and noise. These increased vehicle trips and elevated noise levels would be intermittent and minor. Wildlife inhabiting the project area and the surrounding habitat are habituated to traffic noise on the Traditional Northern Road. Thus, noise levels associated with increased traffic would have a long-term, minor impact on wildlife. Potential impacts on wildlife are discussed in detail in the Wildlife Resources and Threatened and Endangered Species sections of this SEA (Sections 3.8 and 3.9).

3.13 Roadways and Traffic

State Route (SR) 86 is the primary east-west route for vehicular traffic through the main reservation of the Tohono O'odham Nation (Figure 3-10). IRR 19 extends generally south from SR 86 and provides access to the Traditional Northern Road, which extends generally along the U.S side (northern side) of the U.S.-Mexico border. Traffic south of SR 86 is typically local, light traffic and USBP agents use the road for routine border patrols and operations. It is estimated that fewer than 100 vehicle trips per day occur on the Traditional Northern Road.

Vamori Wash crosses the Traditional Northern Road west of San Miguel Gate. After heavy rains, generally experienced during the monsoon season, the Traditional Northern Road can become impassable due to saturated soils and debris. Local USBP agents report that the road can remain impassable for three to six weeks, depending on the storm event, preventing USBP access to border areas and access to proposed IFT sites (USACE 2016 a/b).

3.13.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no construction of a high-water crossing on the Traditional Northern Road in the area of Vamori Wash as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. Thus, there would be no impact

on traffic levels associated with construction. Traffic would continue to be impaired as a result of high water during the monsoon season.

3.13.2 Alternative 2: Preferred Alternative

With the implementation of Alternative 2, construction activities at the high-water crossing site would have a temporary, minor impact on roadways and traffic in the area. An increase of vehicular traffic along SR 86 and IRR 19 would occur, as materials are delivered and work crews access the area during the construction of the high-water crossing. After construction is complete, traffic on Traditional Northern Road would be expected to increase as travelers would be less affected by high water events during the monsoon season. Traffic would consist of local users, USBP agents, and maintenance personal accessing the IFTs. Activities associated with the high-water crossing would include inspection and repairs after overtopping events, and routine inspection anticipated to occur up to four times a year. Post-construction impacts associated with operations of the high-water crossing would be intermittent, long-term, and negligible.

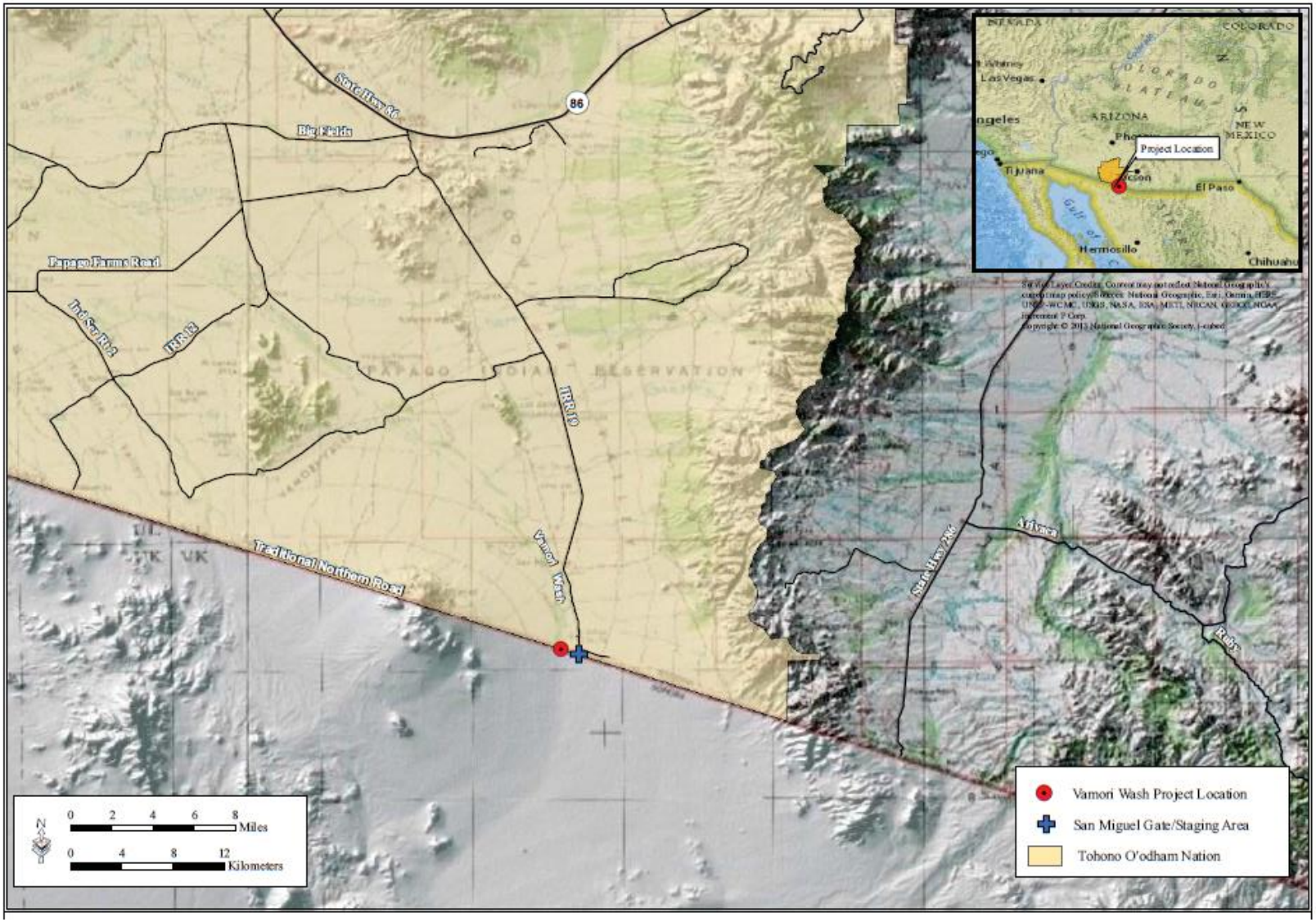


Figure 3-10. Transportation Routes.

3.14 Hazardous Materials

The Proposed Action site is a remote desert location. No evidence of hazardous materials or recognized environmental conditions were detected in the proposed project area during site inspections conducted on February 21, 2017.

3.14.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no construction as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road, thus no impacts associated with the use of hazardous materials.

3.14.2 Alternative 2: Preferred Alternative

The project area is located on the Tohono O'odham Nation. As such, the Tohono O'odham Nation's EPA will be contacted prior to any construction at the project area. Additionally, the Tohono O'odham Nation's Solid Waste Management Office would be contacted for any Tohono O'odham Nation -specific guideline criteria for solid waste disposal.

Alternative 2 would not result in the exposure of the environment or the public to any hazardous materials. The potential exists for minor releases of petroleum, oil, and lubricant (POL) during construction or operational activities. During construction, fueling of vehicles and equipment would take place off-site. Spill containment kits would be available at the staging area for use in the case of spills.

Any hazardous and regulated wastes, materials, and substances generated during construction of the high-water crossing and adjacent roads would be collected, characterized, labeled, stored, transported, and disposed of in accordance with all applicable Federal, state, local, and tribal laws and regulations, including proper waste manifesting procedures. All other hazardous and regulated materials would be handled according to materials safety data sheet instructions and would not affect water, soils, vegetation, wildlife, or human safety. BMPs would be implemented to minimize any potential contamination.

Post-construction maintenance of the high-water crossing would not involve the use of hazardous materials or generate hazardous wastes other than the potential for minor POL release, and BMPs would be implemented to minimize any potential contamination.

3.15 Summary of Impacts

Table 3-7 on the following pages summarizes the impact of the No Action Alternative and Alternative 2, on each of the elements discussed in this section.

Table 3-7. Summary of Impacts.

Affected Environment	No Action Alternative	Alternative 2: Preferred Alternative
Land Use	No direct impacts would occur as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road.	Alternative 2 would have a permanent, minor impact on land use in the project area. Alternative 2 would include approximately 1,700 feet of road improvements. It is anticipated that Alternative 2 would permanently impact up to 4.8 acres, and temporarily impact 1.3 acres. CBP would obtain a ROW for 2.4 acres from the Tohono O'odham Nation. Land use in the ROW would change to border enforcement.
Soils	There would be no modification of soils from construction activities as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. Erosion would continue to occur along the wash without the proposed improvements.	Alternative 2 would have a direct, minor impact on soils in the project area. All impacted soils are locally and regionally common. Alternative 2 would not result in the loss of any soils classified as unique.
Groundwater	No additional impacts on groundwater resources the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. Water usage to repair and maintain the existing road would remain the same.	Alternative 2 would have a temporary, minor adverse impact on groundwater resources during construction. Water needed for construction activities would be purchased and delivered from nearby towns.

Affected Environment	No Action Alternative	Alternative 2: Preferred Alternative
Surface Waters and Waters of the United States	No additional impacts on surface waters or waters of the United States would occur the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. However, erosion and sedimentation would continue to occur without road improvements, thus affecting water quality.	Alternative 2 may potentially have temporary, minor impacts on surface water as a result of increases in erosion and sedimentation associated with project construction. However, a SWPPP would be prepared, and roadwork would be authorized under Non-notifying Nationwide 14 Permit. BMPs would be implemented to ensure minimum degradation of water quality.
Floodplains	No direct impacts on the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. However, indirect impacts such as erosion and sedimentation would continue to occur, and potential effects on floodplain would remain status quo.	Alternative 2 would have minor effects on floodplains. The main channels of Vamori Wash are designed for a 100-year storm event, with overtopping of the box culverts expected during events that exceed the 5-year storm level. Hydraulic analyses predict that water surface elevations at the U.S.-Mexico border could increase about 9 inches during the 10-year flood as the result of water flow being impeded by the guard rails (USACE 2016a). Additionally, hydraulic models predict that debris blockage could result in the 5- year storm event overtopping the structure, and predict an approximately 2.1-foot increase in surface water elevation at the U.S.-Mexico border for a debris blocked structure. However, a debris blockage structure would result in an approximately 0.40 feet increase in water surface elevation for the 100-year storm event (USACE 2016a). It is anticipated that any debris buildup will be removed during the anticipated annual maintenance.

Affected Environment	No Action Alternative	Alternative 2: Preferred Alternative
Vegetative Habitat	No direct impacts would occur the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road	The Preferred Alternative would permanently affect up to 4.8 acres and temporarily alter up to 1.3 acres. Of this impact, 3.85 acres are already disturbed. A total of approximately 0.95 acres of Sonoran desertscrub xeroriparian habitat would be permanently removed. The plant community associated with the high-water crossing is regionally common, and the permanent loss of vegetation would not adversely affect the population viability of any plant species in the region. Temporary impact areas would be allowed to revegetate naturally. BMPs would be implemented to prevent the spread of invasive species.
Wildlife Resources	No direct impacts would occur the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road.	The Preferred Alternative would have a long-term, minor impact on wildlife resources. The Proposed Action would permanently affect up to 4.8 acres and temporarily alter up to 1.3 acres. 3.85 acres of this impact are already disturbed. A total of approximately 0.95 acres of Sonoran desertscrub xeroriparian vegetation would be permanently removed. The permanent loss of vegetation would not adversely affect the population viability or fecundity of any wildlife species in the region.
Threatened and Endangered Species	No direct impacts would occur the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road.	The Preferred Alternative may affect, but is not likely to adversely affect, the jaguar, and yellow-billed cuckoo. No designated or proposed critical habitat is present within the project's action area. ESA Section 7 informal consultation with USFWS is currently ongoing.

Affected Environment	No Action Alternative	Alternative 2: Preferred Alternative
Historic Resources	No direct effect, either beneficial or adverse, on historic resources the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road.	Two previously recorded sites within a 1-mile radius of the project area have been determined to be NRHP-eligible. Given the absence of surface artifacts within or immediately adjacent to the project area, it is unlikely that historic resources would be adversely affected. To minimize potential effects, AZ DD:5:28 (ASM) and AZDD:5:29 should be avoided. Avoidance measures would include staking and flagging the site boundary and having an archaeological and tribal monitor present during construction activities. Construction activities would be restricted to outside of the marked site boundary. Given the distance between AZ DD:5:29(ASM) and the project area, the site will not be directly or indirectly affected by proposed construction activities, but should have avoidance measures app.
Air Quality	No direct impacts on air quality the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. There would be no construction activities. Intermittent, temporary adverse impacts on air quality would occur as a result of fugitive dust emissions during maintenance activities.	Minor, temporary increases in air pollution would occur from the use of construction equipment (combustion emissions) and the disturbance of soils (fugitive dust) during construction of the high- water crossing and adjacent roads. Intermittent, negligible impacts would result from post-construction activities. BMPs would be incorporated to ensure that fugitive dust and other air quality constituent emission levels do not rise above minimum thresholds.

Affected Environment	No Action Alternative	Alternative 2: Preferred Alternative
Noise	No changes in noise in the vicinity of Vamori Wash the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road.	No sensitive receptors (e.g., schools, residences) would be impacted by noise emissions resulting from the project. Construction noise associated with Alternative 2 would result in temporary, minor, impacts on wildlife, including protected species. However, local users and USBP agents will be able to utilize the high- water crossing during the monsoon season, thus increasing vehicle trips and noise. These increased vehicle trips and elevated noise levels would be intermittent and minor. Wildlife inhabiting the project area and surrounding habitat are habituated to traffic noise on the Traditional Northern Road. Thus, noise levels associated with increased traffic would have a long-term, minor impact on wildlife.
Roadways and Traffic	No impact on traffic levels associated with construction, as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. Traffic would continue to be impaired as a result of high water during the monsoon season.	Construction activities would have temporary, minor impacts on roadways and traffic in the region as materials are delivered and work crews access the area during the construction of the high- water crossing. After construction is complete, traffic on Traditional Northern Road would be expected to increase as travelers would be less impeded by high water events during the monsoon season. Traffic would consist of local users, USBP agents and maintenance personal accessing the IFTs, and activities associated with the high-water crossing would include inspection and repairs after overtopping events and routine inspection, which would be expected to occur four times a year. Post-construction impacts associated with operations of the high-water crossing would be intermittent, long-term, and negligible.

Affected Environment	No Action Alternative	Alternative 2: Preferred Alternative
Hazardous Materials	No impacts associated with the use of hazardous materials the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road.	Alternative 2 would not result in the exposure of the environment or the public to any hazardous materials. The potential exists for minor releases of petroleum, oil, and lubricant (POL) during construction or operational activities. During construction, fueling of vehicles and equipment would take place off-site. Spill containment kits would be available at the staging area for use in the case of spills. Post-construction maintenance of the high-water crossing would not involve the use of hazardous materials or generate hazardous wastes other than the potential for minor POL release, and BMPs would be implemented to minimize any potential contamination.

4 Cumulative Impacts

Cumulative impacts result from the direct and indirect impacts of implementing the Proposed Action, in addition to past, present, and foreseeable future actions by CBP or other entities in the area. A discussion of cumulative impacts in the USBP's Ajo and Casa Grande Stations' AOR was presented in the 2017 EA (CBP 2017). One additional project in the region was identified for fence replacement along a 20-mile section of SR 86 from milepost 82 to milepost 102. The Vamori Wash High-Water Crossing project was included in the cumulative impacts analysis. The analysis of cumulative impacts included in the 2017 EA is summarized below and incorporated by reference (CBP 2017).

4.1 Past Impacts within the Region of Influence

The ecosystems within the ROI have been substantially impacted by past and ongoing activities such as ranching, livestock grazing, mining, agricultural development, climate change, cross-border movement and resulting law enforcement actions. All of these actions have, to a greater or lesser extent, contributed to several ongoing impacts to the ecosystem, including loss and degradation of habitat for both common and rare wildlife and plants and the proliferation of roads and trails.

4.2 Current and Reasonably Foreseeable CBP Projects Within and Near the Region of Influence

USBP has conducted law enforcement actions along the border since 1924 and has continuously transformed its methods as missions, modes of operations of cross-border violators, agent needs, and enforcement strategies have evolved. Development and maintenance of training ranges, station and sector facilities, detention facilities, roads, and fences have contributed to impacts on soil, wildlife habitats, water quality, and noise. Beneficial effects have also resulted from the construction of defined transportation routes for patrol use and vehicle barriers and fencing. These beneficial actions include: increased 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 prehistory of the region through biological and historic resources surveys and studies.

With continued funding and implementation of CBP's environmental conservation measures, including use of biological monitors, wildlife water systems, and restoration activities, adverse impacts due to future and ongoing projects would be avoided or minimized. Recent, ongoing, and reasonably foreseeable proposed actions would result in cumulative impacts; however, the contribution to the cumulative impacts from the Proposed Action would not be significant. CBP is currently planning, is conducting, or has recently completed several projects in the USBP's Ajo and Casa Grande Stations' AORs, including the following:

- Installation and maintenance of permanent vehicle barriers (PVB) at the U.S./Mexico border within the Tohono O'odham Nation, creation of a 2-track primitive trail parallel to the PVBs, turn-arounds to facilitate construction and maintenance of the PVBs, and improvement and maintenance of the existing patrol road near the border;
- Construction, operation, and maintenance of a new Ajo Station;

- Construction, operation, and maintenance of a new Ajo Station Forward Operating Base (FOB);
- Construction, operation, and maintenance of communication towers under for Tucson Sector. The Tucson West project was located within Tucson Station's AOR immediately east of the Tohono O'odham Nation (CBP 2008) and the Ajo-1 project within Ajo Station's AOR immediately west of the Tohono O'odham Nation (CBP 2009);
- Road Improvement on the Pozo Nuevo Road in Cabeza Prieta National Wildlife Refuge (CPNWR);
- Expansion of the San Miguel Law Enforcement Center (CBP 2017);
- Expansion of the Papago Farm FOB;
- Restoration of Unauthorized Vehicle Roads within CPNWR and Organ Pipe Cactus National Monument;
- Remote Video Surveillance Systems upgrade for Ajo Station's AOR (CBP 2012);
- Construction of a vehicle bridge or High-Water Crossing over the Vamori Wash in the vicinity of where the existing Traditional Northern Road traverses the wash; and
- Maintenance and repair of roads on the Tohono O'odham Nation. Maintenance and repair of roads within that project area would consist of filling potholes, regrading road surfaces, implementing improved water drainage measures, applying soil stabilization agents, controlling vegetation, removing debris, and adding lost road surface material to reestablish intended surface elevation needed for adequate drainage.

In addition, ADOT and the Tohono O'odham Nation are currently planning or conducting several projects on the Tohono O'odham Nation, which include the following:

- Improvements to 4 miles of SR 86 between San Pedro and Viopuli Road (Mile Post [MP] 137 and MP 141). The project includes expanding the roadway shoulders for enhanced safety, applying a new, smooth driving surface and installing drainage features (Tohono O'odham Nation 2012a); and
- Improvements to pedestrian access along SR 86 through Sells (Tohono O'odham Nation 2012b). Three miles of ADOT right of way along SR 86 through the town of Sells is being considered.

A summary of the anticipated cumulative impacts and their relationship to the Preferred Alternative is presented below. The discussion is presented for each of the previously described resources.

