February
2022

Final

Supplemental Environmental Stewardship Plan

REPLACEMENT, OPERATION, AND MAINTENANCE OF TACTICAL INFRASTRUCTURE
LUNA COUNTY,
EL PASO SECTOR, NEW MEXICO

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

U.S. Customs and Border Protection

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Cover Sheet

Final Supplemental Environmental Stewardship Plan
Replacement, Operation, and Maintenance of Tactical Infrastructure, Luna County, El Paso Sector, New Mexico

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

Parties Consulted: Department of the Interior (DOI); U.S. Environmental Protection Agency (USEPA), Region 6; U.S. Geological Survey (USGS); U.S. Army Corps of Engineers (USACE)–Albuquerque District; U.S. Fish and Wildlife Service (USFWS); U.S. Department of Agriculture (USDA); Texas Historical Commission (THC); New Mexico Department of Game & Fish; New Mexico Historic Preservation Division; and state and local governments; local tribes; non-governmental organizations (NGO); academics; and local landowners.

Affected Location: U.S./Mexico International Border, beginning approximately 20 miles west of the Columbus Port of Entry (POE) and continuing 2.4 miles east.

Project Description: CBP proposes to construct, operate, and maintain tactical infrastructure (TI), which includes replacing existing vehicle barrier with a pedestrian barrier along the U.S./Mexico International border within the USBP El Paso Sector, Deming (DEM) Station Area of Responsibility (AOR). The segment begins approximately 20 miles west of the Columbus POE and continues east for 2.4 miles. The construction corridor will be 60 feet wide; the majority of corridor has previously been disturbed. The replacement barrier will be a bollard style barrier comprised of 6-inch diameter steel bollards, spaced 4 inches apart and 30 feet high. The project also includes repairs and improvements to the existing patrol road, installation of a fiber optic cable for communications, and installation of LED lighting and electrical utilities to supply power to the lighting and communication cable.

Report Designation: Final Supplemental Environmental Stewardship Plan (ESP).

Abstract: CBP plans to remove 2.4 miles of existing vehicle barrier, then construct, operate, and maintain these 2.4 miles of TI including upgrading patrol roads along the U.S./Mexico International border in the USBP El Paso Sector, Deming Station, New Mexico AOR.

Construction of the TI began on July 6, 2020, and was paused on January 20, 2021. The existing vehicle fencing consists of post-and-rail, Normandy-style, and bollard fencing and will be removed. The replacement pedestrian barrier will consist of bollard style barrier comprised of 6-inch diameter steel bollards, spaced 4 inches apart and will be 30 feet high, designed to withstand vehicle impact and resist cutting with hand tools or torches. Continuous openings in the barrier, such as space between adjacent pickets and plates, will be no more than 4 inches, except at drainage crossings where spacing will be no more than 5 inches. The barrier is designed to deter under-digging below the finished grade. Border lights and detection cameras mounted on 40- to 60-foot poles will be installed within the enforcement zone, in addition to the installation of a fiber optic cable along the border for communications use. Access roads and construction roads paralleling the new pedestrian barrier will be at least 28 feet wide.

This document presents the analysis for resources in the project area and examines the potential for environmental impacts.

FINAL

SUPPLEMENTAL ENVIRONMENTAL STEWARDSHIP PLAN

REPLACEMENT, OPERATION, AND MAINTENANCE OF TACTICAL INFRASTRUCTURE, LUNA COUNTY, EL PASO SECTOR, NEW MEXICO

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

FEBRUARY 2022

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Executive Summary

BACKGROUND

On May 15, 2019, the Secretary of the Department of Homeland Security (DHS), pursuant to Section 102(c) of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996, as amended, issued a waiver to ensure the expeditious construction of barriers and roads in the United States Border Patrol (USBP) El Paso Sector. Although the Secretary's waiver means that United States (U.S.) Customs and Border Protection (CBP) no longer has any specific legal obligations under the laws set aside by the waiver, DHS and CBP recognize the importance of responsible environmental stewardship. To that end, CBP has prepared this Environmental Stewardship Plan (ESP), which analyzes the potential environmental impacts associated with construction of tactical infrastructure in the USBP El Paso Sector. The ESP also discusses CBP's plans to potentially mitigate environmental impacts.

This report has been prepared from data collected prior to and during the initial phases of project construction. The data were compiled through field surveys, photo interpretation with ground-truthing, and use of data from prior surveys, and other sources, as referenced. The report is an analysis of potential impacts on the resources discussed based on the initially planned project footprint. This is intended to be viewed as a baseline document and is not intended to capture all impacts during construction.

Upon completion of the project, an additional report, called an Environmental Stewardship Summary Report (ESSR), will be prepared summarizing the observed actual impacts. This ESSR will provide the review of the baseline information presented in this ESP and be used to compare anticipated to actual impacts, so that a final new baseline of impacts is established for any potential future actions, including maintenance and repair activities. The ESSR will document the success of best management practices (BMPs) and any changes or improvements that could be required for the future. Additionally, the ESSR will summarize any significant modifications during construction that increased or reduced environmental impacts.

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

GOALS AND OBJECTIVES OF THE PROJECT

The project will allow USBP agents to strengthen control of the U.S. border between ports of entry (POEs) in the USBP El Paso Sector. The project will help deter illegal entries within the USBP El Paso Sector by improving enforcement efficiency, so that USBP is better equipped to prevent terrorists and terrorist weapons, cross-border violators (CBVs), drugs, and other contraband from entering the U.S., while contributing to a safer environment for USBP agents and the public.

OUTREACH AND AGENCY COORDINATION

CBP coordinates with numerous government agencies and tribes regarding potential project impacts. Stakeholders with interests in the region include Department of the Interior (DOI), including the Bureau of Land Management (BLM), Bureau of Reclamation (BOR), National Park Service (NPS), and U.S. Fish Wildlife Service (USFWS); U.S. Environmental Protection Agency (USEPA); U.S. Army Corps of Engineers (USACE); United States Section, International Boundary and Water Commission (USIBWC); Texas Historical Commission (THC); non-governmental organizations (NGOs); academics; state and local governments; local tribes; and local landowners.

DESCRIPTION OF THE PROJECT

CBP proposes to replace, operate, and maintain 2.4 miles of barrier along the U.S./Mexico international border in New Mexico (the Project). The Project will occur within USBP's El Paso Sector within Luna County, New Mexico. The Project begins approximately 20 miles west of the Columbus POE and continues east for 2.4 miles (the Project Area).

ENVIRONMENTAL IMPACTS AND BEST MANAGEMENT PRACTICES

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

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

Table ES-1. Summary of Environmental Impacts, Mitigation, and Best Management Practices

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
Air Quality	Minor and temporary impacts on air quality have the potential to occur during construction; all calculated air emissions will likely remain below *de minimis* levels.	Bare soil will be wetted to suppress dust, and equipment will be maintained according to specifications. Construction speed limits will not exceed 25 miles per hour on unpaved roads.
Noise	Minor temporary increases to ambient noise levels during construction activities have the potential to occur. Noise impacts have the potential to be greatest during pile-driving activities.	Equipment will be operated on an as-needed basis. Mufflers and properly working construction equipment will be used to reduce noise. Generators will have baffle boxes, mufflers, or other noise abatement capabilities. Blasting mats will be used to minimize noise and debris.

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
Land Use, Recreation, and Aesthetics	There will be no impacts on land use under the Project. Visual interruption has the potential to result in short- and long-term, minor to moderate, adverse impacts.	Environmental monitors will be present during construction to ensure construction activities remain within the Project footprint and impacts on BLM lands are minimized.
Geologic Resources and Soils	Short-term, minor impacts on soils have the potential to occur from the Project. Most of the impacts will involve only topsoil layers.	Construction-related vehicles will remain on established or existing roads as much as possible, and areas with highly erodible soils will be avoided where possible. Gravel or topsoil would be obtained from developed or previously used sources. Where grading is necessary, surface soils will be stockpiled and replaced following construction.
Groundwater	The Project has the potential to have minor to moderate, temporary adverse impacts on the availability of water resources in the region.	Equipment maintenance, staging, laydown, or fuel dispensing will occur upland to prevent runoff. A Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention, Control, and Countermeasure Plan (SPCCP) will be implemented as part of the Project.
Surface Waters and Waters of the United States	Some ephemeral surface waters, including potential Waters of the U.S. jurisdictional waters, could experience permanent and temporary, minor, adverse impacts.	Construction activities will stop during heavy rains. All fuels, oils, and solvents will be collected and stored. Stream crossings will not be located at bends to protect channel stability. Equipment maintenance, staging, laydown, or fuel dispensing will occur upland to prevent runoff. A SPCCP and SWPPP will be implemented as part of the Project.
Floodplains	There are no floodplains in the Survey Area and there will be no impact from the Project.	N/A
Vegetation	Disturbance and clearing have the potential to result in short- and long-term, minor adverse impacts.	Construction equipment will be cleaned to minimize spread of non-native species. Removal of brush in federally protected areas will be limited to the smallest amount possible. Invasive plants that appear on Project Area will be removed. Fill material, if required, will be weed-free to the maximum extent practicable.
Wildlife and Aquatic Resources	Habitat conversion and fragmentation has the potential to result in short-term, minor adverse impacts.	Ground disturbance during migratory bird nesting season will require migratory bird nest survey and possible removal and relocation. To prevent

Resource Area	Effects of the Project	Best Management Practices/ Conservation Measures
		entrapment of wildlife, all excavated holes or trenches will either be covered or provided with wildlife escape ramps. All vertical poles and posts that are hollow will be covered to prevent entrapment and discourage roosting. General BMPs will avoid and reduce impacts on wildlife and aquatic resources.
Protected Species and Critical Habitat	Loss of potential habitat, fragmentation, and elevated noise has the potential to result in short-term, minor adverse impacts.	General BMPs and BMPs will be implemented for monarch butterfly, northern aplomado falcon, yellow-billed cuckoo, Sprague's pipit, Chiricahua leopard frog and beautiful shiner.
Cultural Resources	Cultural resources have the potential to be negatively impacted by the Project. Avoidance measures are recommended.	All construction will be restricted to previously surveyed areas. If any cultural material is discovered during construction, all activities within the vicinity of the discovery will be halted until receipt of clearance to resume work by a qualified archaeologist.
Socioeconomics	Construction activities, increased employment, and new income have the potential to have direct and indirect, short-term, minor, beneficial impacts. No adverse impacts are expected.	None required.
Hazardous Materials and Waste	Waste generation and use of hazardous materials and wastes have the potential to result in short-term, negligible adverse impacts.	All waste materials and other discarded materials will be removed from the Project Area as quickly as possible. Equipment maintenance, staging, laydown, or fuel dispensing will occur upland to prevent runoff.

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

In addition to the design criteria and BMPs, CBP could implement mitigation measures. The scope or extent of CBP's mitigation will be based on the actual impacts from the Project and available funding. CBP will assess the actual impacts from the Project during and upon completion. CBP's assessment will be based on, among other things, feedback from environmental monitors and the

final construction footprint. To the extent mitigation is warranted and funding is available, CBP will work with stakeholders to identify and implement appropriate mitigation measures.

The following definitions describe various impact characteristics:

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

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

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

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

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1. GENERAL PROJECT DESCRIPTION

1.1 INTRODUCTION TO THE ENVIRONMENTAL STEWARDSHIP PLAN

The United States (U.S.) Customs and Border Protection (CBP) will replace 2.4 miles of existing vehicle barrier with new bollard barrier in the Deming Station Area of Responsibility (AOR) within the U.S. Border Patrol (USBP) El Paso Sector (the Project). This new bollard barrier design is critical to the El Paso Sector's ability to prevent illegal entries and to achieve operational control of the border commensurate with Executive Order (E.O.) 13767. Under this E.O., CBP is directed to "…secure the southern border of the United States through the immediate construction of a physical wall on the southern border, monitored and supported by adequate personnel so as to prevent illegal immigration, drug and human trafficking, and acts of terrorism."

Section 102(b) of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) mandates the Department of Homeland Security (DHS) to install and improve fencing, barriers, and roads along the U.S. border. In 2019, the Secretary of DHS, pursuant to Section 102(c) of IIRIRA, determined that it is necessary to waive certain laws, regulations, and other legal requirements to ensure expeditious construction of the barriers and roads in the El Paso Sector. Although the Secretary's waiver means that CBP no longer has any specific legal obligations to do so, DHS and CBP are committed to continue to protect valuable natural and cultural resources through responsible environmental stewardship.

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

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

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

This report has been prepared from data collected prior to and during the initial phases of Project construction. The data was compiled through field surveys, photo interpretation with ground-truthing, and use of data from prior surveys and other sources, as referenced. The report is an analysis of potential impacts on the resources discussed based on the initially planned Project

footprint. This is intended to be viewed as a baseline document and is not intended to capture all impacts during construction.

Upon completion of the Project, an additional report, called an Environmental Stewardship Summary Report (ESSR), will be prepared summarizing the observed actual impacts. This ESSR will review the baseline information provided in this ESP and be used to compare anticipated to actual impacts, so that a final new baseline of impacts is established for any potential future actions, including maintenance and repair activities. The ESSR will document the success of BMPs and any changes or improvements that could be required for the future. Additionally, the ESSR will summarize any significant modifications during construction that increased or reduced environmental impacts.

1.2 U. S. BORDER PATROL BACKGROUND

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

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

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

1.3 GOALS AND OBJECTIVES OF THE PROJECT

The purpose of the Project is to aid CBP in fulfilling its mission to detect and prevent CBVs, terrorists, and terrorist weapons from entering the U.S. and therefore achieve effective control of our nation's borders. The Project will help to deter illegal entries within the USBP El Paso Sector by improving enforcement efficiency, thus putting UBP in a better position to prevent terrorists and terrorist weapons, CBVs, drugs, and other contraband from entering the U.S., while also contributing to a safer environment for USBP agents and the public.

1.4 STAKEHOLDER OUTREACH

CBP has consulted with numerous stakeholders regarding the Project. Stakeholders with interest in the region include the following:

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

    - ***U.S. Fish and Wildlife Service***. CBP has coordinated with the U.S. Fish and Wildlife Service (USFWS) to identify listed species that have the potential to occur in the Project Area.

    - ***U.S. Geological Survey***. CBP has coordinated with the U.S. Geological Survey (USGS) to identify potential impacts on geological resources.

    - ***U.S. Bureau of Land Management***. CBP has coordinated with the U.S. BLM to identify potential impacts to occur in the Project Area.

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

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

- ***U.S. Department of Agriculture***. CBP has coordinated with the U.S. Department of Agriculture (USDA) to identify potential impacts on resources.

- ***State and Local Governments***. CBP has coordinated with the various state and local government officials regarding the Project, including, but not limited to:

    - ***New Mexico Department of Game and Fish***. CBP has coordinated with the New Mexico Department of Game and Fish (NMDGF) regarding potential impacts on species within their jurisdiction.

    - ***Texas Historical Commission***. CBP has coordinated with the Texas Historical Commission (THC) regarding the protection and preservation of historic resources.

    - ***New Mexico Historic Preservation Division.*** CBP has coordinated with the New Mexico Historic Preservation Division (NMHPD) regarding the protection and preservation of historic resources.

- ***Tribes***. CBP has notified and coordinated with various tribes regarding the Project, including the Alabama-Coushatta Tribe of Texas, Carrizo/Comecrudo Tribe of Texas, Kickapoo Traditional Tribe of Texas, and Lipan Apache Tribe of Texas.

1.5 BEST MANAGEMENT PRACTICES

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

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

1.5.1 General Design BMPs

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

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

1.5.2 Air Quality

Measures will be incorporated to ensure that emissions of particulate matter less than or equal to 10 microns in diameter (PM_{10}) do not significantly impact the environment. Such measures include dust suppression methods to minimize airborne particulate matter generated during construction activities. Standard construction BMPs, such as minimized diesel idling and routine watering of the construction site and access roads, will be used to control fugitive dust emissions during the construction phases of the Project. Additionally, all construction equipment and vehicles will be maintained in good operating condition to minimize exhaust emissions.

1.5.3 Noise

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

1.5.4 Geological Resources

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

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

1.5.5 Water Resources

To address stormwater runoff, construction contractors will adopt and implement a SWPPP, which will include BMPs to reduce potential stormwater erosion and sedimentation effects on local drainages, as discussed in **Chapter 1.5.4**.

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

Water storage within the Project Area should be maintained in open water ponds that are not covered and in closed, on-ground containers in upland areas, not in washes. Pumps, hoses, tanks, and other water storage devices will be cleaned and disinfected.

1.5.6 Biological Resources

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

1.5.6.1 Biology General Measures Prior to Construction

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

1.5.6.2 General Biology Measures During Construction

Construction equipment will be cleaned prior to entering and departing the Project corridor to minimize the spread and establishment of non-native invasive plant species.

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

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

1.5.6.3 Measures for Wildlife and Aquatic Resources

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

To prevent wildlife species entrapment during construction, all excavated, steep-walled holes or trenches more than 2 feet deep must be covered by plywood at the close of each working day or provided with one or more escape ramps. Each morning before the start of construction and before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. Any animals discovered must be allowed to voluntarily escape, without harassment, before construction activities resume, or removed from the trench or hole by a Government biologist. Additionally, all vertical bollards that are hollow must be covered to prevent wildlife entrapment. Bollards should be covered from the time they are erected until the time they are filled.

1.5.6.4 Measures for Protected Species and Critical Habitats

Prior to ground-disturbing activities or vegetation removal or trimming, a qualified biologist will present an environmental awareness program to all on-site personnel. The program will contain, at a minimum, information regarding listed species including flat-tailed horned lizard, barefoot banded gecko, burrowing owl, and Peninsular bighorn sheep. This will include general species identification, habitat description, species sensitivity to human activity, and a discussion of measures to avoid and protect the species during construction. Following the education program, photographs of the species must be posted in the office of the contractor and resident engineer, where they will remain throughout the duration of the Project. The contractor is responsible for ensuring that employees are aware of the listed species.

To eliminate attraction of predators to protected animals, all food-related trash items such as wrappers, cans, bottles, and food scraps must be disposed in closed containers and removed daily from the Project site.

When an individual of a federally listed species is found within the Project limits, work must cease in the area of the species. Any threatened and endangered species or species of concern must not

be harmed, harassed, or disturbed to the extent possible by Project activities. Work may resume when the individual moves away on its own, or when a Government biologist safely removes the individual. Individuals of federally listed species found in the Project Area and requiring relocation will be relocated by the Government biologist.

Active burrowing owl burrows will be flagged for avoidance with a 250-foot buffer. Active burrows that cannot be avoided will be collapsed. If construction is during the nesting period (February 15 through September 15), the presence of eggs or young will be determined before owls are prevented from reentering and collapsing the burrows following established guidelines. If young are present, burrows will not be collapsed until they fledge.

1.5.7 Cultural Resources

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

1.5.8 Hazardous Materials and Wastes

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

1.5.9 Potential Avoidance and Mitigation for Unavoidable Impacts

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

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2. DESCRIPTION OF THE PROJECT

2.1 LOCATION

CBP will replace, operate, and maintain 2.4 miles of barrier along the U.S./Mexico international border in USBP's El Paso Sector within Luna County, New Mexico. The Project begins approximately 20 miles west of the Columbus POE and continues east for 2.4 miles. **Table 2-1** lists Project location data and **Figure 2-1** provides a general location map of the Project Area.

Table 2-1. Segment Location Data

Section	Latitude	Longitude
El Paso 6-6 Start	31.783708	-107.963193
El Paso 6-6 Stop	31.7837	-107.923151

The construction corridor is the width of the Roosevelt Reservation, the 60-foot-wide strip of land owned by the Federal Government along the U.S. side of the U.S./Mexico border in California, New Mexico, and Arizona.

2.2 DESIGN

The current design features 18- to 30-foot, bollard-style barrier composed of 6-inch diameter steel bollards spaced center-to-center 10 inches apart, forming a 4-inch gap between each bollard. The construction corridor will be 60 feet wide. Most of the corridor has previously been disturbed. The Project also includes repairs and improvements to the existing patrol road, and installation of a fiber-optic cable for communications, LED lighting, and electrical utilities to supply power to the communications cable and lighting. Border security lighting will illuminate the Project Area to allow for construction at night. In areas where border security lighting is not present, mobile light poles will be used during nighttime construction.

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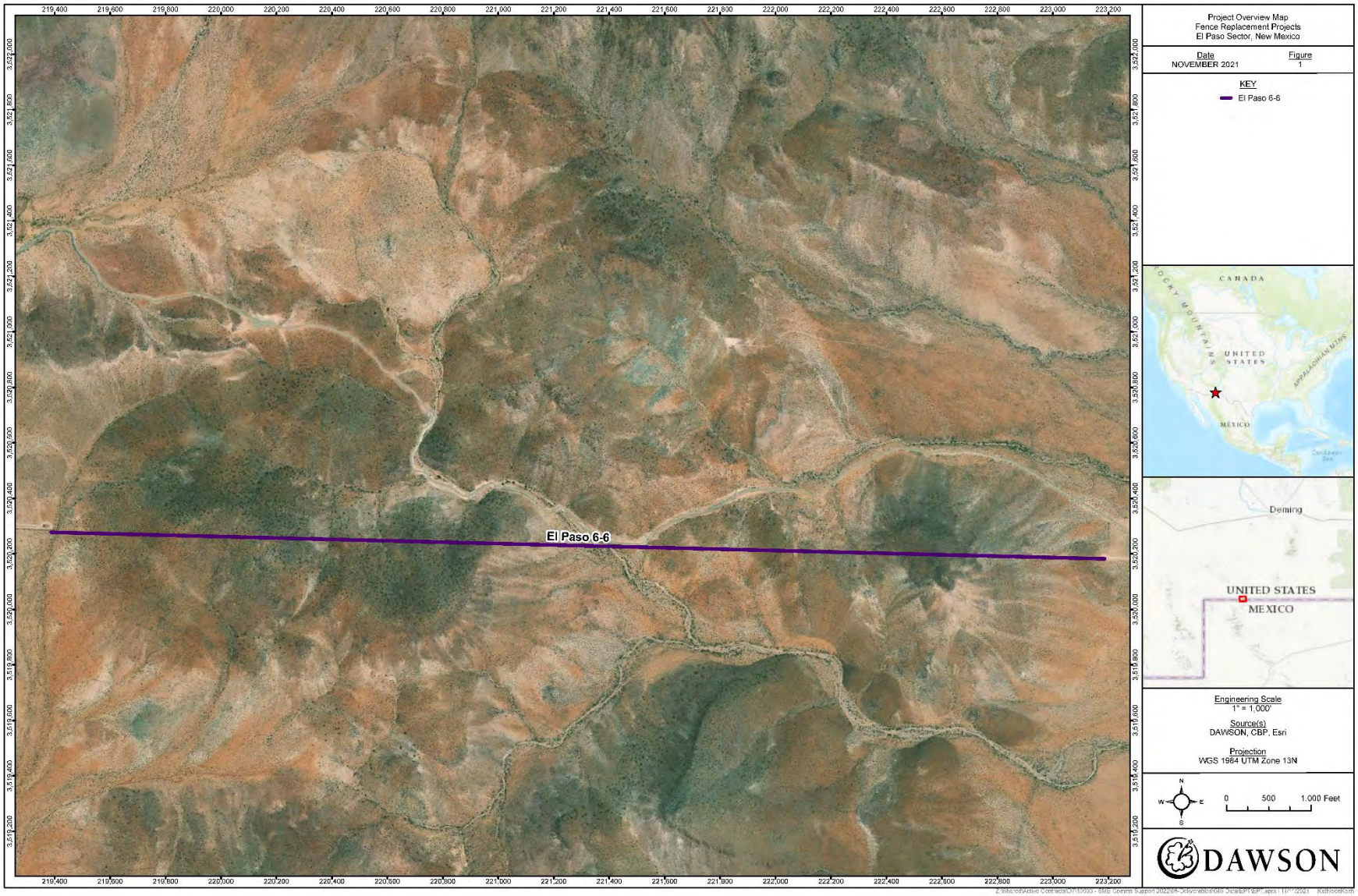
Figure 2-1. Project Overview Map



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2.3 CONSTRUCTION ACCESS, MATERIALS DELIVERY, AND STAGING

The new bollards will be delivered to 4 laydown areas totaling approximately 0.358 acres adjacent to the Roosevelt Reservation and fabricated prior to installation. Each panel will be 8- to 10-feet-wide and composed of eight to ten, 6-inch-square (5/16-inch thick) Core-10 steel bollards filled with cement and welded in place by a horizontal steel bar on the bottom and an approximately 5-foot-wide steel sheet across the top. The steel bollards will be spaced 4 inches apart to allow for cross-border visibility. Each panel is estimated to weigh approximately 3,500 pounds, excluding any below-ground materials or concrete.

The staging areas will store large equipment and construction materials, establish batch plants for mixing concrete, and act as fabrication yards for panel assembly. Access to the Project Area is granted via existing roads within the Project Area wherever possible, including Federal, state, county, and local roads.

2.4 SITE PREPARATION

Site preparation primarily consists of grading 4 laydown areas, which will be in previously disturbed areas whenever possible, including areas previously used for vehicle barrier construction. Erosion-control measures will be necessary prior to ground disturbance activity, as will biological surveys, if construction takes place during the nesting season (from February 15 through September 15). BMPs will limit impacts on resources including wildlife, botanical, and cultural resources, among others (see **Chapter 1.5**). Specific BMPs will be implemented prior to and during construction activities to ensure minimal disturbance within the Project Area.

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

2.5 REMOVAL AND REPLACEMENT OF LEGACY FENCE WITH BOLLARD BARRIER

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

2.6 CONSTRUCTION SCHEDULE

Construction lasted from July 2020 to January 2021. The total duration for the Project was 198 days. Construction generally occurred six days per week from 7:00 a.m. to 7:00 p.m.

2.7 ENVIRONMENTAL CONSIDERATIONS

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

3. AIR QUALITY

3.1 AFFECTED ENVIRONMENT

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

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

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

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

New Mexico Ambient Air Quality Standards. Luna County falls within the New Mexico Southern Border Intrastate Air Quality Control Region 012. The State of New Mexico adopted the NAAQS and promulgated additional New Mexico Ambient Air Quality Standards (New

Mexico AAQS) for criteria pollutants. **Table 3-1** presents the primary and secondary USEPA NAAQS and New Mexico AAQS.

Table 3-1. Ambient Air Quality Standards

Pollutant	Reference	Standards		
		Federal Primary	Federal Secondary	New Mexico State
Carbon Monoxide (CO)				
8-hour average	40 CFR 50.8	9 ppm	none	8.7 ppm
1-hour average	40 CFR 50.8	35 ppm	none	13.1 ppm
Nitrogen Dioxide (NO_2)				
24-hour average	20.2.3.111 NMAC	none	none	0.10 ppm
Annual arithmetic mean	40 CFR 50.11	0.053 ppm	0.053 ppm	0.05 ppm
Ozone (O_3)				
8-hour average	40 CFR 50.10	0.08 ppm	0.08 ppm	none
(The 1997 standard - and the implementation rules for that standard - will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 to the 2008 ozone standard).				
8-hour average	40 CFR 50.15	0.075 ppm	0.075 ppm	none
(Effective May 27, 2008)				
Sulfur Dioxide (SO_2)				
24-hour average	40 CFR 50.4	0.14 ppm	none	0.10 ppm
3-hour average	40 CFR 50.5	none	0.5 ppm	none
Annual (arithmetic mean)	40 CFR 50.4	0.030 ppm	none	0.02 ppm
Particulate Matter ($PM_{2.5}$)				
24-hour average	40 CFR 50.13	35 µg/m^3	35 µg/m^3	none
(Effective December 18, 2006)				
Annual (arithmetic mean)	40 CFR 50.7 & 40 CFR 50.13	15.0 µg/m^3	15.0 µg/m^3	none
Particulate Matter (PM_{10})				
24-hour average	40 CFR 50.6	150 µg/m^3	150 µg/m^3	none
Lead (Pb)				
Rolling 3-month average	40 CFR 50.16	0.15µg/m^3	0.15µg/m^3	none
(Effective 1 year after date of area attainment designation)				
Hydrogen Sulfide				
1-hr average	20.2.3.110 NMAC	none	none	0.010 ppm
Total Reduced Sulfur				
1/2-hour average	20.2.3.110 NMAC	none	none	0.003 ppm
Particulate Matter (TSP)				
24-hour average	20.2.3.109 NMAC	none	none	150 µg/m^3
7-day average	20.2.3.109 NMAC	none	none	110 µg/m^3
30-day average	20.2.3.109 NMAC	none	none	90 µg/m^3

Annual geometric mean	20.2.3.109 NMAC	none	none	60 µg/m^3

Sources: Albuquerque-Bernalillo County Air Quality Control Board, 2012.
Notes: Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb - 1 part in 1,000,000,000) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air (µg/m^3).

Project Area. Luna County is within the Arizona-New Mexico Southern Border Interstate Air Quality Control Region 012. The total area of Region 012 is 10,374 square miles and consists of Grant, Hidalgo, and Luna counties. The Project Area does not fall within any designated nonattainment areas; therefore, conformity does not apply within the Project Area.

The Project Area is within areas that are in attainment for NAAQS.

3.2 ENVIRONMENTAL CONSEQUENCES

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

USEPA's Motor Vehicle Emission Simulator (MOVES) model was used to calculate emissions from construction equipment. Combustion emissions calculations were made for standard construction equipment, such as front-end loaders, excavators, bulldozers, cranes, and cement trucks. Assumptions were made regarding the total number of days each piece of equipment will be used and the number of hours or miles per day for each type of equipment. Fugitive dust emissions were calculated using the emissions factor of 0.22 ton per acre per month (Air Force Civil Engineer Center 2018).

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

Table 3-2 provides a summary of emissions from the Project and a determination of significance. The Imperial County Air Pollution Control District (ICAPCD) screening level thresholds do not apply to construction emissions and are, therefore, not included in **Table 3-2**. The working assumption for calculating emissions is that all construction activity is to be completed within a single year. The total emissions from construction activity are demonstrated to be below the significance threshold levels established by the CFR. Therefore, the Project would likely have no significant impact on ambient air quality. Construction personnel will continue to implement dust control measures, including watering roads, to maintain appropriate air quality levels. Detailed air emissions calculations are provided in **Appendix B**.

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

Type of Emission	VOCs	CO	NO_x	SO_2	$PM_{2.5}$	PM_{10}
Project Emissions (tpy)	0.33748	1.80294	1.63782	0.00382	0.83847	6.82102
Significance Threshold for Nonattainment Areas (tpy)	50	100	100	100	Moderate: 100 Serious: 70	Moderate: 100 Serious: 70

Key: tpy = tons per year

4. NOISE

4.1 AFFECTED ENVIRONMENT

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

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

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

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

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

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

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

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

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

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

4.2 ENVIRONMENTAL CONSEQUENCES

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

Installation of the replacement barrier and repairs and improvements to the existing patrol road are anticipated to be completed in segments. Therefore, construction noise will be temporary and only occur near where work is being performed. Additionally, most of the noise generated by the

Project will occur during construction, and thus does not have the potential to contribute to ambient noise levels. Routine maintenance of the barrier and roads has the potential to result in slight temporary increases in noise levels that will continue to sporadically occur over the long-term and will be similar to those of ongoing road maintenance within the Project Area. Using a worst-case scenario of 104 dBA, the noise model predicts that noise emissions from an impact pile driver (proposed construction equipment) will have to travel 3,000 feet before attenuating to levels below 75 dBA. The area encompassed within the 3,000-foot noise contour does not include sensitive receptors. Therefore, construction and maintenance noise associated with the Project does not have the potential to have an adverse effect.

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5. LAND USE, RECREATION, AND AESTHETICS

5.1 AFFECTED ENVIRONMENT

5.1.1 Land Use and Recreation

The Project will occur within the Roosevelt Reservation, a 60-foot-wide swath of Federal land immediately north of the U.S./Mexico international border that was set aside for border security uses. CBP operations and TI construction within the Roosevelt Reservation, which is consistent with the purpose of the Reservation. Areas immediately outside of the Roosevelt Reservation are owned by BLM (USGS 2021). The Project traverses the Chihuahuan Desert and various other rural areas of Luna County. The landscape within the Project Area is generally undisturbed, consisting of open desert, except for the existing barrier and patrol roads. Certain areas of the Chihuahuan Desert are also identified for recreational use, including but not limited to hiking and trail riding (BLM 2021).

5.1.2 Aesthetics

Aesthetic resources consist of natural and man-made landscape features that give a particular environment its visual characteristics. Most of the Project segment is within areas previously disturbed by prior barrier and road construction and USBP law enforcement activities. Very little natural vegetation is present within the Project Area.

5.2 ENVIRONMENTAL CONSEQUENCES

5.2.1 Land Use and Recreation

Land use would remain the same in the Project Area. All replacement barrier will be constructed within the footprint of existing barrier within the Roosevelt Reservation, resulting in no newly disturbed land. New primary barrier will be constructed within the Roosevelt Reservation, which is land set aside for border security uses. Therefore, the Project would be compatible with the existing land use categories and would not impact land use.

Short-term, minor, adverse impacts on recreation have the potential to occur within the Chihuahuan Desert. Such impacts could include the temporary closure of certain areas that the public uses for recreational purposes. Temporary closure of these areas has the potential to result in decreased public access to land for activities such as hiking and trail riding.

5.2.2 Aesthetics

The existing border barrier to be replaced as part of the Project consists of vehicle barrier — post-and-rail, Normandy-style, and bollard fencing — designed to prevent illegal vehicle traffic. The post-and-rail design consists of a steel pipe (approximately 6 to 8 inches in diameter) placed into the ground at 4 to 6 feet, filled with concrete with welded steel along the tops of the support pipes in a horizontal manner. The vertical support pipes are positioned at 4- to 5- foot centers. The Normandy-style vehicle barrier is typically constructed of welded metal similar to railroad rail that

is placed on the ground and welded together. A typical section of Normandy-style vehicle barrier is 10 to 12 feet long and stands 4 to 6 feet high. Existing bollard vehicle barrier consists of 4-inch-diameter steel bollards sunk vertically, with a continuous reinforced concrete foundation at a depth of 6 inches and a width of 20 inches. This fencing was typically outfitted with pipe, tubing, or similar material to prevent livestock from crossing but allow most wildlife to easily pass through.

The new bollard barrier will be 18- to 30-feet tall, which is significantly taller than the current vehicle barrier. Therefore, the bollard barrier will be visually more substantial than the existing barrier, and therefore more of a visual impediment. However, the new bollard barrier will also provide a greater level of security in the area. Long-term, moderate, adverse impacts would be expected to occur.

6. GEOLOGICAL RESOURCES AND SOILS

6.1 AFFECTED ENVIRONMENT

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

Regional Geology. The Project Area is in the southeastern portion of the Basin and Range physiographic province, which is characterized by northerly to northwesterly trending, narrow, rugged mountain ranges separated by broad basins. This topography results from extensions of the Earth's crust; there are known active fault lines in the area. The Quaternary geological formation is the major geological feature, consisting of undivided clay, silt, sand, gravel, and some caliche. Gravel includes sedimentary and igneous rock clasts (Scott 2012).

Soils. Soil structure and chemistry contributes to the determination of prime and unique farmland. Prime and unique farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. No prime farmland exists within the Project Area. Unique farmland is defined as land other than prime farmland that is used to produce specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high-quality or high yields of a specific crop when treated and managed according to acceptable farming methods. Soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not water or urban developed land. **Table 6-1** describes the soil characteristics of the Project Area.

The Project Area falls within the Chihuahuan Desert ecoregion. The Chihuahuan Desert ecoregion is isolated from adjacent arid regions by two mountain ranges, the Sierra Madre Occidental to the west and the Sierra Madre Oriental to the east. The climate includes hot summers and cool to cold, dry winters. Annual precipitation ranges from approximately 6 to 20 inches, with a large part of the rain falling in the form of monsoonal rains during the summer months. The basin and range topography of the Chihuahuan Desert consists of broad desert valleys (basins) bordered by terraces, mesas, and mountains (ranges). Salt lakes or playas can form because rainwater drains internally in these closed basins. Dune fields composed of quartz or gypsum sand are also common (NPS 2021).

Table 6-1. Soil Characteristics of Project Area

Soil Type	Slope	Runoff Potential	Percent of Project Area[1]
Rough broken and Rock land	25 to 75 percent	Very high	16.3634
Lehmans extremely rocky loam	10 to 25 percent	Very high	0.3504
Upton gravelly sandy loam	3 to 10 percent	High	0.2364
Eba very gravelly clay loam	0 to 10 percent	Very high	0.0640

Source: NRCS Undated.
(1) Natural Resources Conservation Service (NRCS) does not have available data for the 96 percent of the Project Area.

6.2 ENVIRONMENTAL CONSEQUENCES

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

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

Soils. Approximately 17.45 acres of soil have the potential to be permanently affected; however, the soils within the Project Area have already been permanently impacted by previous barrier and all-weather patrol road construction. Therefore, short-term, minor, adverse impacts on soils have the potential to result from further disturbance of ground surfaces, earthmoving activities, and grading within the proposed disturbance area during construction. These activities would excavate soils and expose rock materials, temporarily remove vegetation in some areas, and expose soils to erosion.

In general, accelerated erosion of soils have the potential to be short-term and minimized by appropriately siting and designing facilities to account for soil limitations, employing construction and stabilization techniques appropriate for the soil and climate, and implementing BMPs and erosion-control measures. BMPs include the installation of silt fencing and sediment traps, applying water to disturbed soil to reduce dust, grading staging areas, and revegetating disturbed areas as soon as possible following ground disturbance, as appropriate. Pre- and post-construction BMPs have been developed and will be implemented to reduce or eliminate erosion and potential downstream sedimentation.

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

7. HYDROLOGY AND WATER MANAGEMENT

7.1 AFFECTED ENVIRONMENT

A general Waters of the United States (WOUS) survey was conducted in July 2019 for the entire El Paso 1 project area (the Survey Area), which encompasses the El Paso 6-6 Project Area. Hydrology and water management relate to natural and man-made water resources that are available for use by, and for the benefit of, humans and the environment. Evaluation of hydrology and water resources examines the quantity and quality of the resource and its demand for various purposes.

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

The water in this region exists as groundwater or surface water. These two water sources are interconnected and dependent on drainage features and hydrology. Drainage features and hydrology recharge the aquifers, which provides water for extraction from wells and can flow into surface water in gaining streams and rivers. Evaluation of hydrology requires a study of the occurrence, distribution, and movement of water and its relationship with the environment. Many factors affect the hydrology of a region, including natural precipitation, evaporation rates, and outside influences such as groundwater withdrawals. Groundwater is a subsurface hydrologic resource that can recharge or be recharged by surface water. It is used for drinking, irrigation, and industrial processes. Groundwater can be described in terms of its depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations.

7.1.1 Groundwater

The aquifers in the Survey Area are a part of the Basin and Range–Mimbres Basins (see **Figure 7-1**) consisting of unconfined sediment aquifers in rift basin-fill. The international agreement that governs Rio Grande surface water, the 1944 U.S.-Mexico Water Treaty, doesn't apply to the water of this bi-national aquifer (Villagran 2017), although approximately 78 percent of the population of New Mexico relies on groundwater for drinking water (NMED 2020).

This system consists of a network of hydraulically interconnected aquifers in basin-fill deposits along the Rio Grande Valley and nearby valleys (King et al. 1971). The aquifers of the Rio Grande Valley are capable of high yields and represent a precious resource for New Mexico. Recharge

primarily originates from rainfall and snowmelt in the mountainous areas around the basins, percolating downward through streambeds and porous rock formations.

Precipitation that falls in the valleys is generally lost to evaporation and, more importantly, to transpiration by desert-adapted plant species. Little water percolates to a depth sufficient to recharge the aquifers in the area near this Project. Shallow soil horizons plugged with carbonate inhibit deep movement of soil moisture, thereby retaining the limited amounts of water for plant use and preventing downward percolation into the thick interzone of unsaturated basin fill. Groundwater discharges from the system include evapotranspiration, withdrawal from wells and drains, discharge to streams, and underflow, although pumping wells are the primary means of discharge.

Water quality is typically considered good, but high conductivity (minerals, total dissolved solids, and salinity) can be characteristic.

The primary groundwater quality issue in the Lower Rio Grande Basin is increased salinity, which reduces potable water supplies, deteriorates soil quality, and leads to smaller crop yields (NMED 2020).

Two drinking water wells were identified near the Survey Area in the City of Columbus. No other types of wells (abandoned extraction or injection) were identified by the New Mexico OpenEnviroMap (NMED 2020).

Figure 7-1. Map of Aquifers near the Survey Area

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7.1.2 Surface Water and Waters of the United States

The Survey Area is in the Chihuahuan Desert Ecoregion (Griffith 2006). This ecoregion differs from other hot deserts, such as the Sonoran, because it is at higher elevations and has summer-dominated rainfall as opposed to a biannual precipitation regime. The annual precipitation can exceed 8 inches (NYAP 1978). Some areas of the Chihuahuan desert are the hottest and most arid regions in the state, with low available moisture and high evapotranspiration rates, while at higher elevations there is somewhat greater annual precipitation.

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

The evaluation of wetland and waters indicators to determine the presence of water subject to jurisdiction was conducted in July 2019 (see **Appendix D**). The Survey Area for the delineation consisted of the 60-foot boundary north of the existing vehicle barricade following the main patrol road along the international boundary.

The Navigable Waters Protection Rule was published by the U.S. Environmental Protection Agency (USEPA) and the Department of the Army (Army) in the *Federal Register*, effective June 22, 2020. The rule replaced the already published rule from October 22, 2019. The Navigable Waters Protection Rule implements:

> "the overall objective of the Clean Water Act to restore and maintain the integrity of the nation's waters by maintaining federal authority over those waters that congress determined should be regulated by the Federal government under its Commerce Clause powers, while adhering to Congress' policy directive to preserve States' primary authority over land and water resources. The final definition increases the predictability and consistency of Clean Water Act programs by clarifying the scope of "waters of the United States" federally regulated under the Act" (Federal Register 2020).

The July 2019 Natural Channel Design, Inc. survey identified 21 drainages in the western portion of the 46-mile Project corridor, which merited further characterization to determine whether definition as WOUS under Section 404 of the CWA (40 CFR 230.3(s)) would be warranted. These channels exhibited an OHWM, and traveled into or from Mexico, crossing the border, and as such could be considered interstate waters and subject to the USACE jurisdiction under current regulations.

The ground within the Project Area has been heavily affected by road construction, vehicle travel, and surface maintenance. In many areas, the OHWM was only observable immediately upstream

and downstream from recent disturbance. None of the drainages that flow through the Survey Area connect to a traditional navigable water (TNW). All washes identified on the construction drawings that require a low-water crossing or culvert are isolated waters that do not flow out of the immediate area and do not have a significant nexus to any TNW.

However, the surveyors identified 21 washes that originate in the United States or Mexico and cross the international border (see **Table 3-5**); these could be classified as interstate waters and deemed jurisdictional (Natural Chanel Design, Inc. 2019).

Table 3-5: Washes Crossing the International Border

Site No.	Latitude (dd)	Longitude (dd)	Hydrologic Unit Code	Jurisdictional Area (ac)	Stream Length in Project Area (ft)	Average Width (ft)
Dem A	31.7837	-107.10989	13030202	0.31	370	62
Dem B	31.7837	-107.1503	13030202	0.04	60	35
Dem C	31.7837	-107.184	13030202	0.04	60	43
Dem D	31.7837	-107.2013	13030202	0.07	60	51
Dem E	31.7837	-107.205	13030202	0.066	60	50
Dem F	31.7837	-107.2228	13030202	0.09	60	66
Dem G	31.7837	-107.2345	13030202	0.05	60	40
Dem H	31.7837	-107.2368	13030202	0.04	60	39
Dem I	31.7837	-107.2769	13030202	0.05	60	29
Dem J	31.7837	-107.378	13030202	0.09	60	72
Dem K	31.7837	-107.418	13030202	0.26	60	191
Dem L	31.7837	-107.687	13030202	0.04	60	56
Dem M	31.7837	-107.7007	13030202	0.09	60	65
Dem N	31.7837	-107.7264	13030202	0.017	76	8
Dem O	31.7837	-107.7271	13030202	0.016	74	8
Dem P	31.7837	-107.7361	13030201	0.014	60	11
Dem Q	31.7837	-107.7441	13030201	0.023	60	24
Dem R	31.7837	-107.7535	13030201	0.2	60	166
Dem S	31.7837	-107.8269	13030201	0.06	60	45
Dem T	31.7837	-107.8658	13030201	0.09	60	64
Dem U	31.7837	-107.8675	13030201	0.038	60	30

These interstate waters were delineated for preliminary jurisdictional areas because of potential jurisdictional importance, not because of possible habitat importance. They total 1.694 acres within the Survey Area. The 1987 USACE Wetland Delineation Manual relies heavily on the presence of hydrology (Environmental Laboratory 1978), which is evident, and the presence of hydric soils and hydrophytic plants, which are not present. Due to the climate of the Survey Area, these surface drainage channels are dry much of the year and considered ephemeral. No wetlands or existing TNW are in the area slated for construction, yards, or access roads.

Non-Jurisdictional. Aerial photographs have been interpretated to show outlines of drainages crossing the border where there is sufficient subterranean moisture available to support a denser growth of mesquite. However, upon ground inspection, there are no surface flows that create a channel or evidence of ordinary high water. Many are also depressional features or playas that

could temporarily hold accumulated rainfall, but due to the lack of moisture and vegetation, they do not support conditions to meet the definition of a wetland. There were no other wetlands identified in the field or on the National Wetland Inventory map within the Survey Area.

7.1.3 Floodplains

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

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

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

Floodplains in the Survey Area. There are no floodplains in the Survey Area and there will be no impacts from the Project.

7.2 ENVIRONMENTAL CONSEQUENCES

7.2.1 Groundwater

The Project has the potential to result in minor to moderate, temporary adverse impacts on the availability of water resources in the region. The Project requires water from the local supply for road construction, including pouring concrete, cut-and-fill operations, and fugitive dust suppression during construction activities. If local groundwater pumping is found to have an adverse effect on aquatic-, marsh-, or riparian-dwelling threatened and endangered species, treated water from outside the immediate area must be used.

The likelihood for groundwater contamination due to road improvements or barrier installation will be negligible due to the implementation of SWPPP measures and the natural filtration of soils overlying the aquifers in the Project Area. Groundwater quality is not anticipated to be permanently impacted from the Project.

7.2.2 Surface Water and Waters of the United States

Construction of the proposed barrier system has the potential to result in permanent and temporary, minor, adverse impacts on ephemeral surface waters, including the 0.254 acres of potentially jurisdictional waters within the Project Area. The Project has the potential to increase impervious surfaces, which could redirect surface flows and result in adverse impacts on surface waters if these flows cause scour or introduce sediment or other contaminants not already occurring in the drainages.

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

7.2.3 Floodplains

There are no floodplains in the Survey Area and there will be no impacts from the Project.

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

8.1 AFFECTED ENVIRONMENT

A general biological survey was conducted in July 2019 for the entire El Paso 1 project area (the Survey Area), which encompasses the El Paso 6-6 Project Area (see **Appendix A**). Vegetation mapping was conducted with the use of a sub-meter global positioning system (GPS) and aerial photographs. During all surveys and site visits, biologists documented all plant and wildlife species incidentally observed. The Survey Area was delineated by the vehicle barrier to the south and extended 60 feet to the north following the main patrol road.

The biological survey is intended to identify the presence or absence of suitable habitat for each special status species known to occur in the vicinity and to determine its potential to occur in the Survey Area. Biologists used their best professional judgement using the information and conditions available to make an assessment. Surveys were conducted outside the optimal period when annual special status plant species and special status wildlife would have been detected. In cases where little information is known about species occurrences and habitat requirements, the species evaluation is based on the best professional judgment of the biologists with experience working with the species and habitats.

The Survey Area is split among two segments of land. The first segment begins west of the Columbus POE, starting at Border Monument 31 and extending east approximately 15 miles to Border Monument 23. The second segment is east of the Columbus POE, starting approximately one mile west of Border Monument 20 and extending east approximately 31.5 miles to Border Monument 9. Most of the area has been previously disturbed by past border barrier construction and patrol road. The Project traverses the Chihuahuan Desert and various other rural areas of Luna County. The landscape within the Project Area is generally undisturbed, consisting of open desert, except for the existing barrier and patrol roads. The Survey Area falls within the Chihuahuan Desert ecoregion (NPS 2021).

8.1.1 Vegetation

Vegetation resources include all plants that are found within the region of analysis, in this case the region of analysis is Luna County. Vegetation analysis and descriptions were conducted using Bailey's multi-tiered classification of ecoregions contained in the U.S. Forest Service (USFS) *Descriptions of the Ecoregions of the United States* (USFS 1995). In addition, the USGS Gap Analysis Program Level 3 Data and associated NatureServe descriptions of the ecological systems were used to describe the vegetation in the region of analysis (USGS 2020). Site visits and surveys are further discussed in **Appendix A**.

8.1.1.1 Vegetative Communities

The Survey Area was surveyed for plant associations in July 2019. The survey revealed 13 plant communities along the Survey Area. Four of the plant communities were heavily impacted or created by disturbance such as heavy vehicle traffic, farming, or modifications due to human-made

engineering. The other nine plant communities had minimal to moderate disturbance such as various grazing or communities in stages of habitat succession. **Table 8-1** describes the composition of plant communities within the Project Area.

Table 8-1. Vegetative Communities Found within the Project Area

Plant Community	Percent of Project Area
Disturbed Desert Scrub	3.1
Artificial Drainage Trench	2.3
Artificial Wash	3.8
Agricultural Fields	9.9
Creosotebush	26.7
Sacaton Grasslands	3.8
Desert Grassland with Mixed Shrub	12.9
Arroyo/Wash	3.1
Mixed Desert Scrub	9.2
Mesquite Coppice Dune	14.5
Ocotillo-Creosotebush	3.1
Broomweed-Mesquite	5.3
Dense Mesquite Shrubland in Sandy Soil	2.3

Disturbed Desert Scrub. This habitat is composed almost entirely of bare ground but can also be found with scattered regrowth from *Larrea tridentata*, *Cirsium sp.*, *Guttierezia sp.*, and mixed grass and forbs.

Artificial Drainage Trench. This disturbed community consists of man-made trench bordered by Larrea grasslands. Common plants in the trench can include *Datura meteloides*, *Solanum eliagnifolium*, *Laennecia coulteri*, *Peganum harmala*, *Gutierrezia sp.*, *Bahia absinthifolia*, and *Glandularia sp*.

Artificial Wash. This disturbed community consists of sparse vegetation and mostly bare ground. Large gravel rocks are placed in the area to slow down water during ephemeral floods. Plants growing in the periphery of the rocks could include *Laennecia coulteri*, *Solanum eliagnifolium*, *Larrea tridentata*, *Ephedra trifurca*, *Asclepias brachycarpa*, and *Gutierrezia sp*.

Agricultural Field. This farmland habitat is found in fallow states or with crops.

Creosotebush Scrub. This is the most common and widespread community type in the Survey Area. It is known as Larrea scrub and characterized by *Larrea tridentata* (Creosotebush), the most widespread and abundant species in the Chihuahuan Desert. It is typically found in sandy soils with both igneous and sedimentary geologic features. This community had 30 percent plant cover and a stature of 1.64 feet. Most of the cover consists of *L. tridentata*, especially in lower elevations but other shrub species including *Prosopis glandulosa*, *Parthenium incanum*, and *Krameria erecta* are also present. Grass and forb ground cover is scattered unevenly with palatable species decreasing with grazing pressure. In some, usually disturbed, habitats, mesquite can replace Larrea as the main dominant and become more of a mesquite scrub. Other plants observed in this community include *Ferocactus wislizeni*, *Amphyachryis dracunculoides*, *Cylindropuntia*

imbricata, *Yucca elata*, *Artemisia filifolia*, *Tidestromia lanuginosa*, *Nerisyrenia linearifolia*, *Ziziphus obtusifolia*, *Datura meteloides*, *Cevalia sinuata*, *Gutierrezia sp.*, *Vachellia sp.*, *Zinnia acerosa*, *Bahia absinthifolia*, and *Tiquilia sp*.

Sacaton Grasslands. This grassland is dominated by the salt-tolerant *Sporobolus airoides* (alkali sacaton), which was in the periphery of humid soils. This community had 80 percent plant cover and was mixed with other herbaceous species including *Solanum elaeagnifolium*, *Sphaeralcea angustifolia*, *Sphaeralcea hastulata*, *Laennecia coulteri*, *Glandularia sp.*, and mixed grasses. Scattered infrequent shrubs of *Prosopis glandulosa*, *Flourensia cernua*, and *Gutierrezia sp*. were also present.

Desert Grassland with Mixed Shrubs. This is an open grassland that contains scattered shrubs, many of which are salt-tolerant species. This is a naturally occurring community with signs of grazing and brush encroachment. Flowering heads were not present during surveys but due to the size and growth habits, the dominant grass species is believed to be *Sporobulus contractus*, although the grass composition is continuously varied, and species can replace one another in dominance. Other species seen growing in this community include *Prosopis glandulosa, Ziziphus obtusifolia*, *Gutierrezia sp.*, *Atriplex canescnes*, *Atriplex sp.*, *Suaeda sp.*, *Heliotropiuim sp.*, and several annual composites. This community type was also seen because of previous disturbance and growing alongside *Larrea tridentata*, *Yucca elata*, *Laennecia coulteri*, *Parthenium incanum*, *Ephedra trifurca*, and *Cirsium sp*. and other annual forb species.

Arroyo/Wash. This community was represented by a drainage or wash where water flows during flash floods and has no artificial manipulation.

Mixed Desert Scrub. This community had 60 percent plant cover and stature less than 3.28 feet tall. This community type often blended with other desert scrub communities. Moderate grazing occurred in some areas and reduced forb and grass cover. Some of the dominant species include *Atriplex canescens*, *Prosopis glandulosa*, and *Yucca elata*. Other shrub species included *Lycium sp*. and *Gutierezzia sp*.

Mesquite Coppice Dune. This community averages more than 3.28 feet in height and had about 50 percent plant cover. Mesquite as a dominant species was associated in co-dominance with *Larrea tridendata*, *Artemisia filifolia*, or *Atriplex cansecens* and in other situations mesquite would mix with several other shrubs as a sub-dominant. Other shrubs include *Yucca elata*, *Ziziphus obtusifolia*, *Amphyachryis dracunculoides*, *Koeberlinia spinosa*, *Gutierezzia sp.*, *Lycium sp.*, *Ephedra sp.*, and *Zinnia acerosa*, mixed with forbs such as *Nerisyrenia linearifolia* and others.

Ocotillo-Creosotebush Scrub. This community is composed of Fouquiera-Larrea scrub and is a sub-category of Larrea scrub as it is a desert shrubland dominated by the aforementioned species. However, this community is characterized by scattered wand-like protrusions less than 6.56 feet tall from the spiny stems of the Ocotillo (*Fouquiera splendens*) shrub. This community was mainly found on rocky, sandy soils from mountain sides. Aside from *F. splendens*, this community had vegetation plant cover less than 3.28 feet tall and covered about 50 percent of the ground with species including *Larrea tridendata*, *Gutierezzia sp.*, *Ziziphus obtusifolia*, *Ephedra sp.*, *Zinnia acerosa*, *Ephedra sp.*, *Bahia absinthifolia*, *Senna sp.*, *Ferocactus wislizeni*, *Cylindropuntia imbricata*, and *Nerisyrenia linearifolia*.

Broomweed-Mesquite. This community is less than 3.28 feet tall with sparse vegetation cover of less than 50 percent. This community was dominated by short, compact shrubs that usually included broomweeds: prairie broomweed (*Amphyacharis dracunculoides*), broomweed (*Gutierezzia sp.*), and broom indigobush (*Psorothamnus scoparius*) and Mesquite (*Prosopis glandulosa*). Other species in this community include *Eriogonum abertianum*, *Ephedra sp.*, *Proboscidea sp.*, *Zinnia acerosa*, *Amsonia sp.*, *Vachellia sp.*, *Cylindropuntia sp.*, *Sporobolus sp.*, *Calliandra sp.*, and *Nama hispida*. *Larrea tridendata* can be absent to dominant until transitioning into Larrea scrub.

Dense Mesquite Shrubland in Sandy Soil. The composition and structure of this community is a result of brush encroachment. The plant cover is about 80 percent and shrubs are greater than 6.56 feet tall. The dominant plant is mesquite (*Prosopis glandulosa*) and other plants in this community include *Atiplex canescens*, *Ephedra sp.*, *Vachellia sp.*, *Solanum elaeagnifolium*, *Gutierezzia sp.*, *Senna sp.*, and *Physalis sp*.

8.1.2 Wildlife

Wildlife observed within the Survey Area was consistent with what was expected to be found. The survey included driving the existing patrol road and identifying and recording all avian nests, wildlife sightings, and burrows. Mammal species included the collared peccary (*Dicotyles tajacu*), black-tailed jackrabbit (*Lepus californicus*), the spotted squirrel (*Xerospermophilus spilosoma*), and the desert cottontail (*Syvilagus audubonii*). Reptiles included the Long-nosed lizard (*Gambelia wislizenii*), the Chihuahuan spotted whiptail (*Aspidoscelis exsanguis*), and the desert grassland whiptail (*Aspidoscelis uniparens*).

Twenty species of birds were identified during biological surveys, including the mourning dove (*Zenaida maroura*), red-tailed hawk (*Buteo jamaicensis*), loggerhead shrike (*Lanius ludoviscianus*), scaled quail (*Callipepla squamata*), mourning dove (*Zenaida macroura*), Greater Roadrunner (*Geococcyx californianus*), turkey vulture (*Cathartes aura*), Swainson's hawk (*Buteo swainsoni*), American kestrel (*Falco sparverius*), western kingbird (*Tyrannus verticalis*), Chihuahuan raven (*Corvus cryptoleucus*), northern mockingbird (*Mimus polyglottos*), black-throated sparrow (*Amphispiza bilineata*), western meadowlark (*Sturnella neglecta*), Ash-throated flycatcher (*Myiarchus cinerascens*), burrowing owl (*Athene cunicularia*), horned lark (*Eremophila alpestris*), cactus wren (*Campylorhynchus brunneicapillus*), curve-billed thrasher (*Toxostoma curvirostre*), crissal thrasher (*Toxostoma crissale*), and Lucy's warbler (*Leiothlpis luciae*).

8.1.2.1 Federal-Listed Species

USFWS lists six federally endangered or threatened species within Luna County, New Mexico, including the monarch butterfly (*Danaus plexippus*), northern Aplomado falcon (*Falco femoralis septentrionalis*), yellow-billed cuckoo (*Coccyzus americanus*), Sprague's pipit (*Anthus spragueii*), Chiricahua leopard frog (*Rana chiricahuensis*), and beautiful shiner (*Cyprinella formosa*) (USFWS 2021). No critical habitat for any of these federally listed threatened or endangered species has been identified within the Project Area, nor were any of these species observed during the July 2019 biological survey. However, suitable foraging and nesting habitat for the northern Aplomado falcon and Chiricahua leopard frog was identified.

8.2 ENVIRONMENTAL CONSEQUENCES

8.2.1 Vegetation

Direct, adverse impacts on vegetation within the Survey Area could occur as a result of barrier replacement activities. Vegetation would be impacted through direct loss of individuals. Adverse impacts on vegetation found within the Survey Area could be mitigated by avoidance with guidance by a qualified biological monitor. BMPs would be implemented to minimize potential impacts on special status plant species. Additionally, the anticipated reduction in illegal border traffic from the deterrence provided by the bollard-style barrier will have a beneficial impact on vegetation in the region. Fewer border crossings could result in fewer opportunities for vegetation to be disturbed by foot traffic, litter, and other human activities.

8.2.2 Wildlife and Aquatic Resources

Most of the wildlife likely to be found within the Survey Area is common and widespread throughout the region. Mobile wildlife such as birds and larger mammals would likely move away from barrier replacement activities toward nearby areas of similar habitat, while smaller, slow, or sedentary species such as invertebrates, reptiles, and smaller mammals could potentially be impacted during construction. Therefore, direct, adverse impacts on wildlife within the Survey Area have the potential to occur. However, because construction will be temporary and temporarily impacted native habitat would be restored, this Project is unlikely to result in any long-term or significant decreases in population for most wildlife in the region.

Migratory birds have the potential to be impacted through direct loss of habitat, including foraging, roosting, nesting, and escape cover. Adverse impacts on nesting birds found within the Project footprint could be mitigated by consulting a qualified biologist to implement avoidance measures. Mammals whose migratory patterns have the potential to be disrupted by the inability to traverse through the bollard-style fencing could also experience the loss of genetic diversity when no longer able to mate with populations across the border. BMPs would be implemented to minimize potential impacts on special status wildlife species.

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

The use of portable construction lighting has the potential to affect wildlife. Light pollution can cause disorientation to wildlife by extending diurnal and crepuscular behaviors into the night. Some species could potentially benefit from this because it increases foraging potential for predators but decreases benefits for prey (Longcore and Rich 2004). Conversely, wildlife that forages at night have the potential to be adversely influenced due to the shortened nighttime hours or could move away from the area altogether.

Reproduction in certain species also has the potential to be affected. Frogs, for example, have been documented to stop mating activity in the presence of nighttime light (Touzot 2019). The Project Area will be illuminated at night by permanent lighting for border enforcement activities, which will have a moderate impact on wildlife activities. However, all lighting is shielded and directed downward to prevent light from traveling to areas where it is not needed, therefore minimizing impacts on wildlife.

9. CULTURAL RESOURCES

9.1 AFFECTED ENVIRONMENT

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

9.1.1 Location

The Survey Area encompasses the entire El Paso 1 project area (the Survey Area) which includes the El Paso 6-6 Project Area. The Project Area is in the Basin and Range Province or, more specifically, within the Mexican Highland Section. The semi-arid Basin and Range province in the southwestern corner of New Mexico is part of a larger geologic feature of the same name that also covers portions of western Texas, southern Arizona, western Utah, southern Idaho, eastern California, and most of Nevada. The Basin and Range extends into northern Mexico, as well. In this portion of the province, mountains have a slightly lower elevation than those found in the northern part.

The Survey Area includes roughly 348.58 acres to the east and west of the Columbus POE in southern Luna and Doña Ana counties, New Mexico, along the U.S.-Mexico International Border. The Survey Area is comprised of two segments of the Roosevelt Reservation (the 60-ft-wide corridor on the north side of the border, measuring 33.87 miles between the Santa Teresa POE and the Columbus POE on the east and 14.06 miles west of the Columbus POE). Land ownership includes the Roosevelt Reservation, which is on lands administered by CBP.

9.1.2 Cultural History Overview

The cultural history of south-central New Mexico and the Trans-Pecos region includes four major subdivisions, the Paleoindian Period (ca. 9,000–6,000 Before Common Era [BCE]), the Archaic Period (ca. 6,000 BCE to Common Era [CE] 200), the Formative Period (CE 200–1450), and the Protohistoric and Historic periods (CE 1450 to present). These periods have been defined by archaeologists given changes in cultural adaptations to environmental conditions, technological changes, and subsistence strategies. Note that disagreement exists over specific dates, but consensus exists for the general trends.

9.1.3 Survey Results

A full-coverage survey was completed of all access roads, yards, and of the fiber optic line to the north of the Roosevelt Reservation. Fifteen newly discovered sites were recorded during the Project (see **Table 9-1**). All fifteen sites are historical border monuments that date between 1891–1896. All these sites are considered significant and are recommended as eligible for inclusion in the NRHP under criterion A (historical event). The Project will not affect these sites. It is recommended that all 15 newly recorded sites be avoided. In the event these sites cannot be avoided, the sites and the immediate surrounding area should be monitored during the proposed undertaking.

Table 9-1. Newly Discovered Sites in the Project Area

Site	Type and Age	Elevation	NRHP	Eligibility Management
194680	Border Monument 30	1,252	Eligible	Avoidance/Monitor
194681	Border Monument 29	1,272	Eligible	Avoidance/Monitor
194682	Border Monument 28	1,306	Eligible	Avoidance/Monitor
194683	Border Monument 27*	1,294	Eligible	Avoidance/Monitor
194684	Border Monument 26	1,315	Eligible	Avoidance/Monitor
194685	Border Monument 25	1,297	Eligible	Avoidance/Monitor
194686	Border Monument 24	1,259	Eligible	Avoidance/Monitor
194687	Border Monument 20*	1,211	Eligible	Avoidance/Monitor
194688	Border Monument 19	1,208	Eligible	Avoidance/Monitor
194689	Border Monument 18	1,205	Eligible	Avoidance/Monitor
194690	Border Monument 17	1,203	Eligible	Avoidance/Monitor
194691	Border Monument 15	1,280	Eligible	Avoidance/Monitor
194692	Border Monument 14	1,319	Eligible	Avoidance/Monitor
194693	Border Monument 10	1,259	Eligible	Avoidance/Monitor
194694	Border Monument 9	1,288	Eligible	Avoidance/Monitor

All sites include portions of, or are adjacent to, the Roosevelt Reservation. Note that nearly all the Roosevelt Reservation has previously been disturbed by relatively recent improvements to the border barrier and access roads. Archaeological survey, as well as archaeological test investigations of selected sites, was conducted prior to those improvements (Kurota and Turnbow 2008, 2009; Sechrist 1994; Trierweiler and Bonine 2003; Trierweiler and Smith 2004). During the current Project, 27 previously recorded sites were revisited. Artifacts were identified at 18 of the 27 previously recorded sites. No artifacts or features were found within the Roosevelt Reservation at the remaining nine sites previously recorded within the current Area of Potential Effect (APE).

Previous investigations have recommended that two of the 27 sites (LA 85756 and LA 85758) along the Roosevelt Reservation should not be considered NRHP-eligible. No further action at either of these sites was recommended. Ten sites have been determined NRHP-eligible and another 15 sites have not been evaluated or are considered to have unknown NRHP eligibility. It was recommended that 22 of the 25 eligible and indeterminate sites should be avoided. The proposed undertaking will not involve any impacts outside the Roosevelt Reservation. However, given the possibility of buried deposits (due to shifting sand and dune accumulation), it was recommended that if avoidance is not possible monitoring should be conducted during any ground

disturbance within and near the immediate surrounding area of these sites. The remaining three sites (LA 85755, LA 85757, and LA 85760) have been exhausted of further research potential and no further work is warranted.

Finally, 14 isolated occurrences (IO) were recorded. IOs include prehistoric and historical resources. These include individual artifacts and isolated historic to modern features. None of the IOs meet the criteria for archaeological sites. They are not considered significant, and no additional investigation is recommended.

If previously unidentified cultural resources are encountered during construction, the contractor should stop all ground-disturbing activities in the vicinity of the discovery until officials from CBP are notified and the nature and significance of the find can be evaluated. If human remains are encountered during construction activity, construction should stop, and appropriate notifications made as per NAGPRA.

9.2 ENVIRONMENTAL CONSEQUENCES

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

If human remains are encountered during construction activity, construction should stop, and the proper authorities from CBP must also be notified per NAGPRA. With the implementation of these recommendations, in conjunction with the BMPs listed in **Chapter 1.5.7**, the Project will not have the potential to directly or indirectly adversely impact known cultural resources.

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10. SOCIOECONOMICS

10.1 AFFECTED ENVIRONMENT

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. While population and demographic data are relatively straightforward and maintained by the U.S. Census Bureau, there are many factors that can be used as indicators of economic conditions for a geographic area, such as employment and unemployment rates, employment by business sector, and median household income. In this section, data and analysis are provided for the Project's region of influence (ROI), the geographical area in which most of the socioeconomic effects are expected to occur. For the purposes of this ESP, the ROI is defined as Luna County, New Mexico.

According to the U.S. Census, the 2010 population of Luna County was 25,095 and the projected 2020 population would be 25,283.59 (UNM 2020).

The industries employing the greatest percentages of people in New Mexico are healthcare and social assistance and retail trade industries (UNM 2020). The smallest industry by population of those employed in New Mexico is the Management of Companies and Enterprises. The greatest population of citizens in Luna County are employed in office & administrative support occupations and sales and related occupations (UNM 2020).

The U.S. Census reports that in 2017, employer establishments in Luna County totaled 386 and that the unemployment rate in 2019 was 8.1%, which was above the state (4.5%) and national (3.6%) averages (UNM 2020). The Luna County 2018 per capita personal income (PCPI), the average income earned per person in an area, was $16,496. This is well below the 2018 national and state PCPI averages, which were $47,4516 and $26,085, respectively (UNM 2020).

10.2 ENVIRONMENTAL CONSEQUENCES

The Project is not anticipated to have impacts, direct or indirect, on long-term population or employment. The Project is anticipated to hire local construction crews and contractors for the duration of construction, reducing the need for new employees or relocation of employees. It is not anticipated that potential employees will be required to relocate to Luna County; therefore, population and demographics of the County will remain the same as preconstruction conditions.

The nature of the work associated with the construction phase would be temporary and would not result in additional long-term employment. Additionally, it is anticipated that a portion of the required supplies would be bought from the businesses in the vicinity of the Project Area. It is anticipated that the Project is likely to result in an increase in local spending on food and other incidentals. Although the Project has the potential to result in a short-term, beneficial impact on the economy through the provision of temporary jobs and purchasing materials and other personal expenses from local businesses, any increase in economic activity would not be sustained to permanently alter the economic status of the residents and/or businesses in the immediate vicinity.

Luna County will have the potential to benefit from the Project in the long term, since the replacement of the primary barrier and installation of complimentary security facilities will provide additional protection from illegal traffic across the border.

11. HAZARDOUS MATERIALS AND WASTE

11.1 AFFECTED ENVIRONMENT

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

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

Solid and hazardous wastes are regulated in New Mexico by a combination of mandated laws promulgated by the Federal, state, and regional Councils of Government. A search of USEPA's Envirofacts Data Warehouse showed no superfund sites near the Project Area (USEPA 2019). Furthermore, the Project Area has no structures; therefore, asbestos-containing materials, lead-based paint, and polychlorinated biphenyls in building materials do not exist on the site.

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

11.2 ENVIRONMENTAL CONSEQUENCES

Soils in the Project Area have the potential to be impacted by hazardous or toxic materials in the event of an accidental spill, which could lead to groundwater contamination. BMPs will be implemented during construction activities to avoid any release into the environment as well as to anticipate capture requirements in advance of any potential release. To prevent contamination of the Project Area, care will be taken to avoid impacting the Project Area with hazardous substances (e.g., anti-freeze, fuels, oils, lubricants) used during construction activities. These activities include implementing primary and secondary containment measures, developing a SPCCP prior to the start of construction, and briefing all personnel on the implementation and responsibilities of the SPCCP.

POLs will be stored at designated temporary staging areas to maintain and refuel construction equipment. Cleanup materials (e.g., oil mops) will be maintained on site, in accordance with the SPCCP, to allow for immediate action in the event of an accidental spill. Drip pans will be provided for power generators and other stationary equipment to capture any POLs spilled during maintenance activities or in the event of equipment leaks. A concrete washout containment system will be established to ensure concrete washout is safely managed and properly disposed.

Sanitation facilities will be provided during construction activities and waste products will be collected and disposed of by licensed contractors. No gray water will be discharged to the ground. Disposal contractors will use only established roads to transport equipment and supplies. Proper permits will be obtained by the licensed contractor tasked to handle any unregulated solid waste. All waste will be disposed of in strict compliance with Federal, state, and local regulations, in accordance with the contractor's permits. Therefore, no hazards to the public have the potential to occur through the transport, use, or disposal of unregulated solid waste.

12. RELATED PROJECTS AND POTENTIAL EFFECTS

12.1 CUMULATIVE AFFECTED ENVIRONMENT

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

This cumulative impacts analysis summarizes expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future projects. The geographic scope of the analysis varies by resource area. For example, the geographic scope of cumulative impacts on resources such as soils and vegetation is very narrow and focused on the location of the resource. The scope of air quality, wildlife and sensitive species, visual resources, and socioeconomics is much broader and considers more county or region-wide activities.

Projects that were considered for this analysis were identified by reviewing USBP documents, news releases, and published media reports, as well as through coordination with planning and engineering departments of local governments and state and Federal agencies, although only projects on the U.S. side of the border were possible to evaluate. Projects that do not occur in proximity (i.e., within several miles) to the Project will not contribute to a cumulative impact (or are not possible to evaluate if they are south of the border) and are generally not evaluated further.

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

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

12.2 CUMULATIVE FENCING ALONG THE SOUTHWESTERN BORDER

CBP has been identified to construct approximately 738 total miles of border barrier system, including approximately 659 miles of primary barriers and approximately 63 miles of secondary barriers on the southwestern border (CBP 2021). As of January 2021, approximately 455 miles of new primary and secondary border barrier system have been constructed. A summary of past, present, and reasonably foreseeable future actions near the Project Area are presented below.

12.3 PAST ACTIONS

Past actions include projects that have occurred in the relatively recent past that are within the cumulative effects analysis areas of this ESP. The effects of these past actions are generally described throughout the previous sections. For example, the existing vehicle and pedestrian barrier, existing POEs, the existing access roads, and the previously developed border infrastructure system (BIS) have all contributed to the existing environmental conditions of the area.

12.4 PRESENT ACTIONS

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

- **CBP-Funded Border Barrier** – CBP began construction of 46.2 miles of primary replacement border barrier system along the U.S./Mexico international border in Luna and Doña Ana counties, New Mexico. The project is centered around the Columbus, NM Land POE in Columbus, New Mexico, with Segments A, B, and C to the east of the POE and Segments D, E, and F to the west.

- **BIS Maintenance and Repair** - Routine all-weather road, secondary barrier, and associated lighting and water conveyance system repair and maintenance.

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

A review of the New Mexico Department of Transportation website, Governor's Office of Planning and Research, and Luna County Planning and Development Services did not yield any results for additional construction projects to consider.

12.5 REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions consist of activities that have been approved and can be evaluated with respect to their effects. USBP might be required to implement other activities and operations that are currently not foreseen or mentioned in this document. These actions could be

in response to national emergencies or security events, or to changes in the mode of operations of CBVs.

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

Other organizations, such as BLM, routinely prepare or update Resource Management Plans for the resources they manage. A summary of the anticipated cumulative impacts relative to the Project (i.e., construction of the all-weather road and installation of the secondary barrier) is presented below. These discussions are presented for each of the resources previously described.

12.6 ENVIRONMENTAL CONSEQUENCES

12.6.1 Air Quality

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

12.6.2 Noise

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

12.6.3 Land Use, Recreation, and Aesthetics

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

There will be visually apparent changes within the viewsheds that currently include the primary barrier. However, although the addition of a new, larger barrier has the potential to cause an adverse visual effect in some areas, it does not constitute a major impact on visual resources within the Project Area due to the presence of currently existing infrastructure. Still, when considered with other USBP projects, it has the potential to degrade the existing visual character of the region; thus, cumulative impacts have the potential to be considered moderate and CBP will minimize impacts on resources to the maximum extent feasible.

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

12.6.4 Geological Resources and Soils

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

The Project, when combined with other USBP projects, will not have the potential to permanently reduce prime farmland soils or agricultural production. Pre- and post-construction SWPPP measures will be implemented to control soil erosion. The permanent impact of legacy fence replacement combined with the other USBP projects, has the potential to constitute a moderate cumulative adverse impact.

12.6.5 Hydrology and Water Management

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

With the implementation of appropriate BMPs, the Project will not have the potential to substantially affect water quality.

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

The Project has the potential to have minimal impacts on native vegetation communities, but as discussed in **Chapter 8**, some direct negative impacts on wildlife within the Project Area have the potential to occur due to erosion, noise, lighting, or conflict with construction equipment. However, because construction has the potential to be temporary and impacts will be minimized by implementing appropriate BMPs for the protection of general plants and wildlife, these combined projects are unlikely to result in any long-term or significant decreases in wildlife populations in the region.

12.6.7 Cultural Resources

With the implementation of monitoring and other avoidance measures, as described in **Chapter 9**, the Project has the potential to result in minimal, if any, adverse impacts on cultural resources. Therefore, this action, when combined with other existing and proposed projects in the region, has the potential to have negligible cumulative impacts on cultural resources.

12.6.8 Socioeconomics

Construction of the Project, when combined with other USBP projects, has the potential to result in temporary, minor, and beneficial impacts on the region's economy. No impacts on populations, minorities, or low-income families have the potential to occur. When practicable, materials and other Project expenditures will predominantly be obtained through merchants in the local community. Local construction crews will also be employed to complete the Project. Safety buffer zones will be designated around all construction sites to ensure public health and safety. Long-term, cumulative effects of the projects on the regional economy have the potential to be beneficial by reducing smuggling and other illegal activity in the area. Legal border crossings and international trade have the potential to continue unaffected by the Project. When combined with the ongoing or currently planned projects within the region, there is the potential for minor cumulative, temporary beneficial impacts on the region's socioeconomics.

12.6.9 Hazardous Materials and Waste

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

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14. ABBREVIATIONS AND ACRONYMS

°F	Degrees Fahrenheit
AOR	Area of Responsibility
APE	Area of Potential Effect
BCE	Before Common Era
BIS	Border Infrastructure System
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	Bureau of Reclamation
BSR	Biological Survey Report
CAA	Clean Air Act
CBP	U.S. Customs and Border Protection
CBV	Cross-border violator
CE	Common Era
CFR	Code of Federal Regulations
CO	Carbon monoxide
CTIMR	Comprehensive Tactical Infrastructure Maintenance and Repair
CWA	Clean Water Act
dB	Decibels
dBA	A-Weighted decibel
DHS	Department of Homeland Security
DOI	Department of the Interior
E.O.	Executive Order
ESP	Environmental Stewardship Plan
ESSR	Environmental Stewardship Summary Report
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
GPD	Gallons per day
GPM	Gallons per minute

GPS	global positioning system
ICAPCD	Imperial County Air Pollution Control District
IIRIRA	Illegal Immigration Reform and Immigrant Responsibility Act
IO	Isolated occurrences
mg/m^3	Milligram per cubic meter
MOVES	Motor Vehicle Emission Simulator
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NGO	non-governmental organizations
NHPA	National Historic Preservation Act
NMDFG	New Mexico Department of Game and Fish
NMHPD	New Mexico Historic Preservation Division
NO_2	Nitrogen dioxide
NO_x	Total nitrogen oxides
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
PCPI	Per capita personal income
PM	Particulate matter
POE	Port of Entry
POLs	Petroleum, oil, and lubricants
ppb	Parts per billion
ppm	Parts per million
ROI	Region of Influence
SO_2	Sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasure Plan
SWPPP	Storm Water Pollution Prevention Plan
THC	Texas Historical Commission

TNW	Traditional navigable water
tpy	Tons per year
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USIBWC	U.S. Section, International Boundary and Water Commission
VOC	Volatile organic compound
WOUS	Waters of the U.S.
$\mu g/m^3$	micrograms per cubic meter

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APPENDIX A

Biological Survey Report

U.S. Customs and Border Protection

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Deming Station Area – Environmental Surveys Fence Replacement Projects

Biological Resources Survey Report

July 2019

Deming Station Area – Environmental Surveys Fence Replacement Projects

Biological Resources Survey Report

Deming, New Mexico

Submitted to:

Northland Research, Inc.

Prepared by:

Landhawk Consulting, LLC

LANDHAWK
CONSULTING

July 2019

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EXECUTIVE SUMMARY

Landhawk Consulting, LLC did not observe any state or federally listed wildlife or plant species during a biological resource survey of the 46-mile project area. Four wildlife species from the New Mexico Species of Greatest Conservation Need (SGCN) list were documented within the project area. A total of thirteen (13) plant communities were recorded, ranging from agricultural fields to a creosote bush shrubland. The project area was located in New Mexico within the Roosevelt Reservation of the Customs and Border Protection's Deming Station Area of Responsibility. During construction activities, biological resources protection and awareness will be provided by on-site biological monitors.

PROJECT BACKGROUND

The U.S. Customs and Border Protection (CBP) will replace two existing vehicle fence segments totaling approximately 46 miles with pedestrian fence in the Deming (DEM) Station Area of Responsibility (AOR). The first segment is west of the Columbus Port of Entry and starts at Border Monument 31 and extends east approximately 15 miles to Border Monument 23. The second segment is east of the Columbus Port of Entry and starts approximately one (1) mile west of Border Monument 20 and extends east approximately 31.5 miles to Border Monument 9. The construction will occur within the 60-foot wide Roosevelt Reservation along the New Mexico/Mexico border.

The replacement fence will be bollard style fence comprised of 6-inch diameter steel bollards, spaced 4 inches apart and will be 30 feet high. The project will include repairs and improvements to the existing patrol road, installation of a fiber optic cable for communications, installation of LED lighting, and installation of electrical utilities to supply power to the lighting and communications cable.

The CBP requested a biological resource survey to be conducted within the proposed project area. Accordingly, the purpose of this survey was to 1) determine the presence of rare, threatened and/or endangered species or their habitat occurring within the project area, 2) provide an overview of plant and wildlife occurring within the project area, 3) to record, map and describe all plant communities and 4) provide environmental protection recommendations.

PROJECT SITE DESCRIPTION

The project site is located within the 60-foot wide Roosevelt Reservation along a 46-mile stretch of the United States-Mexico border west of El Paso, Texas, in western Dona Ana county and southern Luna county in New Mexico. The area is located in a rural setting with the surrounding land uses limited to agricultural farming and cattle ranching. The majority of the corridor has previously been disturbed.

The herbaceous cover was diverse though primarily open vegetation, typical of the Chihuahuan desert. Several plant communities were documented and will be discussed at length in the results section of this report.

METHODS

A comprehensive review of federal and state databases was conducted to identify any rare, candidate, threatened and endangered species that could potentially occur within the project area. A list of federally listed species known to occur or potentially occurring in Luna and Dona Ana counties, New Mexico were obtained from the United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (iPAC) website. State listed animal species were obtained from the New Mexico Game & Fish website, while the state listed plant species were obtained from the New Mexico Endangered Plant Program. Other databases consulted include: Natural Heritage New Mexico, Biota Information System of New Mexico (BISON), eBird and iNaturalist.org.

A biological resource survey of the project area was conducted by Landhawk senior wildlife biologist J.D. Cortez and plant ecologist Raziel Flores in July 2019. The project area was limited to the 60-foot wide Roosevelt Reservation. The survey included driving the existing patrol road and identifying and recording all plant communities, avian nests, wildlife sightings, and burrows that Burrowing Owls could potentially utilize.

Categorization of plant communities was done with reference to Powell et al. (2018) and descriptions are provided based on vegetation structure, floristics, dominance, and soil characteristics from fieldwork observations.

RESULTS

Plant Communities

A total of thirteen (13) plant communities were recorded during the July biological resource survey. Four of the plant communities were heavily impacted or created by disturbance such as heavy vehicle traffic, farming, or modifications due to man-made engineering. The other nine plant communities had minimal to moderate disturbance such as various grazing or communities in stages of habitat succession. The composition of plant communities on the project area was 3.1% Disturbed desert scrub, 2.3 % Artificial drainage trench, 3.8% Artificial wash, 9.9% Agricultural fields, Creosotebush 26.7%, Sacaton grasslands 3.8%, Desert grassland with mixed shrubs 12.9%, Arroyo/wash 3.1%, Mixed desert scrub 9.2%, Mesquite coppice dune 14.5%, Ocotillo-Creosotebush 3.1%, Broomweed-mesquite 5.3%, Dense mesquite shrubland in sandy soil 2.3%.

Disturbed desert scrub was disturbed habitat that was composed almost of entirely of bare ground but was also found with scattered regrowth from *Larrea tridentata*, *Cirsium sp*., *Guttierezia sp*., and mixed grass and forbs.

Artificial drainage trench is a disturbed community with a man-made trench and bordered by Larrea grasslands. Common plants in the trench include *Datura meteloides*, *Solanum eliagnifolium*, *Laennecia coulteri*, *Peganum harmala*, *Gutierrezia sp*., *Bahia absinthifolia*, and *Glandularia sp*.

Artificial wash represents a disturbed community with sparse vegetation and mostly bare ground. Large gravel rocks have been placed in the area to slow down water during ephemeral floods. Plants growing in the periphery of the rocks include *Laennecia coulteri*, *Solanum eliagnifolium*, *Larrea tridentata*, *Ephedra trifurca*, *Asclepias brachycarpa*, and *Gutierrezia sp*.

Agricultural field is farmland habitat that was found in fallow states or with crops, such as recently harvested Alfalfa (*Medicago sativa*).

Creosotebush scrub is the most common and widespread community type in the survey area. It is known as *Larrea* scrub and characterized by *Larrea tridentata* (Creosotebush), the most widespread and abundant species in the Chihuahuan desert. It is typically found in sandy soils with both igneous and sedimentary geologic features. This community had ca. 30% plant cover and a stature of ca. 0.5 m. Most of the cover is of *L. tridentata*, especially in lower elevations but other shrub species were also co-dominant or subdominant including *Prosopis glandulosa*, *Parthenium incanum*, and *Krameria erecta*. Grass and forb ground cover is scattered unevenly with palatable species decreasing with grazing pressure. In some, usually disturbed, habitats, mesquite can replace *Larrea* as the main dominant and become more of a mesquite scrub. Other plants observed in this community include *Ferocactus wislizeni*, *Amphyachryis dracunculoides*, *Cylindropuntia imbricata*, *Yucca elata*, *Artemisia filifolia*, *Tidestromia lanuginosa*, *Nerisyrenia linearifolia*, *Ziziphus obtusifolia, Datura meteloides*, *Cevalia sinuata*, *Gutierrezia sp*., *Vachellia sp*., *Zinnia acerosa*, *Bahia absinthifolia*, and *Tiquilia sp*.

Sacaton grasslands is dominated by the salt tolerant *Sporobolus airoides* (alkali sacaton), which seemed to be in the periphery of humid soils. This community had 80% plant cover and was mixed with other herbaceous species including *Solanum elaeagnifolium*, *Sphaeralcea angustifolia*, *Sphaeralcea hastulata*, *Laennecia coulteri*, *Glandularia sp*., and mixed grasses. Scattered infrequent shrubs of *Prosopis glandulosa*, *Flourensia cernua*, *Gutierrezia sp*. were also present.

Desert grassland with mixed shrubs is an open grassland that contains scattered shrubs, many of which are salt tolerant species. This is a naturally occurring community with signs of grazing

and brush encroachment. Flowering heads were not present during the survey period but due to the size and growth habits, the dominant grass species is believed to be *Sporobulus contractus*, although the grass composition continuously varied and can replace one another in dominance. Other species seen growing in this community include *Prosopis glandulosa*, *Ziziphus obtusifolia*, *Gutierrezia sp*., *Atriplex canescnes*, *Atriplex sp*., *Suaeda sp*., *Heliotropiuim sp*. and several annual composites. This community type was also seen as a result of previous disturbance and growing alongside *Larrea tridentata*, *Yucca elata*, *Laennecia coulteri*, *Parthenium incanum*, *Ephedra trifurca*, and *Cirsium sp*. and other annual forb species.

Arroyo/wash represented a drainage or wash where water flows during flash floods and has no artificial manipulation.

Mixed desert scrub community had 60% plant cover and <1 m tall. This community type often blended in with other desert scrub communities. Moderate grazing occurred in some areas and reduced forb and grass cover. Some of the dominant species include *Atriplex canescens*, *Prosopis glandulosa*, and *Yucca elata*. Other shrub species included *Lycium sp*. and *Gutierezzia sp*.

Mesquite coppice dune is a transition from a grassland and formed as sandy soils clump around vegetation. This community averages over 1 m in height and had about 50% plant cover. Mesquite as a dominant species was associated in co-dominance with *Larrea tridendata*, *Artemisia filifolia*, or *Atriplex cansecens* and in other situations mesquite would mix with several other shrubs as a sub dominant. Other shrubs include *Yucca elata*, *Ziziphus obtusifolia*, *Amphyachryis dracunculoides*, *Koeberlinia spinosa*, *Gutierezzia sp*., *Lycium sp*., *Ephedra sp.,* and *Zinnia acerosa*, mixed with forbs such as *Nerisyrenia linearifolia* and others.

Ocotillo-Creosotebush scrub is composed of *Fouquiera-Larrea* scrub. This community is a subcategory of *Larrea* scrub as it a desert shrubland dominated by the aforementioned species, however, this community is characterized by scattered wand-like protrusions >2 m tall from the spiny stems of the Ocotillo (*Fouquiera splendens*) shrub. This community was mainly found on rocky, sandy soils from mountain sides. And aside from *F. splendens,* had vegetation plant cover <1 m tall and covered about 50% of the ground with species including *Larrea tridendata*, *Gutierezzia sp*., *Ziziphus obtusifolia*, *Ephedra sp*., *Zinnia acerosa*, *Ephedra sp*., *Bahia absinthifolia*, *Senna sp*., *Ferocactus wislizeni*, *Cylindropuntia imbricata*, and *Nerisyrenia linearifolia*.

Broomweed-mesquite community was <1 m tall with sparse vegetation cover of <50%. This community was dominated by short compact shrubs that usually included broomweeds: prairie broomweed (*Amphyacharis dracunculoides*), broomweed (*Gutierezzia sp.*), and broom indigobush (*Psorothamnus scoparius*) and Mesquite (*Prosopis glandulosa)*. Other species in this

community include *Eriogonum abertianum, Ephedra sp*., *Proboscidea sp*., *Zinnia acerosa*, *Amsonia sp*., *Vachellia sp*., *Cylindropuntia sp*., *Sporobolus sp*., *Calliandra sp*., and *Nama hispida*. *Larrea tridendata* is can be absent to dominant until transitioning into *Larrea* scrub.

Dense mesquite shrubland in sandy soil. The composition and structure of this community is a result of brush encroachment. The plant cover is about 80% and shrubs are >2 m tall. The dominant plant is mesquite (*Prosopis glandulosa*) and other plants in this community include *Atiplex canescens*, *Ephedra sp*., *Vachellia sp*., *Solanum elaeagnifolium*, *Gutierezzia sp*., *Senna sp*., and *Physalis sp*.

Rare, Threatened and Endangered Species

No state or federally threatened or endangered wildlife species were observed or documented during the July biological survey. Four wildlife species from the New Mexico Species of Greatest Conservation Need (SGCN) list were documented within the project area including: Scaled Quail (*Callipepla squamata*), Mourning Dove (*Zenaida macroura*), Lucy's Warbler (*Oreothlypis luciae*), and Burrowing Owl (*Athene cunicularia*). All the wildlife species observed during the July survey can be found in **Table 1**.

Table 1. Wildlife Species Documented Within the Project Area

Mammals	
Collared peccary	*Pecari tajacu*
Black-tailed Jackrabbit	*Lepus californicus*
Spotted ground squirrel	*Spermophilus spilosoma*
Desert cottontail	*Sylvilagus audubonii*
Reptiles	
Long-nosed leopard lizard	*Gambelia wislizenii*
Chihuahuan spotted whiptail	*Aspidoscelis exsanguis*
Desert grassland whiptail	*Aspidoscelis uniparens*
Birds	
Scaled Quail	*Callipepla squamata*
Mourning Dove	*Zenaida macroura*
Greater Roadrunner	*Geococcyx californianus*
Turkey Vulture	*Cathartes aura*
Swainson's Hawk	*Buteo swainsoni*
American Kestrel	*Falco sparverius*
Western Kingbird	*Tyrannus verticalis*
Chihuahuan Raven	*Corvus cryptoleucus*
Northern Mockingbird	*Mimus polyglottos*
Black-throated Sparrow	*Amphispiza bilineata*
Western Meadowlark	*Sturnella neglecta*
Red-tailed Hawk	*Buteo jamaicensis*

Ash-throated flycatcher	*Myiarchus cineranscens*
Burrowing Owl	*Athene cunicularia*
Horned lark	*Eremophila alpestris*
Cactus wren	*Campylorhynchus brunneicapillus*
Curve-billed thrasher	*Toxostoma curvirostre*
Crissal thrasher	*Toxostoma crissale*
Loggerhead Shrike	*Lanius ludovicianus*
Lucy's warbler	*Oreothlypis luciae*

No state or federally threatened or endangered plant species were observed or documented during the July biological survey. Sand pricklypear (*Opuntia arenaria*), a rare plant species from the New Mexico Species of Greatest Conservation Need (SGCN) list, was not found in the project area; however, habitat for the species, sandy dunes with desert scrub, was observed. It does not seem impossible that Sand pricklypear (*Opuntia arenaria*) may emerge in this area, but the survey results indicate that any such occurrence must be a rare event. All the plant species observed during the July survey can be found in **Table 2**.

Table 2. Plant Species Documented Within Project Area

Common Name	Scientific Name
Prairie Broomweed	*Amphyachryis dracunculoides*
Bluestars	*Amsonia sp.*
Threeawn	*Aristida sp.*
Sand Sage	*Artemisia filifolia*
Bract Milkweed	*Asclepias brachycarpa*
Four-Wing Saltbush	*Atriplex canescnes*
Saltbush	*Atriplex sp.*
Whitened Leaf Bahia	*Bahia absinthifolia*
Feather duster	*Calliandra sp.*
Stinging Cevalia	*Cevalia sinuata*
Thistle	*Cirsium sp*
Tree Cholla	*Cylindropuntia imbricata*
Wright's Jimsonweed	*Datura wrightii*
Longleaf Jointfir	*Ephedra trifurca*
Abert's Wild Buckwheat	*Eriogonum abertianum*
Arizona Barrel Cactus	*Ferocactus wislizeni*
Tarbush	*Flourensia cernua*
Mock Vervain	*Glandularia sp.*
Linearleaf Fanmustard	*Greggia linearifolia*
Broomweed	*Guttierezia sp*
Heliotrope	*Heliotropiuim sp.*

Allthorn	*Koeberlinia spinosa*
Littleleaf Ratany	*Krameria erecta*
False Conyza	*Laennecia coulteri*
Creosote Bush	*Larrea tridentata*
Wolfberry	*Lycium sp.*
Alfalfa	*Medicago sativa*
Bristly Nama	*Nama hispida*
Mariola	*Parthenium incanum*
Groundcherry	*Physalis sp*.
Devil's Claw	*Proboscidea sp.*
Honey Mesquite	*Prosopis glandulosa*
Broom Indigobush	*Psorothamnus scoparius*
Senna	*Senna sp.*
Silver Leaf Nightshade	*Solanum eliagnifolium*
Narrowleaf Globemallow	*Sphaeralcea angustifolia*
Spear Globemallow	*Sphaeralcea hastulata*
Alkali Sacaton	*Sporobolus airoides*
Dropseed	*Sporobulus contractus*
Seepweed	*Suaeda sp.*
Crinklemat	*Tiquilia sp*.
Acacia	*Vachellia sp.*
Espanta Vaqueros	*Wooly Tidestromia*
Soaptree Yucca	*Yucca elata*
Desert Zinnia	*Zinnia acerosa*
Lotebush	*Ziziphus obtusifolia*

Avian Nests

A total of four active avian nests were documented during the July survey within the project area. Three nests belonged to Cactus Wrens, while the fourth nest belonged to a Swainson's Hawk. GPS coordinates were taken in proximity of the nests and can be found in **Table 3**.

Table 3. Avian Nest Locations

Avian Species	**Location**
Cactus Wren	31°47'1.82"N 107° 8'9.13"W
Cactus Wren	31°47'1.76"N 107°14'23.04"W
Cactus Wren	31°47'1.68"N 107°17'17.47"W
Swainson's Hawk	31°47'1.62"N 107°27'45.89"W

Burrows

A total of 12 burrows were documented and recorded. The burrows featured dimensions suitable for the Burrowing Owl to utilize. Burrowing Owls are federally protected by the Migratory Bird Treaty Act and are considered a Species of Greatest Conservation Need (SGCN) by the State of New Mexico. The burrow locations and the location of the lone sighting of a Burrowing Owl are found in **Table 4**.

Table 4. Potential Burrowing Owl burrow locations

Burrow	Location
Burrow 1	31°47'1.88"N 107°45'28.02"W
Burrow 2	31°47'1.82"N 107°45'7.82"W
Burrow 3	31°47'1.52"N 107°43'22.98"W
Burrow 4	31°47'1.88"N 107°42'25.01"W
Burrow 5	31°47'2.24"N 107°42'23.85"W
Burrow 6	31°47'1.78"N 107°34'4.67"W
Burrow 7	31°47'1.83"N 107°33'18.33"W
Burrow 8	31°47'1.81"N 107°31'51.20"W
Burrow 9	31°47'1.74"N 107°29'48.09"W
Burrow 10	31°47'1.64"N 107°29'6.71"W
Burrow 11	31°47'1.60"N 107°14'0.09"W
Burrow 12	31°47'1.57"N 107°11'21.31"W

ENVIRONMENTAL IMPACT AVOIDANCE RECOMMENDATIONS

A biological survey was conducted along the 46-mile project area without any significant findings of protected wildlife. It should be noted that the staging and batch plant areas were identified after the biological survey was completed. Accordingly, it is recommended that the biological monitors survey these areas before they are cleared and ensure heavy machinery stays within the project limits to avoid impacts to sensitive species outside the project boundaries. Biological monitors should be prepared to work with local authorities on relocation of any rare plant species that are found during the construction process.

CONCLUSION

No state or federally threatened or endangered species were detected within the project area during the July biological survey. Four (4) State of New Mexico Species of Greatest Conservation Need were observed within the project area. Four and twelve active nests and potential Burrowing Owl burrows were identified within the project area, respectively. A total of thirteen (13) plant communities were recorded as well, ranging from agricultural fields to creosote bush shrubland.

Surveys can confirm the presence of rare, threatened or endangered species, but negative results do not guarantee that rare, threatened or endangered species are absent.

Biological resources protection and awareness will be provided with on-site biological monitors. It is recommended that the on-site biological monitors continue to monitor the project area for rare, threatened or endangered species, especially during vegetation clearing/ground disturbance portion of the project.

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APPENDIX A

(Plant Community Photographs)

Figure 1. Disturbed desert scrub

Figure 2. Artificial drainage trench

Figure 3. Artificial wash

Figure 4. Agricultural fields

Figure 5. Creosotebush scrub

Figure 6. Sacaton grasslands

Figure 7. Desert grassland with mixed shrubs

Figure 8. Arroyo/Wash

Figure 9. Mixed desert scrub

Figure 10. Mesquite coppice dune

Figure 11. Ocotillo-Creosotebush scrub

Figure 12. Broomweed-mesquite

Figure 13. Dense mesquite shrubland in sandy soil

APPENDIX B

(Project Overview Map and Plant Community Maps)

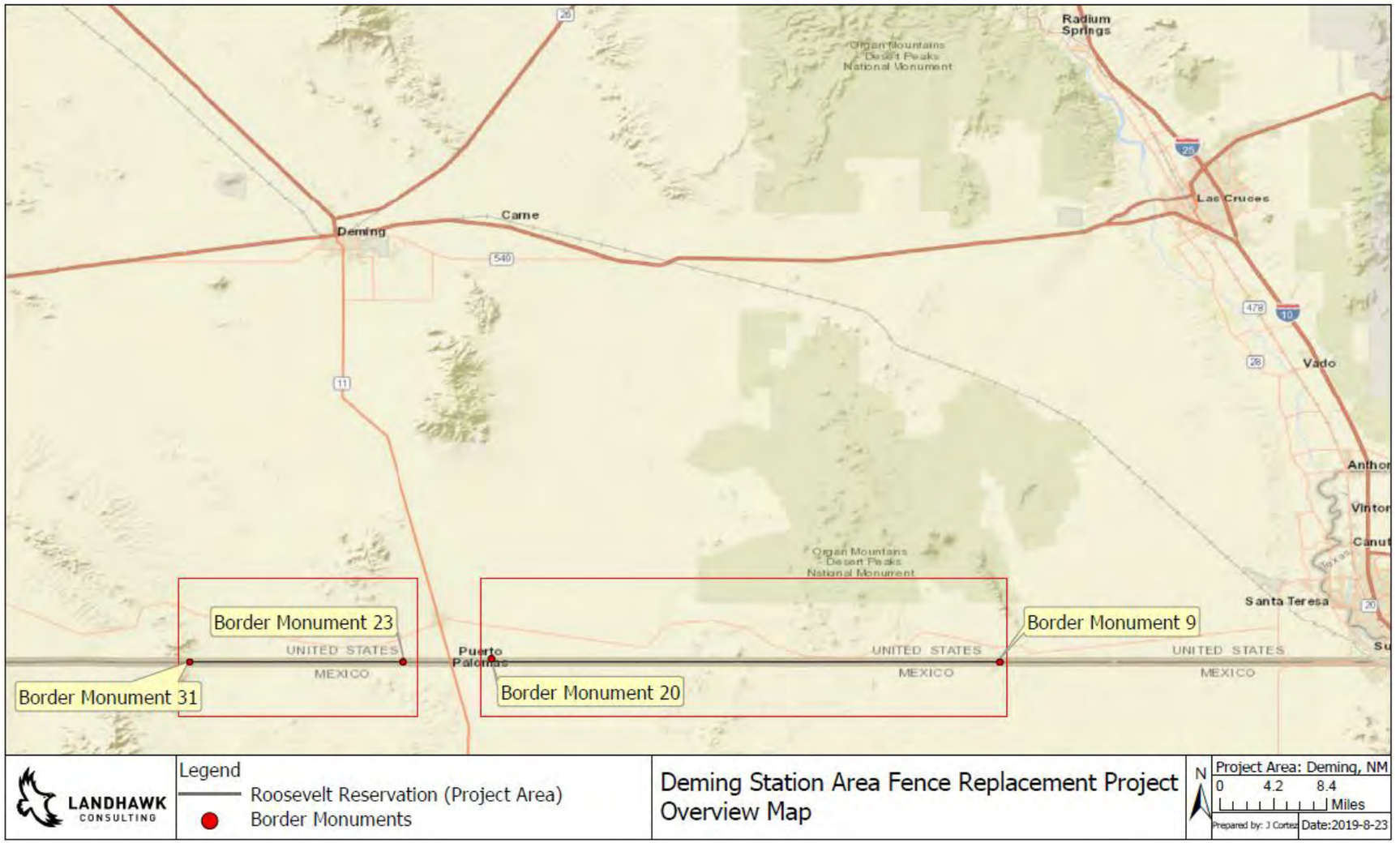


Figure 14. Overview Map of Deming Station Area Fence Replacement Project

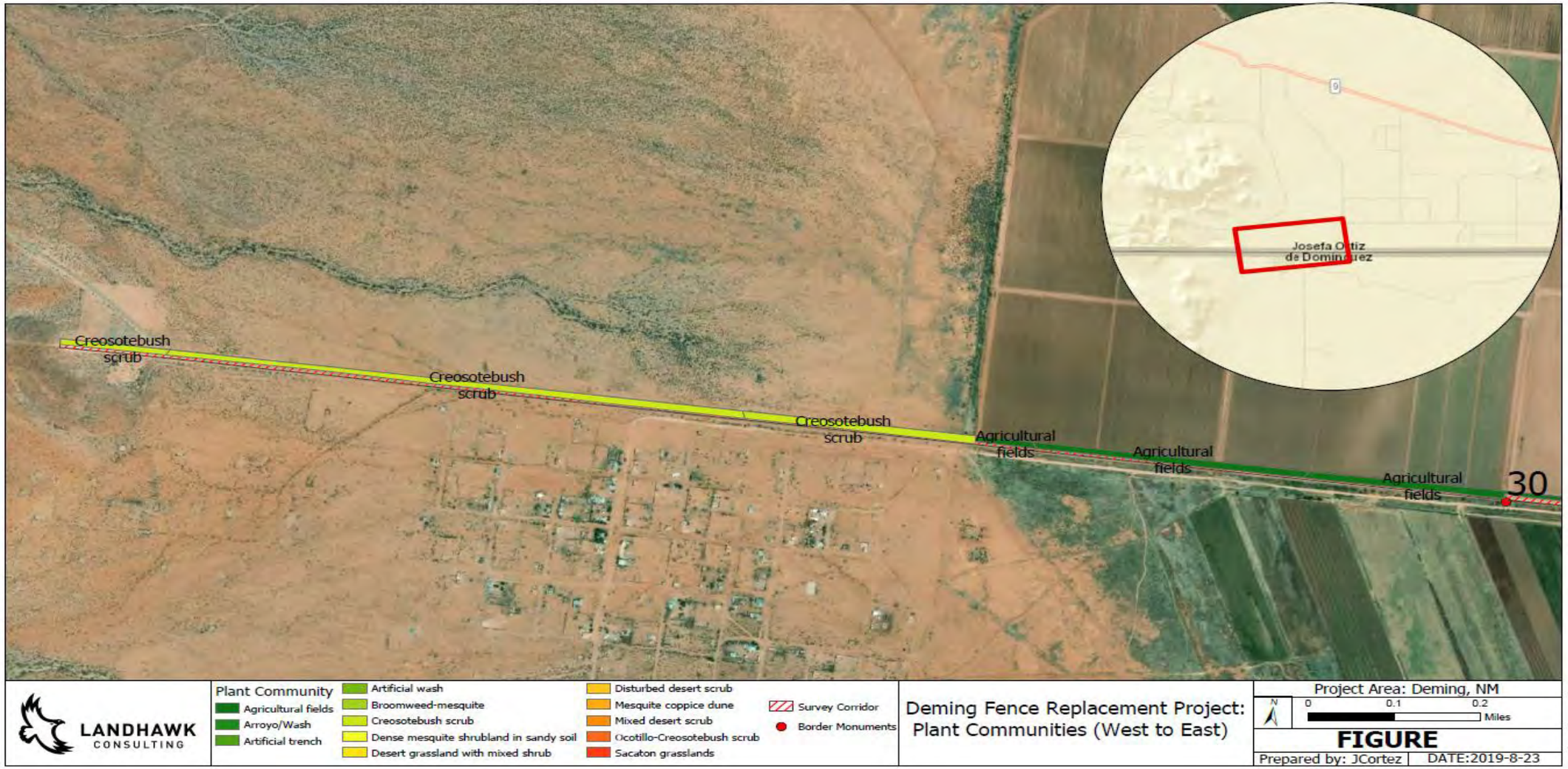


Figure 15. Plant communities mapped, section 1.

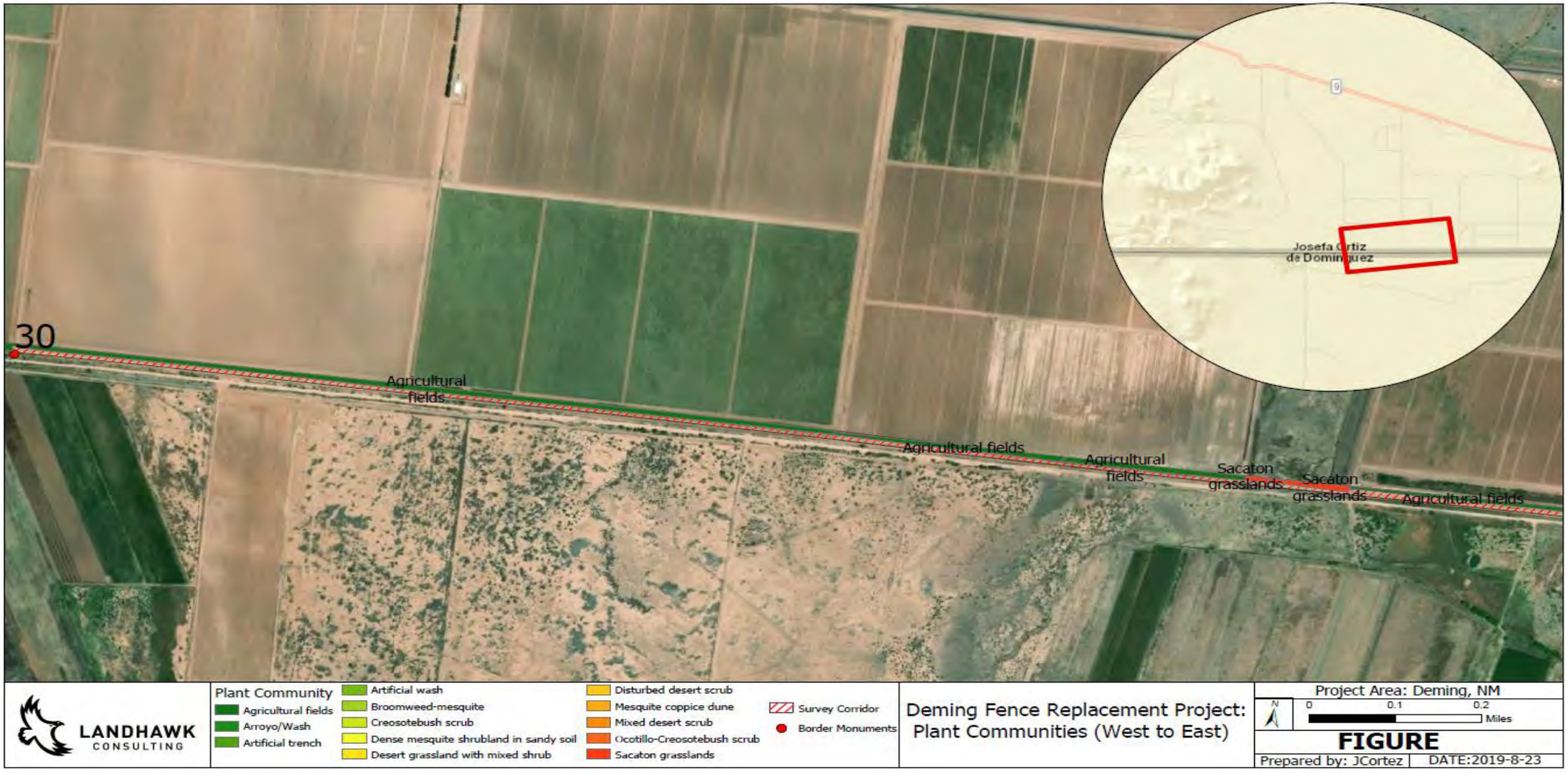


Figure 16. Plant communities mapped, section 2.

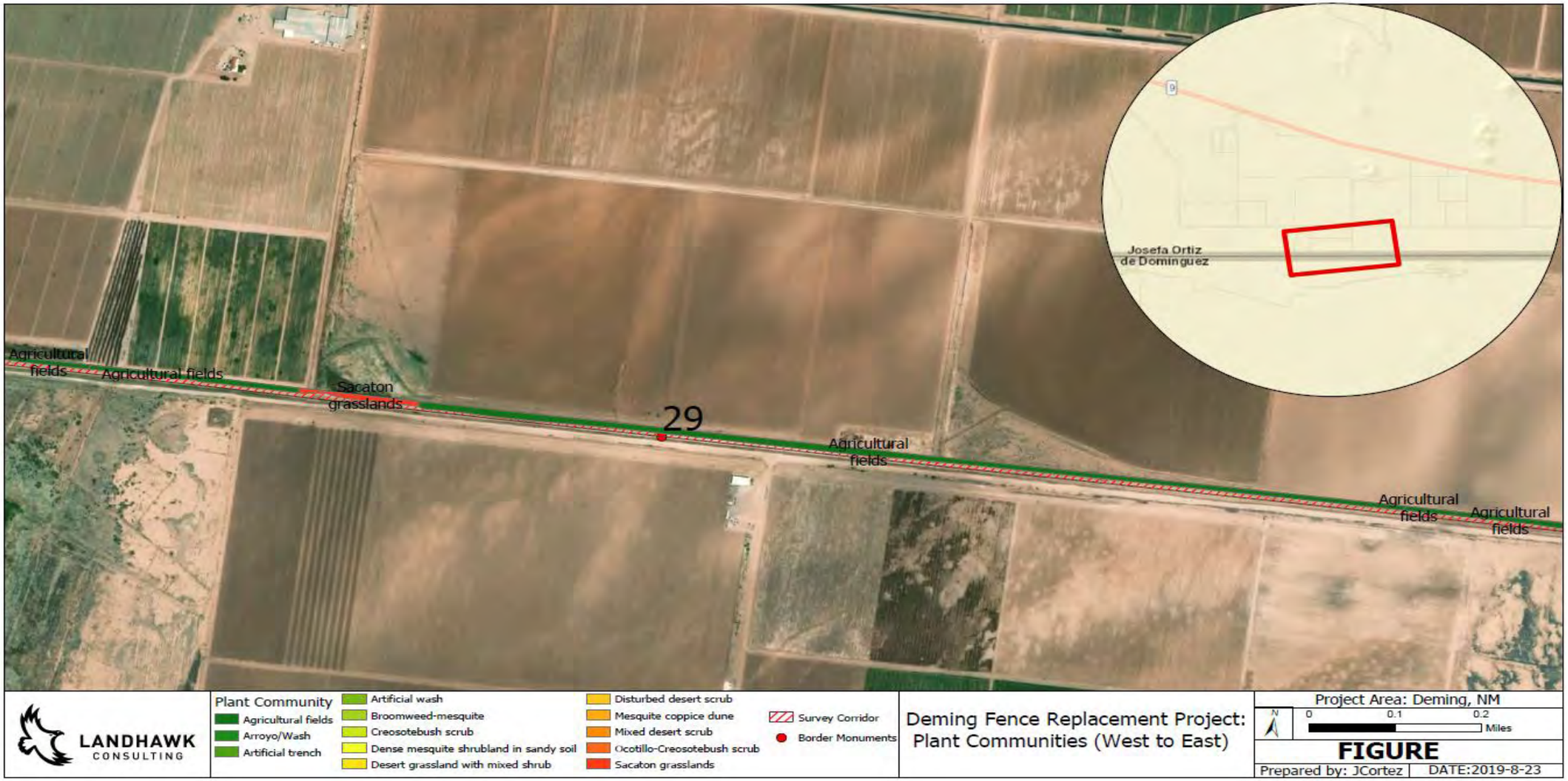


Figure 17. Plant communities mapped, section 3.

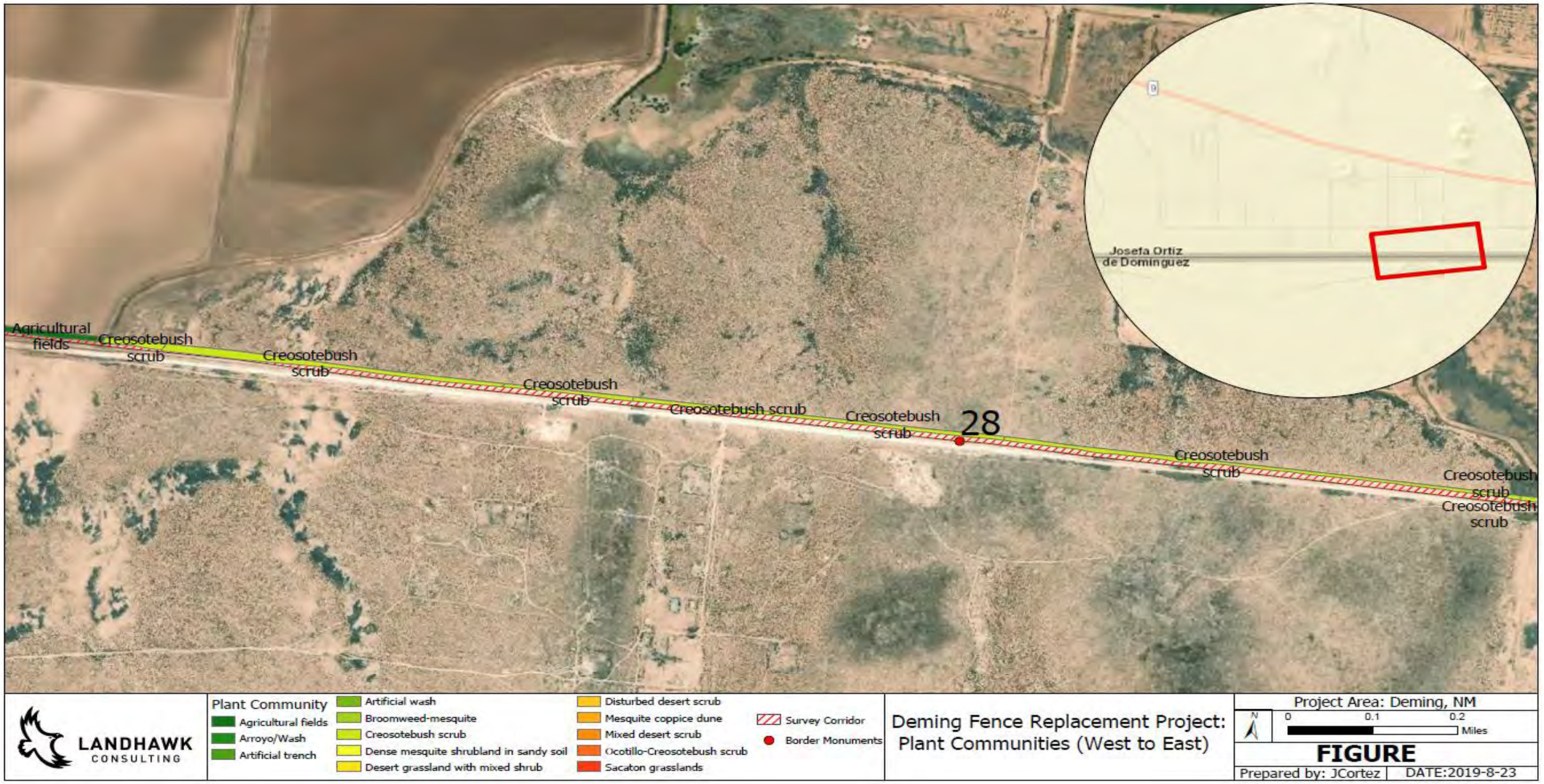


Figure 18. Plant communities mapped, section 4.

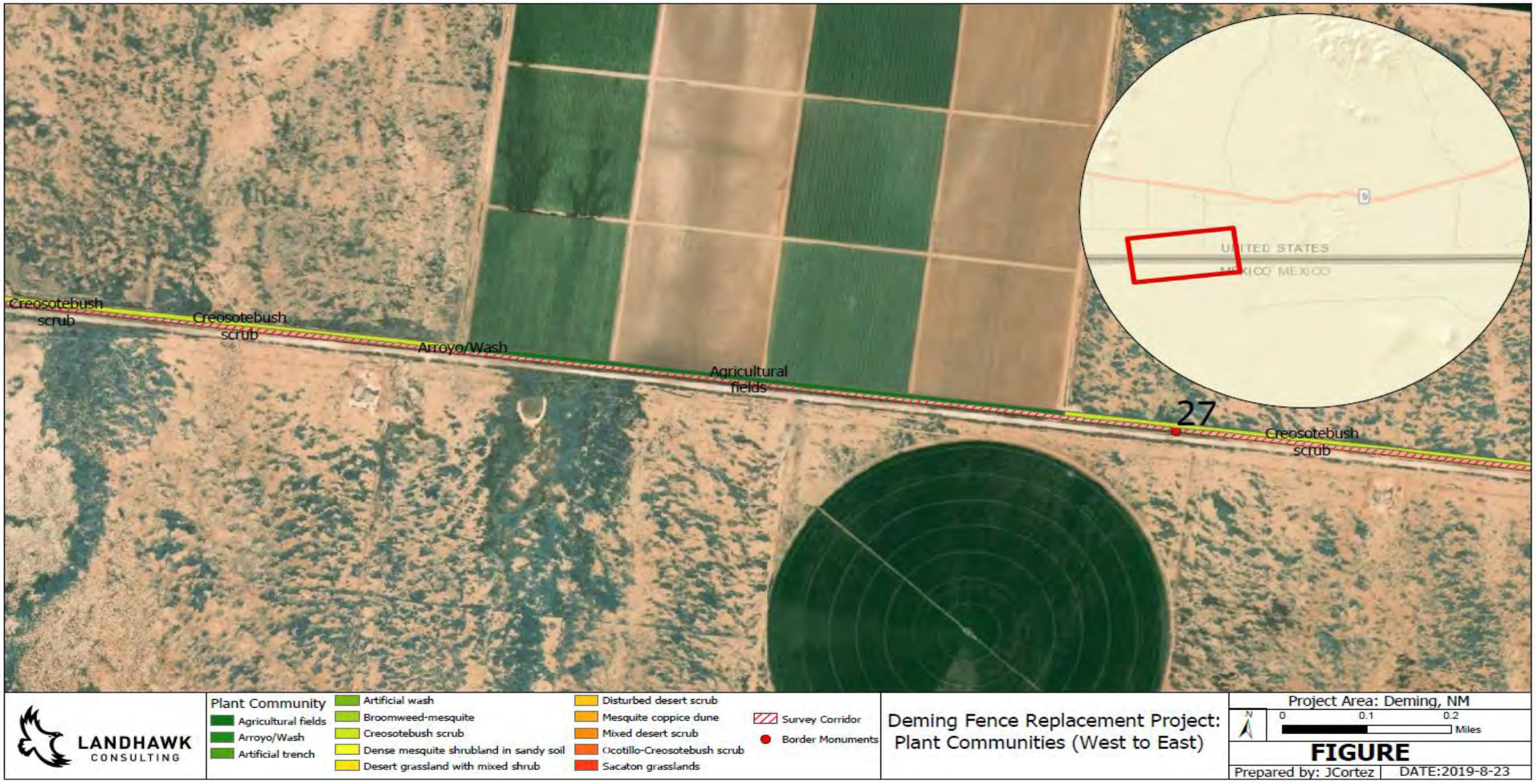


Figure 19. Plant communities mapped, section 5

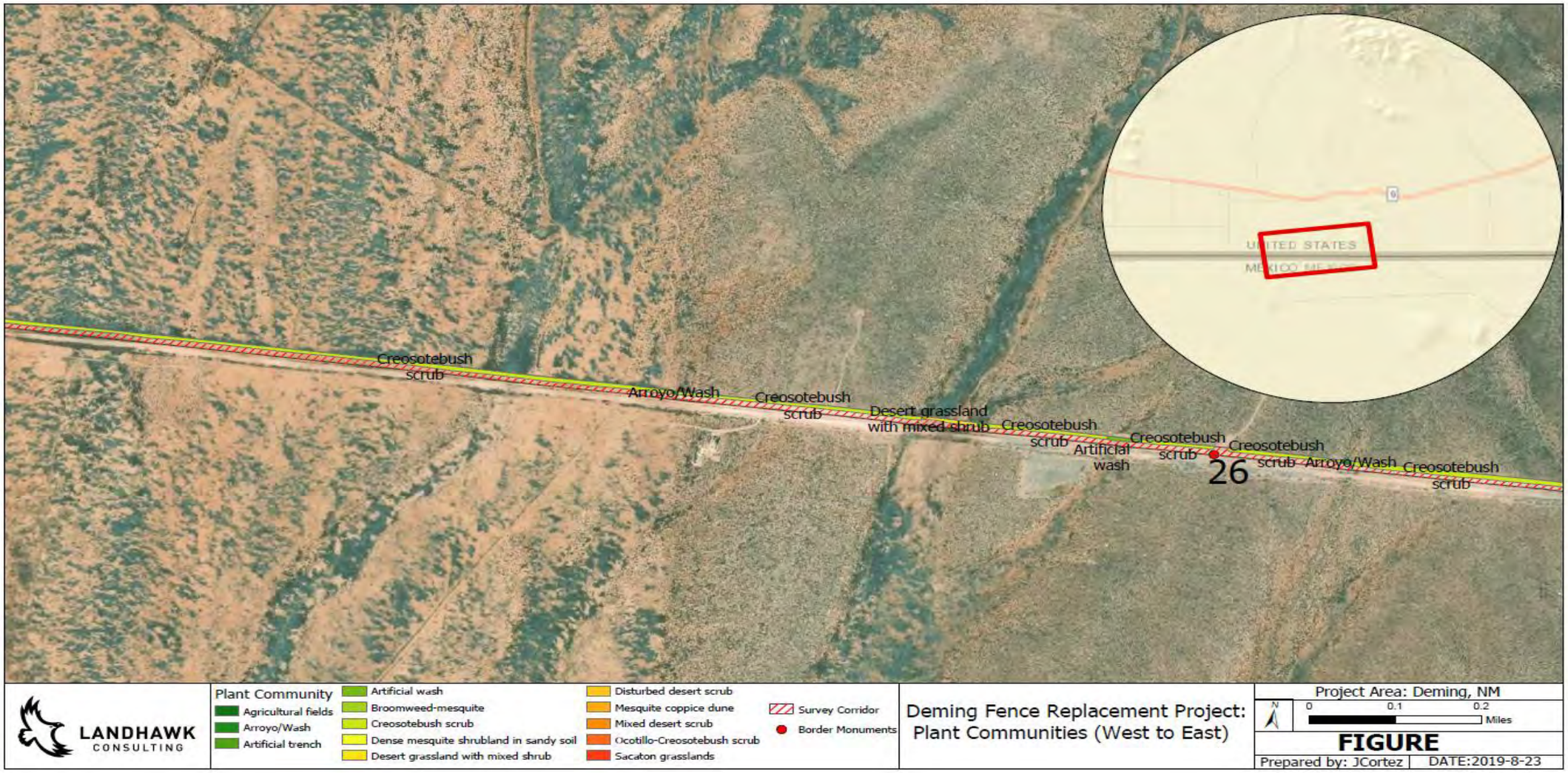


Figure 20. Plant communities mapped, section 6.

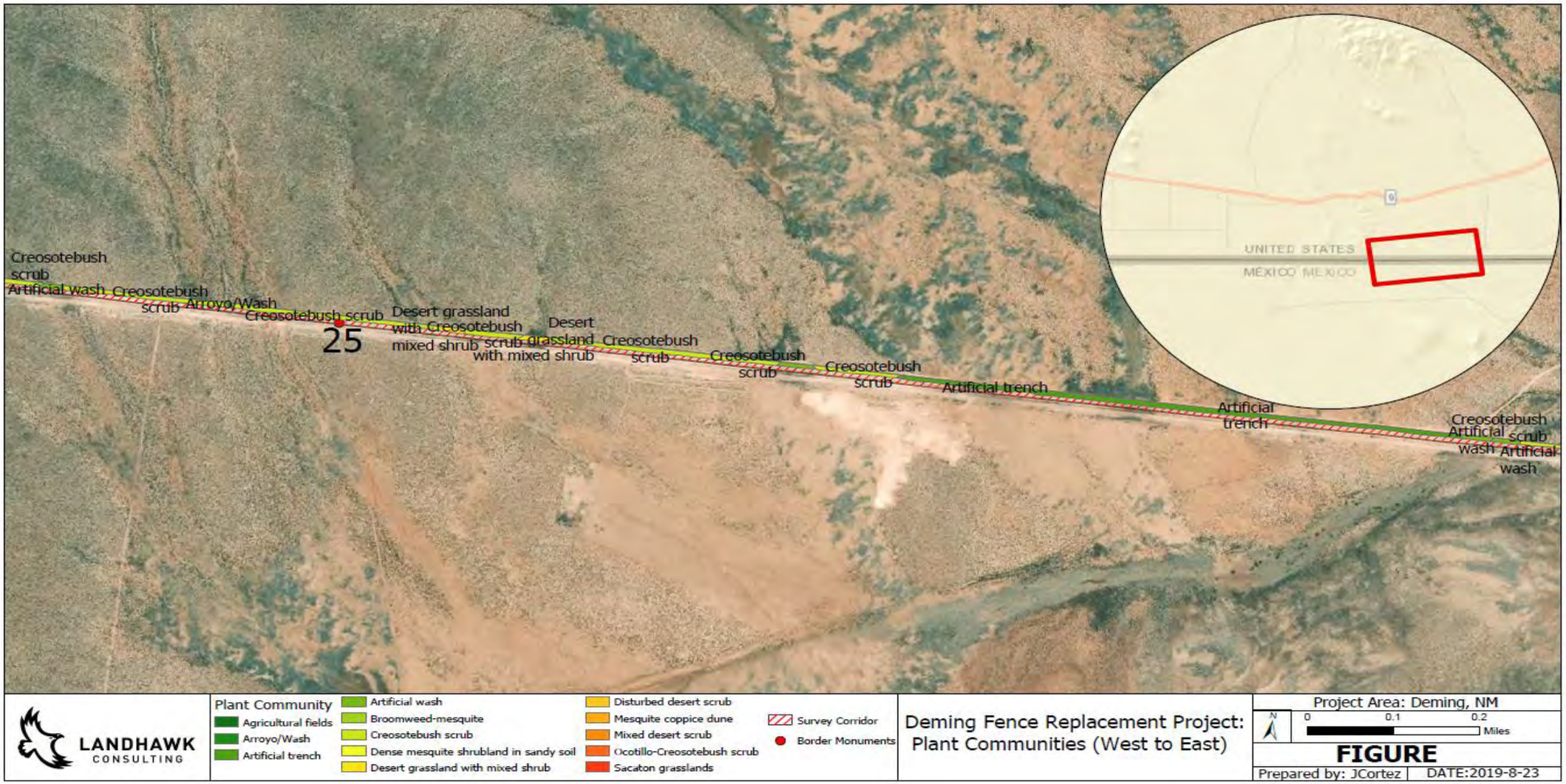


Figure 21. Plant communities mapped, section 7.

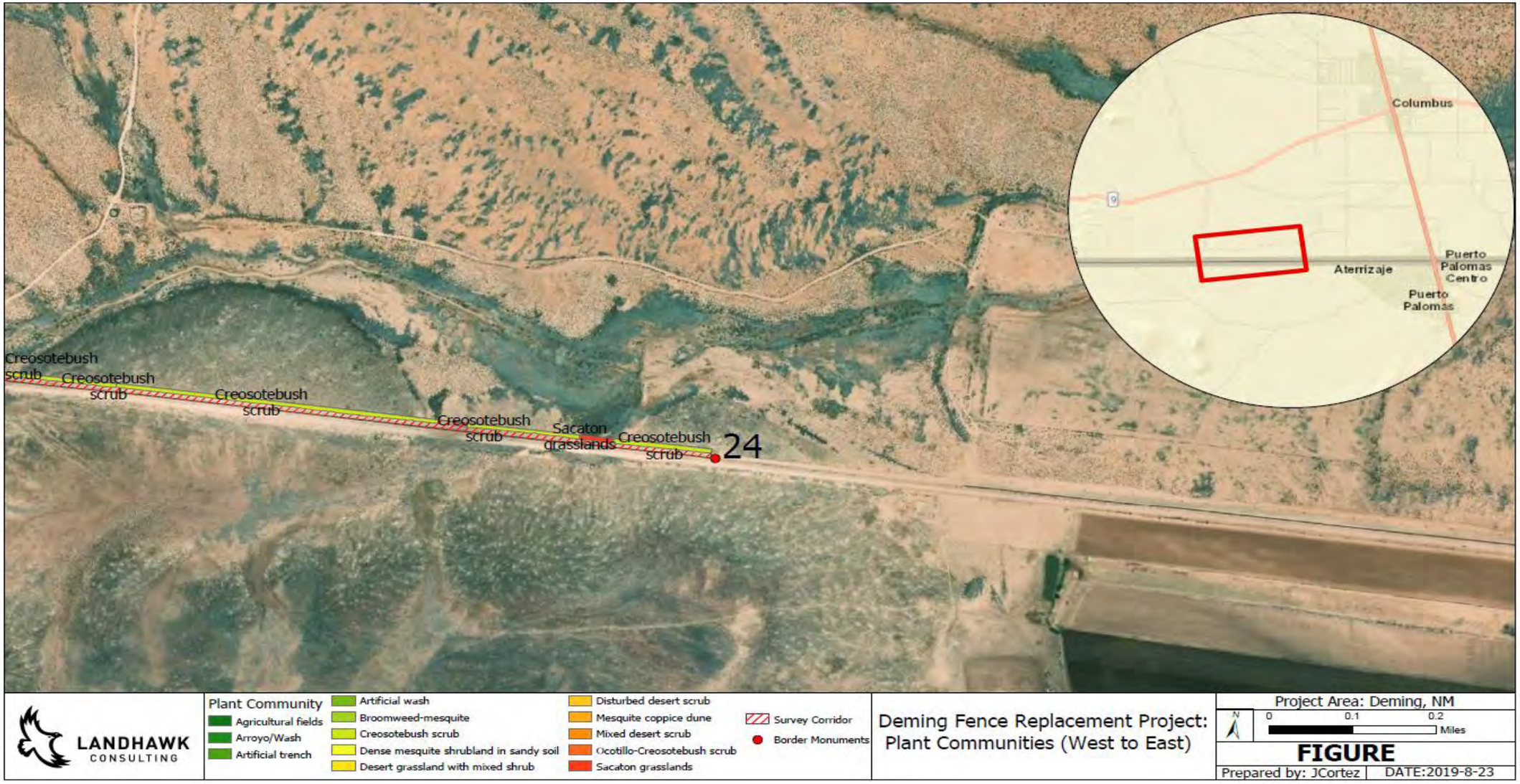
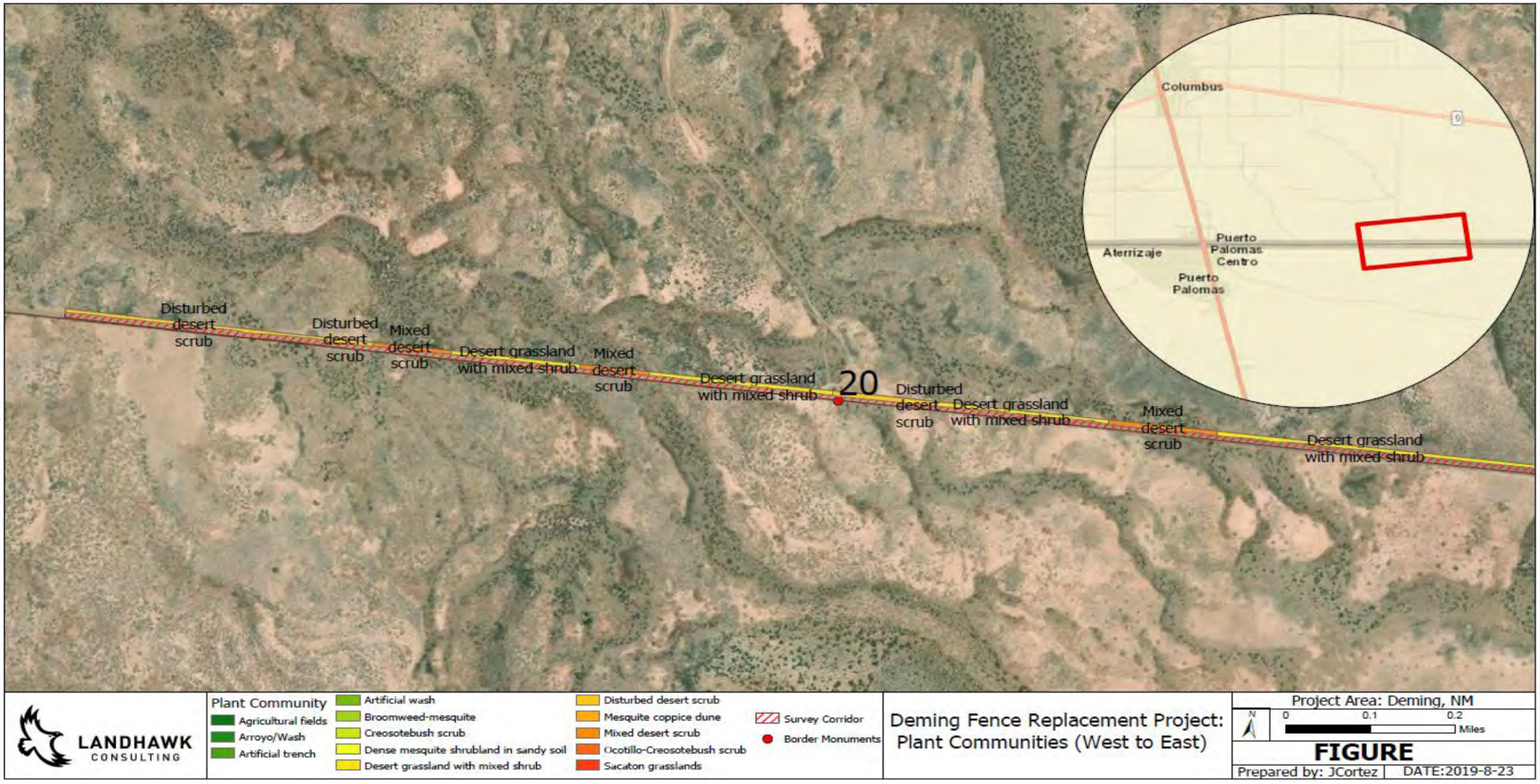


Figure 22. Plant communities mapped, section 8.



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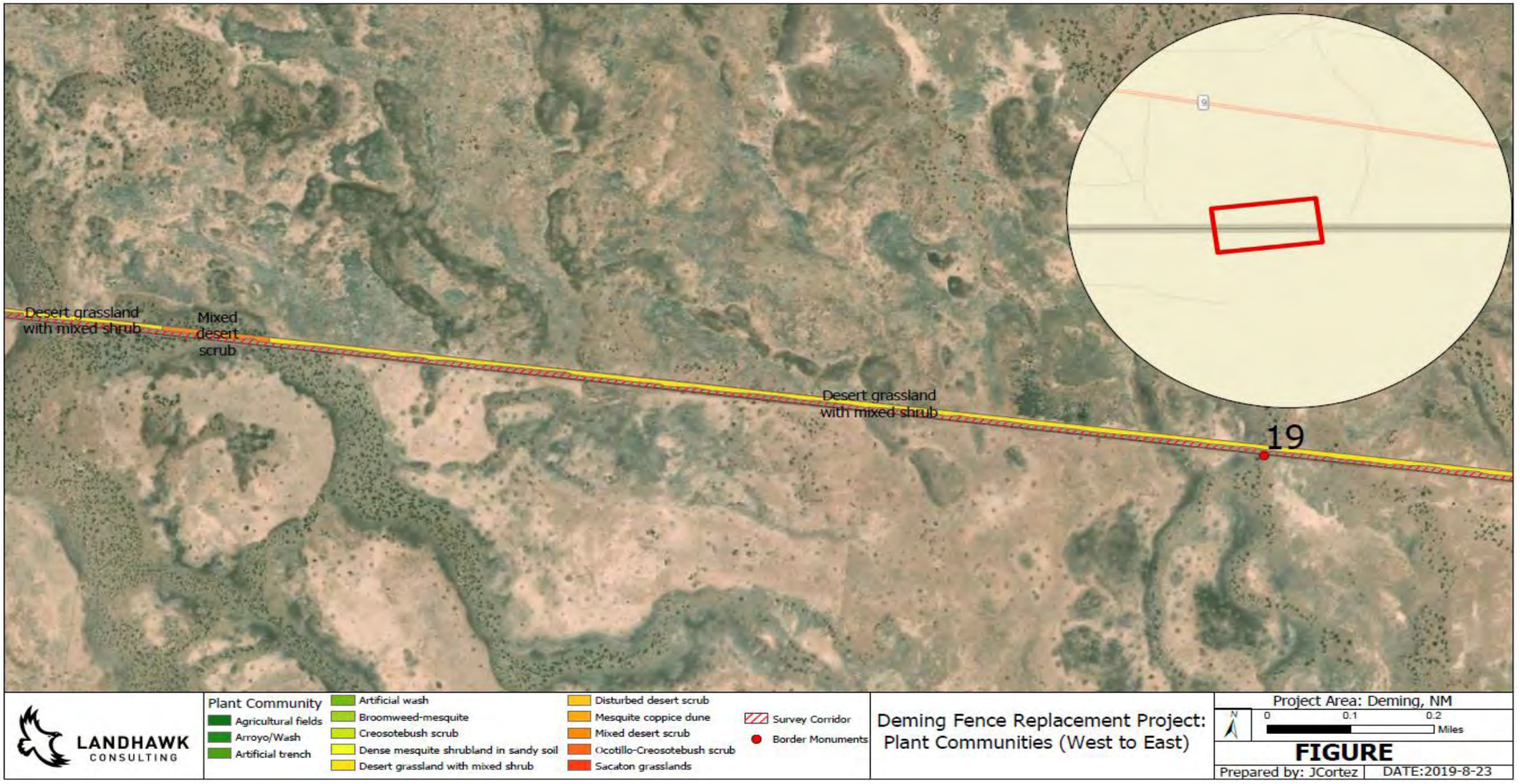


Figure 24. Plant communities mapped, section 10.

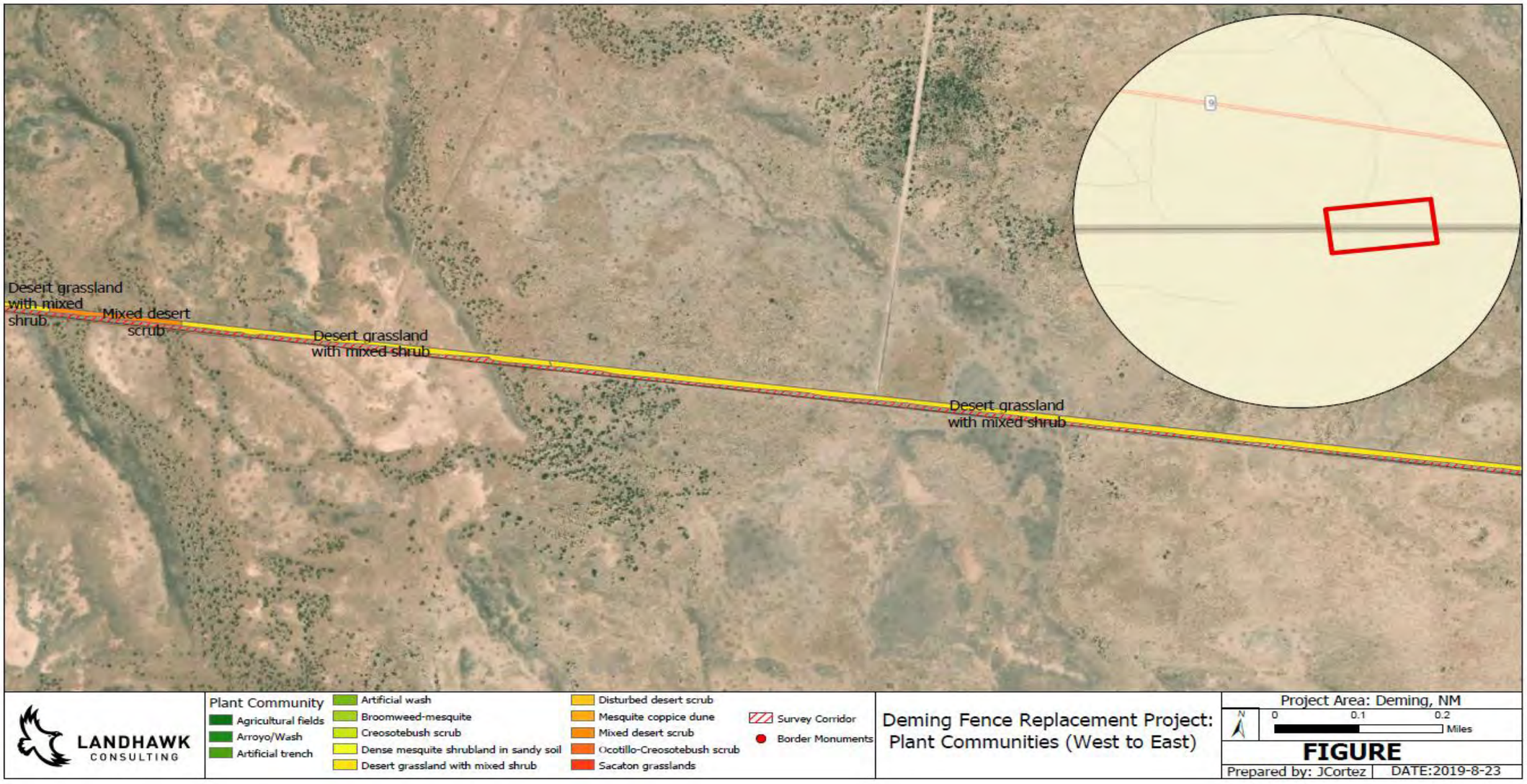
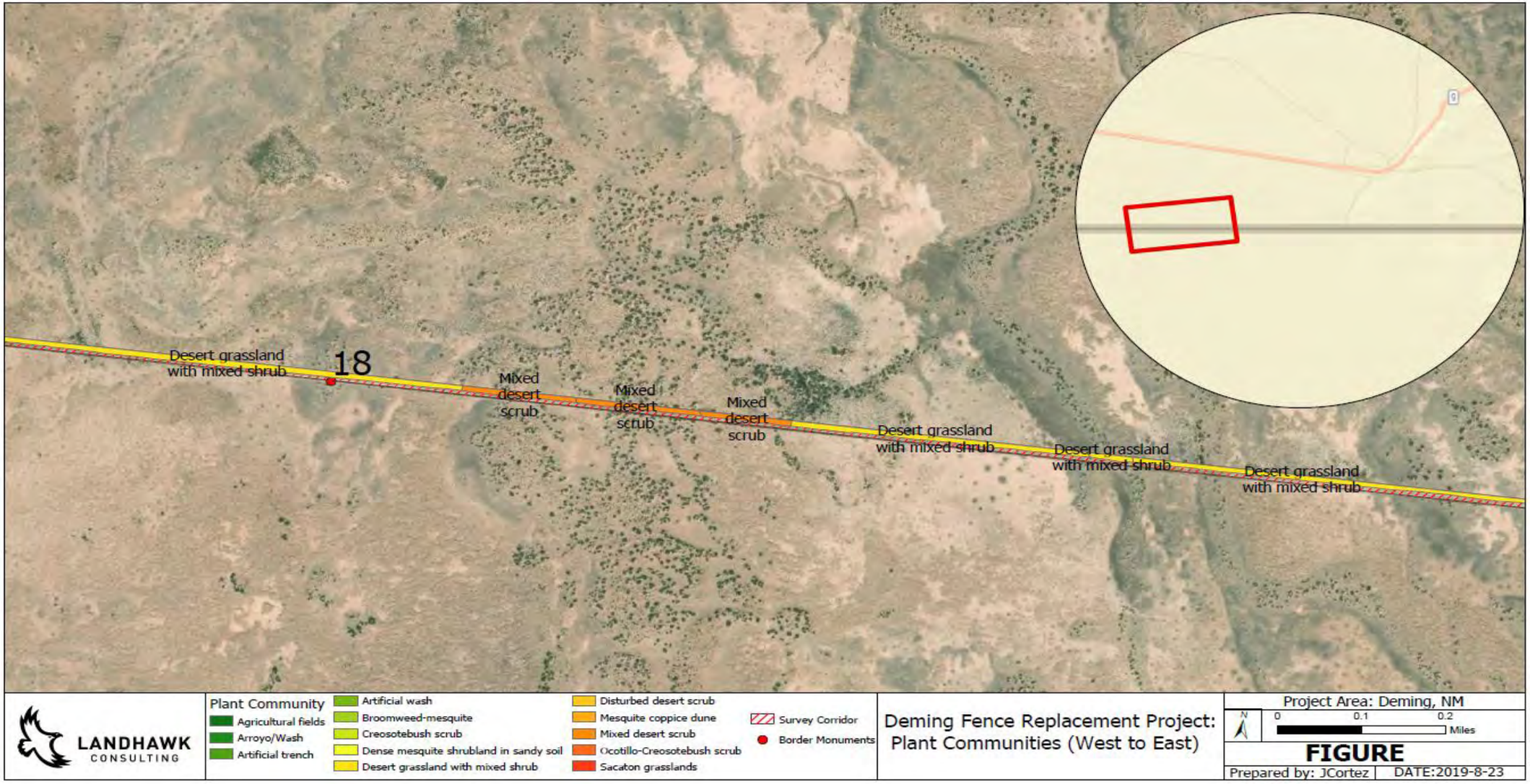


Figure 25. Plant communities mapped, section 11.



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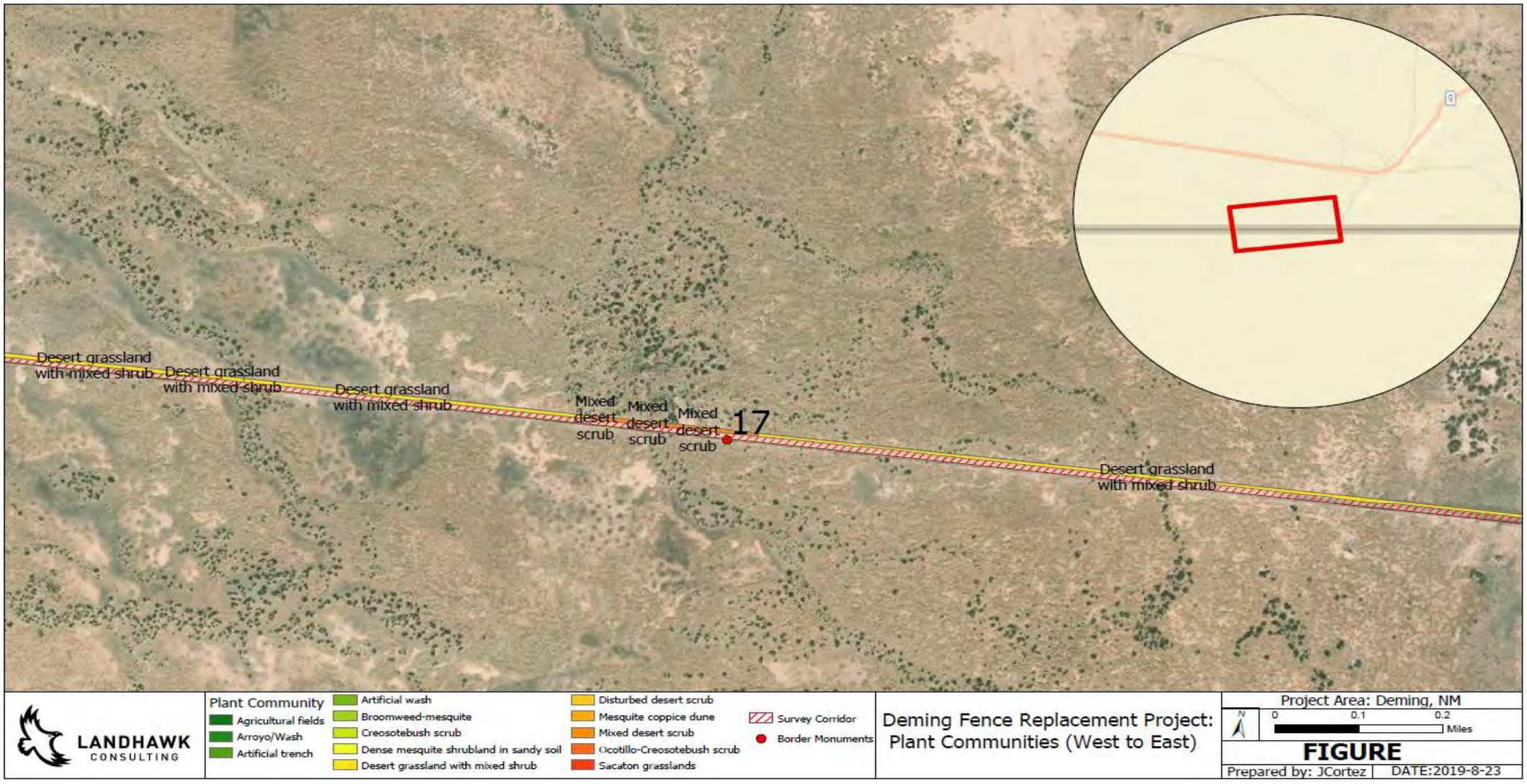

Figure 27. Plant communities mapped, section 13.

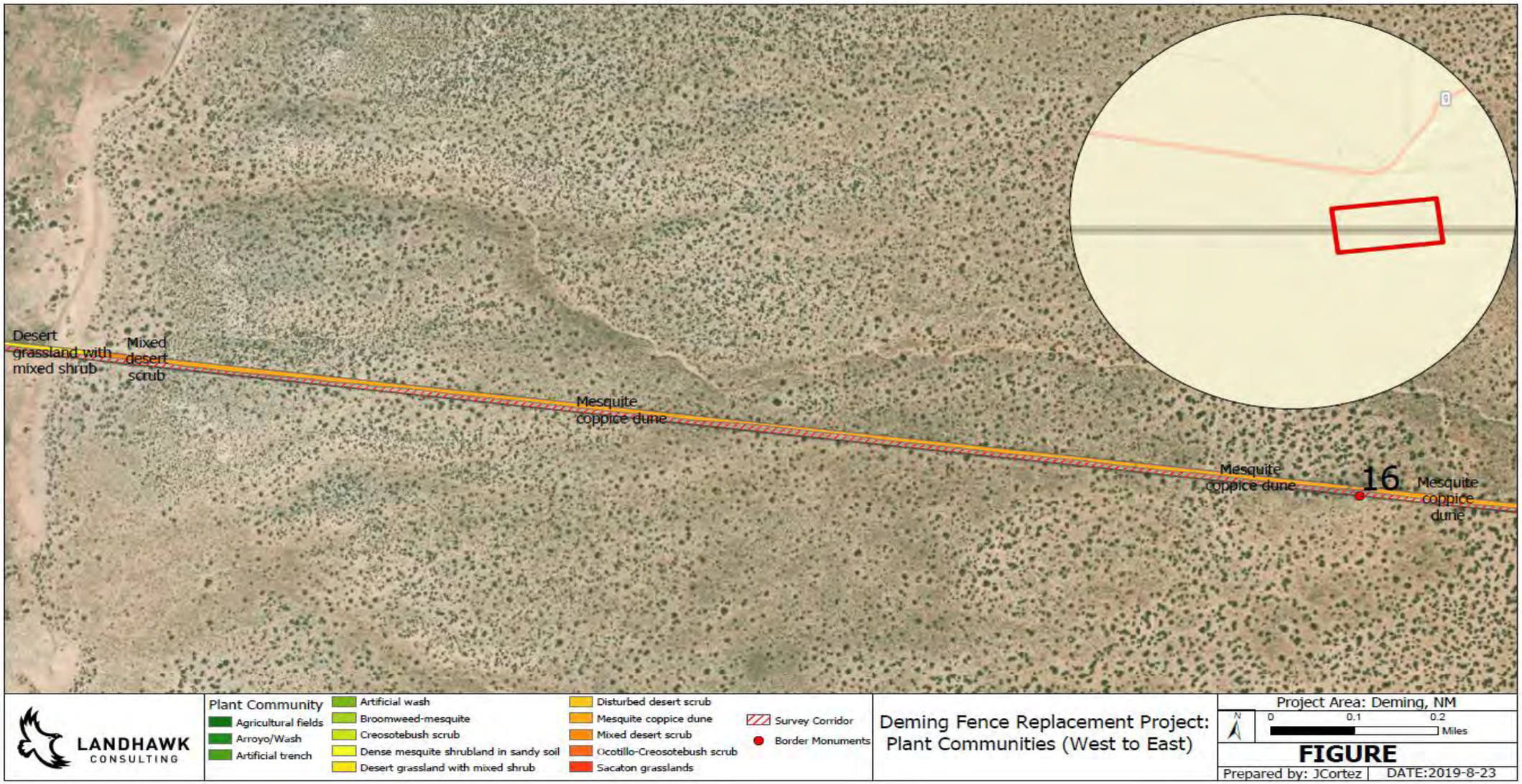

Figure 28. Plant communities mapped, section 14.

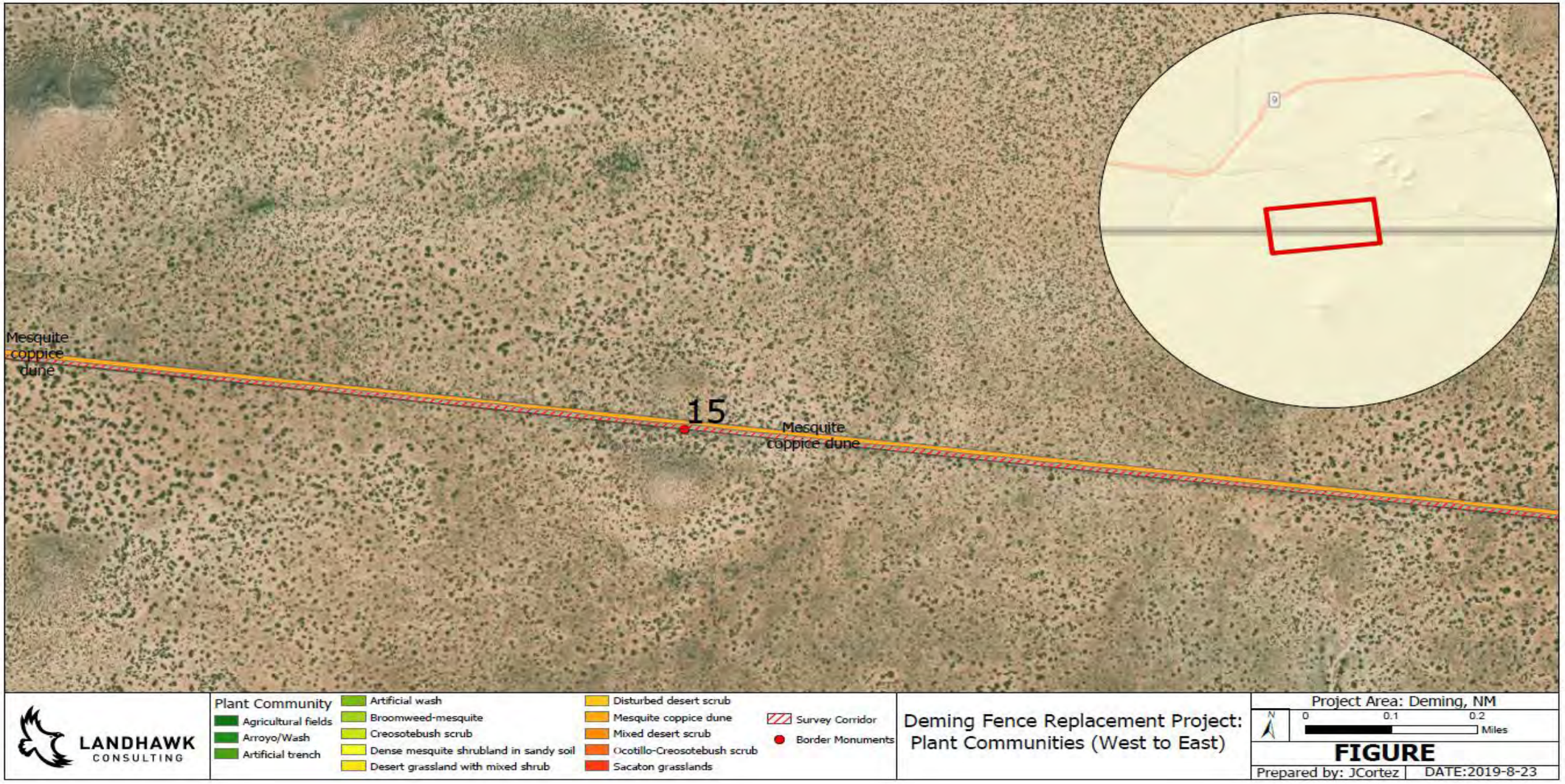

Figure 29. Plant communities mapped, section 15.

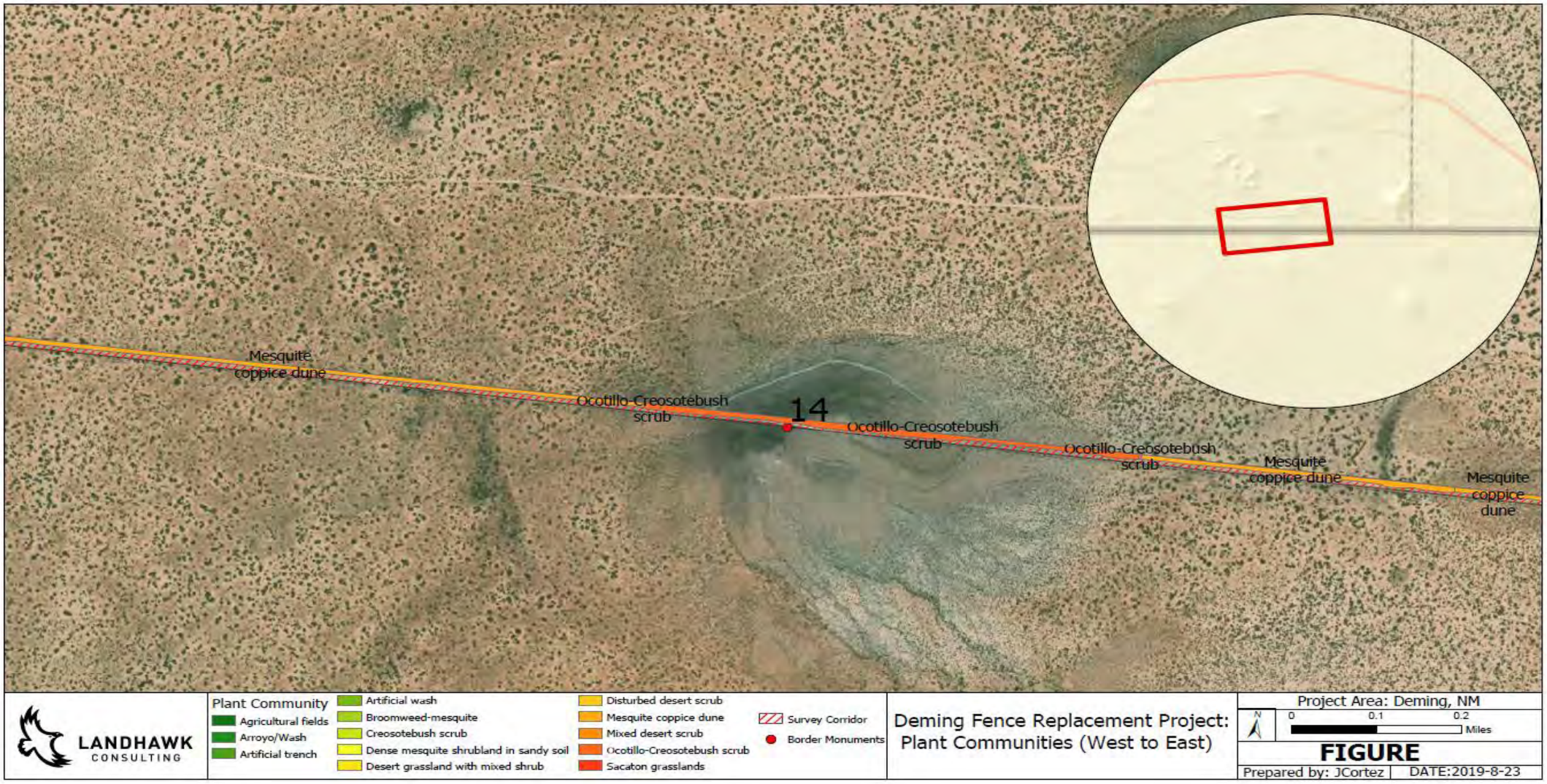

Figure 30. Plant communities mapped, section 16.