4.3 Analysis of Cumulative Impacts

Impacts on each resource were evaluated according to how other actions and projects within the ROI might be affected by the Proposed Action. Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts is classified as negligible, minor,

moderate, or major. These intensity thresholds were previously defined in Section 3.0. A summary of the anticipated cumulative impacts on each resource is presented below. All impacts would be adverse unless otherwise stated.

4.3.1 Land Use

The project area is currently undeveloped scrub and brush rangeland located in a rural area. Under No Action Alternative, land use would not change. Although Alternative 2 would permanently impact up to 4.8 acres, and 1.3 acres would be temporarily impacted, less than 1 acre of vegetation would be affected which is a minor change to land uses. Alternatives 2, and other CBP actions would not initiate an increase of development in the immediate vicinity of the projects. Therefore, Alternative 2, when combined with past and proposed actions in the region, would not be expected to result in a major cumulative effect.

4.3.2 Soils

Modification of soils through construction activities would not occur under the No Action Alternative as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which only allows current activity levels which is limited to maintenance and repair of the current Traditional Northern Road. However, erosion would continue to occur along the wash without the proposed improvements. The existing low-water crossing is unstable and would continue to erode at the current rate in the absence of any proposed improvements. Also soils would continue to be impacted due to cross-border violator activity in the area coverage. The permanent disturbance of up to 4.8 acres of previously undisturbed soil from Alternative 2 would result in minor impacts, and when combined with past and proposed actions in the region, would not be considered a major cumulative effect.

4.3.3 Groundwater, Surface Water, Waters of the United States, and Floodplains

Under the No Action Alternative which uses the Preferred Alternative from the 2017 EA, which only allows current activity levels which is limited to maintenance and repair of the current Traditional Northern Road, no impacts on water resources would occur because there would be no change to the crossing. Groundwater withdrawals and drainage patterns of surface water sources would not be impacted by any of the alternatives. Water quality in the area would remain unchanged under all alternatives. Specific erosion and sedimentation controls and other BMPs would be in place during construction as standard operating procedures and roadwork would be permitted under Nationwide Permit (NWP) 14. Therefore, none of the alternatives, in conjunction with other past, ongoing, and proposed regional projects, would create a major cumulative effect on water resources in the region.

4.3.4 Vegetative Habitat

Because the No Action Alternative uses the Preferred Alternative from the 2017 EA, which only allows current activity levels which is limited to maintenance and repair of the current Traditional Northern Road, road construction and improvements would not occur under the No Action Alternative, vegetative habitat would not be disturbed or removed. Approximately 2 million acres of Sonoran Desert Scrub rangeland occur within the region. Therefore, the potential, permanent disturbance of 4.8 acres of Sonoran Desert scrub habitat would result in minor impacts, and in conjunction with other past, ongoing, and

proposed regional projects, would not create a major cumulative effect on vegetative habitat.

4.3.5 Wildlife Resources

Under the No Action Alternative which uses the Preferred Alternative from the 2017 EA, which only allows current activity levels which is limited to maintenance and repair of the current Traditional Northern Road, no direct impacts on wildlife or wildlife habitats would occur. Approximately 2 million acres of Sonoran Desert Scrub rangeland occur within the area. The potential permanent disturbance of 4.8 acres of habitat, in conjunction with other past, ongoing, and proposed regional projects, and the amount of habitat potentially removed, would be minor on a regional scale. Thus, Alternatives 2 would not create a major cumulative effect on wildlife populations in the region.

4.3.6 Threatened and Endangered Species

Under the No Action Alternative which uses the Preferred Alternative from the 2017 EA, which only allows current activity levels which is limited to maintenance and repair of the current Traditional Northern Road, there would be no direct impacts on threatened or endangered species or their habitats as no construction activities would occur. Alternative 2 may affect, but is not likely to adversely affect, the Western YBC and would have no effect on the jaguar. There is no designated critical habitat within the project area. Thus, when combined with other existing and proposed actions in the region, Alternative 2 would not result in major cumulative impacts on protected species or designated or proposed critical habitats. Any indirect, cumulative impacts on protected species and their critical habitats would be negligible to minor.

4.3.7 Historic Resources

No impacts on historic resources would occur from construction activities under the No Action Alternative. The area impacted by the Proposed Action would not result in adverse impacts to historic resources or historic properties. The area has been surveyed and two sites have been identified and both will be avoided. Given the distance between AZ DD:5:29 (ASM) and the project area, the site will not be directly or indirectly affected by proposed construction activities, but should have avoidance measures applied. The Proposed Action, when combined with other existing and proposed actions in the region, would not result in major cumulative impacts on historic resources or historic properties.

4.3.8 Air Quality

No direct impacts on air quality would occur due to construction activities under the No Action Alternative which uses the Preferred Alternative from the 2017 EA, which only allows current activity levels which is limited to maintenance and repair of the current Traditional Northern Road. Under Alternative 2 the proposed construction and post-construction activities do not exceed Federal de minimis thresholds for NAAQS and thus would only contribute negligible impacts to regional air quality. Therefore, Alternative 2, when combined with other past, ongoing, and proposed actions in the region, would not result in major cumulative impacts.

4.3.9 Noise

Under the No Action Alternative, the sensitive noise receptors and wildlife near the proposed crossing site and road would not experience construction or operational noise because the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. Most of the noise generated by Alternatives 2 would occur during construction, and road maintenance, and occasional running of the backup propane generator. These activities would be negligible and would not contribute to cumulative impacts on ambient noise levels. Thus, the noise generated by Alternatives 2, when considered with the other existing and proposed actions in the region, would not result in major cumulative impacts.

4.3.10 Roadways and Traffic

Under the No Action Alternative, impacts on roadways and traffic would remain status quo. The proposed crossing would not induce increased traffic in the area. Therefore, when combined with past, ongoing, or proposed actions in the region, no major cumulative adverse effect on roadways and traffic would occur as a result of the Proposed Action.

4.3.11 Hazardous Materials

Under the No Action Alternative, no impacts associated with the use of hazardous materials would be expected as the No Action Alternative uses the Preferred Alternative from the 2017 EA, which limits current activity to maintenance and repair of the Traditional Northern Road. No health or safety risks would be created by Alternatives 2. The effects of Alternatives 2, when combined with other past, ongoing, and proposed actions in the region, would not be considered a major cumulative effect.

5 Best Management Practices

BMPs would be implemented by construction and maintenance contractors to reduce or eliminate potential adverse impacts associated with the Proposed Action on the human and natural environments. BMPs were discussed in the 2017 EA and are incorporated herein by reference (CBP 2017).

BMPs on federally-listed species are included in the following paragraphs. These BMPs were compiled from USFWS Information for Planning and Conservation (IPaC) web tool (https://ecos.fws.gov/ipac/) and from previous consultation with USFWS and the Tohono O'odham Nation.

5.1 Best Management Practice 1 – (Training – BMP1)

All contractors, work crews (including military personnel), and CBP personnel in the field performing construction and maintenance activities will receive environmental awareness training. At a minimum, environmental awareness training will provide the following information: maps indicating occurrence of potentially affected and Federally-listed species; the general ecology, habitat requirements, and behavior of potentially affected Federally-listed species; the BMPs listed here and their intent; reporting requirements; and the penalties for violations of the ESA. It will be the responsibility of the project manager(s) to ensure that their personnel are familiar with general BMPs, the specific BMPs presented here, and other limitations and constraints. Photographs of potentially affected Federally-listed species will be incorporated into the environmental awareness

training and posted in the contractor and resident engineer's office, where they will remain through the duration of the project, and copies will be made available that can be carried while conducting proposed activities. In addition, training in identification of non-native invasive plants and animals will be provided for contracted personnel engaged in follow-up monitoring of construction sites.

5.2 Best Management Practice 2 – (General Construction BMP2)

BMPs will be implemented as standard operating procedures during all construction activities within or near habitat occupied by, or potentially occupied by, protected species and will include the following:

- BMP2a - proper handling, storage, and disposal of hazardous and regulated materials and other waste;
- BMP2b - minimizing ground disturbance;
- BMP2c - minimizing noise and light pollution; and
- BMP2d - minimizing disturbance related to human presence.

5.2.1 BMP2a – Proper handling, storage, and disposal of hazardous and regulated materials and other waste

1. The Tohono O'odham Nation's EPA will be contacted prior to any construction at the project area. Additionally, the Tohono O'odham Nation's Solid Waste Management Office would be contacted for any Tohono O'odham Nation -specific guideline criteria for solid waste disposal.
2. Where handling of hazardous and regulated materials does occur, all fuels, waste oils, and solvents will be collected and stored in clearly labeled tanks or drums within a secondary containment system that consists of an impervious floor and bermed sidewalls capable of containing the volume of the largest container stored therein.
3. Proper and routine maintenance of all vehicles and equipment will be implemented so that emissions are within the design standards of all equipment.
4. The refueling of machinery will be completed following accepted industry guidelines, and all vehicles left at the project location or staging area will have drip pans during storage to contain minor spills and drips.
5. Nonhazardous waste materials and other discarded materials, such as construction waste, will be contained until removed from the construction and maintenance sites.
6. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed daily from the project site.
7. Wastewater will be stored in closed containers on-site until removed for disposal. Waste water is water used for project purposes that is contaminated with construction materials or from cleaning equipment and thus carries oils or other toxic materials or other contaminants as defined by state regulations. Concrete wash water will not be dumped on the ground, but is to be collected and moved off-site for disposal.

5.2.2 BMP2b – Minimizing ground disturbance

1. **Historic Properties** - Tohono O'odham tribal representatives will be present during construction of the high-water crossing and other associated construction activities.

2. **Historic Properties** - Two sites, AZ DD:5:28 (ASM) and AZ DD:5:29 (ASM) are to be protected. AZ DD:5:28 (ASM) has been identified as having boundary with in the project area. Given the absence of surface artifacts within or immediately adjacent to the project area, it is unlikely that historic resources would be adversely affected. However, there is limited potential for subsurface cultural materials to be affected. AZ DD:5:29 (ASM) boundaries are outside of the project area.

3. **Historic Properties** - To minimize potential effects, AZ DD:5:28 (ASM) and AZ DD:5:29 (ASM) should be avoided. Avoidance measures would include staking and flagging the site boundary and having an archaeological and tribal monitor present during construction activities. Construction activities would be restricted to outside of the marked site boundary.

4. **Historic Properties** - To minimize potential effects, AZ DD:5:28 (ASM) and AZ DD:5:29 (ASM) should be avoided. The perimeter of all new areas to be disturbed will be clearly demarcated using flagging or temporary construction fencing. Any disturbance outside the perimeter will not be allowed.

5. **Historic Properties** - should known archaeological resources be inadvertently affected in a manner that was not anticipated, the following procedures would be implemented:

    - The project proponent or contractor will immediately cease all activities within a 100- foot buffer and the onsite archaeologist will take steps to stabilize and protect the discovered resource.

    - CBP shall notify the Tohono O'odham Nation Cultural Affairs Office and the BIA Western Regional Office (WRO) Regional Archaeologist within 24 hours, to document and preliminarily assess the find and formulate a recommendation regarding whether the discovery is National Register-eligible or a tribal sacred object and merits further consideration. The assessment shall address the following factors:

    - The nature of the resource, such as the number and kinds of artifacts, presence or absence of archaeological features, or sacred to the Tohono O'odham.

    - The spatial extent of the resource.

    - The nature of the deposits in which the discovery was made.

    - The contextual integrity of the resource, damage related to the initial discovery, and potential impacts of the continued activity that resulted in the discovery.

    - If the preliminary evaluation concludes that the find is not a NRHP-eligible property or tribal sacred object, nor a contributing element of an historic

property or its documentation has exhausted the information potential, this conclusion and accompanying documentation shall be transmitted by CBP to the THPO and the BIA WRO. If the THPO and the BIA WRO agree within five calendar days of receipt, CBP may authorize resumption of the activity that resulted in the discovery.

- If the preliminary evaluation concludes that the find is a NRHP-eligible property, a contributing element of an historic property, a tribal sacred object, or that its documentation has not exhausted the information potential, this conclusion and accompanying documentation shall be transmitted by CBP to the THPO with a Treatment Plan. If the THPO and the BIA WRO determine that the Treatment Plan is acceptable, the THPO and the BIA WRO shall ensure that the plan is implemented to resolve the adverse effects. CBP shall not resume the activity that resulted in the discovery until the THPO, in consultation with the BIA WRO, has determined that the adverse effect has been resolved and authorizes resumption of the activity.

6. **Human Remains** - In the event that human remains are discovered during construction or any other project-related activities: 1) law enforcement will be contacted if human remains are found, and 2) if Native American human remains are found, CBP will consult with culturally affiliated tribes and the Arizona State Historic Preservation Officer regarding their management and disposition in compliance with Native American Graves Protection and Repatriation Act.
7. Areas that will be disturbed later in the construction period will be used for staging, parking, and equipment storage.
8. The area of disturbance will be minimized by limiting deliveries of materials and equipment to only those needed for effective project implementation.
9. Within the designated disturbance area, grading or topsoil removal will be limited to areas where this activity is needed to provide the ground conditions necessary for construction or maintenance activities.
10. The removal of vegetation will be limited to only those portions of plants necessary to allow the passage of vehicles, material, and equipment.
11. Construction and repairs shall avoid making windrows with the soils once grading activities are completed, and any excess soils will be used on-site to shape road or crossing surface, as applicable.
12. Erosion control measures and appropriate BMPs, as required and promulgated through site-specific SWPPP and engineering designs, will be implemented before, during, and after soil-disturbing activities.
13. Areas with highly erodible soils will be given special consideration when preparing the SWPPP to ensure incorporation of various erosion control techniques such as straw bales, silt fencing, aggregate materials, wetting compounds, and rehabilitation, where possible, to decrease erosion.
14. Materials such as straw bales used for on-site erosion control will be free of non-

native plant seeds and other plant parts to limit potential for infestation.

15. Rehabilitation will include revegetating or the distribution of organic or geologic material (i.e., boulders, rocks, or limbs) over the disturbance area to reduce erosion while allowing the area to naturally revegetate.

16. Vegetation targeted for retention will be flagged for avoidance to reduce the likelihood of being treated or removed.

17. Materials such as gravel, topsoil, or fill will be obtained from existing developed or previously used sources that are compatible with the project location and are from legally permitted sites. Materials from undisturbed areas adjacent to the project location will not be used.

18. Soil-binding agents will be applied only during the late summer/early fall months to avoid impacts on Federally-listed species. Soil-binding agents will not be applied in or near (within 100 feet) surface waters (e.g., wetlands, perennial streams, intermittent streams or washes). Soil-binding agents will only be applied to areas that lack any vegetation.

19. Air Quality - BMPs will include the placement of flagging and construction fencing to restrict traffic within the construction limits in order to reduce soil disturbance. Soil watering will be utilized to minimize airborne particulate matter created during construction activities. Bare ground may be covered with hay or straw (see 5.3, paragraph 5) to lessen wind erosion during the time between tower construction and the revegetation of temporary impact areas with a mixture of native plant seeds, nursery plantings, and/or allowed to revegetate naturally. All construction equipment and vehicles will be kept in good operating condition to minimize exhaust emissions.

5.2.3 BMP2c – Minimizing noise and light pollution

1. All generators will have an attached muffler or use other noise-abatement methods in accordance with industry standards.

2. Lighting impacts during the night will be avoided by conducting construction and maintenance activities during daylight hours only. If night lighting is unavoidable 1) special bulbs designed to ensure no increase in ambient light conditions will be used, 2) the number of lights used will be minimized, 3) lights will be placed on poles pointed toward the ground, with shields on lights to prevent light from going up into the sky or out laterally into the landscape, and 4) lights will be selectively placed so they are directed away from all native vegetative communities.

3. Noise impacts during the night will be avoided by conducting construction and maintenance activities during daylight hours only. If construction or maintenance must occur during nighttime hours, the duration and frequency of these activities will be minimized to the greatest extent possible.

5.2.4 BMP2d – Minimizing disturbance related to human presence

1. The number of vehicles traveling to and from the project site and the number of trips per day will be minimized to reduce the likelihood of disturbing animals in the area or injuring animals on the road.

2. Construction vehicle speed limits will not exceed 35 miles per hour (mph) on major unpaved roads (i.e., graded with ditches on both sides) and 25 mph on all other unpaved roads. During periods of decreased visibility (e.g., night, poor weather, curves), vehicles will not exceed speeds of 25 mph.

5.3 Best Management Practice 3 – (Prevent Spread of Aquatic Disease and Pests – BMP3)

1. Water tankers that convey untreated surface water will not discard unused water within two miles of any drainage, aquatic habitat, or marsh habitat.
2. Storage tanks containing untreated water will be of a size that if a rainfall event were to occur, the tank (assuming open) will not be overtopped and cause a release of water into the adjacent drainages.
3. Water storage on the project location will be in on-ground containers located on upland areas and not in washes.

5.4 Best Management Practice 4 – (Biological Monitors – BMP4)

1. Biological monitors will be present at each area of construction activity.
2. Biological monitors will be able to communicate the purpose of all BMPs and will be able to consult project managers on appropriate actions.
3. Biological monitors will survey habitats potentially occupied by Federally-listed species and species protected under the Migratory Bird Treaty Act (MBTA) prior to the arrival of construction equipment or vehicles.
4. Following this initial survey, the biological monitors will be in sight of all construction equipment, vehicles, and personnel during all construction activities.
5. Duties of the biological monitor will include ensuring that activities stay within designated project footprints, evaluating the response of Federally-listed species and species protected under the MBTA that come near the project site, and implementing appropriate response actions.
6. Biological monitors will notify the construction manager of any activities that may harm or harass an individual of a Federally-listed species. Upon such notification, the construction manager shall temporarily suspend all project activities and notify the Tohono O'odham Nation's Ecologist, the Contracting Officer, the Administrative Contracting Officer, and the Contracting Officer's Representative of the suspension so that the key personnel can be notified and apprised of the situation and the potential conflict can be resolved.
7. If an individual of a Federally-listed species is found in the designated project location, work will cease in the area of the species until either a qualified specialist (an individual, agency personnel, or personnel with the Tohono O'odham Nation's WVMP with permits to handle the species) can safely remove the individual, or it moves away on its own.
8. Individual animals found in the project location will be relocated by a qualified specialist (an individual or agency personnel with permits to handle the species) to a nearby safe location in accordance with accepted species handling protocols. Information on the appropriate protocols will be coordinated with USFWS.

9. Biological monitors will check visible space underneath all vehicles and heavy equipment for listed species and other wildlife prior to moving vehicles and equipment at the beginning of each workday and after vehicles have idled for more than 15 minutes.
10. Biological monitors will document the use of BMPs, any actions not compliant with BMPs, and any incidence of harm or harassment of Federally-listed species. A list of species observed during monitoring will be included in the monitoring reports.
11. Reports from the biological monitor will be used for development of the post-construction report.

5.5 Best Management Practice 5 – (Species-Specific BMPs – BMP5)

Yellow-Billed Cuckoo Construction, Post-construction Activities

1. Construction activities will be initiated prior to yellow-billed cuckoo (*Coccyzus americanus* [YBC]) breeding season (May 15 to September 30).
2. Post-construction maintenance will avoid the YBC (May 15 to September 30) to the extent practicable.
3. Any emergency repair maintenance or repair activities during YBC breeding season will occur in coordination with the Tohono O'odham Nation.
4. All work will be performed during daylight hours.
5. The existing low-water crossing will be abandoned following construction and barriers installed outside the floodplain to prevent vehicle access.
6. The soil will be scarified at the abandoned low-water crossing footprint to promote natural regeneration of vegetation.

5.6 Best Management Practice 6 – (Minimize Impacts on Water Resources – BMP6)

Construction and maintenance contractors will comply with the following water resources BMPs.

1. Wastewater will be stored in closed containers on-site until removed for disposal. Wastewater is water used for project purposes that is contaminated with construction materials or from cleaning equipment and thus carries oils or other toxic materials or other contaminants as defined by Federal or state regulation.
2. Contamination of ground and surface waters will be avoided by collecting concrete wash water in open containers and disposing of it off-site.
3. Natural aquatic and wetland systems contamination via runoff will avoided by limiting all equipment maintenance, staging, and laydown and by not dispensing hazardous liquids, such as fuel and oil, to designated upland areas.
4. Cease work during heavy rains and do not resume work until conditions are suitable for the movement of equipment and materials.
5. Implement erosion control measures and appropriate BMPs, as required and promulgated through a site-specific SWPPP and engineering designs, before, during, and after soil disturbing activities.

6. Give highly erodible soils special consideration when preparing the SWPPP to ensure incorporation of various erosion control techniques, such as straw bales, silt fencing, aggregate materials, wetting compounds, and rehabilitation, where possible, to decrease erosion.

7. All construction and maintenance contractors and personnel will review the CBP approved spill protection plan and implement it during construction and maintenance activities.

8. Limit work with drainages to dry periods to reduce effects on downstream water quality except for emergency repairs required to protect human life.

9. Prevent runoff from entering drainages by placing fabric filters, sand bag enclosures, or other capture devices around the work area. Empty or clean out the capture device at the end of each day and properly dispose of the wastes.

10. Collect wastewater from pressure washing. A ground pit or sump can be used to collect the wastewater. Wastewater from pressure washing must not be discharged into any surface water.

11. If soaps or detergents are used, the wastewater and solids must be pumped or cleaned out and disposed of in an approved facility. If no soaps or detergents are used, the wastewater must first be filtered or screened to remove solids before being allowed to flow off-site. Detergents and cleaning solutions must not be sprayed over or discharged into surface waters.

12. Design and implement road maintenance so that the hydrology of streams, ponds, and other habitats are not altered.

5.7 Best Management Practice 7 – (Non-native and Invasive Plants – BMP7)

1. The removal of native vegetation and disturbance of soils will be minimized as described under BMP2b.

2. Removal of non-native plants will be done in coordination with the Tohono O'odham Nation's WVMP. All non-native removed plants will be bagged and disposed of in construction-related debris bins. Herbicides can be used according to label directions if they are not toxic to Federally-listed species that may be in the area. If herbicides are used, the plants will be left in place.

3. All chemical applications on the Tohono O'odham Nation must be in coordination with the Tohono O'odham Nation's Environmental Protection Office to ensure accurate reporting.

5.8 Best Management Practice 8 – (Migratory Birds – BMP8)

1. If construction is initiated during the migratory bird breeding season (February 1 to September 1), surveys for migratory birds will be conducted for migratory birds and nests no more than two weeks prior to the initiation of construction. If an active nest is found, a 25-foot buffer zone will be established around the nest and no activities will occur within that zone until nestlings have fledged and abandoned the nest.

2. A survey for migratory birds will also be conducted prior to all maintenance

activities that involve removing vegetation or ground disturbance during the nesting period (February 1 through September 1) in areas where migratory birds might be nesting. If a nest is observed within the project site, the maintenance contractor will notify personnel with the Tohono O'odham Nation's WVMP prior to performing maintenance activities.

3. If construction or maintenance is scheduled during the migratory bird nesting season (February 1 through September 1), steps will be taken to prevent migratory birds from establishing nests in the potential impact area. These steps could include covering equipment and structures, and use of various excluders (e.g., noise). Birds can be harassed to prevent them from nesting on the site. Once a nest is established, the birds cannot be harassed until all young have fledged and left the nest site. If nesting birds are found during the supplemental survey, intrusive maintenance activities will be deferred until the birds have left the nest.

5.9 Best Management Practice 9 – (Wildlife– BMP9)

Construction, maintenance contractors, and environmental monitors will ensure compliance with the following wildlife resources BMPs.

1. To prevent entrapment of wildlife species, ensure that excavated, steep-walled holes or trenches are either completely covered by plywood or metal caps at the close of each workday or provided with one or more escape ramps (at no greater than 1,000-foot intervals and sloped less than 45 degrees) constructed of earthen fill or wooden planks.

2. Each morning before the start of construction or maintenance activities and before such holes or trenches are filled, ensure that the holes or trenches are thoroughly inspected for trapped animals. Ensure that any animals discovered are allowed to escape voluntarily (by escape ramps or temporary structures), without harassment, before construction activities resume, or are removed from the trench or hole by a qualified person and allowed to escape unimpeded.

3. Do not permit pets owned or under the care of the contractor or Sector personnel inside the project boundaries, adjacent native habitats, or other associated work areas. This BMP does not apply to law enforcement working animals, such as USBP working dogs and horses.

6 References

1. Arizona Department of Transportation (ADOT). 2015. Guidelines for Scoping Pavement Preservation Projects. Internet URL: https://apps.azdot.gov/files/Roadway-Engineering/predesign/guidelines-for-scoping-pavement-preservation-projects.pdf
2. Arizona Department of Water Resources (ADWR). 2014. Arizona Water Atlas Volume Lower Colorado River Planning Area Water Atlas. Internet URL: http://www.azwater.gov/azdwr/StatewidePlanning/WaterAtlas/LowerColoradoRiver/defa ult.htm. Last updated March 27, 2014.
3. Arizona Game and Fish Department (AGFD). 2017. Arizona State Listed Species compiled and edited by the HDMS. Phoenix, Arizona. 4pp. Internet URL: https://www.azgfd.com/PortalImages/files/wildlife/planningFor/speciesLists/AllSpecies_ByCounty.pdf. Last accessed on April 25, 2017.
4. Brown, D.E., T.C. Brennan, and P.J. Unmack. 2007. A digitized biotic communities map for plotting and comparing North American plant and animal distributions. Canotia 3(1):1- 12.
5. Brown, D. E. and C. A. Lopez Gonzalez. 2001. Borderland Jaguars. University Utah Press, Salt Lake City, Utah.
6. Brown, D. E. and C.H. Lowe. 1994. Biotic Communities: Southwestern United States and Northwestern Mexico. David E. Brown, editor. University of Utah Press, Salt Lake City, Utah.
7. Childs, J. L. and A. M. Childs. 2008. Ambushed on the jaguar trail: hidden cameras on the Mexican border. Rio Nuevo Publishers, Tucson, Arizona.
8. Council on Environmental Quality (CEQ). 2005. Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508).
9. Davis, T. 2016. New jaguar roams Southern Arizona, photo indicates. Arizona Daily Star. December 7, 2016. Internet URL: http://tucson.com/news/local/new-jaguar-roams-southern-arizona-photo-indicates/article_53c50cf8-9664-5dcd-b276-1b50c77b8787.html. Last accessed on April 25, 2017.
10. EES Group, Inc. 2010. Sound Survey and Analysis Report Proposed Wind Energy Facility Brewster, Massachusetts. August 2010.
11. Gulf South Research Corporation (GSRC). 2017. Vamori Wash High-Water Crossing Biological Survey Field Notes. February 2017.
12. Halterman, M., M. J. Johnson, J. A. Holmes, and S. A. Laymon. 2015. A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo: U.S. Fish and Wildlife Techniques and Methods. April 22, 2015. Internet URL: https://www.fws.gov/southwest/es/Documents/R2ES/YBCU_SurveyProtocol_FINAL_DRAFT_22Apr2015.pdf

13. Hart, David R. 2014. Cultural Resources Inventory in Support of Integrated Fixed Towers on the Tohono O'odham Nation, U.S. Border Patrol, Tucson Sector, Arizona. Report prepared for the Department of Homeland Security, U.S. Customs and Border Protection, Office of Technology Innovation and Acquisition, Arlington, Virginia, and the U.S. Army Corps of Engineers, Planning, Environmental, and Regulatory Division, Fort Worth, Texas. Report prepared by Gulf South Research Corporation, Tucson, Arizona.

14. Hart, David R. and John Lindemuth. 2006. Archaeological Survey for Permanent Vehicle Barriers and Related Improvements along the International Border on the Tohono O'odham Nation, U.S. Border Patrol, Tucson Sector, Pima County, Arizona. Northland Research, Inc. Flagstaff, and GSRC, Baton Rouge.

15. Hatten, J. R., A. Averill-Murray, and W.E. Van Pelt. 2003. Characterizing and mapping potential jaguar habitat in Arizona. Nongame and Endangered Wildlife Program Technical Report 203. AGFD, Phoenix, Arizona.

16. Hatten, J. R., A. Averill-Murray, and W.E. Van Pelt. 2005. A spatial model of potential jaguar habitat in Arizona. Journal of Wildlife Management 69(3), 1024-1033.

17. HDR. 2015. Cultural Resource Survey of Washes and Road Segments on the Tohono O'odham Nation by the United States Customs and Border Protection, Pima County, Arizona. HDR, Phoenix.

18. KGUN 9 On Your Side. 2019. New Pictures Released of Jaguar in Chiricahua Mountains. News Television Channel. Access December 30, 2019. https://www.kgun9.com/news/local-news/new-pictures-released-of-jaguar-in-chiricahua-mountains

19. Kramer, R. 2014. Biological Survey of Approximately 7 Acres for the Proposed Vamori Wash Bridge on Tohono O'odham Nation Lands, Pima County Arizona. Prepared for U.S. Department of Homeland Security, CBP. August 26, 2014.

20. LiveScience. 2018. Someone Just Killed One of the Last Remaining Jaguars in the US. Article. June 28, 2018.

21. Martynec, Richard, Charles Suhler, Sandra Martynec, Sharlene Allday, and Duane Peter. 1995. Cultural Resources Survey/Monitoring of a JTF-6 Action, Tohono O'odham Sector, Arizona. Miscellaneous Report of Investigations Number 39. Geomarine, Inc., Plano, Texas.

22. McCain, E. B. and J. L. Childs. 2008. Evidence of Resident Jaguars (Panthera onca) in the Southwestern United States and the Implications for Conservation. Journal of Mammology 89(1):1-10. Midwest Research Institute. 1996. Improvement of Specific Emission Factors (BACM Project No. 1). Prepared for South Coast Air Quality Management District. SCAQMD Contract 95040, Diamond Bar, CA. April 1996.

23. Natural Resources Conservation Service (NRCS). 1999. Soil Survey of Tohono O'odham Nation, Arizona, Parts of Maricopa, Pima, and Pinal Counties. USDA and NRCS in cooperation with the U.S. Department of Interior, Bureau of Indian Affairs; the Arizona Agricultural Experiment Station; and the Tohono O'odham Nation. Internet URL: http://soildatamart.nrcs.usda.gov/manuscripts/AZ703/0/tohono.pdf

24. Pima County. 2019. Website. Pima County Grading Requirements. hyperlink to Pima County Grading Requirements Last Accessed December 30, 2019.

25. Russell, S. M. and G. Monson. 1998. The birds of Sonora. University of Arizona Press, Tucson, Arizona.

26. Tohono O'odham Nation. 2012a. Construction continues on SR 86 improvement project west of Robles Junction. Internet URL: hyperlink to San Pedro Announcement

27. Tohono O'odham Nation. 2012b. State Route 86 Pedestrian Study. Internet URL: TON Fact Sheet

28. Tohono O'odham Nation. 2014. Tohono O'odham Nation History and Culture. Internet URL: http://www.tonation-nsn.gov/history_culture.aspx 6

29. Turner, R.M. and D.E. Brown. 1982. Sonoran Desertscrub. In D. E. Brown, ed. Biotic communities of the American southwest-United States and Mexico. Desert Plants 4:181-221. University of Arizona, Tucson, Arizona.

30. U.S. Army Corps of Engineers (USACE). 2012. Decision Document Nationwide Permit 14. Michael Walsh, Deputy Commanding General for Civil and Emergency Operations.

31. USACE. 2016a. Design Analysis. AZ003 Vamori Wash High-Water Crossing, 100% Submittal. Jber, Alaska: U.S. Army Corps of Engineers. 26 August 2016.

32. USACE. 2016b. Geotechnical Report Vamori Wash Bridge, Tucson Sector, Ajo and Casa Grande Stations, Tohono O'odham Nation Lands, Pima County, Arizona. March 11, 19 2016.

33. U.S. Customs and Border Protection (CBP). Final Environmental Assessment for Remote Video Surveillance Systems Upgrade Program (New Towers), U.S. Border Patrol, Tucson and Yuma Sectors, Arizona, U.S. Customs and Border Protection, Department of Homeland Security. Washington, D.C. June 2012.

34. CBP. 2015. Office of Technology Innovation and Acquisition. Internet URL: http://www.cbp.gov/border-security/along-us-borders/technology-innovation-acquisition. Last accessed Nov. 27, 2015.

35. CBP. 2017. Final Environmental Assessment for Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol Tucson Sector, Arizona. Washington, D.C.: Department of Homeland Security.

36. U.S. Environmental Protection Agency (USEPA). 2001. Procedures Document for National Emission Inventory, Criteria Air Pollutants 1985-1999. EPA-454/R-01-006. Office of Air Quality Planning and Standards Research Triangle Park NC 27711.

37. USEPA. 2009. Policy Guidance on the Use of MOVES2010 for State Implementation Plan Development, Transportation Conformity and Other Purposes. Office of Transportation and Air Quality. EPA-420-B-09-046.

38. U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). 1998. Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act. Final version, May 1998.

39. USFWS. 2012. Recovery Outline for the Jaguar (Panthera onca). Internet URL: https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/Jaguar/049777%20- %20Jaguar%20Recovery%20Outline.pdf. Last accessed on April 25, 2017.

40. USFWS. 2014a. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (Coccyzus americanus); Final Rule. Federal Register 79:192 (3 October 2014) pp. 45.

41. USFWS. 2014b. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for Western Distinct Population Segment of the Yellow-billed Cuckoo; Proposed 3 Rule. Federal Register 79:158 (15 August 2014) pp. 48548-48652.

42. USFWS. 2015. Draft Recovery Plan for the Sonoran pronghorn (Antilocapra Americana sonoriensis), Second Revision. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, New Mexico, USA.

43. USFWS. 2016. Environmental Conservation Online Service Species by County. Pima County.

44. Last accessed March 4, 2016.USFWS. 2017. Press Release: Jaguar photographed in southern Arizona’s Cochise County. March 2, 2017. Internet URL: https://www.fws.gov/news/ShowNews.cfm?ref=jaguar-photographed-in-southern-arizona%E2%80%99s-cochise-county-&_ID=35988. Last accessed on April 25, 2017.

7 List of Preparers

This SEA was prepared under the direction of U.S. Customs and Border Protection. Individuals who assisted in issue resolution and provided agency guidance for this document, as well as being responsible for all final revisions and document content are:

- Paul Schmidt, U.S. Customs and Border Protection
- Michelle Barnes, U.S. Customs and Border Protection

The following contractors were primarily responsible for preparing this SEA.

Name	Agency/ Organization	Discipline/ Expertise	Experience	Role in Preparing EA
Alvin Brown	NRI	NEPA Specialist	40 years of EA/EIS preparation and environmental planning studies.	DRAFT and Final SEA's, Final Preparation
Ami Barrera	NRI	Environmental Support	26 years of NEPA compliance	Project Manager; SEA preparation, edits, and review
Jeff Coron	LMI	CBP Environmental Support/NEPA Program Manager	23 years of EA/EIS preparation and environmental planning studies	SEA review
Howard Nass	GSRC	Forestry/ Wildlife	27 years of EA/EIS preparation and environmental planning studies	Project Manager; SEA preparation and review
Ashley Bogrand	GSRC	Wildlife Biology	5 years of biological resources surveys; protected species surveys	Land use, groundwater , vegetation, and soils
Rob Nixon	GSRC	Biology	18 years of biological resources	Wildlife resources, threatened and endangered species
Dave Hart	GSRC	Archaeology	20 years of professional archaeology; cultural resources	Historic/Cultural resources

Name	Agency/ Organization	Discipline/ Expertise	Experience	Role in Preparing EA
Ann Guissinger	GSRC	Economics	35 years of economic development; Socioeconomics; environmental justice; NEPA	Floodplains, surface waters, air quality, noise, traffic and transportation
Chris Ingram	GSRC	Biology	36 years of NEPA compliance	SEA review
Jason Glenn	GSRC	English	6 years of technical review	Technical review
Sharon Newman	GSRC	GIS/Graphics	24 years of GIS/graphics	GIS/graphics

8 Consultation and Coordination

Public and Agency Coordination

Public involvement and agency scoping was initiated as part of the environmental assessment that was completed in 2017. As part of that process, CBP invited the Tohono O'odham Nation and the BIA to participate with cooperating agencies in the development of the original EA because of their jurisdiction by law and expertise. Under the Proposed Action, BIA would issue ROWs to CBP for proposed activities on Tohono O'odham Nation lands after the Tohono O'odham Nation has consented to the ROW.

Copies of this coordination are found in Appendix A.

Section 7 Consultation and Coordination

In addition to NEPA coordination addressed above, the CBP initiated coordination with the USFWS in accordance with Section 7 of the ESA, on September 9, 2019 through the agency's IPaC database. The IPaC database provides information on known or expected protected species, candidate species, and critical habitat within the identified project area. CBP is continuing to consult with the USFWS under the ESA.

Section 106 Coordination

In accordance with Section 106 of the National Historic Preservation Act (NHPA), CBP initiated coordination with the THPO on February 21, 2020. Previous surveys of the project area have identified two sites within the area of potential impact.

Public Availability

CBP's Draft SEA will be available for public review for 30 days at: the Tohono O'odham Community College Library, Sells, Arizona; the Venito Garcia Library and Archives, Sells, Arizona; the Pima County Public Library, Tucson, Arizona; and will be available

electronically at https://www.cbp.gov/about/environmental-cultural-stewardship/documents/docs-review. CBP will publish a Notice of Availability (NOA) for the Draft SEA in the *The Runner*, *Ajo Copper News*, and *Arizona Daily Star* to announce the availability of the Draft SEA and Draft Finding of No Significant Impact for public review.

Appendix A includes correspondence sent or received during the preparation of this document.