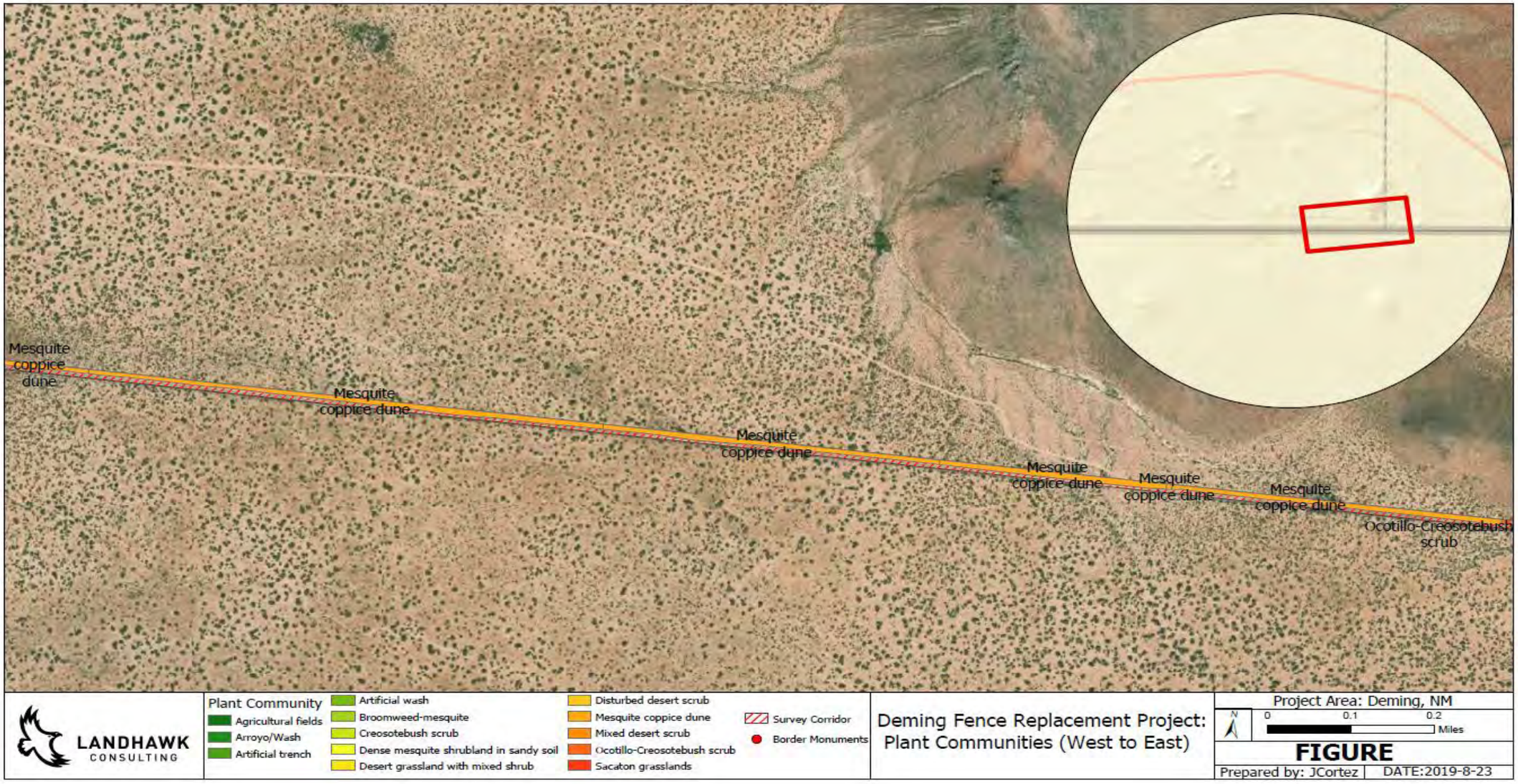

Figure 31. Plant communities mapped, section 17.

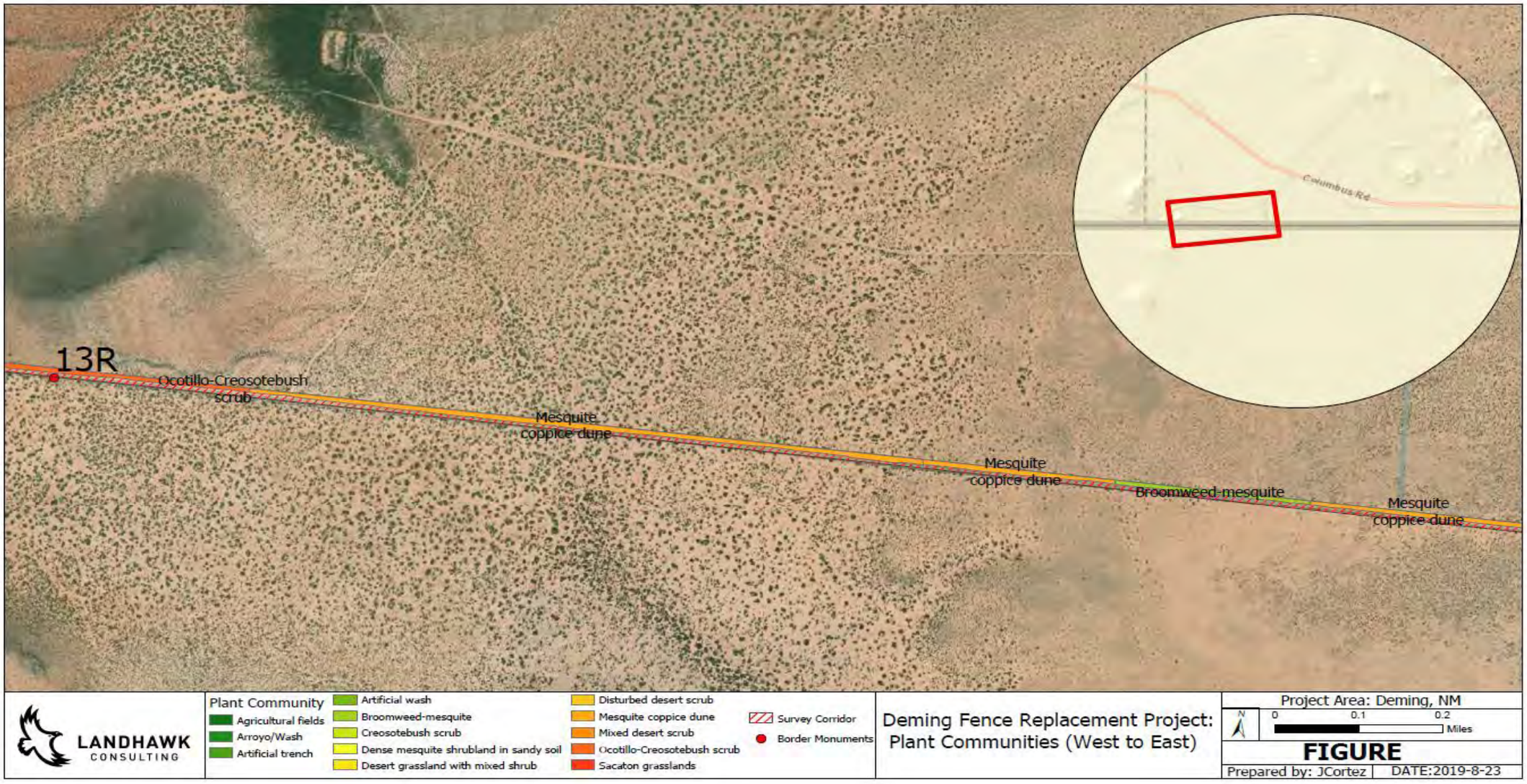

Figure 32. Plant communities mapped, section 18.

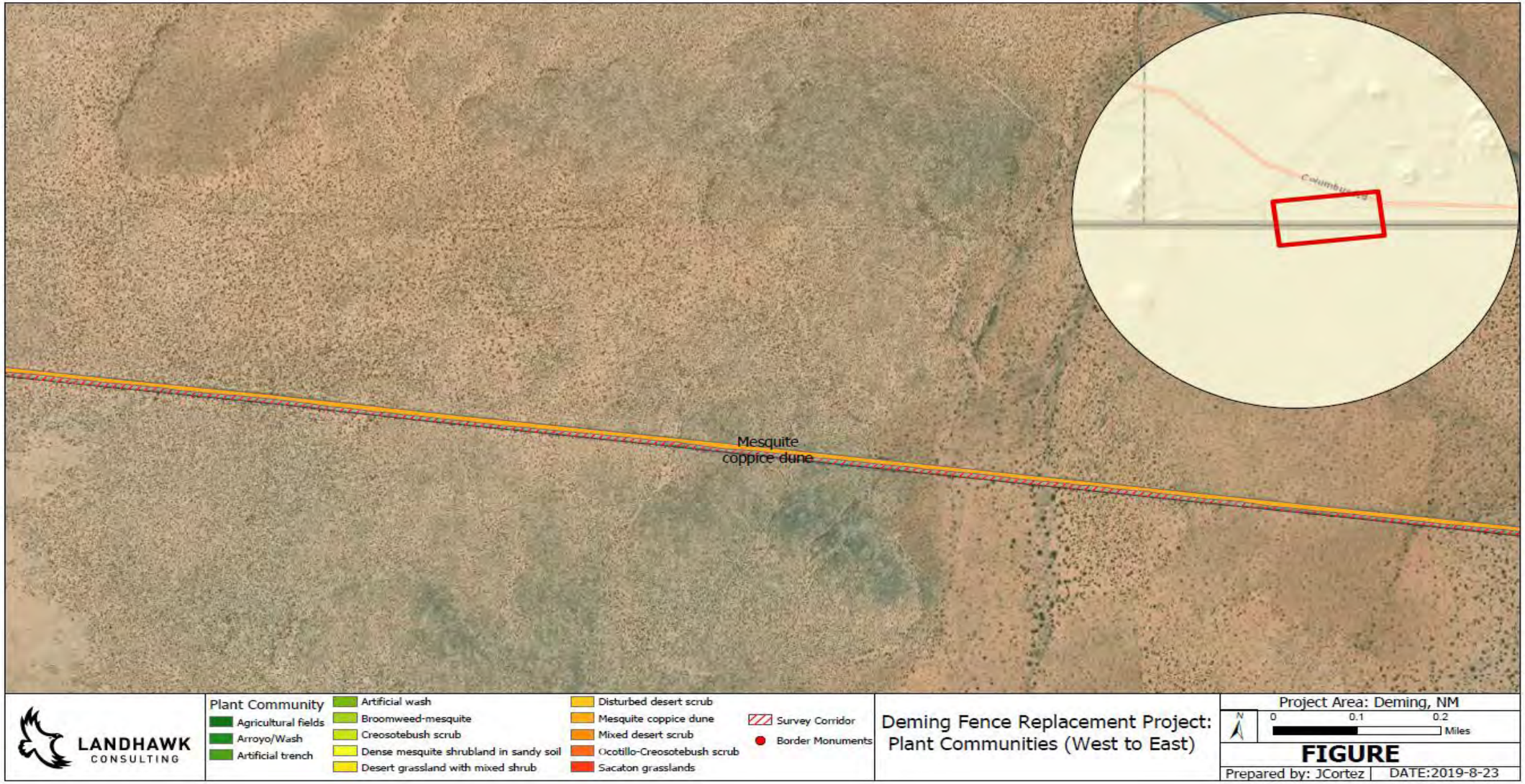

Figure 33. Plant communities mapped, section 19.

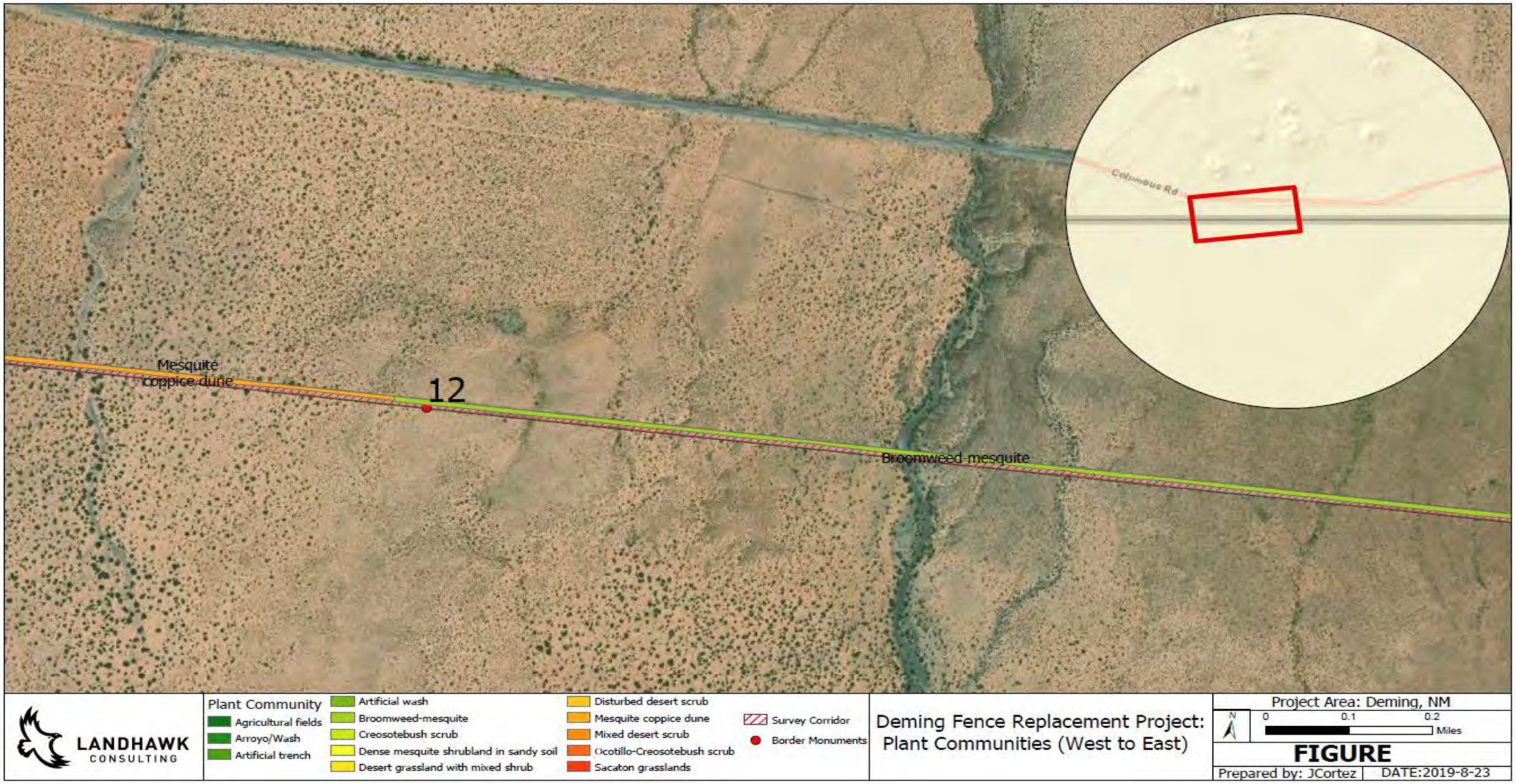

Figure 34. Plant communities mapped, section 20.

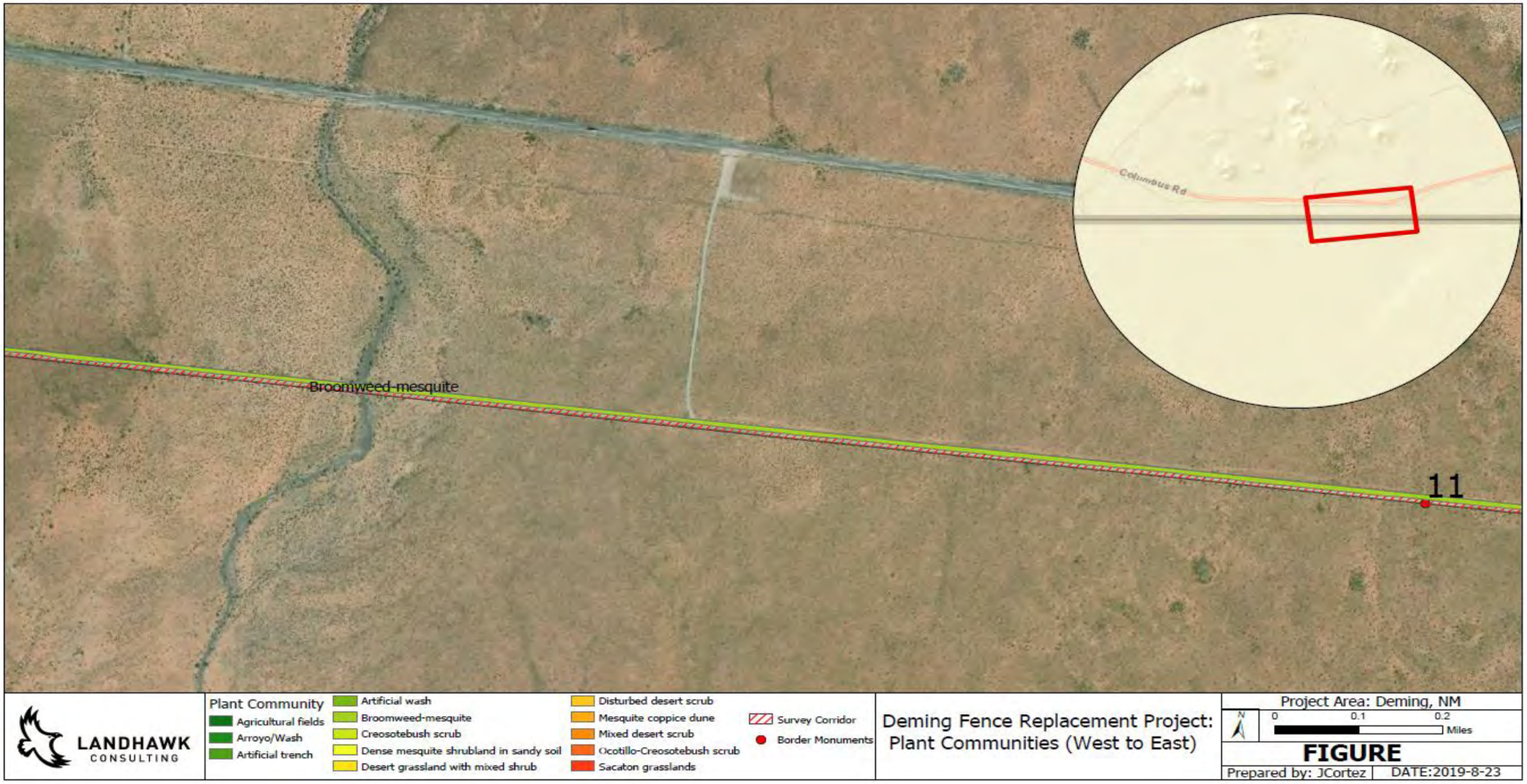

Figure 35. Plant communities mapped, section 21.

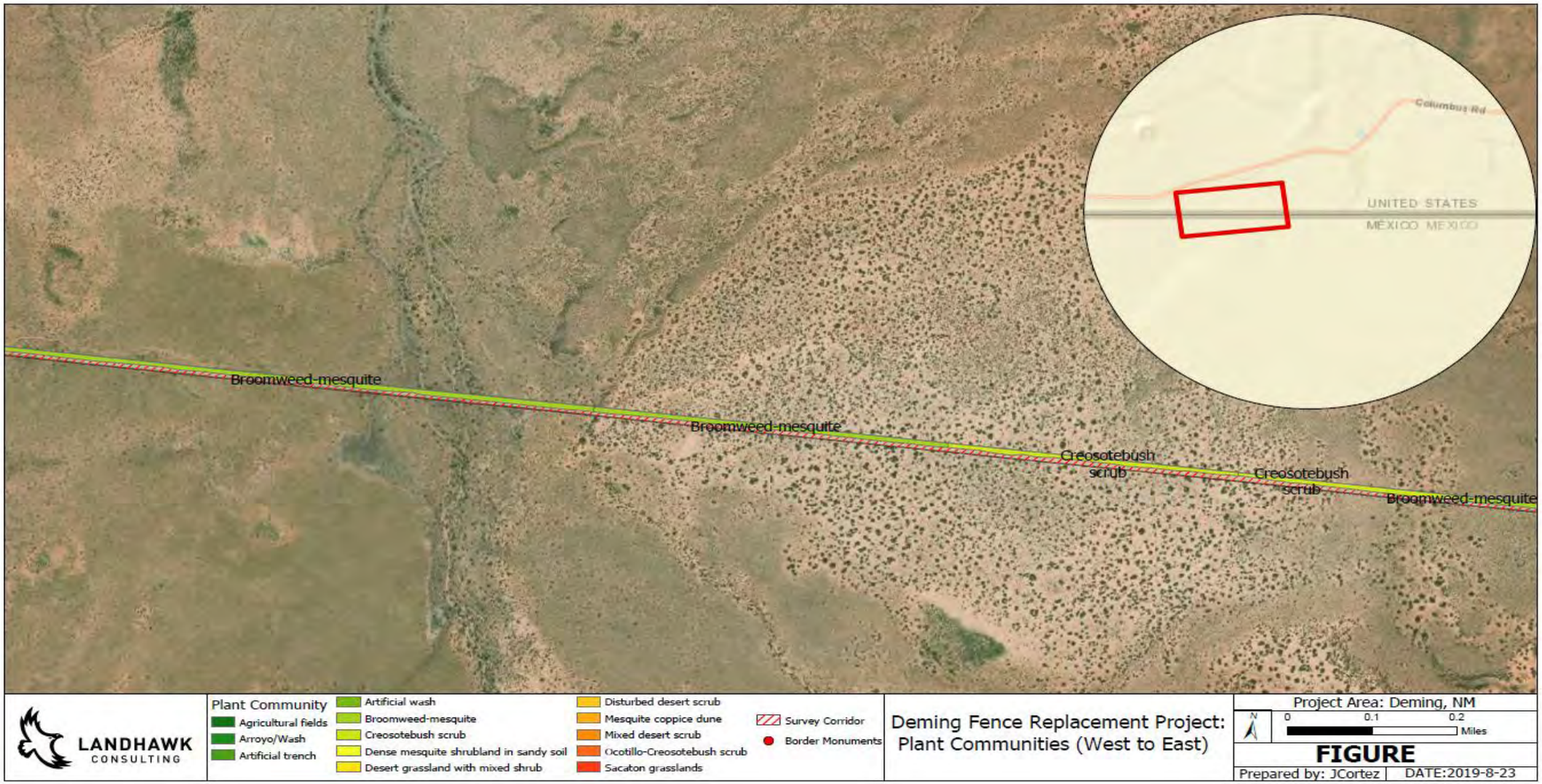

Figure 36. Plant communities mapped, section 22.

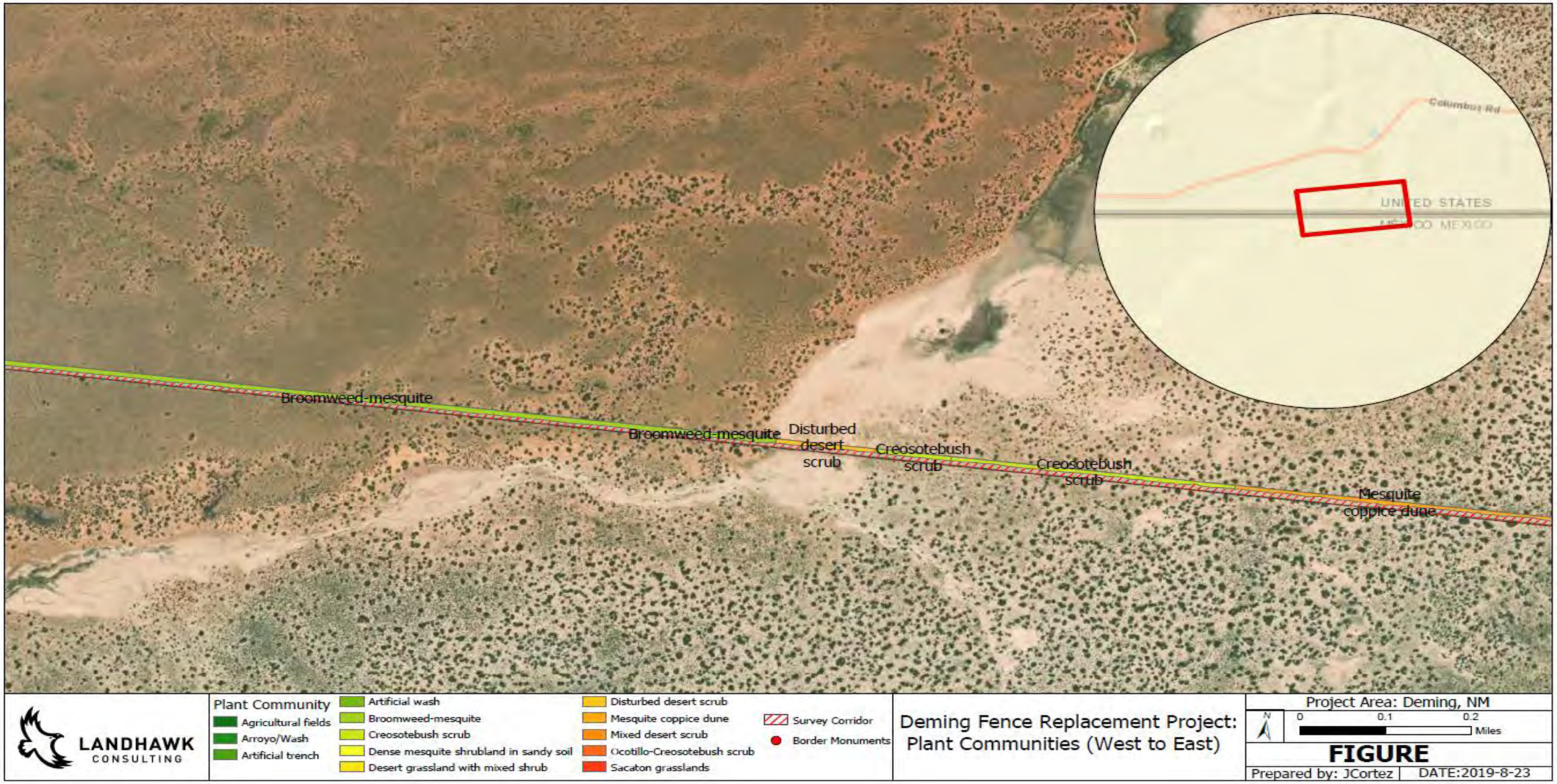

Figure 37. Plant communities mapped, section 23.

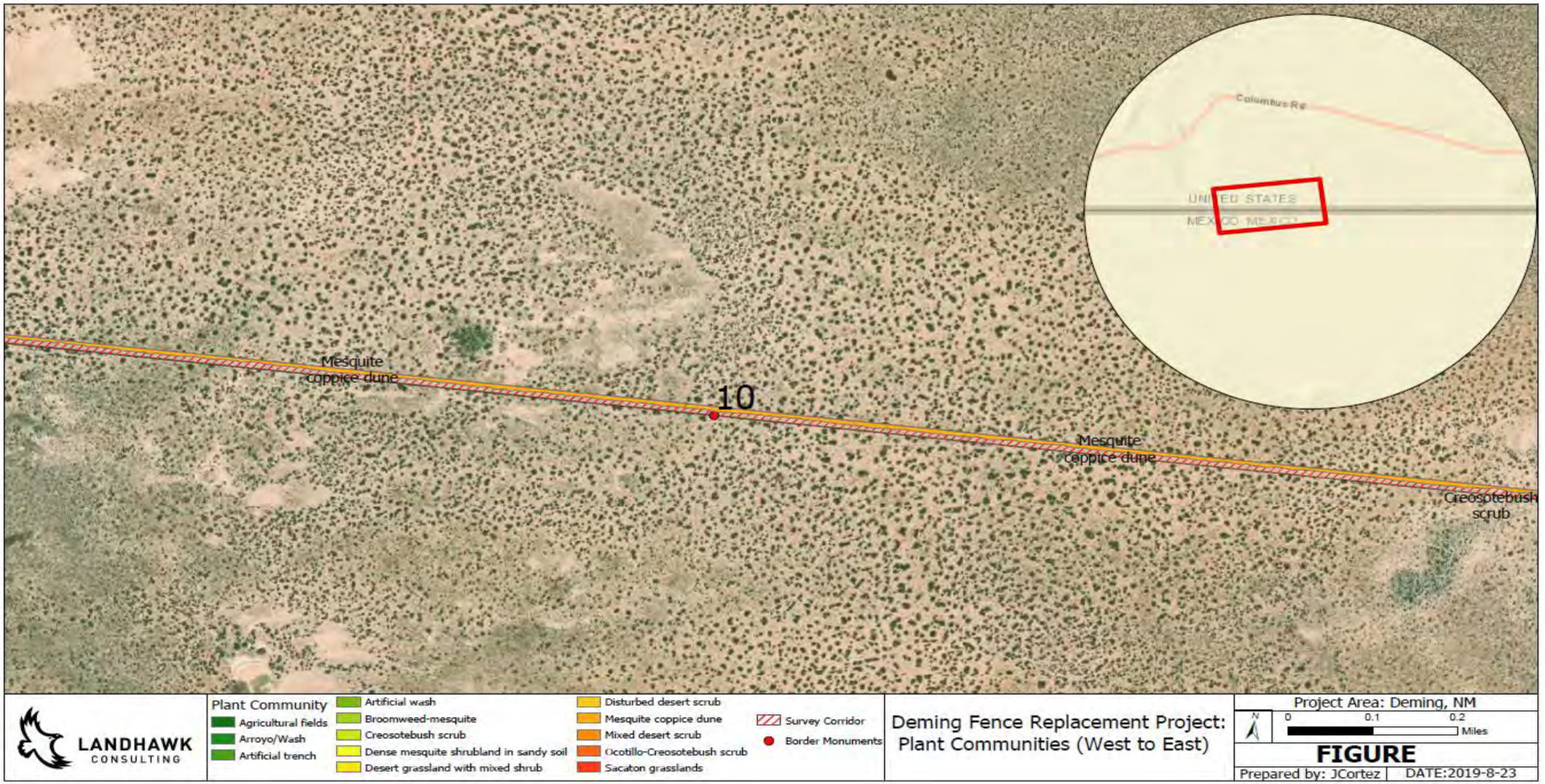

Figure 38. Plant communities mapped, section 24.

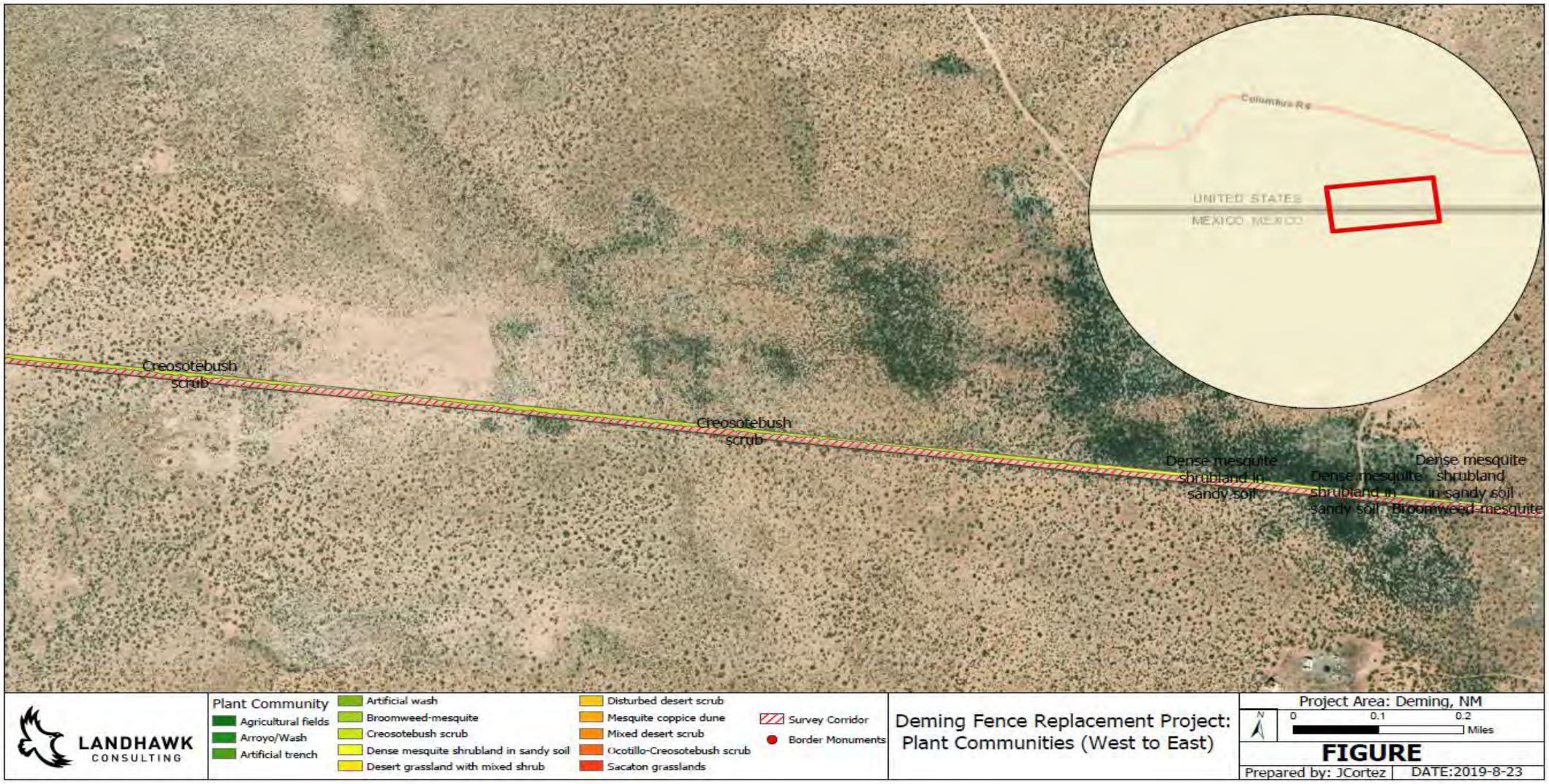

Figure 39. Plant communities mapped, section 25.

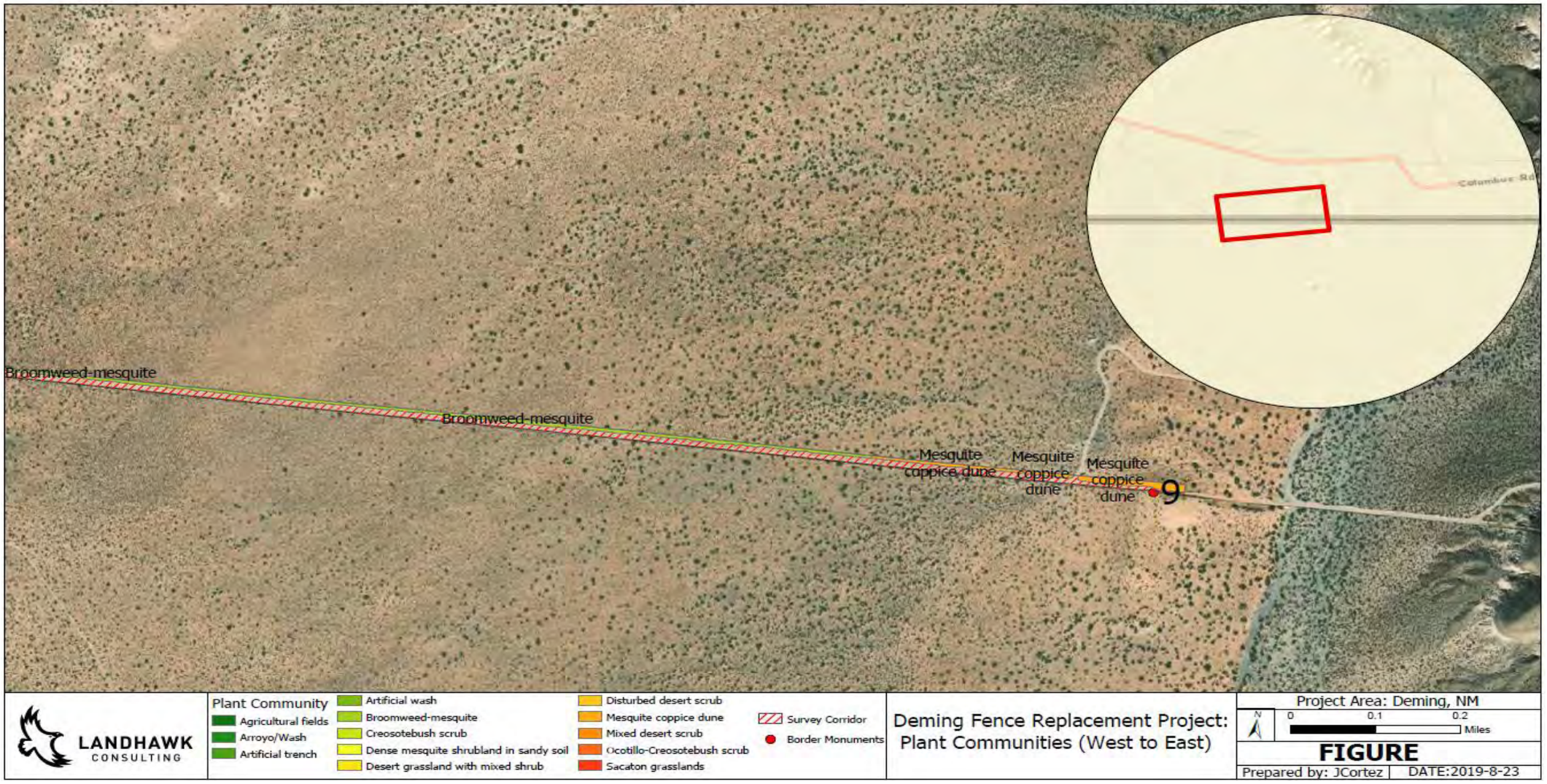

Figure 40. Plant communities mapped, section 26.

APPENDIX B

Air Emissions Calculations

U.S. Customs and Border Protection

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Assumptions	Impacted Area	Notes
Border wall length (miles):	2.4	Equivalent to 390,720 feet
Total number of panels:	274.67	Assume 659.20 panels per mile. (659.20 panels/mile x 2.4 miles)
Total construction area (square feet):	38,016	(390,720 feet of fence x 3 feet of fence width)
Estimated distance from wall to nearby town (miles):	24.5	Estimated distance (one way) from Columbus to starting-point of Project segment
Construction duration (days):	198	Construction lasted from July 2020 to January 2021. The total duration for the Project was 198 days. Construction generally occurred six days per week from 7:00 a.m. to 7:00 p.m.

Estimated Equipment Usage*

Type of Equipment	Quantity	Total Days	Number of Trips	Total Usage	Total Usage Units	Comments
Loader	1	198	-	2376	hours	Assumed to be used 12 hours per day, 6 days per week, 52 weeks per year for a total of 198 days.
Dozer	1	11	-	135	hours	Assume dirt to be removed = 2.4 mi x (5280 ft/mi) x (3 ft wide) = 38,016 ft2 = 0.87 acres 38,016 ft2 x 6 ft deep = 228,096 ft3. Assume spread and leveling dirt** at 48 m3/hour and 12-hour days = 576 m3/day (or 20,341.2 ft3/day). Total impacted volume (228,096 ft3) / rate of spread and leveling (20,341 ft3/day) = 11 12-hour days = 135 hours.
Excavator	1	13	-	161	hours	Assume dirt to be removed = 2.4 mi x (5280 ft/mi) x (3 ft wide) = 38,016 ft2 = 0.87 acres 38,016 ft2 x 6 ft deep = 228,096 ft3. Assume digging*** 40 m3/hour and 12-hour days = 480 m3/day (or 16,951 ft3/day). Total impacted volume (228,096 ft3) / rate of spread and leveling (16,951 ft3/day) = 13 12-hour days = 161 hours.
Crane	1	198	198	2376	hours	Assumed to be used 12 hours per day, 6 days per week, 52 weeks per year for a total of 198 days.
Water Truck	1	-	198	475	miles	Assume water truck stays at project site and drives ___ miles in the project corridor every day. 198 trips x 2.4 miles = 475 total miles
Delivery Truck	1	-	55	2802	miles	Based on round trip from Columbus to midpoint of Project segment (25.7 miles one way). Assume necessary for construction. Assume 5 panels per trip. 274.67 total panels/5 panels per trip = 55 trips. 55 trips x 51 round trip miles = 2802 miles.
Hauling Truck	1	-	3	156	miles	Based on round trip from Columbus to midpoint of Project segment (25.7 miles one way). Assume 274.67 panels at 550 lbs per panel are needed for construction. Assume flat bed truck with 50,000-lb capacity. 50,000lbs/550lbs = 90 panels per truck 274.67 panels/90 panels per trucks = 3 truck loads. 3 truck loads x 51 round trip miles = 156 miles.
Cement Truck	1	-	3250	165727	miles	Based on estimated distance between batch plant and midpoint of Project segment (25.7 miles one way). Assume 8-yd3 concrete capacity per delivery. Assume wall footing = 27.5ft x 1ft x 2ft = 55ft3 x 5280ft/mi = 290,400 ft3 of cement per mile of footing. 290,400 ft3/mile x 2.4 mi = 696,960 ft3 of cement for all footing. Assume 8 poles per 10-ft panel of fence and poles are 0.5-ft (6 in) x 0.5-ft (6 in) x 18-ft = 4.5 ft3*8 poles = 36 ft3. Assume poles filled half-capacity with cement to account for rebar = 36 ft3/2= 18 ft3 of cement per panel. 18ft3 x 274.67 panels = 4,944 ft3 of cement for panels. 696,960 ft3 + 4,944 ft3 = 701,904 ft3 = 25,996 yd3 of cement. 25,996 yd3 total of cement / 8-yd3 capacity per trip = 3,250 trips. 3,250 trips x 51 round trip miles = 165,727 miles.
Passenger Car (Worker Commute)	7	-	198	70686	miles	Based on round trip from Columbus to midpoint of Project segment (25.7 miles one way). Assume one operator, two riggers, and one safety representative for crane; one operator and one assistant for all other equipment; 3 other construction site workers (e.g., foreman).
Passenger Truck (Worker Commute)	8	-	198	80784	miles	Assume 7 passenger cars (7 vehicles x 51 miles x 198 days = 70,686) and 8 passenger trucks (8 vehicles x 51 miles x 198 days = 80,784 miles).

* Equipment usage is based off estimates from the Environmental Stewardship Plan For the Proposed Yuma Wall Replacement Project (https://www.cbp.gov/sites/default/files/assets/documents/2019-Jun/Yuma%20Primary%20Fence%20Replacement_Environmental%20Stewardship%20Plan.pdf)

** Excavation production and removal rates extracted from https://www.methvin.org/construction-production-rates/excavation/bulk-excavation to estimate PM10 for excavation using equation 4-4 from Air Emissions Guide for Air Force Transitory Sources, Methods for Estimating Emissions of Air Pollutants for Transitory Sources at U.S. Air Force Installations, August 2018 (http://solutioenv.com/Documents/2018%20TransitorySourceGuide.pdf)

***Spread and level (Average) rate for grading extracted from: https://www.methvin.org/construction-production-rates/excavation/spread-and-level - Dozer, 1.2m3 bucket, 50-200m2, Sand/Soil Slow: 43.5 Average: 48.0 Fast: 52.6 Unit: m3/hr to estimate PM 10 using equation 4-4 from Air Emissions Guide (see previous bullet point).

Equipment Emission Rates

Equipment	Horsepower (hp)	Emission Rate*							Unit
		VOC	CO	CO2e	NOx	SO2	PM2.5	PM10	
Crane	300	0.14773	0.21564	-	1.01555	2.74E-03	3.90E-02	4.02E-02	g/hp-hr per day
Excavator	175	0.13668	0.2279	-	0.55829	2.65E-03	3.45E-02	3.56E-02	g/hp-hr per day
Dozer	175	0.14123	0.28219	-	0.7193	2.69E-03	4.89E-02	5.04E-02	g/hp-hr per day
Loader	100	0.58932	3.9348	-	3.03713	4.03E-03	0.51927	0.53533	g/hp-hr per day
Water Truck	-	6.45E-04	3.97E-03	6.79E-02	1.12E-03	5.69E-07	3.36E-06	3.66E-06	lbs/mi
Cement Truck	-	5.73E-04	1.05E-03	8.48E-03	0	6.98E-08	3.05E-07	3.32E-07	lbs/mi
Hauling Truck	-	5.73E-04	1.05E-03	8.48E-03	0	6.98E-08	3.05E-07	3.32E-07	lbs/mi
Delivery Truck	-	5.73E-04	1.06E-03	8.48E-03	0	6.98E-08	3.05E-07	3.32E-07	lbs/mi

Equipment	Type of PM Emission	Emission Rate*							Unit
		VOC	CO	CO2e	NOx	SO2	PM2.5	PM10	
Passenger Truck	-	1.72E-04	7.28E-03	-	0.00013185	6.60E-06	-	-	lbs/mi
	Primary Exhaust						9.10E-06	1.03E-05	lbs/mi
	Tirewear Particulate						3.38E-05	2.25E-05	lbs/mi
	Brakewear Particulate						1.67E-05	0.000134	lbs/mi
Passenger Car	-	1.06E-04	5.79E-03	-	7.80E-05	5.41E-06	-	-	lbs/mi
	Primary Exhaust						6.26E-06	7.07E-06	lbs/mi
	Tirewear Particulate						3.38E-06	2.25E-05	lbs/mi
	Brakewear Particulate						8.05E-05	1.01E-05	lbs/mi

* Emission rates extracted from the Environmental Stewardship Plan For the Proposed Yuma Wall Replacement Project (https://www.cbp.gov/sites/default/files/assets/documents/2019-Jun/Yuma%20Primary%20Fence%20Replacement_Environmental%20Stewardship%20Plan.pdf) which were originally acquired from USEPA's Motor Vehicle Emission Simulator (MOVES).

Fugitive Dust Emissions

Equipment	Type of PM Emission	Acreage	Emission Rate*		Unit
			PM2.5**	PM10	
Excavator	Fugitive Dust	26.91	2	20	lb/ac-day
Dozer	Fugitive Dust	26.91	2	20	lb/ac-day

*PM2.5 is calculated using PM10 conversion factor of 0.1

* Emission rates extracted from Air Emissions Guide for Air Force Transitory Sources, Methods for Estimating Emissions of Air Pollutants for Transitory Sources at U.S. Air Force Installations, August 2018 (http://solutioenv.com/Documents/2018%20TransitorySourceGuide.pdf)

** PM2.5 was calculated using PM10 conversion factor of 0.1 acquired from Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors (https://www3.epa.gov/ttn/chief/ap42/ch13/bgdocs/b13s02.pdf)

Equipment Emissions

Equipment	Total Emissions (lbs/year)*						
	VOC	CO	CO2e	NOx	SO2	PM2.5**	PM10**
Crane	232.15226	338.87033	-	1595.89947	4.30581	61.28707	63.17282
Excavator	8.51497	14.19785	-	34.78068	0.16509	726.36184	7244.34320
Dozer	7.33210	14.65017	-	37.34318	0.13965	606.05507	6037.78090
Loader	308.69823	2061.13115	-	1590.91269	2.11100	272.00457	280.41713
Water Truck	0.30633768	1.88830224	32.2765344	0.53241	0.00027	0.00160	0.00174
Cement Truck	94.88553	174.80919	1406.14671	0	0.01156	0.05058	0.05498
Hauling Truck	0.08911	0.16417	1.32060	0	0.00001	0.00005	0.00005
Delivery Truck	1.60403	2.98314	23.77074	0	0.00020	0.00086	0.00093
Passenger Truck	13.91585	588.08328	-	10.65137	0.53292	4.81509	13.45981
Passenger Car	7.46232	409.09523	-	5.51262	0.38239	6.37012	2.80306
TOTAL	674.96074	3605.87282	1463.51457	3275.63241	7.64890	1676.94683	13642.03463

* Total emissions for Crane, Excavator, Dozer, and Loader were calculated using the following formula: *Total emission (lbs) = Emission rate (g/hp-hr per day) * Hours equipment is used (hrs) * Horsepower of equipment (hp) * g to lb conversion factor*

Total emissions for Water Truck, Cement Truck, Hauling Truck, Delivery Truck were calculated using the following formula: *Total Emission (lbs) = Emission rate (lbs/mi) * Total miles driven (mi)*

** PM emission values for Excavator and Dozer include primary exhaust and fugitive dust emission rates.

PM emission values for Passenger Truck and Car include primary exhaust, tirewear particulate, and brakewear particulate emission rates.

APPENDIX C

Cultural Resources Survey Report

U.S. Customs and Border Protection

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NMCRIS No. 143648

A CULTURAL RESOURCES SURVEY FOR THE PROPOSED REPLACEMENT OF APPROXIMATELY 46 MILES OF BORDER FENCE LOCATED IN LUNA AND DOÑA ANA COUNTIES, NEW MEXICO

Prepared by:

Nicholas R. Billstrand M.A., RPA

NRI Project No. 19-33

Prepared for:

U.S. Customs and Border Protection
Office of Border Patrol
Task Order 70B01C19F00000338
Work Order 01

Submitted by:

Eric S. Cox, M.A., R.P.A.
Principal Investigator

BLM Cultural Use Permit No. 291-2920-14C
State of New Mexico General Permit No. NM-19-161-S

Technical Report No. 19-28
Northland Research, Inc.
Tempe, Arizona

August 6, 2019

ABSTRACT

NMCRIS Activity #: 143648

Project Sponsor: U.S. Customs and Border Protection (CBP), Department of Homeland Security (DHS)

Report Title: A Cultural Resources Survey for the Proposed Replacement of Approximately 46 Miles of Border Fence Located in Luna and Doña Ana Counties, New Mexico

Permittee field number and/or name for project: Northland Project Number 19-33, Deming Primary Fence Replacement

Field Crew: Nick Billstrand (Project Director), John Marshall (Archaeologist), and Matt Steber (Archaeologist)

Date Fieldwork: 17-21 June 2019

Report Date: August 6, 2019

Cultural Resource Use Permit Number(s): BLM Cultural Use Permit No. 291-2920-14C; State of New Mexico General Permit No. NM-19-161-S

Land Ownership Status: Roosevelt Reservation; Federal Land

Location of Project Area: The project area includes roughly 348.58 acres to the east and west of the Columbus Port of Entry (POE) in southern Luna, and Doña Ana Counties, New Mexico, along the United States-Mexico International Border. The project area is comprised of two segments of the Roosevelt Reservation (the 60-ft wide corridor on the north side of the border measuring 33.87 miles between the Santa Teresa POE and the Columbus POE on the east and 14.06 miles west of the Columbus POE). The length and area of the various portions of the project area are listed in Table i. The project area includes portions of multiple sections (Table ii). Land ownership includes the Roosevelt Reservation which is on lands administered by CBP.

Table i. Summary of Project Area Components.

Portion	Length	Area (Acres)
Roosevelt Reservation West	14.06	102.25
Roosevelt Reservation East	33.87	246.33
Total		348.58

Table ii. List of Sections in the Project Area.

Roosevelt Reservation East	T29S, R7W Section 13–17
	T29S, R6W Section 13–18
	T29S, R5W Section 13–18
	T29S, R4W Section 13–16
	T29S, R3W Section 13–16
	T29S, R2W Section 13–16
Roosevelt Reservation West	T29S, R11W Section 13
	T29S, R10W Section 13–16
	T29S, R9W Section 13–16
	T29S, R8W Section 17-18

USGS quad name(s): Hermanas, N. Mex. 7.5' series quadrangle; Malpais Hill, N. Mex. 7.5' series quadrangle; Columbus, N. Mex. 7.5' series quadrangle; Columbus SE, N. Mex. 7.5' series quadrangle; Coyote Hill, N. Mex. 7.5' series quadrangle; Camel MT, N. Mex. 7.5' series quadrangle; Guzmans Lookout MT, N. Mex. 7.5' series quadrangle; Mount Riley, N. Mex. 7.5' series quadrangle.

Project Description: Northland Research, Inc. (Northland), completed a Class III cultural resources survey and records check for CBP for a proposed fence replacement project located to the east and west of the Columbus POE, in Luna and Doña Ana Counties, New Mexico. The undertaking will involve replacing approximately 46 miles of existing vehicle fence with a new pedestrian wall near the Santa Teresa and Columbus Station Areas of Responsibility, starting approximately 20 miles west of the Santa Teresa POE and following the alignment of the existing vehicular fence west for 34 miles and approximately 14 miles west of the Columbus POE. The construction corridor will be confined to the 60-foot wide Roosevelt Reservation; the replacement fence will be bollard style fence comprised of 6-inch diameter steel bollards, spaced 4 inches apart, and will be 30 feet high. The project will include repairs and improvements to the existing patrol road, installation of a fiber optic cable for communications, installation of LED lighting, and installation of electrical utilities to supply power to the lighting and communications cable. Northland conducted a cultural resources survey in order to identify and assess the significance of cultural resources within the project area.

Total Acreage: The Area of Potential Effect (APE) involved a total of 348.58 acres (Table iii). This includes 102.25 acres of the Roosevelt Reservation west of the Columbus POE, and 246.33 acres of the Roosevelt Reservation to the east of the Columbus POE.

Table iii. Acreage of Project Area Components.

Portion	Land Jurisdiction	Acreage
Roosevelt Reservation East	U.S. Government	246.33
Roosevelt Reservation West	U.S. Government	102.25
Total		348.58

Results: Northland completed survey of the proposed APE within the Roosevelt Reservation. The weather conditions were favorable during the current survey, consisting of mostly sunny days ranging in temperature from 85–95 degrees. Likewise, ground surface visibility was excellent throughout the survey area, ranging from 60–100%. Fifteen newly discovered sites were recorded during the project (Table iv, Appendix C). All fifteen sites are historical border monuments that date to between 1891–1896. All of these sites are considered significant and are recommended as eligible for inclusion in the National Register of Historic Places (NRHP) under criterion A (historical event). The proposed undertaking will not affect these sites. It is recommended that all 15 newly recorded sites be avoided. In the event these sites cannot be avoided, the sites and the immediate surrounding area should be monitored during the proposed undertaking.

Table iv. Summary of Newly Recorded Sites.

Site	Type and Age	Elev. (m)	NRHP Eligibility Recommendation	Management Recommendation
194680	Border Monument 30	1,252	Eligible	Avoidance/ Monitor
194681	Border Monument 29	1,272	Eligible	Avoidance/ Monitor
194682	Border Monument 28	1,306	Eligible	Avoidance/ Monitor
194683	Border Monument 27*	1,294	Eligible	Avoidance/ Monitor
194684	Border Monument 26	1,315	Eligible	Avoidance/ Monitor
194685	Border Monument 25	1,297	Eligible	Avoidance/ Monitor
194686	Border Monument 24	1,259	Eligible	Avoidance/ Monitor
194687	Border Monument 20*	1,211	Eligible	Avoidance/ Monitor
194688	Border Monument 19	1,208	Eligible	Avoidance/ Monitor
194689	Border Monument 18	1,205	Eligible	Avoidance/ Monitor
194690	Border Monument 17	1,203	Eligible	Avoidance/ Monitor
194691	Border Monument 15	1,280	Eligible	Avoidance/ Monitor
194692	Border Monument 14	1,319	Eligible	Avoidance/ Monitor
194693	Border Monument 10	1,259	Eligible	Avoidance/ Monitor
194694	Border Monument 9	1,288	Eligible	Avoidance/ Monitor

* Not photographed.

Prior to the survey, Northland conducted a Class I records review of New Mexico Cultural Resources Information System (NMCRIS), the Archaeological Records Management Section (ARMS), and all project records on file at Northland for previous projects and previously recorded sites within one-half mile of the current project area. In addition to the 15 newly recorded sites, Northland revisited 27 previously recorded sites during fieldwork (Table v, Appendix B). These sites are located along the United States-Mexico International Border in southern Luna and Doña Ana Counties, New Mexico.

All sites include portions of, or are adjacent to, the Roosevelt Reservation. Note that nearly all of the Roosevelt Reservation has previously been disturbed by relatively recent improvements to the border fence and road. Archaeological survey, as well as archaeological test investigations of selected sites, was conducted prior to those improvements (Kurota and Turnbow 2008, 2009; Sechrist 1994; Trierweiler and Bonine 2003; Trierweiler and Smith 2004). During the current project, 27 previously recorded sites were revisited by Northland archaeologists (see Table v). Artifacts were identified at 18 of the 27 previously recorded sites. No artifacts or features were

found within the Roosevelt Reservation at the remaining nine previously recorded sites within the current APE.

Previous investigations have recommended that two of the 27 previously sites (LA 85756 and LA 85758) along the Roosevelt Reservation should not be considered NRHP eligible. Northland recommends no further action at either of these sites. Ten sites have been determined NRHP eligible and another 15 sites have not been evaluated or are considered unknown NRHP eligibility (see Table v). Northland recommends that 22 of the 25 eligible and indeterminate sites should be avoided. The proposed undertaking will not involve any impacts outside the 60-ft wide Roosevelt Reservation. However, given the possibility of buried deposits (due to shifting sand and dune accumulation), Northland recommends that if avoidance is not possible monitoring should be conducted during any ground disturbance within and near the immediate surrounding area of these sites. The remaining three sites (LA 85755, LA 85757, and LA 85760) have been exhausted of further research potential and no further work is warranted.

Table v. Summary of Previously Recorded Sites Within the APE.

LA Site Number	Age and Type	NHRP Eligibility	Management Recommendations
35222	Prehistoric habitation site	Not evaluated	Avoidance/Monitor
35272	Prehistoric limited activity	Not evaluated	Avoidance/Monitor
85076	Prehistoric Mogollon and Historic artifact scatter	Eligible	Avoidance/Monitor
85078	Mogollon and Historic artifact scatter	Not evaluated	Avoidance/Monitor
85079	Prehistoric and Historic artifact scatter	Not evaluated	Avoidance/Monitor
85755	Mogollon limited activity	Not evaluated	No further work
85756	Mogollon limited activity	Not eligible	No further work
85757	Archaic to Mogollon limited activity and Historic artifact scatter	Not evaluated	No further work
85758	Mogollon limited habitation	Not eligible	No further work
85759	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
85760	Mogollon habitation site	Eligible	No further work
85761	Prehistoric and historic artifact scatter	Not evaluated	Avoidance/Monitor
85764	Prehistoric limited activity	Not evaluated	Avoidance/Monitor
85765	Mogollon artifact scatter	Eligible	Avoidance/Monitor
85769	Late Archaic artifact scatter	Eligible	Avoidance/Monitor
85770	Prehistoric artifact scatter	Eligible	Avoidance/Monitor
85771	Prehistoric artifact scatter	Eligible	Avoidance/Monitor
85772	Late Archaic to Mogollon artifact scatter	Eligible	Avoidance/Monitor
139014	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
139015	Prehistoric and Historic limited activity	Not evaluated	Avoidance/Monitor
139016	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
139017	Prehistoric artifact scatter	Not evaluated	Avoidance/Monitor
139018	Archaic to Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
139019	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
159817	Historic monument	Eligible	Avoidance/Monitor
159818	Historic monument	Eligible	Avoidance/Monitor
159819	Historic monument	Eligible	Avoidance/Monitor

Finally, 14 isolated occurrences (IO) were recorded (Table vi). IOs include prehistoric and historical resources. These include individual artifacts and isolated historic to modern features. None of the IOs meet the criteria for archaeological sites. They are not considered significant and no additional investigation is recommended.

Table vi. Isolated Occurrences.

No.	Type	Description	Age
1	Lithic	1 Brown Rhyolite Tertiary Flake	Prehistoric, indeterminate
2	GLO Section marker	Sections 13, 18; T29S, R4W-R3W	1936
3	GLO Section marker	Sections 16, 14; T29S, R4W	1936
4	GLO Section marker	Sections 15, 16/ Mexico; T29S, R2W/Mexico (marks international border)	1936
5	GLO Section marker	Sections 16, 15; T29S, R4W	1936
6	GLO Section marker	Sections 18, 17; T29S, R4W	1936
7	Lithic	1 grey chert core chopper	Prehistoric, indeterminate
8	GLO Section marker	Sections 15, 14; T29S, R5W	1936
9	GLO Section marker	Sections 16, 15; T29S, R5W	1936
10	Ground stone	1 black basalt mano (bifacially flattened/ground)	Prehistoric, indeterminate
11	GLO Section marker	Sections 13, 18; T29S, R6W-R5W	1936
12	Ceramic	1 El Paso brownware sherd	Prehistoric; Formative (AD 200-1450)
13	Lithic	1 tan chert tertiary flake	Prehistoric, indeterminate
14	Lithic	1 tan chert tertiary flake	Prehistoric, indeterminate

Recommendations: Fifteen historic sites were recorded during the current survey. All of these sites consisted of International Border Monuments placed or repaired from 1891–1896. Each of the monuments are considered significant and are recommended as eligible for inclusion on the NRHP. Avoidance of these sites is recommended.

Twenty-seven previously recorded sites within the current APE were re-visited during the current project. All of the sites are located within the Roosevelt Reservation. During the current project, 18 sites were relocated based on the identification of surface artifacts. No artifacts or features were found within the Roosevelt Reservation at the remaining nine previously recorded sites within the current APE. Based on previous recordings and the current survey, avoidance is recommended for 22 of the 27 previously recorded sites (see Table v). No further work is warranted at the other previously recorded sites.

If previously unidentified cultural resources are encountered during the fence replacement project, the contractor should stop all ground disturbing activities in the vicinity of the discovery until officials from CBP are notified and the nature and significance of the find can be evaluated. If human remains are encountered during construction activity, construction should stop and appropriate notifications made as per the Native American Graves Protection and Repatriation Act (NAGPRA).

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INTRODUCTION

Northland Research, Inc. (Northland), completed a Class III cultural resources survey and records check for the U.S. Customs and Border Protection (CBP) for a proposed fence replacement project located to the east and west of the Columbus Port of Entry (POE), in Luna and Doña Ana Counties, New Mexico. The undertaking will involve replacing approximately 46 miles of existing vehicle fence with a new pedestrian wall near the Santa Teresa and Columbus Station Areas of Responsibility, starting approximately 20 miles west of the Santa Teresa POE and following the alignment of the existing vehicular fence west for 34 miles and approximately 14 miles west of the Columbus POE (Figure 1; Table 1). The replacement fence will be a bollard style fence comprised of 6-inch diameter steel bollards, spaced 4 inches apart, and will be 30 feet high. The project will include repairs and improvements to the existing patrol road, installation of a fiber optic cable for communications, installation of LED lighting, and installation of electrical utilities to supply power to the lighting and communications cable. Northland conducted a cultural resources survey in order to identify and assess the significance of cultural resources within the project area.

Table 1. Summary of Project Area Components.

Portion	Length	Area (Acres)
Roosevelt Reservation West	14.06	102.25
Roosevelt Reservation East	33.87	246.33
Total		348.58

The principal mission requirements of the Department of Homeland Security (DHS) include border security and the detection and prevention of illegal entry into the United States. Congress has provided the Secretary of Homeland Security (the Secretary) with a number of authorities necessary to carry out DHS's border security mission. One of these authorities is found at Section 102 of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA). In Section 102(a) of IIRIRA, Congress provided that the Secretary of Homeland Security shall take such actions as may be necessary to install additional physical barriers and roads (including the removal of obstacles to detection of illegal entrants) in the vicinity of the United States border to deter illegal crossings in areas of high illegal entry into the United States. In Section 102(b) of IIRIRA, Congress has called for the installation of additional fencing, barriers, roads, lighting, cameras, and sensors on the southwest border. Finally, in Section 102(c) of IIRIRA, Congress granted to the Secretary the authority to waive all legal requirements that the Secretary determines necessary to ensure the expeditious construction of barriers and roads authorized by Section 102 of IIRIRA.

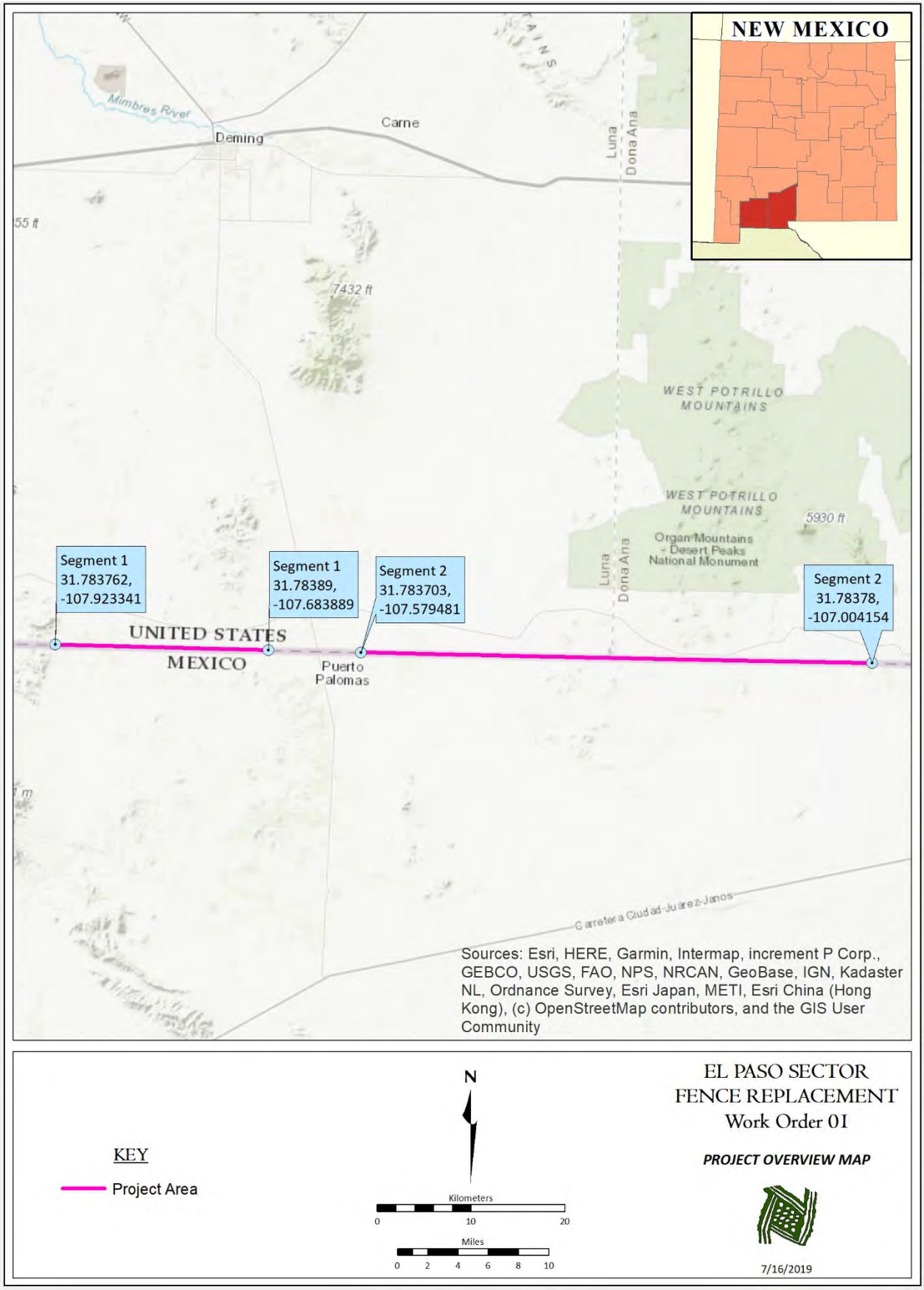

Figure 1. Overview of project location.

The Secretary of the DHS has determined, pursuant to Section 102(c) of IIRIRA, that it is necessary to waive certain laws, regulations and other legal requirements in order to ensure the expeditious construction of barriers and roads in the vicinity of the International Border near the Columbus POE. A waiver of environmental laws was signed by the Secretary and posted to the Federal Register on April 24, 2019. Although the Secretary's waiver means that CBP no longer has any specific legal obligations under the laws that are included in the waiver for the project previously described, DHS and CBP are committed to continue to protect valuable natural and cultural resources through responsible environmental stewardship. In order to uphold this commitment to responsible environmental stewardship, CBP will complete environmental resource surveys, an Environmental Stewardship Plan (ESP), and associated environmental plans for the project.

Fieldwork for the proposed 46 miles of fence replacement was conducted on 17–21 June 2019 by Northland archaeologists Nick Billstrand (Project Director), John Marshall, and Matt Steber. Eric Cox served as Principal Investigator; Mr. Cox meets the Professional Qualifications Standards as outlined in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. The survey was conducted in order to identify and assess the significance of cultural resources within the project area in accordance with Section 106 of the National Historic Preservation Act (NHPA).

Northland completed pedestrian survey of the proposed area of potential effect (APE) within the Roosevelt Reservation. Fifteen newly discovered sites were recorded during the project (Table 2, Appendix C). All fifteen sites are historical border monuments that date from between 1891–1896. All of these sites are considered significant and are recommended as eligible for inclusion in the National Register of Historic Places (NRHP) under criterion A (historical event). It is recommended that these sites be avoided. If these sites and the immediate surrounding area can not be avoided monitoring of any ground disturbance activity is recommended.

Table 2. Summary of Newly Recorded Sites.

Site	Type and Age	Elev. (m)	NRHP Eligibility Recommendation	Management Recommendation
194680	Border Monument 30	1,252	Eligible	Avoidance/Monitor
194681	Border Monument 29	1,272	Eligible	Avoidance/Monitor
194682	Border Monument 28	1,306	Eligible	Avoidance/Monitor
194683	Border Monument 27*	1,294	Eligible	Avoidance/Monitor
194684	Border Monument 26	1,315	Eligible	Avoidance/Monitor
194685	Border Monument 25	1,297	Eligible	Avoidance/Monitor
194686	Border Monument 24	1,259	Eligible	Avoidance/Monitor
194687	Border Monument 20*	1,211	Eligible	Avoidance/Monitor
194688	Border Monument 19	1,208	Eligible	Avoidance/Monitor
194689	Border Monument 18	1,205	Eligible	Avoidance/Monitor
194690	Border Monument 17	1,203	Eligible	Avoidance/Monitor
194691	Border Monument 15	1,280	Eligible	Avoidance/Monitor
194692	Border Monument 14	1,319	Eligible	Avoidance/Monitor
194693	Border Monument 10	1,259	Eligible	Avoidance/Monitor
194694	Border Monument 9	1,288	Eligible	Avoidance/Monitor

* Not photographed.

Northland revisited 27 previously recorded sites during fieldwork (Table 3, Appendix B). These sites are located along the United States-Mexico International Border in southern Luna and Doña Ana Counties, New Mexico.

Table 3. Summary of Previously Recorded Sites Within the APE.

LA Site No.	Age and Type	Elevation (MSL)	NHRP Eligibility	Reference
35222	Prehistoric habitation site	4,072	Not evaluated	Hilley 1981, New Mexico ARMS 2014
35272	Prehistoric limited activity	4,140	Not evaluated	Hilley 1981, New Mexico ARMS 2014
85076	Prehistoric Mogollon and Historic artifact scatter	4,000	Eligible	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85078	Mogollon and Historic artifact scatter	4,160	Not evaluated	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Gibbs et al. 2007
85079	Prehistoric and Historic artifact scatter	4,020	Not evaluated	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Kurota and Turnbow 2008
85755	Mogollon limited activity	4,080	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85756	Mogollon limited activity	4,110	Not eligible	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85757	Archaic to Mogollon limited activity and Historic artifact scatter	4,075	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85758	Mogollon limited habitation	4,070	Not eligible	Sechrist 1994, Trierweiler and Bonine 2003
85759	Mogollon artifact scatter	4,060	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85760	Mogollon habitation site	4,080	Eligible	Sechrist 1994, Kurota and Turnbow 2008, Kurota and Turnbow 2009
85761	Prehistoric and historic artifact scatter	4,000	Not evaluated	Sechrist 1994, Kurota and Turnbow 2008
85764	Prehistoric limited activity	4,115	Not evaluated	Sechrist 1994, Gibbs et al. 2007
85765	Mogollon artifact scatter	3,960	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85769	Late Archaic artifact scatter	3,970	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85770	Prehistoric artifact scatter	3,970	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Aztlan Archaeology Inc. 1999, Gibbs et al. 2007
85771	Prehistoric artifact scatter	3,950	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85772	Late Archaic to Mogollon artifact scatter	3,980	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Aztlan Archaeology Inc. 1999, Gibbs et al. 2007

Table 3. Summary of Previously Recorded Sites Within the APE.

LA Site No.	Age and Type	Elevation (MSL)	NHRP Eligibility	Reference
139014	Mogollon artifact scatter	4,089	Not evaluated	Trierweiler and Bonine 2003
139015	Prehistoric and Historic limited activity	4,090	Not evaluated	Trierweiler and Bonine 2003
139016	Mogollon artifact scatter	4,120	Not evaluated	Trierweiler and Bonine 2003
139017	Prehistoric artifact scatter	4,108	Not evaluated	Trierweiler and Bonine 2003
139018	Archaic to Mogollon artifact scatter	4,110	Not evaluated	Trierweiler and Bonine 2003
139019	Mogollon artifact scatter	4,100	Not evaluated	Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
159817	Historic monument	4,071	Eligible	Kurota and Turnbow 2008
159818	Historic monument	4,074	Eligible	Kurota and Turnbow 2008
159819	Historic monument	4,106	Eligible	Kurota and Turnbow 2008

All sites include portions of, or are adjacent to, the Roosevelt Reservation. Note that nearly all of the Roosevelt Reservation has previously been disturbed by relatively recent improvements to the border fence and road. Archaeological survey, as well as archaeological test investigations of selected sites, was conducted prior to those improvements (Kurota and Turnbow 2008, 2009; Sechrist 1994; Trierweiler and Bonine 2003; Trierweiler and Smith 2004). During the current project, no artifacts or features were found within the Roosevelt Reservation at nine of the 27 previously recorded sites within the current APE.

Previous investigations have recommended that two of the sites (LA 85756, LA 85758) along the Roosevelt Reservation should not be considered NRHP eligible. Three sites (LA 85755, LA 85757, and LA 85760) have, through previous and current investigations, been exhausted of any research potential. Northland recommends no further action at these five sites. Northland recommends avoidance of the remaining 22 previously recorded sites. If avoidance is not possible monitoring is recommended within the sites and the immediate surrounding areas.

PROJECT LOCATION

The survey area includes two components: 1) a 34-mile segment of the 60-ft wide Roosevelt Reservation between the Santa Teresa and Columbus POEs, and 2) a 14-mile segment of the 60-ft wide Roosevelt Reservation west of the Columbus POE. Maps showing the locations of the project area are shown on Figures 2–17. See Table 1, above, for lengths and area of the various components of the project. All of the project area is located in Luna and Doña Ana Counties, New Mexico.

The fence replacement along the United States-Mexico border will start west of the Columbus POE in Section 13, T29S, R11W, and follow the alignment of the existing vehicular fence east for approximately 14 miles to Border Monument 20. The second segment of fence replacement will start east of the Columbus POE in Section 17, T29S, R7W, and follow the alignment of the existing vehicular fence east for approximately 34 miles to Border Monument 9. The project area covers the 60-ft wide Roosevelt Reservation, on lands administered by CBP.

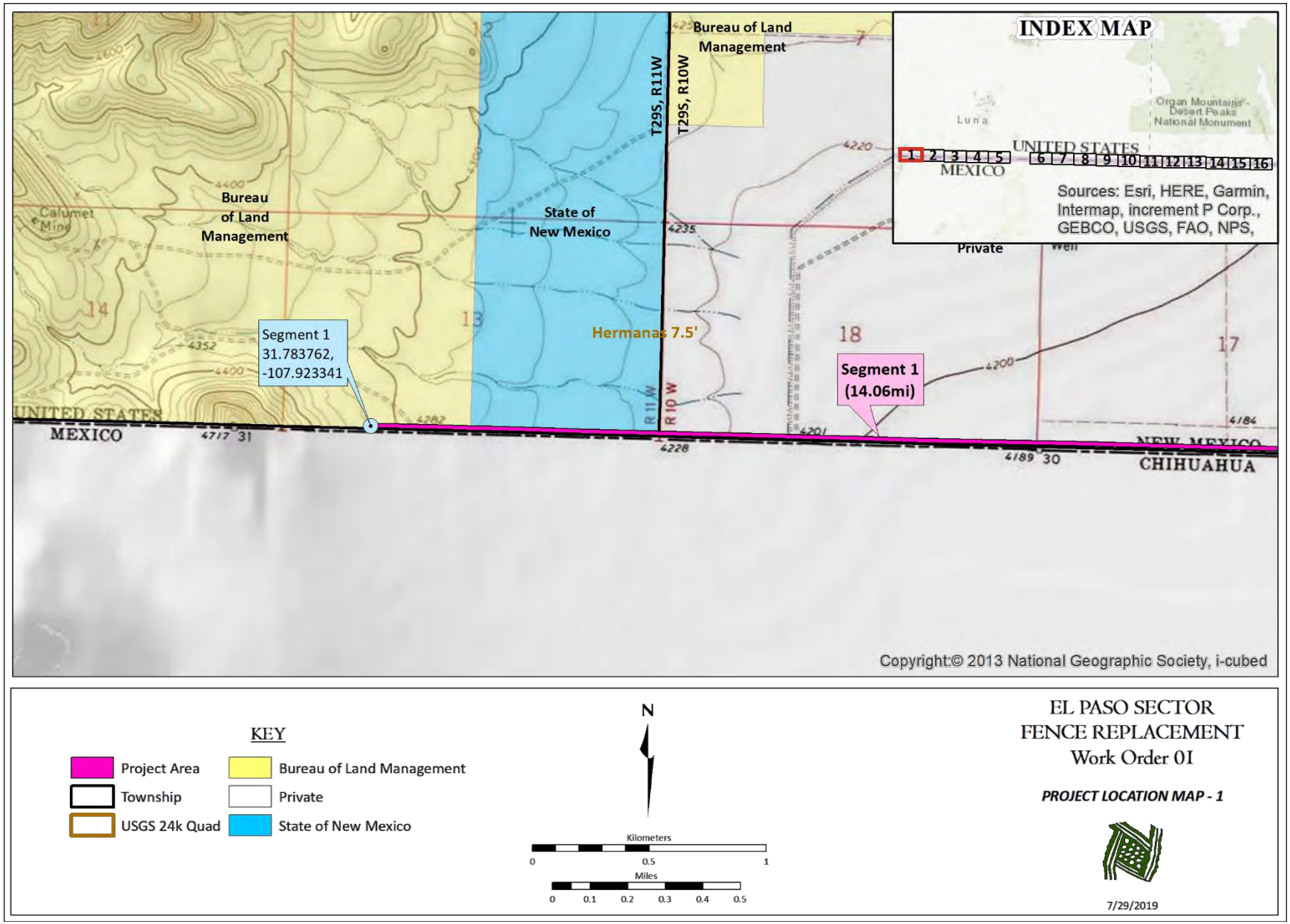

Figure 2. Overview of project area, Map 1 of 16.

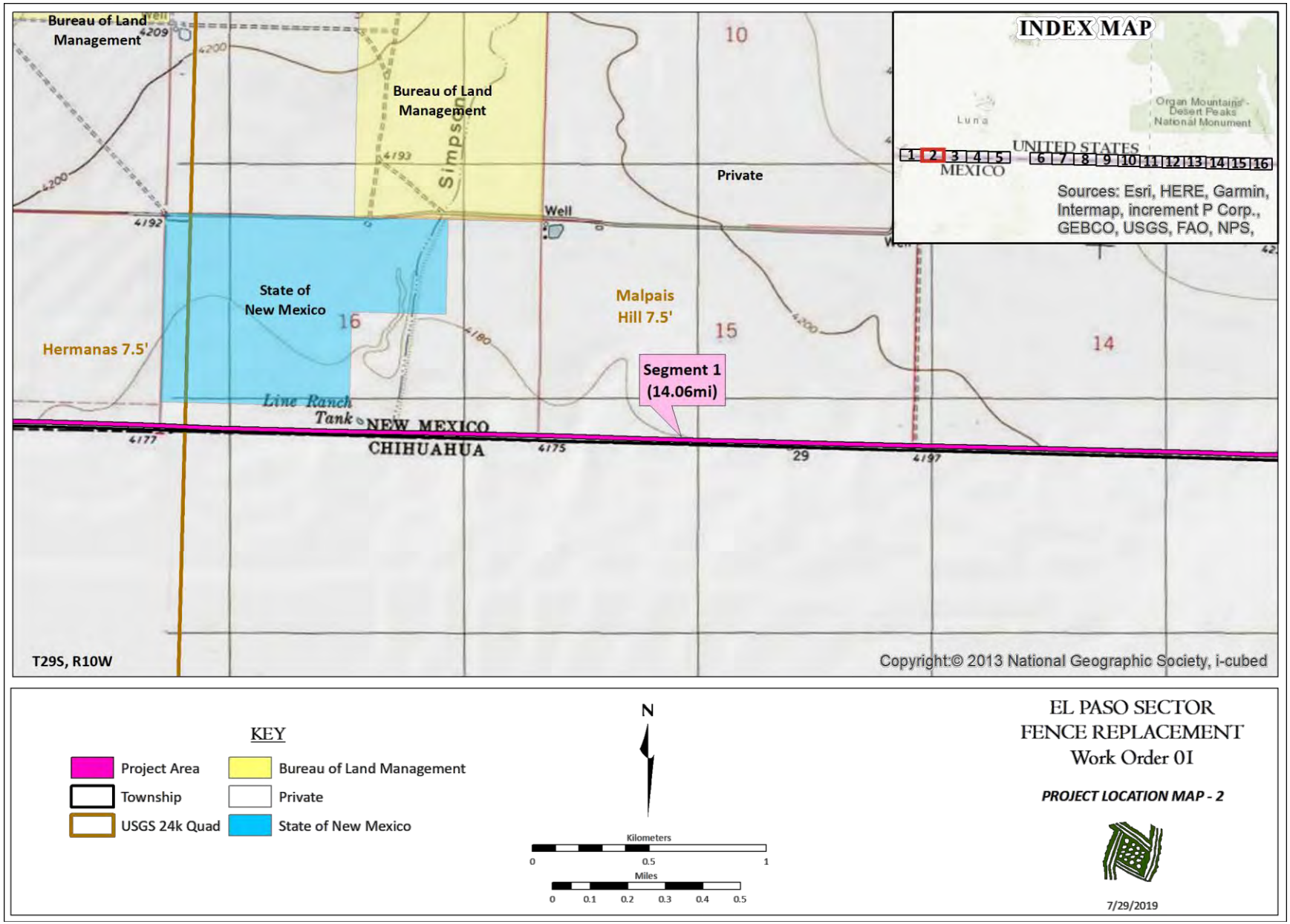

Figure 3. Overview of project area, Map 2 of 16.

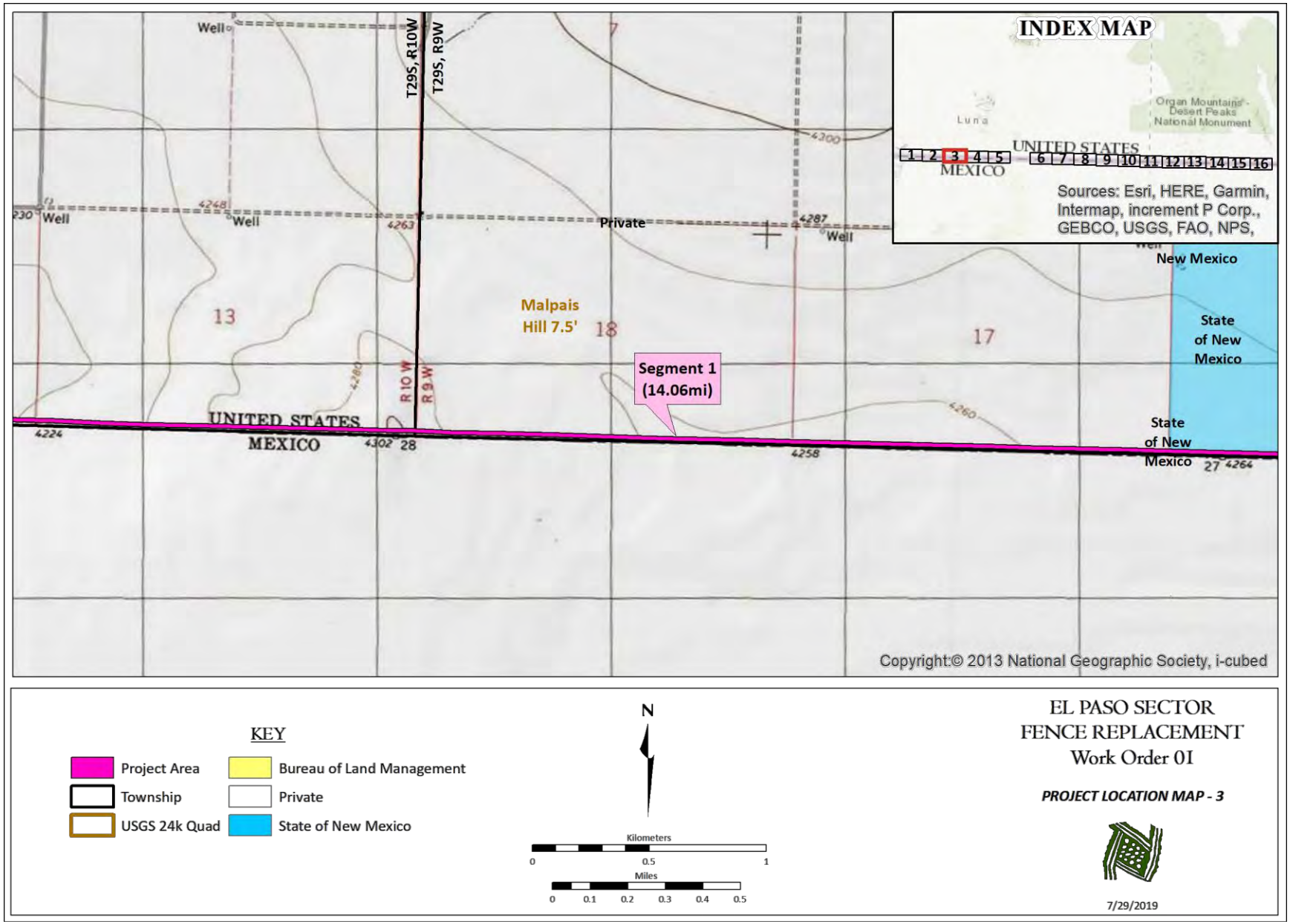

Figure 4. Overview of project area, Map 3 of 16.

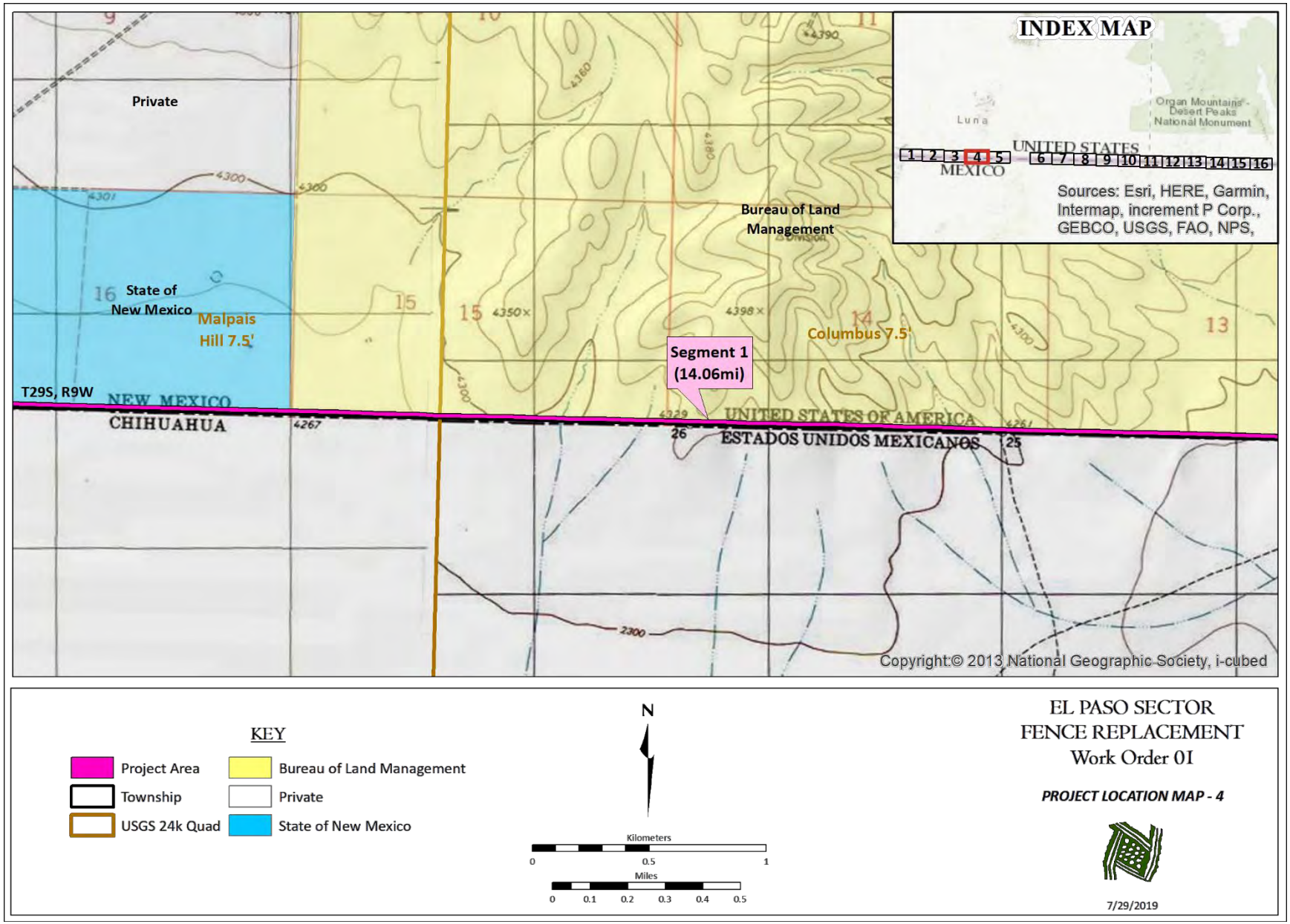

Figure 5. Overview of project area, Map 4 of 16.

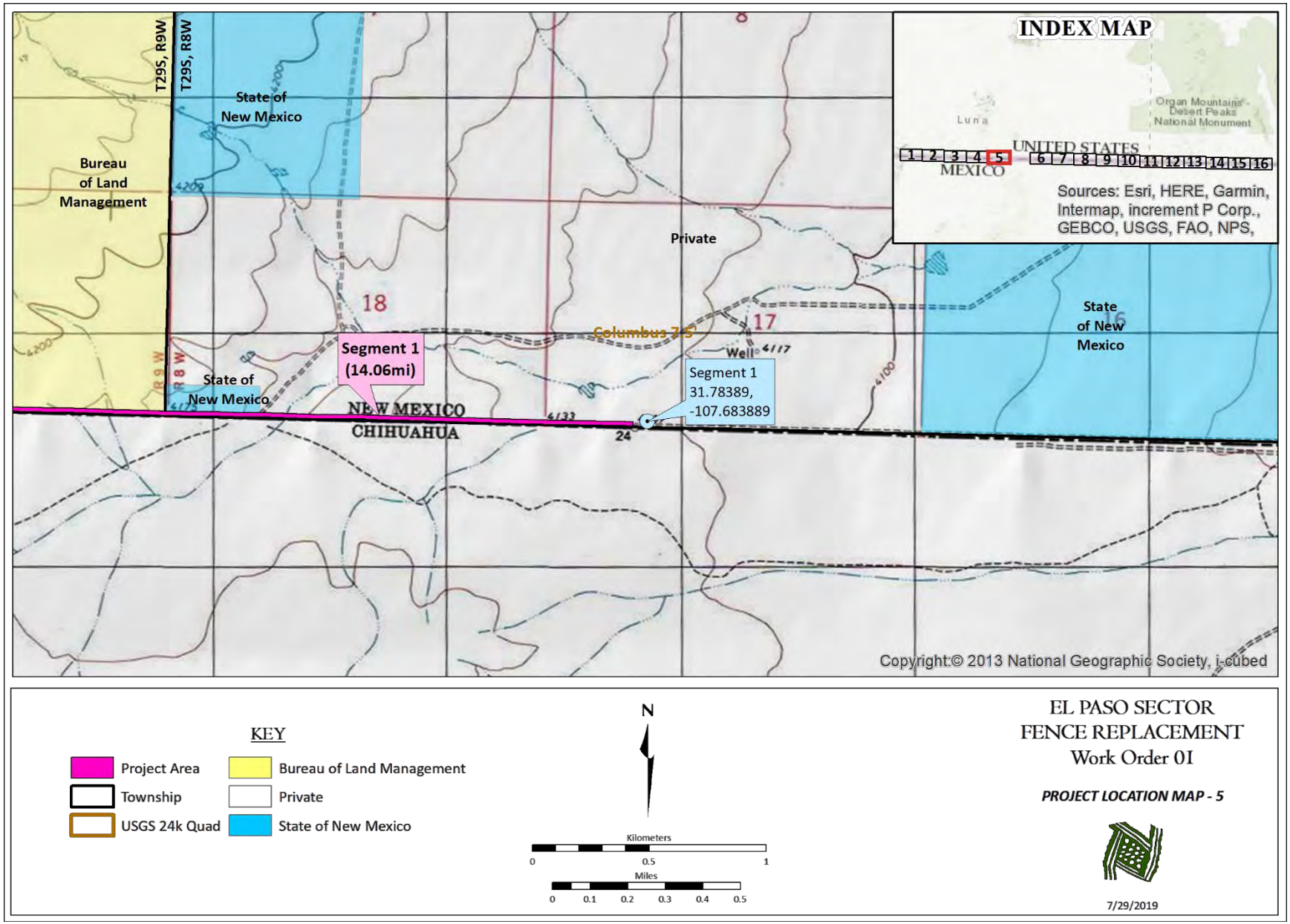

Figure 6. Overview of project area, Map 5 of 16.

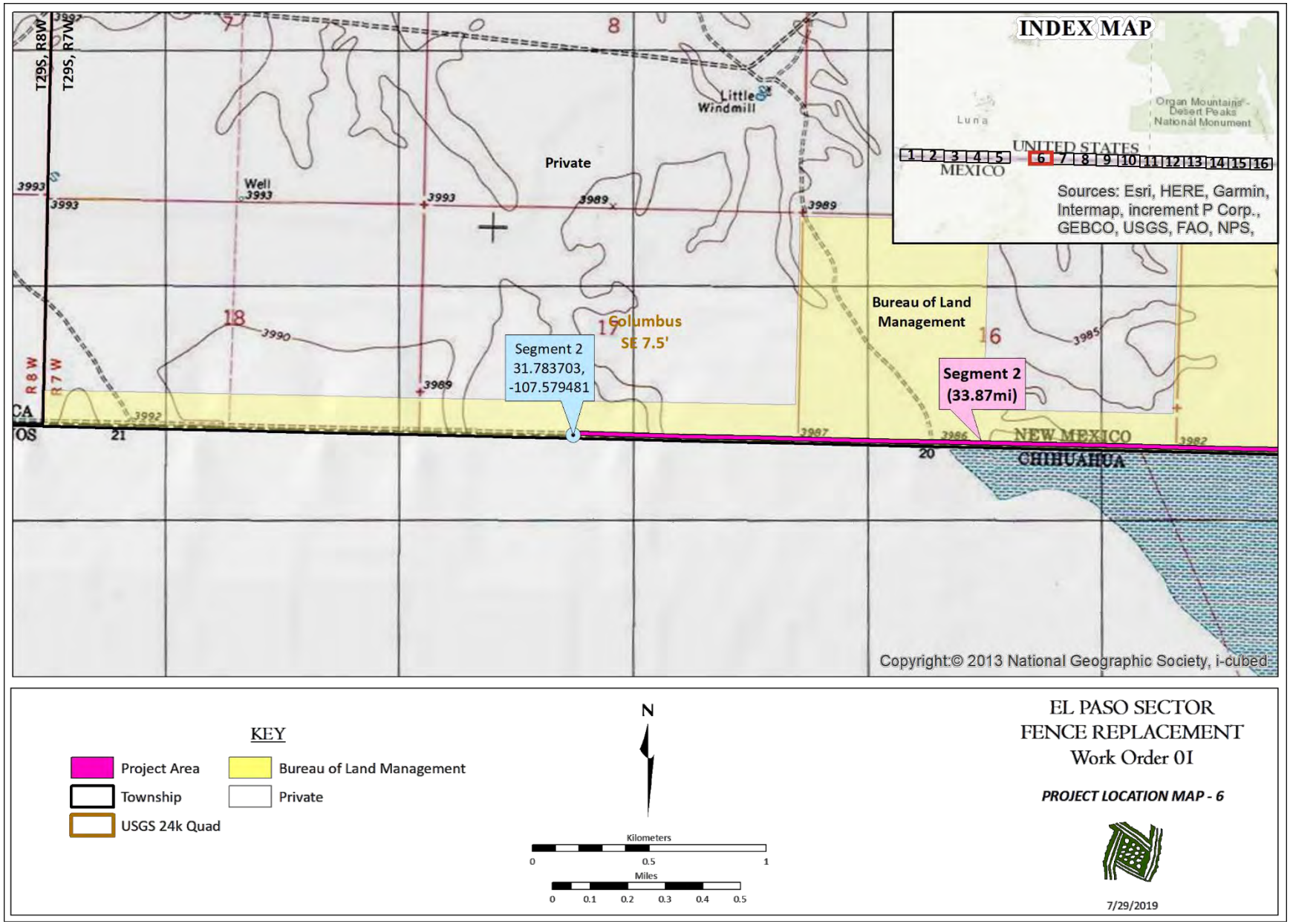

Figure 7. Overview of project area, Map 6 of 16.

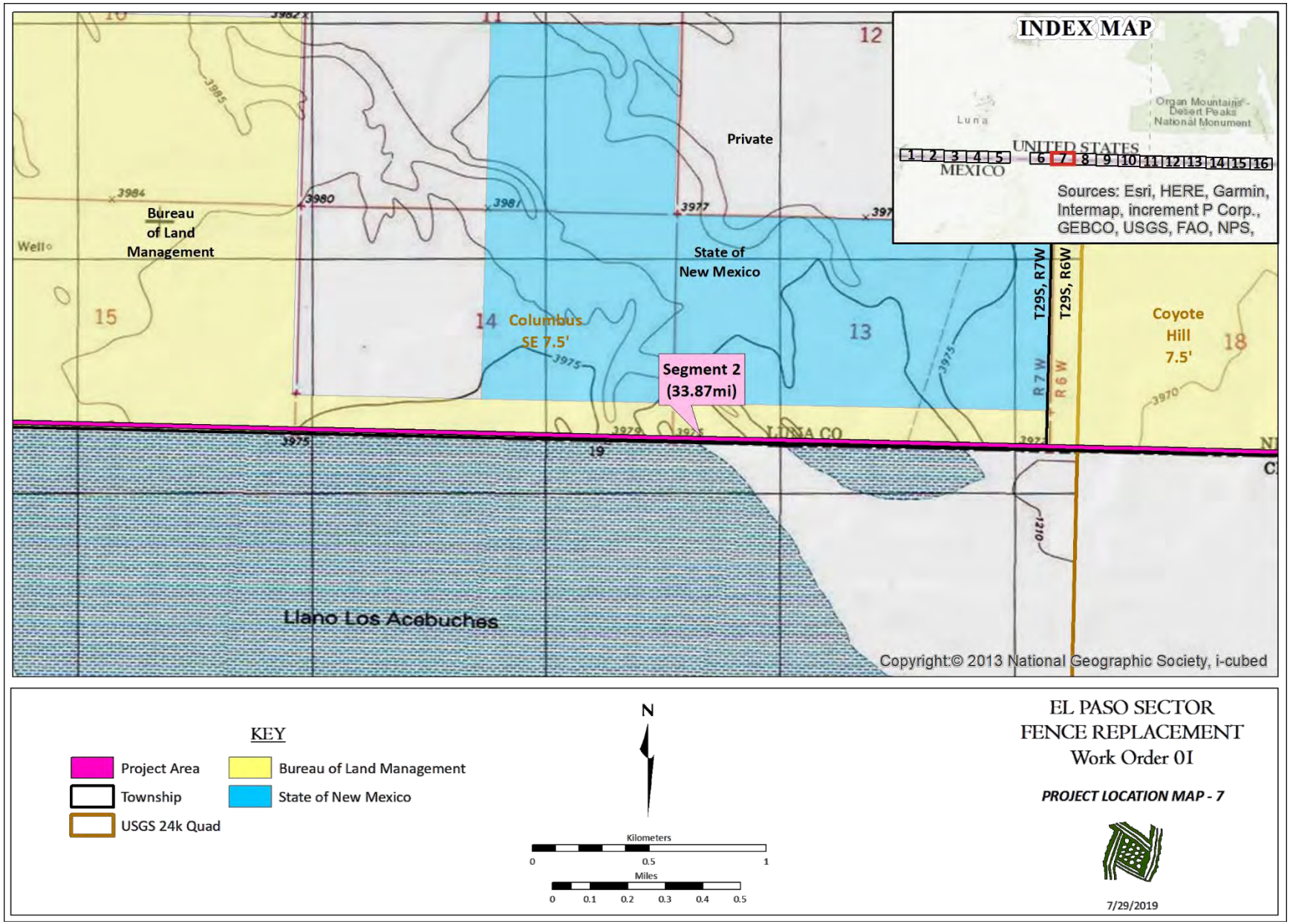

Figure 8. Overview of project area, Map 7 of 16.

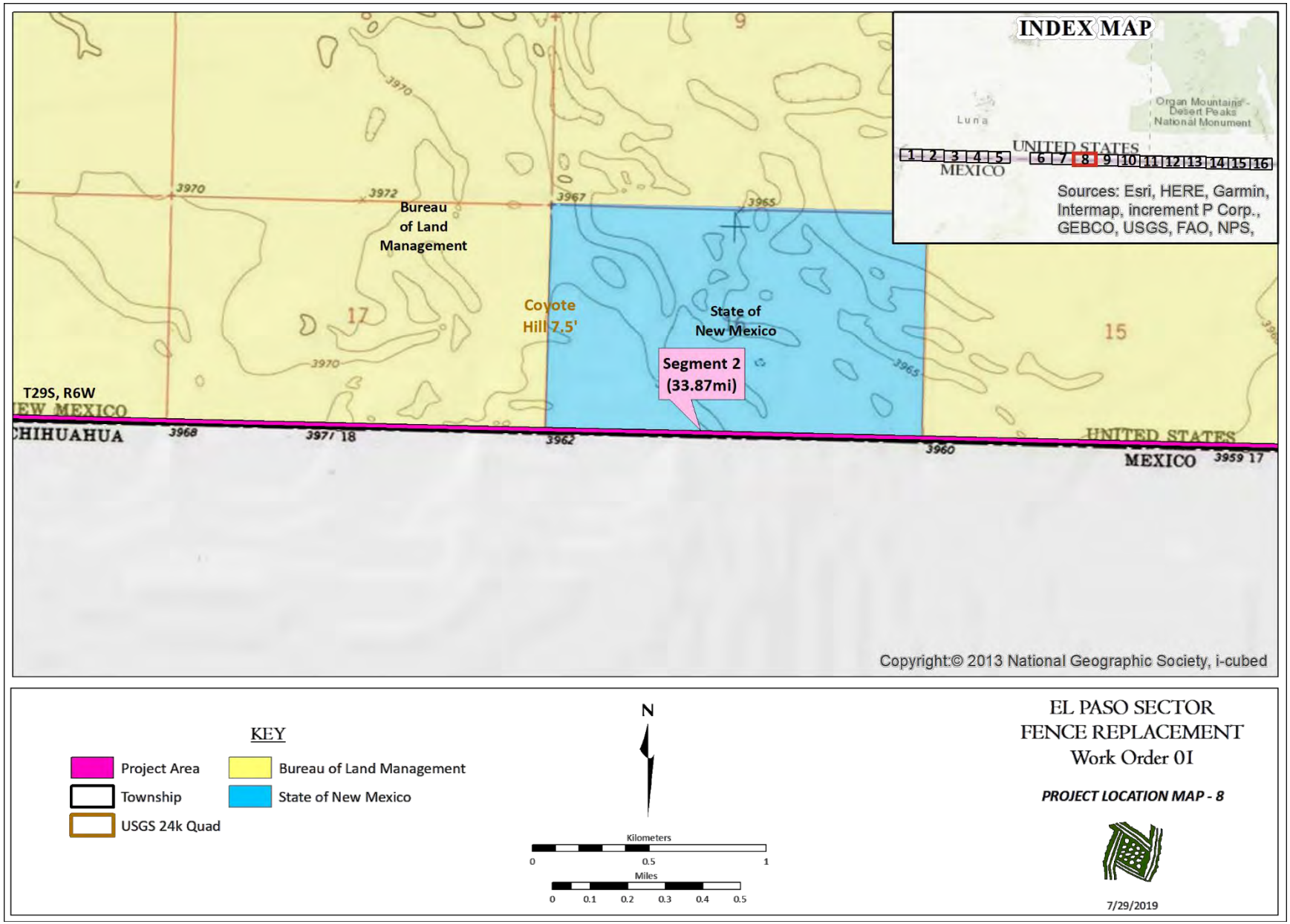

Figure 9. Overview of project area, Map 8 of 16.

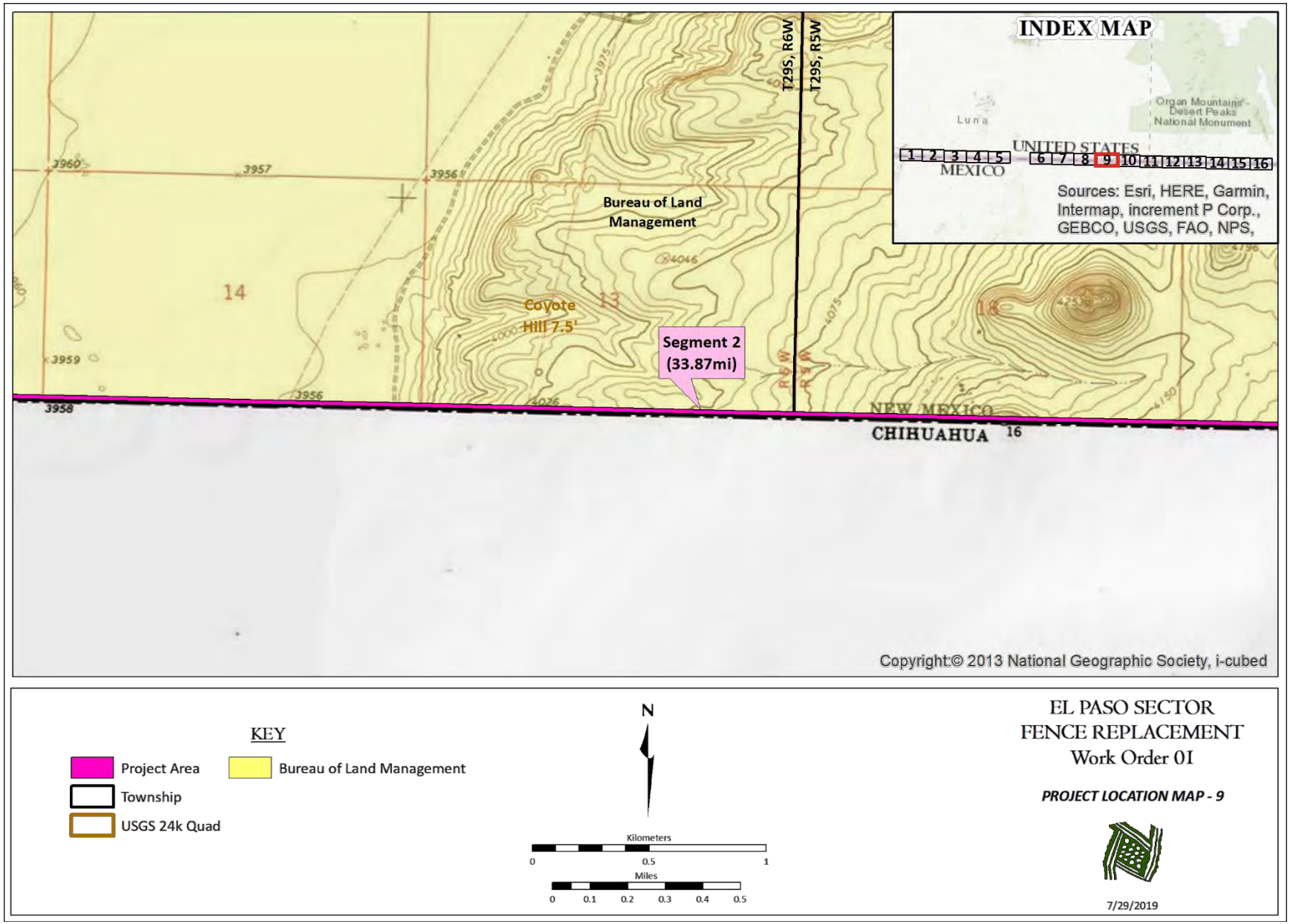

Figure 10. Overview of project area, Map 9 of 16.

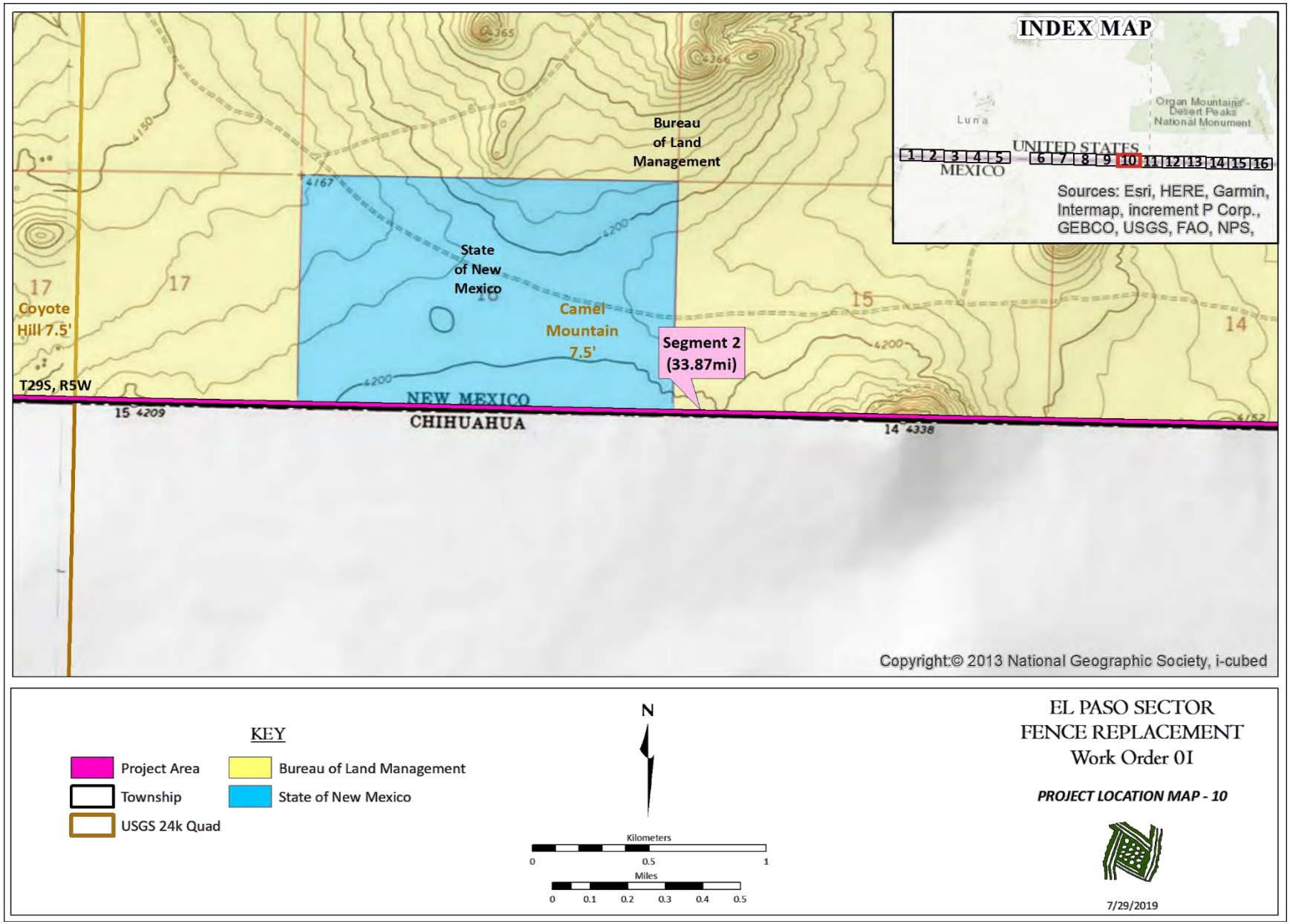

Figure 11. Overview of project area, Map 10 of 16.

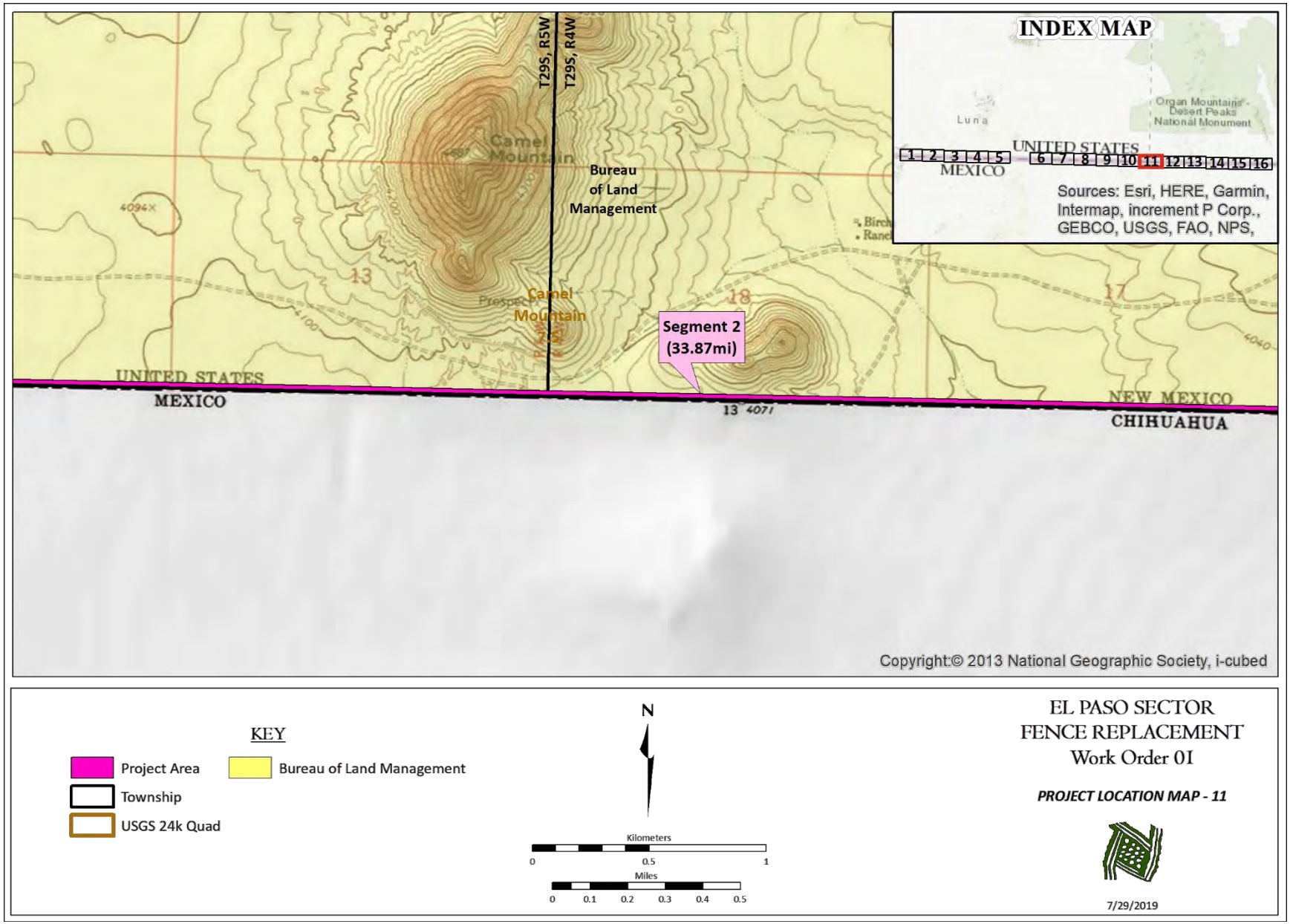

Figure 12. Overview of project area, Map 11 of 16.

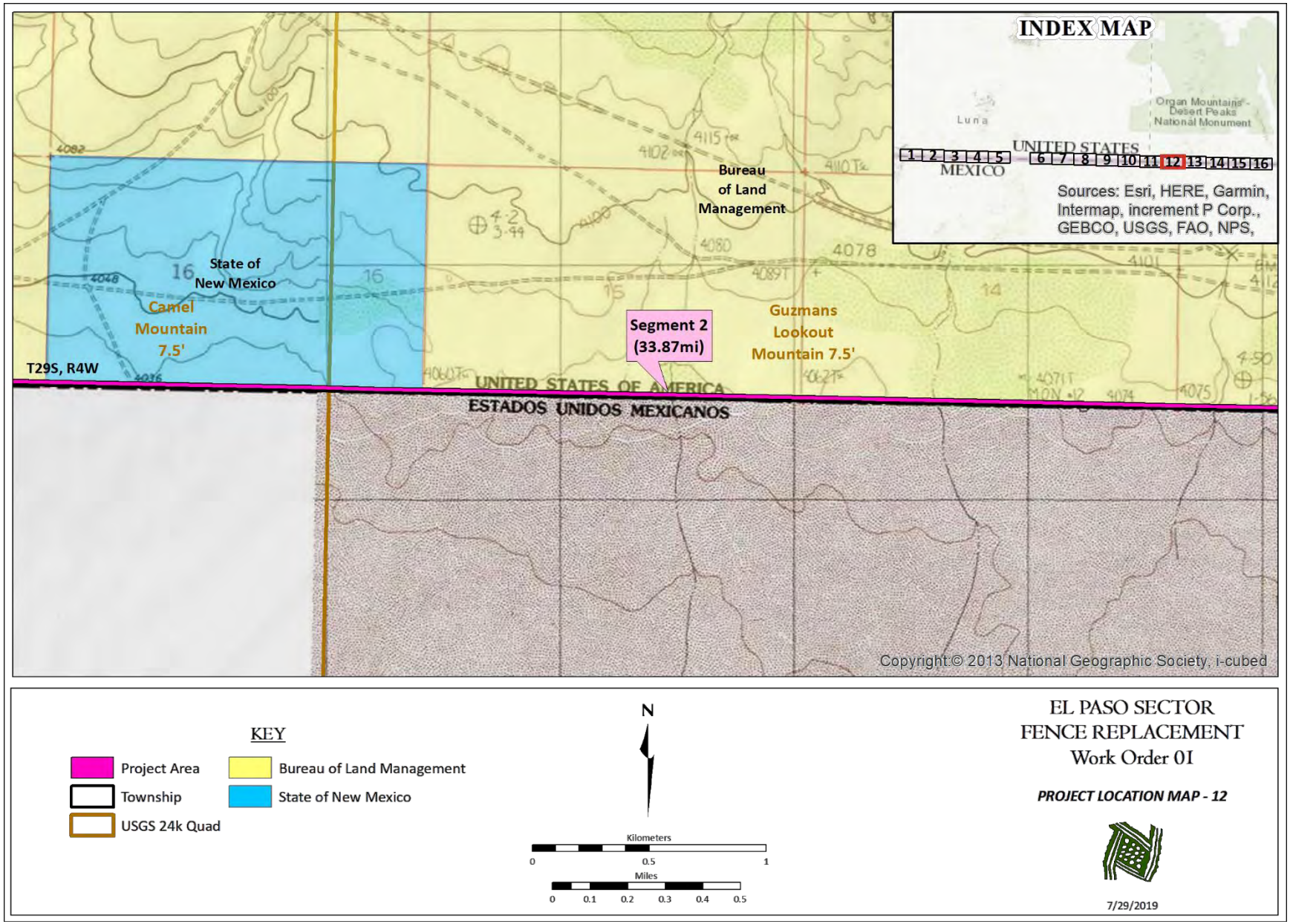

Figure 13. Overview of project area, Map 12 of 16.

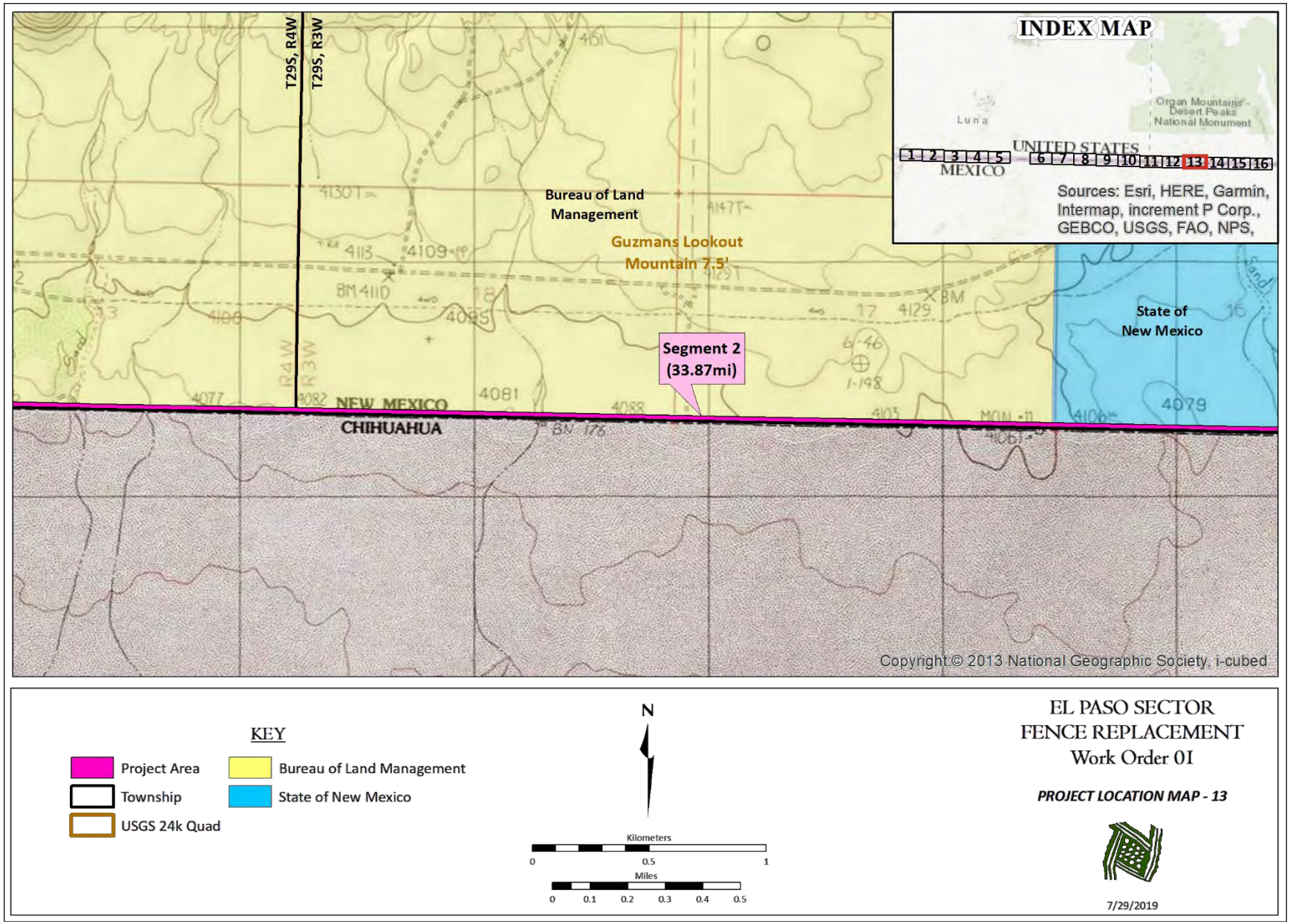

Figure 14. Overview of project area, Map 13 of 16.

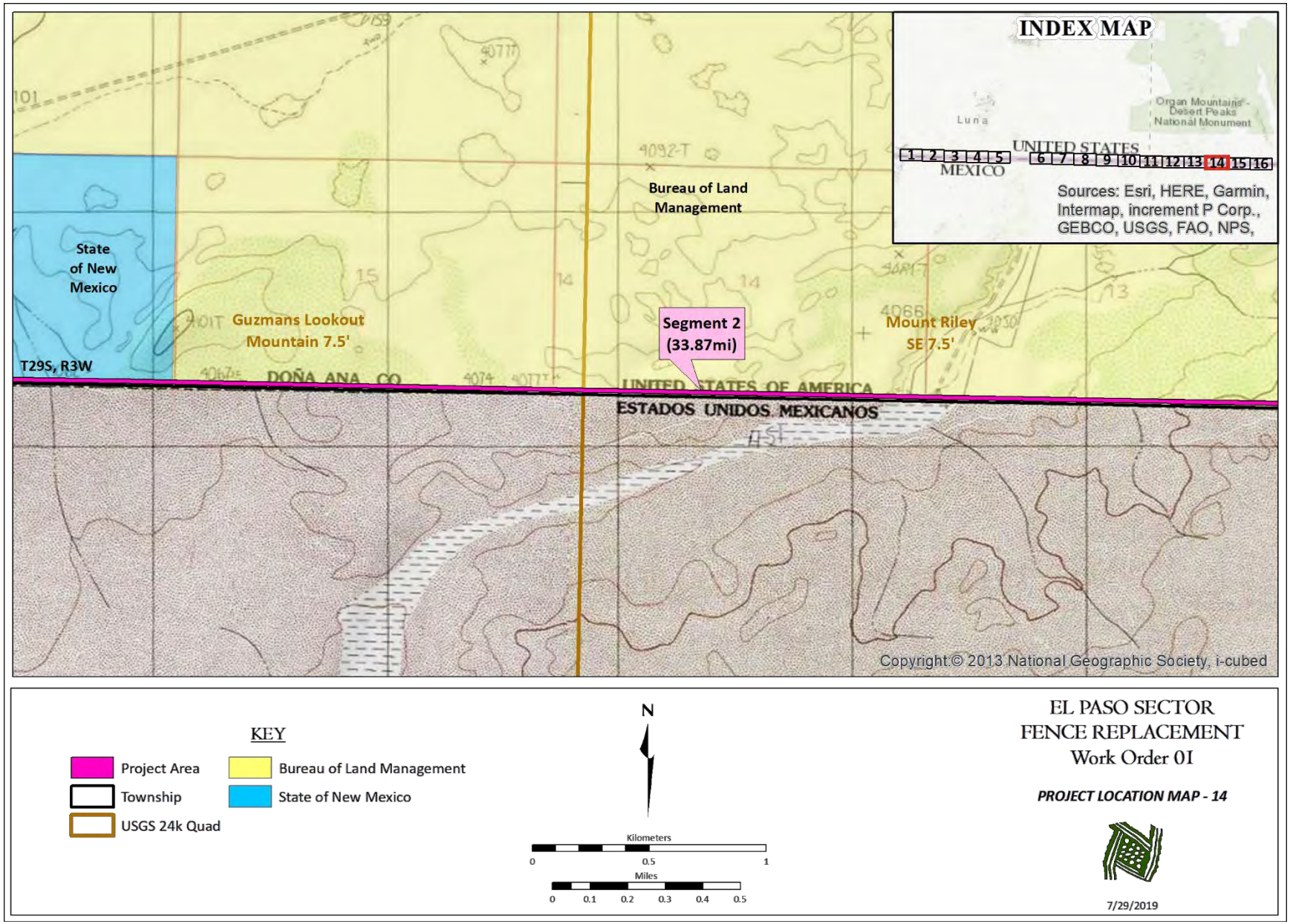

Figure 15. Overview of project area, Map 14 of 16.

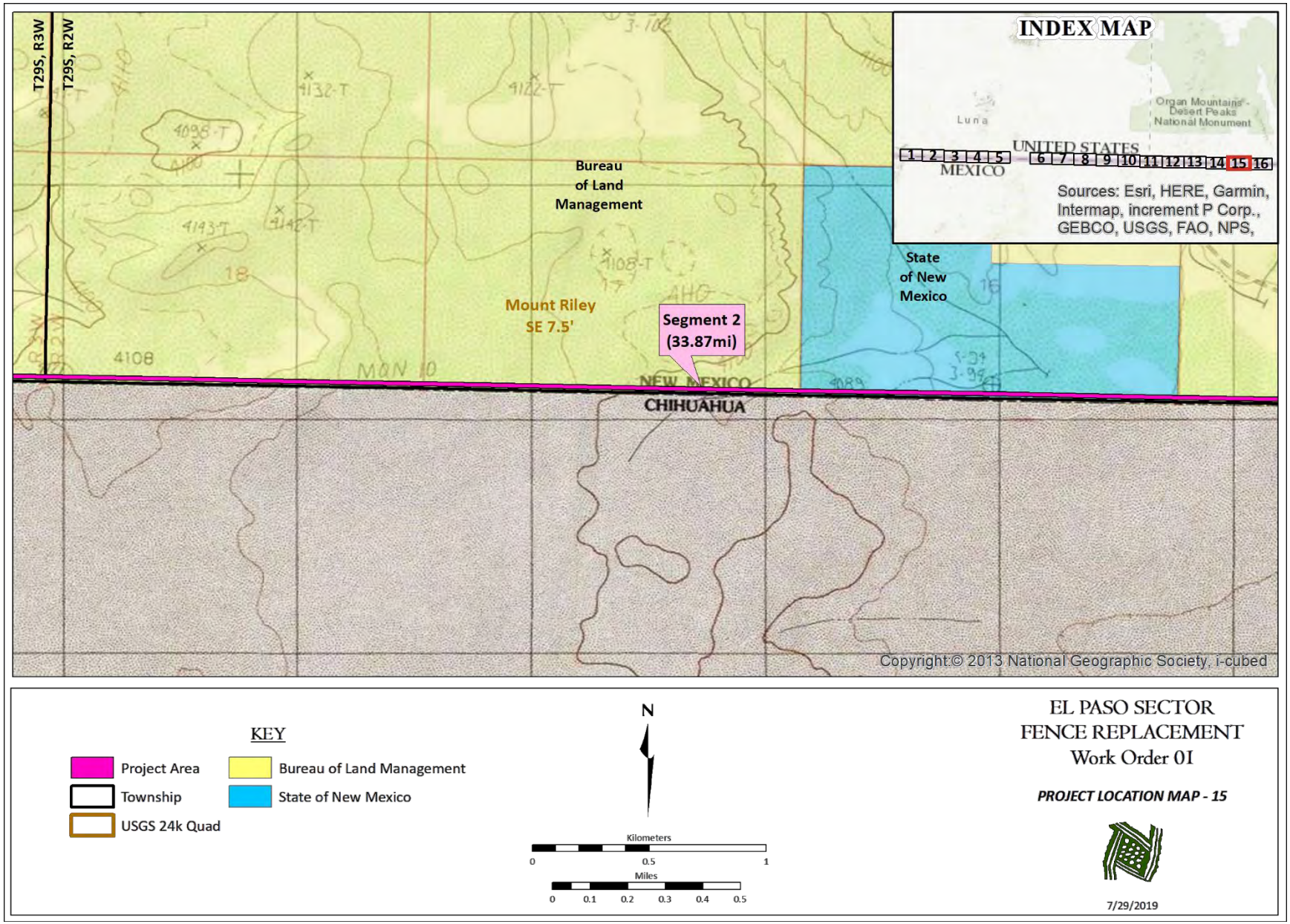

Figure 16. Overview of project area, Map 15 of 16.

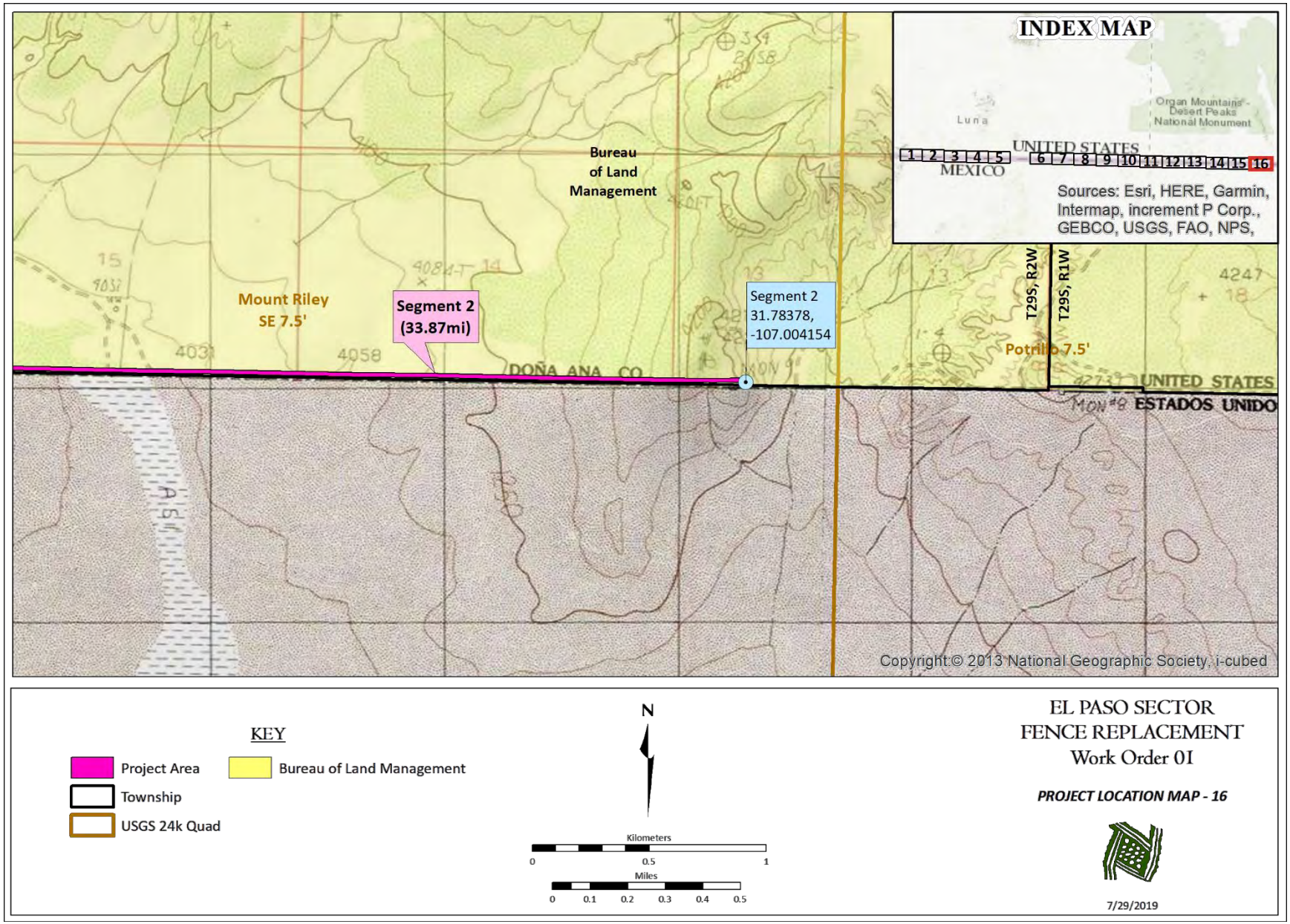

Figure 17. Overview of project area, Map 16 of 16.

ENVIRONMENTAL SETTING

The project area is located in the Mesilla Bolson (basin). It is in the eastern part of the Basin and Range physiographic province and includes some of the western portion of the Rio Grande Rift (Baldridge and Olsen 1989). The Mesilla Bolson covers the area roughly between Las Cruces on the northwest and El Paso on the southeast and the Organ-Franklin-Juarez Mountain chain on the east and the East Potrillo Mountains on the west (Hawley et al. 2001). The basin is comprised of Quaternary-Tertiary sediments derived from erosion of surrounding ranges. Elevation ranges from roughly 4,180 feet to around 3,950 feet. A slight rise to just over 4,200 feet is present near the boundary between T29S, R2W.

Surface sediments throughout the project area largely consist of aeolian sands often forming coppice dunes. The region has been heavily impacted by historical grazing (Rango et al. 2000), with former grasslands replaced by the current landscape replete with coppice dunes. These are stable mounds formed around plants. Mesquite, in particular is a common anchor plant for the coppice dunes.

Average precipitation in the region is 7–9 inches, mostly coming during the summer monsoon season. High temperature averages range from the mid-90s during the summer to upper 50s in winter; low temperature averages range from the mid-60s in the summer to mid-20s in the winter (Bulloch and Neher 1980).

The project area spans two similar biotic communities: Semidesert Grassland, and Chihuahuan Desertscrub (Brown 1994a, 1994b). Vegetation is dominated by mesquite, with creosote also prominent in some areas. Saltbush and soaptree yucca are also common. A variety of miscellaneous grasses and annuals are present, but are generally not very dense. Ground surface visibility was typically good to excellent across the project area.

CULTURAL HISTORY OVERVIEW

The culture history of south-central New Mexico and the Trans-Pecos includes four major subdivisions, which include the Paleoindian Period (ca. 9,000–6,000 B.C.), the Archaic Period (ca. 6,000 B.C. to A.D. 200), the Formative Period (A.D. 200–1450), and the Protohistoric and Historic periods (A.D. 1450 to present). These periods have been defined by archaeologists based on changes in cultural adaptations to environmental conditions, technological changes, and subsistence strategies. Some disagreement exists over specific dates, but consensus exists for the general trends.

The following culture history represents a regional overview and is not meant to be comprehensive. Detailed information about specific aspects of the prehistory and history of the region can be found in a variety of detailed archaeological, historical, and ethnographic reports (e.g., Hester and Turner 2019; Metz 1993; Miller 2005, Miller and Kenmotsu 2004; Perttula 2004; Timmons 1990).

Paleoindian Period (9,000 to 6,000 B.C.)

Human populations have lived in the Southwest since at least the end of the last ice age, roughly 13,000 years ago. The Paleoindian Period (9,000 to 6,000 B.C.) is characterized by mobile

hunter-gatherer groups that exploited the now-extinct megafauna, as well as a variety of plant and animal resources. Paleoindian groups were probably organized into small bands of less than 20 individuals who traveled great distances throughout the year in order to obtain different food sources (Black 1989:48). The main diagnostic artifacts from early Paleoindian Period sites are large, fluted lanceolate Clovis projectile points. The Clovis complex is associated with megafauna and sites are often located near Pleistocene lakes that are now playas. The Clovis complex and Clovis spear point are named after the town of Clovis, the county seat of Curry County, New Mexico, in the east-central part of the state. Clovis points—discovered in 1932—were found in association with mammoth kills.

The succeeding Folsom complex emerges at a time when megafauna were disappearing and the general climate was transitioning to modern conditions. Fluted Folsom points, smaller than the Clovis predecessors, are the diagnostic artifact of the complex. The Folsom complex is named after the town of Folsom in Union County, New Mexico, in the northeastern corner of the state. Folsom points, discovered in 1927, were found in association with bison bones. Subsistence strategies continued to emphasize big-game hunting; however, recent research suggests that a variety of small game animals and wild plants were undoubtedly exploited on a more regular basis (Meltzer 1993). Archaeological evidence further suggests that Paleoindian populations lived in small, highly mobile groups that moved seasonally depending on plant and animal availability.

Most of the evidence for Paleoindian occupations in the region comes from cross-dating lanceolate points that have been found primarily in the floodplain of the Rio Grande Valley (Miller and Kenmotsu 2004). Examples of Paleoindian shelter sites in the Trans-Pecos Region such as Fresnal Shelter (Carmichael 1982; Jones 1990; Tagg 1996), Burnet Cave (Roney 1995) and Pendejo Cave (Chrisman et al. 1996) have yielded chronometric dates that suggest late Paleoindian occupations.

Archaic Period (6000 B.C. to ca. A.D. 200)

The Archaic Period is closely linked to the end of the climatic shift that brought about warmer and drier conditions across the Southwest. In general, the Archaic is characterized by mobile bands of hunter-gatherers employing a more generalized subsistence strategy, which was necessitated by the extinction of megafauna (Black 1989:51). Projectile points reflect the shift from use of the spear to the atlatl and dart. Projectile points are smaller and show increasing variability over time. Technological changes also include introduction of ground stone tools and basketry.

The Archaic Period in southern New Mexico is divided into the Gardner Springs Phase (6,000 to 4,300 B.C.), the Keystone Phase (4,300 to 2,600 B.C.), the Fresnal Phase (2,600 to 900 B.C.), and the Hueco Phase (900 B.C. to A.D. 200) (MacNeish 1993). Use of these phases is questioned by some researchers, who suggest the traditional Early, Middle, and Late Archaic framework is more appropriate (e.g., Miller 2005). In general, the early portion of the Archaic is represented by small, mobile populations. This pattern continues throughout most of the Archaic, but by the later stages of the period, there is evidence of increasing sedentism, introduction of horticulture (Upham et al. 1987; Tagg 1996), and increased diversification in material culture and environmental adaptations across the region (Carmichael 1982). Over time, settlement patterns and technological adaptations during the Archaic Period increasingly foreshadow those of the Formative period (Miller and Kenmotsu 2004).

Formative Period (ca. A.D. 200 to 1450)

The Formative period, which is well-represented in the region, is a time of rapid change from the Archaic that culminates with the Puebloan occupations in A.D. 1300 to 1450. Changes in architecture, settlement structure, subsistence and technology occurred along with more sedentism and a greater reliance on agriculture and increased specialization (Miller 2010; Miller and Kenmotsu 2004:236–237). Widespread adoption and elaboration of ceramic technology is a key development. The period saw the emergence of the well-documented Puebloan occupations of the Jornada Mogollon (Miller and Kenmotsu 2004). The Formative Period is divided into three phases (Lehmer 1948; Miller 2005): the Mesilla phase (ca. A.D. 200/400 to 1000), the Doña Ana phase (A.D. 1000 to 1200), and the El Paso phase (A.D. 1200 to 1450).

Mesilla Phase (A.D. 200/400 to 1000)

The Mesilla phase is typified by the El Paso brownware ceramic tradition with Alma plain as a rare intrusive ware (Miller 2010; Miller and Kenmotsu 2004). Other intrusive ceramics including Mimbres white wares and other Mogollon wares also appeared in the region after A.D. 600, and El Paso Bichrome also made its first appearance late in this phase (Miller 2005). The pit house was the most common form of domestic architecture during this period and was similar to the earlier Archaic huts (Lehmer 1948; Hard 1983). After A.D. 600, domestic architecture becomes more formal and sites become larger, and more abundant. In addition to the larger sites, more artifacts are also found in comparison to earlier Archaic period sites.

Mesilla phase sites for all environmental zones show an association between sites and playas in the central basin (Miller 2010). Mauldin et al. (1998) suggest that Mesilla phase peoples may be characterized as residential foragers. The central basin and alluvial fans are thought to have been components in a residential foraging strategy in which groups lived throughout the region as hunter-gatherers (Miller 2010). After A.D. 600 changes in settlement and subsistence practices led to a less intensive, logistical use of the central basin (Mauldin et al.1998). In general, during the Mesilla phase settlement was likely seasonal, with huts utilized in the summer and pit houses used as winter residences. The hunting of rabbits and small game coupled with the foraging of wild plant resources provided the bulk of the subsistence of early Mesilla phase people. Agriculture was likely a more opportunistic subsistence strategy, though evidence shows a greater reliance in cultigens toward the end of the phase. This move toward a more sedentary lifestyle and a reliance on cultigens later in the Mesilla phase was a strategy used to offset environmental variability (Miller 2010; Wills 1988).

Doña Ana Phase (A.D. 1000 to 1300)

Originally defined by Lehmer (1948) and refined by Carmichael (1986), Doña Ana phase sites are typified by the presence of El Paso Bichrome and El Paso Polychrome pottery associated with adobe surface construction (Miller 2010). Early Doña Ana phase (A.D. 1000 to 1150) occupations have informal pit houses and burned-rock activity areas, while the Late Doña Ana phase (A.D. 1150 to 1300) sites tend to have deep, square-shaped formal pit houses and discrete trash middens, suggesting a more sedentary lifestyle than the earlier time periods. Corn, squash, and beans are the predominate cultigens in a diet supplemented with small game animals (Miller 2010). Research shows that this period is characterized by increasing population levels and a shift of

settlement areas to runoff zones located on lower alluvial fans of the Franklin, Hueco, and Organ mountains (Whalen 1977, 1978, 1981). This shift from a general use of all areas within the region to concentrated use of specific environmental zones is an example of a shift to a more sedentary way of life reliant upon agriculture. In general, the changes that occurred during the Doña Ana phase include the introduction of polychrome pottery, rapid population increase, artifact changes that included larger manos and metates, decreased projectile point sizes with larger forms still in use, and changes in intrusive ceramic types from Mimbres to Chupadero and Chihuahuan wares (Miller 2010; Miller and Kenmotsu 2004). The formal pit structures of the late Doña Ana phase gave rise to Puebloan architecture that would later characterize the El Paso phase.

El Paso Phase (A.D. 1300 to 1450)

Prehistoric occupation of the region was most intensive during the El Paso phase (Miller 2010). This phase (also known as the Puebloan phase) is most notable for an increase in the number of large and small residential sites, increased artifact densities, and a clustered settlement pattern (Carmichael 1986; Whalen 1977, 1978), as well as the introduction of small triangular projectile point forms. During the El Paso phase there was great variability in settlement size which ranged from large pueblos with 100-plus rooms (Bentley 1993; Brook 1970; Lowry 2005) to the more common smaller individual surface room structures (Batcho et al. 1985; Browning et al. 1992; Dering et al. 2001). Miller (2010) characterizes the El Paso phase as peak population levels, diverse artifact assemblages, use of pit structures, individual surface rooms, above-ground pueblos, and dependence on agriculture, but not to the exclusion of hunting and foraging. Researchers characterize population movement during the El Paso phase as a combination of permanent habitations at sites during wet years coupled with seasonal movement during periods of dryness. Some seasonal mobility alternating between the desert floor, alluvial fans, and riverine environments has also been suggested (Miller 2010).

Protohistoric Period (A.D. 1450 to 1520)

Although there is some variability across the region, in general, the Protohistoric period is the timespan between the end of the Formative Period and the first contacts between Europeans and Native Americans. During the Protohistoric Period, drastic changes to the aboriginal way of life occurred due to the contact between Native Americans and Europeans. The introduction of metals and livestock revolutionized subsistence activities, and settlement patterns were altered in favor of smaller more mobile "camps." The Mescalero Apache and Manso represent documented aboriginal inhabitants of the region (Becket and Corbett 1992; Miller 2010). Unfortunately, the period is poorly represented in the archaeological record and artifactual evidence for these groups has either not been found or at least has not been recognized (Miller 2010).

Historic Period (Post A.D. 1520)

The historic period in southern New Mexico began with the Exploration Period (ca. A.D. 1520–1680). During this time, there was only a sporadic Spanish presence in the area. In general, the region held little interest for the Spanish and their presence was mostly restricted to passing through the area. One notable entrada in the El Paso area was that of Don Juan de Oñate, in the late 1590s. Following establishment of missions in central and northern New Mexico, El Paso

became an important point in the communication and trade routes between the missions and the Mexican interior.

The Exploration period ended with the Pueblo Revolt of 1680. The revolt was largely the result of suppression of indigenous religious practices. It resulted in the expulsion of the Spanish from much of the Southwest. In the aftermath of the Pueblo Revolt of 1680, the Spanish largely retreated into northern Mexico. This led to increased settlement in the Casas Grandes Valley in Chihuahua. Gradually over time the Spanish resumed their intrusion into New Mexico. However, the continued threat from Apache groups hampered the Spanish. Several skirmishes between the Spanish and Apaches occurred in the Boot Heel, including battles in the Animas Mountains and the Big Hatchet and Little Hatchet mountains (Pratt and Scurlock 1991:69–70). Presidios were established for protection, but occupation of the region was mostly temporary and the Spanish population was generally sparse.

The brief Mexican Period (1821–1854) in New Mexico began in 1821 when Mexico gained independence from Spain. New Mexico was part of the Mexican Republic during this interval. Like the Spanish occupation, Mexican presence in the area was limited. Ranching was the primary activity undertaken. The Mexican-American War (1846–1848) took place during this time period, but little action occurred in New Mexico.

The American Period in New Mexico began in 1854 when the Gadsden Purchase was ratified. Under this agreement, the United States acquired large sections of land south of the Gila River in Arizona and New Mexico. In 1912, New Mexico became the 47th state. In southern Luna and Doña Ana Counties, mining and ranching were the primary economic activities. Mining, primarily in the Potrillo Mountains and the southwest portion of the county, has seen short booms, but was never sustained. Ranching has consistently been a more productive endeavor. Southern Luna and Doña Ana County has remained sparsely populated and is largely uninhabited today.

PREFIELD RESEARCH

Prior to fieldwork, Northland staff conducted a records search and literature review to identify previous archaeological investigations and previously recorded archaeological sites in or near the APE. The digital records of the Archaeological Records Management Section (ARMS) of New Mexico were consulted via the New Mexico Cultural Resources Information System (NMCRIS). In addition, all previous projects on file at Northland, the NRHP, and historical General Land Office (GLO) data were consulted.

As a result of the records search, 51 projects were identified near the current APE. Projects are shown on Figures A1–A16 (Appendix A) and listed in Table A1 (Appendix A). Previous investigations include survey, testing, monitoring, and data recovery efforts. All of the Roosevelt Reservation within the current area of investigation has previously been surveyed (Kurota and Turnbow 2008, 2009; Sechrist 1994; Trierweiler and Bonine 2003; Trierweiler and Smith 2004).

The records search identified 92 sites in or near the current area of investigation. Twenty-seven of the 92 total sites intersected with the current APE; a list of those sites is presented in Table 4. For a full list of sites near the project area see Appendix A. A large number of these sites

are prehistoric artifact concentrations comprised of sherd and lithic scatters. Fire-cracked rock indicative of roasting pits has been recorded at multiple sites. There are also habitation components identified at several sites. Further discussion of these sites is presented below in the results section of this report.

Table 4. Summary of Sites that Intersect with the Current Project Area.

LA Site Number	Age and Type	NHRP Eligibility
35222	Prehistoric habitation site	Not evaluated
35272	Prehistoric limited activity	Not evaluated
85076	Prehistoric Mogollon and Historic artifact scatter	Eligible
85078	Mogollon and Historic artifact scatter	Not evaluated
85079	Prehistoric and Historic artifact scatter	Not evaluated
85755	Mogollon limited activity	Not evaluated
85756	Mogollon limited activity	Not eligible
85757	Archaic to Mogollon limited activity and Historic artifact scatter	Not evaluated
85758	Mogollon limited habitation	Not eligible
85759	Mogollon artifact scatter	Not evaluated
85760	Mogollon habitation site	Eligible
85761	Prehistoric and historic artifact scatter	Not evaluated
85764	Prehistoric limited activity	Not evaluated
85765	Mogollon artifact scatter	Eligible
85769	Late Archaic artifact scatter	Eligible
85770	Prehistoric artifact scatter	Eligible
85771	Prehistoric artifact scatter	Eligible
85772	Late Archaic to Mogollon artifact scatter	Eligible
139014	Mogollon artifact scatter	Not evaluated
139015	Prehistoric and Historic limited activity	Not evaluated
139016	Mogollon artifact scatter	Not evaluated
139017	Prehistoric artifact scatter	Not evaluated
139018	Archaic to Mogollon artifact scatter	Not evaluated
139019	Mogollon artifact scatter	Not evaluated
159817	Historic monument	Eligible
159818	Historic monument	Eligible
159819	Historic monument	Eligible

RESEARCH ORIENTATION AND EXPECTED RESOURCES

Historic contexts are the research and management framework around which the historic preservation process is structured. The intent is to provide a basis for identifying and evaluating the significance of property types with respect to their place in prehistoric and historic contexts. The cultural resources of southern New Mexico are obviously rich and diverse, representing a long history of human occupation of the region. The types of data typically generated by survey, however, are often limited. With this in mind, the research orientation of the project was primarily descriptive in nature. Descriptive data was gathered to assess the significance of the sites and their place in regional historic contexts.

Primary goals for survey were determining the age of each site and assessing the nature of the activity represented. Based on the limited property types encountered—fifteen historic sites consisting of International Border Monuments, as well as eight historic and six prehistoric isolated occurrences (IO)—research themes are necessarily limited. The sites represent single-episode historical construction of monuments marking the international border separating the United States and Mexico. Aside from assessing their age and condition, they contain negligible research potential.

Given the number of prehistoric sites of various ages located in proximity to the project area, it was expected that prehistoric sites could be discovered. These nearby sites include artifact scatters and/or limited activity sites, but possible habitation components have also been noted. The project encountered artifacts at 18 of the 27 previously recorded sites. Of these 18 sites two were recorded as multi-component sites, three are solely historic (border monuments), the remaining twelve consist of low-medium density prehistoric lithic and ceramic scatters. Additionally, 14 prehistoric and historic IOs were recorded. The six prehistoric isolates consisting of single artifacts include an isolated core chopper (IO 7), a ground stone mano (IO 10), a sand tempered brown ware sherd (IO 12), and individual flaked stone fragments (IO 1, 13–14). All eight of the historic isolates are GLO section markers placed in 1936. The quantity and density of artifacts at each IO location did not qualify as a site. The paucity of prehistoric resources found during the current investigation precludes elaboration of relevant research domains for prehistoric resources.

FIELD METHODS

Northland conducted fieldwork for the 46 miles of proposed international border fence replacement project from 17–21 June 2019. Field crew included Nick Billstrand (Project Director) and archaeologists John Marshall and Matt Steber. Conditions at the time of survey were close to ideal. There were no issues affecting accessibility of the project area and weather conditions were favorable. The following discussion of field methods describes the treatment of cultural resources located within the Roosevelt Reservation.

Full coverage (100% survey) of the 60-ft wide Roosevelt Reservation itself was deemed unnecessary because it has recently been improved, including fence and road upgrades. Figures 18 and 19 show the typical state of the APE within the Roosevelt Reservation east and west segments. Prior to that work in the late 2000s, the Roosevelt Reservation was surveyed and archaeological testing was conducted at several sites (Sechrist 1994; Kurota and Turnbow 2008, 2009; Trierweiler and Bonine 2003; Trierweiler and Smith 2004). Therefore, the current survey covered only portions of the Roosevelt Reservation immediately north of the previous disturbance caused by the construction and maintenance of the existing boarder road (approximately 5–10 meters) through pedestrian survey. Pedestrian survey was accomplished via parallel 15-m spaced transects oriented roughly east-west immediately north of the existing roadway.

In all areas, ground along and between transects was inspected for significant cultural remains and/or modifications. A Trimble GeoXT hand-held global positioning system (GPS) with sub-meter accuracy was used for navigation and to record isolated artifacts and sites.

Figure 18. Overview of the typical condition on the APE along the Roosevelt Reservation eastern segment.

Figure 19. Overview of the typical condition on the APE along the Roosevelt Reservation western segment.

Ground surface visibility throughout the project area was generally good to excellent (75–95%). Vegetation was relatively sparse and weeds/annuals were minimal in most areas. Some minor exceptions were noted, in particular near coppice dunes, but these did not comprise a significant portion of the survey area.

When cultural resources were encountered in the field, the field crew examined the area to determine the nature and extent of the finding. Artifacts were pin-flagged to establish the extent, quantity, and density of the deposit. Based on the size and density of the finding, it was determined if the resource should be considered an archaeological site or was an IO. General criteria used for site determination included:

1. A site represents past human activity that is at least 50 years old.
2. Thirty or more artifacts of a single class in a 15-m diameter area. (Note that artifacts do not represent a single source like a broken bottle or broken ceramic vessel).
3. Twenty or more artifacts of at least two artifact classes in a 15-m diameter area.
4. One or more features in temporal association with artifacts.
5. Two or more temporally associated features without associated artifacts.

Professional experience and judgment were also applied. Cultural resources that did not meet site criteria were recorded as IOs. These include occurrences with few artifacts, or very low artifact density, or isolated un-dateable features. Regardless, the location of each IO was recorded with a GPS. For each IO, artifact class and type were also recorded. Scale drawings and photographs were taken when appropriate (e.g., diagnostic tools). In the case of the 15 newly recorded sites consisting of isolated border monuments, features were treated as sites even though no temporally associated artifacts were identified with the features (criteria 4 and 5).

All sites were recorded in the following manner. After establishing the extent of the site, boundaries were mapped with a Trimble GeoExplorer XT GPS with sub-meter accuracy. Any artifact concentrations were also bounded and recorded. Surface features were photographed and recorded. Photographs and scale drawings were also done when appropriate.

Previously recorded sites within the portion of the Roosevelt Reservation included in the scope of work were revisited. During the current project, 27 previously recorded sites plotted within or adjacent to the Roosevelt Reservation were revisited to determine the nature and extent of the sites within the APE. Results of the effort are discussed below.

RESULTS

Northland completed survey of the 46 miles of border road located within the Roosevelt Reservation. The road has been improved and well-maintained. During the current survey, 15 new sites and 14 IOs were recorded. Additionally, 27 previously recorded sites were revisited during the current survey. Descriptions of the sites and IOs are presented below. Following the descriptions, evaluations of the properties and recommendations for their management are presented.

Newly Recorded Sites

Fifteen newly recorded sites were documented during the current survey (see Table 4; Appendix C). These sites are isolated features consisting of International Border Monuments that lacked any associated artifacts. Each monument was treated as an individual site in accordance with guidelines established by the New Mexico State Historic Preservation Office. Due to the redundant nature of each monument description, a singular description is provided below and then each individual monument is briefly summarized in Table 5. An image and map of each monument and their respective locations are provided in Appendix C.

Table 5. Summary of Newly Recorded Sites.

Site	Type and Age	Elev. (m)	NRHP Eligibility Recommendation	Management Recommendation
194680	Border Monument 30	1,252	Eligible	Avoidance/Monitor
194681	Border Monument 29	1,272	Eligible	Avoidance/Monitor
194682	Border Monument 28	1,306	Eligible	Avoidance/Monitor
194683	Border Monument 27*	1,294	Eligible	Avoidance/Monitor
194684	Border Monument 26	1,315	Eligible	Avoidance/Monitor
194685	Border Monument 25	1,297	Eligible	Avoidance/Monitor
194686	Border Monument 24	1,259	Eligible	Avoidance/Monitor
194687	Border Monument 20*	1,211	Eligible	Avoidance/Monitor
194688	Border Monument 19	1,208	Eligible	Avoidance/Monitor
194689	Border Monument 18	1,205	Eligible	Avoidance/Monitor
194690	Border Monument 17	1,203	Eligible	Avoidance/Monitor
194691	Border Monument 15	1,280	Eligible	Avoidance/Monitor
194692	Border Monument 14	1,319	Eligible	Avoidance/Monitor
194693	Border Monument 10	1,259	Eligible	Avoidance/Monitor
194694	Border Monument 9	1,288	Eligible	Avoidance/Monitor

* Not photographed.

LA 194680—LA 194694

Thirteen of the monuments consist of a cast-iron obelisk bolted onto a concrete foundation. The obelisk measures 6.5 ft (1.98 m) tall and 1 ft by 1 ft (0.3 m) at the base. The concrete foundation measures 3 ft by 3 ft (0.92m by 0.92m) and is approximately 1 ft (0.3 m) thick. On the northern face of the monument rests a metal plaque that reads "Boundary of the United States, Treaty of 1848 Re-established by treaties of 1882-1889." The monuments are painted with silver paint. On the eastern face of each monument is metal number, respectively numbered 9, 10, 14, 15, 17–20, and 24–30.

The remaining two Border Monuments (Monuments LA 194684 and LA 194691) consist of large obelisks constructed out of locally sourced stone and mortar. The exterior of the obelisks are plastered with sandy cement, and covered in white wash. The foundation consists of a 6-ft by 1-ft concrete block measuring 1ft in height. The obelisk itself measures 4.5 ft by 4.5 ft at its base, which rest directly atop the concrete foundation. The obelisk stands approximately 12 ft tall. On the northern face of the monument rests a metal plaque that reads "Repaired by the Border

Commission created by Treaties of 1882-1889." The monuments are two of the original monuments placed in 1855. These monuments were repaired between 1891–1896 and remain in excellent condition.

All monuments look to be unchanged from previous recordings and will not be impacted by the current project. The only exception to this is LA 194680 (Monument 30). LA 194680 is obstructed by heavy vegetation and only a small portion could be observed during the current survey. However, the monument looks to be in good condition based upon the portion that was visible during the time it was recorded (see Figure C1).

Recommendation: LA 194680—LA 194694 are recommended eligible for inclusion in NRHP based on Criterion A (Event). These sites should be avoided during the current ground disturbance activities.

Previously Recorded Sites

Northland revisited 27 previously recorded sites during fieldwork (Table 6, Appendix B). These sites are located along the United States-Mexico International Border in southern Luna and Doña Ana Counties, New Mexico.

Table 6. Summary of Previously Recorded Sites Within the APE.

LA Site No.	Age and Type	Elevation (msl)	NHRP Eligibility	Reference
35222	Prehistoric habitation site	4,072	Not evaluated	Hilley 1981, New Mexico ARMS 2014
35272	Prehistoric limited activity	4,140	Not evaluated	Hilley 1981, New Mexico ARMS 2014
85076	Prehistoric Mogollon and Historic artifact scatter	4,000	Eligible	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85078	Mogollon and Historic artifact scatter	4,160	Not evaluated	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Gibbs et al. 2007
85079	Prehistoric and Historic artifact scatter	4,020	Not evaluated	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Kurota and Turnbow 2008
85755	Mogollon limited activity	4,080	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85756	Mogollon limited activity	4,110	Not eligible	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85757	Archaic to Mogollon limited activity and Historic artifact scatter	4,075	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85758	Mogollon limited habitation	4,070	Not eligible	Sechrist 1994, Trierweiler and Bonine 2003

Table 6. Summary of Previously Recorded Sites Within the APE.

LA Site No.	Age and Type	Elevation (msl)	NHRP Eligibility	Reference
85759	Mogollon artifact scatter	4,060	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
85760	Mogollon habitation site	4,080	Eligible	Sechrist 1994, Kurota and Turnbow 2008, Kurota and Turnbow 2009
85761	Prehistoric and historic artifact scatter	4,000	Not evaluated	Sechrist 1994, Kurota and Turnbow 2008
85764	Prehistoric limited activity	4,115	Not evaluated	Sechrist 1994, Gibbs et al. 2007
85765	Mogollon artifact scatter	3,960	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85769	Late Archaic artifact scatter	3,970	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85770	Prehistoric artifact scatter	3,970	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Aztlan Archaeology Inc. 1999, Gibbs et al. 2007
85771	Prehistoric artifact scatter	3,950	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007
85772	Late Archaic to Mogollon artifact scatter	3,980	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Aztlan Archaeology Inc. 1999, Gibbs et al. 2007
139014	Mogollon artifact scatter	4,089	Not evaluated	Trierweiler and Bonine 2003
139015	Prehistoric and Historic limited activity	4,090	Not evaluated	Trierweiler and Bonine 2003
139016	Mogollon artifact scatter	4,120	Not evaluated	Trierweiler and Bonine 2003
139017	Prehistoric artifact scatter	4,108	Not evaluated	Trierweiler and Bonine 2003
139018	Archaic to Mogollon artifact scatter	4,110	Not evaluated	Trierweiler and Bonine 2003
139019	Mogollon artifact scatter	4,100	Not evaluated	Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004
159817	Historic monument	4,071	Eligible	Kurota and Turnbow 2008
159818	Historic monument	4,074	Eligible	Kurota and Turnbow 2008
159819	Historic monument	4,106	Eligible	Kurota and Turnbow 2008

All sites include portions of, or are adjacent to, the Roosevelt Reservation. Nearly all of the Roosevelt Reservation has previously been disturbed by recent improvements to the border fence and the associated access road. Archaeological surveys, as well as archaeological testing investigations of selected sites, were conducted prior to those improvements being implemented (Kurota and Turnbow 2008, 2009; Rieder 1999a, 1999b; Sechrist 1994; Trierweiler and Bonine 2003; Trierweiler and Smith 2004). During the current project, artifacts were identified at 18 of the 27 sites that were revisited. No artifacts or features were found within the Roosevelt Reservation at nine of the 27 previously recorded sites within the current APE.

Previous investigations have recommended that two of the sites (LA 85756, LA 85758) along the Roosevelt Reservation should not be considered NRHP eligible. Three sites (LA 85755, LA 85757, and LA 85760) have, through previous and current investigations, been exhausted of

any research potential. Northland recommends no further action at these five sites. Northland recommends avoidance of the remaining 22 previously recorded sites. The proposed undertaking will not involve any impacts outside the 60-ft wide Roosevelt Reservation. However, given the possibility of buried deposits—due to shifting sand and dune accumulation—Northland recommends that if avoidance is not possible monitoring should be conducted during any ground disturbance within and near the immediate surrounding area of these sites. A summary of the current survey's findings at each of the previously recorded sites is presented below. Maps of each site and their location are provided in Appendix B.