9 Acronyms

Acronym	Definition
ACHP	Advisory Council on Historic Preservation
A.D.	Anno Domini
ADOT	Arizona Department of Transportation
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
amsl	Above Mean Sea Level
ANHP	Arizona Natural Heritage Program
AOR	Area of Responsibility
APE	Area of Potential Effect
ASM	Arizona State Museum
AZ	Arizona
B.C.	Before Christ
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practice
CBP	U.S. Customs and Border Protection
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations

Acronym	Definition
CO	Carbon monoxide
CO_2	Carbon dioxide
CPNWR	Cabeza Prieta National Wildlife Refuge
CWA	Clean Water Act
DHS	Department of Homeland Security
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FOB	Forward Operating Base
FONSI	Finding of No Significant Impact
FR	Federal Register
GHG	Greenhouse gases
IFT	Integrated Fixed Tower
INS	Immigration and Naturalization Services
IPaC	Information for Planning and Conservation
IRR	Indian Reservation Road
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act

Acronym	Definition
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOx	Nitrogen oxides
NOA	Notice of Availability
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWP	Nationwide Permit
OA	Office of Acquisition
OSHA	Occupational Safety and Health Administration
PM-2.5	Particulate matter less than 2.5 microns
PM-10	Particulate matter less than 10 microns
POL	Petroleum, oil, and lubricant
PVB	Permanent vehicle barrier
ROI	Region of influence
ROW	Right-of-Way
SEA	Supplemental Environmental Assessment
SHPO	State Historic Preservation Officer
SO_2	Sulfur dioxide
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traditional Cultural Properties
THPO	Tribal Historic Preservation Officer
TNR	Traditional Northern Road

Acronym	Definition
U.S.	United States
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
U.S.C.	U.S. Code
VOC	Volatile organic compounds
WRO	Western Regional Office
WVMP	Wildlife and Vegetation Management Program
YBC	Yellow-Billed Cuckoo

1

10 Appendices

Appendix A – Correspondence

Appendix B – Tribal Coordination and Section 106

Appendix C – Section 7 Endangered Species Act Consultation

Appendix D – Public Involvement

Appendix E – Arizona State-Listed Species

Appendix F - Air Quality Calculations

Appendix A – Correspondence

Vamori Wash SEA Agency Coordination Letters

1. Bureau of Indian Affairs
   Western Region Environmental Protection Officer
   2600 N. Central Avenue
   4th Floor Mailroom
   Phoenix, AZ 85004-3050

2. Bureau of Indian Affairs
   Superintendent, Papago Agency
   P.O. Box 490
   Sells, AZ 85634
   (520) 383-3286

3. Tohono O'odham Nation
   Honorable Ned Norris, Jr. (Chairman)
   P.O. Box 837
   Sells, AZ 85634
   Cc: Peter Steere, THPO
   Director, Water Resources
   Director, Realty Office
   Director, Natural Resources
   Chair, Legislative Cultural Preservation Committee
   Chair, Legislative Natural Resources Committee
   Chair, Domestic Affairs Committee
   Timothy Joaquin, Chairman, Tohono O'odham Legislative Council
   Director, Tohono O'odham Nation Environmental Protection Office

4. Ms. Kathryn Leonard, State Historic Preservation Officer
   Arizona State Parks
   Attn: Dr. James Cogswell, Ph.D., Compliance Specialist/Archaeologist
   State Historic Preservation Office
   1100 West Washington Street
   Phoenix, Arizona 85007

5. Director, Arizona Department of Environmental Quality
   ATTN: Misael Cabrera, PE
   1110 West Washington Street
   Phoenix, AZ 85007

6. Arizona Department of Environmental Quality
   Southern Regional Office
   Office of Border Environmental Protection
   ATTN: Edna Mendoza, Director
   400 West Congress, Suite 433
   Tucson, AZ 85701

7. Arizona Game and Fish Department
   Project Evaluation Program Supervisor
   Habitat Branch- Project Evaluation Program
   5000 W. Carefree Highway
   Phoenix, AZ 85086-5000

8. Arizona Game and Fish Department
   Habitat Program Manager, Region V
   555 N. Greasewood Road
   Tucson, AZ 85023

9. Alita Henderson, Manager Environmental Review Office Coordinator
   U.S. Environmental Protection Agency, Region 9
   75 Hawthorne Street
   San Francisco, CA 94105

10. Office of Federal Activities
    U.S. Environmental Protection Agency
    75 Hawthorne Street
    San Francisco, California 94105

11. U.S. Fish and Wildlife Service
    Arizona Ecological Services Field Office
    ATTN: Jeff Humphrey, Field Supervisor
    9828 North 31st Avenue #C3
    Phoenix, AZ 85051-2517

12. Department of the Interior
    ATTN: Jon Andrew
    1849 C Street, NW
    MS 3428
    Washington, DC 20240

13. U.S. Fish and Wildlife Service
    Arizona Ecological Services Field Office
    ATTN: Julie McIntyre
    Assistant Field Supervisor for Southern Arizona
    201 N. Bonita Avenue, Suite 141
    Tucson, AZ 85745

14. U.S. Army Corps of Engineers
    Senior Project Manager
    5205 East Comanche Street
    Tucson, AZ 85707

15. U.S. Army Corps of Engineers
    Colonel Aaron Barta, District Commander
    915 Wilshire Boulevard, Suite 980
    Los Angeles, California 90017

16. Jayne Harkins, Commissioner
    International Boundary and Water Commission
    4171 North Mesa
    Building C, Suite C-100
    El Paso, TX 79902-1441
17. Principal Engineer
    International Boundary and Water Commission
    4171 North Mesa
    Building C, Suite 100
    El Paso, Texas 79902
18. Ms. Sharon Bronson, Supervisor, District 3
    Pima County Board of Supervisors
    130 West Congress St., 11th floor
    Tucson, AZ 85701
19. Mr. Chuck Huckelberry, County Administrator
    Pima County
    130 West Congress St., 10th Floor
    Tucson, AZ 85701

The following letter and attachments serves as an example of the correspondence sent to the above individuals.

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and Border Protection

February 27, 2017

International Boundary and Water Commission
Mr. Jose A. Nunez, Principal Engineer
4171 North Mesa Building C, Suite 100
El Paso, TX 79902

SUBJECT: Proposed Supplemental Environmental Assessment for the Office of Acquisition's Vamori Wash High-water crossing on the Tohono O'odham Nation

Dear Mr. Kruse,

On behalf of the Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), the U.S. Army Corps of Engineers (USACE), Fort Worth District, is preparing a Supplemental Environmental Assessment (SEA) for the Office of Acquisition's (OA) construction, maintenance, and repair of a high-water crossing and one-lane road across Vamori Wash (Proposed Action). The Proposed Action is located on the Tohono O'odham Nation within Pima County, Arizona (Figure 1). This SEA will address the Proposed Action, including the relocation of the existing border road and fence (Figures 2, 3, and 4). The purpose of the Proposed Action is to sustain surveillance, enhance U.S. Border Patrol (USBP) operations, and support capabilities along the traditional northern road by providing a year-round/weather-resistant road crossing through Vamori Wash.

The SEA will analyze the potential for significant adverse impacts or beneficial effects of the Proposed Action on the environment and includes the following activities:

- Construct a high-water crossing with overflow (approximately 180 feet long)
- Install box culverts in the east channel of the Vamori Wash
- Install culverts and perform drainage improvements
- Install and replace riprap on upstream and downstream sides of fills
- Relocate the existing vehicle/border fence south of its current location but still within the Roosevelt Easement
- Reroute the existing road and build up road elevations
- Install a temporary low-water crossing during construction activities
- Perform post-construction maintenance and repair of the crossing
- Obtain a Right of Way (ROW) from the Bureau of Indian Affairs and the Tohono O'odham Nation

Mr. Bernie Kruse

Page 2

CBP is not aware of any utility transmission lines, water lines, or fiber-optic cables that run parallel to or transect this segment of the Traditional Northern Road. Should CBP discover such lines or cables during the course of construction, these lines would be rerouted underground within the project areas footprint.

CBP submitted Application Number 2016-80, prepared by the U.S. Army Corps of Engineers, in support of this project. On February 3, 2017 your agency approved this permit application.

CBP is gathering data and input from Federal, tribal, state, and local governmental agencies, departments, and bureaus that may be affected by, or otherwise have an interest in, this proposed action. Since your agency or organization may have particular knowledge and expertise regarding potential environmental impacts from CBP's Proposed Action, your input is sought regarding the likely or anticipated environmental effects of this Proposed Action. Your response should include any state and local restrictions, permitting or other requirements with which CBP would have to comply during project siting, construction, and operation.

Per DHS Instruction 023-01-001-01, Rev. 01, Implementation of the NEPA, we will provide your agency with a copy of the Draft SEA for the OA Vamori Wash High-water crossing. Please let us know if additional copies are needed.

Your prompt attention to this request would be greatly appreciated. If you have any questions, please contact Ms. Elizabeth Kimmerly by telephone at (571) 468-7473 or email at elizabeth.a.kimmerly@cbp.dhs.gov.