LA 35222

Site Number:	LA35222
Field Site Number:	1
Site Type:	Prehistoric Habitation
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	N/A
USGS Topographic Quadrangle:	Guzmans Lookout Mountain 7.5'
Elevation:	4,072 ft (1,241 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: LA 35222 was originally recorded by New Mexico State University (Hilley 1981) as a limited activity prehistoric site consisting of prehistoric lithic debitage, ground stone tools, and a possible deflated structure. No additional information was available pertaining to the nature of the site and the extent of its previous investigations. The current survey attempted to relocate the site with the current project area (Figures 20 and 21).

Artifacts: No artifacts or features were identified within the current APE.

Discussion and Recommendation: No evidence of the site was identified within the APE. The lack of artifacts identified within the APE may be due to the accumulation of sand and dunes. The site has not been evaluated for its eligibility for the NRHP. While no evidence of LA 35222 was identified during the current survey it is possible that it has been covered by the formation of coppice dunes. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 20. Overview of LA 35222 facing northeast.

Figure 21. Overview of LA 35222 facing northwest.

LA 35272

Site Number:	LA35272
Field Site Number:	2
Site Type:	Prehistoric artifact scatter
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Formative (AD 200-1450)
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,140 ft (1,262 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: LA 35272 was originally recorded by New Mexico State University (Hilley 1981) as a limited activity prehistoric site consisting of prehistoric lithic debitage, ground stone tools, and a hearth feature. No additional information was available pertaining to the nature of the site and the extent of its previous investigations. The current survey attempted to relocate the site within the current project area (Figures 22 and 23).

Figure 22. Overview of LA 35272 facing northeast.

Figure 23. Overview of LA 35272 and LA 85756 facing northwest.

Artifacts: The current investigation identified one El Paso Brown Ware sherd within the APE.

Discussion and Recommendation: The one El Paso Brown Ware sherd suggests a general date range within the Formative Period (AD 200–1450). No additional evidence of the site was identified within the APE. The lack of artifacts identified within the APE may be due to the accumulation of sand and dunes. The site has not been evaluated for its eligibility for the NRHP. Based on the current survey Northland recommends that LA 35272 be monitored during any ground disturbance activity.

LA 85076

Site Number:	LA85076
Field Site Number:	3
Site Type:	Multi-component
Cultural Affiliation:	Historic; American Prehistoric; Unknown
Date Range:	1891-1896 AD 200-1450
USGS Topographic Quadrangle:	Coyote Hill 7.5’
Elevation:	4,000 ft (1,219 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent

Features:	n/a
Site Condition:	Fair to poor
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: LA 85076 was originally recorded as a Formative period artifact scatter in 1981 by New Mexico State University (Hilley 1981). The site is situated along the southern border of the United States and extends into Mexico. The southern portion of the site has been heavily disturbed by the border road and maintenance including grading and capping of the current road with gravels. The portion of the site immediately north of the existing border road is untouched, consisting primarily of native desert vegetation including mesquite, and yucca. The landscape is currently covered with coppice dunes stabilized by brush mesquite vegetation (Figures 24–27).

The site was revisited multiple times between 1991 and 2007. The site was tested through surface collection of artifacts and in-field analysis by Aztlan in 1999 (Rieder 1999a). The most recent investigation of LA 85076 was conducted by Zia Engineering in 2007 (Gibbs et al. 2007). The site has been combined with previously recorded LA 35226. Thousands of artifacts were previously recorded at LA 85076 including late stage reduction flakes, El Paso Brown Ware ceramic fragments, fire cracked rock (FCR), and ground stone fragments. The current survey revisited LA 85076 within the Roosevelt Reservation.

Figure 24. Overview of LA 85076 facing northeast.

Figure 25. Overview of LA 85076 facing northeast.

Figure 26. Overview of LA 85076 facing northeast.

Figure 27. Overview of LA 85076 facing northeast.

Artifacts: 58 artifacts were identified during the current survey including one basalt mano fragment, one unifacial expedient scraper, one core scraper, two red chert biface fragments (Figure 28), three pieces of Red-on-buff ceramics (possibly from the same vessel) (Figure 29), multiple lithic fragments from various material types and reduction stages, and a very sparse scatter of historic trash. All artifacts were point located and a list is presented below (Table 7).

Figure 28. Artifact 36–red chert biface identified at LA 85076.

Figure 29. Artifact 39–Red-on-buff ceramic fragment identified at LA 85076.

Table 7. Point Located Artifacts Identified at LA 85076.

Artifact No.	Artifact/Material Type	Lithic color	Age	Area
1	Rhyolite secondary flake	Mottled black/brown/purple	NA	Single artifact
2	Rhyolite tertiary flake	Mottled black/brown/purple	NA	Single artifact
3	Rhyolite tertiary flake	Grey	NA	Single artifact
4	Rhyolite tertiary flake	Grey	NA	Single artifact
5	Rhyolite tertiary flake	Mottled black/brown/purple	NA	Single artifact
6	Rhyolite tertiary flake	Mottled black/brown/purple	NA	Single artifact
7	Basalt mano fragment	Black	NA	Single artifact
8	Rhyolite tertiary flake	Grey	NA	Single artifact
9	Rhyolite secondary flake	Mottled black/brown/purple	NA	Single artifact
10	Rhyolite tertiary flake	Grey	NA	Single artifact
11	Rhyolite secondary flake	Grey	NA	Single artifact
12	Chert tertiary flake	Tan	NA	Single artifact
13	Rhyolite tertiary flake	Grey	NA	Single artifact
14	Rhyolite secondary flake	Grey	NA	Single artifact
15	Rhyolite tertiary flake	Banded grey/white	NA	Single artifact
16	2 rhyolite tertiary flakes	Grey	NA	<1 m^2
17	Fine grain basalt secondary flake	Black	NA	Single artifact
18	Chert secondary flake	Grey	NA	Single artifact
19	Rhyolite tertiary flake	Grey	NA	Single artifact
20	Fine grain basalt tertiary flake	Black	NA	Single artifact
21	Rhyolite tertiary flake	Grey	NA	Single artifact
22	Rhyolite tertiary flake	Grey	NA	Single artifact
23	Rhyolite tertiary flake	Grey	NA	Single artifact
24	Basalt ground stone fragment	Black	NA	Single artifact
25	Chert primary flake	Grey	NA	<1 m^2
	Rhyolite unifacial scraper fragment	Grey	NA	
	Crushed sanitary can	n/a	Unknown historic	
26	Rhyolite core scraper	Grey	NA	Single artifact
27	Rhyolite tertiary flake	Grey	NA	Single artifact
28	Chert tertiary flake	Tan	NA	<2 m^2
	11 container glass fragments	Brown	Unknown historic	
29	Chert secondary flake	Red	NA	Single artifact
30	Rhyolite secondary flake	Grey	NA	Single artifact
31	Rhyolite tertiary flake	Grey	NA	Single artifact
32	Fine grain basalt tertiary flake	Black	NA	<1 m^2
	Rhyolite secondary flake	Grey	NA	
33	Glass container fragment	Clear	NA	Single artifact
34	Chert tertiary flake	Red	NA	<1 m^2
	2 rhyolite tertiary flakes	Grey	NA	
35	Rhyolite tertiary flake	Grey	NA	Single artifact
36	Chert biface fragment (pp tip)	Red	NA	Single artifact
37	Rhyolite tertiary flake	Grey	NA	Single artifact
38	Chert biface fragment	Red	NA	Single artifact
39	3 Red-on-buff ceramic sherds	Grey paste, no slip, quartz (1/4) and feldspar (3/4) temper		~3m^2

Discussion and Recommendation: LA 85076 has been revisited a number of times and was tested through surface collection and in-field analysis of artifacts in 1999 (Rieder 1999). It is likely that the site contains subsurface deposits. The presence of Red-on-buff wares within the site suggests a Hohokam interaction (e.g. trade). This is not unheard of in southern New Mexico; however, it is also not common this far east. Based upon the current investigation of LA 85076 Northland concurs with previous recommendations that this site be recommended eligible for inclusion in the NRHP. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

LA 85078

Site Number:	LA85078
Field Site Number:	4
Site Type:	Prehistoric artifact scatter Historic International Border Monument
Cultural Affiliation:	Prehistoric; Unknown Historic; American
Date Range:	Formative (AD 200-1450) 1891-1896
USGS Topographic Quadrangle:	Coyote Hill 7.5’
Elevation:	4,160 ft (1,268 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair to poor
NRHP Eligibility:	Not Evaluated
Management Recommendation:	Monitor

Description: LA 85078 rests on a north sloping hill along the United States-Mexico border. It was originally recorded by HRS in 1991 (Laumbach 1991, Sechrist 1994) as a Formative period artifact scatter with a few historic (1920s) artifacts, potentially associated with the construction of the border monument (Monument 16), which rests at the southern extent of the prehistoric site. The southern portion of the site has been disturbed by the border road and maintenance including grading and capping of the current road with gravels; it is truncated by the international border and likely extends into Mexico. The portion of the site immediately north of the existing border road consists of native vegetation and mesquite stabilized dunes. The current survey revisited LA 85078 (Figures 30 and 31).

Artifacts: The current survey identified one El Paso Brown Ware sherd. The Brown Ware sherd suggests a general Formative period date (AD 200–1450) for LA 85078. Border Monument 16 was also documented and looks to be unchanged since the previous recording. The monument feature consists of United States-Mexico International Border Monument 16 (Figure 32). The monument was set in place between 1891 and 1896. A vehicle barrier rests approximately 1 meter north of the monument.

Figure 30. Overview of LA 85078 facing northeast.

Figure 31. Overview of LA 85078 facing northwest.

Figure 32. Overview of International Border Monument 16 facing south-southwest.

The monument is a cast-iron obelisk bolted onto a concrete foundation. The obelisk measures 6.5 ft (1.98 m) tall and 1 ft by 1 ft (0.3 m) at the base. The concrete foundation measures 3 ft by 3 ft (0.92 m by 0.92 m) and is approximately 1 ft (0.3 m) thick. On the northern face of the monument rests a metal plaque that reads "Boundary of the United States, Treaty of 1848 Re-established by treaties of 1884-1889." The monument is painted with silver paint. On the eastern face of the monument is metal number "16". The monument remains in excellent condition and will not be impacted by the current undertaking.

Discussion and Recommendation: No additional evidence of the site was identified within the APE. The lack of artifacts identified within the APE may be due to the accumulation of sand and coppice dunes on the north side of the current border road. The International Border Monument will not be impacted during the current project. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

LA 85079

Site Number:	LA85079
Field Site Number:	5
Site Type:	Prehistoric artifact scatter
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Formative (AD 200-1450)
USGS Topographic Quadrangle:	Camel Mountain 7.5’
Elevation:	4,020 ft (1,225 m) above sea level

Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair to poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: LA 85079 was originally recorded in 1991 by HRS as a moderate density artifact scatter located on the western slope of a small mountain foothill along the United States-Mexico border (Laumbach 1991, Sechrist 1994). The site was revisited in 2008 by the University of New Mexico Office of Contract Archaeology. This survey identified 18 lithic artifacts including ground stone manos, FCR, and one complete Antelope Wells obsidian projectile point. The majority of the artifact scatter was identified within the western portion of the site boundary and the FCR was noted to be primarily in the eastern portion of the site. The site is truncated to the south by the existing CBP border road, while the northern portion of the site is located in a natural desert landscape covered by mesquite stabilizing dunes. The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 33 and 34).

Figure 33. Overview of LA 85079 facing northeast.

Figure 34. Overview of LA 85079 facing northwest.

Artifacts: The current survey identified only two tertiary rhyolite flakes and one crushed sanitary can. No additional evidence of the site was identified within the APE.

Discussion and Recommendation: The lack of artifacts identified within the APE may be due to the accumulation of sand and dunes along the western half of the site. The majority of the site is also located north of the current APE. It is unlikely that there are any buried deposits in the eastern half of LA 85079. While the findings of the current survey did not match those of previous investigations of LA 85079, it is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

LA 85755

Site Number:	LA85755
Field Site Number:	6
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Formative (AD 200-1450)
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,080 ft (1,243 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	Possible Hearth

Site Condition: Fair
NRHP Eligibility: Not evaluated
Management Recommendation: No further work

Description: LA 85755 was originally recorded by HRS in 1991 as a prehistoric artifact scatter covering approximately five acres immediately north of the United States-Mexico International Border (Sechrist 1994). The site was revisited in 2004 by EComm at which time the one feature (prehistoric hearth) was hand excavated to examine the potential for cultural depth within the site. It was determined that the site did not retain any cultural depth and was thus recommended not eligible for inclusion in the NRHP (Trierweiler and Smith 2004). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 35 and 36).

Artifacts: During the current survey a FCR concentration consistent with the previously recorded prehistoric hearth (Feature 1) was relocated in the eastern portion of the site (Figure 37). No additional evidence of the site was identified within the APE.

Discussion and Recommendation: Based on the previous recordings LA 85755 is likely to be a limited use camp site dating to the Formative Period (AD 200–1450). The current survey relocated only the deflated hearth that was previously recorded by EComm in 2004 (Trierweiler and Smith 2004). It was determined that the hearth and the surrounding area did not retain any cultural depth. Based on the lack of cultural depth and lack of cultural material Northland concurs with the previous recommendation that LA 85755 has been exhausted of any research potential and is not eligible for inclusion in the NRHP. No further work is necessary at LA 85755.

Figure 35. Overview of LA 85755 facing northeast.

Figure 36. Overview of LA 85755 facing northwest.

Figure 37. Overview of LA 85755 Feature 1 (deflated hearth) facing north-northeast.

LA 85756

Site Number:	LA85756
Field Site Number:	7
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Unknown
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,110 ft (1,253 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Not eligible
Management Recommendation:	No further work

Discussion: LA 85756 was originally recorded by HRS in 1991 as a prehistoric artifact scatter covering less than one acre immediately north of the United States/Mexico International Border (Sechrist 1994). The site was revisited in 2004 by EComm at which time the site boundary was expanded to cover approximately five acres. The 2004 survey recorded 100% of the surficial artifact scatter within LA 85756, which consisted primarily of burned caliche, FCR, and a low density of prehistoric ceramic and lithic artifacts. It was determined that the site did not retain any cultural depth and was thus determined not eligible for inclusion in the NRHP (Trierweiler and Smith 2004). The current survey revisited the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figure 38).

Figure 38. Overview of LA 85756 and LA 35272 facing northwest.

Artifacts: No artifacts or any evidence of LA 85756 was identified within the current APE.

Discussion and Recommendation: Based on the previous recordings, LA 85756 is likely to be a limited use camp site dating to an unknown prehistoric period. The current survey did not relocate any cultural material within the project area. Based on the lack of cultural depth and lack of cultural material Northland concurs with the previous recommendation that LA 85756 has been exhausted of any research potential within the current APE and is not eligible for inclusion in the NRHP. No further work is necessary at LA 85756.

LA 85757

Site Number:	LA85757
Field Site Number:	8
Site Type:	Multi-Component
Cultural Affiliation:	Prehistoric; Unknown Historic; American
Date Range:	n/a 1920-1930s
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,075 ft (1,242 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Not Evaluated
Management Recommendation:	No further work

Description: LA 85757 was originally recorded in 1991 by HRS as consisting of multiple deflated hearths and three concentrations of FCR (Sechrist 1994). The site was revisited in 2004 by EComm and recommended for subsurface testing based on the identification of a low-density artifact scatter that covered a 1.1 km by 150 m area (33 acres). The site was determined to have a potential for buried deposits based upon the site being covered by dune activity. In 2003 the site was tested with 10 backhoe trenches measuring 10–20 meters in length placed throughout the site. Two features were identified from the 2003 testing at LA 85757. These features were void of any cultural material. It was determined that while there is potential for additional subsurface features underlying the dunes it is likely that any additional features would not be intact enough for future research potential due to the continuous environmental pressures (Trierwieler and Smith 2004). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 39–42).

Artifacts: The current investigation of LA85757 identified three artifacts. These artifacts include two prehistoric lithics and one possibly historic crushed sanitary can. The lithic fragments consisted of one tan chert secondary flake and one grey rhyolite core scraper. The historic can was completely crushed and no measurements or additional data could be identified.

Figure 39. Overview of LA 85757 facing west-northwest.

Figure 40. Overview of LA 85757 facing east-northeast.

Figure 41. Overview of LA 85757 facing west.

Figure 42. Overview of LA 85757 facing northwest.

Discussion and Recommendation: Based on the presence of the crushed sanitary can LA 85757 is a multi-component site. The historic component of the site is a non-contributing element to LA 85757 and has limited research value based on the sparse artifacts scatter. LA 85757 has been previously recommended eligible for inclusion in NRHP. Previous investigations have thoroughly tested and recorded the site for subsurface deposits. Base on the current survey and previous subsurface testing LA 85757 has been exhausted of any research potential. No further work is warranted at LA 85757.

LA 85758

Site Number:	LA85758
Field Site Number:	9
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	n/a
USGS Topographic Quadrangle:	Guzmans Lookout Mountain 7.5’
Elevation:	4,070 ft (1,240 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Not Eligible
Management Recommendation:	No further work

Description: LA 85758 was originally recorded by HRS in 1991 as a prehistoric artifact scatter containing hundreds of artifacts including multiple ceramic types, lithic debitage, a charcoal stain, and a possible jacal structure covering approximately 10 acres immediately north of the United States-Mexico International Border (Sechrist 1994). The survey conducted in 2003 by EComm could not relocate the site at the location it was originally recorded (Trierweiler and Bonine 2003). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 43 and 44).

Artifacts: No artifacts were identified within the APE during the current investigation of LA 85758.

Discussion and Recommendation: No evidence of the site was identified within the APE during the current survey. The site has been previously recommended as not eligible for NRHP inclusion. Northland concurs with this previous assessment and recommends no further work at LA 85758.

Figure 43. Overview of LA 85758 facing northeast.

Figure 44. Overview of LA 85758 facing northwest.

LA 85759

Site Number:	LA85759
Field Site Number:	10
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Unknown
USGS Topographic Quadrangle:	Guzmans Lookout Maintain 7.5’
Elevation:	4,080 ft (1,243 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair to poor
NRHP Eligibility:	Not Evaluated
Management Recommendation:	Monitor

Description: LA 85759 was originally recorded in 1991 by HRS (Sechrist 1994). The original recording noted hundreds of prehistoric artifacts which included multiple ceramic types and lithic debitage. The site was revisited in 2003 by EComm (Trierweiler and Bonine 2003). The revisit noted that the number of artifacts recorded in 2003 were much less than those originally recorded. The Bureau of Land Management, United States Army Corps of Engineers, and EComm recommended the site retained information potential despite the deflated nature and the lack of intact cultural features. In 2003 the site was tested and a sample of the surface artifacts within 30 meters of the border fence was documented (Trierweiler and Smith 2004). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 45–47).

Artifacts: The current survey relocated LA 85759 and only one artifact was recorded. The single prehistoric artifact consisted of a brown rhyolite tertiary flake.

Discussion and Recommendation: No additional evidence of the site was identified within the APE during the current survey. The lack of artifacts may be due to the accumulation of sand and dunes. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 45. Overview of LA 85759 facing west.

Figure 46. Overview of LA 85759 facing east.

Figure 47. Overview of LA 85759 facing west.

LA 85760

Site Number:	LA85760
Field Site Number:	11
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Early- Late Pueblo
USGS Topographic Quadrangle:	Guzmans Lookout Mountain 7.5'
Elevation:	4,080 ft (1,243 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	Possible Hearth
Site Condition:	Fair
NRHP Eligibility:	Eligible
Management Recommendation:	No further work

Description: LA 85760 was originally recorded in 1991 by HRS as habitation site consisting of thousands of artifacts including FCR, formal and informal stone tools, and multiple ceramic types (Sechrist 1994). The site was revisited in 2007 by OCA/UNM and was recommended for subsurface investigation (Kurota and Turnbow 2008). The following year OCA/UNM returned to LA 85760 and conducted data recovery excavations of the site. The excavations recorded 20 subsurface features, hundreds of ceramic sherds consisting of multiple types, as well as 40 pieces

of lithic debitage and one ground stone fragment. Most of the lithic debitage identified consisted of late stage and retouch reduction flakes. The 41 analyzed ceramic sherds included six different ceramic types dating to the Early to Late Pueblo period. For a complete summary of the 2008 excavation see Kurota and Turnbow 2009. The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 48 and 49).

Figure 48. Overview of LA 85760 facing northeast.

Figure 49. Overview of LA 85760 facing northwest.

Artifacts: The current survey identified 21 prehistoric artifacts including lithic debitage and ceramics (Table 8). A previously recorded FCR concentration (Feature 1) was also identified just north of the current APE (Figure 50). Examples of ceramics identified during the current survey are presented in Figures 51–53.

Table 8. Point Located Artifacts Identified at LA 85760.

Artifact No.	Artifact/Material Type	Lithic color	Age	Area
1	2 tooled sand tempered Brown Ware (Casas Grandes)	Brown	AD700-1450	Single Artifact
2	Rhyolite tertiary flake	Tan		Single Artifact
3	3 El Paso Brown Ware	Brown	AD200-1450	<1m2
4	Sand tempered white ware sherd	White		Single Artifact
5	2 El Paso Brown Ware	Brown	AD200-1450	<1m2
6	Sand tempered white ware sherd	White		Single Artifact
7	3 El Paso Brown Ware	Brown	AD200-1450	<1m2
8	2 El Paso Brown Ware	Brown	AD200-1450	<1m2
	1 rim sherd (Casas Grandes?)	Brown	AD700-1450	
9	El Paso Brown Ware sherd	Brown	AD200-1450	Single Artifact
10	2 El Paso Brown (El Paso Polychrome)	Brown/tan/black	AD1050-1450	<1m2
11	Black-on-brown sherd (El Paso Bichrome)	Black/brown	AD1050-1450	Single Artifact
12	El Paso Brown Ware sherd	Brown	AD200-1450	Single Artifact

Figure 50. Overview of Feature 1 at LA 85760 facing north.

Figure 51. Artifact 1–tooled brown ware sherds at LA 85760.

Figure 52. Artifact 10–El Paso Brown (El Paso Polychrome) sherds at LA 85760.

Figure 53. Artifact 11–Black-on-Brown (El Paso Bichrome) sherd at LA 85760.

Discussion and Recommendation: Based on the current survey Northland concurs with previous recommendations that LA 85760 is eligible for inclusion in NRHP. In 2008, data recovery efforts took place at LA 85760 (Kurota and Turnbow 2009). Based on the finding during the data recovery and the current survey, LA 85760 has been exhausted of any further research potential. No further work is warranted

LA 85761

Site Number:	LA85761
Field Site Number:	12
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Formative (AD 200-1450)
USGS Topographic Quadrangle:	Camel Mountain 7.5'
Elevation:	4,000 ft (1,219 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: LA 85761 was originally recorded in 1991 by HRS as a Mogollon food gathering and processing area dating to the Mesilla phase (AD 900–1200) (Sechrist 1994). The site consisted of 16 lithics flakes from eight different materials and three ceramic sherds. The site was originally recommended as not eligible for NRHP inclusion. LA 85761 was revisited by OCA/UNM in 2007 and determined to be a seasonal camp site. The 2007 site recording identified seven stone artifacts which included one siltstone metate and one basalt projectile point tip. A single Mimbres Black-on-white sherd was also identified. OCA/UNM determined that the site was likely to have been used as a seasonal camp associated with food procurement and processing and has potential for subsurface cultural material (Kurota and Turnbow 2008). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 54 and 55).

Artifacts: The current survey identified two prehistoric artifacts including one Mimbres Black-on-white bowl rim sherd (Figure 56) and one fine grain basalt tertiary flake. No additional evidence of the site was identified within the APE.

Discussion and Recommendation: The low density of artifacts identified within the APE may be due to the accumulation of sand and dunes. The ceramics identified during the current survey suggest the site dates roughly within AD 880–1150. While no features have been identified in association with LA 85761, it is possible that there are subsurface deposits present within the site. The site has not been previously investigated for subsurface deposits. Due to the limited APE within the site it is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 54. Overview of LA 85761 facing northeast.

Figure 55. Overview of LA 85761 facing northwest.

Figure 56. Artifact 1–Mimbres Black-on-White ceramic fragment at LA 85761.

LA 85764

Site Number:	LA85764
Field Site Number:	13
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Formative Period (AD 200-1450)
USGS Topographic Quadrangle:	Coyote Hil 7.5'
Elevation:	4,115 ft (1,254 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	Possible Hearth
Site Condition:	Fair
NRHP Eligibility:	Not Evaluated
Management Recommendation:	Monitor

Description: Originally recorded in 1991 by HRS (Sechrist 1994), LA 85764 was recorded as a large prehistoric lithic artifact scatter with potential for buried deposits (Figures 57 and 58). The site was revisited in 2007 by Zia Engineering and their findings matched closely to those of the original survey. The 2007 survey recorded seven lithic flakes, one core, eight El Paso Brown Ware sherds, and one hearth feature. LA 85764 was recommended eligible by Zia Engineering in 2007 based on information potential and the potential for buried deposits within the site (Gibbs et al. 2007). The possibility for cultural depth was based on the identification of a hearth feature and good soil context extending down 65 cm below the surface. The soil context was based on the observed road cut (Gibbs et al. 2007). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road.

Figure 57. Overview of LA 85764 facing northeast.

Figure 58. Overview of LA 85764 facing northwest.

Artifacts: No evidence of the site was identified within the APE.

Discussion and Recommendation: Previous projects have recorded ceramics within LA 85764 that suggest a date within the Formative Period (AD200–1450). However, no artifacts were recorded during the current investigation of LA 85764. The majority of the site is located north of the current APE. The lack of artifacts identified within the APE may be due to the accumulation of sand and dunes. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

LA 85765

Site Number:	LA85765
Field Site Number:	14
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Late Archaic-Formative (AD 200-1450)
USGS Topographic Quadrangle:	Coyote Hill 7.5’
Elevation:	3,960 ft (1,207 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: LA 85765 was previously recorded by HRS in 1991 (Sechrist 1994), Aztlan in 1998 (Rieder 1999a, 1999b), and Zia Engineering in 2007 (Gibbs et al. 2007). The previous surveys determined the site to be a large prehistoric artifact scatter dating from the Late Archaic to the Formative period. In 1999 Aztlan tested LA 85765 using artifact collection, in-field analysis, and shovel scraping, and recommended the site eligible for inclusion in the NRHP based on information potential and the likelihood of buried cultural deposits (Rieder 1999a, 1999b). Zia Engineering revisited LA 85765 in 2007 and concurred with the recommendation of LA 85765 as eligible for NRHP (Gibbs et al. 2007). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 59 and 60).

Artifacts: One grey rhyolite core chopper was identified and point located with GPS during the current survey. No additional artifacts were observed.

Discussion and Recommendation: The recent investigation of LA 85765 located one prehistoric artifact within the current APE. The majority of the site is north of the current project area. While no features were identified there is potential for subsurface material, as the site and surrounding area is covered with intermittent coppice dune accumulations. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 59. Overview of LA 85760 facing northeast.

Figure 60. Overview of LA 85764 facing northwest.

LA 85769

Site Number:	LA85769
Field Site Number:	15
Site Type:	Prehistoric artifact scatter
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Late Archaic- Formative (AD200-1450)
USGS Topographic Quadrangle:	Coyote Hill 7.5'
Elevation:	3,970 ft (1,210 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: LA 85769 was previously recorded by HRS in 1991 (Sechrist 1994), Aztlan in 1998 (Rieder 1999a, 1999b), and Zia Engineering in 2007 (Gibbs et al. 2007). The previous surveys determined the site to be a large prehistoric artifact scatter dating from the Late Archaic period. In 1999 Aztlan tested LA 85769 using artifact collection, in-field analysis, and shovel scraping, and recommended the site eligible for inclusion in the NRHP based on information potential and the likelihood of buried cultural deposits (Rieder 1999a, 1999b). Zia Engineering revisited LA 85769 in 2007 and concurred with the recommendation of LA 85769 as eligible (Gibbs et al. 2007). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 61 and 62).

Artifacts: During the current survey 15 artifacts were identified within the APE. All artifacts were point located (Figure B27, Appendix B). The artifacts include five bullet casings, one ceramic sherd, one unifacial tool fragment (possible preform), and eight lithic flakes. Table 9 summarizes all point located artifacts observed at LA 85769.

Table 9. Point Located Artifacts Identified at LA 85769.

Artifact No.	Artifact/Material Type	Lithic Color	Age	Area
1	1 .45 pistol cartridge 1 .38 pistol cartridge	NA	NA	<1m2
2	Rhyolite tertiary flake (utilized)	Grey	NA	Single artifact
3	Rhyolite tertiary flake	Grey	NA	Single artifact
4	Chalcedony tertiary flake	White	NA	Single artifact
5	3 .45 pistol cartridges	NA	NA	<3m2
6	Rhyolite tertiary flake	Grey	NA	Single artifact
7	Rhyolite tool fragment (possible preform)	Grey	NA	Single artifact
8	Chert tertiary flake	Tan	NA	Single artifact
9	Rhyolite tertiary flake	Grey	NA	Single artifact
10	Rhyolite secondary flake	Grey	NA	Single artifact
11	Basalt ground stone fragment	Black	NA	Single artifact
12	El Paso Brown Ware sherd	Brown	AD200–1450	Single artifact

Figure 61. Overview of LA 85769 facing northeast.

Figure 62. Overview of LA 85769 facing northwest.

Discussion and Recommendation: The recent investigation of LA 85769 located 15 prehistoric artifacts within the current APE. The majority of the site is north of the current project area and has been previously recommended eligible for inclusion in NRHP. While no features were identified there is potential for subsurface material as the site and the surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

LA 85770

Site Number:	LA85770
Field Site Number:	16
Site Type:	Prehistoric artifact scatter
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	n/a
USGS Topographic Quadrangle:	Coyote Hill 7.5’
Elevation:	3,970 ft (1,210 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: LA 85770 was previously recorded by HRS in 1991 (Sechrist 1994), Aztlan in 1998 (Rieder 1999a, 1999b), and Zia Engineering in 2007 (Gibbs et al. 2007). The previous surveys determined the site to be a large prehistoric artifact scatter from an unknown prehistoric period. In 1999 Aztlan tested LA 85770 through surface collection of artifacts, in-field analysis, and shovel scraping, and recommended the site eligible for inclusion in the NRHP based on information potential and the likelihood of buried cultural deposits (Rieder 1999a, 1999b). Zia Engineering revisited LA 85770 in 2007 and concurred with the recommendation of LA 85770 as eligible (Gibbs et al. 2007). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 63 and 64).

Artifacts: Three artifacts were point plotted within the APE during the current survey of LA 85070. The artifacts include one grey rhyolite turtle back scraper (Figure 65) and two grey rhyolite tertiary flakes. No additional artifacts were identified.

Discussion and Recommendation: The recent investigation of LA 85770 identified three prehistoric artifacts within the current APE. The majority of the site is north of the current project area and has been previously recommended as eligible for inclusion in NRHP. While no features were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 63. Overview of LA 85770 facing northeast.

Figure 64. Overview of LA 85770 facing northwest.

Figure 65. Scraper identified at LA 85770.

LA 85771

Site Number:	LA85771
Field Site Number:	17
Site Type:	Prehistoric artifact scatter
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	n/a
USGS Topographic Quadrangle:	Columbus SE 7.5’
Elevation:	3,950 ft (1,204 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Fair
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: LA 85771 was previously recorded by HRS in 1991 (Sechrist 1994), Aztlan in 1998 (Rieder 1999a, 1999b), and Zia Engineering in 2007 (Gibbs et al. 2007). The previous surveys determined the site to be a very low-density prehistoric artifact scatter dating from an unknown prehistoric period. HRS recommended LA 85771 as ineligible for inclusion in the NRHP due to the small artifact assemblage. In 1999 Aztlan recommended the site eligible for inclusion in the NRHP based on information potential due to the likelihood of buried cultural deposits (Rieder 1999a, 1999b). Zia Engineering revisited LA 85771 in 2007 and concurred with the

recommendation of LA 85771 as eligible for inclusion in the NRHP (Gibbs et al. 2007). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figure 66).

Artifacts: The current survey of LA 85771 did not identify any cultural material within the APE.

Discussion and Recommendation: The recent investigation of LA 85771 did not identify any artifacts within the current APE. The majority of the site is north of the current project area and has been previously recommended as eligible for inclusion in the NRHP. While no features or artifacts were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 66. Overview of LA 85771 facing north.

LA 85772

Site Number:	LA85772
Field Site Number:	18
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Early Archaic- Formative (AD 200-1450)
USGS Topographic Quadrangle:	Columbus SE 7.5'
Elevation:	3,980 ft (1,213 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: LA 85772 was previously recorded by HRS in 1991 (Sechrist 1994), Aztlan in 1998 (Rieder 1999a, 1999b), and Zia Engineering in 2007 (Gibbs et al. 2007). The previous surveys determined the site to be a large prehistoric artifact scatter dating from the Early Archaic to the Formative period. In 1999 Aztlan tested LA 85772 through surface collection of identified artifacts, in-field analysis, and shovel scraping, and recommended the site eligible for inclusion in the NRHP based on information potential and the likelihood of buried cultural deposits (Rieder 1999a, 1999b). Zia Engineering revisited LA 85772 in 2007 and concurred with the recommendation of LA 85772 as eligible to the NRHP (Gibbs et al. 2007). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figure 67).

Artifacts: No evidence of the site was identified within the APE.

Discussion and Recommendation: The recent investigation of LA 85772 did not identify any artifacts within the current APE. The majority of the site is north of the current project area and has been previously recommended as eligible for inclusion in the NRHP. While no features or artifacts were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 67. Overview of LA 85772 facing north.

LA 139014

Site Number:	LA139014
Field Site Number:	19
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Late Formative (AD 800-1450)
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,089 ft (1,216 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: Originally documented in 2003 by EComm, LA 139014 was recorded as a small, low-density prehistoric artifact scatter consisting of burned caliche and ceramics (Trierweiler and Bonine 2003). The burned caliche was noted to be a disperse scattering of a deflated hearth feature. Noted ceramics included El Paso Bichrome and Brown Ware jar body sherds. The ceramics identified from the 2003 survey suggest the site dates to the Late Formative Period (AD 800–1450). The site has not been evaluated for NRHP eligibility potential. The current survey covered

the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 68 and 69).

Artifacts: No evidence of the site was identified within the APE.

Discussion and Recommendation: The recent investigation of LA 139014 did not identify any artifacts within the current APE. The majority of the site is north of the current project area and has been not been previously evaluated for NRHP eligibility. While no features or artifacts were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 68. Overview of LA 139014 facing northeast.

Figure 69. Overview of LA 139014 facing northwest.

LA 139015

Site Number:	LA139015
Field Site Number:	20
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	n/a
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,090 ft (1,2316 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	Possible Hearth
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: Originally documented in 2003 by EComm, LA 139015 was recorded as a small, low-density prehistoric artifact scatter consisting of burned caliche and one brown chert flake (Trierweiler and Bonine 2003). The burned caliche was noted to be a dispersed scatter of a deflated hearth. The 2003 survey also recorded two crimped seam historic cans. Temporal information for the site is unknown as no diagnostic artifacts were identified during the survey. The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 70 and 71).

Figure 70. Overview of LA 139015 facing northeast.

Figure 71. Overview of LA 139015 facing northwest.

Artifacts: The current investigation of LA 139015 within the APE identified one tan chert tertiary lithic flake and one FCR concentration (possible deflated hearth) (Figure 72).

Figure 72. Overview of Feature 1 (deflated hearth) LA 139015 facing north.

Discussion and Recommendation: The recent investigation of LA 139015 identified one lithic flake and one possible hearth feature that consists of a deflated concentration of FCR. The possible hearth feature was located well outside of the current APE in the northeastern portion of the site. No additional evidence of the site was identified within the APE. The majority of the site is north of the current project area and has been not been previously evaluated for NRHP eligibility. While no features or artifacts were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and immediate area surrounding the site boundary be monitored during any ground disturbance activity.

LA 139016

Site Number:	LA139016
Field Site Number:	21
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Formative (AD 200-1450)
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,120 ft (1,256 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: Originally documented in 2003 by EComm, LA 139016 was recorded as a small, low-density prehistoric artifact scatter consisting of burned caliche and ceramics (Trierweiler and Bonine 2003). The burned caliche was noted to be a disperse scattering of a deflated hearth feature. Noted ceramics included El Paso brownware jar body sherds. The ceramics identified from the 2003 survey suggest the site dates to the Formative Period (AD 200–1450). No stone tools or debitage were identified. EComm noted that the entire assemblage consisted of less than 100 artifacts in total throughout the 3-acre site (Trierweiler and Bonine 2003). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 73 and 74).

Artifacts: The current survey identified only one tan chert secondary lithic flake. No additional evidence of the site was identified within the APE.

Discussion and Recommendation: The recent investigation of LA 139016 identified one lithic flake within the current APE. No additional evidence of the site was identified within the APE. The majority of the site is north of the current project area and has been not been previously evaluated for NRHP eligibility. While no features or artifacts were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 73. Overview of LA 139016 facing northeast.

Figure 74. Overview of LA 139016 facing northwest.

LA 139017

Site Number:	LA139017
Field Site Number:	22
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	n/a
USGS Topographic Quadrangle:	Mount Riley 7.5’
Elevation:	4,108 ft (1,252 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: Originally documented in 2003 by EComm, LA 139017 was recorded as a small, low-density prehistoric artifact scatter consisting of burned caliche and thirteen lithic flakes covering approximately 1.7 acres (Trierweiler and Bonine 2003). The burned caliche was noted to be a dispersed scatter of a deflated hearth feature. Temporal information for the site is unknown as no diagnostic artifacts were identified during the survey. The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 75 and 76).

Artifacts: No evidence of the site was identified within the APE.

Discussion and Recommendation: No additional evidence of LA 139017 was identified within the APE. The majority of the site is north of the current project area and has been not been previously evaluated for NRHP eligibility. While no features or artifacts were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 75. Overview of LA 139017 facing northeast.

Figure 76. Overview of LA 139017 facing northwest.

LA 139018

Site Number:	LA139018
Field Site Number:	23
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Archaic; Formative (AD 200-1450)
USGS Topographic Quadrangle:	
Elevation:	4,110 ft (1,253 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: Originally documented in 2003 by EComm, LA 139018 was recorded as a small, low-density prehistoric artifact scatter consisting of burned caliche, lithic debitage, and ceramics (Trierweiler and Bonine 2003). In total the artifact scatter consisted of less than 50 items. Noted artifacts included one stemmed projectile point possibly dating to the Archaic period, one El Paso Brown Ware sherd, a single tan chert core chopper, and one light grey chert flake. No features were identified during the survey. However, the burned caliche was noted to be a dispersed scatter of a deflated hearth feature. The ceramics identified from the 2003 survey suggest the site dates to the Formative Period (AD 200–1450). The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 77 and 78).

Artifacts: No evidence of the site was identified within the APE.

Discussion and Recommendation: No additional evidence of LA 139018 was identified within the APE. The majority of the site is north of the current project area and has been not been previously evaluated for NRHP eligibility. While no features or artifacts were identified there is potential for subsurface material as the site and surrounding area are covered with intermittent coppice dune accumulations. There is good potential for buried deposits within the site. It is recommended that the site and immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 77. Overview of LA 139018 facing northeast.

Figure 78. Overview of LA 139018 facing northwest.

LA 139019

Site Number:	LA139019
Field Site Number:	24
Site Type:	Prehistoric Camp Site
Cultural Affiliation:	Prehistoric; Unknown
Date Range:	Formative (AD 200-1450)
USGS Topographic Quadrangle:	Guzmans Lookout Maintain 7.5’
Elevation:	4,100 ft (1,250 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	n/a
Site Condition:	Poor
NRHP Eligibility:	Not evaluated
Management Recommendation:	Monitor

Description: Originally documented in 2003 by EComm, LA 139019 was recorded as a small, low-density prehistoric artifact scatter consisting of burned caliche, numerous pieces of lithic debitage, and two El Paso Brown Ware ceramic fragments (Trierweiler and Bonine 2003). In total the artifact scatter included less than 100 items covering approximately 7 acres. No features were identified during the survey. However, the burned caliche was noted to be a dispersed scatter of a deflated hearth feature. The ceramics identified from the 2003 survey suggest the site dates to the Formative Period (AD 200–1450). Further investigation in 2003 was conducted with an in-field analysis of all surface artifacts. The findings of the second investigation at LA 139019 matched those of the initial investigation and the site was recommended ineligible due to the lack of intact cultural features and the low-density of diagnostic artifacts (Trierweiler and Smith 2004). However, no subsurface testing was conducted to investigate the presence of buried deposits. The current survey covered the portion of the site located within the Roosevelt Reservation to the north of the existing border road (Figures 79 and 80).

Artifacts: The current investigation of LA 139019 point located two prehistoric artifacts including one banded pink and tan chert flake and one El Paso Brown Ware sherd. The identification of the El Paso Brown Ware suggests a general Formative Period date (AD 200–1450) for LA 139019.

Discussion and Recommendation: The current investigation of LA 139019 identified one lithic flake and one ceramic sherd within the current APE. The majority of the site is north of the current project area and has been previously recommended as not eligible for inclusion in the NRHP (Trierweiler and Smith 2004). The sparse nature of artifacts identified within the APE may be due to the accumulation of sand and dunes. While previous investigations have recommended LA 319019 as not eligible for inclusion in NRHP an evaluation of NRHP eligibility could not be completed at this time. It is recommended that the site and the immediate area surrounding the site boundary be monitored during any ground disturbance activity.

Figure 79. Overview of LA 139019 facing northeast.

Figure 80. Overview of LA 139019 facing northwest.

LA 159817

Site Number:	LA159817
Field Site Number:	25
Site Type:	Historic (Border Monument)
Cultural Affiliation:	Historic, American
Date Range:	1891-1896
USGS Topographic Quadrangle:	Camel Mountain 7.5’
Elevation:	4,071 ft (1,241 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	Border Monument "13R"
Site Condition:	Poor
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: Previously recorded by OAC/UNM, LA 159817 consists of United States-Mexico International Border Monument 13 R. The monument was set in place between 1891 and 1896 (Kurota and Turnbow 2008). A vehicle barrier sits approximately 1 meter north of the monument.

Artifacts: The monument is a cast-iron obelisk bolted onto a concrete foundation (Figure 81). The obelisk measures 6.5 ft (1.98 m) tall and 1 ft by 1 ft (0.3 m) at the base. The concrete foundation measures 3 ft by 3 ft (0.92 m by 0.92 m) and is approximately 1 ft (0.3 m) thick. On the northern face of the monument rests a metal plaque that reads "Boundary of the United States, Treaty of 1848 Re-established by treaties of 1882-1889." The monument is painted with silver paint. On the western face of the monument are a metal number "13" and a metal letter "R." The monument remains in excellent condition and will not be impacted by the current project. No additional artifacts were identified in association with Border Monument 13 R.

Discussion and Recommendation: The monument remains in excellent condition. The proposed undertaking should not impact LA 159817. The monument is eligible for inclusion in the NRHP under Criterion A. It is recommended that the site be avoided. The proposed undertaking is unlikely to impact the site. However, if the site and the immediate surrounding area cannot be avoided, monitoring of any ground disturbance activity is recommended.

Figure 81. Overview of International Border Monument 13R facing south-southeast.

LA 159818

Site Number:	LA159818
Field Site Number:	26
Site Type:	Historic (Border Monument)
Cultural Affiliation:	Historic, American
Date Range:	1891-1896
USGS Topographic Quadrangle:	Guzmans Lookout Mountain 7.5’
Elevation:	4,074 ft (1,242 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	Border Monument "12"
Site Condition:	Poor
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: Previously recorded by OAC/UNM, LA 159818 consists of United States-Mexico International Border Monument 12 (Kurota and Turnbow 2008). The monument was set in place between 1891 and 1896. A vehicle barrier is located approximately 1 meter north of the monument.

Artifacts: The monument is a cast-iron obelisk bolted onto a concrete foundation (Figure 82). The obelisk measures 6.5 ft (1.98 m) tall and 1 ft by 1 ft (0.3 m) at the base. The concrete foundation

measures 3 ft by 3 ft (0.92 m by 0.92 m) and is approximately 1 ft (0.3 m) thick. On the northern face of the monument rests a metal plaque that reads "Boundary of the United States, Treaty of 1848 Re-established by treaties of 1882-1889." The monument is painted with silver paint. On the eastern face of the monument is a metal number "12." The monument remains in excellent condition and will not be impacted by the current project. No additional artifacts were identified in association with Border Monument 12.

Discussion and Recommendation: The monument remains in excellent condition. The current project should not impact LA 159818. It is recommended that the site be avoided. The proposed undertaking is unlikely to impact the site. However, if the site and the immediate surrounding area cannot be avoided, monitoring of any ground disturbance activity is recommended.

Figure 82. Overview of International Border Monument 12 facing south-southwest.

LA 159819

Site Number:	LA159819
Field Site Number:	27
Site Type:	Historic (Border Monument)
Cultural Affiliation:	Historic, American
Date Range:	1891-1896
USGS Topographic Quadrangle:	Guzmans Lookout Mountain 7.5’
Elevation:	4,106 ft (1,251 m) above sea level
Vegetation:	Mesquite, creosote, rabbit bush, miscellaneous grasses and annuals
Ground Surface Visibility:	Excellent
Features:	Border Monument "11"
Site Condition:	Poor
NRHP Eligibility:	Eligible
Management Recommendation:	Monitor

Description: Previously recorded by OAC/UNM, LA 159819 consists of United States-Mexico International Border Monument 11 (Kurota and Turnbow 2008). The monument was set in place in 1855 and repaired between 1891 and 1896. A vehicle barrier is located approximately 1 meter north of the monument.

Artifacts: The monument is a large obelisk constructed out of locally sourced stone and mortar (Figure 83). The exterior of the obelisk is plastered with sandy cement, and covered in white wash. The foundation consists of a 6 ft by 1 ft concrete block measuring 1 ft in height. The obelisk itself measures 4.5 ft by 4.5 ft at its base, which rest directly atop the concrete foundation. The obelisk stands approximately 12 ft tall. On the northern face of the monument rests a metal plaque that reads "Repaired by the Border Commission created by Treaties of 1882-1889." On the eastern face of the monument is a metal number "11." The monument is one of the original monuments that was placed in 1855 and repaired between 1891–1896. This monument remains in excellent condition. The current undertaking will not be impact the monument.

Discussion and Recommendation: The monument remains in excellent condition. The current project should not impact LA 159819. The monument is eligible for inclusion in the NRHP under Criterion A. It is recommended that the site be avoided. The proposed undertaking is unlikely to impact the site. However, if the site and the immediate surrounding area cannot be avoided, monitoring of any ground disturbance activity is recommended.

Figure 83. Overview of International Border Monument 11 facing south-southwest.

ISOLATED OCCURRENCES

Finally, 14 IOs were recorded (Table 10). IOs include prehistoric and historical resources. These include individual artifacts and GLO section markers. None of the IOs meet site criteria. They are not considered significant and no additional investigation is recommended.

Table 10. Isolated Occurrences.

No.	Type	Description	Age
1	Lithic	1 brown rhyolite tertiary flake	Prehistoric, indeterminate
2	GLO Section marker	Sections 13, 18; T29S, R4W-R3W	1936
3	GLO Section marker	Sections 16, 14; T29S, R4W	1936
4	GLO Section marker	Sections 15, 16/ Mexico T29S, R2W/ Mexico (marks international border)	1936
5	GLO Section marker	Sections 16, 15; T29S, R4W	1936
6	GLO Section marker	Sections 18, 17; T29S, R4W	1936
7	Lithic	1 grey chert core chopper	Prehistoric, indeterminate
8	GLO Section marker	Sections 15, 14; T29S, R5W	1936
9	GLO Section marker	Sections 16,15; T29S, R5W	1936
10	Ground stone	1 black basalt mano (bifacially flattened/ground)	Prehistoric, indeterminate
11	GLO Section marker	Sections 13, 18; T29S, R6W-R5W	1936
12	Ceramic	1 El Paso Brown Ware sherd	Prehistoric; Formative (AD 200–1450)
13	Lithic	1 tan chert tertiary flake	Prehistoric, indeterminate
14	Lithic	1 tan chert tertiary flake	Prehistoric, indeterminate

EVALUATION OF PROPERTIES

A total of 46 cultural properties were investigated during the current project. During the survey Northland recorded 15 new archaeological sites and revisited 27 previously recorded sites. The 15 newly recorded sites are historic monuments that mark the international border between the United States and Mexico. As noted in the site descriptions, all 15 newly recorded sites are associated with the Treaty of 1848 which was "Re-established by treaties of 1882-1889." These sites are recommended eligible for NRHP inclusion under Criterion A—associated with events that have made a significant contribution to the broad patterns of our history.

Twenty-seven previously recorded sites that were in, or near, the Roosevelt Reservation were also revisited. In general, the Roosevelt Reservation has been extensively disturbed in the past and these sites have been impacted. Northland recommends avoidance or monitoring at 22 of the 27 previously recorded sites. During the pedestrian survey Northland found artifacts and or cultural features associated with 18 of the 27 sites that had been previously recorded.

No artifacts were identified at seven (LA 35222, LA 85764, LA 85771, LA 85772, LA 319014, LA 139017, LA 319018) of the 22 sites recommended for avoidance. While no artifacts or cultural features were identified during the current survey, these sites have been covered by recent dune accumulation. Based on the previous documentation and likelihood for buried deposits these sites are recommended for avoidance or monitoring of any ground disturbance activities.

Previous investigations have recommended that two of the sites (LA 85756, LA 85758) along the Roosevelt Reservation should not be considered NRHP eligible. Northland concurs with these previous recommendations. Additionally, three sites (LA 85755, LA 85757, and LA 85760) have, through previous and current investigations, been exhausted of any research potential. Cultural material was identified in association with these three sites. The artifacts identified at these sites during the current survey match the findings of their previous documentation. Based on the previous data recovery efforts, the artifacts identified at LA 85755, LA 85757, and LA 85760 do not suggest any additional research potential beyond their previous investigations. Therefore, these three sites have been exhausted of any further research potential and no further work is warranted.

SUMMARY AND RECOMMENDATIONS

Northland completed survey of 46 miles of border road located within the Roosevelt Reservation. The road has been improved and well-maintained. During the current survey a total of 42 archaeological sites were investigated. These sites include 15 newly recorded sites (Table 11). The 15 new sites consist of historic monuments that mark the international border between the United States and Mexico. These sites are recommended eligible for NRHP inclusion under Criterion A—potential for addressing research issues pertaining to historical events from the Treaty of 1948. Avoidance of these sites is recommended. In the event avoidance is not possible the sites and the immediate surrounding area should be monitored. Fourteen IOs were also recorded. These are not considered significant and no additional investigation of the IOs is recommended.

Table 11. Summary of Newly Recorded Sites.

Site	Type and Age	Elev. (m)	NRHP Eligibility Recommendation	Management Recommendation
194680	Border Monument 30	1,252	Eligible	Avoidance/Monitor
194681	Border Monument 29	1,272	Eligible	Avoidance/Monitor
194682	Border Monument 28	1,306	Eligible	Avoidance/Monitor
194683	Border Monument 27*	1,294	Eligible	Avoidance/Monitor
194684	Border Monument 26	1,315	Eligible	Avoidance/Monitor
194685	Border Monument 25	1,297	Eligible	Avoidance/Monitor
194686	Border Monument 24	1,259	Eligible	Avoidance/Monitor
194687	Border Monument 20*	1,211	Eligible	Avoidance/ Monitor
194688	Border Monument 19	1,208	Eligible	Avoidance/Monitor
194689	Border Monument 18	1,205	Eligible	Avoidance/Monitor
194690	Border Monument 17	1,203	Eligible	Avoidance/Monitor
194691	Border Monument 15	1,280	Eligible	Avoidance/Monitor
194692	Border Monument 14	1,319	Eligible	Avoidance/Monitor
194693	Border Monument 10	1,259	Eligible	Avoidance/Monitor
194694	Border Monument 9	1,288	Eligible	Avoidance/Monitor

* Not photographed.

Northland also revisited 27 previously recorded sites during the current fieldwork (Table 12). These sites are located along the United States-Mexico International Border. All 27 sites are adjacent to, or include portions of, the Roosevelt Reservation.

Table 12. Summary of Previously Recorded Sites Within the APE.

LA Site Number	Age and Type	NHRP Eligibility	Management Recommendations
35222	Prehistoric habitation site	Not evaluated	Avoidance/Monitor
35272	Prehistoric limited activity	Not evaluated	Avoidance/Monitor
85076	Prehistoric Mogollon and Historic artifact scatter	Eligible	Avoidance/Monitor
85078	Mogollon and Historic artifact scatter	Not evaluated	Avoidance/Monitor
85079	Prehistoric and Historic artifact scatter	Not evaluated	Avoidance/Monitor
85755	Mogollon limited activity	Not evaluated	No further work
85756	Mogollon limited activity	Not eligible	No further work
85757	Archaic to Mogollon limited activity and Historic artifact scatter	Not evaluated	No further work
85758	Mogollon limited habitation	Not eligible	No further work
85759	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
85760	Mogollon habitation site	Eligible	No further work
85761	Prehistoric and historic artifact scatter	Not evaluated	Avoidance/Monitor
85764	Prehistoric limited activity	Not evaluated	Avoidance/Monitor
85765	Mogollon artifact scatter	Eligible	Avoidance/Monitor
85769	Late Archaic artifact scatter	Eligible	Avoidance/Monitor
85770	Prehistoric artifact scatter	Eligible	Avoidance/Monitor
85771	Prehistoric artifact scatter	Eligible	Avoidance/Monitor
85772	Late Archaic to Mogollon artifact scatter	Eligible	Avoidance/Monitor
139014	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
139015	Prehistoric and Historic limited activity	Not evaluated	Avoidance/Monitor
139016	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
139017	Prehistoric artifact scatter	Not evaluated	Avoidance/Monitor
139018	Archaic to Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
139019	Mogollon artifact scatter	Not evaluated	Avoidance/Monitor
159817	Historic monument	Eligible	Avoidance/Monitor
159818	Historic monument	Eligible	Avoidance/Monitor
159819	Historic monument	Eligible	Avoidance/Monitor

Nearly all of the Roosevelt Reservation has been previously disturbed by relatively recent improvements to the border fence and the associated border access road. Archaeological survey, as well as the archaeological test investigations of selected sites, was conducted prior to those improvements (Kurota and Turnbow 2008, 2009; Rieder 1999a, 1999b; Sechrist 1994; Trierweiler and Bonine 2003; Trierweiler and Smith 2004). During the current project, artifacts and/or cultural features were found in association with 18 of the 27 previously recorded sites in the current APE.

Northland recommends avoidance at 22 of the 27 previously recorded sites. If avoidance is not possible monitoring is recommended within the sites and the immediate surrounding areas. Northland recommends no further action at the remaining five sites.

If previously unidentified cultural resources are encountered during the fence replacement project, the contractor should stop all ground disturbing activities in the vicinity of the discovery until officials from CBP are notified and the nature and significance of the find can be evaluated. If human remains are encountered during construction activity, construction should stop and appropriated notifications made as per the Native American Graves Protection and Repatriation Act (NAGPRA).

APPENDIX A.

PREVIOUSLY RECORDED SITES AND PREVIOUS SURVEYS NEAR APE

Table A1. Previous Archaeological Investigations in Proximity to the Current APE.

NMCRIS Activity No.	Description	Results	References
115	Survey	LA35222, LA35272, LA35140, LA35141, LA35142, LA35216, LA35217, LA35218, LA35219, LA35220, LA35221, LA35223, LA35224, LA35226, LA35228	Hilley 1981
9895	Survey	Nothing in current APE	Leftwich and Proper 1983
10090	Survey	Nothing in current APE	Leftwich et al. 1982
11248	Survey	Nothing in current APE	Kirkpatrick 1979
11324	Survey	Nothing in current APE	Todd 1978
16494	Survey	Revisited LA56836	Mallouf 1986
35220	Survey	LA82890	Mallouf 1990
37147	Survey	LA86788	Stuart 1991
37999	Survey	Revisited LA85076, LA85077, LA85078, LA85079	Laumbach 1991
38616	Survey	Nothing in current APE	Duran 1985
39628	Survey	Revisited LA86788	Browning 1992
40005	Survey	Nothing in current APE	Kneebone 1992
40885	Survey	Revisited LA85768	Human Systems Research, Inc. 1992
49300	Survey	LA54879	Boyer et al.1994
49612	Survey	Nothing in current APE	Michalik 1995b
50486	Survey	LA85076, LA85077, LA85078, LA85079, LA85746, LA85747, LA85748, LA85749, LA85750, LA85751, LA85752, LA85755, LA85756, LA85757, LA85758, LA85759, LA85760, LA85761, LA85764, LA85765, LA85766, LA85768, LA85769, LA85770, LA85771, LA85772, LA85773, LA85774, LA85775, LA85776, LA85777, LA85778, LA85779, LA85780, LA85781, LA85782, LA85783, LA85789, LA85797, LA100706, LA100707; Revisited LA82890, LA86788	Sechrist 1994
51054	Survey	Nothing in current APE	Michalik 1995a
54807	Monitoring	Revisited LA85076, LA85077, LA85078, LA85079, LA85768, LA100707	Mendez et al. 1994
54813	Testing	Revisited LA85076, LA85077, LA85078, LA85079	Kirkpatrick et al. 1994
63403	Survey	Revisited LA85076, LA85077, LA85765, LA85769, LA85770, LA85771, LA85772, LA85773, LA35226, LA85768, LA85774, LA85775, LA85776, LA85777, LA85778, LA85779, LA85780, LA85781, LA85782, LA85783, LA85797, LA100707, LA125753	Rieder 1999a
64687	Mitigation	Revisited LA35226, LA85076, LA85077, LA85765, LA85768, LA85769, LA85770, LA85771, LA85772, LA85773, LA85774	Rieder 1999b
67167	Survey	Revisited LA54879	Lone Mountain's Staff 2002
70902	Testing	Revisited LA85752	Escondida Research Group 2000

Table A1. Previous Archaeological Investigations in Proximity to the Current APE.

NMCRIS Activity No.	Description	Results	References
73568	Mitigation	Revisited LA85752	Ogden Environmental and Energy Services 2000
73569	Testing	Revisited LA85752	Dello-Russo 2000a
75465	Survey	LA133193; Revisited LA85750, LA85751, LA85768, LA85780	Trierweiler 2001
76823	Data recovery	Revisited LA85752	Dello-Russo 2000b
78833	Monitoring	Revisited LA85770, LA85772, LA85774	Aztlan Archaeology Inc. 1999
79957	Data recovery	Revisited LA54879	Heartfield et al. 2010
82917	Survey	LA139014, LA139015, LA139016, LA139017, LA139018, LA139019, LA139004, LA139005, LA139007, LA139008, LA139009, LA139010, LA139011, LA139012, LA139013; Revisited LA85746, LA85747, LA85748, LA85749, LA85750, LA85751, LA85755, LA85756, LA85757, LA85758, LA85759, LA85768, LA86788, LA133193	Trierweiler and Bonine 2003
89050	Testing	Revisited LA85755, LA85756, LA85757, LA85759, LA86788, LA133193, LA139019	Trierweiler 2004
90385	Testing	Revisited LA85755, LA85756, LA85757, LA85759, LA86788, LA133193, LA139019	Trierweiler and Smith 2004
102597	Survey	LA154852, LA154850; Revisited LA85076, LA85077, LA85078, LA85764, LA85765, LA85769, LA85770, LA85771, LA85772, LA85773, LA35226, LA85766, LA85768, LA85774, LA85775, LA85776, LA85777, LA85778, LA85779, LA85780, LA85781, LA85782, LA85783, LA85797, LA100706, LA100707, LA125753	Gibbs et al. 2007
106267	Survey	Revisited LA85766, LA100706	Zamora 2007
108893	Survey	LA159474	Swain and Trierweiler 2008
110649	Survey	LA159817, LA159818, LA159819, LA159821, LA159822, LA159824; Revisited LA85079, LA85748, LA85760, LA85761, LA139004	Kurota and Turnbow 2008
111514	Data recovery	Revisited LA85776, LA85777, LA85779	Kurota 2008
111924	Survey	LA161089	UNM Office of Contract Archaeology 2008
112659	Data recovery	Revisited LA85760	Kurota and Turnbow 2009
112879	Survey	Revisited LA100707	Kurota and Cohen 2010
113215	Survey	LA162364, LA162365, LA162366, LA162367	McCormack and Allison 2009
115125	Data recovery	Revisited LA125753	Kurota 2010

Table A1. Previous Archaeological Investigations in Proximity to the Current APE.

NMCRIS Activity No.	Description	Results	References
116621	Data recovery	Revisited LA85774	Geo-Marine, Inc. 2010
118135	Survey	Nothing in current APE	Cordua 2010
120800	Monitoring	Revisited LA125753	Kurota 2012
122668	Survey	Revisited LA85797	Sechrist and Graham 2012
131883	Survey	Revisited LA35222, LA35272	New Mexico ARMS 2014
138372	Survey	Nothing in current APE	Herrera 2017
139432	Survey	Revisited LA85746, LA85747, LA85748, LA85749, LA85750, LA85751, LA85774, LA86788, LA133193, LA139004, LA139005, LA139007, LA139008, LA139009, LA139010, LA139011, LA139012, LA139013, LA159821, LA159822	Marshall 2018
140973	Survey	Nothing in current APE	Yates 2018
141797	Monitoring	Revisited LA85789	Cox 2019

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
35222	Prehistoric roomblock, lithic debitage, ceramics, 2 hearths	Prehistoric habitation site	4072	Not evaluated	Hilley 1981, New Mexico ARMS 2014	115, 131883
35272	Prehistoric lithic debitage, ground stone tools, hearth	Prehistoric limited activity	4140	Not evaluated	Hilley 1981, New Mexico ARMS 2014	115, 131883
85076	Prehistoric lithic debitage, stone tools, ground stone tools, ceramics, FCR and Historic metal, glass	Prehistoric Mogollon and Historic artifact scatter	4000	Eligible	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007	37999, 50486, 54807, 54813, 63403, 64687, 102597
85077	Prehistoric lithic debitage, stone tools, ground stone tools, FCR	Prehistoric artifact scatter	3960	Eligible	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007	37999, 50486, 54807, 54813, 63403, 64687, 102597
85078	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics, FCR and Historic metal, glass	Mogollon and Historic artifact scatter	4160	Eligible by recorder	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Gibbs et al. 2007	37999, 50486, 54807, 54813, 102597
85079	Prehistoric lithic debitage, stone tools, ground stone tools	Prehistoric and Historic artifact scatter	4020	Not evaluated	Laumbach 1991, Sechrist 1994, Mendez et al. 1994, Kirkpatrick et al. 1994, Kurota and Turnbow 2008	37999, 50486, 54807, 54813, 110649
85755	Prehistoric lithic debitage, stone tools, ground stone tools, ceramics, FCR and Historic metal	Mogollon limited activity	4080	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004	50486, 82917, 89050, 90385
85756	Prehistoric lithic debitage, stone tools, ground stone tools, ceramics, FCR, hearth	Mogollon limited activity	4110	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004	50486, 82917, 89050, 90385
85757	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics, FCR, hearth and Historic metal	Archaic to Mogollon limited activity and Historic artifact scatter	4075	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004	50486, 82917, 89050, 90385

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
85758	Prehistoric Jacal structure, lithic debitage, stone tools, ground stone tools, ceramics	Mogollon limited habitation	4070	Not eligible	Sechrist 1994, Trierweiler and Bonine 2003	50486, 82917
85759	Prehistoric lithic debitage, stone tools, ground stone tools, ceramics, FCR	Mogollon artifact scatter	4060	Not evaluated	Sechrist 1994, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004	50486, 82917, 89050, 90385
85760	Prehistoric rock alignment, lithic debitage, stone tools, ground stone tools, ceramics, FCR, 2 roasting pits	Mogollon habitation site	4080	Eligible	Sechrist 1994, Kurota and Turnbow 2008, Kurota and Turnbow 2009	50486, 110649, 112659
85761	Prehistoric lithic debitage, stone tools, ceramics, FCR and Historic faunal bone	Prehistoric and historic artifact scatter	4000	Not eligible	Sechrist 1994, Kurota and Turnbow 2008	50486, 110649
85764	Prehistoric lithic debitage, stone tools, ground stone tools, ceramics, hearth	Prehistoric limited activity	4115	Eligible by recorder	Sechrist 1994, Gibbs et al. 2007	50486, 102597
85765	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics, ornaments, FCR	Mogollon artifact scatter	3960	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007	50486, 63403, 64687, 102597
85769	Prehistoric lithic debitage, stone tools, projectile points, FCR	Late Archaic artifact scatter	3970	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007	50486, 63403, 64687, 102597
85770	Prehistoric lithic debitage, stone tools, ground stone tools	Prehistoric artifact scatter	3970	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Aztlan Archaeology Inc. 1999, Gibbs et al. 2007	50486, 63403, 64687, 78833, 102597
85771	Prehistoric lithic debitage, ground stone tools, FCR	Prehistoric artifact scatter	3950	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007	50486, 63403, 64687, 102597
85772	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics, FCR	Late Archaic to Mogollon artifact scatter	3980	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Aztlan Archaeology Inc. 1999, Gibbs et al. 2007	50486, 63403, 64687, 78833, 102597

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
85773	Prehistoric lithic debitage, projectile points, ground stone tools	Late archaic artifact scatter	3985	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007	50486, 63403, 64687, 102597
139014	Prehistoric ceramics, FCR	Mogollon artifact scatter	4089	Not evaluated	Trierweiler and Bonine 2003	82917
139015	Prehistoric lithic debitage, FCRHistoric metal	Prehistoric and Historic limited activity	4090	Not evaluated	Trierweiler and Bonine 2003	82917
139016	Prehistoric lithic debitage, ceramics, FCR	Mogollon artifact scatter	4120	Not evaluated	Trierweiler and Bonine 2003	82917
139017	Prehistoric lithic debitage, FCR	Prehistoric artifact scatter	4108	Not evaluated	Trierweiler and Bonine 2003	82917
139018	Prehistoric lithic debitage, stone tools, projectile points, ceramics, FCR	Archaic to Mogollon artifact scatter	4110	Not evaluated	Trierweiler and Bonine 2003	82917
139019	Prehistoric lithic debitage, ground stone tools, ceramics, FCR	Mogollon artifact scatter	4100	Not evaluated	Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004	82917, 89050, 90385
154852	Prehistoric ceramics, hearth	Mogollon artifact scatter	4050	Eligible by recorder	Gibbs et al. 2007	102597
159817	U.S. Mexico boundary monument	Historic monument	4071	Eligible	Kurota and Turnbow 2008	110649
159818	Historic international boundary monument	Historic monument	4074	Eligible	Kurota and Turnbow 2008	110649
159819	Historic border monument, metal, glass, ceramics	Historic monument	4106	Eligible	Kurota and Turnbow 2008	110649
159824	Prehistoric lithic debitage, stone tools, grounds tone tools, ceramics	Mogollon artifact scatter	4080	Not evaluated	Kurota and Turnbow 2008	110649
1049	Prehistoric ceramics	Mogollon	4060	Not evaluated	No info	No info
35140	Prehistoric lithic debitage, ceramics, hearth	Prehistoric	4140	Not evaluated	Hilley 1981	115

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
35141	Prehistoric lithic debitage, ceramics, hearth	Prehistoric	4135	Not evaluated	Hilley 1981	115
35142	Prehistoric lithic debitage, ceramics	Prehistoric	4130	Not evaluated	Hilley 1981	115
35216	Prehistoric ceramics, hearth	Mogollon	4070	Not evaluated	Hilley 1981	115
35217	Prehistoric lithic debitage, ceramics, hearth	Mogollon	4135	Not evaluated	Hilley 1981	115
35218	Prehistoric lithic debitage, ground stone tools, ceramics, 8 hearths	Mogollon	4075	Not evaluated	Hilley 1981	115
35219	Prehistoric lithic debitage, ceramics, hearth	Mogollon	4095	Not evaluated	Hilley 1981	115
35220	Prehistoric lithic debitage, ground stone tools, ceramics	Mogollon	4100	Not evaluated	Hilley 1981	115
35221	Prehistoric lithic debitage, ceramics	Mogollon	4065	Not evaluated	Hilley 1981	115
35223	Prehistoric lithic debitage, 3 hearths	Prehistoric	4155	Not evaluated	Hilley 1981	115
35224	Prehistoric lithic debitage, 8 hearths	Mogollon	4125	Not evaluated	Hilley 1981	115
35226	Prehistoric lithic debitage, stone tools, projectile points ground stone tools, ceramics, hearth	Archaic to Mogollon artifact scatter	3970	Eligible by recorder	Hilley 1981, Rieder 1999a, Rieder 1999b, Gibbs et al. 2007	115, 63403, 64687, 102597
35228	Prehistoric lithic debitage, hearth	Prehistoric	3972	Not evaluated	Hilley 1981	115
54879	Historic metal, glass, debris	Historic railroad monument	4113	Eligible	Boyer et al.1994, Lone Mountain's Staff 2002, Heartfield et al. 2010	49300, 67167, 79957
56836	Historic foundation, trash	Historic habitation site	4037	Not evaluated	Mallouf 1986	16494
82890	Historic foundation, corral, windmill, water tank, metal, glass	Historic ranch	4010	Eligible	Mallouf 1990, Sechrist 1994	35220, 50486

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
85746	Prehistoric lithic debitage, ground stone tools, ceramics	Mogollon artifact scatter	4090	Not evaluated	Sechrist 1994, Trierweiler 2001, Marshall 2018	50486, 82917, 139432
85747	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics	Late Archaic to Mogollon artifact scatter	4090	Not evaluated	Sechrist 1994, Trierweiler 2001, Marshall 2018	50486, 82917, 139432
85748	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics, roasting pit	Middle Archaic to Mogollon limited activity	4099	Eligible	Sechrist 1994, Trierweiler 2001, Kurota and Turnbow 2008, Marshall 2018	50486, 82917, 110649, 139432
85749	Prehistoric lithic debitage, stone tools, ground stone tools, ceramics, hearth	Mogollon limited activity	4110	Not evaluated	Sechrist 1994, Trierweiler 2001, Marshall 2018	50486, 82917, 139432
85750	Prehistoric lithic debitage, stone tools, ground stone tools, ceramics, 4 hearths and Historic metal	Mogollon limited activity and Historic artifact scatter	4116	Not evaluated	Sechrist 1994, Trierweiler 2001, Trierweiler and Bonine 2003, Marshall 2018	50486, 75465, 82917, 139432
85751	Prehistoric lithic debitage, stone tools, ground stone tools	Prehistoric artifact scatter	4120	Not evaluated	Sechrist 1994, Trierweiler 2001, Trierweiler and Bonine 2003, Marshall 2018	50486, 75465, 82917, 139432
85752	Prehistoric lithic debitage, ceramics, FCR	Mogollon artifact scatter	4120	Not evaluated	Sechrist 1994, Escondida Research Group 2000, Ogden Environmental and Energy Services 2000, Dello-Russo 2000a, Dello-Russo 2000b	50486, 70902, 73568, 73569, 76823
85766	Historic cans, structure	Historic mine	4580	Eligible	Sechrist 1994, Gibbs et al. 2007, Zamora 2007	50486, 102597, 106267
85768	Historic monument, metal, glass	Historic international boundary monument	3735	Eligible	Human Systems Research 1992, Sechrist 1994, Mendez et al. 1994, Rieder 1999a, Rieder 1999b, Trierweiler 2001, Trierweiler and Bonine 2003, Gibbs et al. 2007	40885, 50486, 54807, 63403, 64687, 75465, 82917, 102597

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
85774	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics and Historic metal, glass, ceramics	Prehistoric limited activity and Historic ranch	3990	Eligible	Sechrist 1994, Rieder 1999a, Rieder 1999b, Aztlan Archaeology, Inc. 1999, Gibbs et al. 2007, Geo-Marine, Inc. 2010, Marshall 2018	50486, 63403, 64687, 78833, 102597, 116621, 139432
85775	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools	Late Archaic artifact scatter	4510	Not evaluated	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007	50486, 63403, 102597
85776	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics, FCR, hearth	Archaic to Mogollon limited activity	4520	Eligible by recorder	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007, Kurota 2008	50486, 63403, 102597, 111514
85777	Prehistoric lithic debitage, stone tools, projectile points	Prehistoric artifact scatter	4540	Eligible by recorder	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007, Kurota 2008	50486, 63403, 102597, 111514
85778	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools	Late Archaic artifact scatter and Historic mine	4550	Not eligible by recorder	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007	50486, 63403, 102597
85779	Prehistoric lithic debitage, stone tools, projectile points, hearth	Prehistoric limited activity	4560	Not evaluated	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007, Kurota 2008	50486, 63403, 102597, 111514
85780	Prehistoric lithic debitage, stone tools	Prehistoric artifact scatter	4570	Not evaluated	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007, Trierweiler 2001	50486, 63403, 102597, 75465
85781	Prehistoric lithic debitage, stone tools	Prehistoric artifact scatter	4570	Not evaluated	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007	50486, 63403, 102597
85782	Historic metal, glass	Historic artifact scatter	4410	Not eligible by recorder	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007	50486, 63403, 102597
85783	Prehistoric lithic debitage	Prehistoric artifact scatter	4410	Not evaluated	Sechrist, 1994, Rieder 1999a, Gibbs et al. 2007	50486, 63403, 102597
85789	Historic metal, glass, structural foundations	Historic military camp	4770	Not evaluated	Sechrist 1994, Cox 2019	50486, 141797
85797	Prehistoric lithic debitage, stone tools, FCR	Prehistoric artifact scatter	4400	Not eligible	Sechrist 1994, Rieder 1999a, Gibbs et al. 2007, Sechrist and Graham 2012	50486, 63403, 102597, 122668

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
86788	Prehistoric lithic debitage, stone tools, projectile points, ground stone tools, ceramics, FCR, 2 hearths, 1 midden	Mogollon limited activity	4096	Not evaluated	Stuart 1991, Browning 1992, Sechrist 1994, Trierweiler 2001, Trierweiler 2004, Trierweiler and Smith 2004, Marshall 2018	37147, 39628, 50486, 82917, 89050, 90385, 139432
100706	Historic glass, structure	Historic camp	4575	Not evaluated	Sechrist 1994, Gibbs et al. 2007, Zamora 2007	50486, 102597, 106267
100707	Historic metal, glass, ceramics	Historic artifact scatter	4900	Not evaluated	Sechrist 1994, Mendez et al. 1994, Rieder 1999a, Gibbs et al. 2007, Kurota and Cohen 2010	50486, 54807, 63403, 102597, 112879
125753	Prehistoric lithic debitage, ground stone tools, 5 roasting pits, grinding slick and Historic metal, glass, ceramics	Mogollon and Historic limited activity	4350	Eligible	Rieder 1999a, Gibbs et al. 2007, Kurota 2010, Kurota 2012	63403, 102597, 115125, 120800
133193	Prehistoric lithic debitage, ground stone tools and Historic metal, glass	Prehistoric isolated occurrence and Historic artifact scatter	4115	Not evaluated	Trierweiler 2001, Trierweiler and Bonine 2003, Trierweiler 2004, Trierweiler and Smith 2004, Marshall 2018	75465, 82917, 89050, 90385, 139432
139004	Prehistoric lithic debitage, stone tools, ceramics	Mogollon artifact scatter	4080	Not evaluated	Trierweiler 2001, Kurota and Turnbow 2008, Marshall 2018	82917, 110649, 139432
139005	Prehistoric lithic debitage, ground stone tools, ceramics, FCR, burned adobe, hearth	Mogollon limited activity	4095	Not evaluated	Trierweiler 2001, Marshall 2018	82917, 139432
139007	Prehistoric ceramics, FCR	Mogollon artifact scatter	4076	Not evaluated	Trierweiler 2001, Marshall 2018	82917, 139432
139008	Prehistoric/Historic lithic debitage, FCR	Prehistoric/Historic artifact scatter	4100	Not evaluated	Trierweiler 2001, Marshall 2018	82917, 139432
139009	Prehistoric lithic debitage, ground stone tools, ceramics	Mogollon artifact scatter	4114	Not evaluated	Trierweiler 2001, Marshall 2018	82917, 139432
139010	Prehistoric/Historic FCR	Prehistoric/Historic artifact scatter	4117	Not evaluated	Trierweiler 2001, Marshall 2018	82917, 139432
139011	Prehistoric lithic debitage, FCR	Prehistoric artifact scatter	4117	Not evaluated	Trierweiler 2001, Marshall 2018	82917, 139432

Table A2. Complete List of Previously Recorded Sites Within One-Half Mile of APE.						
LA Site Number	Description	Age and Type	Elev. (msl)	NHRP Eligibility	Reference	Activity Numbers
139012	Prehistoric lithic debitage, FCR	Prehistoric artifact scatter	4117	Not evaluated	Trierweiler 2001, Marshall 2018	82917, 139432
139013	Prehistoric/Historic FCR	Prehistoric/Historic artifact scatter	4119	Not eligible	Trierweiler 2001, Marshall 2018	82917, 139432
154850	Historic metal, glass, ceramics	Historic mine	4750	Eligible by recorder	Gibbs et al. 2007	102597
159474	No information	-	-	Not evaluated	Swain and Trierweiler 2008	108893
159821	Historic metal, glass, ceramics	Historic artifact scatter	4030	Not eligible	Kurota and Turnbow 2008, Marshall 2018	110649, 139432
159822	Historic metal, glass, ceramics	Historic artifact scatter	4030	Not eligible	Kurota and Turnbow 2008, Marshall 2018	110649, 139432
161089	No info	Historic	No info	Not evaluated	UNM Office of Contract Archaeology 2008	111924
162364	Historic foundation, metal, glass, ceramics, architectural stone, corral, windmill	Historic ranch	4153	Eligible	McCormack and Allison 2009	113215
162365	Historic metal, glass, ceramics	Historic artifact scatter	4167	Not evaluated	McCormack and Allison 2009	113215
162366	Historic metal, glass, ceramics	Historic artifact scatter	4152	Not eligible	McCormack and Allison 2009	113215
162367	Historic metal, glass, ceramics	Historic artifact scatter	4126	Not eligible	McCormack and Allison 2009	113215

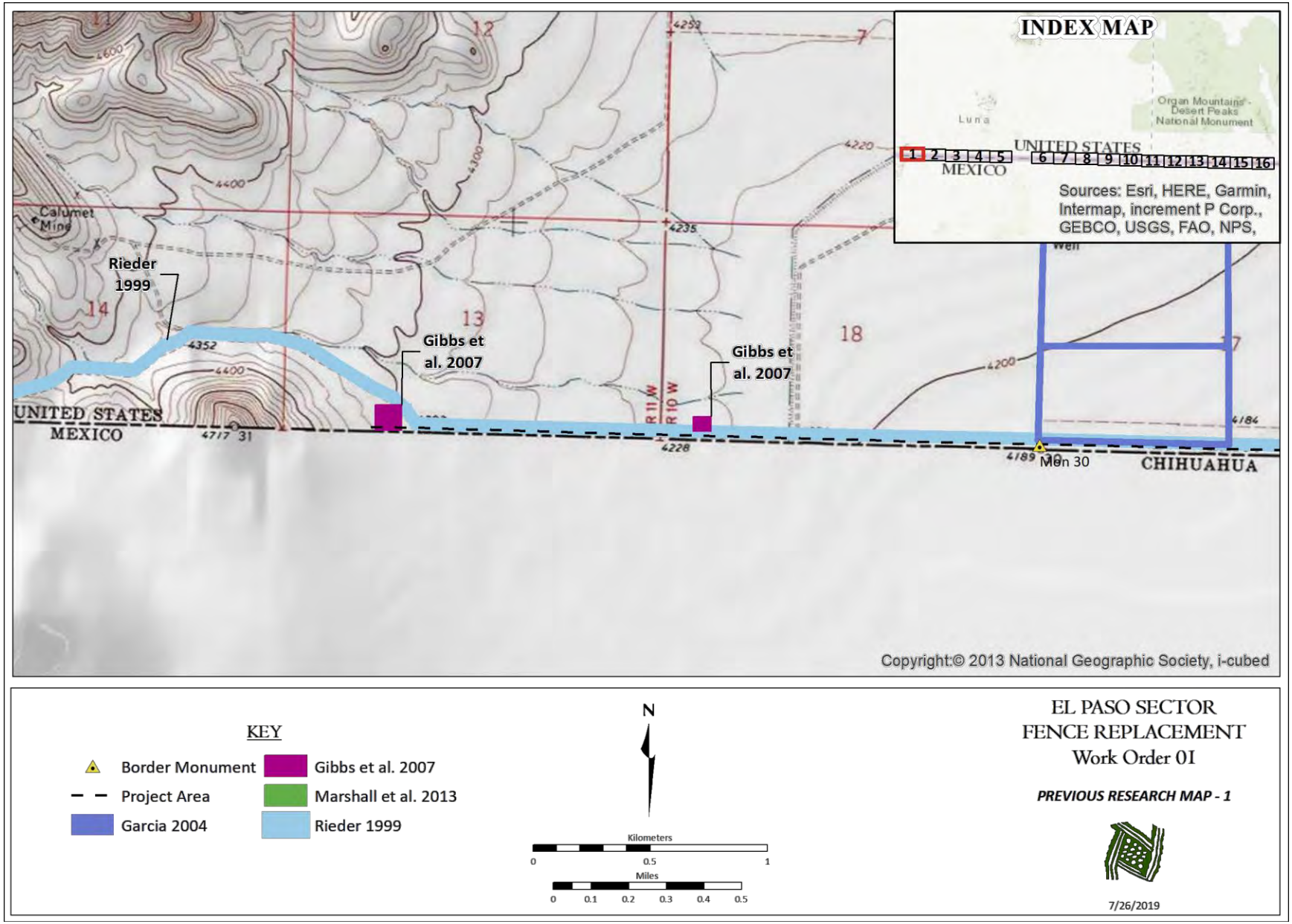

Figure A1. Previous sites and projects near the APE, Map 1 of 16.