Sincerely,

Paul C. Schmidt

Environmental Planning & Real Estate Section Office of Acquisition

U.S. Customs and Border Protection

Attachment 1 – Figures

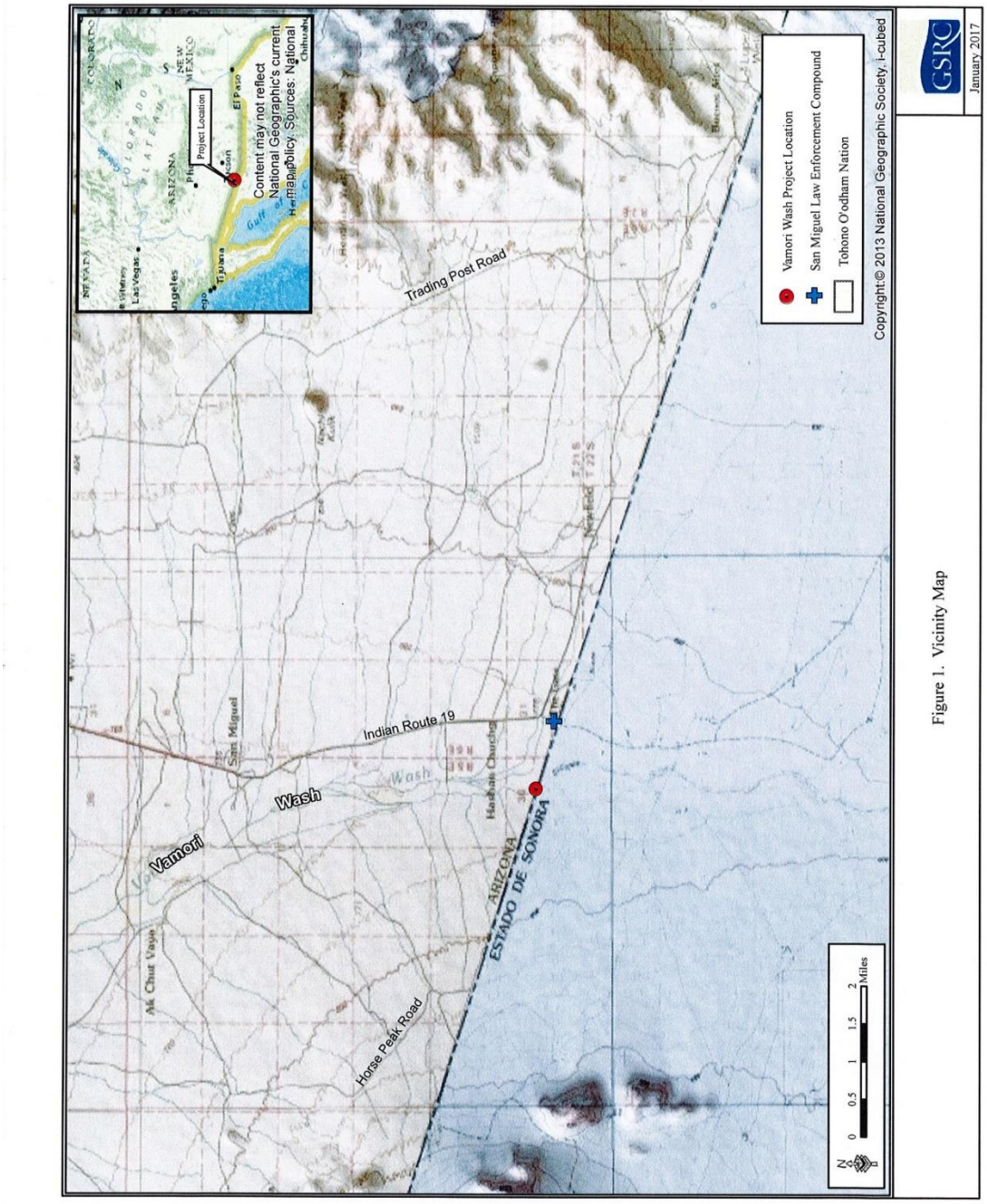


Figure 1. Vicinity Map

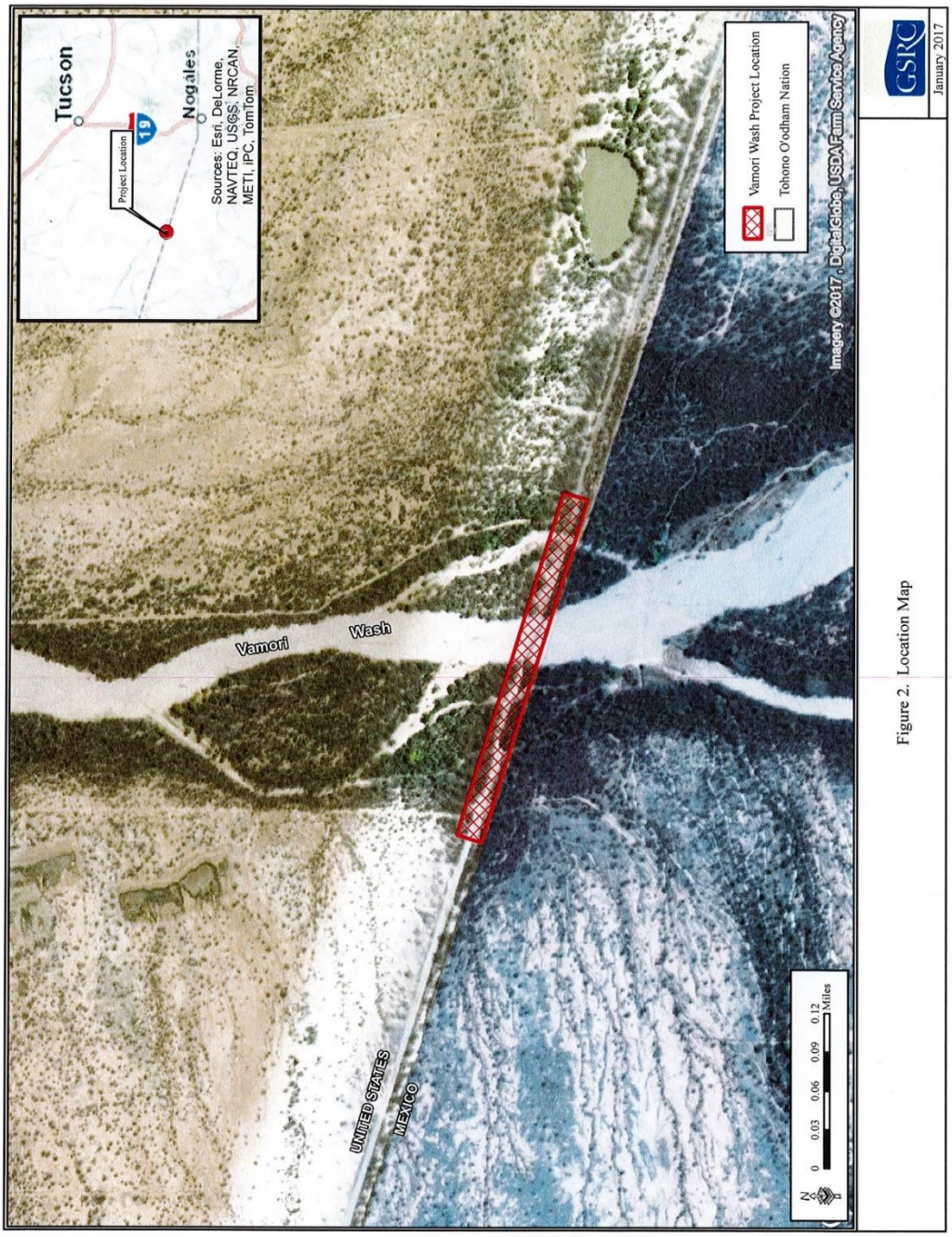


Figure 2. Location Map

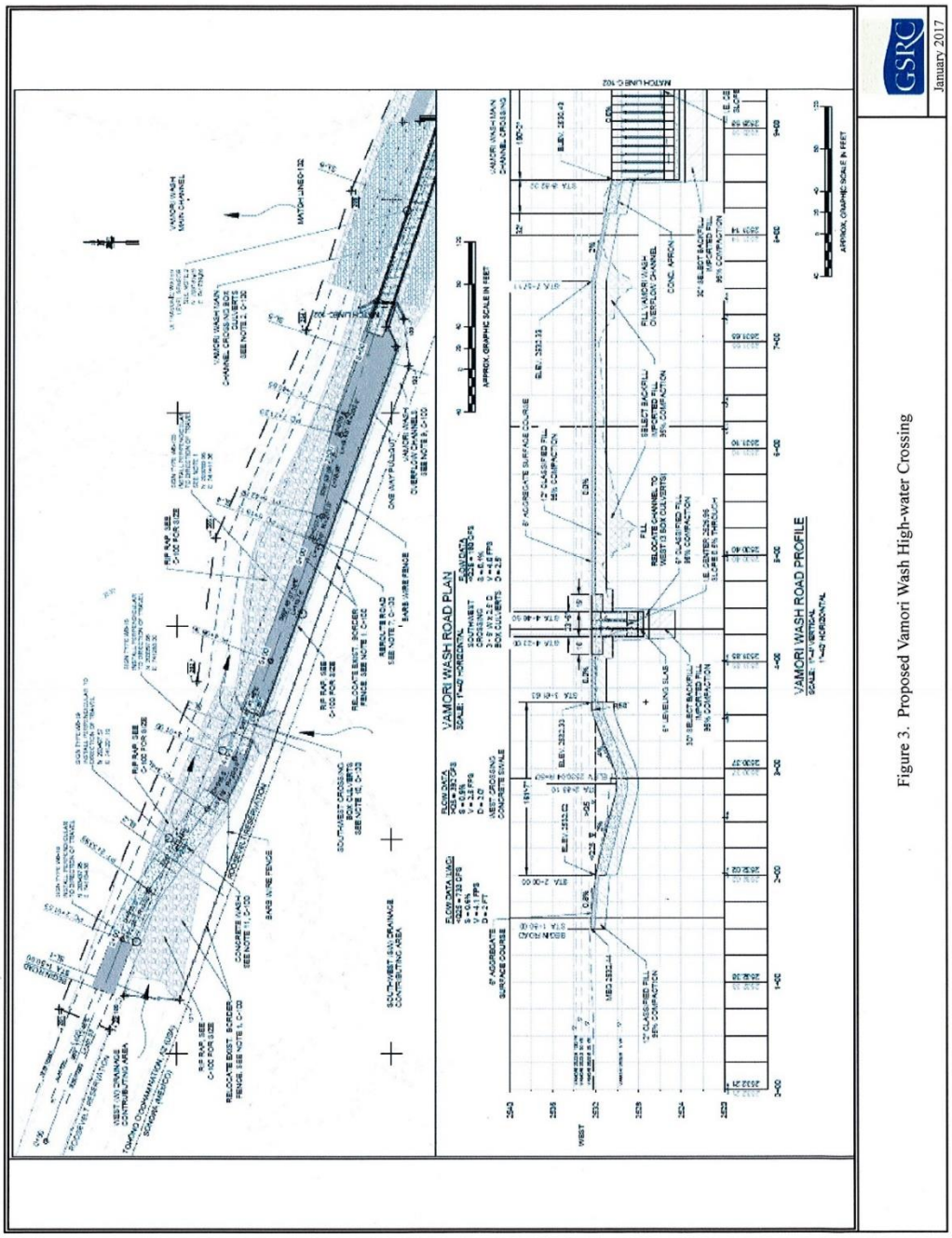


Figure 3. Proposed Vamori Wash High-water Crossing

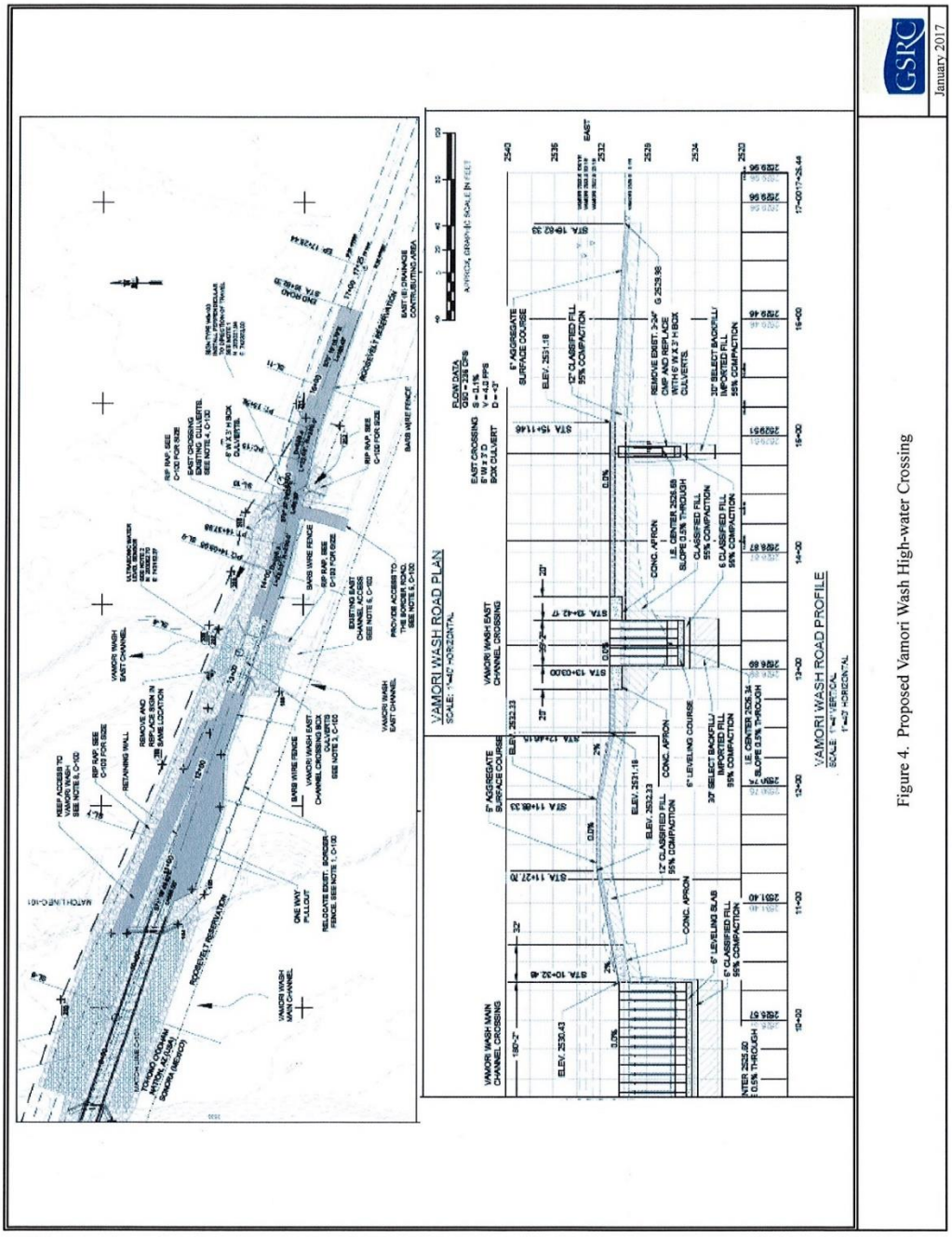


Figure 4. Proposed Vamori Wash High-water Crossing

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

March 8, 2017

Paul C. Schmidt
Environmental Planning and Real Estate
Office of Acquisition
U.S. Customs and Border Protection
1300 Pennsylvania Ave. NW, MS 1043
Washington, DC 20229

Subject: Proposed Supplemental Environmental Assessment for the Office of Acquisition's Vamori Wash High-water crossing on the Tohono O'odham Nation

Dear Mr. Schmidt,

The International Boundary and Water Commission, United States Section (USIBWC), is in receipt of you letter dated February 1, 2017, informing our agency of the intent to prepare a Supplemental Environmental Assessment for the construction of a high water crossing across the Vamori Wash near the international border.

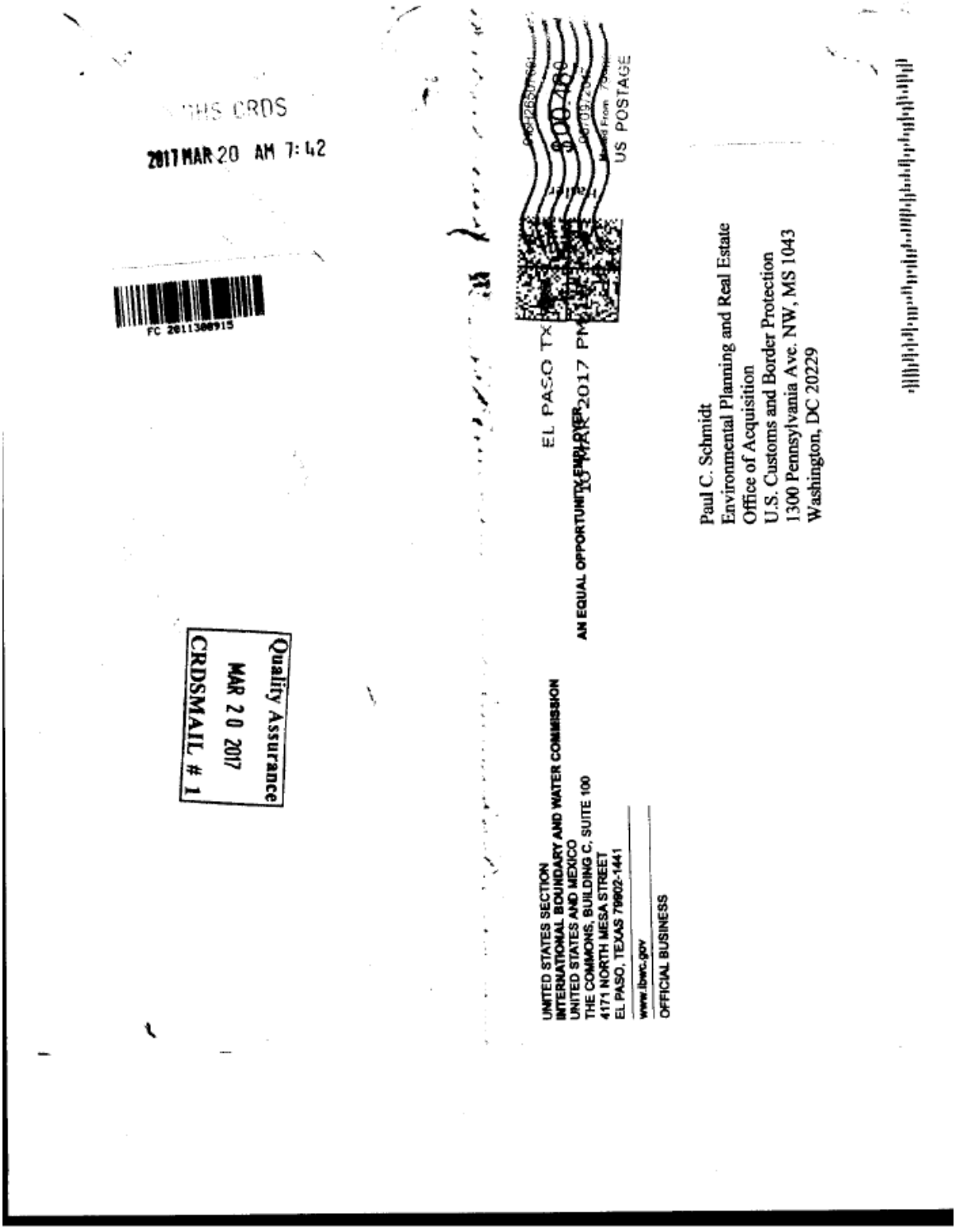
When developing the project design, the project needs to ensure that the natural flow of stormwater are maintained as they cross the international border and that there is no increase, deflection, or acceleration of stormwater into Mexico. The USIBWC would like to review the Hydrologic and Hydraulic studies demonstrating impacts to stormwater flows due to the project.

The project is to construct the high water crossing on property of the Tohona O'odham Nation and, therefore, will not require any permits, license, or letters of concurrence from the USIBWC. If you have any questions or comments, please contact Mr. Wayne Belzer, Environmental Engineer, at (915) 832-4703.

Sincerely,

Jose A. Nuñez, P.E.
Principal Engineer

The Commons, Building C, Suite 100 • 4171 N. Mesa Street • El Paso, Texas 79902-1441
(915) 832-4100 • Fax: (915) 832-4190 • http://www.ibwc.gov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INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
THE COMMONS, BUILDING C, SUITE 100
4171 NORTH MESA STREET
EL PASO, TEXAS 79902-1441
www.ibwc.gov
OFFICIAL BUSINESS
Paul C. Schmidt
Environmental Planning and Real Estate
Office of Acquisition
U.S. Customs and Border Protection
1300 Pennsylvania Ave. NW, MS 1043
Washington, DC 20229

From: SCHMIDT, PAUL
To: SCHMIDT, PAUL
Subject: Mexican Section Comments on Vamori Wash High Water Crossing
Date: Wednesday, February 27, 2019 2:57:27 PM

From: Apurba Borah [mailto:Apurba.Borah@ibwc.gov]
Sent: Monday, October 30, 2017 12:33 PM
To: elizabeth.a.kimmerly@cbp.dhs.gov <mailto:elizabeth.a.kimmerly@cbp.dhs.gov>
Cc: MAHADY, CAROLE L. <CAROLE.L.MAHADY@cbp.dhs.gov <mailto:CAROLE.L.MAHADY@cbp.dhs.gov> >; jeffrey.gunlicks@cbp.dhs.gov <mailto:jeffrey.gunlicks@cbp.dhs.gov> ; RECINOS, SCOTT <SCOTT.RECINOS@cbp.dhs.gov <mailto:SCOTT.RECINOS@cbp.dhs.gov> >; Jose Nunez <Jose.Nunez@ibwc.gov <mailto:Jose.Nunez@ibwc.gov> >; Padinare Unnikrishna <Padinare.Unnikrishna@ibwc.gov <mailto:Padinare.Unnikrishna@ibwc.gov> >
Subject: Mexican Section Comments on Vamori Wash High Water Crossing

Hi Betsey,
Design documents and report of the Vamori Wash High Water Crossing project were shared with the Mexican section on July 19, 2017 as the project is in vicinity of International Border. Recently (October 10th, 2017), USIBWC received comments from the Mexican Section regarding the high water crossing which it called as culvert bridge. I understand this project was designed by USACE, Alaska District for DHS. We specifically need response for the following comments:

1. The culvert bridge does not have capacity to convey the flood flows for a 5-year return period if you consider the obstruction from the debris.

2. In addition to this, there is a Normandy-type wall to the South of the proposed culvert that, as has been observed at other sites, retains material transported by the flood flows, obstructing the runoff and causing ponding of water. In this process, the force of the retained water ends up displacing the wall downstream and causes sediment accumulation upstream of the wall, with the potential to obstruct the proposed culvert if it is not adequately maintained.

Your response will be forwarded to Mexican Section once we receive it.

V/R
Apurba
Apurba K. Borah, Ph.D., P.E., PMP, CFM
Lead Hydraulic Engineer
IBWC, U.S. Section
Headquarters, ESD
(915) 832-4710

CLASSIFICATION: UNCLASSIFIED

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and Border Protection

March 14, 2019

Mr. Jose A. Nunez, P.E.
International Boundary and Water Commission
The Commons, Building C, Suite 100
4171 North Mesa Street
El Paso, Texas 79902-1411

Dear Mr. Nunez:

RE: Proposed Vamori Wash High Water Crossing Supplemental Environmental Assessment
Tohono O' odham Nation
U.S. Customs & Border Protection

This letter responds to your letter dated March 8, 2017 and the October 30, 2017 memo from Apurba K. Borah to Betsy Kimmerly regarding the proposed Vamori Wash High Water Crossing located near San Miguel, in Pima County, Arizona. I have included this correspondence for easy reference,

The email from Mr. Borah contained the following comments based on a review of the project design by the Mexico Section:

Mexico Section Comment 1. The culvert bridge does not have capacity to convey the flood flows for a 5-year return period if you consider the obstruction from the debris.

CBP Response: The culvert bridge is designed to pass clear-water flows for a 5-year return period. The addition of debris assumes the bridge would be overtopped if/when the culverts are about 50% blocked. This was an estimate based on generalized data in the area and best practices in modeling potential debris. Any structure placed across this wash would require maintenance. In the past the wash was un-drivable for 2 to 3 weeks after flood events because of the saturated sediment. This structure was designed to allow traffic soon after a flood event; not during an event as roads leading to the crossing would not be safe during a flood.

Mexico Section Comment 2. In addition to this, there is a Normandy-type wall to the South of the proposed culvert that, as has been observed at other sites, retains material transported by the flood flows, obstructing the runoff and causing ponding of water. In this process, the force of the retained water ends up displacing the wall downstream and causes sediment accumulation upstream of the wall, with the potential to obstruct the proposed culvert if it is not adequately maintained.

Mr. Jose Nunez
Vamori Wash High Water Crossing
Page 2

CBP Response: Currently, the Normandy-type fence is removed each flood season and replaced after the flood season is over by U.S. Customs and Border Protection. Seasonal removal and replacement of the Normandy-type fence will continue after the new high water crossing is installed.

As requested, a copy of the high water crossing design plans including the hydrologic and hydraulic calculations will be sent to you electronically.

If you would please provide an IBWC staff contact to send the link to the electronic design files that would be appreciated.

If you have further questions regarding the proposed design after the review of this material, do not hesitate to contact me. My contact information is: email - paul.c.schmidt@cbp.dhs.gov and phone 571-468-7292 (office) or 202-329-3112 (mobile).

Sincerely,

PAUL C SCHMIDT

Digitally signed by PAUL C SCHMIDT
DN: c=US, o=U.S. Government, ou=Department of Homeland Security, ou=CBP, ou=People, cn=PAUL C SCHMIDT, 0.9.2342.19200300.100.1.1=0509797147.CBP.1
Date: 2019.03.14 07:12:11 -04'00'

Paul C. Schmidt, Manager
Environmental Planning & Real Estate Section
Systems Engineering Directorate
Office of Acquisition

Attachments

CC: IFT Program Office
Tucson Sector
Facilities & Management Engineering
U.S. Army Corps of Engineers

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and Border Protection

February 1, 2017

Pima County
Mr. Chuck Huckelberry, County Administrator
130 West Congress St., 10th Floor
Tucson, AZ 85701

SUBJECT: Proposed Supplemental Environmental Assessment for the Office of Acquisition's Vamori Wash High-water crossing on the Tohono O'odham Nation

Dear Mr. Huckelberry,

On behalf of the Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), the U.S. Army Corps of Engineers (USACE), Fort Worth District, is preparing a Supplemental Environmental Assessment (SEA) for the Office of Acquisition's (OA) construction, maintenance, and repair of a high-water crossing and one-lane road across Vamori Wash (Proposed Action). The Proposed Action is located on the Tohono O'odham Nation within Pima County, Arizona (Figure 1). This SEA will address the Proposed Action, including the relocation of the existing border road and fence (Figures 2, 3, and 4). The purpose of the Proposed Action is to sustain surveillance, enhance U.S. Border Patrol (USBP) operations, and support capabilities along the traditional northern road by providing a year-round/weather-resistant road crossing through Vamori Wash.

The SEA will analyze the potential for significant adverse impacts or beneficial effects of the Proposed Action on the environment and includes the following activities:

- Construct a high-water crossing with overflow (approximately 180 feet long)
- Install box culverts in the east channel of the Vamori Wash
- Install culverts and perform drainage improvements
- Install and replace riprap on upstream and downstream sides of fills
- Relocate the existing vehicle/border fence south of its current location but still within the Roosevelt Easement
- Reroute the existing road and build up road elevations
- Install a temporary low-water crossing during construction activities
- Perform post-construction maintenance and repair of the crossing
- Obtain a Right of Way (ROW) from the Bureau of Indian Affairs and the Tohono O'odham Nation

Mr. Chuck Huckelberry
Page 2

CBP is not aware of any utility transmission lines, water lines, or fiber-optic cables that run parallel to or transect this segment of the Traditional Northern Road. Should CBP discover such lines or cables during the course of construction, these lines would be rerouted underground within the project areas footprint.

CBP is gathering data and input from Federal, tribal, state, and local governmental agencies, departments, and bureaus that may be affected by, or otherwise have an interest in, this proposed action. Since your agency or organization may have particular knowledge and expertise regarding potential environmental impacts from CBP's Proposed Action, your input is sought regarding the likely or anticipated environmental effects of this Proposed Action. Your response should include any state and local restrictions, permitting or other requirements with which CBP would have to comply during project siting, construction, and operation.

Per DHS Instruction 023-01-001-01, Rev. 01, Implementation of the NEPA, we will provide your agency with a copy of the Draft SEA for the OA Vamori Wash High-water crossing. Please let us know if additional copies are needed.

Your prompt attention to this request would be greatly appreciated. If you have any questions, please contact Ms. Elizabeth Kimmerly by telephone at (571) 468-7473 or email at elizabeth.a.kimmerly@cbp.dhs.gov.

Sincerely,

Paul C. Schmidt
Environmental Planning & Real Estate Section
Office of Acquisition
U.S. Customs and Border Protection

Attachment 1 - Figures

PIMA COUNTY
FLOOD CONTROL

MEMORANDUM

DATE: March 16, 2017

TO: Carmine DeBonis
Deputy County Administrator – Public Works

FROM: Suzanne Shields, P.E.
Director

SUBJECT: **Department of Homeland Security's Proposed Vamori Wash High Water Crossing on the Tohono O'odham Nation**

The Department of Homeland Security's (DHS) Environmental Planning and Real Estate Section wrote to Pima County about a proposal to construct a crossing at Vamori Wash on the Tohono O'Odham Nation. The letter requested data and input from Pima County on the proposal's potential impact to the environment, which would be used to develop the Supplemental Environmental Assessment (SEA).

Mr. Huckelberry inquired about whether the improvement would be a good investment to improve border access, or would the funds be better spent on improving access on Ruby Road, which is a Pima County road frequented by the DHS Border Patrol.