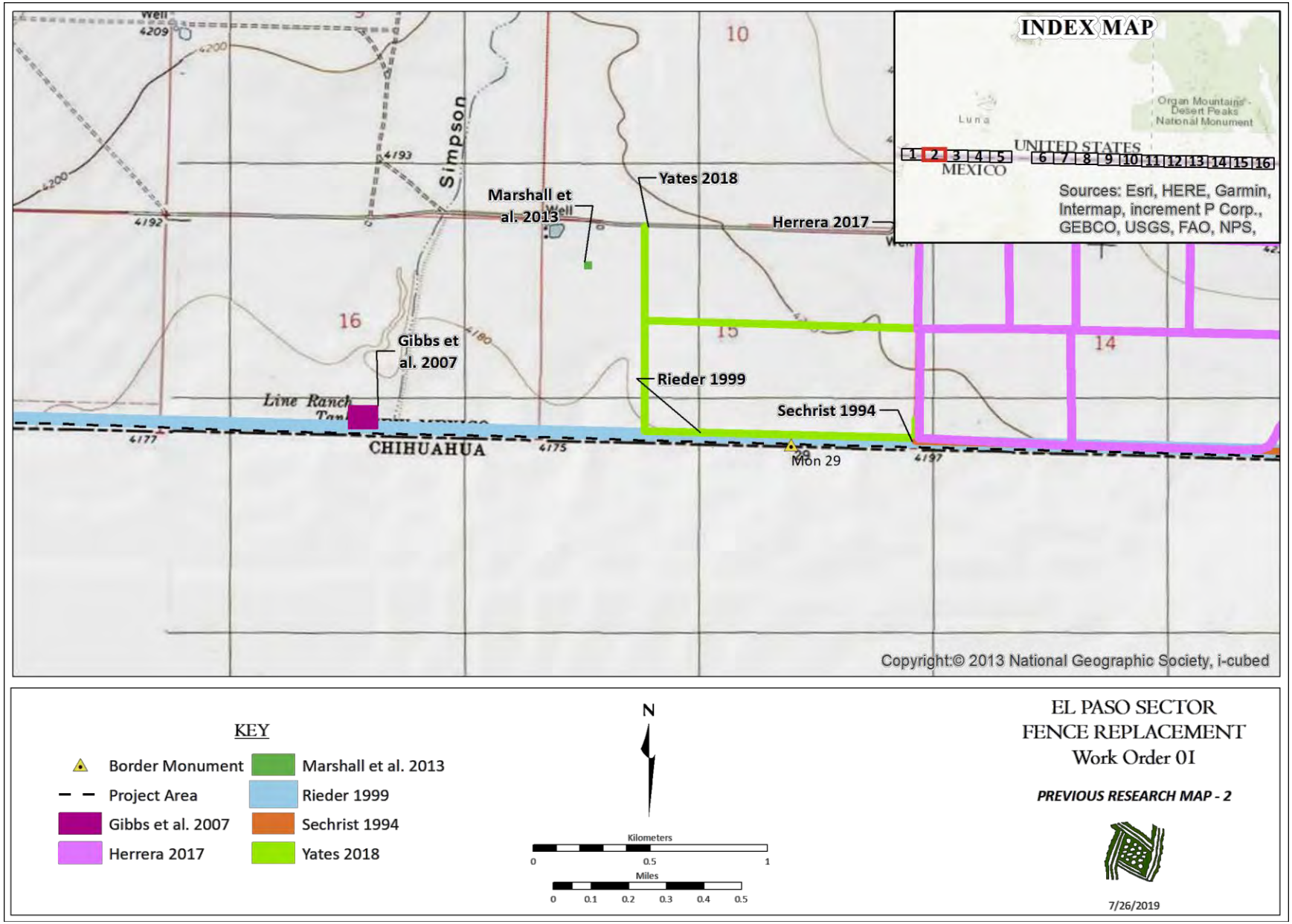

Figure A2. Previous sites and projects near the APE, Map 2 of 16.

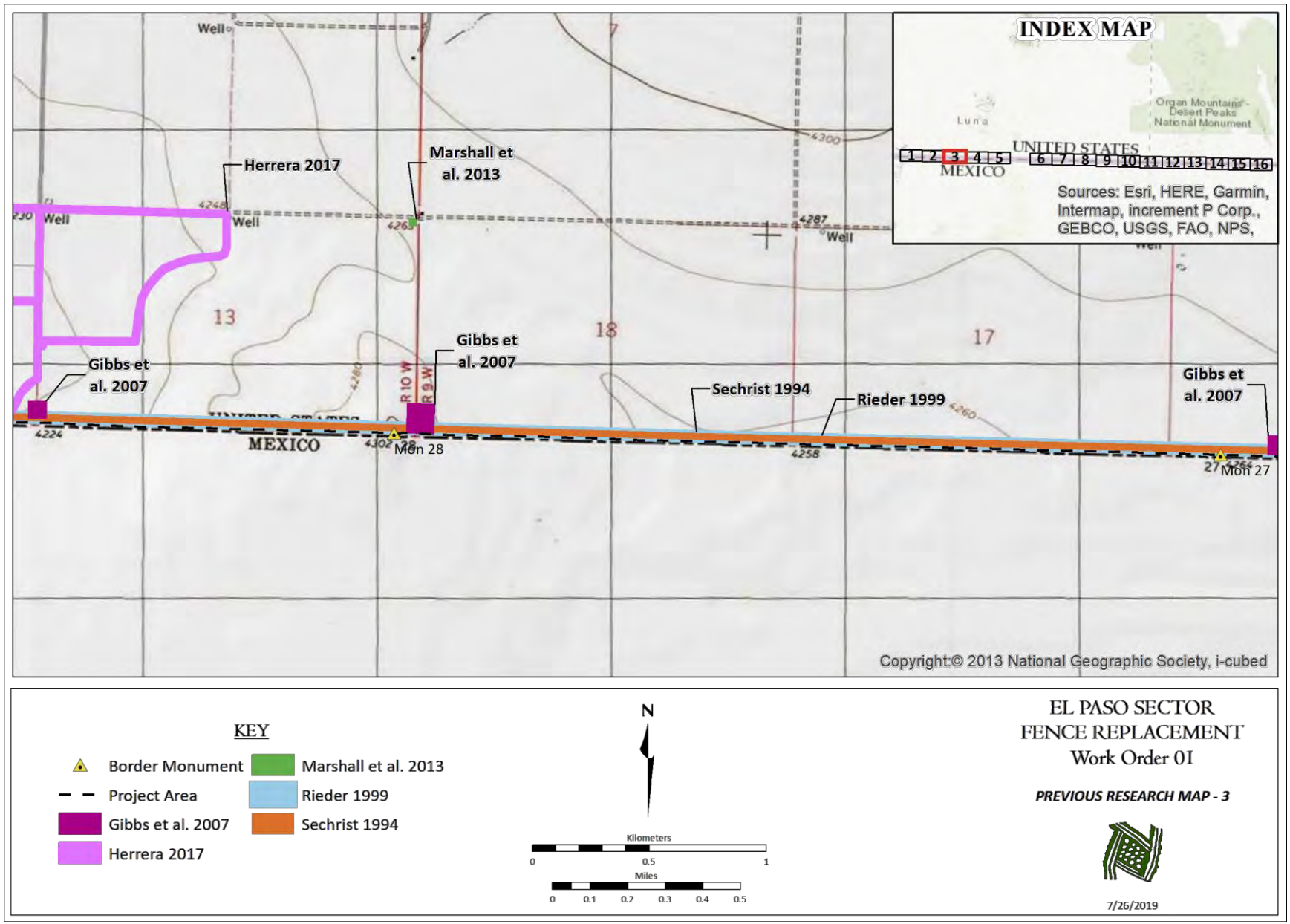

Figure A3. Previous sites and projects near the APE, Map 3 of 16.

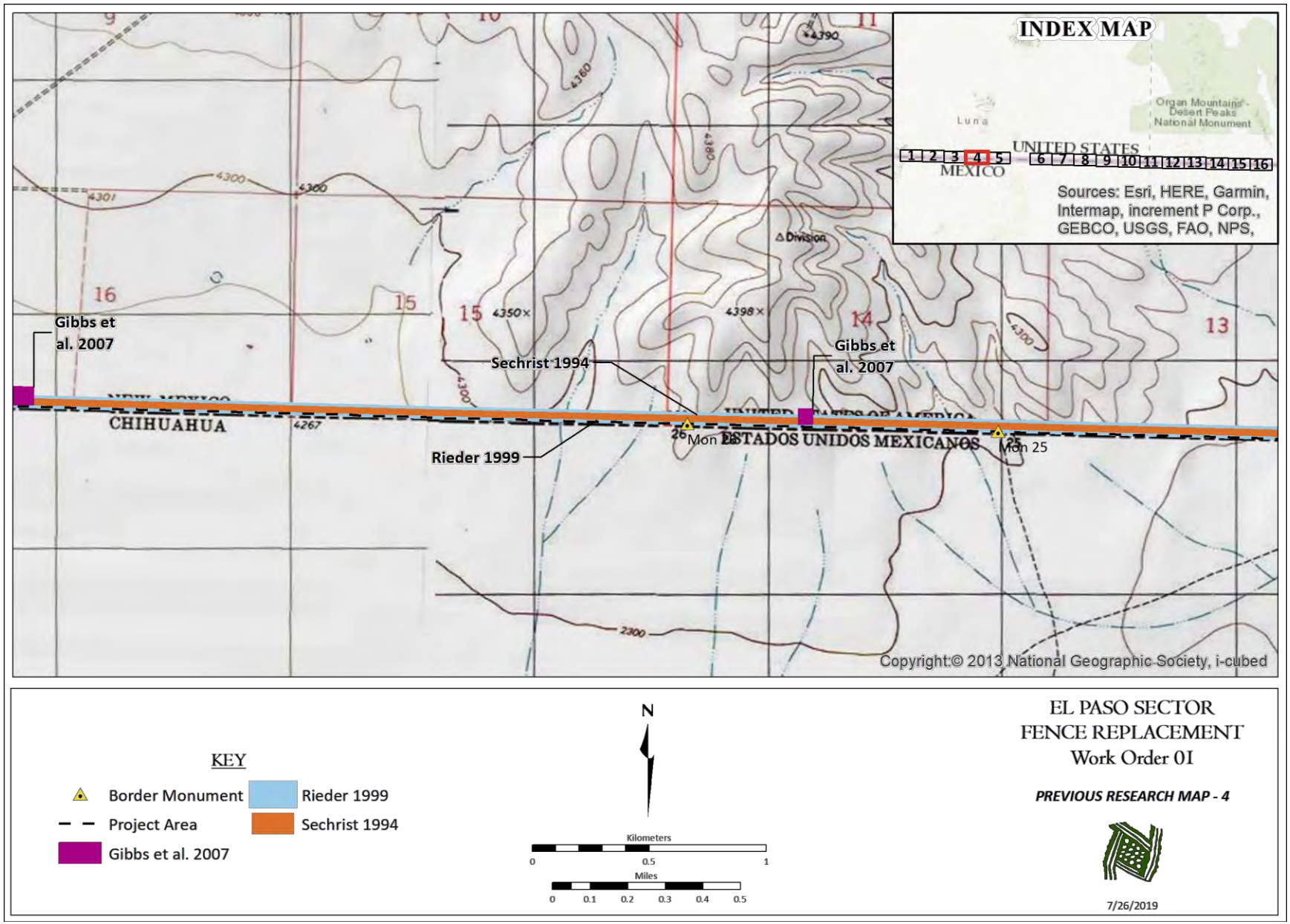

Figure A4. Previous sites and projects near the APE, Map 4 of 16.

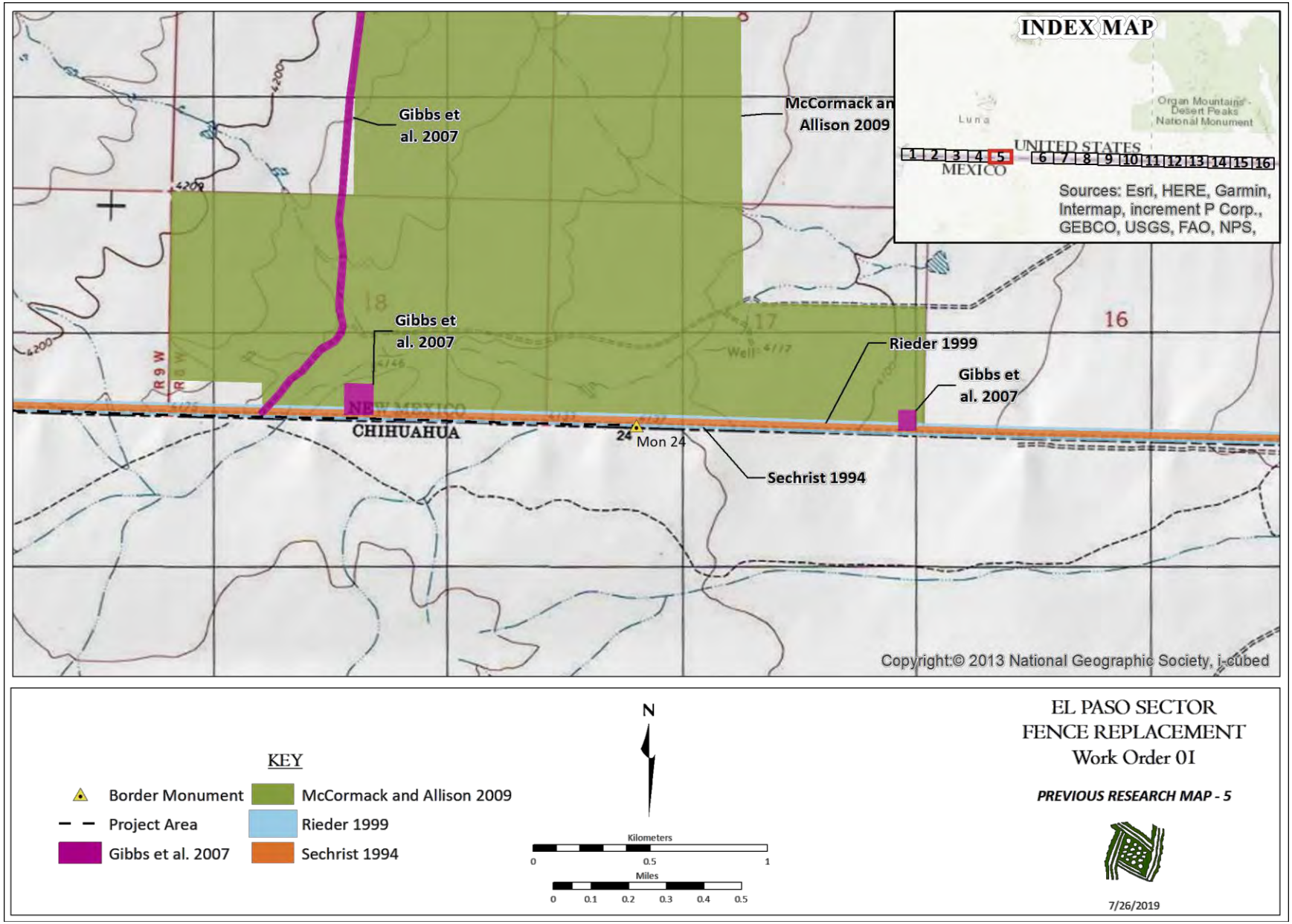

Figure A5. Previous sites and projects near the APE, Map 5 of 16.

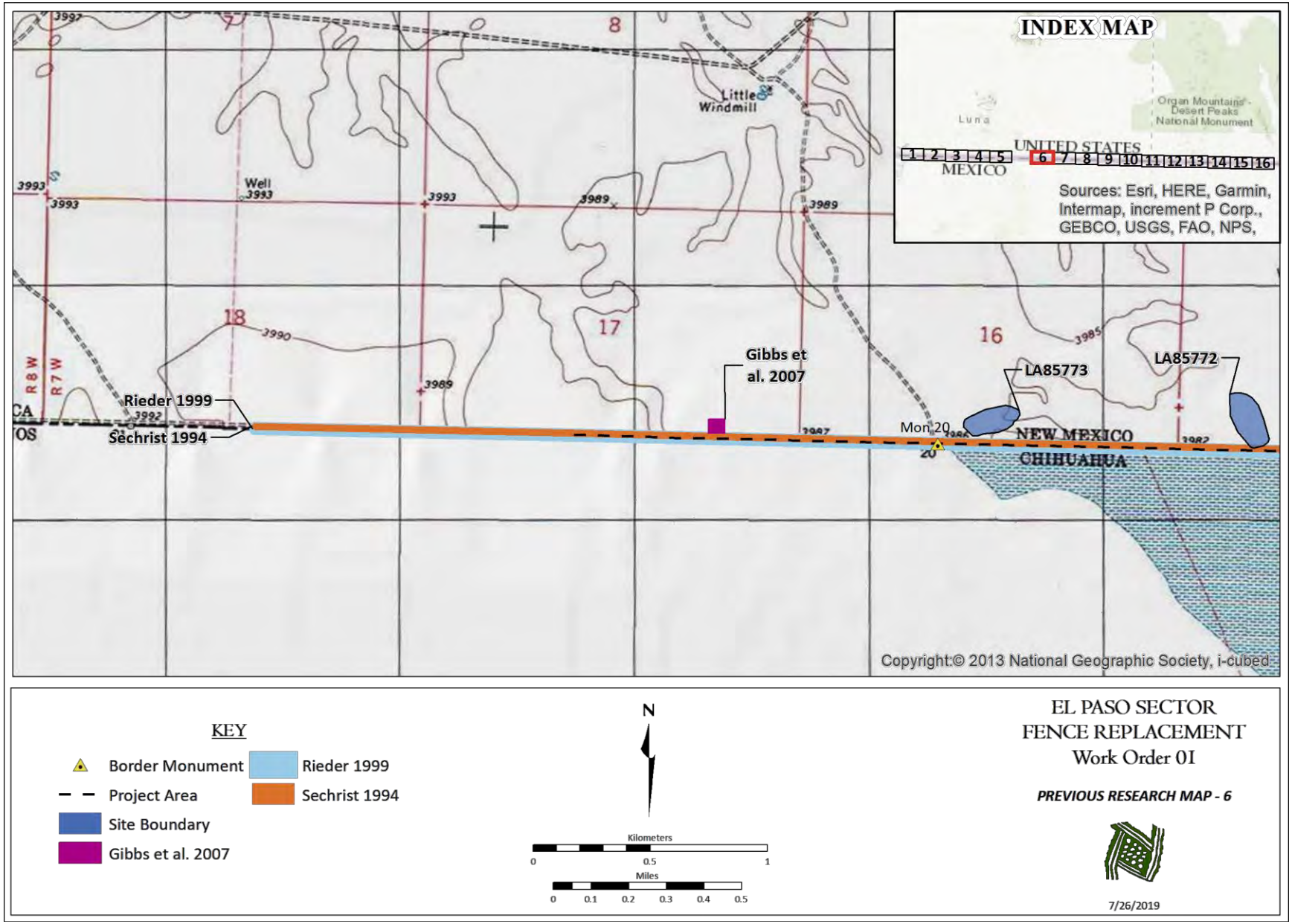

Figure A6. Previous sites and projects near the APE, Map 6 of 16.

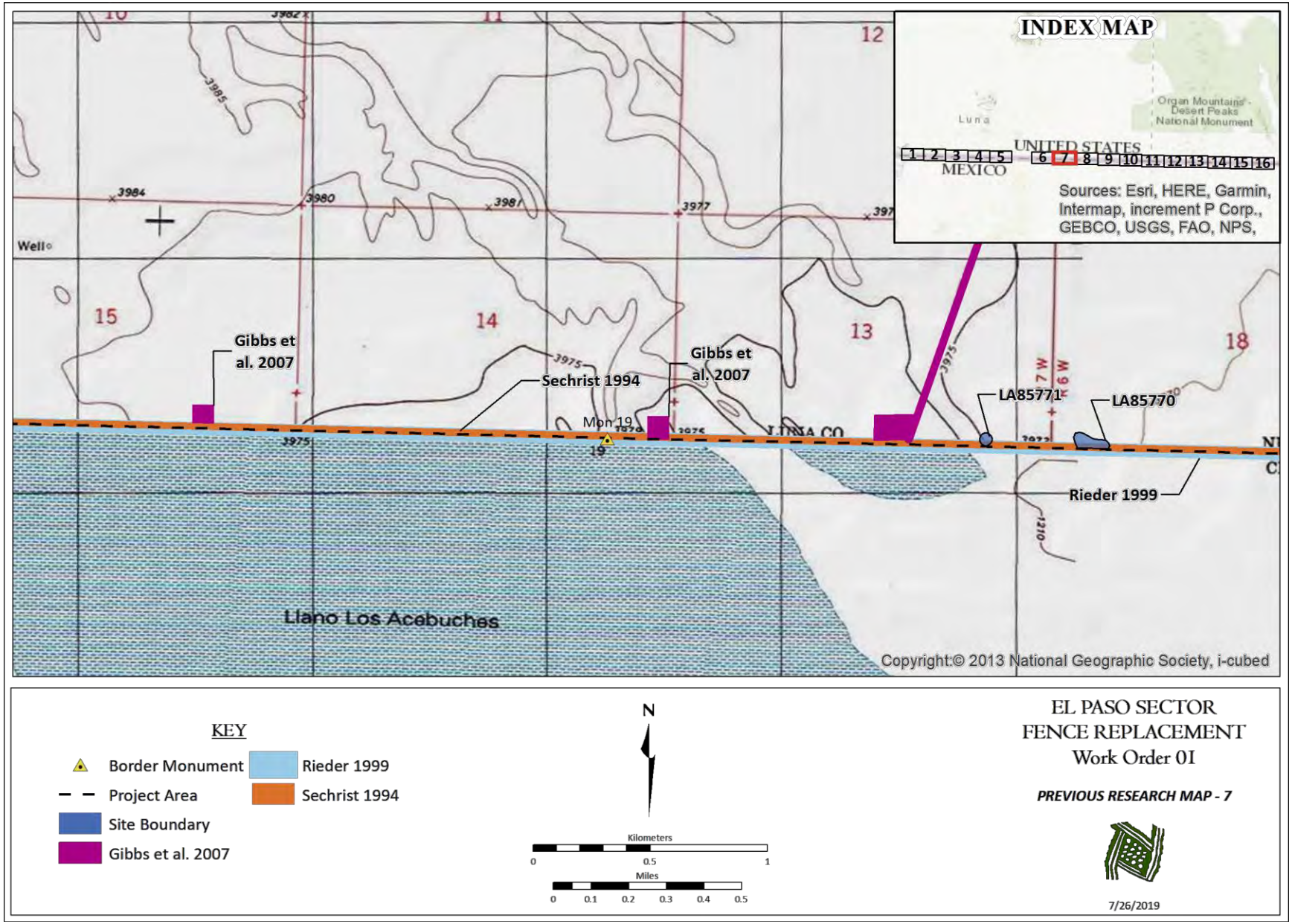

Figure A7. Previous sites and projects near the APE, Map 7 of 16.

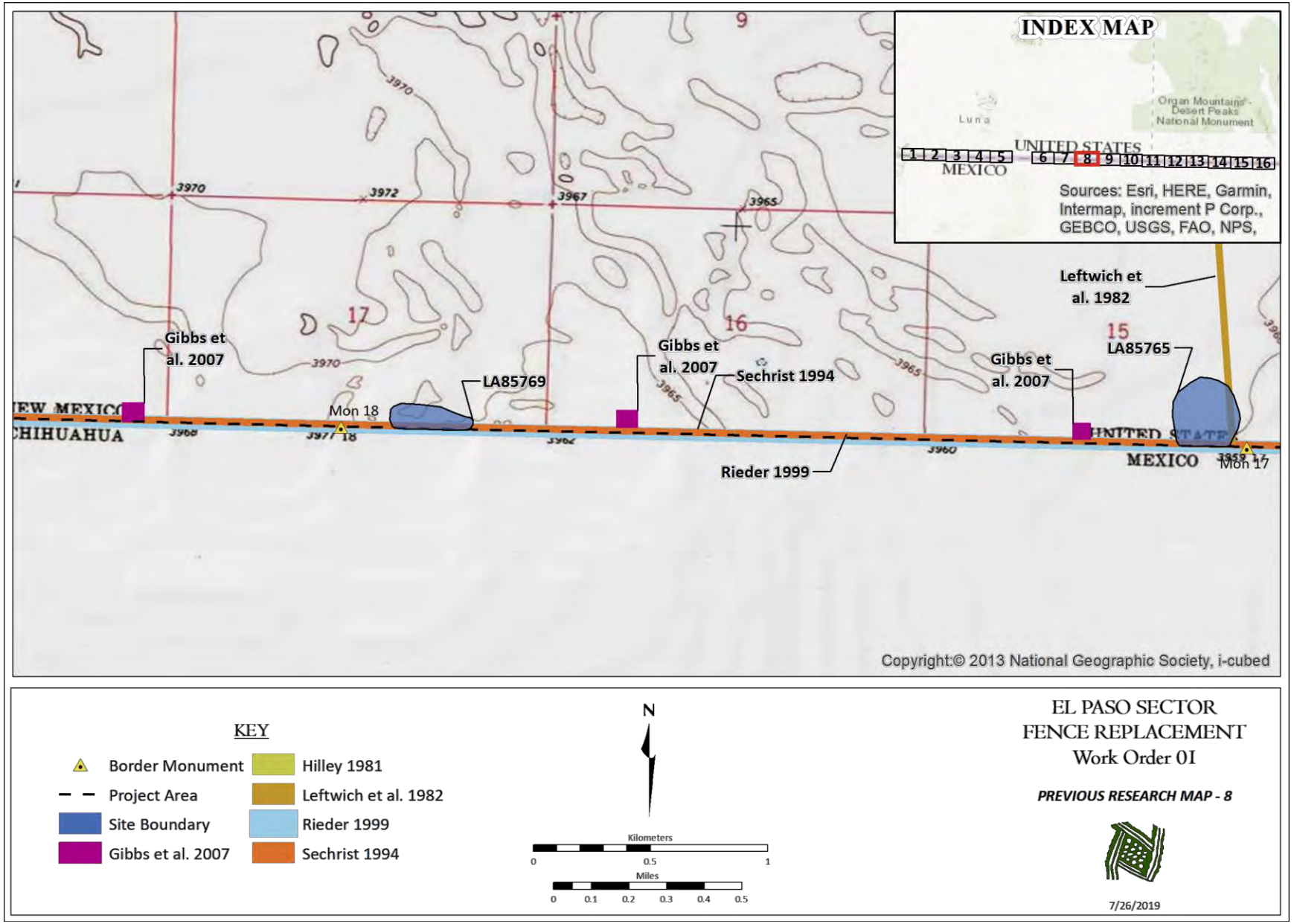

Figure A8. Previous sites and projects near the APE, Map 8 of 16.

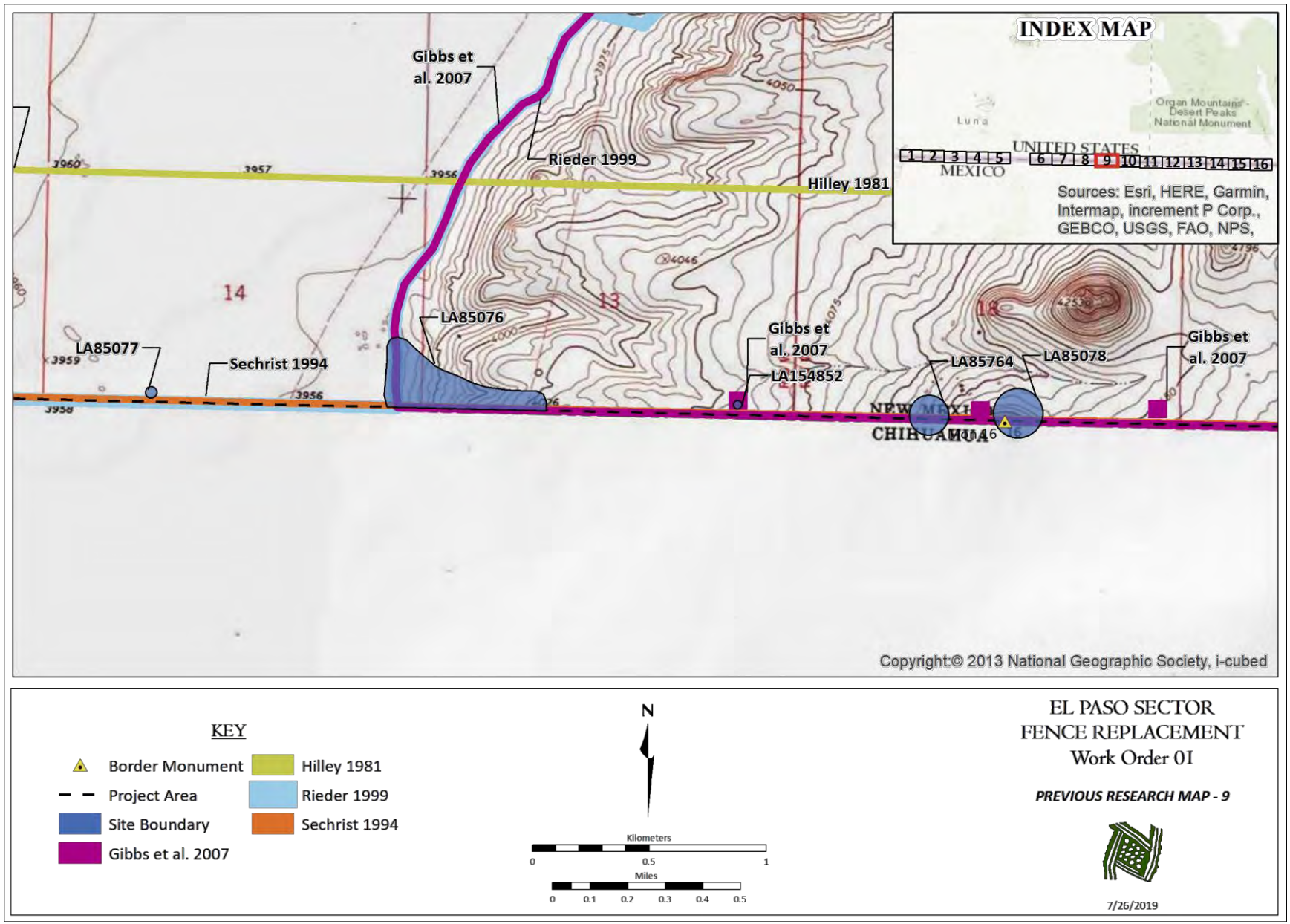

Figure A9. Previous sites and projects near the APE, Map 9 of 16.

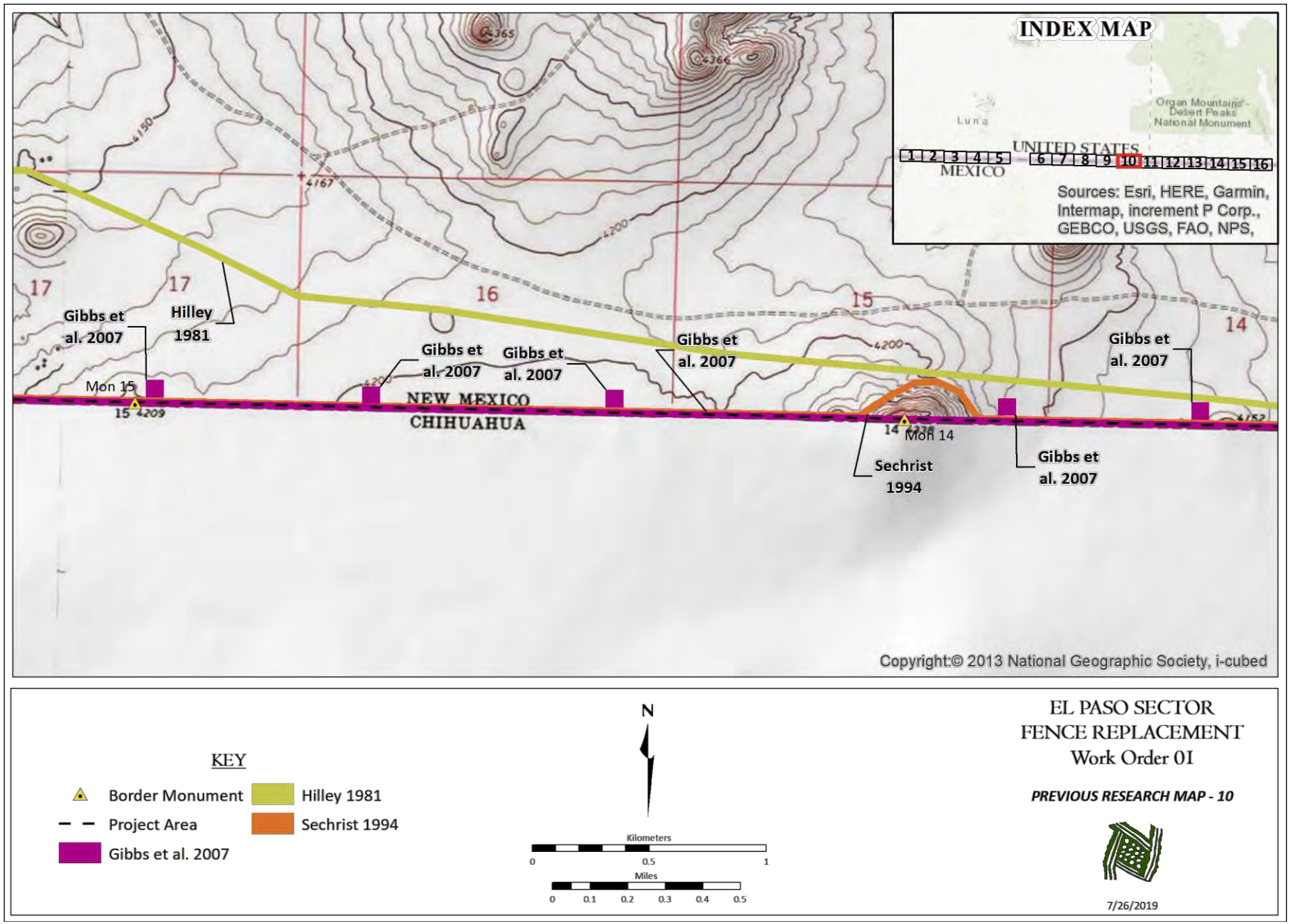

Figure A10. Previous sites and projects near the APE, Map 10 of 16.

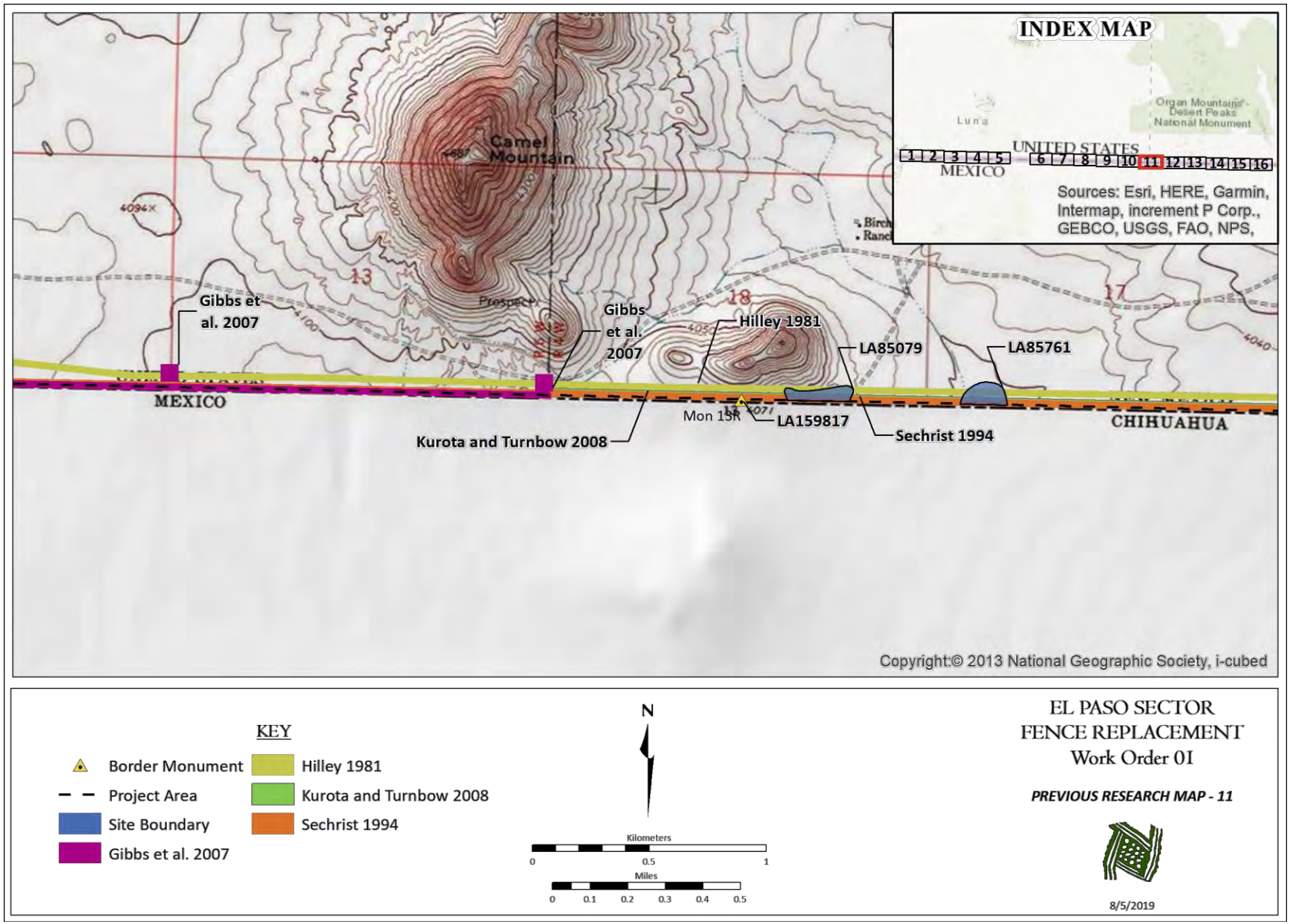

Figure A11. Previous sites and projects near the APE, Map 11 of 16.

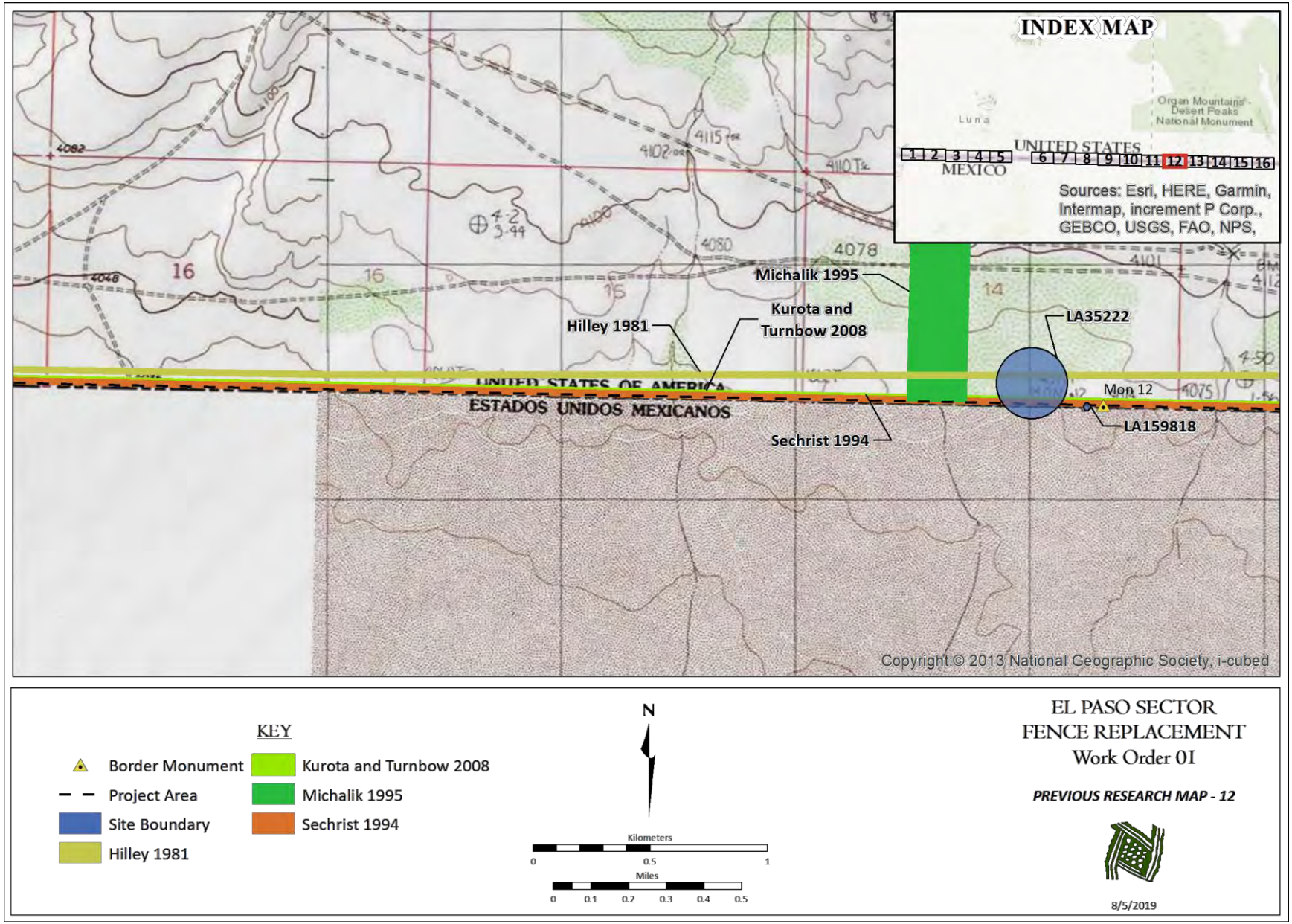

Figure A12. Previous sites and projects near the APE, Map 12 of 16.

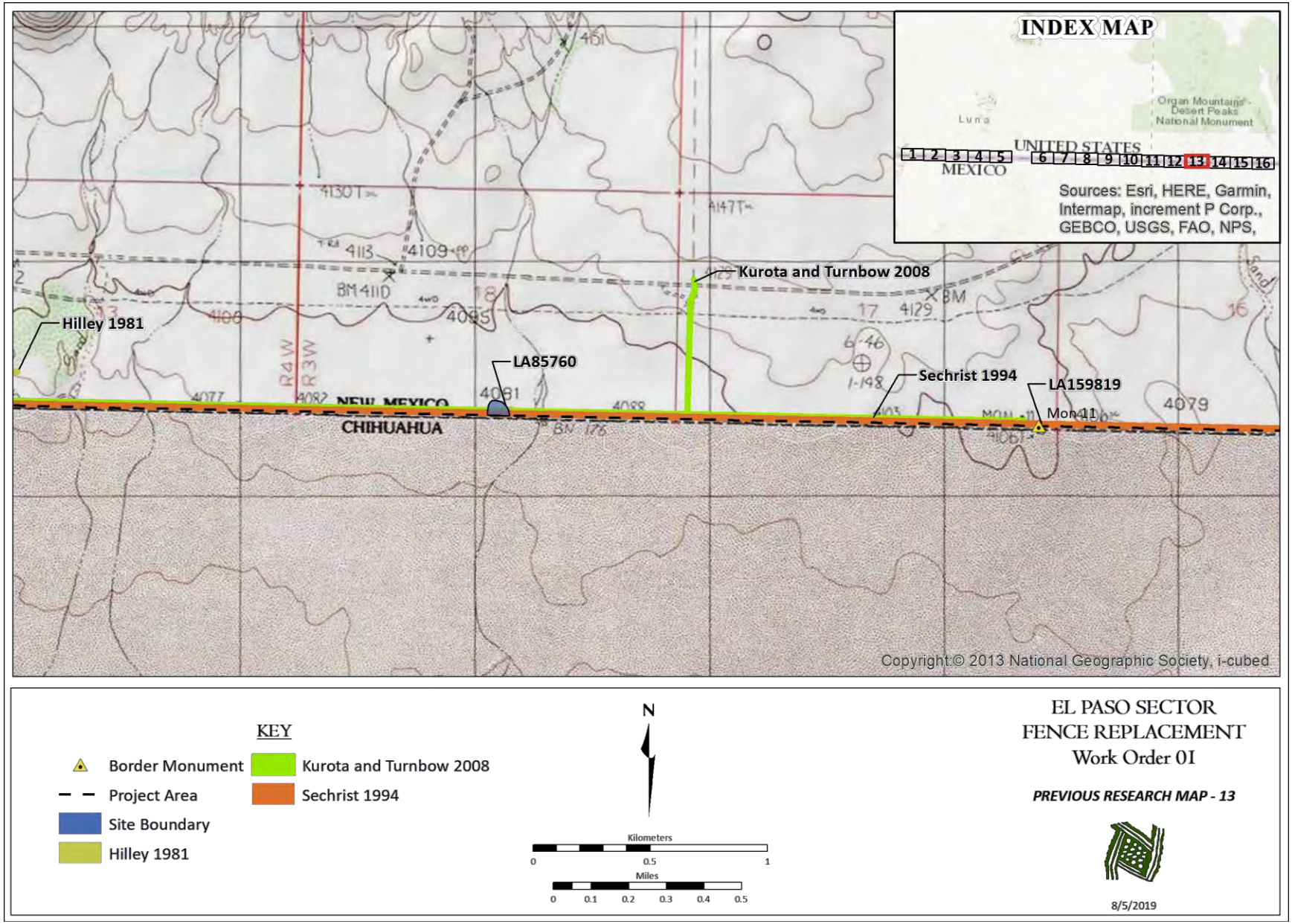

Figure A13. Previous sites and projects near the APE, Map 13 of 16.

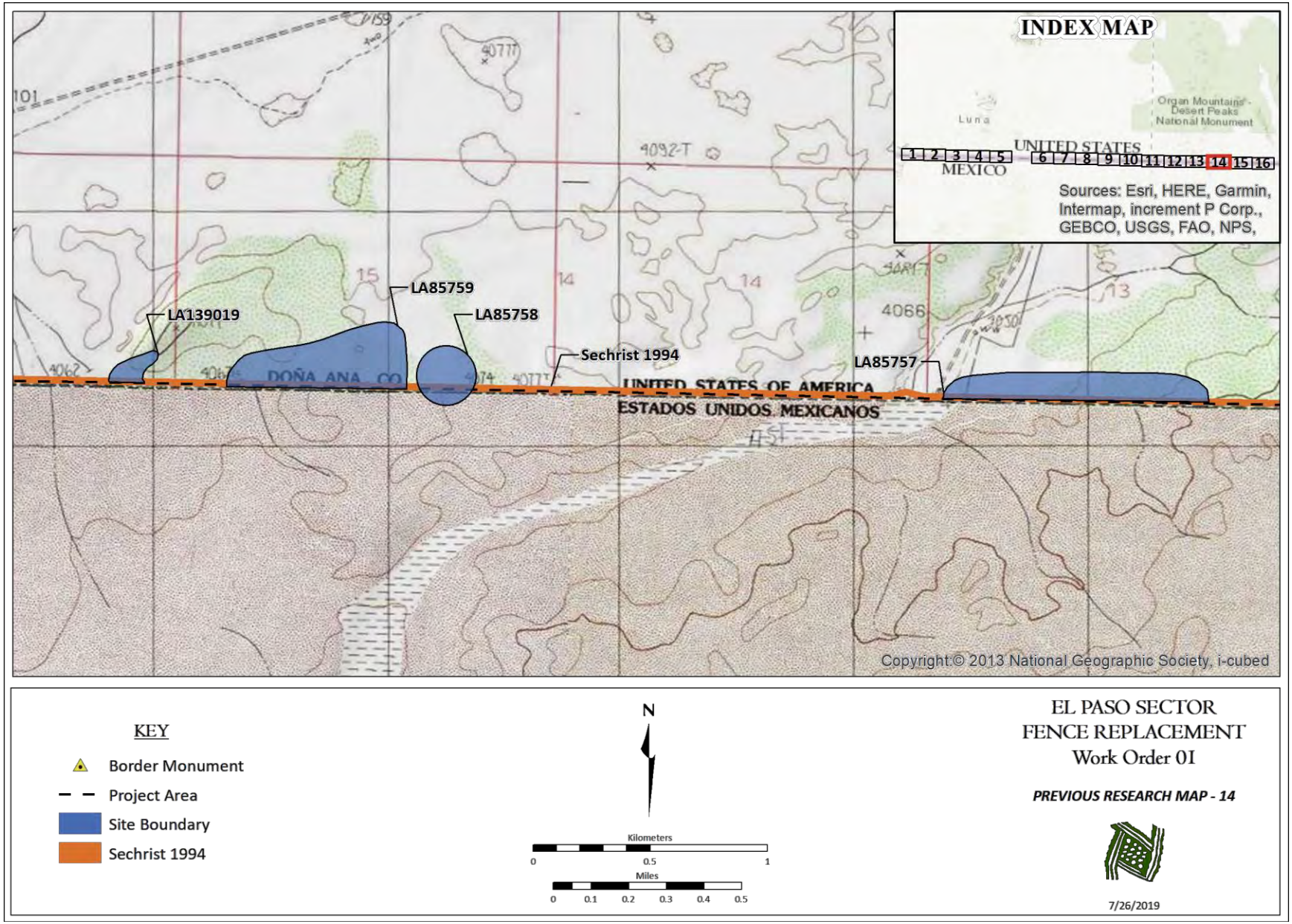

Figure A14. Previous sites and projects near the APE, Map 14 of 16.

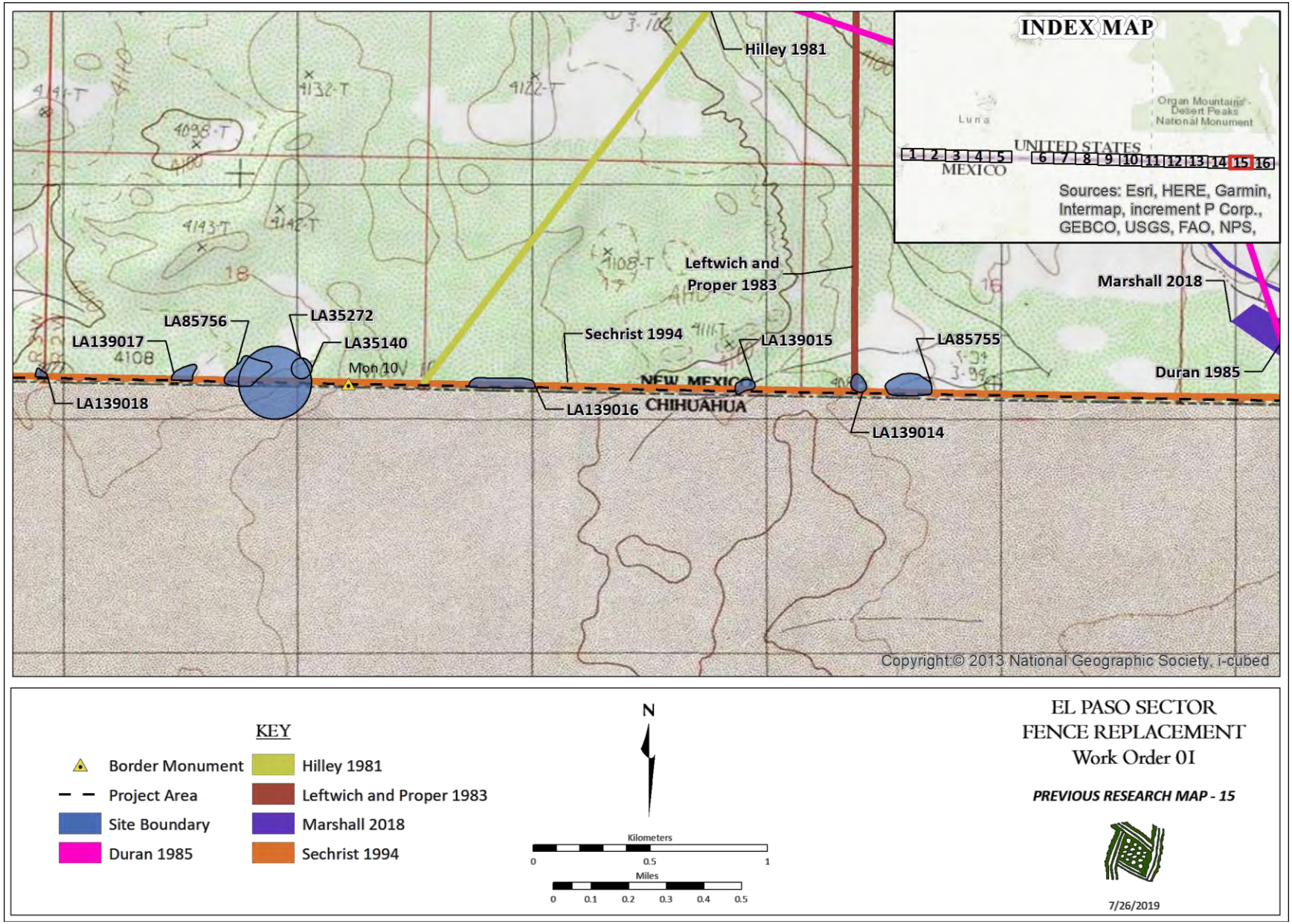

Figure A15. Previous sites and projects near the APE, Map 15 of 16.

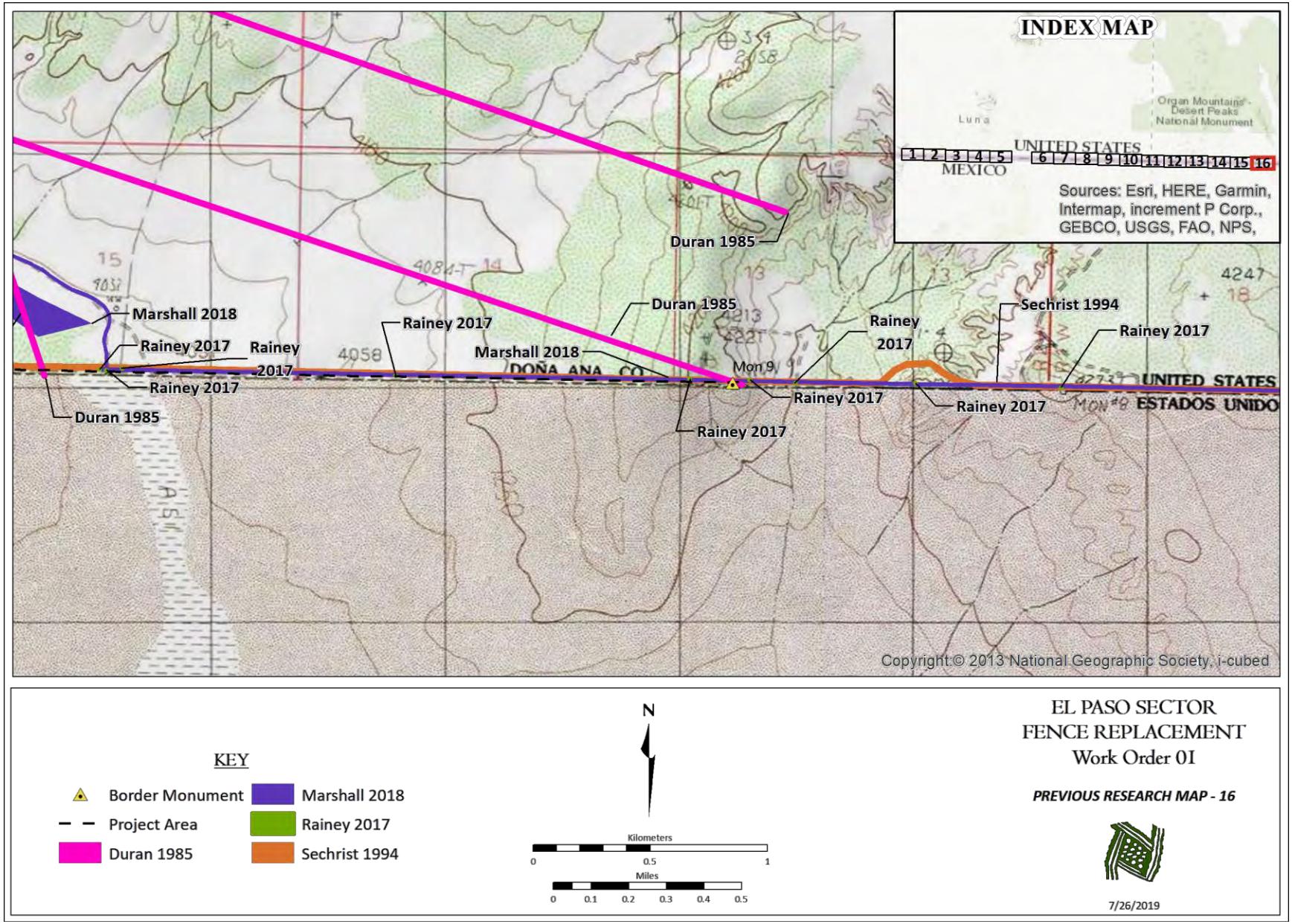

Figure A16. Previous sites and projects near the APE, Map 16 of 16.

APPENDIX B.

SURVEY RESULTS AND SITE MAPS

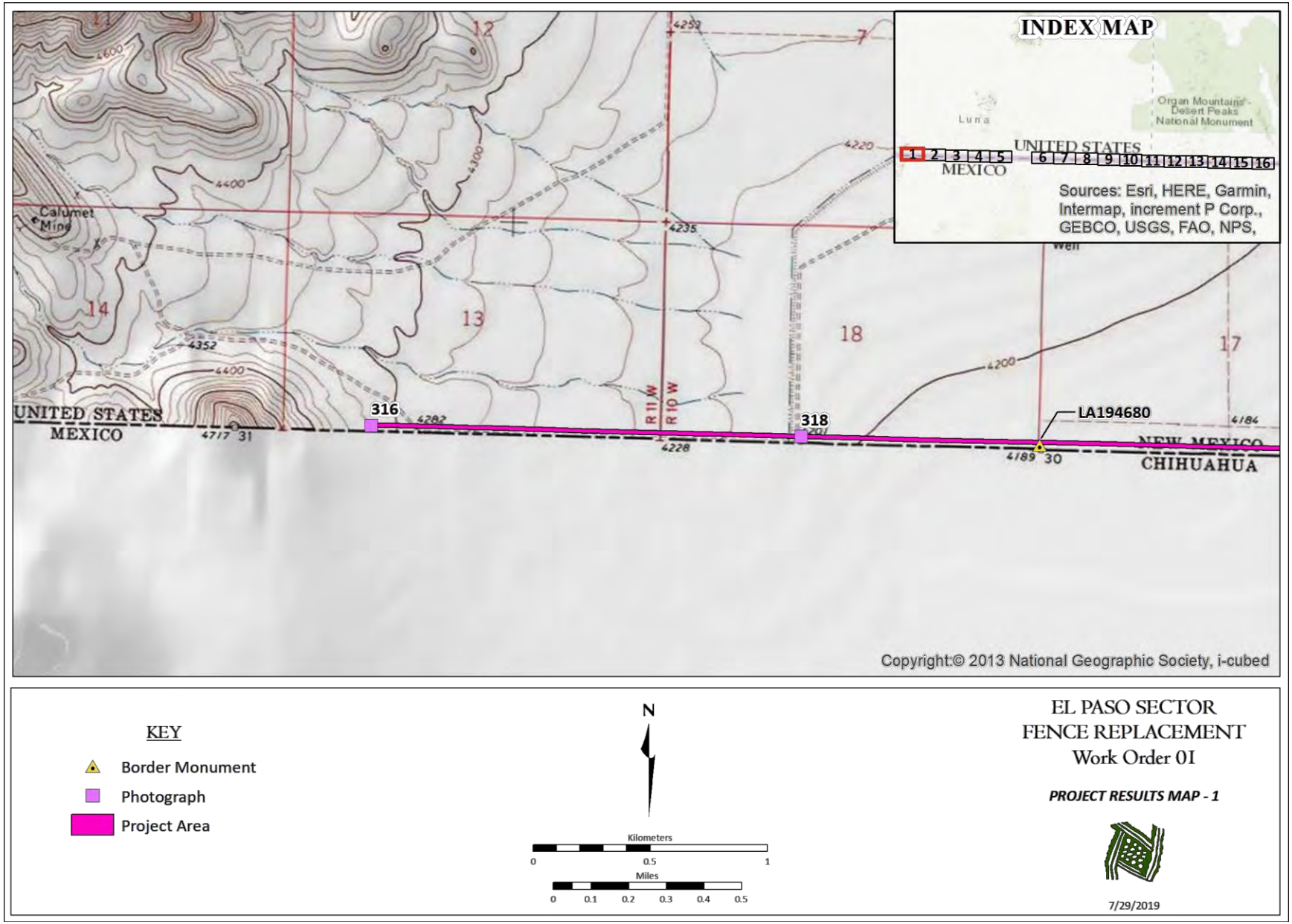

Figure B1. Roosevelt Reservation West segment, Map 1 of 16.

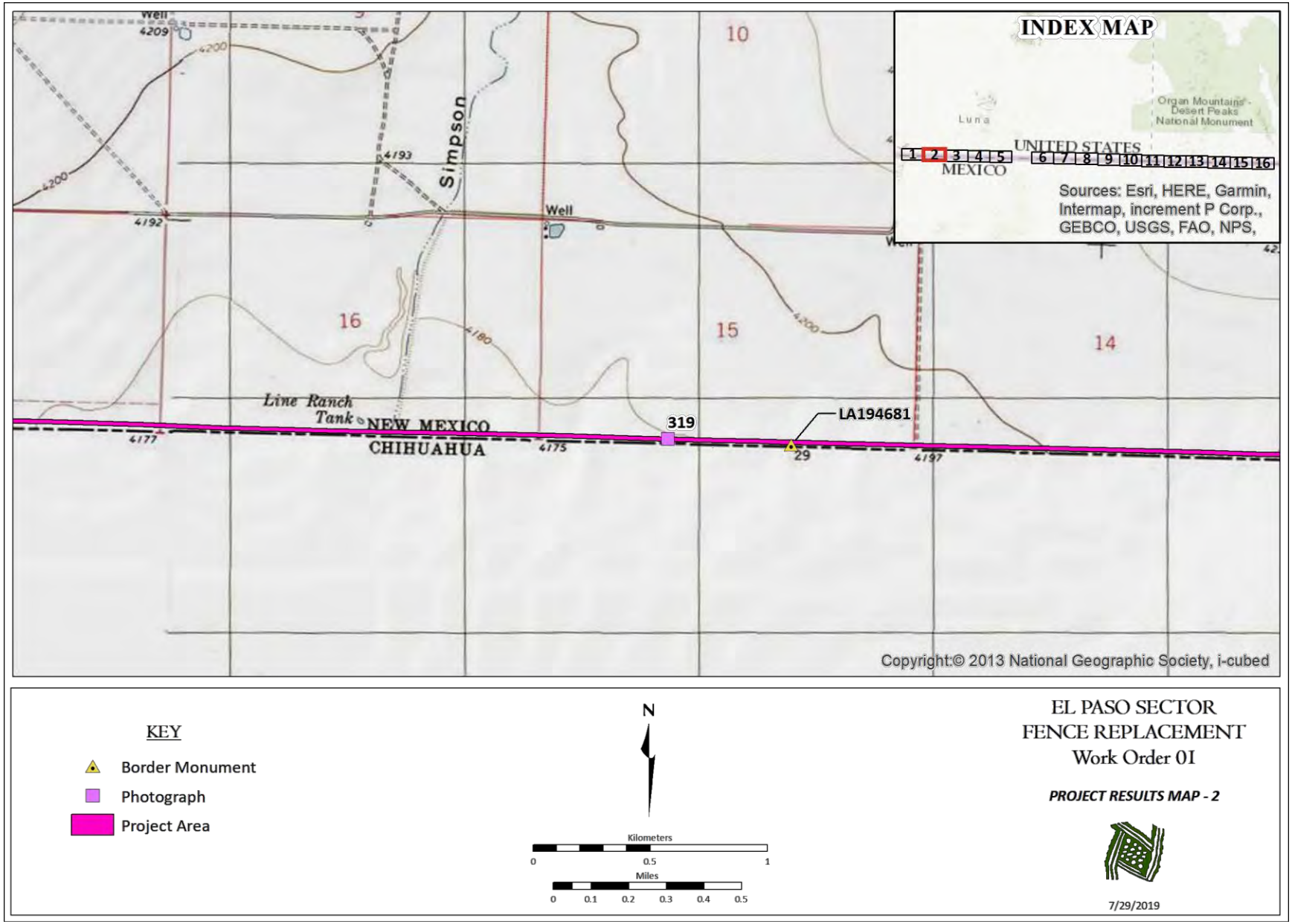

Figure B2. Roosevelt Reservation West segment, Map 2 of 16.

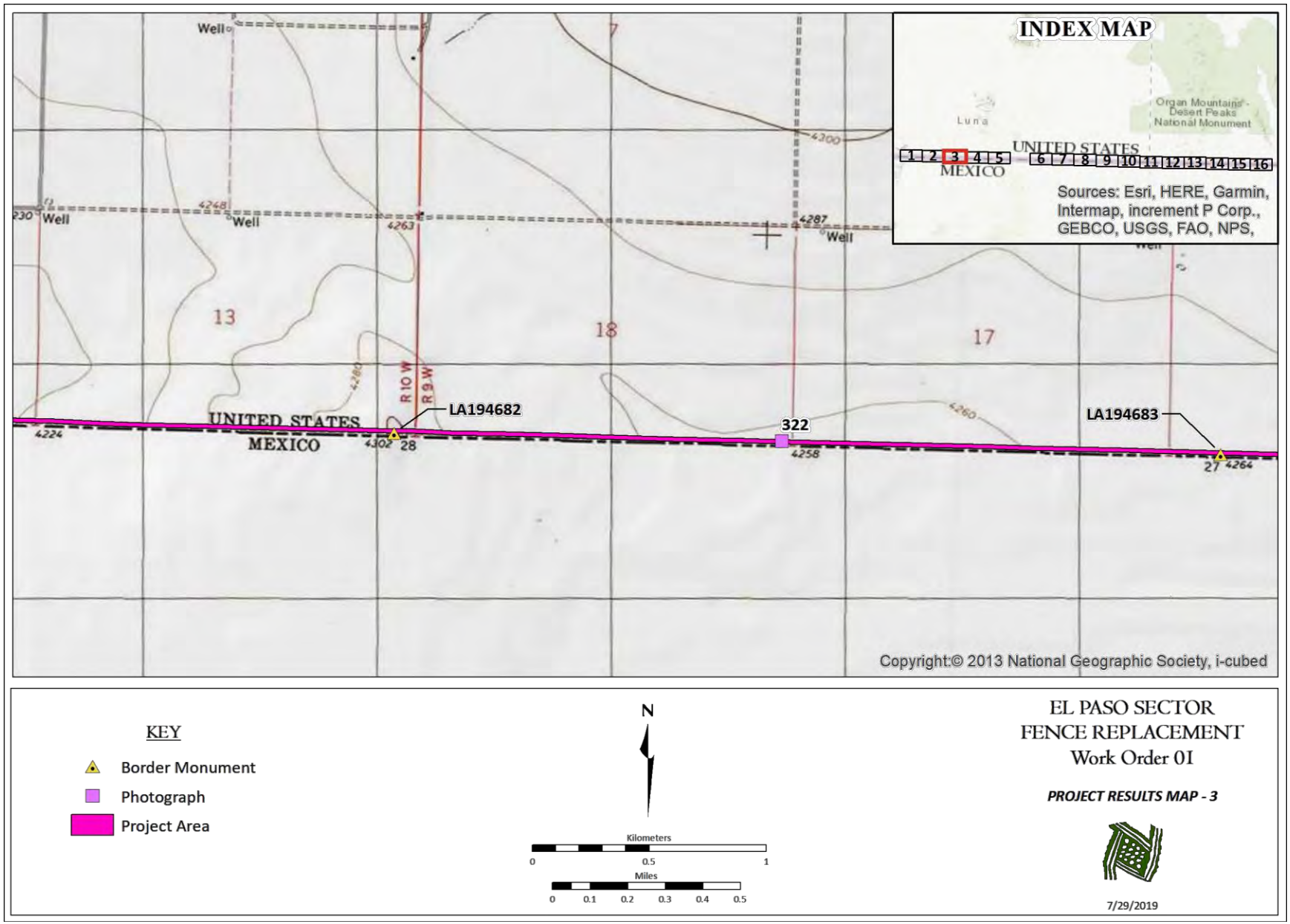

Figure B3. Roosevelt Reservation West segment, Map 3 of 16.

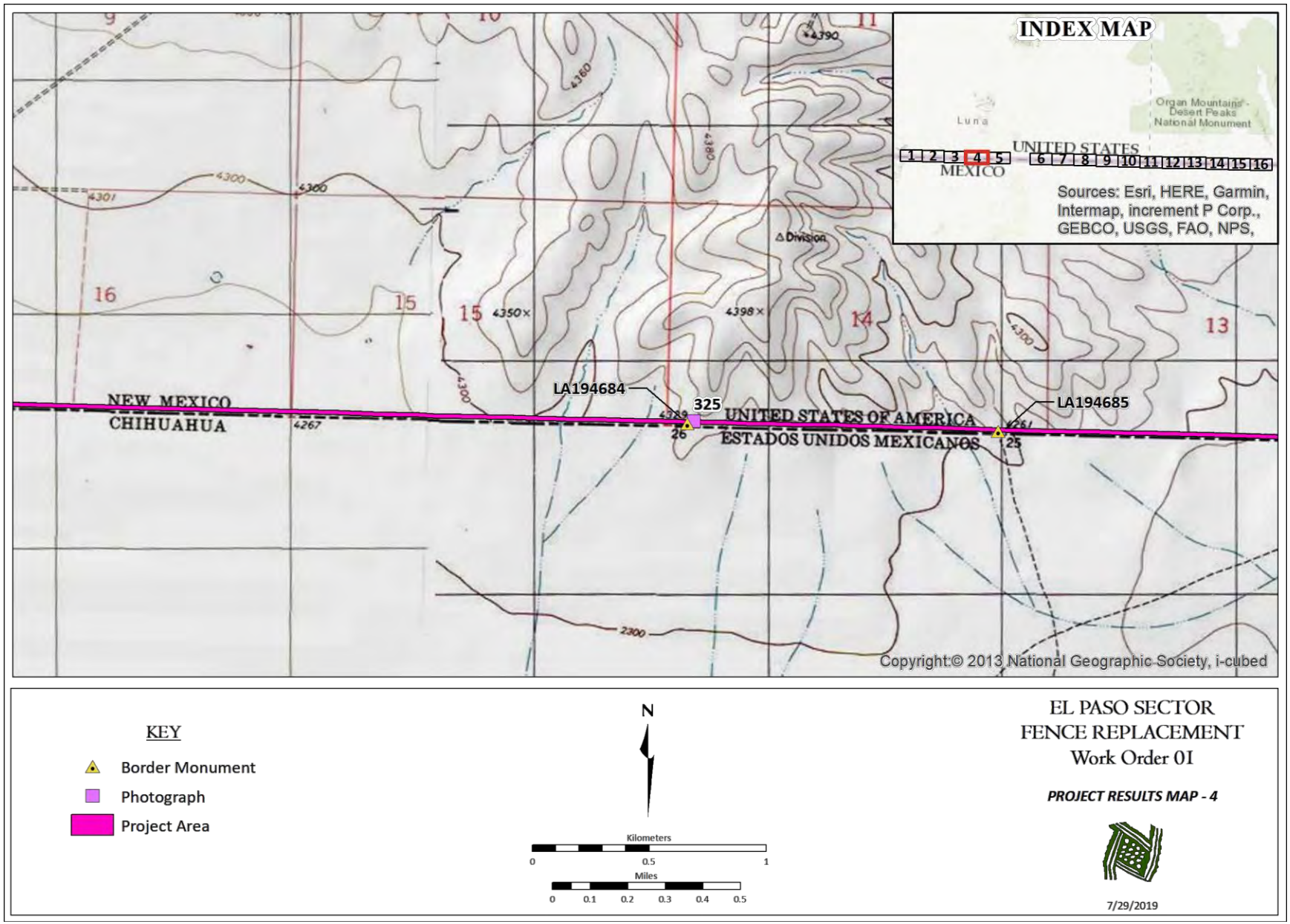

Figure B4. Roosevelt Reservation West segment, Map 4 of 16.

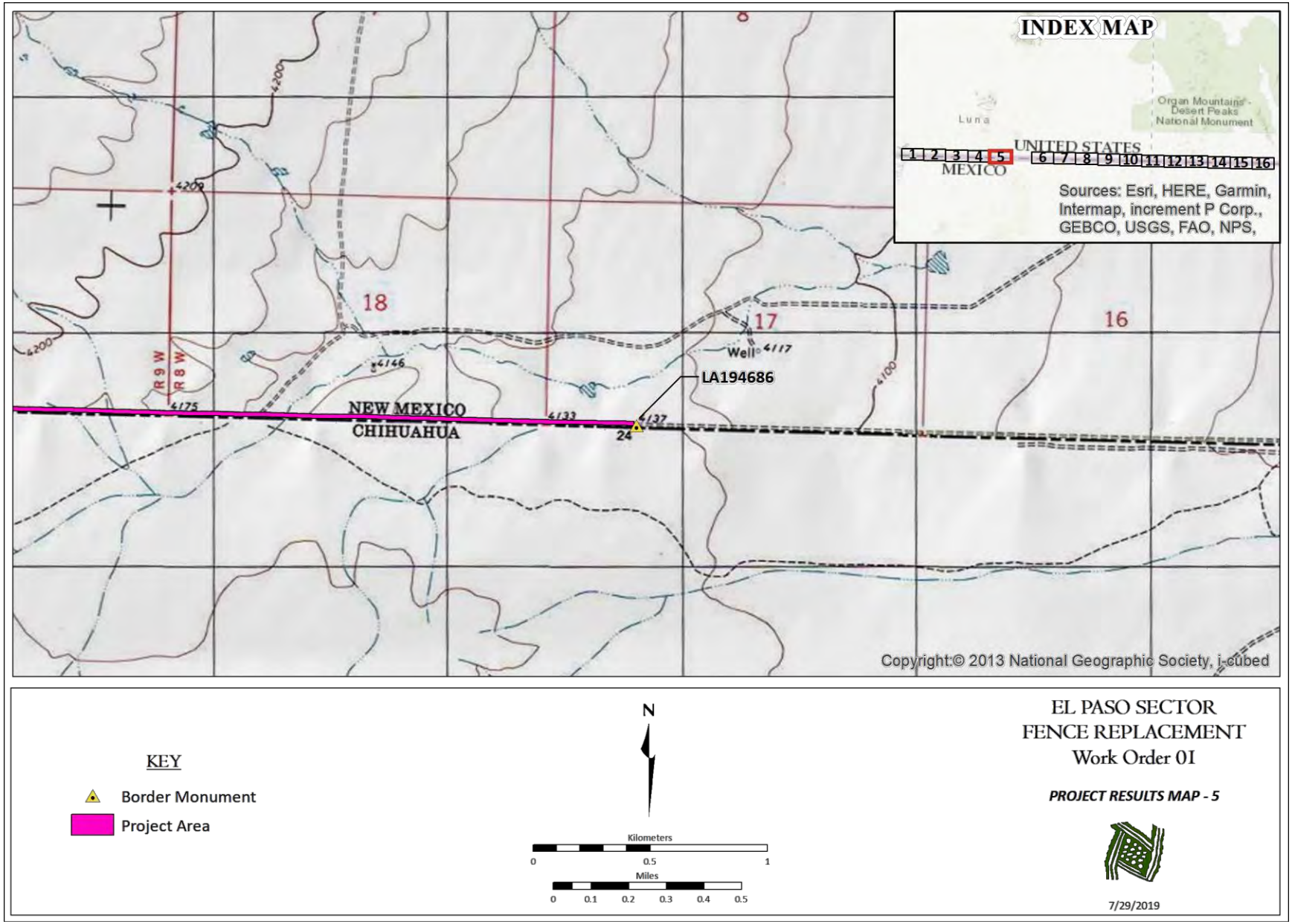

Figure B5. Roosevelt Reservation West segment, Map 5 of 16.

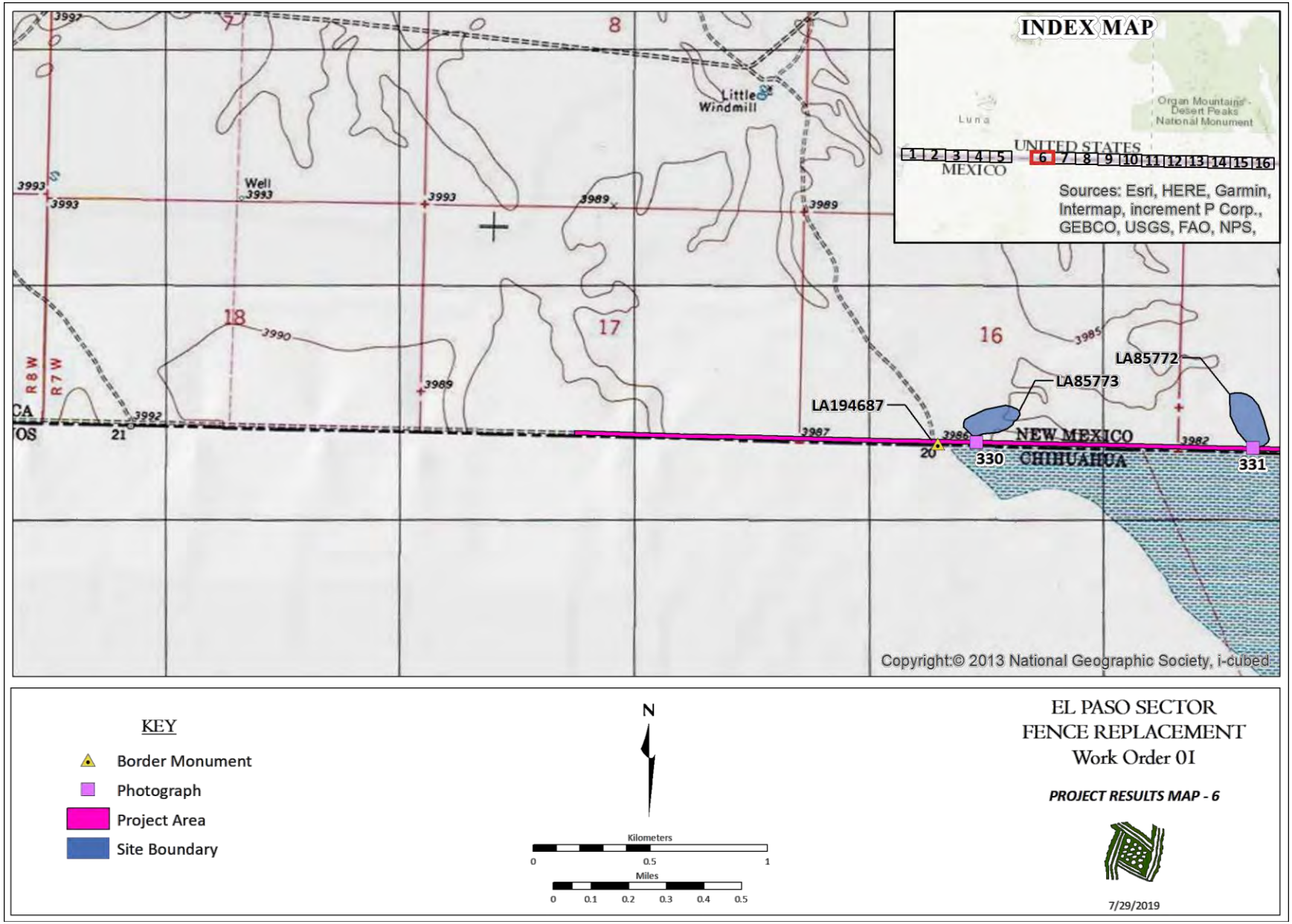

Figure B6. Roosevelt Reservation East segment, Map 6 of 16.

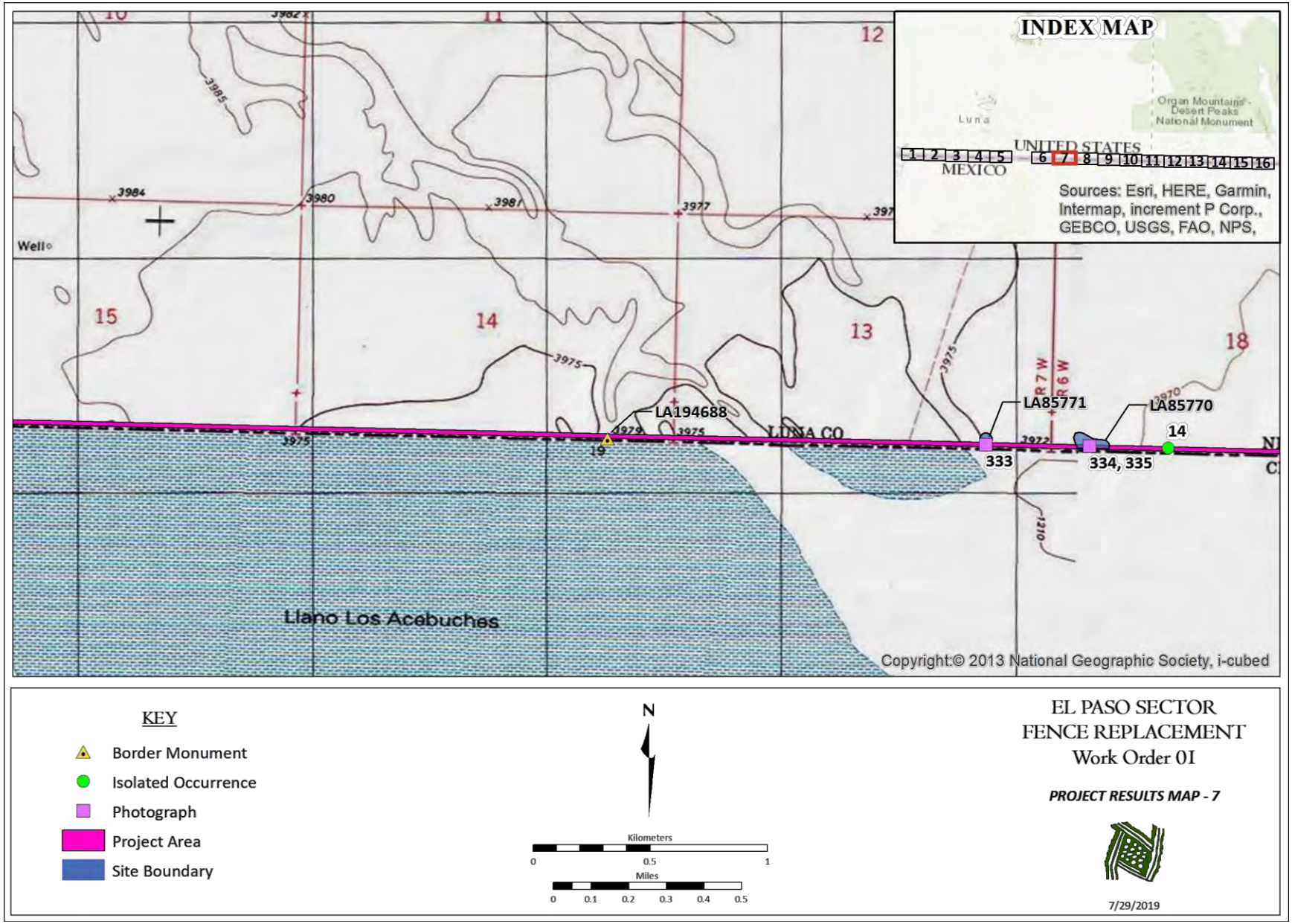

Figure B7. Roosevelt Reservation East segment, Map 7 of 16.