Regional Flood Control District staff have reviewed the watershed, preliminary crossing design and channel and floodplain conditions. The following information is being provided to respond to the DHS's proposal for Vamori Wash, and to provide alternatives for more viable access enhancement for DHS's Border Patrol in Pima County.

Using the U. S. Geological Survey regional equations, the 100-year discharge for Vamori Wash is estimated to be between 24,000 cubic feet per second (cfs) and 19,000 cfs. Vamori Wash channel is braided and immediately upstream are a number of large meanders (see photograph). Currently, there are three channels crossing the border, which make up Vamori Wash with the center channel being the primary flow path. Over time, the channel location for Vamori Wash will change, either due to an upstream meander, a switch in flow to one of the other channels, or a combination of both.

The proposed plans for the Vamori Wash improvements are conceptual and difficult to read. There are notes on the plans indicating information (not provided), such as *design flow, and may be found on other plan sheets*. The plan is to utilize box culverts that are 6 feet wide by 3 feet high on the side channels with a total of 23 culverts that are 6 feet wide by 4 feet high on the main channel. Given the remote location, it appears the design utilizes pre-cast box culverts, which can be transported to the site. While allowing for easier transport and construction, the size of the culverts on such a major stream would be ineffective due to sedimentation and clogging from debris. The clogging of the culverts would result in overtopping and a washout of the roadway and/or a change in the flow path for Vamori Wash. A more suitable and cost effective crossing would be a dip crossing that is stabilized using of soil cement that would allow for easier cleanup post flow event.

Vamori Wash is just one of many large rivers that cross the international border, so improving access at this location would not ensure all-weather access for the Border Patrol. The focus on this location may be due to the heavy rains resulting from remnants of Hurricane Norbert on September 8, 2014.

Such occurrences of heavy rainfall from moisture from hurricanes and tropical storms are common in Pima County in September and October.

In Pima County, there are many rural roadways used almost exclusively by the Border Patrol including Ruby Road. Vehicle count on Ruby Road south of Arivaca are between 113 to 135 vehicles per day of which many are Border Patrol vehicles. Border Patrol representative indicated last summer (*With no Ruby Road Solution on the Horizon, Costs to County Keep Rising*, Arizona Daily Star, February 19, 2017) that the condition of Ruby Road has "negatively impacted Tucson Sector Border Patrol's fleet by increasing maintenance and repair costs." Despite the low vehicle usage, Pima County spent $61,000 last fiscal year on fixing potholes at a cost of $11,400 per mile. Pima County's estimates to redo Ruby Road is $965,000 for new asphalt or $550,000 for a double chip-seal.

Please let me know if you have any questions.

SS/tj

Attachment

c: C. H. Huckelberry, County Administrator
Chris Cawein, Director – Natural Resources, Parks and Recreation
Eric Shepp, P.E., Deputy Director – Regional Flood Control District
Bill Zimmerman, Deputy Director – Regional Flood Control District
Andy Dinauer, P.E., Division Manager – Regional Flood Control District

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and Border Protection

March 14, 2019

Mr. C. H. Huckelberry
County Administrator
Pima County
130 W. Congress, Floor 10
Tucson, AZ 85701-1317

Dear Mr. Huckelberry:

RE: Proposed Vamori Wash High Water Crossing Supplemental Environmental Assessment
Tohono O' odham Nation
U.S. Customs & Border Protection

This letter responds to your letter dated March 21, 2017 and the March 16, 2017 memo from Suzanne Shields to Carmine DeBonis regarding the proposed Vamori Wash High Water Crossing located near San Miguel, in Pima County, Arizona. I have included this correspondence for easy reference,

U.S. Customs and Border Protection (CBP) agrees with the analysis prepared by Pima County that the proposed high water crossing will be overtopped during flood flows within the wash, and that the culverts will be blocked with sediment and debris during high water events. Due to the overtopping of the crossing during these flood flows, the crossing will be closed, and therefore, CBP does not anticipate that CBP agents or others will be exposed to dangerous conditions during flood flows. However, CBP disagrees that flood events would wash out the high water crossing.

CBP does not believe that a dip crossing stabilized with soil cement is a suitable alternative for the Vamori Wash crossing. Currently, the road across the wash is closed for a period of several weeks after each high flow event due to saturated soils within the crossing. The inability to cross Vamori Wash during this time has an adverse impact on the CBP border security mission in this area. CBP does not believe a dip crossing stabilized with soil cement is likely to address the lengthy down time on use of this crossing. By contrast, CBP believes that the current design would enable crossing of the Vamori Wash within days after a high water event.

As requested, a copy of the high water crossing design plans including the hydrologic and hydraulic calculations will be sent to you electronically.

If you would please provide a staff contact to send the link to the electronic design files that would be appreciated.

Mr. C. H. Huckelberry
Vamori Wash High Water Crossing
Page 2

If Pima County has further questions regarding the proposed design after the review of this material, do not hesitate to contact me. My contact information is: email - paul.c.schmidt@cbp.dhs.gov and phone 571-468-7292 (office) or 202-329-3112 (mobile).

Sincerely,

PAUL C SCHMIDT

Digitally signed by PAUL C SCHMIDT
DN: c=US, o=U.S. Government, ou=Department of Homeland Security, ou=CBP, ou=People, cn=PAUL C SCHMIDT, 0.9.2342.19200300.100.1.1=0509797147.CBP.1
Date: 2019.03.14 07:16:30 -04'00'

Paul C. Schmidt, Manager
Environmental Planning & Real Estate Section
Systems Engineering Directorate
Office of Acquisition

Attachments

CC: IFT Program Office
Tucson Sector
Facilities & Management Engineering
U.S. Army Corps of Engineers

COUNTY ADMINISTRATOR'S OFFICE
PIMA COUNTY GOVERNMENTAL CENTER
130 W. CONGRESS, FLOOR 10, TUCSON, AZ 85701-1317
(520) 724-8661 FAX (520) 724-8171

C.H. HUCKELBERRY
County Administrator

March 18, 2019

Paul C. Schmidt, Manager
Environmental Planning and Real Estate Section
Systems Engineering Directorate
Office of Acquisition
Department of Homeland Security
Washington, DC 20229

Re: **Your March 14, 2019 Letter Regarding the Proposed Vamori Wash High Water Crossing Supplemental Assessment**

Dear Mr. Schmidt:

Thank you for your March 14, 2019 letter.

Please provide a copy of the high water crossing design plans, including the hydrologic and hydraulic calculations to Pima County's Regional Flood Control Director Suzanne Shields at Suzanne.Shields@pima.gov and/ or 201 N. Stone Avenue, 9th Floor Tucson, Arizona 85701.

We also ask for your engineer's cost estimate for constructing the high water crossing as now designed.

Sincerely,

C.H. Huckelberry
County Administrator

CHH/anc

Enclosure

c: Carmine DeBonis, Jr., Deputy County Administrator for Public Works
Suzanne Shields, Director, Regional Flood Control District

COUNTY ADMINISTRATOR'S OFFICE
PIMA COUNTY GOVERNMENTAL CENTER
130 W. CONGRESS, FLOOR 10, TUCSON, AZ 85701-1317
(520) 724-8661 FAX (520) 724-8171

C.H. HUCKELBERRY
County Administrator

March 21, 2017

Mr. Paul Schmidt
Environmental Planning and Real Estate Section
Office of Acquisition – US Customs and Border Protection
US Department of Homeland Security
Washington, DC 20229

Re: **Your February 1, 2017 Letter Regarding Proposed Supplemental Environmental Assessment for the Office of Acquisition's Vamori Wash High-water Crossing on the Tohono O'odham Nation**

Dear Mr. Schmidt:

I appreciate your February 1, 2017 notification regarding development of an appropriate high-water crossing at Vamori Wash on the Tohono O'odham Nation.

Pima County's Regional Flood Control District has reviewed this proposal, and their comments are contained in the attached March 16, 2017 memorandum. It is our belief the proposed improvements will be ineffective because of the small discharge area of each prefabricated, precast box culvert. The 100-year discharge for Vamori Wash is estimated at between 24,000 cubic feet per second (cfs) and 19,000 cfs, which will substantially overwhelm the proposed 23 culverts. Our experience indicates they would be clogged with debris and sediment, creating backwater flooding on the Republic of Mexico. Because of the clogging, the culverts would also be subject to overtopping which would wash out the roadway, creating a potential dangerous condition for personnel who would be near the roadway crossing. In addition, should the culverts become clogged and out flanked by flood flows – either to the east or to the west – additional damage and flooding would occur on the Tohono O'odham Nation.

We strongly suggest the present proposal be abandoned and that a more suitable crossing be constructed using a dip crossing stabilized with soil cement.

Mr. Paul Schmidt
Re: **Your February 1, 2017 Letter Regarding Proposed Supplemental Environmental Assessment for the Office of Acquisition's Vamori Wash High-water Crossing on the Tohono O'odham Nation**
March 21, 2017
Page 2

In addition, it is appropriate to bring to your attention the adverse and costly impact of US Customs and Border Protection operations on Pima County public roads. Ruby Road, in the vicinity of Arivaca, is only one example. The details of these impacts are identified on the last paragraph on Page 2 of the attached March 16, 2017 memorandum.

We appreciate the opportunity to comment on this proposal and suggest other alternatives be pursued.

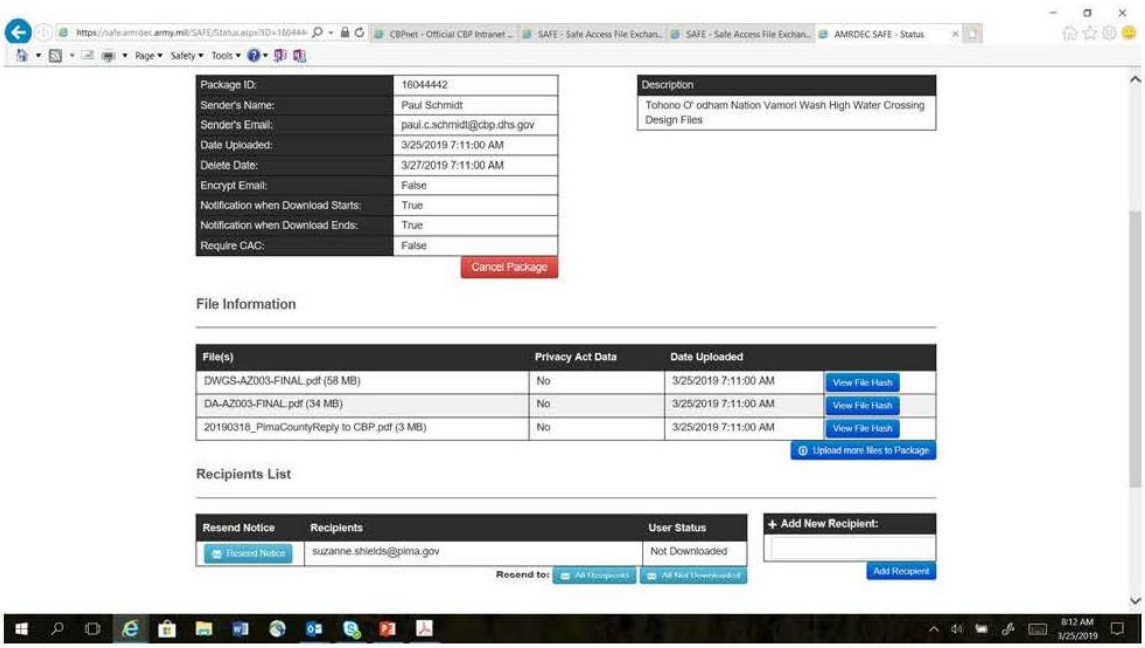
Sincerely,

C.H. Huckelberry
County Administrator

CHH/anc

Attachment

c: The Honorable John McCain, United States Senator for Arizona
The Honorable Jeff Flake, United States Senator for Arizona
The Honorable Martha McSally, Arizona District 2 Representative, United States House of Representatives
The Honorable Edward D. Manuel, Chairman, Tohono O'odham Nation
The Honorable Sharon Bronson, Chair, Pima County Board of Supervisors



Package ID:	16044442
Sender's Name:	Paul Schmidt
Sender's Email:	paul.c.schmidt@cbp.dhs.gov
Date Uploaded:	3/25/2019 7:11:00 AM
Delete Date:	3/27/2019 7:11:00 AM
Encrypt Email:	False
Notification when Download Starts:	True
Notification when Download Ends:	True
Require CAC:	False

Cancel Package

Description
Tohono O' odham Nation Vamori Wash High Water Crossing Design Files

File Information

File(s)	Privacy Act Data	Date Uploaded	
DWGS-AZ003-FINAL.pdf (58 MB)	No	3/25/2019 7:11:00 AM	View File Hash
DA-AZ003-FINAL.pdf (34 MB)	No	3/25/2019 7:11:00 AM	View File Hash
20190318_PimaCountyReply to CBP.pdf (3 MB)	No	3/25/2019 7:11:00 AM	View File Hash

Upload more files to Package

Recipients List

Resend Notice	Recipients	User Status
Resend Notice	suzanne.shields@pima.gov	Not Downloaded

Resend to: All Recipients All Not Downloaded

+ Add New Recipient:

Add Recipient

Appendix B – Tribal Coordination and Section 106

1300 Pennsylvania Avenue NW
Washington, DC 20229

U.S. Customs and Border Protection

February 21, 2020

Mr. Peter Steere
Tribal Historic Preservation Officer
Tohono O'odham Nation
Main Street, Building #49
Sells, AZ 85634

SUBJECT: Notification of CBP Proposed Undertaking for the Proposed Vamori Wash High-Water Crossing on the Tohono O'odham Nation

Dear Mr. Steere,

The United States (U.S.) Customs and Border Protection (CBP), U.S. Border Patrol (USBP) Program Management Office Directorate, is initiating consultation with the Tohono O'odham Nation in accordance with 36 CFR Part 800.10(c) regarding its proposed construction of the Vamori Wash high-water crossing on the Tohono O'odham Nation.

CBP is proposing to construct and maintain a High Water Crossing at the Vamori Wash in Pima County, Arizona in the lands of the Tohono O'odham Nation. The purpose of the Proposed Action is to sustain surveillance, enhance USBP operations, and support capabilities along the Traditional Northern Road by providing an all-weather road crossing through Vamori Wash. The Proposed Action is needed for the following reasons:

- To maintain access to proposed Integrated Fixed Tower (IFT) sites and their approach and access roads;
- To perform maintenance and repair of the existing vehicle barrier fence along the U.S.-Mexico border;
- To improve law enforcement operations along the Traditional Northern Road and at San Miguel Gate;
- To improve the safety of USBP agents and the public who traverse the Traditional Northern Road; and
- To facilitate access of Tribal members along the Traditional Northern Road.

The Proposed Action would construct:

- a one-lane high-water crossing (approximately 182 feet long and 13 feet wide) with box culverts through the main channel of Vamori Wash; a one-lane high-

water crossing (approximately 47 feet long and 13 feet wide) with box culverts through the east channel of Vamori Wash;

- improvement of the existing east side and west side approach roads to two-lane unpaved approach roads (16 feet wide with 2-foot shoulders); installation of culverts installation of a concrete swale in west channel of Vamori Wash;
- installation of box culverts in southwest channel of Vamori Wash;
- and installation and replacement of riprap on upstream and downstream sides of fills.

The Proposed Action would require obtaining a right-of-way from the Bureau of Indian Affairs and the Tohono O'odham Nation. The proposed area of potential effects (APE) has been previously surveyed, and only one archaeological site, AZ DD:5:28 (ASM), partially overlaps the northwestern portion of the project area.

As part of CBP's due diligence, a Gulf South Research Corporation archaeologist visited the project area on February 21, 2017 to assess the current condition of the site. No cultural resources were identified within or adjacent to the APE and no artifacts or features were observed within the portion of the site within the APE. It is possible, though unlikely, that subsurface materials could be present. CBP proposes to avoid the site through staking, flagging, and archaeological/tribal monitoring. All construction activities and personnel would be restricted from the site. The current condition of the site and recommendations are detailed in the attached Cultural Resources Site Visit Survey Report.

Please do not hesitate to contact Paul Schmidt at paul.c.schmidt@cbp.dhs.gov or 571-468-7292 if you have any questions.

Sincerely,

Paul Enriquez
Program Management Office Directorate
United States Border Patrol

Enclosure: Cultural Resources Site Visit Survey dated April 2017

cc: Rafael Castillo, U.S. Border Patrol

From: CASTILLO, RAFAEL M
To: Peter Steere; SCHMIDT, PAUL
Cc: SALAS, AARON; edelahanty@chukut-kuk.org; Kendall Jose; Ned Norris Jr.; Wavalene Saunders; Jesse Navarro; Bennett Chewing; Richard Saunders; Eric D. Verwys; Fred Stevens Jr.; Jefford Francisco; Samuel Fayuant; CHAVEZ, SAMUEL O
Subject: RE: Vamori Wash High Water Crossing
Date: Monday, March 9, 2020 8:46:23 AM

Good Morning Peter,

Thank you for your response. This was discussed from the beginning of the project as it was initially set as part of the IFT Project. Due to the finding of the Yellow Billed Cuckoo we had to do additional studies and bird surveys in the area. (All surveys and studies completed) It was decided at that time with the Nation that we would pull that part of the initial first part of the project and Mr. Schmidt would work on doing a supplemental EA to the original EA submitted for the project. The District and the Domestic Affairs Committee are aware of the project and have been supportive of the high water crossing over the Vamori as it is a huge benefit for everyone. Also there is no endangered SW Willow Fly Catcher in this project area. This is the initial phase of the resubmittal notice that we would be working on the supplemental EA for the Vamori High Water Crossing. Everything will move in the same fashion as you have outlined. Thank you for your time and consideration on this project.

Thanks,
Rafael M. Castillo
Tucson Sector Tribal Liaison
Office: 520-519-2640
Cell: 520-403-6235
RAFAEL.M.CASTILLO@cbp.dhs.gov

From: Peter Steere <Peter.Steere@tonation-nsn.gov>
Sent: Friday, March 6, 2020 11:30 AM
To: SCHMIDT, PAUL <paul.c.schmidt@cbp.dhs.gov>
Cc: CASTILLO, RAFAEL M <RAFAEL.M.CASTILLO@cbp.dhs.gov>; SALAS, AARON <AARON.SALAS@cbp.dhs.gov>; edelahanty@chukut-kuk.org; Kendall Jose <kjose@chukut-kuk.org>; Ned Norris Jr. <Ned.NorrisJr@tonation-nsn.gov>; Wavalene Saunders <Wavalene.Saunders@tonation-nsn.gov>; Jesse Navarro <Jesse.Navarro@tonation-nsn.gov>; Bennett Chewing <Bennett.Chewing@tonation-nsn.gov>; Richard Saunders

<Richard.Saunders@tonation-nsn.gov>; Eric D. Verwys <Eric.Verwys@tonation-nsn.gov>; Fred Stevens Jr. <Fred.StevensJr@tonation-nsn.gov>; Jefford Francisco <Jefford.Francisco@tonation-nsn.gov>; Samuel Fayuant <Samuel.Fayuant@tonation-nsn.gov>
Subject: Vamori Wash High Water Crossing

March 6, 2010

Paul Schmidt, Rafael Castillo and Aaron Salas, DHS/USBP

I assume that this proposal for a high water crossing / all weather road at Vamori Wash has been presented to the Chairman, the Legislative Council and the Chukut Kuk District for review and approval.