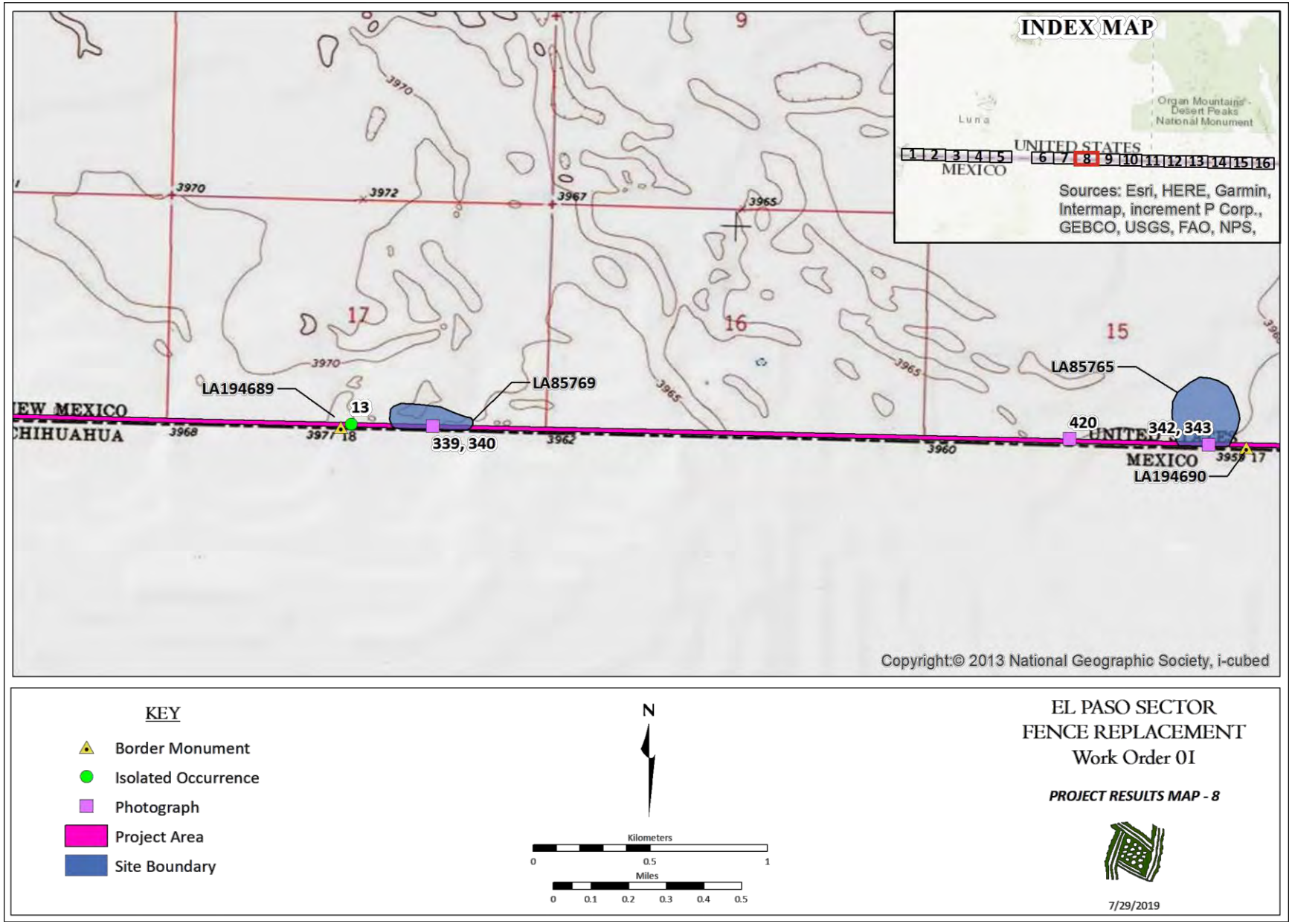

Figure B8. Roosevelt Reservation East segment, Map 8 of 16.

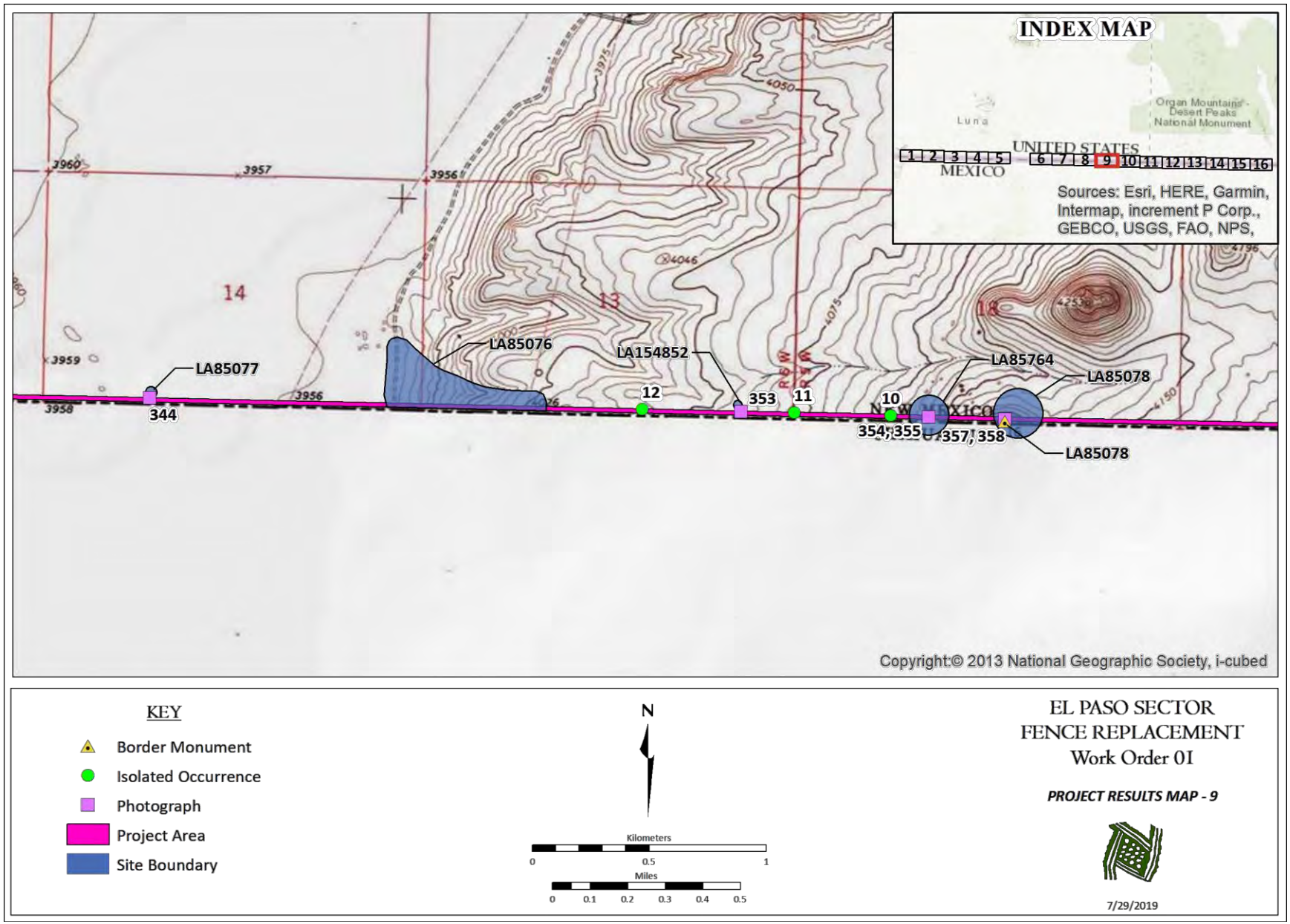

Figure B9. Roosevelt Reservation East segment, Map 9 of 16.

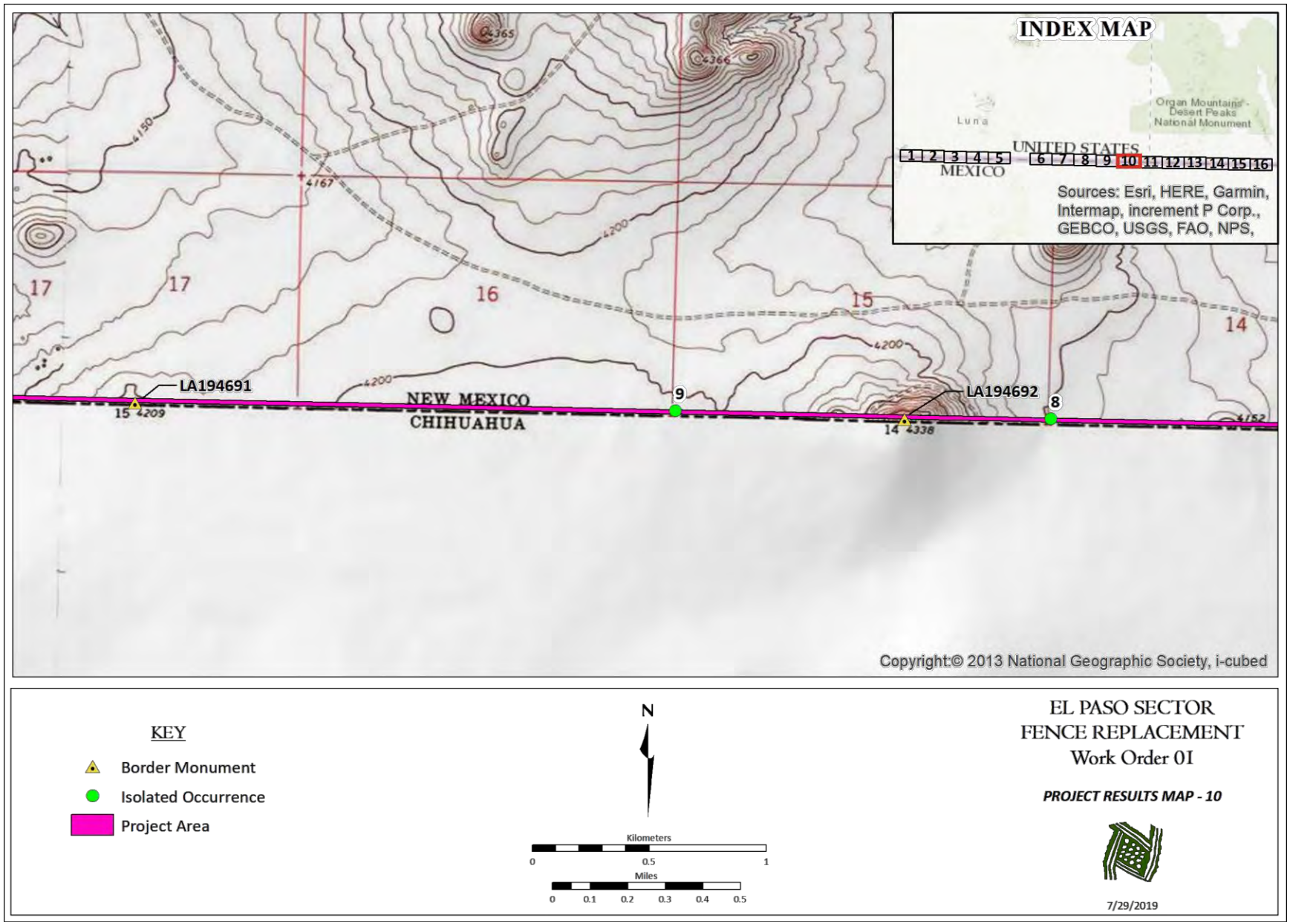

Figure B10. Roosevelt Reservation East segment, Map 10 of 16.

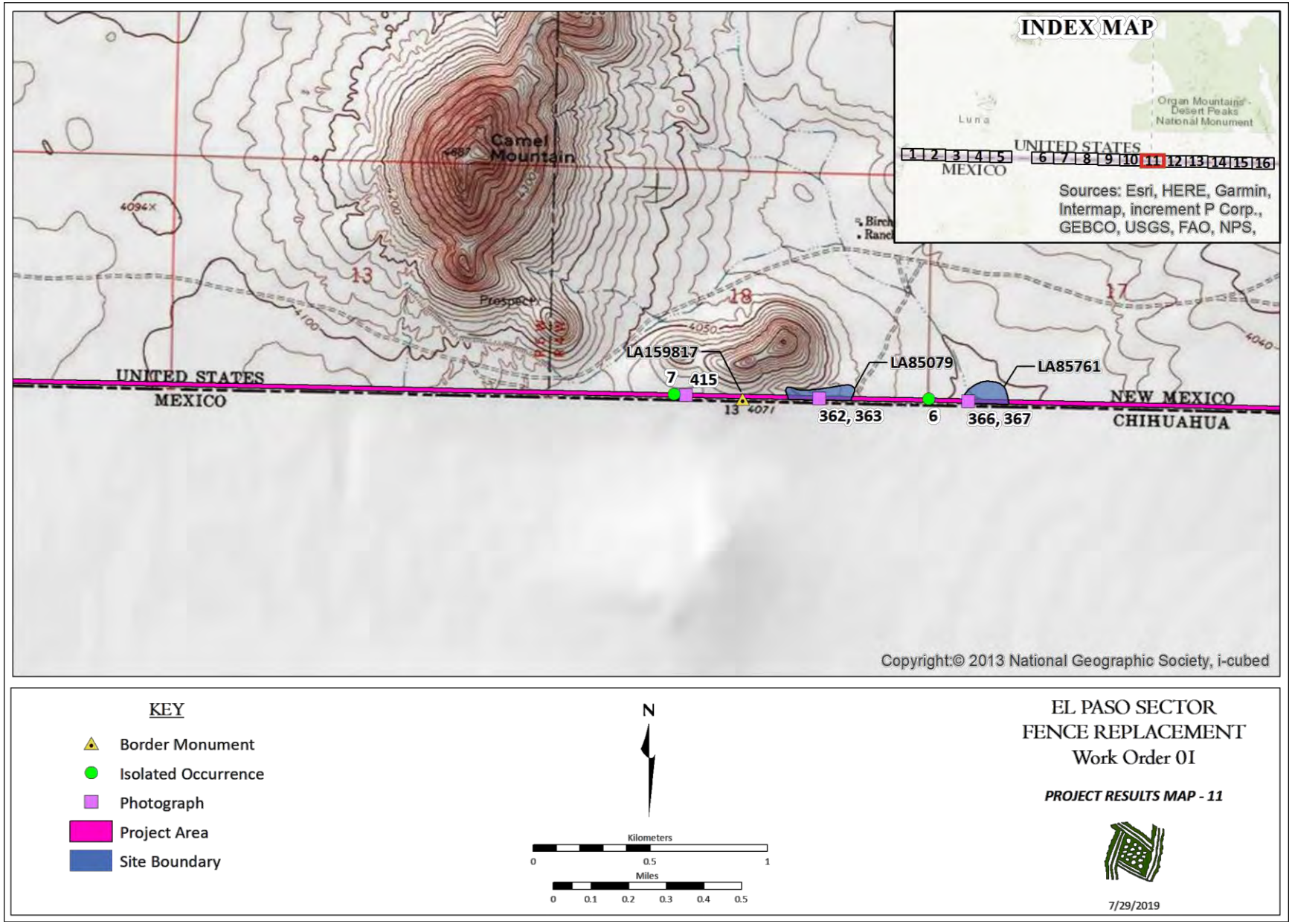

Figure B11. Roosevelt Reservation East segment, Map 11 of 16.

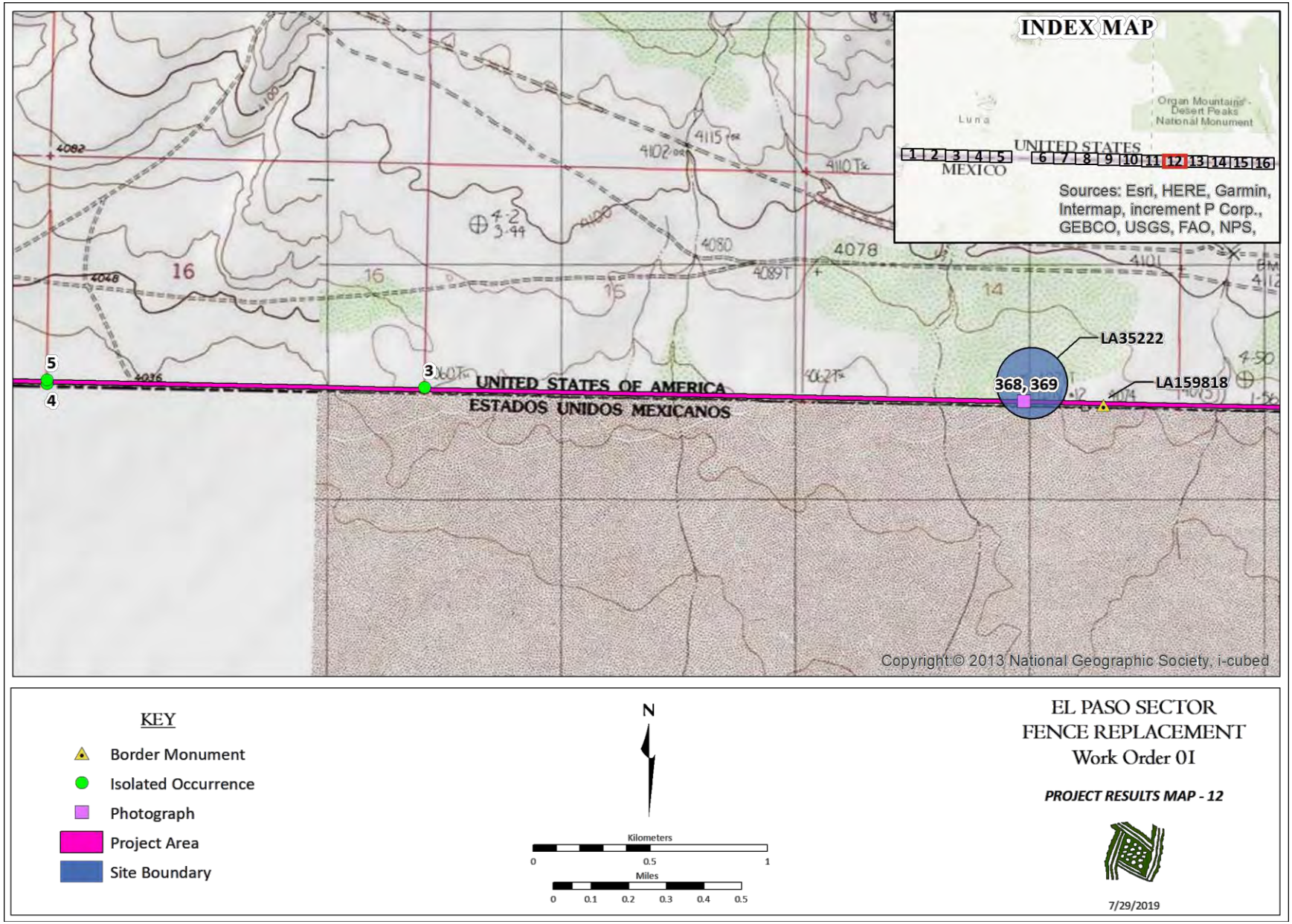

Figure B12. Roosevelt Reservation East segment, Map 12 of 16.

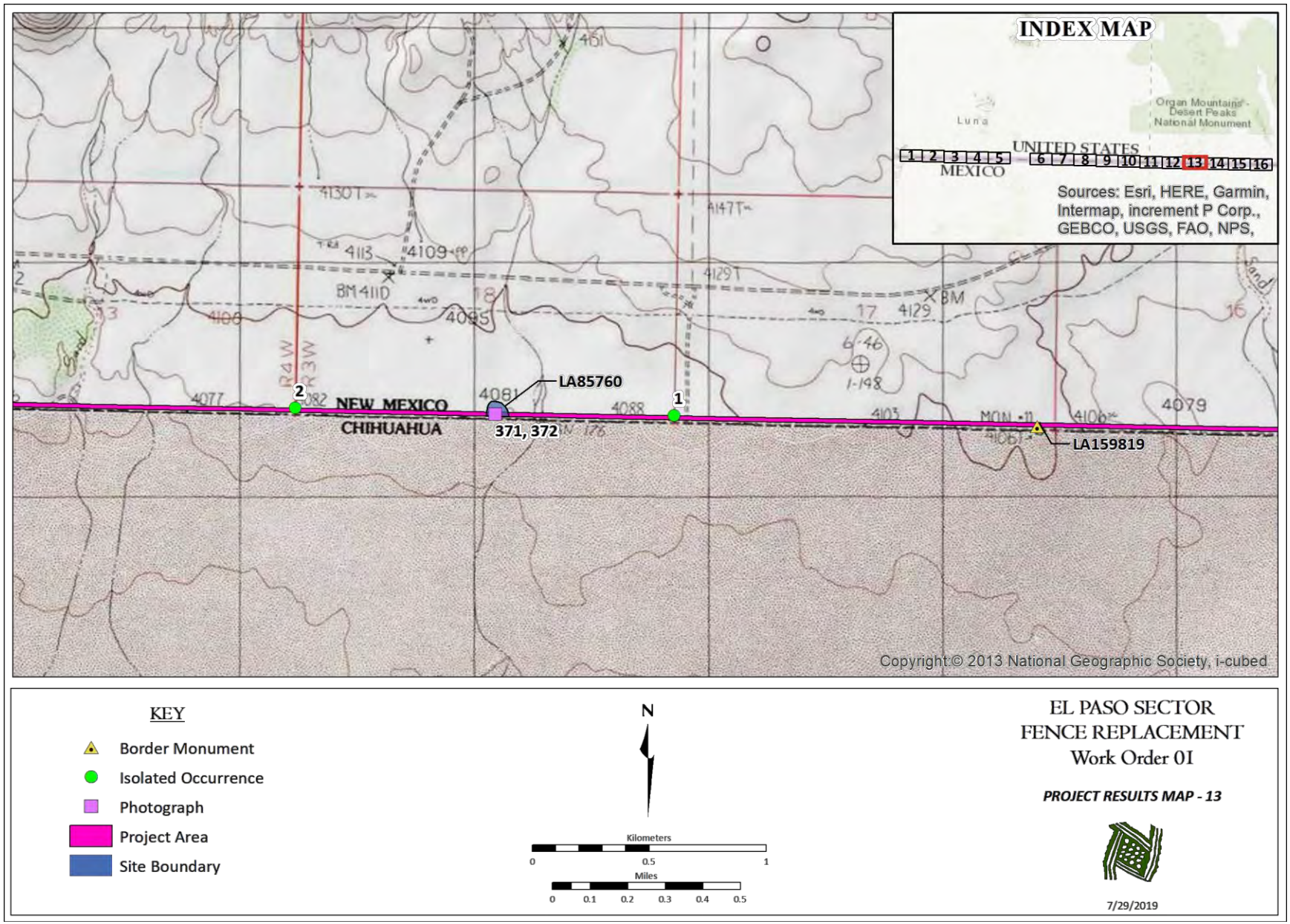

Figure B13. Roosevelt Reservation East segment, Map 13 of 16.

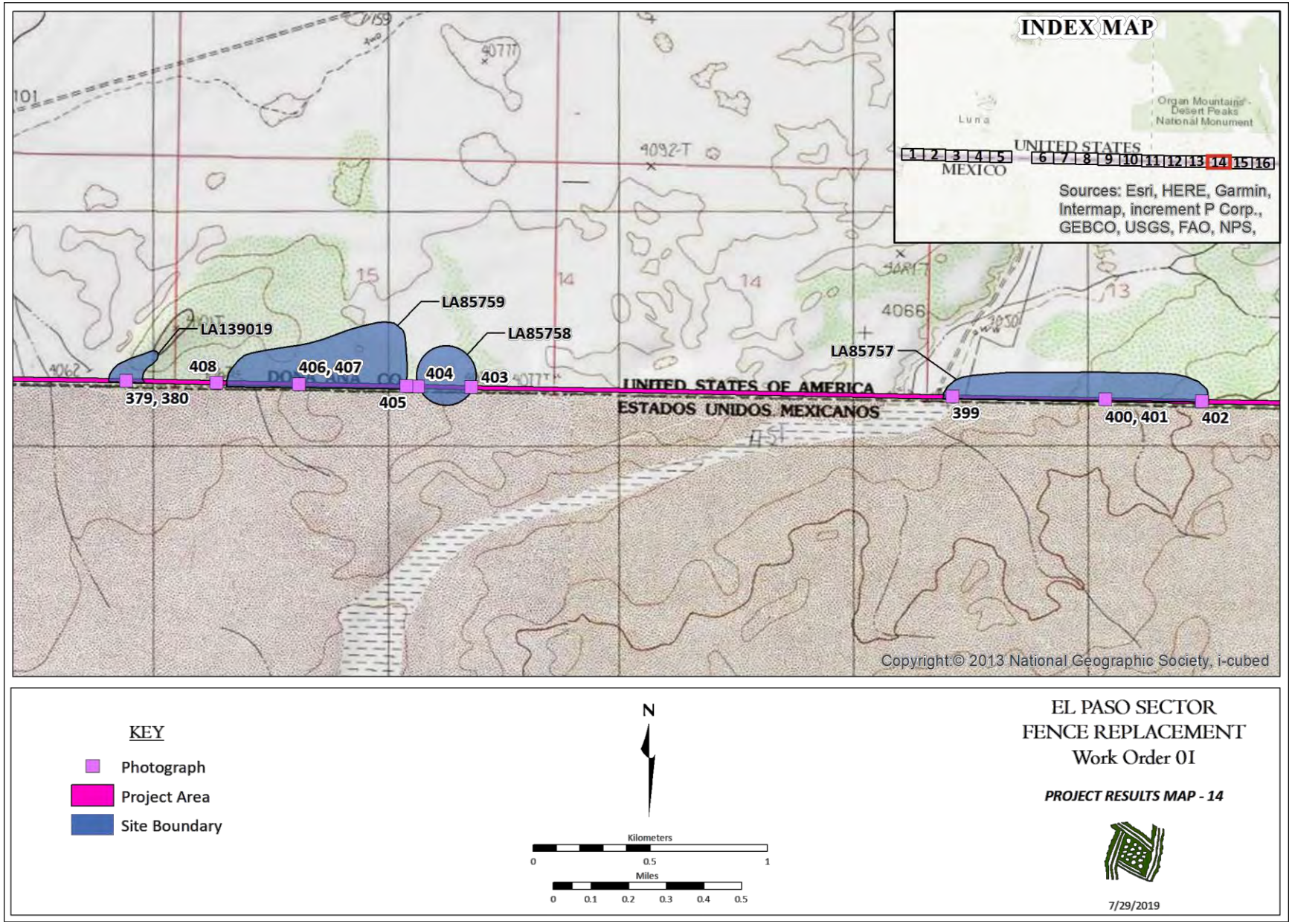

Figure B14. Roosevelt Reservation East segment, Map 14 of 16.

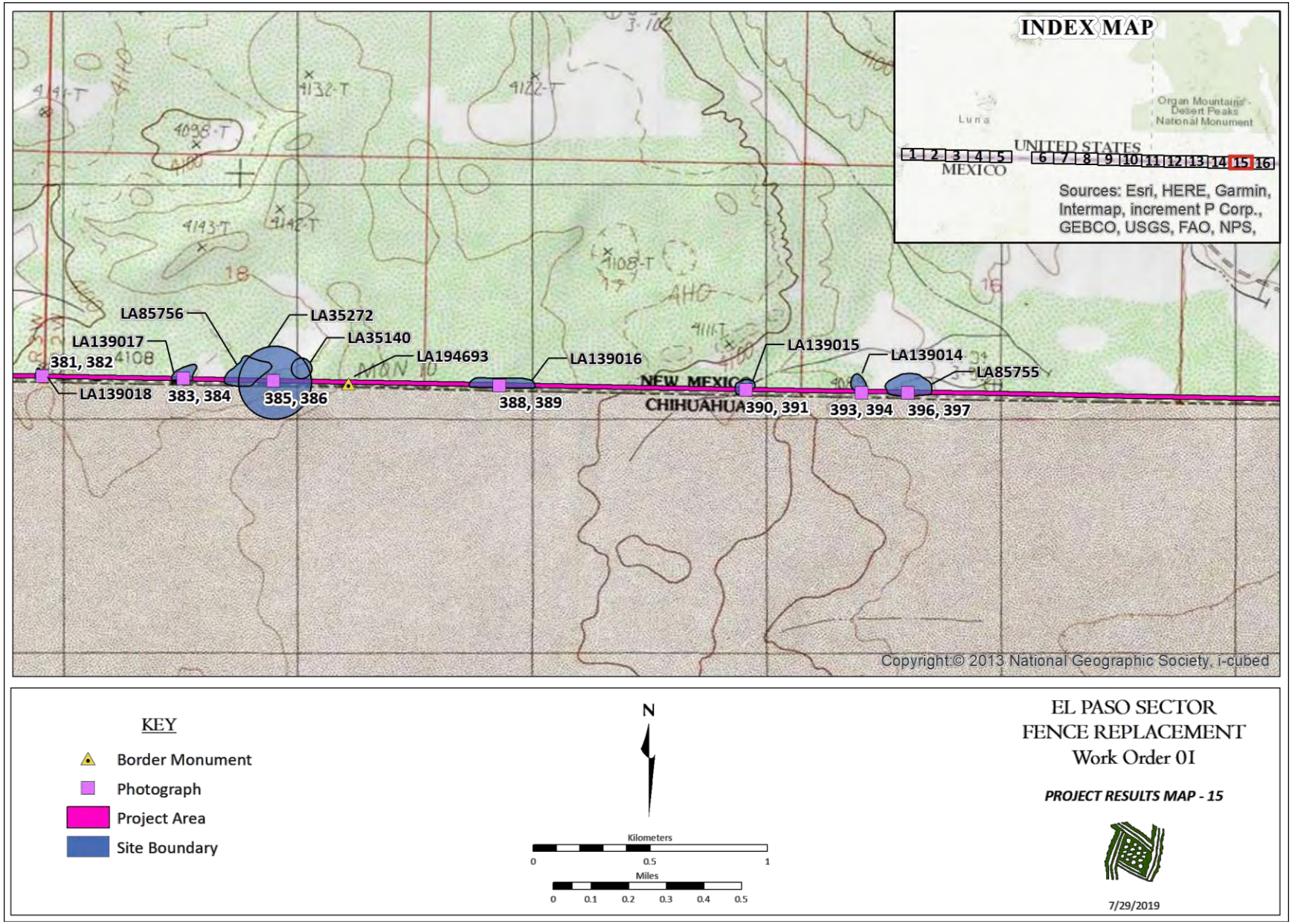

Figure B15. Roosevelt Reservation East segment, Map 15 of 16.

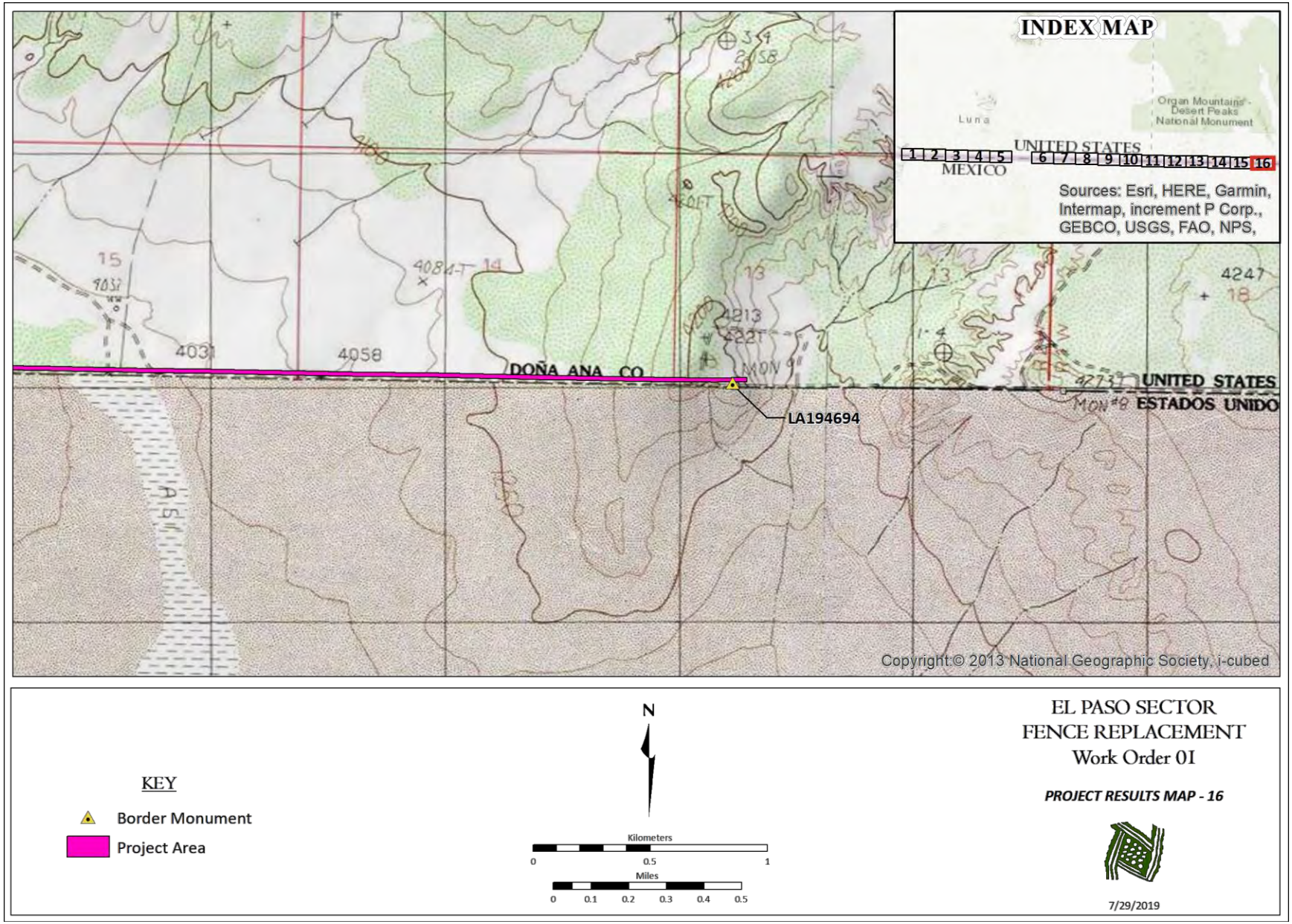

Figure B16. Roosevelt Reservation East segment, Map 16 of 16.

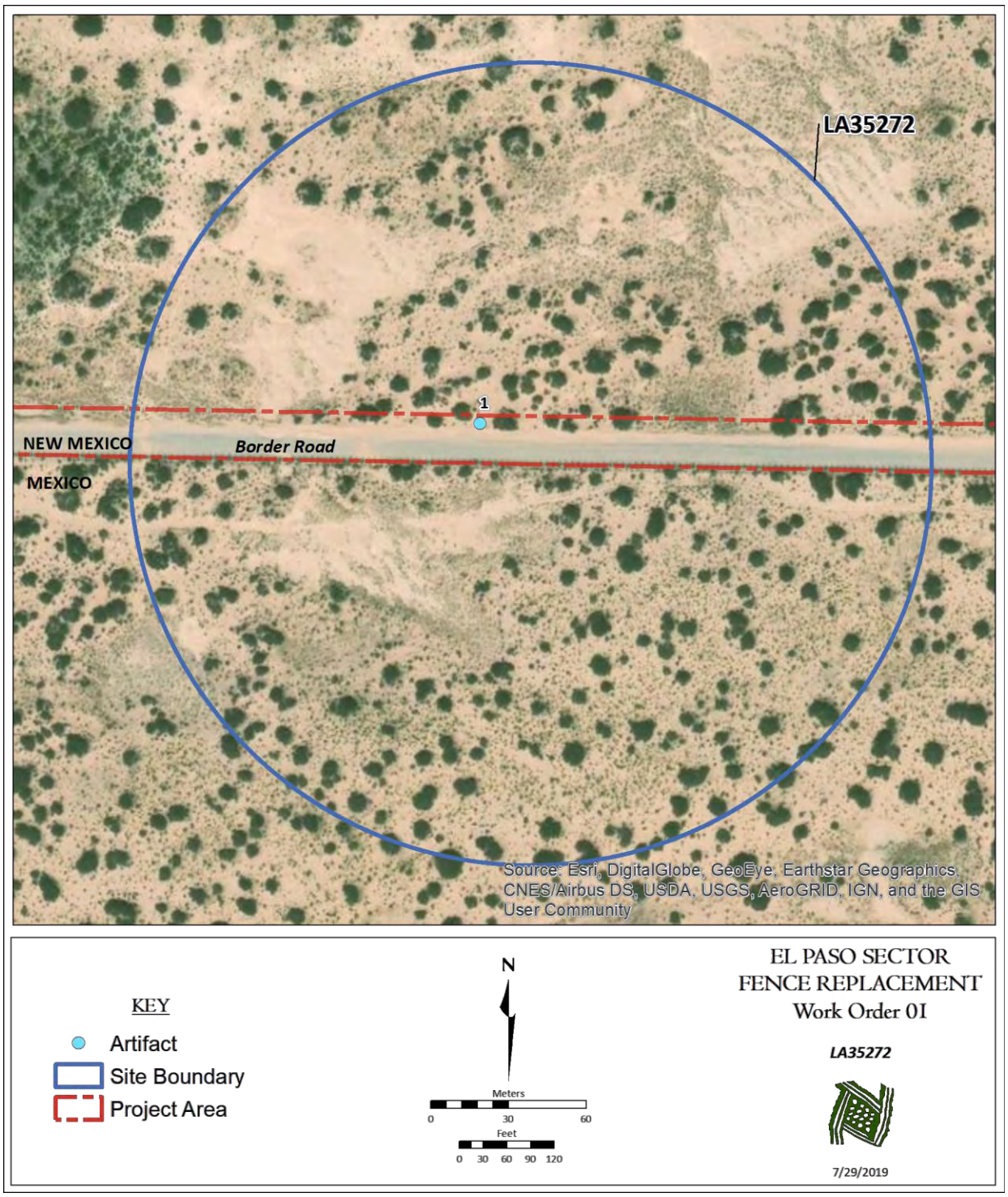

Figure B17. Results map of LA 35272.

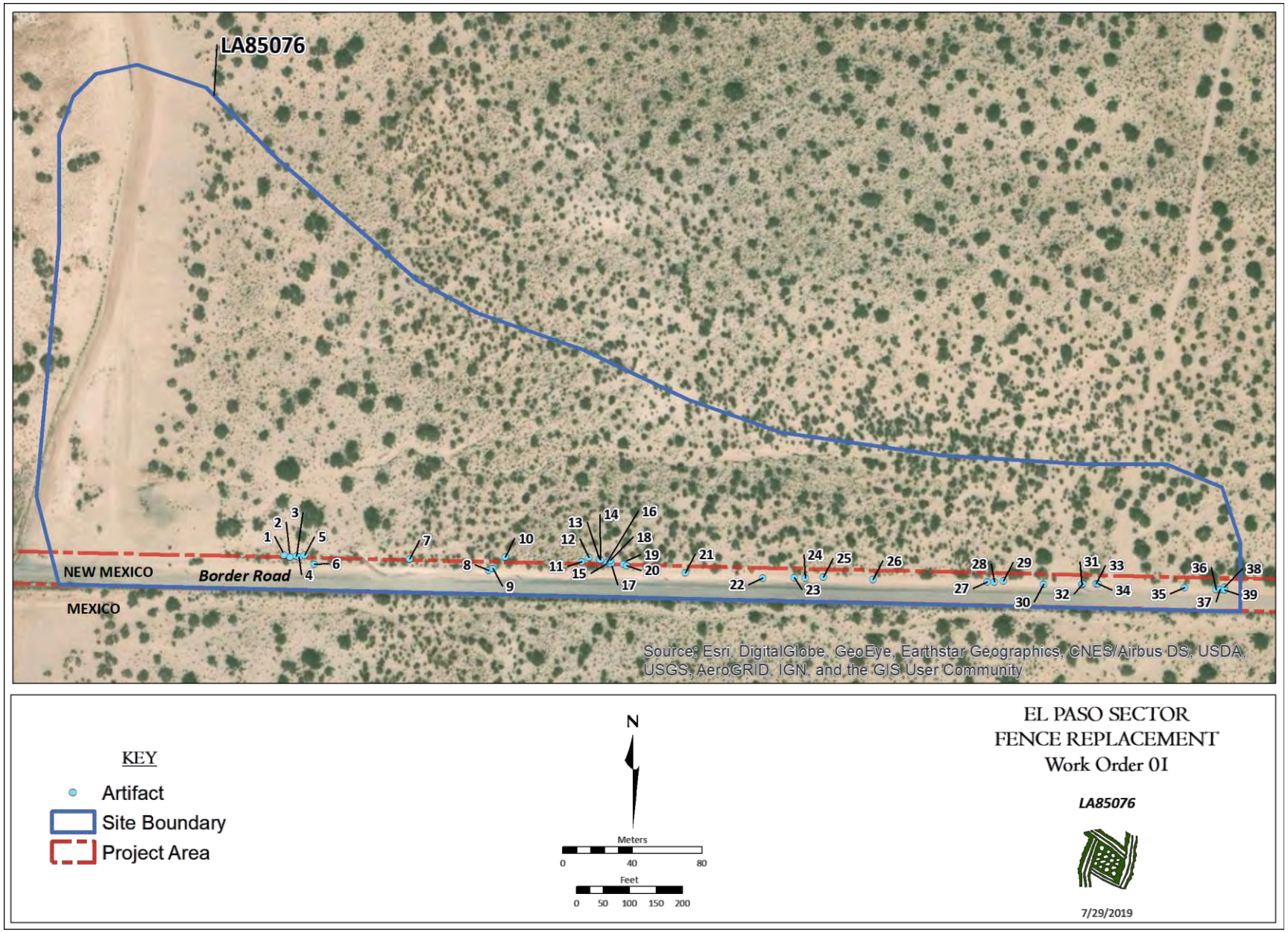

Figure B18. Results map of LA 85076.

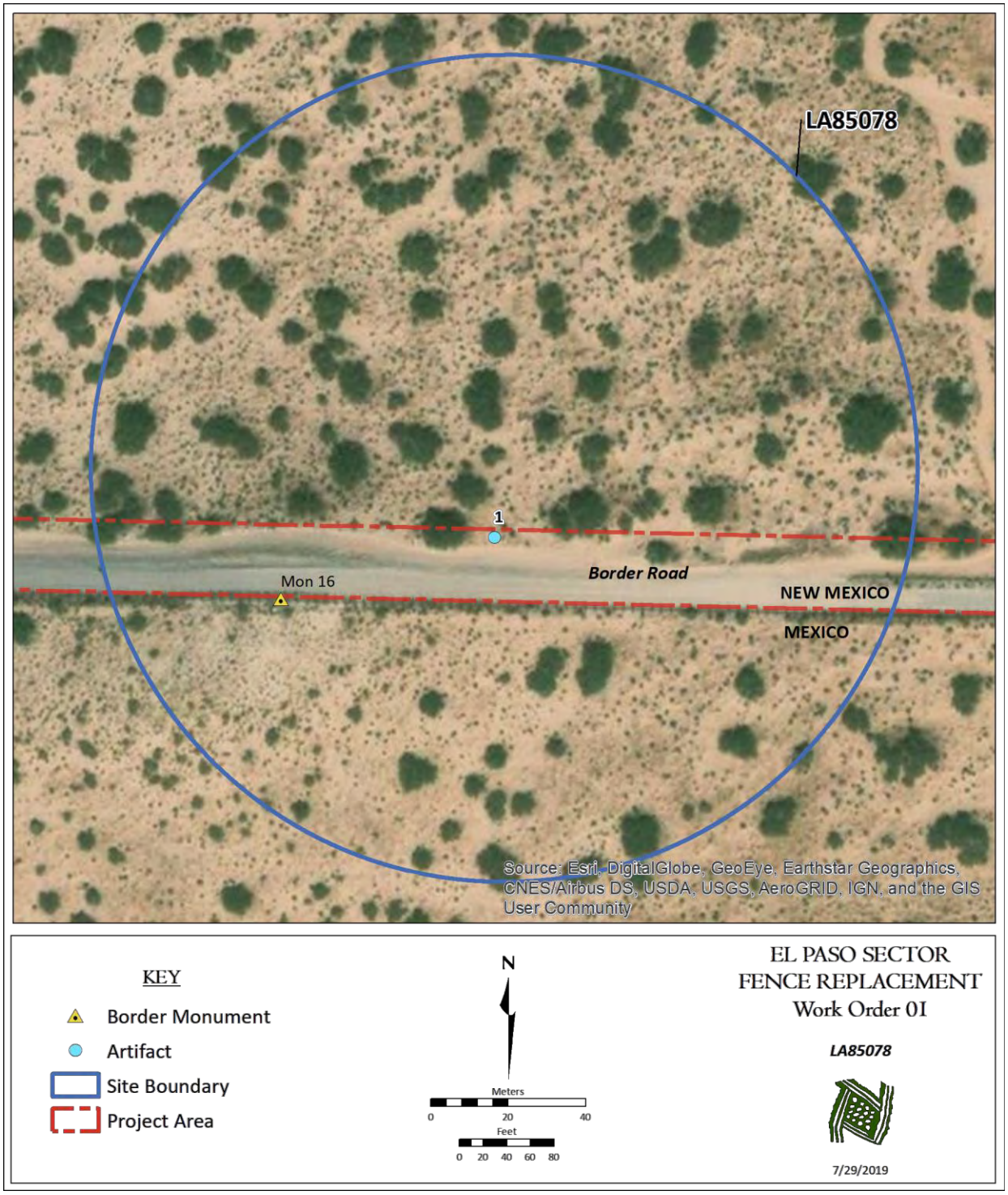

Figure B19. Results map of LA 85078.

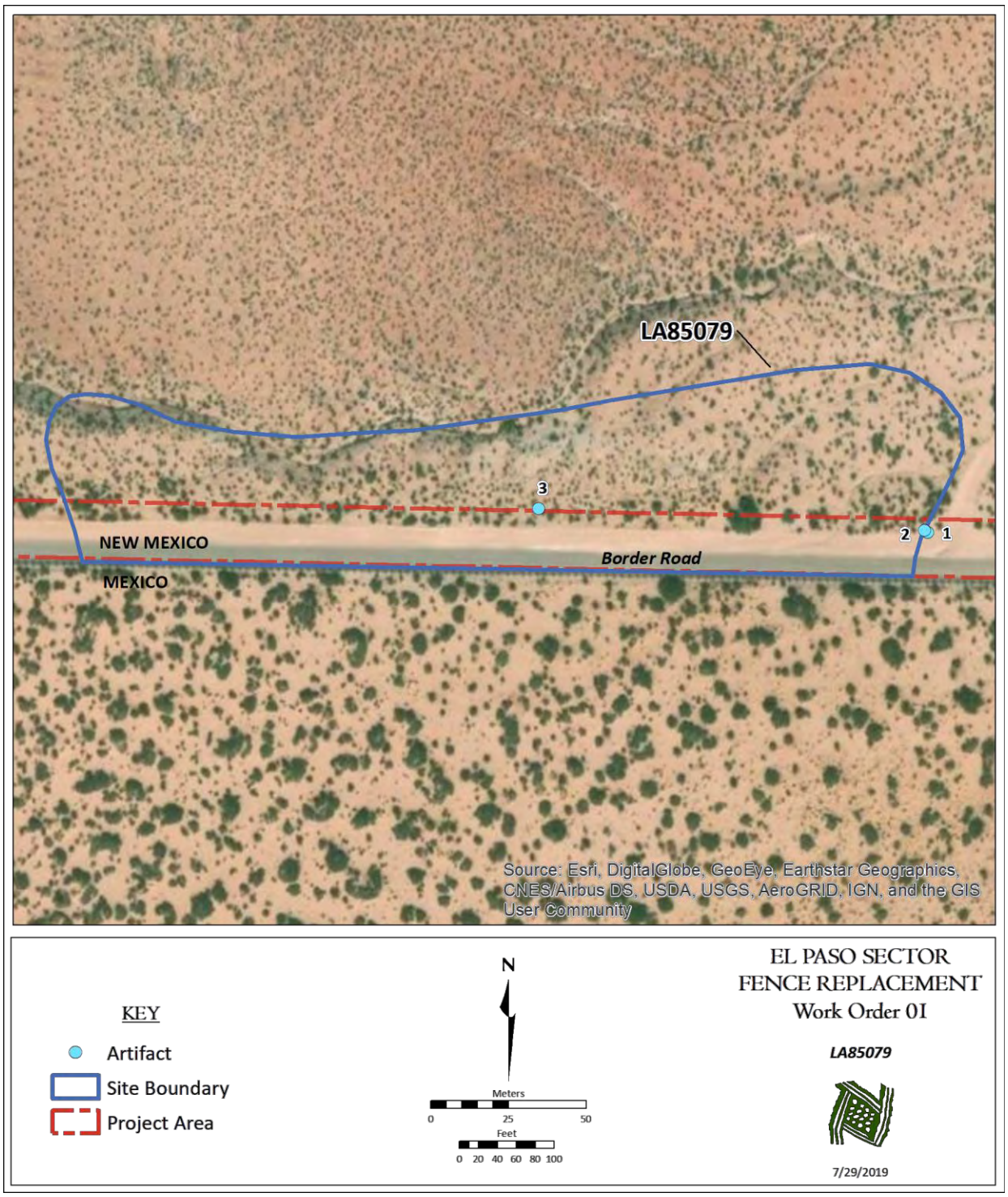

Figure B20. Results map of LA 85079.

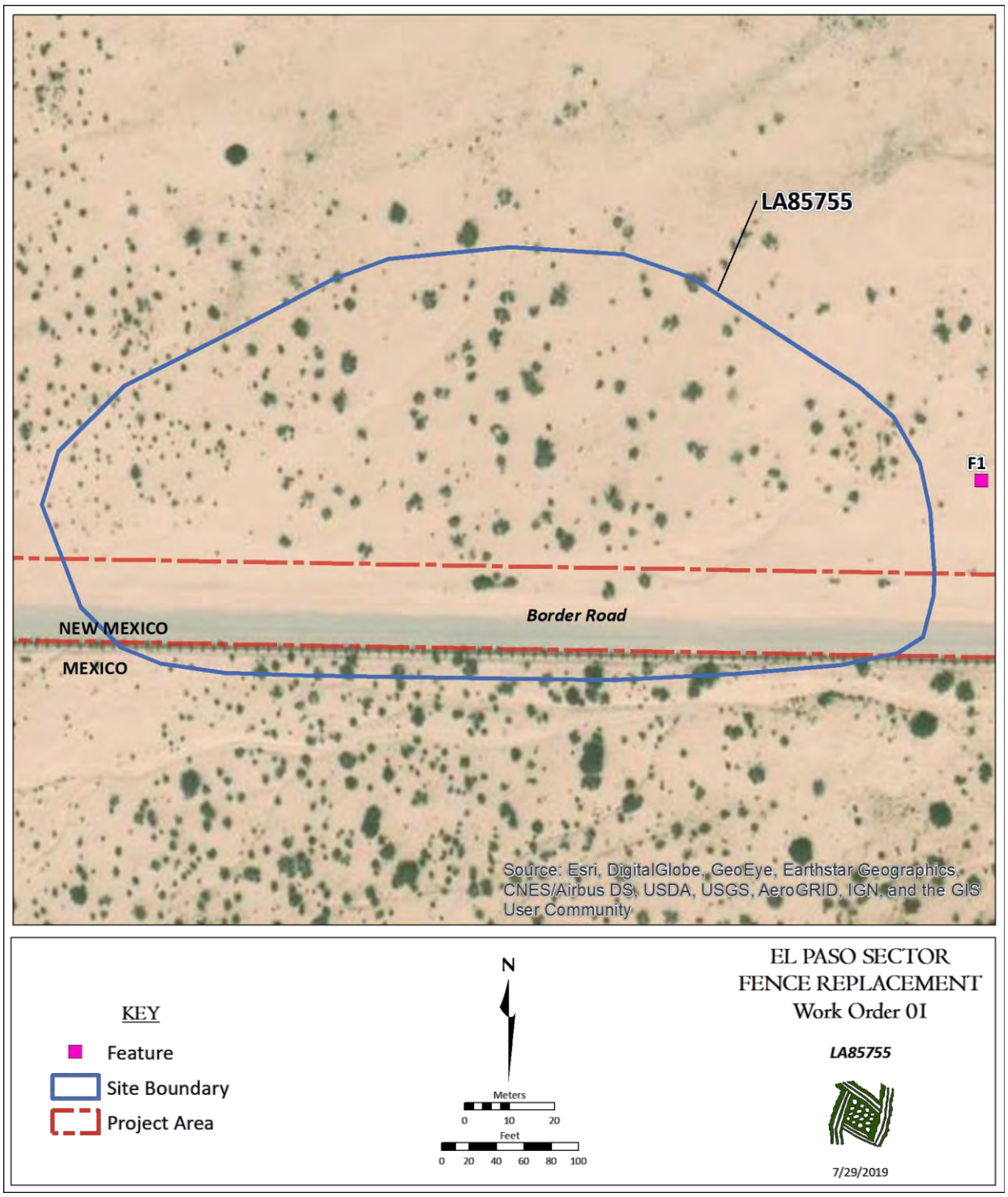

Figure B21. Results map of LA 85755.

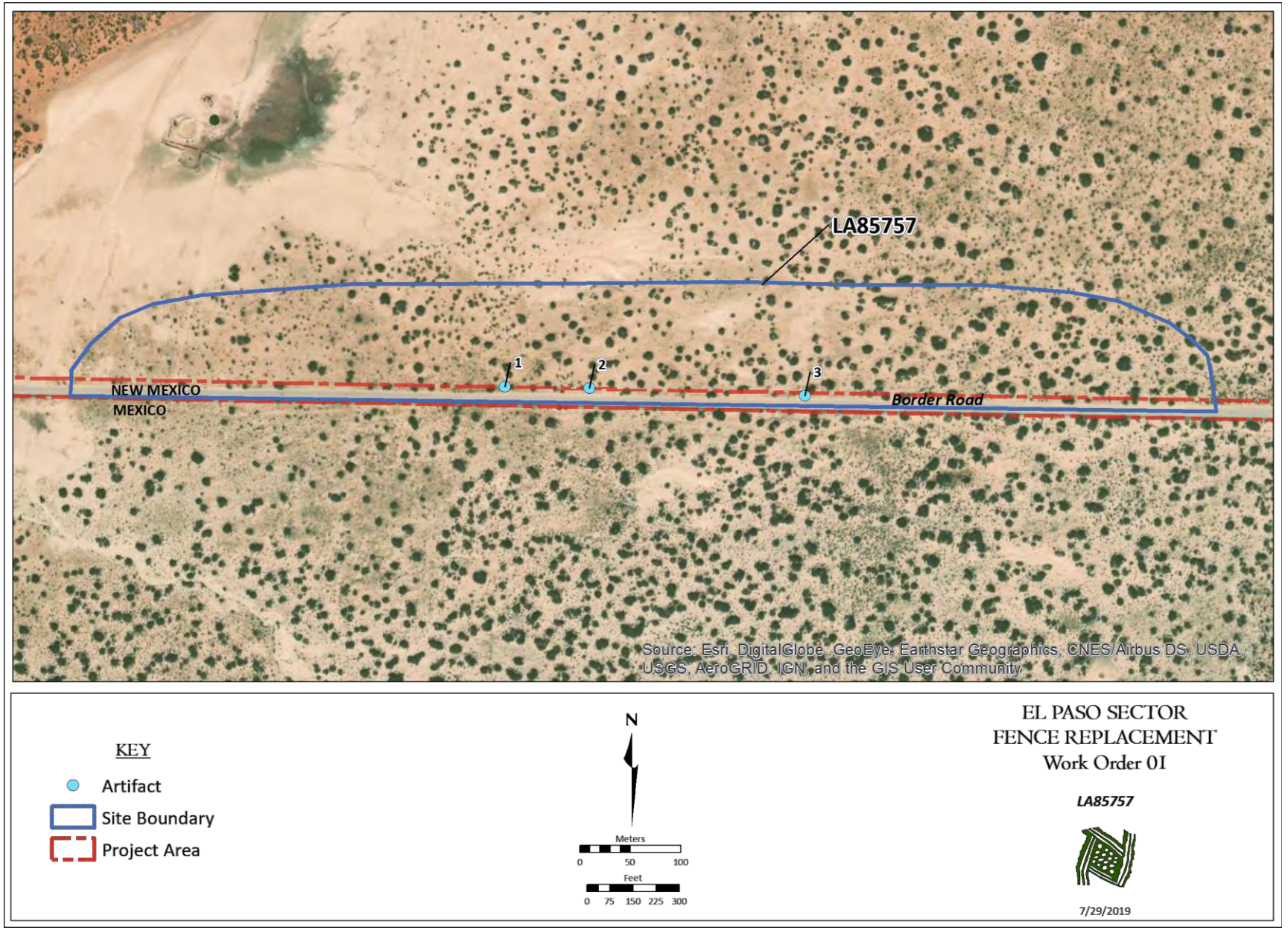

Figure B22. Results map of LA 85757.

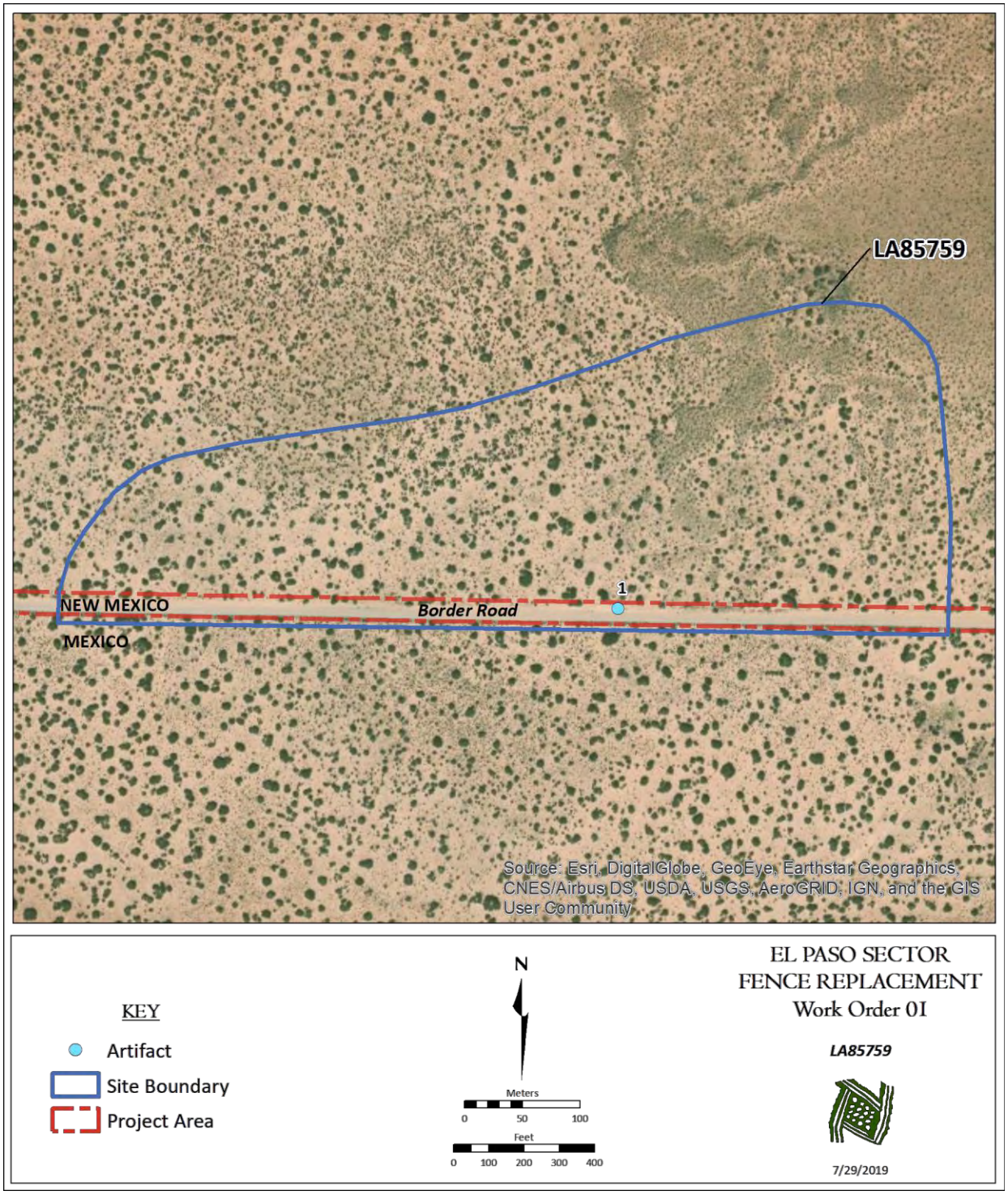

Figure B23. Results map of LA 85759.

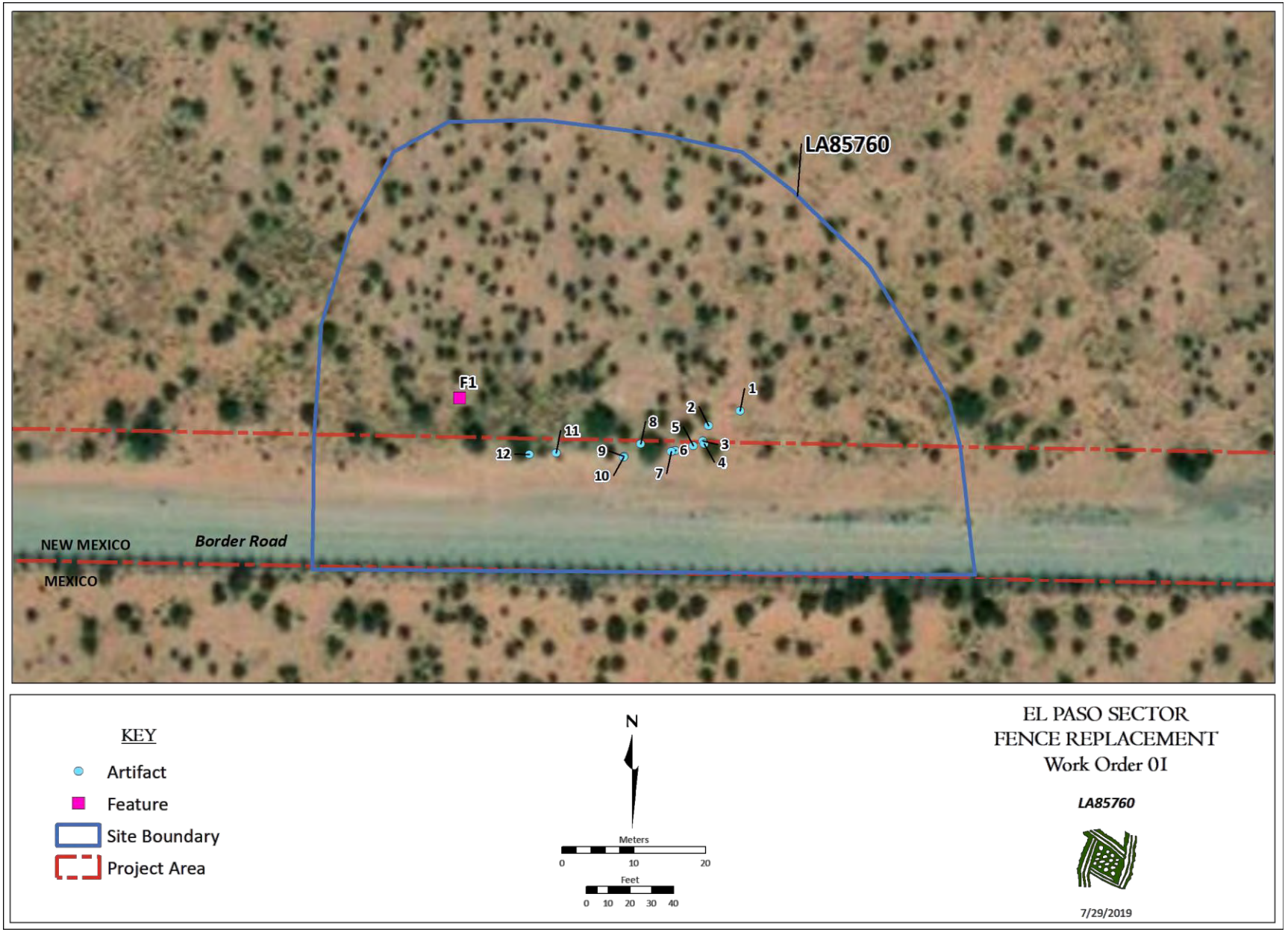

Figure B24. Results map of LA 85760.

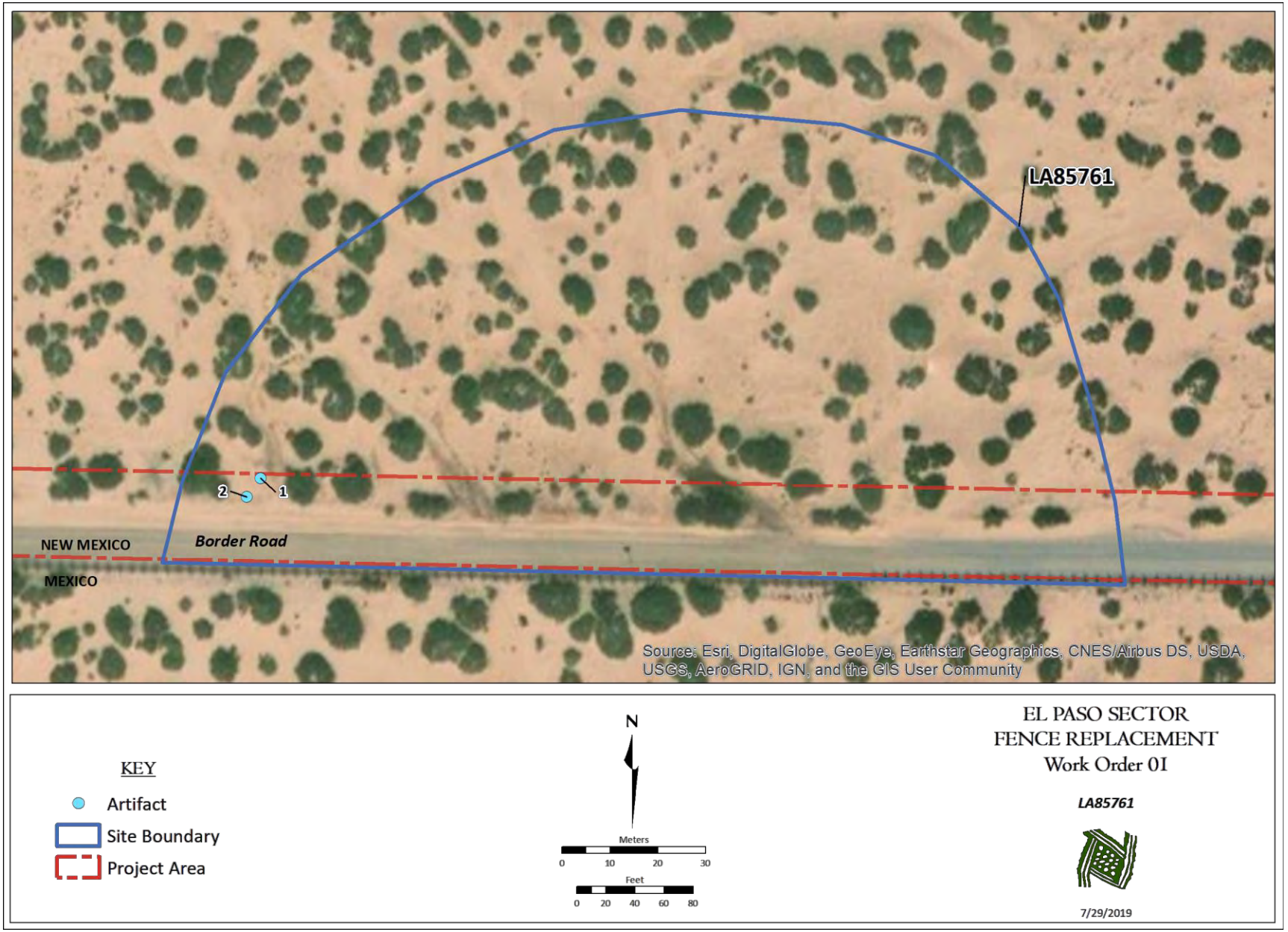

Figure B25. Results map of LA 85761.

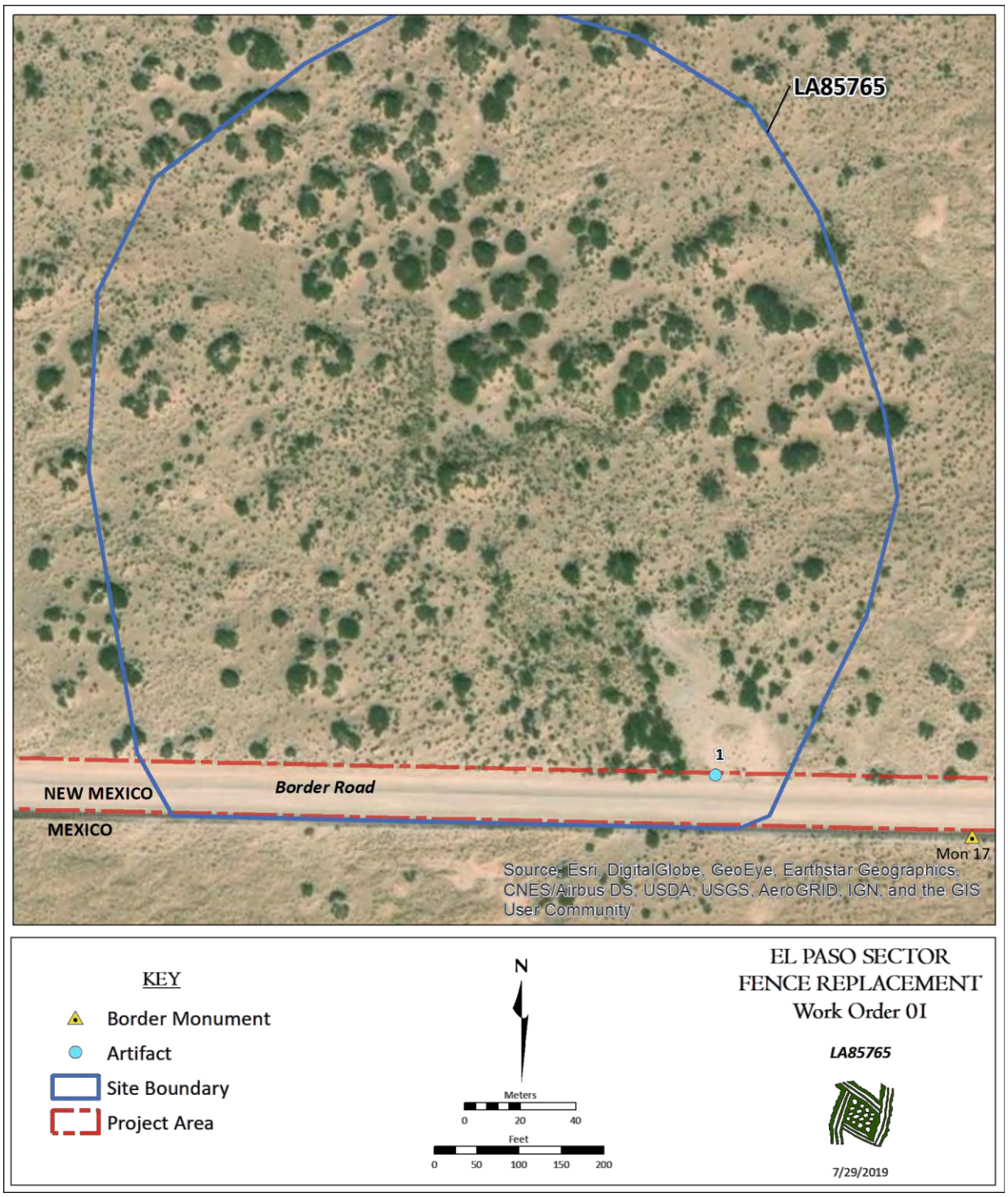

Figure B26. Results map of LA 85765.

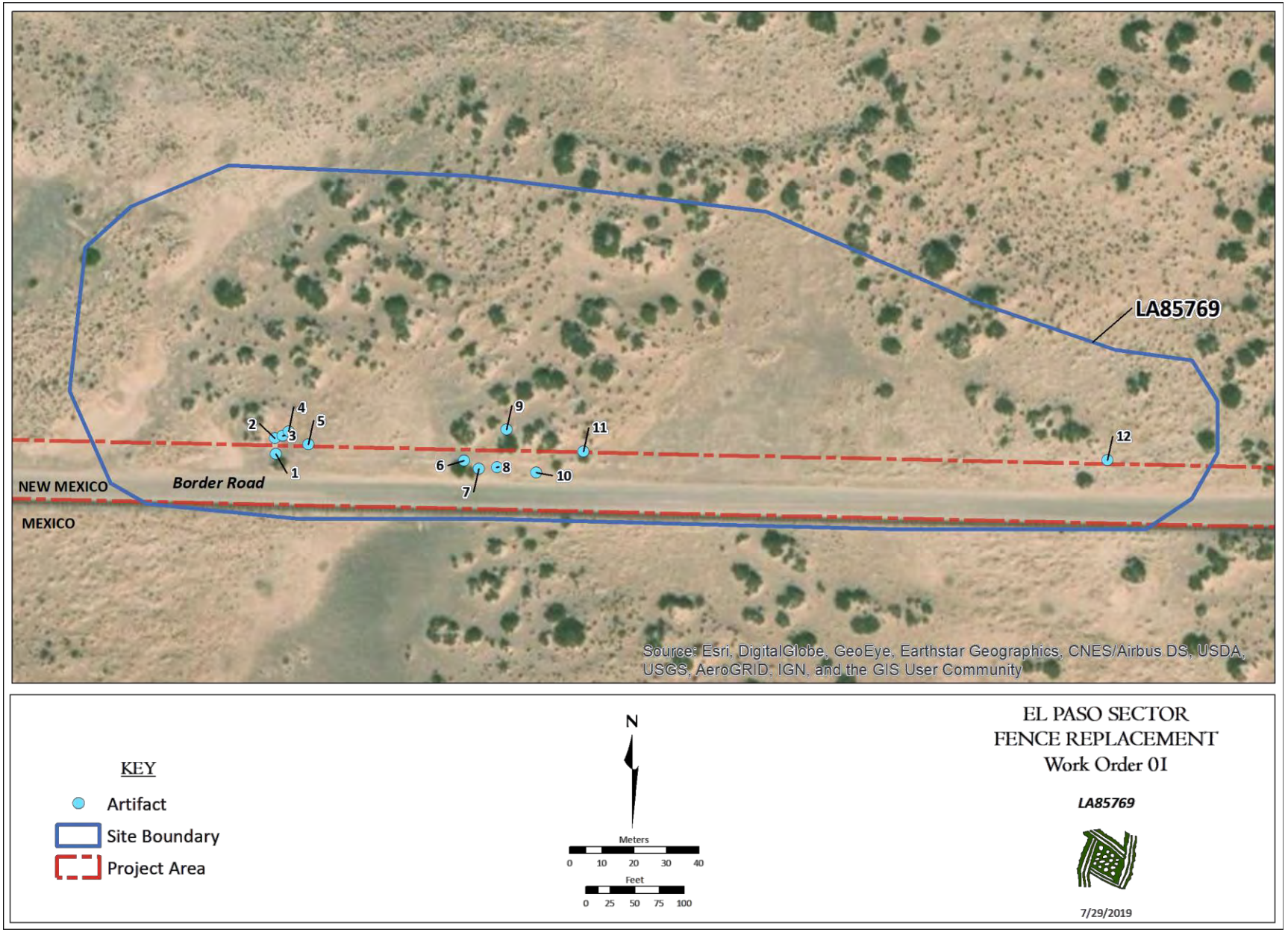

Figure B27. Results map of LA 85769.

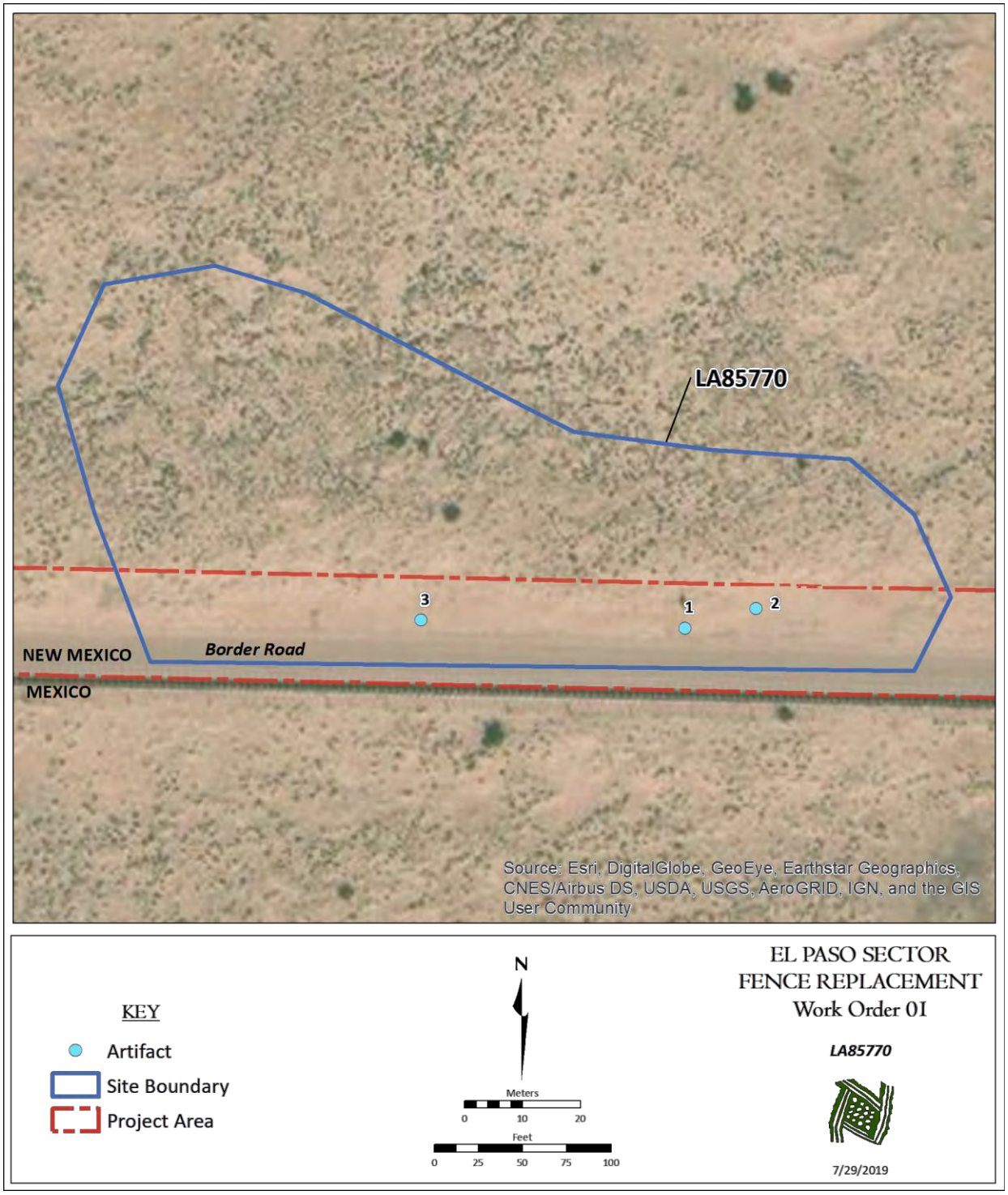

Figure B28. Results map of LA 85770.