I know there have been many various plans in the past for some type of structure across Vamori Wash from a bridge to a high water crossing.

I concur that archaeological sites AZ DD:5:29 (ASM) and AZ DD:5:28 (ASM) which are located near the proposed project area is far enough away that they should not be impacted by the proposed high water crossing and can be avoided

I also concur that both of these sites should staked and flagged prior to the start of construction for the high water crossing on Vamori Wash.

All construction activity would be outside the flagged and staked site area

A tribal monitor should be on site during construction

Has a biological survey been done for the endangered SW Willow Fly Catcher that I believe was recorded in this area some years ago

Peter L. Steere, THPO, Tohono O'odham Nation

From: BARNES, MICHELLE L
Sent: Tuesday, December 8, 2020 2:33 PM
To: 'Ned.NorrisJr@tonation-nsn.gov' <Ned.NorrisJr@tonation-nsn.gov>
Cc: 'Wavalene.Saunders@tonation-nsn.gov' <Wavalene.Saunders@tonation-nsn.gov>; 'Jesse.Navarro@tonation-nsn.gov' <Jesse.Navarro@tonation-nsn.gov>; 'Peter.Steere@tonation-nsn.gov' <Peter.Steere@tonation-nsn.gov>; 'Fred.StevensJr@tonation-nsn.gov' <Fred.StevensJr@tonation-nsn.gov>; 'timothy.joaquin@tonation-nsn.gov' <timothy.joaquin@tonation-nsn.gov>; 'Quintin.Lopez@tonation-nsn.gov' <Quintin.Lopez@tonation-nsn.gov>; 'grace.manuel@tonation-nsn.gov' <grace.manuel@tonation-nsn.gov>; 'Vivian.Saunders@tonation-nsn.gov' <Vivian.Saunders@tonation-nsn.gov>; 'Gloria.ramirez@tonation-nsn.gov' <Gloria.ramirez@tonation-nsn.gov>; 'leander.mase@tonation-nsn.gov' <leander.mase@tonation-nsn.gov>; 'lucinda.allen@tonation-nsn.gov' <lucinda.allen@tonation-nsn.gov>; 'RAFAEL.Castillo@dhs.gov' <RAFAEL.Castillo@dhs.gov>; CHAVEZ, SAMUEL O <SAMUEL.O.CHAVEZ@cbp.dhs.gov>; ENRIQUEZ, PAUL <paul.enriquez@cbp.dhs.gov>
Subject: FOR REVIEW: Draft Supplemental Environmental Assessment for Integrated Fixed Towers - High Water Crossing at Vamori Wash in Pima County
Importance: High

Dear Chairman Norris,

I hope this message finds you healthy and safe. Attached for review is a draft Supplemental Environmental Assessment (SEA). U.S. Customs and Border Protection (CBP) is proposing to construct and maintain a high water crossing at the Vamori Wash in Pima County, Arizona in the lands of the Tohono O'odham Nation. This SEA evaluates a no action alternative as well as two action alternatives and supplements the Final Environmental Assessment for Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' areas of responsibility, U.S. Border Patrol Tucson Sector, Arizona, and Finding of No Significant Impact approved March 28, 2017 (CBP 2017).

Attached for your convenience is a comment response matrix to capture any edits or comments you might have. Please be advised that Chairwoman Elaine Delahanty and Vice-Chairman Kendall Jose will also receive the SEA for review and comment. CBP respectfully requests that you provide comments by Wednesday, January 6, 2021 or within 30 calendar days. CBP will incorporate applicable comments and feedback and will distribute the draft SEA for an additional 30 day public comment period. You will be notified when CBP distributes the SEA for public comment.

Thank you for your continued partnership on this project and other border security projects.

Shelly Barnes
Environmental Planning Lead
Infrastructure Program
Program Management Office Directorate
United States Border Patrol

Appendix C – Section 7 Endangered Species Act Consultation

Appendix D – Public Involvement

Notice of Availability, Newspaper Proof, etc.

Appendix E – Arizona State-Listed Species

Pima	FISH	Gila intermedia	Gila Chub	AFCJB13160	LE			P	1A		S2	G2
Pima	FISH	Agosia chrysogaster chrysogaster	Gila Longfin Dace	AFCJB37151	SC	S			A	1B		S3S4	G4T3T4
Pima	FISH	Catostomus clarkii	Desert Sucker	AFCJC02040	SC	S	S			1B		S3S4	G3G4
Pima	FISH	Cyprinodon macularius	Desert Pupfish	AFCNB02060	LE				P	1A		S1	G1
Pima	FISH	Cyprinodon eremus	Quitobaquito Pupfish	AFCNB02140	LE					1A		S1	G1
Pima	FISH	Poeciliopsis occidentalis occidentalis	Gila Topminnow	AFCNC05021	LE				A	1A		S1S2	G3
Pima	MAMMAL	Sorex arizonae	Arizona Shrew	AMABA01240	SC		S		P	1B		S2	G3
Pima	MAMMAL	Notiosorex cockrumi	Cockrum's Desert Shrew	AMABA05020						1B		S1	GNR
Pima	MAMMAL	Macrotus californicus	California Leaf-nosed Bat	AMACB01010	SC	S				1B		S3	G4
Pima	MAMMAL	Choeronycteris mexicana	Mexican Long-tongued Bat	AMACB02010	SC	S	S		A	1C		S3	G4
Pima	MAMMAL	Leptonycteris curasoae yerbabuenae	Lesser Long-nosed Bat	AMACB03030	LE				A	1A		S2S3	G4
Pima	MAMMAL	Myotis velifer	Cave Myotis	AMACC01050	SC	S				1B		S3S4	G5
Pima	MAMMAL	Myotis thysanodes	Fringed Myotis	AMACC01090	SC							S3S4	G4
Pima	MAMMAL	Myotis occultus	Arizona Myotis	AMACC01160	SC	S				1B		S3	G4
Pima	MAMMAL	Lasiurus blossevillii	Western Red Bat	AMACC05060			S			1B		S3	G5
Pima	MAMMAL	Lasiurus xanthinus	Western Yellow Bat	AMACC05070			S			1B		S2S3	G5
Pima	MAMMAL	Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	AMACC08014	SC	S	S	4		1B		S3S4	G3G4T3T4
Pima	MAMMAL	Tadarida brasiliensis	Brazilian Free-tailed Bat	AMACD01010						1B		S3S4	G5
Pima	MAMMAL	Eumops perotis californicus	Greater Western Bonneted Bat	AMACD02011	SC	S				1B		S3	G5T4
Pima	MAMMAL	Eumops underwoodi	Underwood's Bonneted Bat	AMACD02020	SC					1B		S1	G4
Pima	MAMMAL	Nyctinomops femorosaccus	Pocketed Free-tailed Bat	AMACD04010						1B		S3	G4
Pima	MAMMAL	Nyctinomops macrotis	Big Free-tailed Bat	AMACD04020	SC							S3	G5
Pima	MAMMAL	Lepus alleni	Antelope Jackrabbit	AMAEB03070						1B		S3	G5
Pima	MAMMAL	Cynomys ludovicianus	Black-tailed Prairie Dog	AMAFB06010	CCA	S			A	1A		SX51	G4
Pima	MAMMAL	Sciurus arizonensis	Arizona Gray Squirrel	AMAFB07060					A	1B		S4	G4
Pima	MAMMAL	Peromyscus merriami	Merriam's Deermouse	AMAFF03020			S					S2	G5
Pima	MAMMAL	Baiomys taylori	Northern Pygmy Mouse	AMAFF05010			S					S3	G4G5
Pima	MAMMAL	Sigmodon ochrognathus	Yellow-nosed Cotton Rat	AMAFF07040	SC					1C		S4	G4G5
Pima	MAMMAL	Panthera onca	Jaguar	AMAJH02010	LE				P	1A		S1	G3
Pima	MAMMAL	Leopardus pardalis	Ocelot	AMAJH05010	LE				P	1A		S1	G4
Pima	MAMMAL	Antilocapra americana sonoriensis	Sonoran Pronghorn	AMALD01012	LE				P	1A		S1	G5T1
Pima	REPTILE	Terrapene ornata luteola	Desert Box Turtle	ARAAD08021		S			PR	1A		S2S3	G5T4
Pima	REPTILE	Kinosternon sonoriense longifemorale	Sonoyta Mud Turtle	ARAAE01041	C*				P	1A		S1	G4T1
Pima	REPTILE	Kinosternon arizonense	Arizona Mud Turtle	ARAAE01060						1B		S2	G4

Pima	REPTILE	Gopherus morafkai	Sonoran Desert Tortoise	ARAAF01013	CCA		S		A	1A		S4	G4
Pima	REPTILE	Heloderma suspectum suspectum	Reticulate Gila Monster	ARACE01012					A	1A		S4	G4T4
Pima	REPTILE	Crotaphytus nebrius	Sonoran Collared Lizard	ARACF04050						1B		S3S4	G4
Pima	REPTILE	Phrynosoma cornutum	Texas Horned Lizard	ARACF12010	SC							S3S4	G4G5
Pima	REPTILE	Sceloporus slevini	Slevin's Bunchgrass Lizard	ARACF14180		S	S			1B		S2	G4
Pima	REPTILE	Uma rufopunctata	Yuman Desert Fringe-toed Lizard	ARACF15040	SC	S			P	1B		S2	G3
Pima	REPTILE	Plestiodon callicephalus	Mountain Skink	ARACH01030			S					S2	G4G5
Pima	REPTILE	Aspidoscelis stictogramma	Giant Spotted Whiptail	ARACJ02011	SC		S			1B		S2	G4
Pima	REPTILE	Aspidoscelis xanthonota	Red-backed Whiptail	ARACJ02012	SC		S			1B		S2	G2
Pima	REPTILE	Aspidoscelis arizonae	Arizona Striped Whiptail	ARACJ02071		S				1B		S1S2	G2
Pima	REPTILE	Lichanura trivirgata	Rosy Boa	ARADA01020	SC				A	1B		S1S2	G4G5
Pima	REPTILE	Chionactis occipitalis klauberi	Tucson Shovel-nosed Snake	ARADB05012	SC					1A		S3	G5T3Q
Pima	REPTILE	Chionactis palarostris organica	Organ Pipe Shovel-nosed Snake	ARADB05021						1B		S1	G3G4T2
Pima	REPTILE	Hypsiglena sp. nov.	Hooded Nightsnake	ARADB18050						1B		S4	G4
Pima	REPTILE	Coluber bilineatus	Sonoran Whipsnake	ARADB21010						1B		S5	G5
Pima	REPTILE	Oxybelis aeneus	Brown Vinesnake	ARADB24010			S			1B		S1	G5
Pima	REPTILE	Phyllorhynchus browni	Saddled Leaf-nosed Snake	ARADB25010					PR	1B		S5	G5
Pima	REPTILE	Thamnophis eques megalops	Northern Mexican Gartersnake	ARADB36061	LT		S		A	1A		S1	G4T3
Pima	REPTILE	Senticolis triaspis intermedia	Northern Green Ratsnake	ARADB44011			S			1B		S3	G5T4
Pima	REPTILE	Crotalus lepidus klauberi	Banded Rock Rattlesnake	ARADE02051					PR	1A		S3	G5T5
Pima	REPTILE	Crotalus pricei	Twin-spotted Rattlesnake	ARADE02080			S		PR	1A		S2	G5
Pima	INVERTEBRATE	Argia sabino	Sabino Canyon Dancer	IIODO68100	SC		S					S2	G2
Pima	INVERTEBRATE	Sonorella eremita	San Xavier Talussnail	IMGASC9240	CCA					1A		S1	G1
Pima	INVERTEBRATE	Sonorella magdalenensis	Sonoran Talussnail	IMGASC9370			S			1C		S2	G2G3
Pima	INVERTEBRATE	Sonorella papagorum	Black Mountain Talussnail	IMGASC9480						1B		S1	G1
Pima	INVERTEBRATE	Tryonia quitobaquitae	Quitobaquito Tryonia	IMGASJ7130	SC					1A		S1	G1
Pima	PLANT	Lilaeopsis schaffneriana ssp. recurva	Huachuca Water-umbel	PDAPI19051	LE						HS	S2	G4T2
Pima	PLANT	Amsonia grandiflora	Large-flowered Blue Star	PDAPO03060	SC		S					S2	G2
Pima	PLANT	Amsonia kearneyana	Kearney's Blue-star	PDAPO030M0	LE						HS	S1	G1
Pima	PLANT	Asclepias lemmonii	Lemmon Milkweed	PDASC020Z0			S					S2	G4?
Pima	PLANT	Metastelma mexicanum	Wiggins Milkweed Vine	PDASC050P0	SC		S					S1S2	G3G4
Pima	PLANT	Erigeron piscaticus	Fish Creek Fleabane	PDAST3M4X0	SC	S	S				SR	S1	G1
Pima	PLANT	Erigeron arisolius	Arid Throne Fleabane	PDAST3M510			S					S2	G2
Pima	PLANT	Heterotheca rutteri	Huachuca Golden Aster	PDAST4V0J0	SC	S	S					S2	G2

Pima	PLANT	Hieracium pringlei	Pringle Hawkweed	PDAST4W170	SC							S1	G2Q
Pima	PLANT	Pectis imberbis	Beardless Chinch Weed	PDAST6W0A0	SC		S					S1	G3
Pima	PLANT	Perityle ajoensis	Ajo Rock Daisy	PDAST700Y0							SR	S1	G1
Pima	PLANT	Packera neomexicana var. toumeyi	Toumey Groundsel	PDAST8H274			S					S2	G5T2Q
Pima	PLANT	Stevia lemmonii	Lemmon's Stevia	PDAST8V010			S					S2	G3G4
Pima	PLANT	Berberis harrisoniana	Kofa Mt Barberry	PDBER02030		S						S1	G1G2
Pima	PLANT	Amoreuxia gonzalezii	Saiya	PDBIX01010	SC		S				HS	S1	G1
Pima	PLANT	Pennellia tricornuta	Chiricahua Rock Cress	PDBRA06200			S					S1S2	G1
Pima	PLANT	Coryphantha scheeri var. robustispina	Pima Pineapple Cactus	PDCAC040C1	LE						HS	S2	G4T2
Pima	PLANT	Echinocactus horizonthalonius var. nicholii	Nichol Turk's Head Cactus	PDCAC05022	LE						HS	S2	G4T2
Pima	PLANT	Echinocereus fasciculatus	Magenta-flower Hedgehog-cactus	PDCAC06065							SR	S3	G4G5T4T5
Pima	PLANT	Echinocereus nicholii	Nichol's Hedgehog Cactus	PDCAC060L0							SR	S2	G4?Q
Pima	PLANT	Ferocactus cylindraceus	Desert Barrel Cactus	PDCAC08080					PR		SR	S4	G5
Pima	PLANT	Ferocactus emoryi	Emory's Barrel-cactus	PDCAC08090							SR	S1S2	G4
Pima	PLANT	Mammillaria heyderi var. bullingtoniana	Cream Cactus	PDCAC0A035							SR	S1S2	G4?T2T4
Pima	PLANT	Mammillaria mainiae	Counter Clockwise Fishhook Cactus	PDCAC0A060							SR	S1	G3
Pima	PLANT	Mammillaria thornberi	Thornber Fishhook Cactus	PDCAC0A0C0							SR	S4	G4
Pima	PLANT	Mammillaria viridiflora	Varied Fishhook Cactus	PDCAC0A0D0							SR	S4	G4
Pima	PLANT	Opuntia versicolor	Stag-horn Cholla	PDCAC0D1K0							SR	S2S3	G4
Pima	PLANT	Opuntia engelmannii var. flavispina		PDCAC0D224							SR	S3?	G5T3?
Pima	PLANT	Cylindropuntia x kelvinensis	Kelvin Cholla	PDCAC0D2M0							SR	SHYB	GNA
Pima	PLANT	Echinomastus erectocentrus var. acunensis	Acuna Cactus	PDCAC0J0E1	LE				P		HS	S1	G3T1T2Q
Pima	PLANT	Echinomastus erectocentrus var. erectocentru	Needle-spined Pineapple Cactus	PDCAC0J0E2	SC						SR	S3	G3T3Q
Pima	PLANT	Echinomastus intertextus	White Fishhook Cactus	PDCAC0J0G0							SR	S2	G4G5
Pima	PLANT	Peniocereus greggii var. transmontanus	Desert Night-blooming Cereus	PDCAC0V012					PR		SR	S3S4	G3G4T3T4
Pima	PLANT	Peniocereus striatus	Dahlia Rooted Cereus	PDCAC0V020							SR	S1	G4
Pima	PLANT	Stenocereus thurberi	Organ Pipe Cactus	PDCAC10020							SR	S4	G5
Pima	PLANT	Lophocereus schottii	Senita	PDCAC14010							SR	S1S2	G4
Pima	PLANT	Lobelia fenestralis	Leafy Lobelia	PDCAM0E0H0							SR	S1	G4
Pima	PLANT	Graptopetalum bartramii	Bartram Stonecrop	PDCRA06010	SC	S	S				SR	S3	G3
Pima	PLANT	Tumamoca macdougalii	Tumamoc Globeberry	PDCUC0S010		S	S				SR	S3	G4
Pima	PLANT	Manihot davisiae	Arizona Manihot	PDEUP0Z010			S					S2	G4
Pima	PLANT	Tragia laciniata	Sonoran Noseburn	PDEUP1D060			S					S3?	G3G4
Pima	PLANT	Dalea tentaculoides	Gentry's Indigo Bush	PDFAB1A1K0	SC	S	S				HS	S1	G1

Pima	PLANT	Lupinus huachucanus	Huachuca Mountain Lupine	PDFAB2B210		S					S2	G2
Pima	PLANT	Lupinus lemmonii	Lemmon's Lupine	PDFAB2B2A0		S					S1Q	G1Q
Pima	PLANT	Lysiloma watsonii	Littleleaf False Tamarind	PDFAB2C040						SR	S1	G4?
Pima	PLANT	Abutilon parishii	Pima Indian Mallow	PDMAL020E0	SC	S	S			SR	S3	G2
Pima	PLANT	Pseudabutilon thurberi	Thurber Indian Mallow	PDMAL020P0						SR	SH	G2?
Pima	PLANT	Passiflora arizonica	Arizona Passionflower	PDPAS01073		S					S2	G5T3T5
Pima	PLANT	Eriogonum capillare	San Carlos Wild-buckwheat	PDPGN08100	SC					SR	S4	G4
Pima	PLANT	Eriogonum terrenatum	San Pedro River Wild Buckwheat	PDPGN08760		S					S1S2	G1
Pima	PLANT	Samolus vagans	Chiricahua Mountain Brookweed	PDPRI09040			S				S2	GUQ
Pima	PLANT	Potentilla albiflora	White-flowered Cinquefoil	PDROS1B010			S				S1S2	G1G2
Pima	PLANT	Vauquelinia californica ssp. sonorensis	Arizona Sonoran Rosewood	PDROS1R024		S					S1S2	G4T1
Pima	PLANT	Penstemon discolor	Catalina Beardtongue	PDSCR1L210			S			HS	S2	G2
Pima	PLANT	Capsicum annuum var. glabriusculum	Chiltepin	PDSOL06012			S				S2	G5T5
Pima	PLANT	Physalis latiphysa	Broadleaf Groundcherry	PDSOL0S0H0			S				S1	G1
Pima	PLANT	Ayenia jaliscana	Ayenia	PDSTE010C0			S				S1	GNR
Pima	PLANT	Viola umbraticola	Shade Violet	PDVIO042E0			S				S2?	G3G4
Pima	PLANT	Agave parviflora ssp. parviflora	Santa Cruz Striped Agave	PMAGA010L2	SC		S		A	HS	S3	G3T3
Pima	PLANT	Agave schottii var. treleasei	Trelease Agave	PMAGA010N2	SC		S			HS	S1	G5T1Q
Pima	PLANT	Carex chihuahuensis	Chihuahuan Sedge	PMCYP032T0			S				S2S3	G3G4
Pima	PLANT	Carex ultra	Arizona Giant Sedge	PMCYP03E50		S	S				S2	G3?
Pima	PLANT	Sisyrinchium cernuum	Nodding Blue-eyed Grass	PMIRI0D0B0			S				S2	G5
Pima	PLANT	Allium gooddingii	Goodding Onion	PMLIL02120	CCA		S	3		HS	S3S4	G4
Pima	PLANT	Allium plummerae	Plummer Onion	PMLIL021V0						SR	S3	G4
Pima	PLANT	Lilium parryi	Lemon Lily	PMLIL1A0J0	SC		S			SR	S2	G3
Pima	PLANT	Triteleiopsis palmeri	Blue Sand Lily	PMLIL22010		S				SR	S1	G3
Pima	PLANT	Hexalectris arizonica	Arizona Crested coral-root	PMORC1C041			S			SR	S1S2	G5T2T4
Pima	PLANT	Hexalectris colemanii	Coleman's coral-root	PMORC1C060			S				S2	G1G2
Pima	PLANT	Listera convallarioides	Broad-leaved Twayblade	PMORC1N050						SR	S1	G5
Pima	PLANT	Malaxis abieticola	Slender-flowered Malaxis	PMORC1R090						SR	S1	G4
Pima	PLANT	Platanthera limosa	Thurber's Bog Orchid	PMORC1Y0G0						SR	S4	G4
Pima	PLANT	Schiedeella arizonica	Fallen Ladies'-tresses	PMORC67020						SR	S4	GNR
Pima	PLANT	Muhlenbergia elongata	Sycamore Muhly	PMPOA48220			S				S1	G3
Pima	PLANT	Muhlenbergia palmeri	Palmer's Muhly	PMPOA48350			S				S1S2	GNR
Pima	PLANT	Notholaena lemmonii	Lemmon Cloak Fern	PPADI0G0D0	SC						S1S2	G3?

Pima	PLANT	Asplenium dalhousiae	Dalhouse Spleenwort	PPASP020A0		S							S1	GNR
Pima	PLANT	Psilotum nudum	Whisk Fern	PPPSI01020			S						HS S1	G5
Pima	PLANT	Thelypteris puberula var. sonorensis	Aravaipa Woodfern	PPTHE05192		S	S						S2	G5T3
Pinal	AMPHIBIAN	Anaxyrus retiformis	Sonoran Green Toad	AAABB01140		S				PR	1B		S3	G4
Pinal	AMPHIBIAN	Gastrophryne olivacea	Western Narrow-mouthed Toad	AAABE01020		S				PR	1C		S3	G5
Pinal	AMPHIBIAN	Lithobates yavapaiensis	Lowland Leopard Frog	AAABH01250	SC	S	S			PR	1A		S3	G4
Pinal	BIRD	Ictinia mississippiensis	Mississippi Kite	ABNKC09010						PR	1B		S3	G5
Pinal	BIRD	Haliaeetus leucocephalus pop. 3	Bald Eagle - Sonoran Desert Population	ABNKC10014	SC	S	S	2	P		1A		S2S3	G5TNR
Pinal	BIRD	Haliaeetus leucocephalus (wintering pop.)	Bald Eagle - Winter Population	ABNKC10015	SC	S	S	2	P		1A		S4N	G5TNR
Pinal	BIRD	Buteo plagiatus	Gray Hawk	ABNKC19150	SC								S3	GNR
Pinal	BIRD	Aquila chrysaetos	Golden Eagle	ABNKC22010		S		3	A		1B		S4	G5
Pinal	BIRD	Falco peregrinus anatum	American Peregrine Falcon	ABNKD06071	SC	S	S	4	PR		1A		S4	G4T4
Pinal	BIRD	Rallus obsoletus yumanensis	Yuma Ridgeway's Rail	ABNME0501A	LE				A		1A		S3	G5T3
Pinal	BIRD	Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	ABNRB02020	LT		S	2			1A		S3	G5
Pinal	BIRD	Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl	ABNSB08041	SC	S	S				1B		S1	G5T3
Pinal	BIRD	Athene cunicularia hypugaea	Western Burrowing Owl	ABNSB10012	SC	S	S	4	PR		1B		S3	G4T4
Pinal	BIRD	Strix occidentalis lucida	Mexican Spotted Owl	ABNSB12012	LT			3	A		1A		S3S4	G3T3
Pinal	BIRD	Antrostomus ridgwayi	Buff-collared Nightjar	ABNTA07060			S				1B		S2S3	G5
Pinal	BIRD	Camptostoma imberbe	Northern Beardless-Tyrannulet	ABPAE04010		S					1B		S4	G5
Pinal	BIRD	Empidonax traillii extimus	Southwestern Willow Flycatcher	ABPAE33043	LE			2	E		1A		S1	G5T2
Pinal	BIRD	Tyrannus crassirostris	Thick-billed Kingbird	ABPAE52040			S				1B		S2	G5
Pinal	FISH	Gila robusta	Roundtail Chub	AFCJB13150	PT, DPS		S	2	A		1A		S2	G3
Pinal	FISH	Gila intermedia	Gila Chub	AFCJB13160	LE				P		1A		S2	G2
Pinal	FISH	Meda fulgida	Spikedace	AFCJB22010	LE						1A		S1	G2
Pinal	FISH	Rhinichthys osculus	Speckled Dace	AFCJB37050	SC	S			E		1B		S3S4	G5
Pinal	FISH	Tiaroga cobitis	Loach Minnow	AFCJB37140	LE				E		1A		S1	G2
Pinal	FISH	Agosia chrysogaster chrysogaster	Gila Longfin Dace	AFCJB37151	SC	S			A		1B		S3S4	G4T3T4
Pinal	FISH	Catostomus clarkii	Desert Sucker	AFCJC02040	SC	S	S				1B		S3S4	G3G4
Pinal	FISH	Catostomus insignis	Sonora Sucker	AFCJC02100	SC	S	S		P		1B		S3	G3G4
Pinal	FISH	Cyprinodon macularius	Desert Pupfish	AFCNB02060	LE				P		1A		S1	G1
Pinal	FISH	Poeciliopsis occidentalis occidentalis	Gila Topminnow	AFCNC05021	LE				A		1A		S1S2	G3
Pinal	MAMMAL	Macrotus californicus	California Leaf-nosed Bat	AMACB01010	SC	S					1B		S3	G4
Pinal	MAMMAL	Choeronycteris mexicana	Mexican Long-tongued Bat	AMACB02010	SC	S	S		A		1C		S3	G4
Pinal	MAMMAL	Leptonycteris curasoae yerbabuenae	Lesser Long-nosed Bat	AMACB03030	LE				A		1A		S2S3	G4

Appendix F – Air Quality Calculations

CALCULATION SHEET-COMBUSTION EMISSIONS-CONSTRUCTION - PROPOSED ACTION

Assumptions for Combustion Emissions					
Type of Construction Equipment	Num. of Units	HP Rated	Hrs/day	Days/yr	Total hp-hrs
Water Truck	1	300	8	240	576,000
Diesel Dump Truck	2	300	8	240	1,152,000
Diesel Excavator	1	300	8	240	576,000
Diesel Bore/Drill Rigs	2	300	8	240	1,152,000
Diesel Cranes	1	175	8	240	336,000
Diesel Bulldozers	2	300	8	240	1,152,000
Diesel Front-End Loaders	2	300	8	240	1,152,000
Diesel Concrete Truck*	4	300	8	3	28,800

Emission Factors[1]							
Type of Construction Equipment	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	PM-10 g/hp-hr	PM-2.5 g/hp-hr	SO2 g/hp-hr	CO2 g/hp-hr
Water Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Dump Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Excavator	0.340	1.300	4.600	0.320	0.310	0.740	536.300
Diesel Bore/Drill Rigs	0.600	2.290	7.150	0.500	0.490	0.730	529.700
Diesel Cranes	0.440	1.300	5.720	0.340	0.330	0.730	530.200
Diesel Bulldozers	0.360	1.380	4.760	0.330	0.320	0.740	536.300
Diesel Front-end Loaders	0.380	1.550	5.000	0.350	0.340	0.740	536.200
Diesel Concrete truck*	0.440	2.070	5.490	0.410	0.400	0.740	536.000

1. Emission factors (EF) were generated using USEPA's preferred model for nonroad sources, the NONROAD2008 model. Emmisions were modeled for the 2007 calendar year. The VOC EFs include exhaust and evaporative emissions. The VOC evaporative components included in the NONROAD2008 model are diurnal, hotsoak, running loss, tank permeation, hose permeation, displacement, and spillage. The construction equipment age distribution in the NONROAD2008 model is based on the population in U.S. for the 2007 calendar year.

*Assumed to be the same as Diesel Dump Truck

Emission Calculations							
Type of Construction Equipment	VOC tons/yr	CO tons/yr	NOx tons/yr	PM-10 tons/yr	PM-2.5 tons/yr	SO_2 tons/yr	CO_2 tons/yr
Water Truck	0.279	1.314	3.485	0.260	0.254	0.470	340.227
Diesel Dump Truck	0.559	2.628	6.970	0.520	0.508	0.939	680.454
Diesel Excavator	0.216	0.825	2.920	0.203	0.197	0.470	340.417
Diesel Bore/Drill Rigs	0.762	2.907	9.077	0.635	0.622	0.927	672.456
Diesel Cranes	0.163	0.481	2.118	0.126	0.122	0.270	196.318
Diesel Bulldozers	0.457	1.752	6.043	0.419	0.406	0.939	680.835
Diesel Front-end Loaders	0.482	1.968	6.348	0.444	0.432	0.939	680.708
Diesel Concrete Truck*	0.014	0.066	0.174	0.013	0.013	0.023	17.011
Total Emissions	**2.932**	**11.941**	**37.134**	**2.621**	**2.553**	**4.978**	**3608.428**

Conversion factors	
Grams to tons	1.102E-06

MOVES2010a MODEL ON-ROAD TRANSPORTATION AIR EMISSIONS-
DELIVERY MATERIALS AND COMMUTING DURING CONSTRUCTION ACTIVITIES

MOVES 2010a					
Source	Fuel type	Number of vehicles	Miles traveled per day	Days of travel per year	Miles traveled per year
Passenger cars	Gasoline	5	60	240	72,000
Passenger truck	Gasoline	5	60	240	72,000
Light commercial truck	Diesel	2	60	240	28,800
Short-haul truck	Diesel	1	80	120	9,600
Long-haul truck	Diesel	1	80	120	9,600

Emission Factors (MOVES 2010a Emission Rates)[1]							
Source	VOC (g/mile)	CO (g/mile)	NOx (g/mile)	PM-10 (g/mile)	PM-2.5 (g/mile)	SO_2 (g/mile)	CO_2 and CO_2 Equivalents (g/mile)
Passenger cars	8.497	2.892	0.576	0.019	0.018	0.005	320
Passenger truck	3.645	5.449	1.168	0.027	0.025	0.007	439
Light commercial truck	4.460	2.158	2.986	0.164	0.190	0.005	609
Short-haul truck	2.438	2.273	6.095	0.270	0.313	0.007	929
Long-haul truck	2.519	3.610	14.776	0.625	0.726	0.016	2,020

Total Emission for On-Road Construction Activities (tons/year)							
Source	VOC	CO	NOx	PM-10	PM-2.5	SO_2	CO_2 and CO_2 Equivalents
Passenger cars	0.674	0.229	0.046	0.002	0.001	0.000	25
Passenger truck	0.289	0.432	0.093	0.002	0.002	0.001	35
Light commercial truck	0.142	0.068	0.095	0.005	0.006	0.000	19
Short-haul truck	0.026	0.024	0.064	0.003	0.003	0.000	10
Long-haul truck	0.027	0.038	0.156	0.007	0.008	0.000	21
Total	1.157	0.793	0.454	0.018	0.020	0.001	111

Key:
Short-haul trucks category includes trucks such as dump trucks and cement trucks.
Long-haul trucks category includes trucks such as semi-trailers (18-wheelers).

1. Emission factors were generated by the USEPA preferred model MOVES2010a. MOVES simulates daily motor vehicle operations and produces emission rates. MOVES emission rates include sources from engine combustion, tire wear, brake wear, evaporative fuel permiation, vapor venting and leaking (running and parking), and crankcase loss. Emission rates are daily averages for each of the criteria pollutants. The averages are from a combination of vehicle operations such as stop and go, highway travel, acceleration at on-ramps, parking, start-up, extended idle, etc.

Conversion factor:	gms to tons
	0.000001102

MOVES2010a MODEL ON-ROAD TRANSPORTATION AIR EMISSIONS- ONGOING OPERATIONS

MOVES 2010a					
Source	Fuel type	Number of vehicles	Miles traveled per day	Days of travel per year	Miles traveled per year
Passenger cars	Gasoline	3	60	10	1,800
Passenger truck	Gasoline	2	60	10	1,200
Light commercial truck	Diesel	1	60	5	300
Short-haul truck	Diesel	3	60	5	900
Long-haul truck	Diesel	-	60	0	-

Emission Factors (MOVES 2010a Emission Rates)[1]							
Source	VOC (g/mile)	CO (g/mile)	NOx (g/mile)	PM-10 (g/mile)	PM-2.5 (g/mile)	SO_2 (g/mile)	CO_2 and CO_2 Equivalents (g/mile)
Passenger cars	8.497	2.892	0.576	0.019	0.018	0.005	320
Passenger truck	3.645	5.449	1.168	0.027	0.025	0.007	439
Light commercial truck	4.460	2.158	2.986	0.164	0.190	0.005	609
Short-haul truck	2.438	2.273	6.095	0.270	0.313	0.007	929
Long-haul truck	2.519	3.610	14.776	0.625	0.726	0.016	2,020

Total Emission for On-Road Commuter Activities (tons/year)							
Source	VOC	CO	NOx	PM-10	PM-2.5	SO_2	CO_2 and CO_2 Equivalents
Passenger cars	0.02	0.01	0.00	0.00	0.00	0.00	1
Passenger truck	0.00	0.01	0.00	0.00	0.00	0.00	1
Light commercial truck	0.00	0.00	0.00	0.00	0.00	0.00	0
Short-haul truck	0.00	0.00	0.01	0.00	0.00	0.00	1
Long-haul truck	0.00	0.00	0.00	0.00	0.00	0.00	-
Total	0.03	0.02	0.01	0.00	0.00	0.00	2

Key:
Short-haul trucks category includes trucks such as dump trucks and cement trucks.
Long-haul trucks category includes trucks such as semi-trailers (18-wheelers).

1. Emission factors were generated by the USEPA preferred model MOVES2010a. MOVES simulates daily motor vehicle operations and produces emission rates. MOVES emission rates include sources from engine combustion, tire wear, brake wear, evaporative fuel permiation, vapor venting and leaking (running and parking), and crankcase loss. Emission rates are daily averages for each of the criteria pollutants. The averages are from a combination of vehicle operations such as stop and go, highway travel, acceleration at on-ramps, parking, start-up, extended idle, etc.

Conversion factor:	gms to tons
	0.000001102

CALCULATION SHEET-FUGITIVE DUST-CONSTRUCTION

Assumptions for Combustion Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
General Construction Activities	0.19	ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006
PM-2.5 Emissions			
PM-2.5 Multiplier	0.10	(10% of PM-10 emissions assumed to be PM-2.5)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM-10 and PM-2.5 emissions)	EPA 2001; EPA 2006

Project Assumptions

			Conversion Factors	
Construction Area (0.19 ton PM-10/acre-month)				
Duration of Soil Disturbance in Projec	6	months	0.000022957	acres per feet
Length	0.3	miles	5280	feet per mile
Length (converted)	1700	feet		
Width	24	feet		
Area	0.94	acres		16 ft wide road with 2 4-ft shoulders - total 24' wide
Staging Areas				
Duration of Construction Project	12	months		
Length		miles		
Length (converted)		feet		
Width		feet		
Area	2.00	acres		

*Assume that construction activities during road modification are limited to 10 miles area during any given constructioin day.

	Project Emissions (tons/year)			
	PM-10 uncontrolled	PM-10 controlled	PM-2.5 uncontrolled	PM-2.5 controlled
Construction Area (0.19 ton PM-10/a	1.07	0.53	0.11	0.05
Staging Areas	0.38	0.19	0.04	0.02
Total	**1.45**	**0.72**	**0.14**	**0.07**

References:

USEPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

USEPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Assumptions for Fugitive Emissions

General Construction Activities Emission Factor **0.19 ton PM-10/acre-month** Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM-10/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM-10/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions from Construction Operations, calculated the 0.19 ton PM-10/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM-10/acre-month) and 75% of the average emission factor (0.11 ton PM-10/acre-month).

The 0.19 ton PM-10/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM-10/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particle (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District and the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM-10 and PM-2.5 in PM nonattainment areas.

New Road Construction Emission Factor **0.42 ton PM-10/acre-month** Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM-10/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM-10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

PM-2.5 Multiplier **0.10**

PM-2.5 emissions are estimated by applying a particle size multiplier of 0.10 to PM-10 emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM-10 and PM-2.5 **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM-10 and PM-2.5 in PM nonattainment areas. Wetting controls will be applied during project construction (EPA 2006).

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

CALCULATION SHEET-SUMMARY OF EMISSIONS

Summary of Emissions (tons/year)									
Emission Source	VOC	CO	NOx	PM-10	PM-2.5	SO_2	CO_2	CO_2 Equivalents	Total CO_2
Combustion Emissions	2.93	11.94	37.13	2.62	2.55	4.98	3608.43	11,622	15,230
Construction Site-Fugitive PM-10	NA	NA	NA	0.72	0.07	NA	NA	NA	NA
Construction Workers Commuter & Trucking	1.16	0.79	0.45	0.02	0.02	0.00	NA	111	111
Total Emissions-CONSTRUCTION	**4.09**	**12.73**	**37.59**	**3.36**	**2.65**	**4.98**	**3608**	**11,733**	**15,341**
Operational Emissions	0.03	0.02	0.01	0.00	0.00	0.00	NA	2	2
Generators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-
Total Operational Emissions	**0.03**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**-**	**2**	**2**
De minimis Threshold (1)	100	100	100	70	100	100	NA	NA	25,000

1. Note that Pima County is a moderate non-attainment area for PM-10 area for CO (USEPA 2013b).

Carbon Equivalents	Conversion Factor
N_2O or NOx	311
Methane or VOCs	25

Source: EPA 2010 Reference, Tables and Conversions, Inventory of U.S. Greenhouse Gas Emissions and Sinks; http://www.epa.gov/climatechange/emissions/usinventoryreport.html