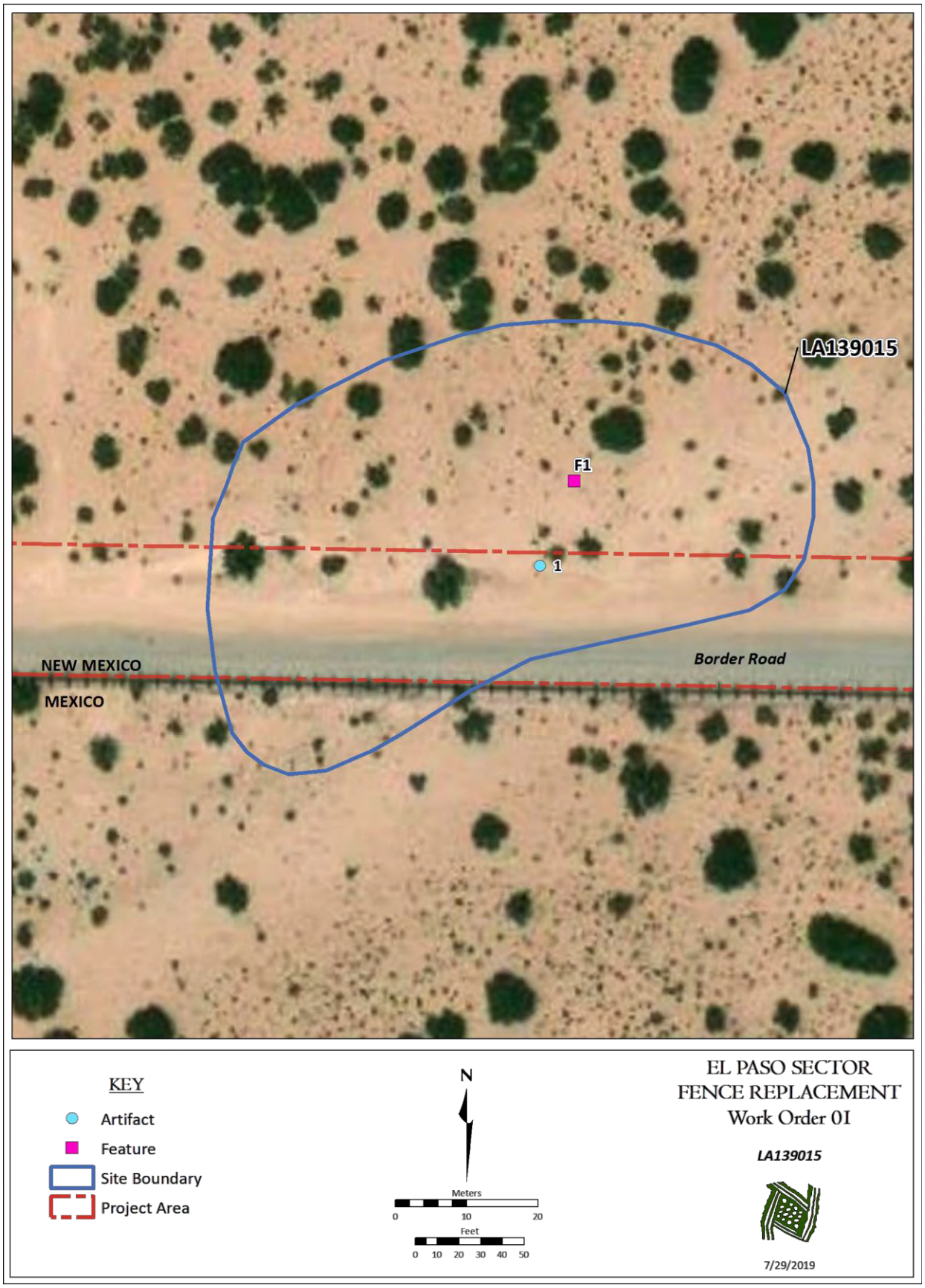

Figure B29. Results map of LA 139015.

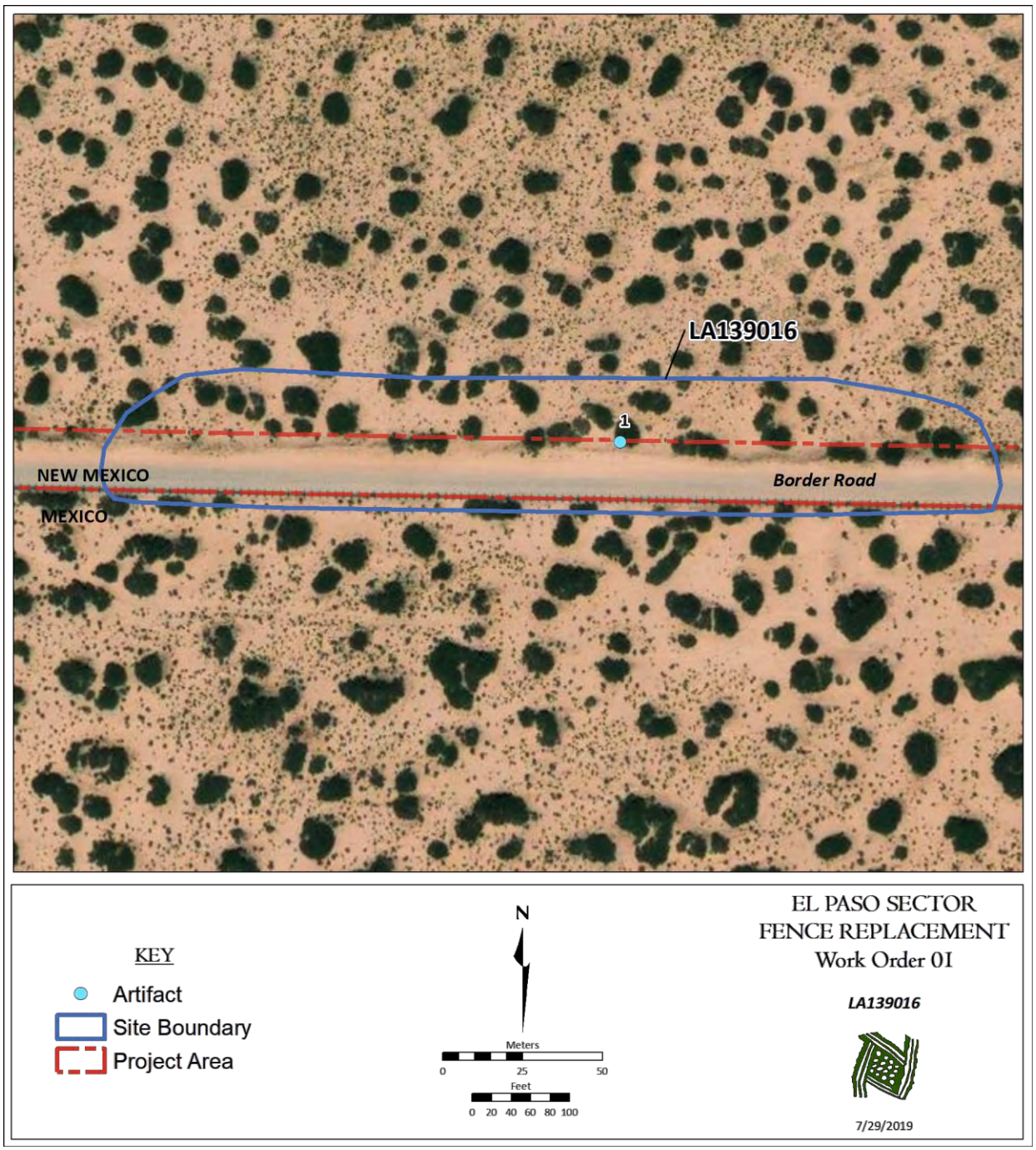

Figure B30. Results map of LA 139016.

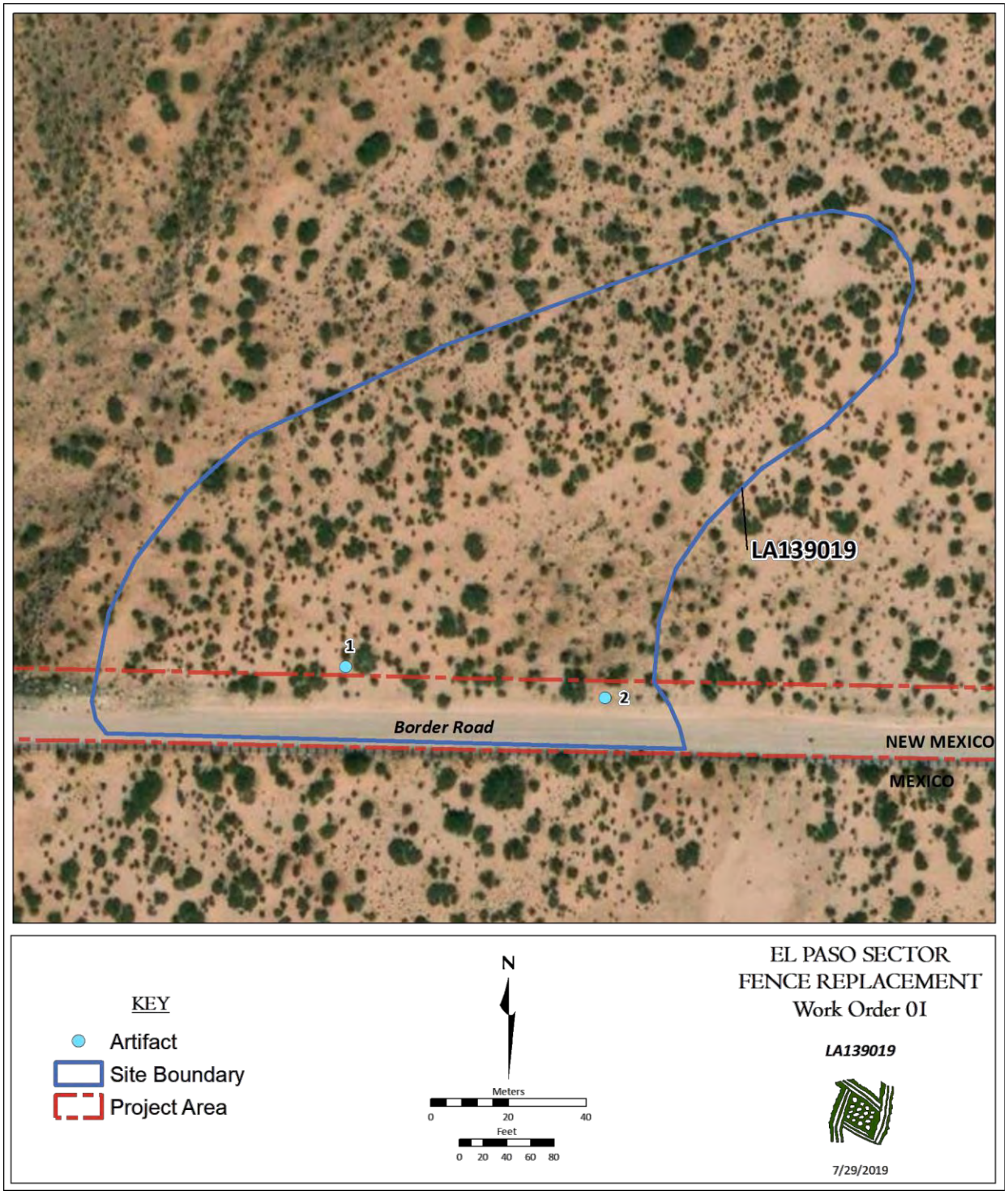

Figure B31. Results map of LA 139019.

APPENDIX C.

NEWLY RECORDED SITES

Figure C1. Overview of International Border Monument 30 facing southeast.

Figure C2. Overview of International Border Monument 29 facing south-southwest.

Figure C3. Overview of International Border Monument 28 facing south-southwest.

Figure C4. Overview of International Border Monument 26 facing south-southwest.

Figure C5. Overview of International Border Monument 25 facing south-southwest.

Figure C6. Overview of International Border Monument 24 facing south-southwest.

Figure C7. Overview of International Border Monument 19 facing south-southwest.

Figure C8. Overview of International Border Monument 18 facing south-southwest.

Figure C9. Overview of International Border Monument 17 facing south-southwest.

Figure C10. Overview of International Border Monument 15 facing south-southwest.

Figure C11. Overview of International Border Monument 14 facing south-southwest.

Figure C12. Overview of International Border Monument 10 facing south-southwest.

Figure C13. Overview of International Border Monument 9 facing south-southwest through existing bollard fence.

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APPENDIX D

Waters of the U.S. Jurisdictional Assessment

U.S. Customs and Border Protection

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Deming Station Area – Environmental Surveys Fence Replacement Projects

Waters of the U.S. Delineation Report

Deming, NM

Natural Channel Design, Inc.

July 2019

Deming Station Area – Environmental Surveys Fence Replacement Projects

Waters of the U.S. Delineation Report

Deming, NM

Submitted to:
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July 2019

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Executive Summary

Natural Channel Design, Inc documented nineteen potential waters of the U.S. during a survey of an approximate 46-mile stretch of the international border between the U.S. and Mexico. Project area was located within the Roosevelt Reservation in the Customs and Border Protection's Deming Station Area of Responsibility. These channels exhibited an ordinary high water mark, and traveled into or from Mexico, crossing the border, and as such could be considered interstate waters and subject to Army Corp jurisdiction under current regulations.

Project Background

The U.S. Customs and Border Protection (CBP) is preparing environmental resource surveys for the planned replacement of two sections of existing vehicle fence with an improved pedestrian fence along the U.S/Mexico border in the Deming Station Area of Responsibility. The project area has two segments. Segment 1 starts approximately 19 miles west of the Santa Teresa port of entry at Border Monument 9 and extends west approximately 31.5 miles to Border Monument 20. Segment 2 starts at Border Monument 23 and extends west approximately 15 miles to Border Monument 31. Construction will occur within the 60 foot Roosevelt Reservation along the New Mexico/Mexico border.

Report Outline

This report documents current site conditions and attempts to identify potential Waters of the U.S. within the project corridor. Sites that are potentially jurisdictional are broken out in this report and include maps showing delineated areas along with photo documentation and descriptions of each site. The preliminary jurisdictional determination worksheets are provided in Appendix A.

Project Site

The project area is located within the 60-foot wide Roosevelt Reservation along a 46-mile stretch of the U.S.- Mexican border west of El Paso, in western Dona Ana County and Southern Luna County in New Mexico. Observed drainages typically originate in the West Potrillo and Tres Hermanas Mountains, and flow south into Mexico. The landform is primarily composed of shrub coppice dunes with sparsely-vegetated interdunes, transforming to a more playa-like habitat with widespread sand dunes. The soil is generally fine sandy loam with low runoff potential, though some of the steeper hillslopes are more gravelly sandy loam with higher runoff potential (NRCS web soil survey). Vegetation is primarily mesquite, saltbush and yucca with very sparse grass, with creosote bush in the western areas. The far western end of the survey area traverses through agricultural fields.

Delineation Methods

The project area is limited to the 60 ft. wide Roosevelt Reservation. The survey included driving the existing patrol road and identifying and photographing any channels or other fluvial features along the route. The ground within the Roosevelt Reserve has been heavily impacted by road construction, vehicle travel and surface maintenance. In all areas, the Ordinary High Water Mark (OHWM) was only observable upstream of the road, typically

outside of the Reserve boundary. Views over the fence into Mexico allowed visual estimation of the OHWM, but no travel across the border was undertaken.

Within the project area, the existing border road, border fence and associated maintenance has obliterated almost all natural channel forms. As water flows across the road, it tends to pool and spread as it crosses before reentering the downstream channel. Therefore, the stream channel extending to the north of the road, outside the project area, was evaluated for the presence of an OHWM. If an OHWM was observed, the outline was surveyed utilizing MapItFast™ software created by AgTerra Technologies, Inc. The software was installed on an android tablet that has GPS capability. The channel flow path was then estimated as it flowed across the Reservation from/to Mexico to estimate the potential jurisdictional area inside the project area. Existing channel information to the north of the Reserve was also recorded on paper data sheets which are included as a separate attachment. It is assumed that these channel conditions would have been present through the relatively short reach as it flowed through the Reservation prior to the installation of the road.

The delineation of OHWM in the channel outside of the Reserve followed the methods identified in the USACOE document "Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States". Delineation utilized field observations of channel geomorphology and associated vegetation, along with aerial photo interpretation. The lateral extent of the OHWM was mapped along a change of substrate and/or slope breaks along banks, and/or the presence of vegetation extending out of the banks. The presence of scour lines or debris lines was limited due to the lack of streamflow. This region sees very little precipitation with an average annual precipitation of 9.7 inches (El Paso), with the majority taking place during the summer months. Within the Reserve, the estimated area that would be inundated from streamflow was drawn based on connections upstream and downstream from the road and fence.

The channel length across the reserve at each site is generally 60 feet, as most channels flow perpendicular to the road crossing. The estimated area of inundation of the road crossings are larger than is seen in the intact channel upstream of the crossings. This is due to a lack of defined channel and water tends to pool and spread. This estimated area at each site was drawn on the site maps and recorded in table 1.

Results

There are no perennial channels within the project site. None of the drainages that flow through the project area appear to connect to a Traditional Navigable Water (TNW) and do not have a significant nexus to any TNW, but are Isolated Waters. It appears that all drainages ultimately recede into the ground or end in dry lake beds, either along the border or slightly over the border into Mexico. However, since they do flow across the international boundary they could be defined as interstate waters. As interstate waters, they would be jurisdictional under the Clean Water Act (1986/1988 Regulatory Definition of "Waters of the United States 40 CFR 230.3(s)).

During the survey, there were nineteen washes identified that display an ordinary high water mark and originate in the U.S. or Mexico and cross the international border. These channels

are not relatively permanent waters (which are defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least seasonally, typically 3 months), but are ephemeral and appear to flow in response to precipitation events. In following the flow chart presented in the U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook , page 10 (Figure 1), Army Corp Headquarters concurrence with a jurisdictional determination may be required. The channels described in this report were delineated for consideration as Preliminary Jurisdictional Areas and a summary of the channel locations and jurisdictional areas are included in Table 1.

Non-Jurisdictional Waters

Aerial photo interpretation show outlines of drainages crossing the border where there is sufficient subterranean moisture available to support a denser growth of mesquite. However upon ground inspection, there are no surface flows which create a channel or evidence of ordinary high water. Many are also depressional features or playas which may temporarily hold accumulated rainfall but due to the lack of moisture and vegetation, they do not support conditions to meet the definition of a wetland. There were no other wetlands identified in the field or on the National Wetland Inventory map within the project area.

Section 2 of this report shows an overview map of the survey area followed by individual site photos and delineated areas.

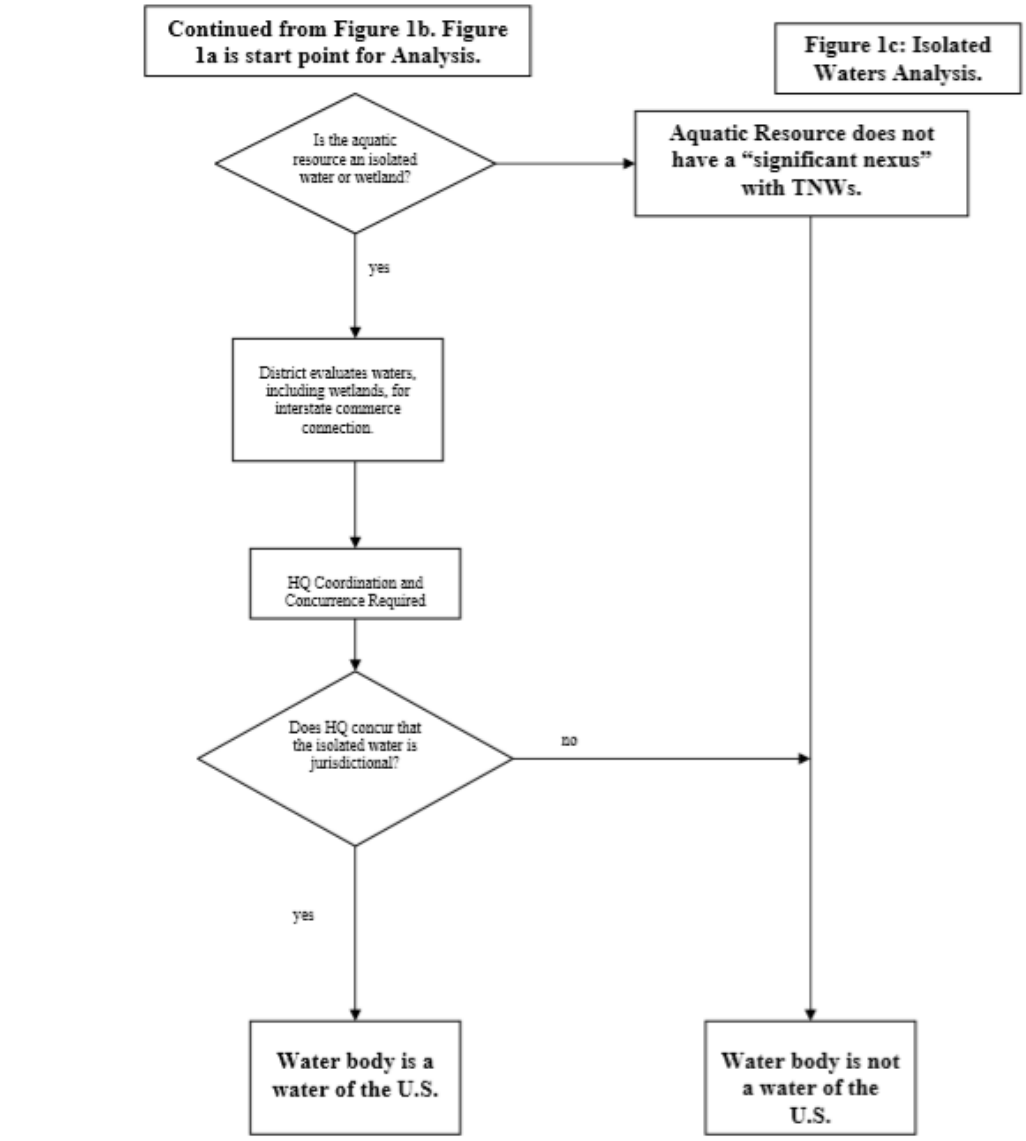

Figure 1. Flow chart for Isolated Water Analysis.

Table 1. Potential WOUS Summary

Site Name	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated Acreage in Project Area	Type of Resource
Dem A	31.7837	-107.10989	0.31	Isolated, riverine, Interstate Waters
Dem B	31.7837	-107.1503	0.04	Isolated, riverine, Interstate Waters
Dem C	31.7837	-107.184	0.04	Isolated, riverine, Interstate Waters
Dem D	31.7837	-107.2013	0.07	Isolated, riverine, Interstate Waters
Dem E	31.7837	-107.205	0.066	Isolated, riverine, Interstate Waters
Dem F	31.7837	-107.2228	0.09	Isolated, riverine, Interstate Waters
Dem G	31.7837	-107.2345	0.05	Isolated, riverine, Interstate Waters
Dem H	31.7837	-107.2368	0.04	Isolated, riverine, Interstate Waters
Dem I	31.7837	-107.2769	0.05	Isolated, riverine, Interstate Waters
Dem J	31.7837	-107.3878	0.09	Isolated, riverine, Interstate Waters
Dem K	31.7837	-107.418	0.26	Isolated, riverine, Interstate Waters
Dem L	31.7837	-107.687	0.04	Isolated, riverine, Interstate Waters
Dem M	31.7837	-107.7007	0.09	Isolated, riverine, Interstate Waters
Dem N	31.7837	-107.7264	0.017	Isolated, riverine, Interstate Waters
Dem O	31.7837	-107.7271	0.016	Isolated, riverine, Interstate Waters
Dem P	31.7837	-107.7361	0.014	Isolated, riverine, Interstate Waters
Dem Q	31.7837	-107.7441	0.023	Isolated, riverine, Interstate Waters
Dem R	31.7837	-107.7535	0.2	Isolated, riverine, Interstate Waters
Dem S	31.7837	-107.8269	0.06	Isolated, riverine, Interstate Waters
Dem T	31.7837	-107.8658	0.09	Isolated, riverine, Interstate Waters
Dem U	31.7837	-107.8675	0.038	Isolated, riverine, Interstate Waters
		Total WOUS in Project Area (acres)	1.694	

Section 2

Individual Site Photos and Locations

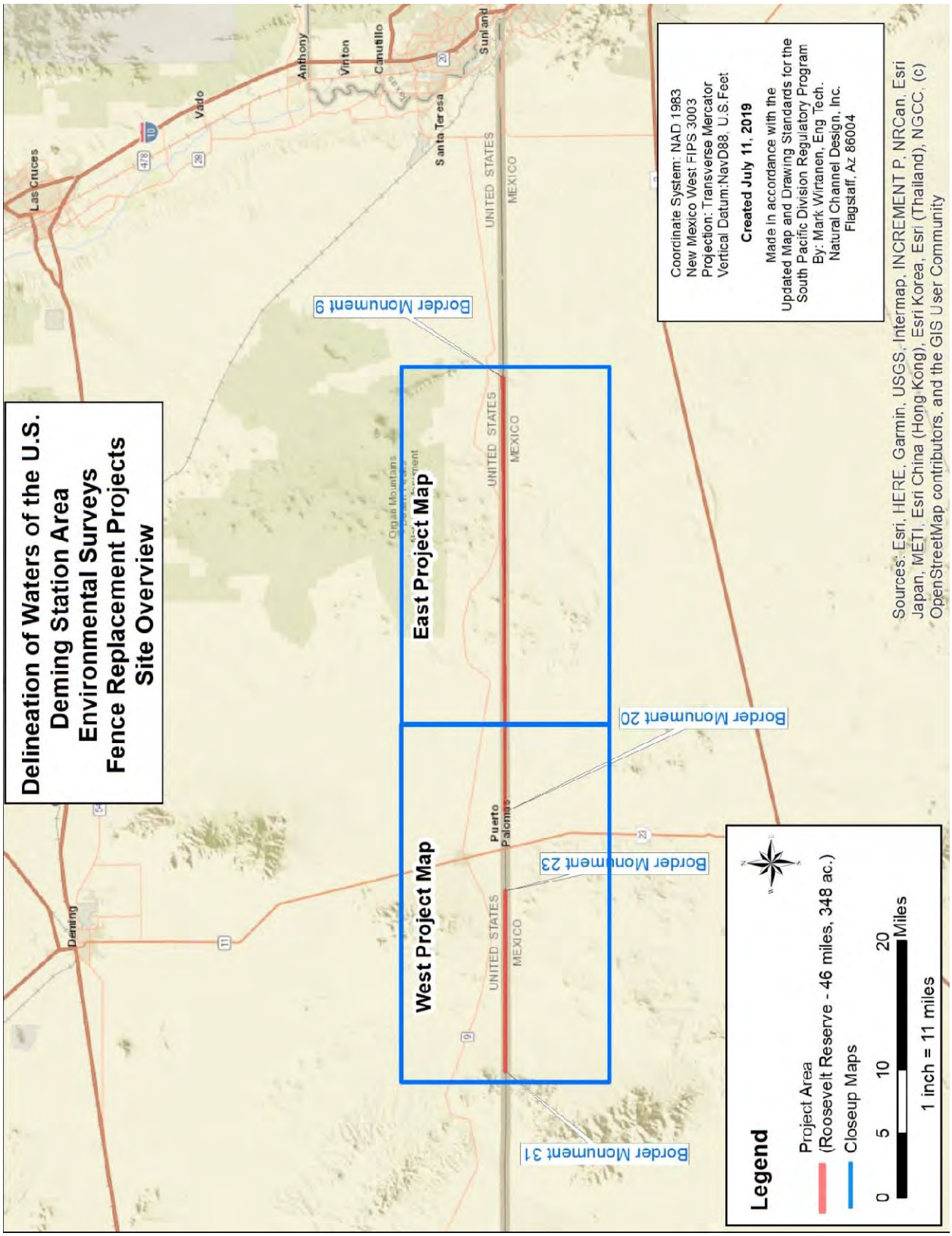

Figure 2. Overview Map of Project Location

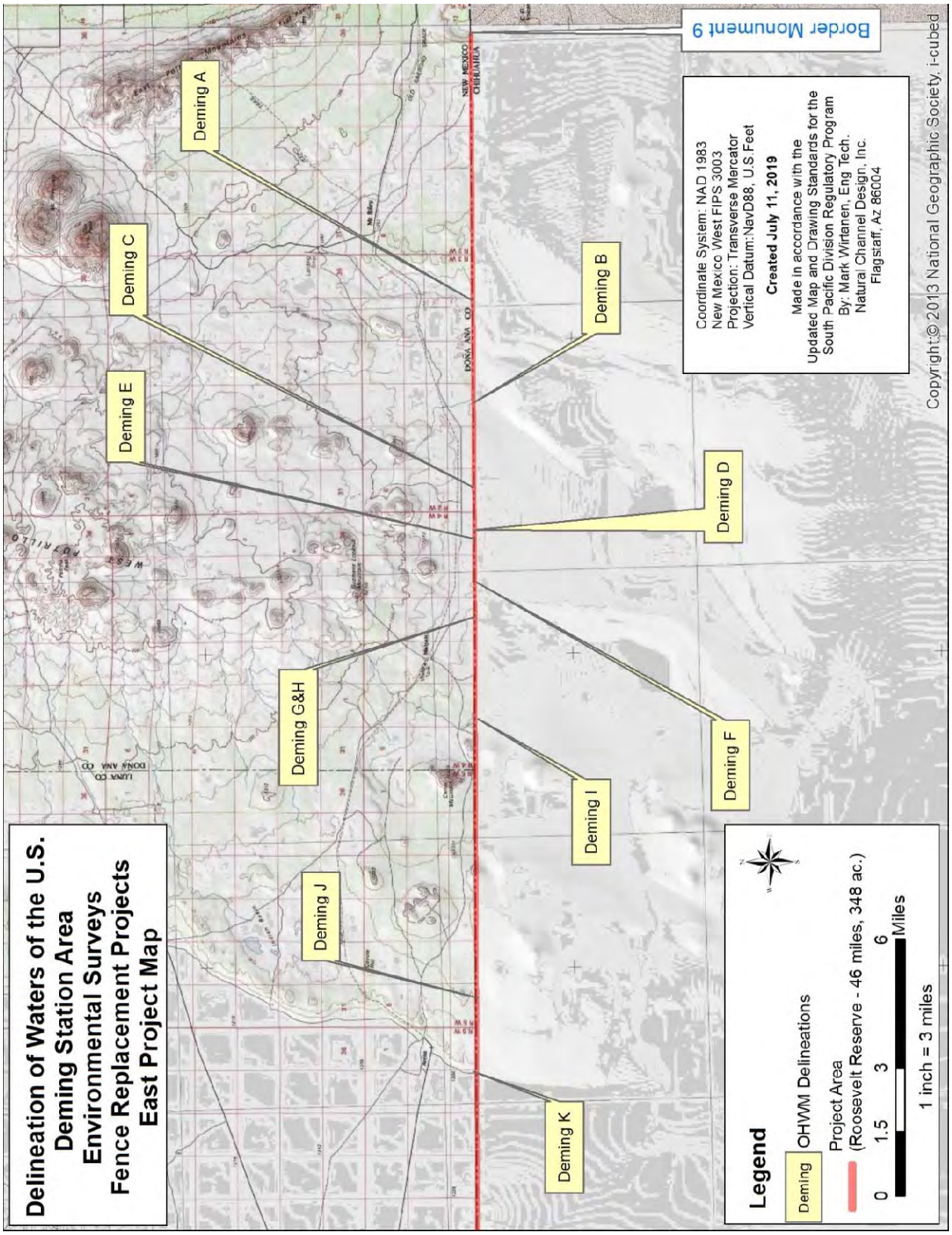

Figure 3. Individual wash locations – East end of project.

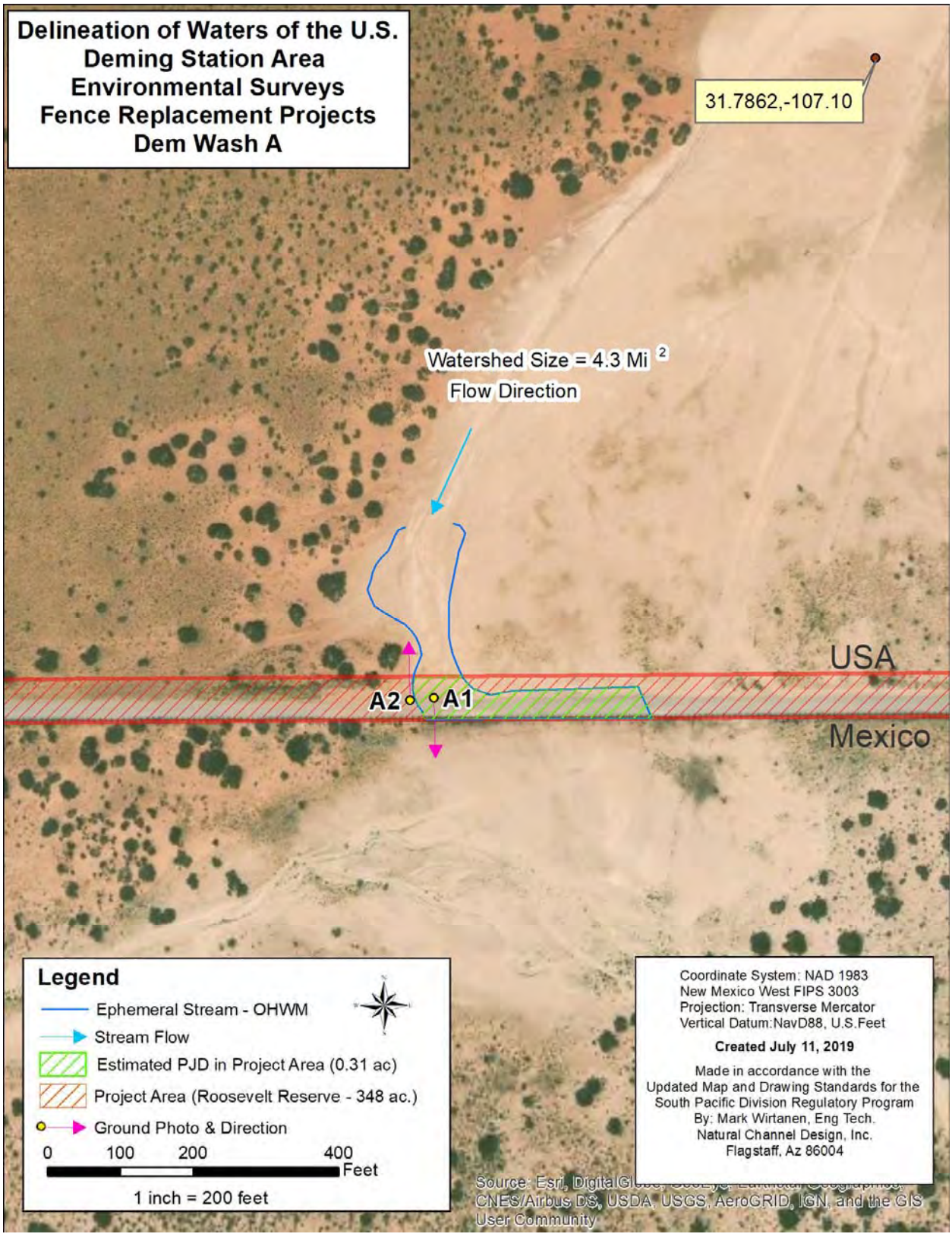

Figure 4. Aerial view of wash Deming A with photo points.

Figure 5. Photo point A1, Looking upstream into the U.S.

The upstream end of this wash is a dry lakebed. Though the watershed area is 4.3 sq mi, the actual contributing area is much smaller.

Figure 6. Photo point A2, looking downstream into Mexico.

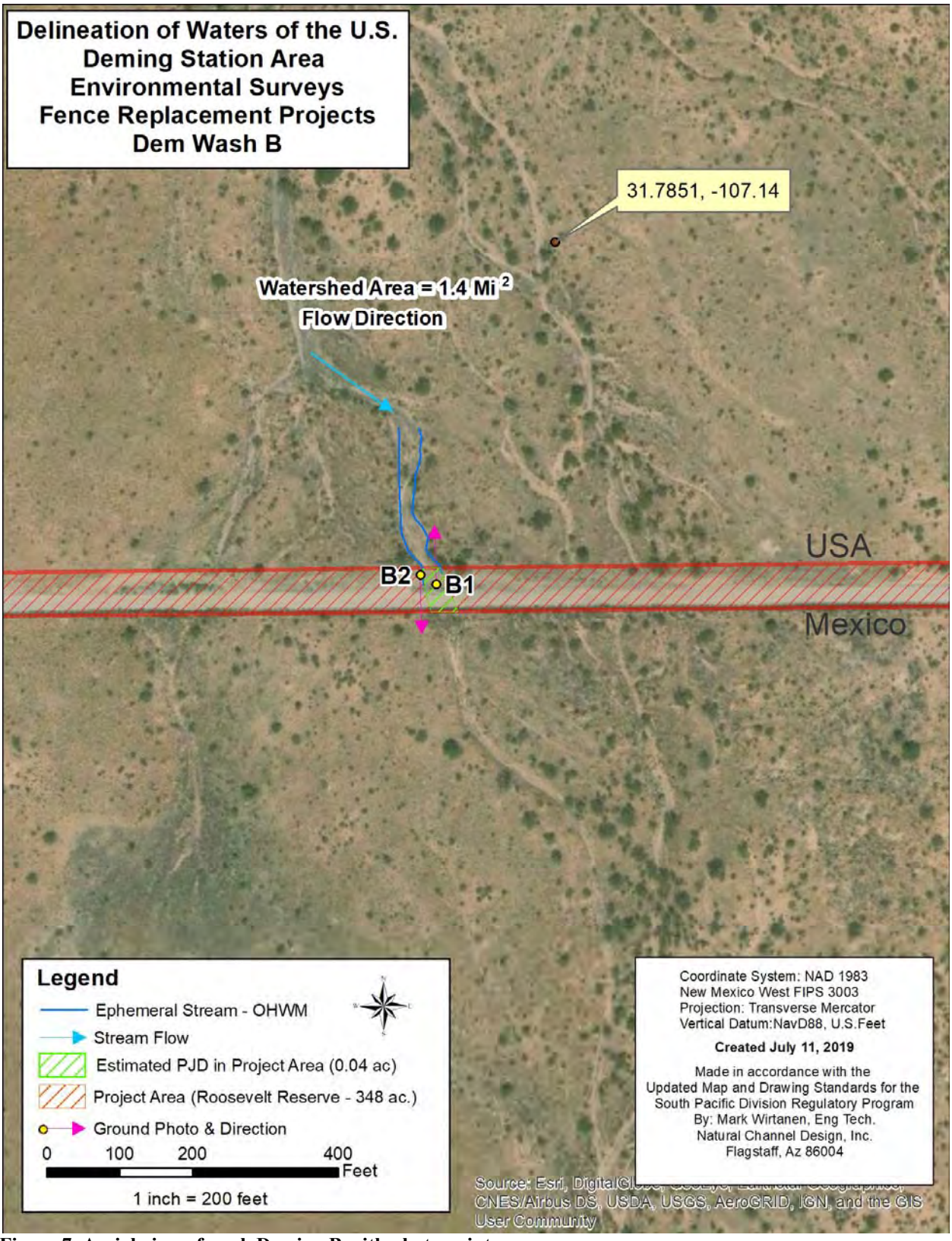

Figure 7 Aerial view of wash Deming B with photo points.

Figure 8 Photo point B1, looking upstream into the U.S.

Figure 9 Photo point B2, looking downstream into Mexico.

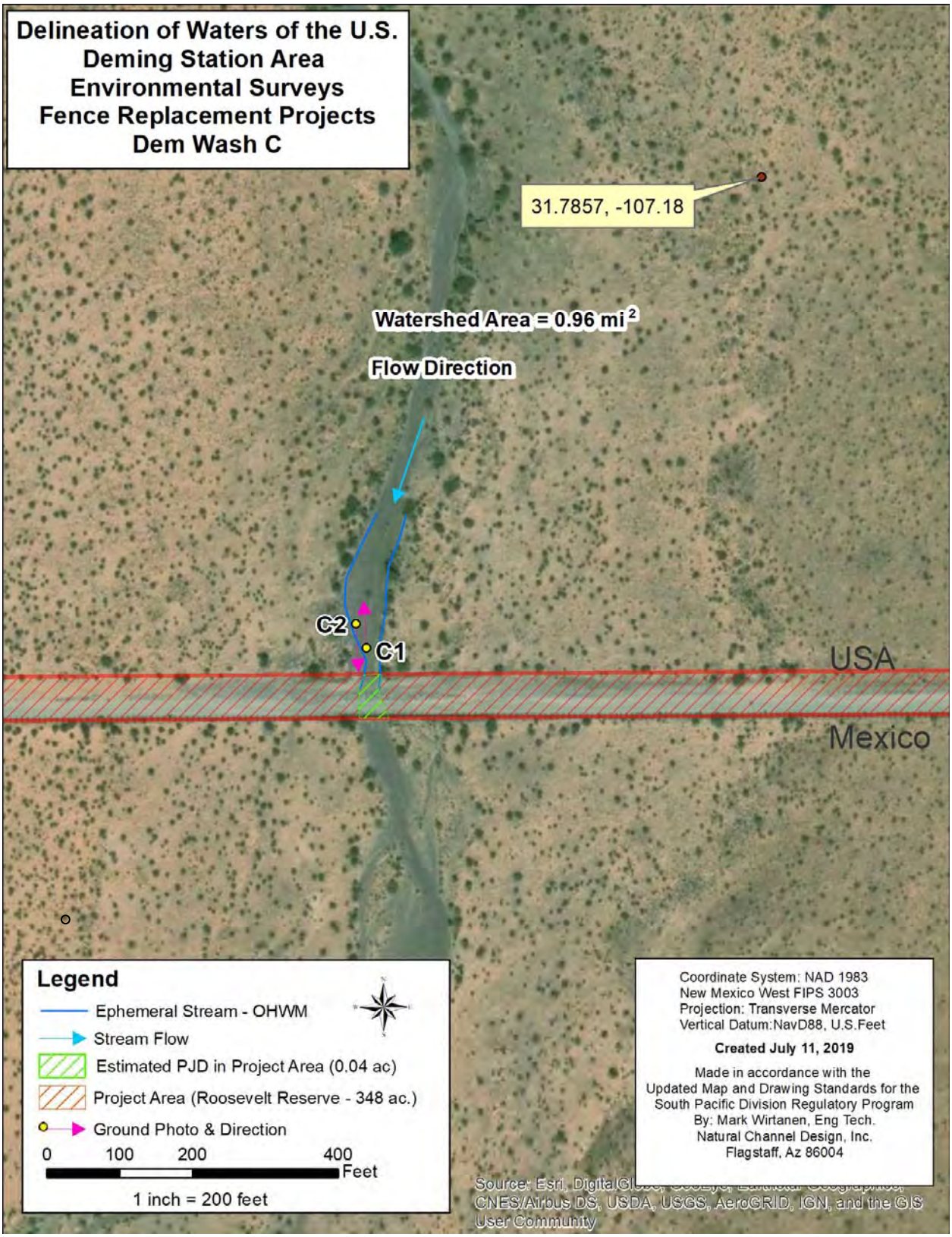

Figure 10 Aerial view of wash Deming C with photo points.

Figure 11 Photo point C1, looking upstream into the U.S.

Figure 12 Photo point C2, looking downstream towards Mexico.

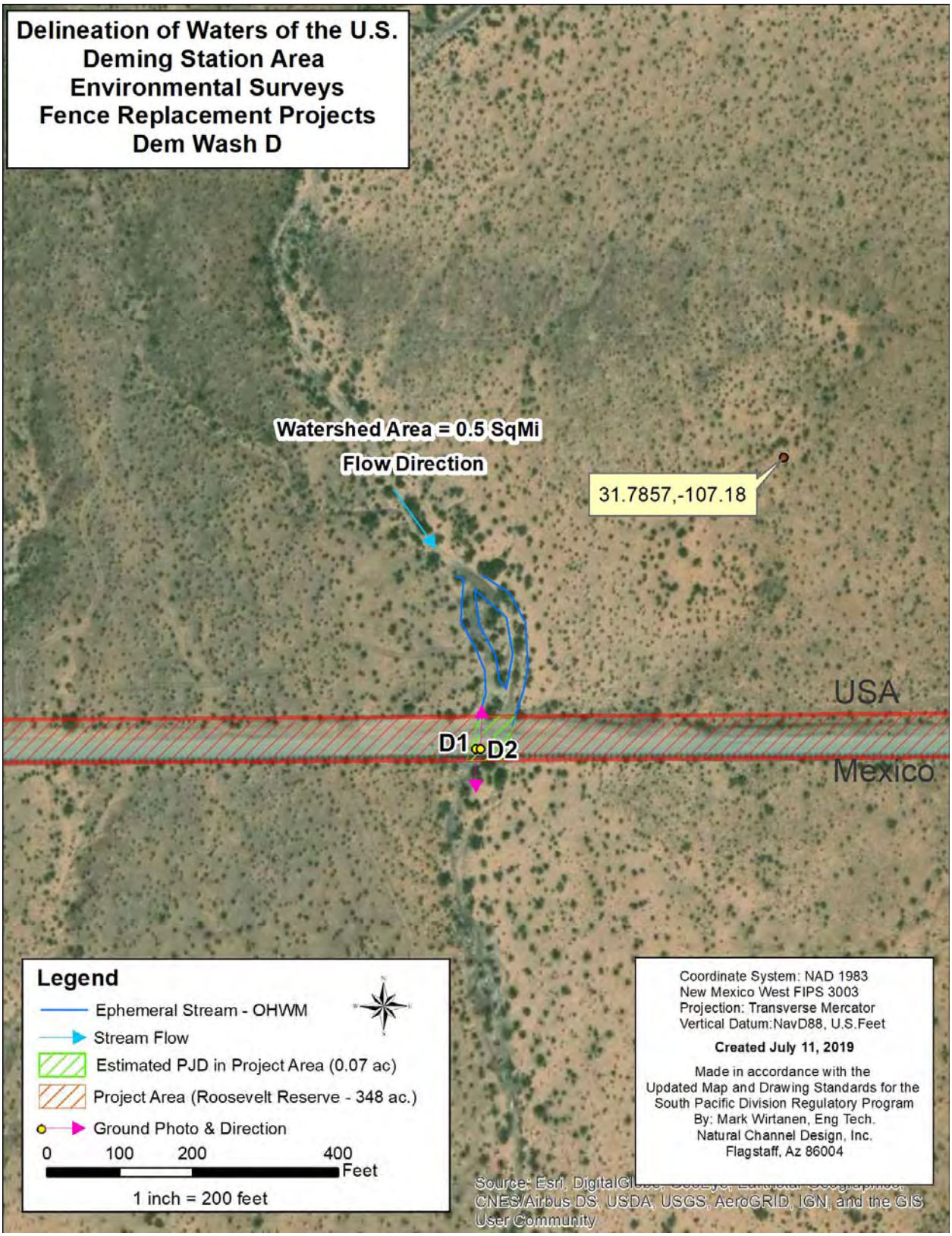

Figure 13 Aerial view of wash Deming D with photo points.

Figure 14 Photo point D1, looking upstream into the U.S.

Figure 15 Photo point D2, looking downstream into Mexico.

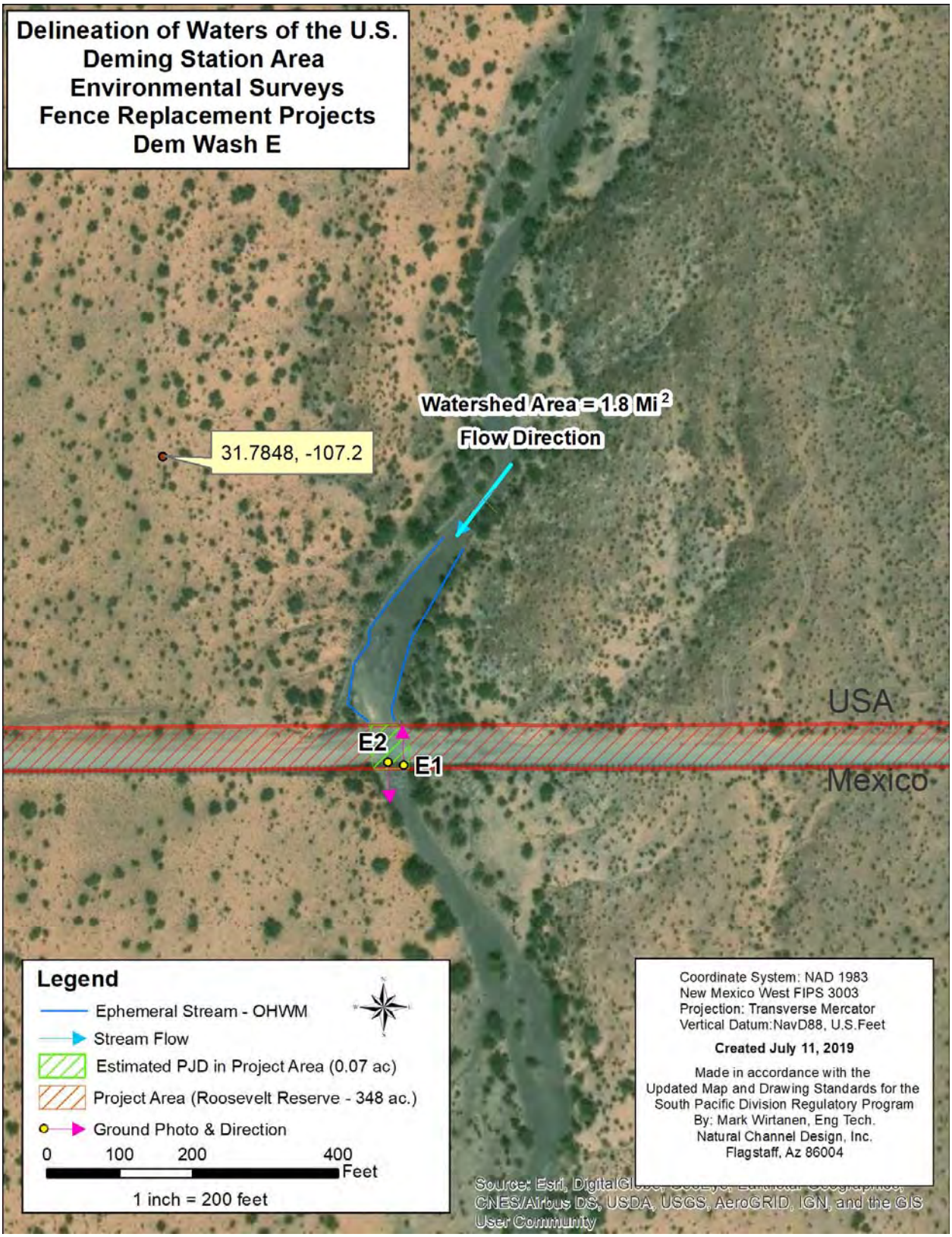

Figure 16 Aerial view of wash Deming E with photo points.

Figure 17 Photo point E1, looking upstream into the U.S.

Figure 18 Photo point E2, looking downstream into Mexico.

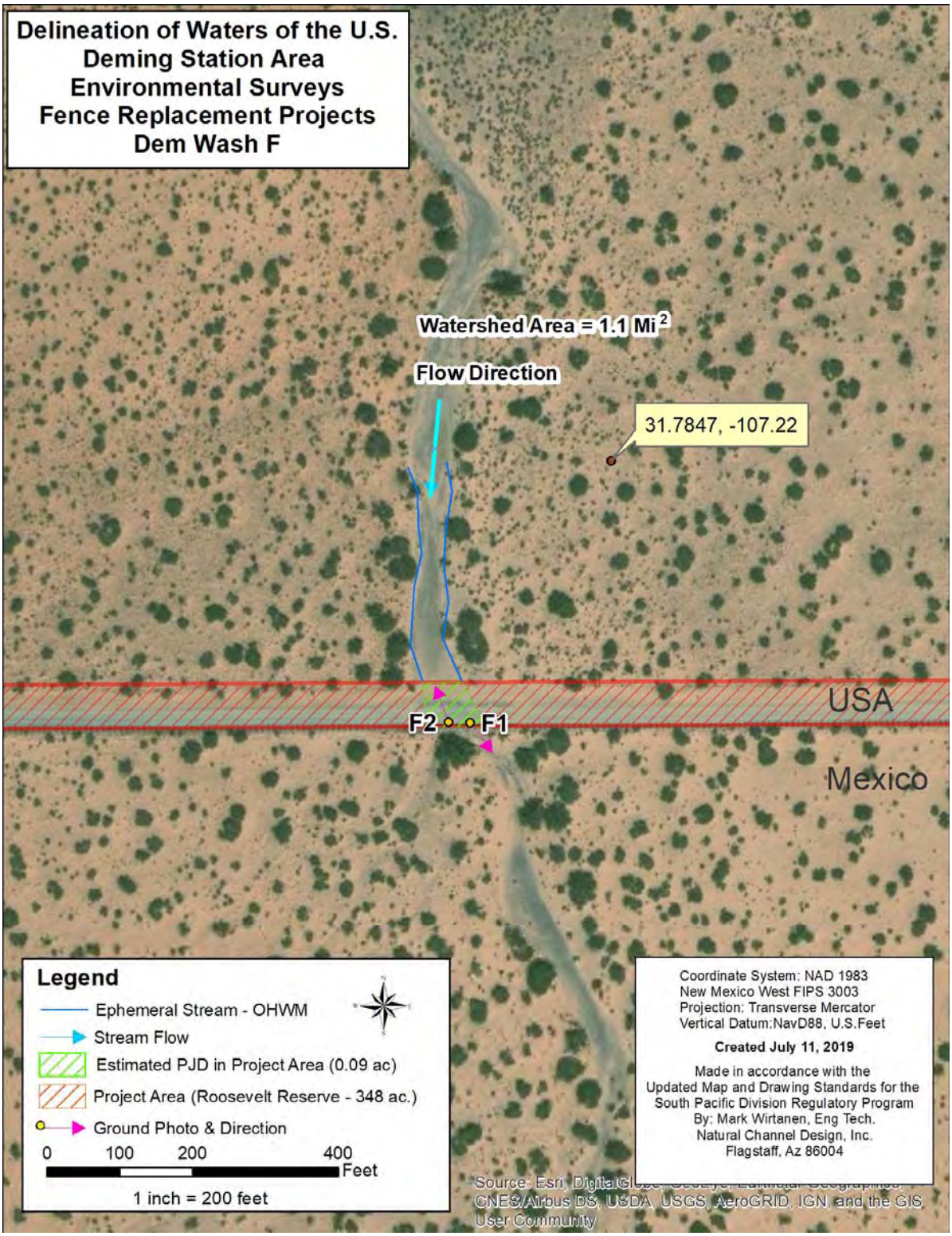

Figure 19 Aerial view of wash Deming F with photo points.

Figure 20 Deming - Photo point F1, looking downstream into Mexico.

Figure 21 Photo point F2, looking upstream into the U.S.

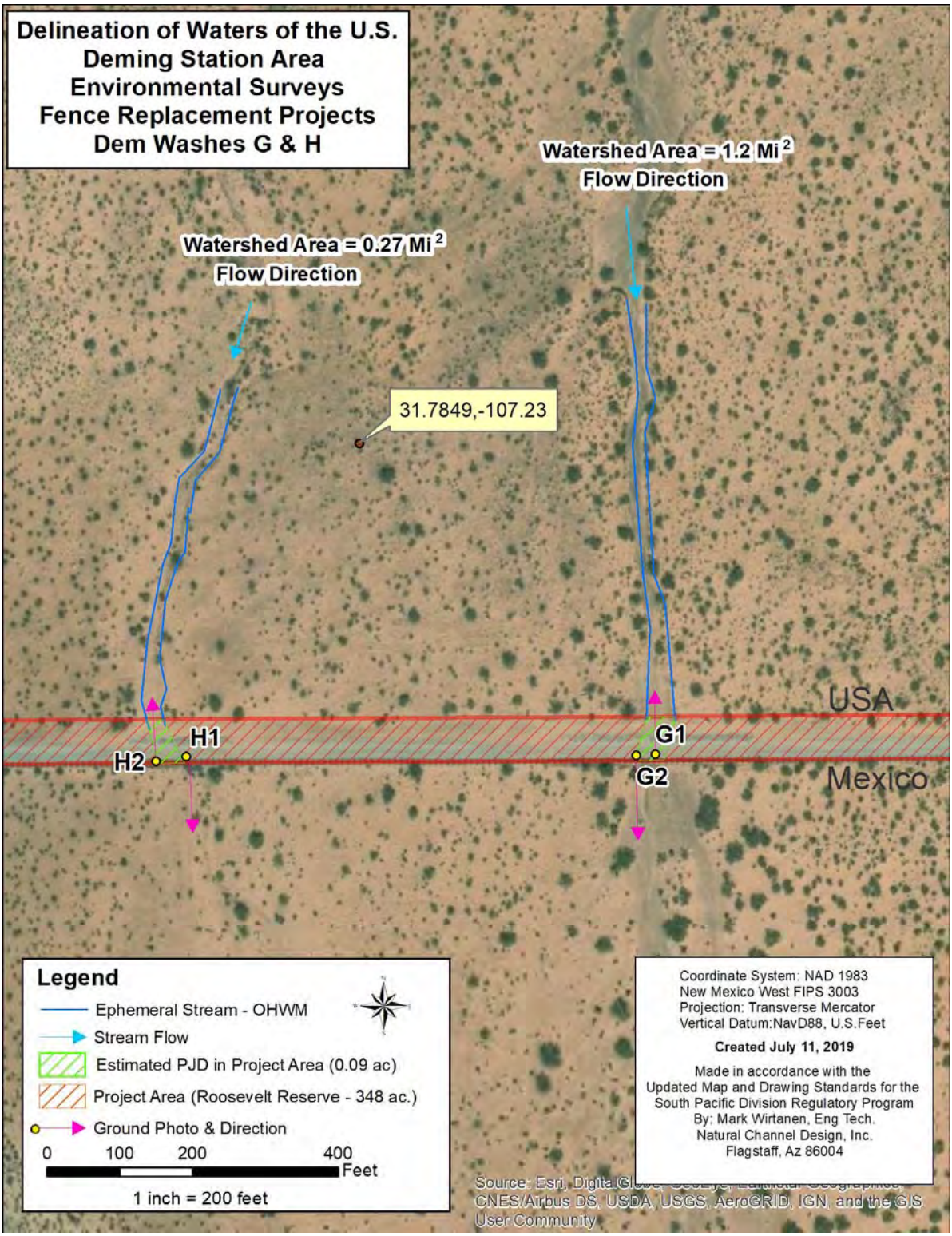

Figure 22 Aerial view of washes Deming G & H with photo points.

Figure 23 Photo point G1, looking upstream into the U.S.

Figure 24 Photo point G2, looking downstream into Mexico.

Figure 25 Photo point H1, looking downstream into Mexico.

Figure 26 Photo Point H2, looking upstream into the U.S.

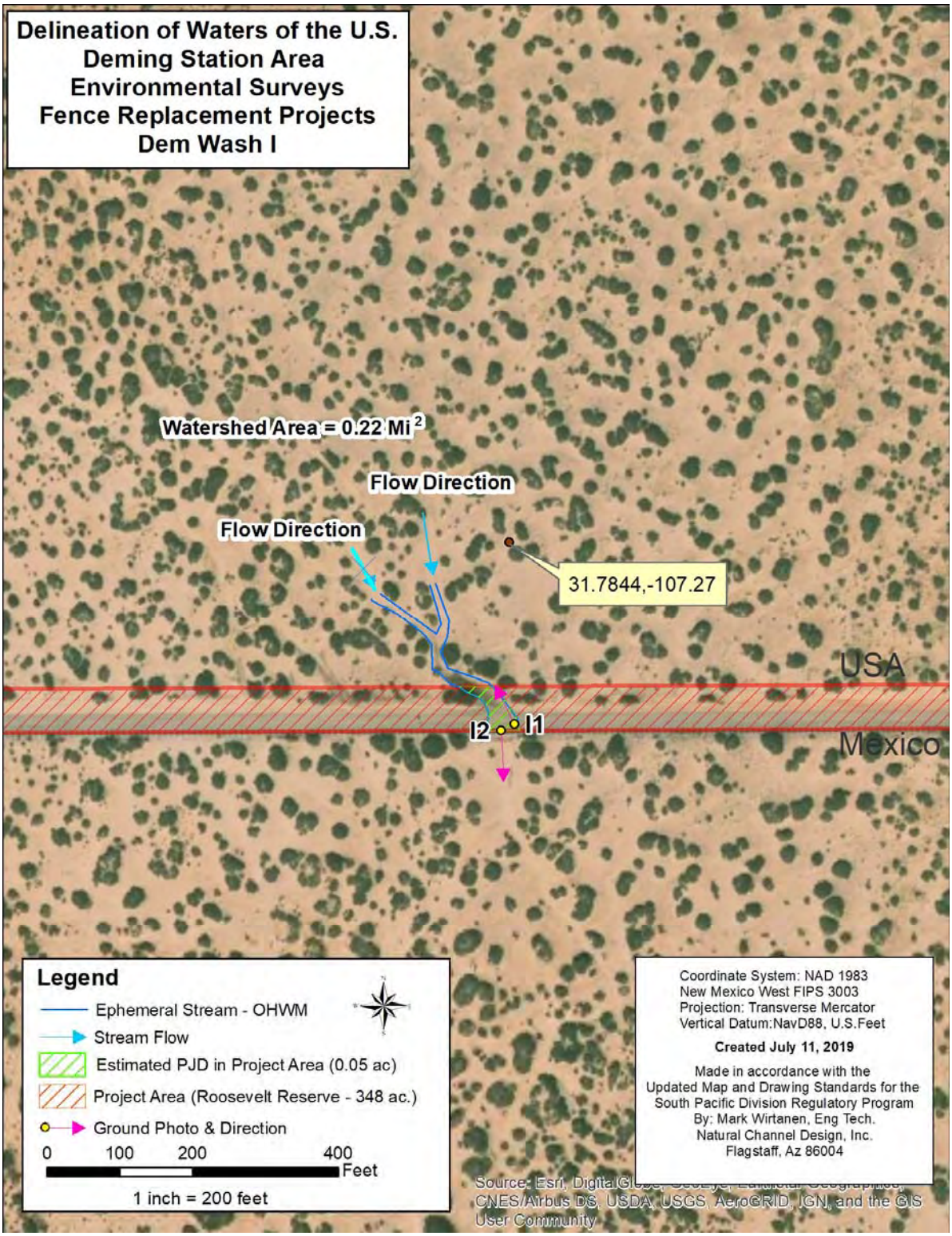

Figure 27 Aerial view of wash Deming I with photo points.

Figure 28 Photo Point I1, looking upstream into the U.S.

Figure 29 Photo Point I2, looking downstream into Mexico.

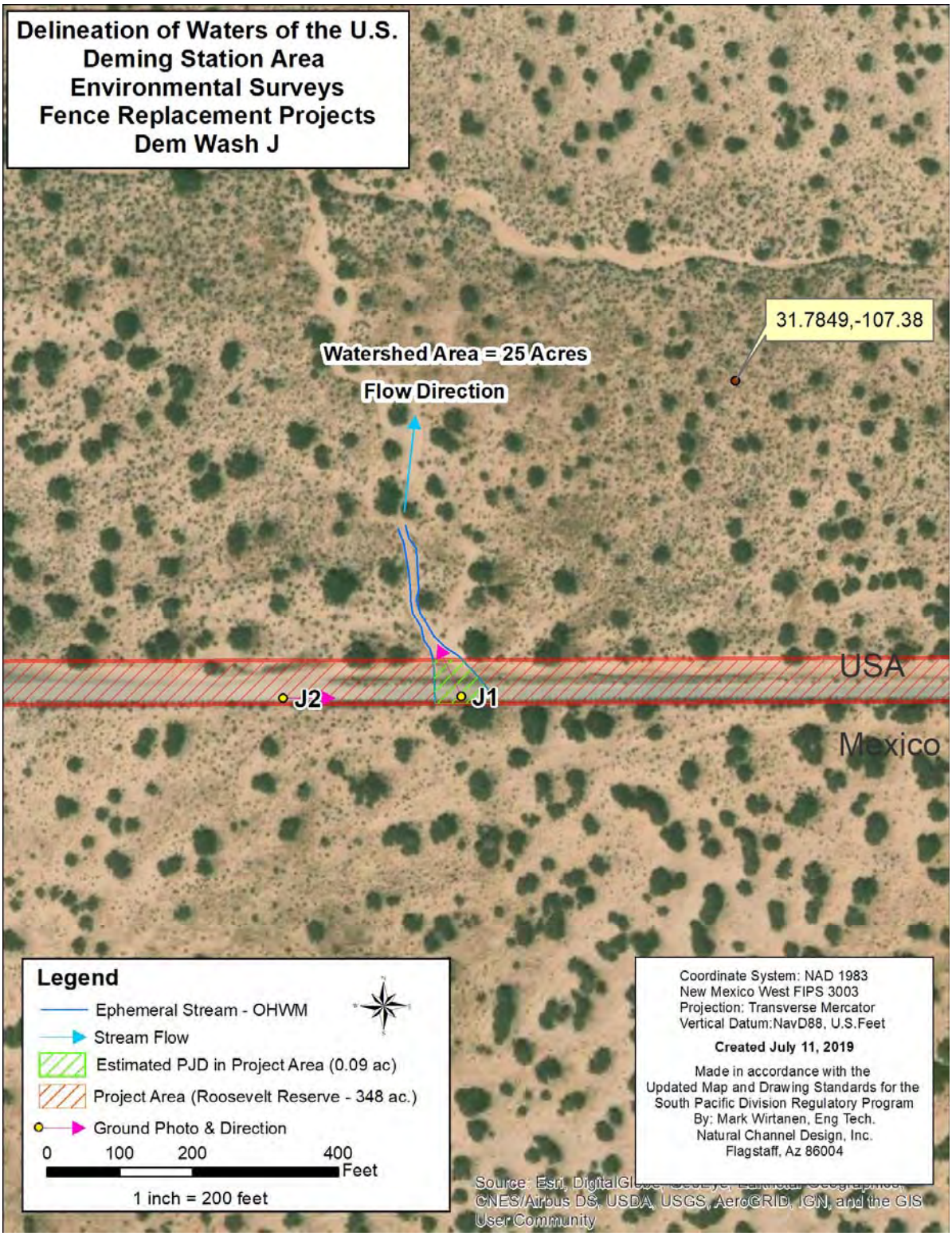

Figure 30. Aerial view of wash Deming J with photo points.

The majority of this watershed appears to be coming from road runoff concentrating at a low point.

Figure 31 Photo Point J1, looking downstream into the U.S.

Figure 32 Photo Point J2, looking east towards channel J.

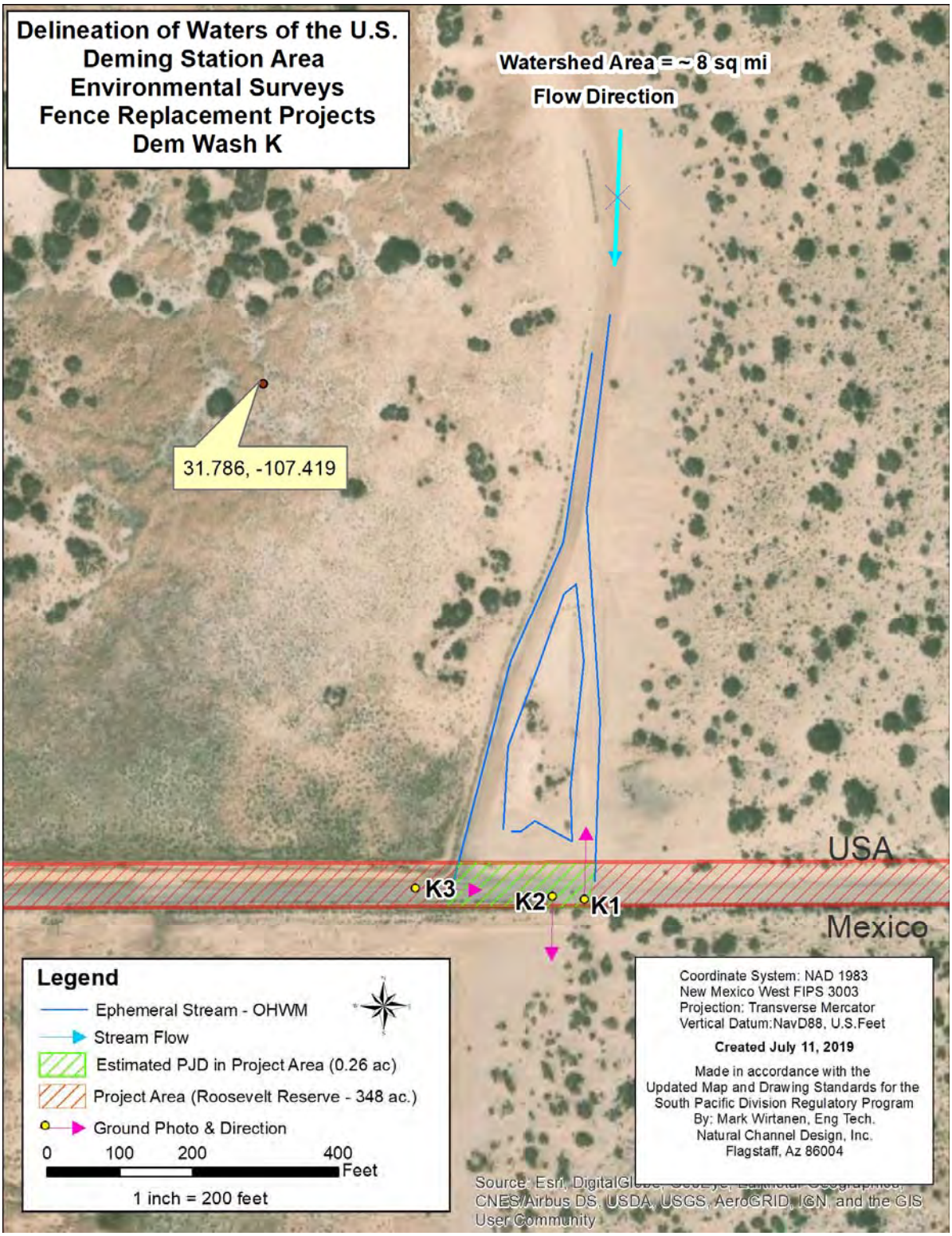

Figure 33. Aerial view of wash Deming K with photo points.

Actual watershed area may considerably larger than indicated, but the landscape is very flat and it is unclear what areas may actually contribute to flows.

Figure 34 Photo Point K1, looking upstream into the U.S.

Figure 35 Photo Point K2, looking downstream into Mexico.

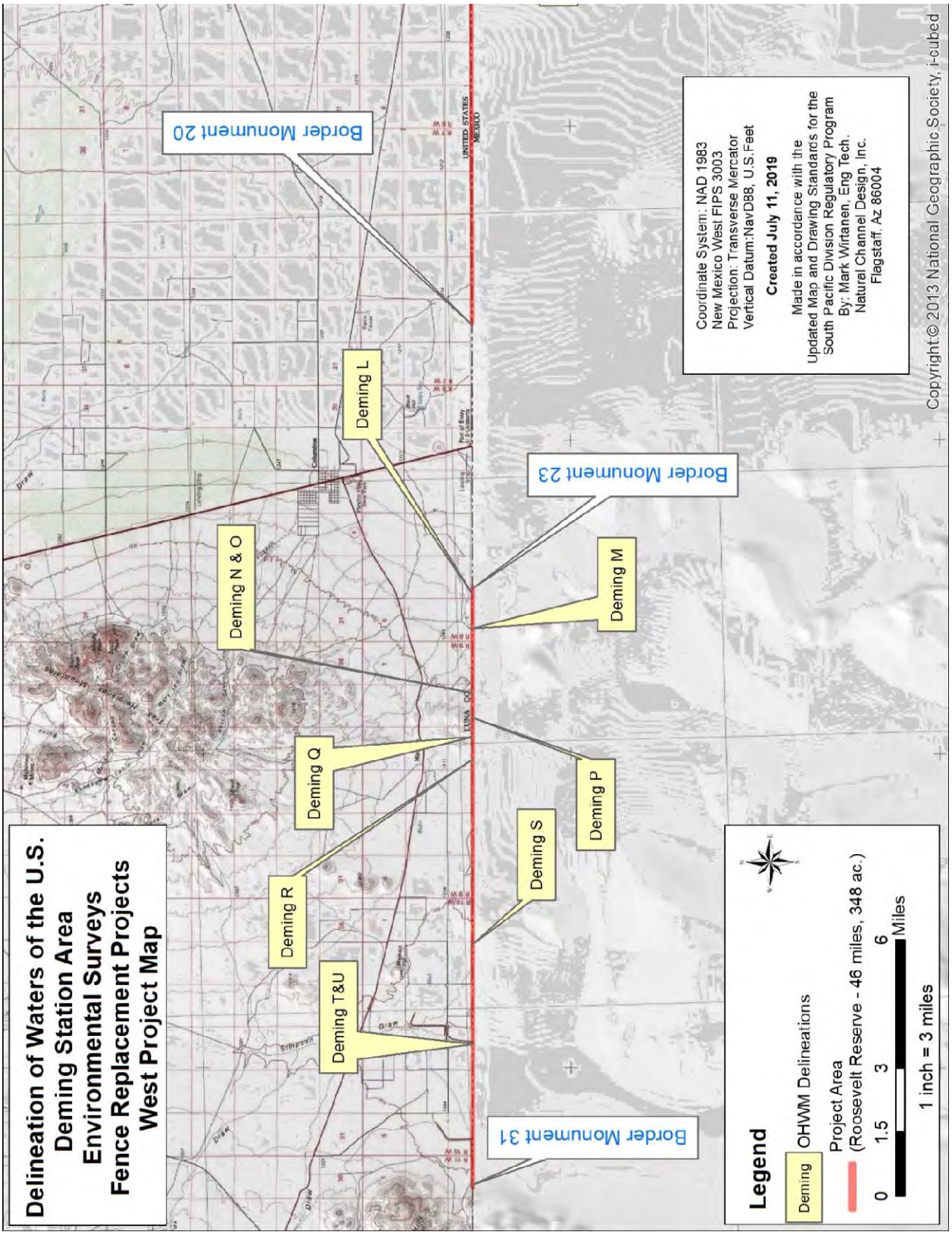

Figure 36 Individual wash locations – West end of project.

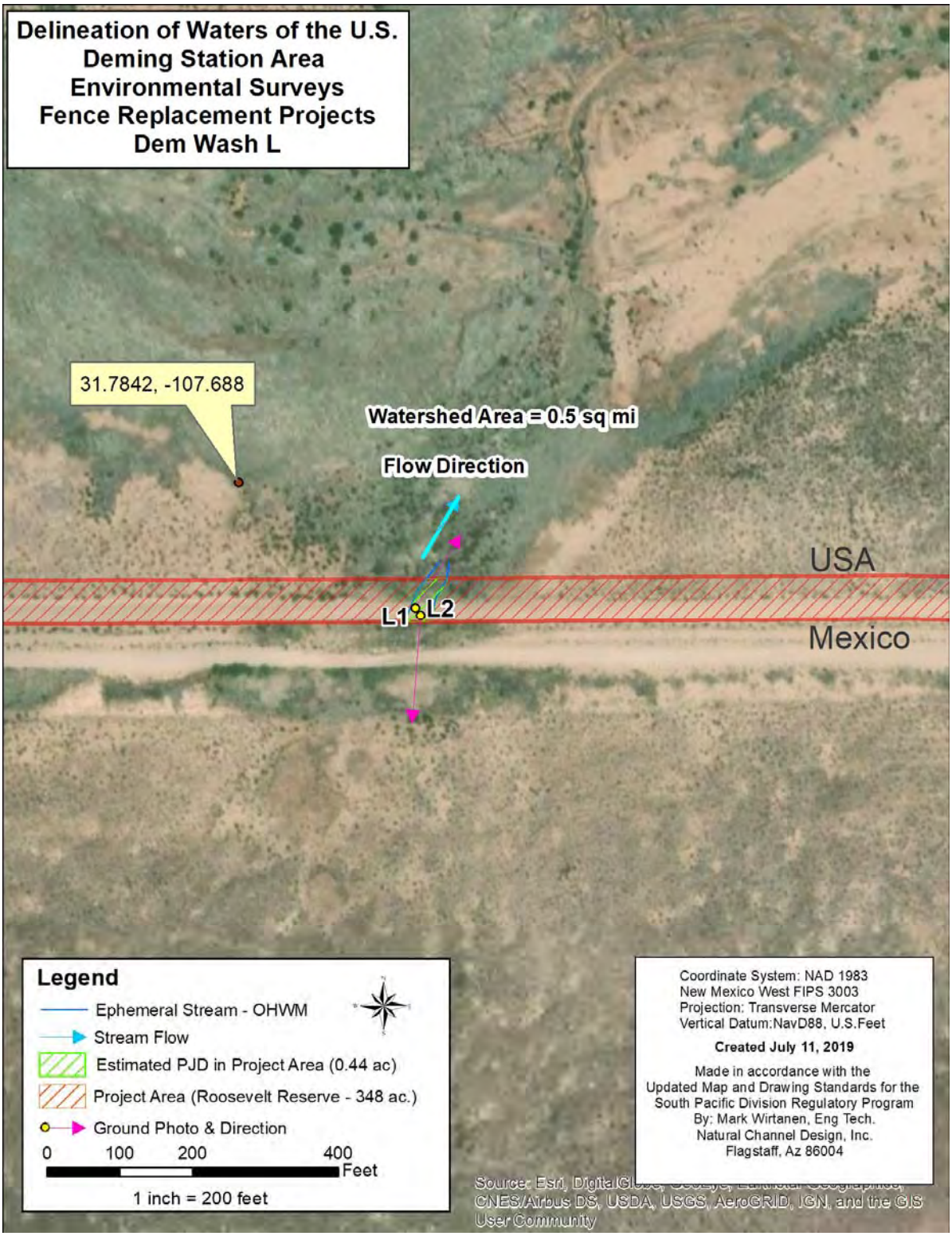

Figure 37 Aerial view of wash Deming L with photo points.

Figure 38 Photo Point L1, looking upstream into Mexico

Figure 39 Photo Point L2, looking downstream into the U.S.

Stream slope is flat through here and road crossing allows water to spread out increasing vegetation.

Figure 40 Aerial view of wash Deming M with photo points.

Figure 41 Photo Point M1, looking downstream into the U.S.

Figure 42 Photo Point M2, looking upstream into Mexico.

Figure 43 Photo Point M3, looking east across PJD .

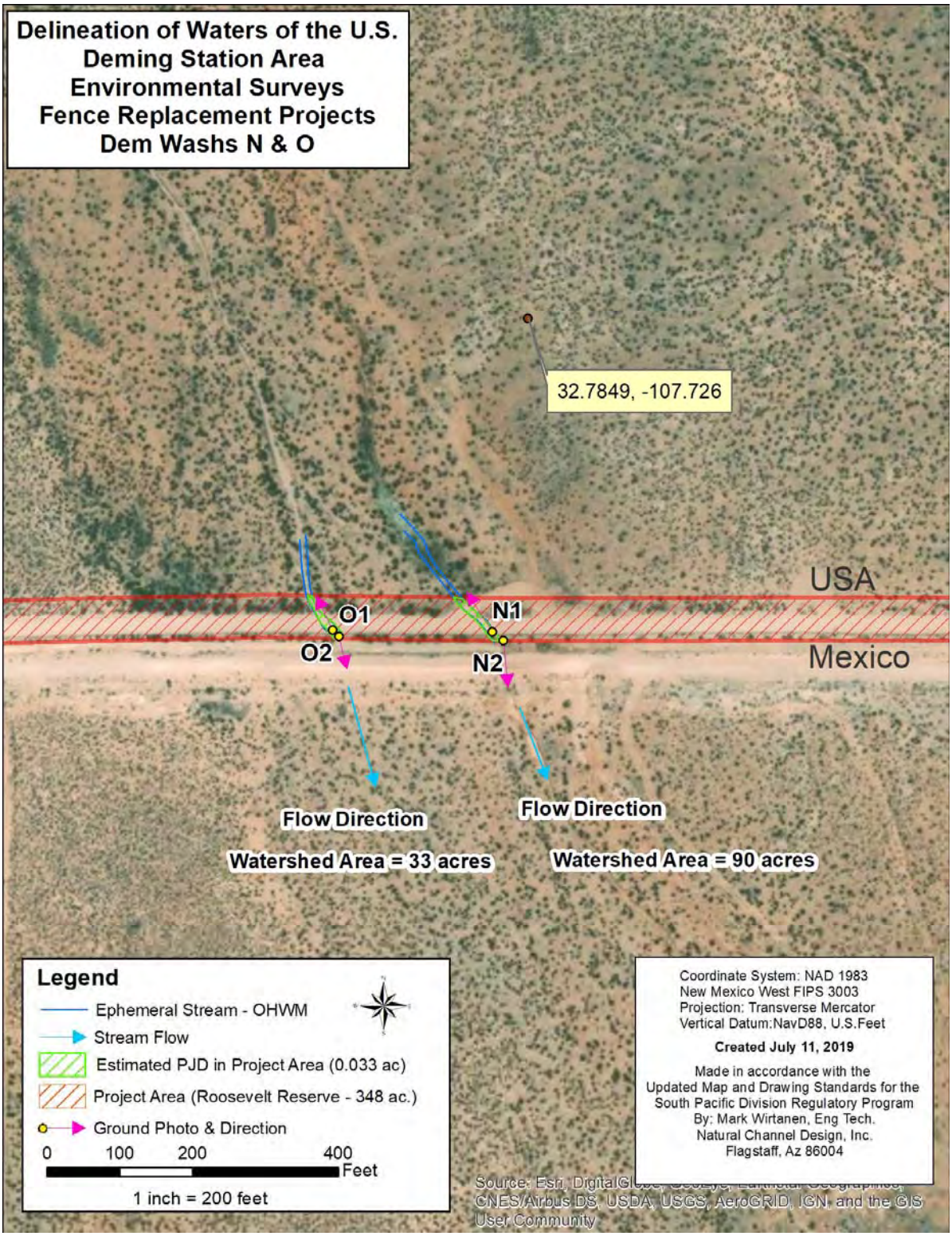

Figure 44. Aerial view of washes Deming N & O with photo points.

Figure 45 Photo Point N1, looking upstream into the U.S.

Figure 46 Photo Point N2, looking downstream into Mexico.

Figure 47 Photo Point O1, looking downstream into Mexico.

Figure 48 Photo Point O2, looking upstream into the U.S.

Figure 49 Aerial view of wash Deming P with photo points.

Figure 50 Photo Point P1, looking upstream into the U.S.

Figure 51 Photo Point P2, looking downstream into Mexico.

Figure 52 Aerial view of wash Deming Q with photo points.

Figure 53 Photo Point Q1, looking upstream into the U.S.

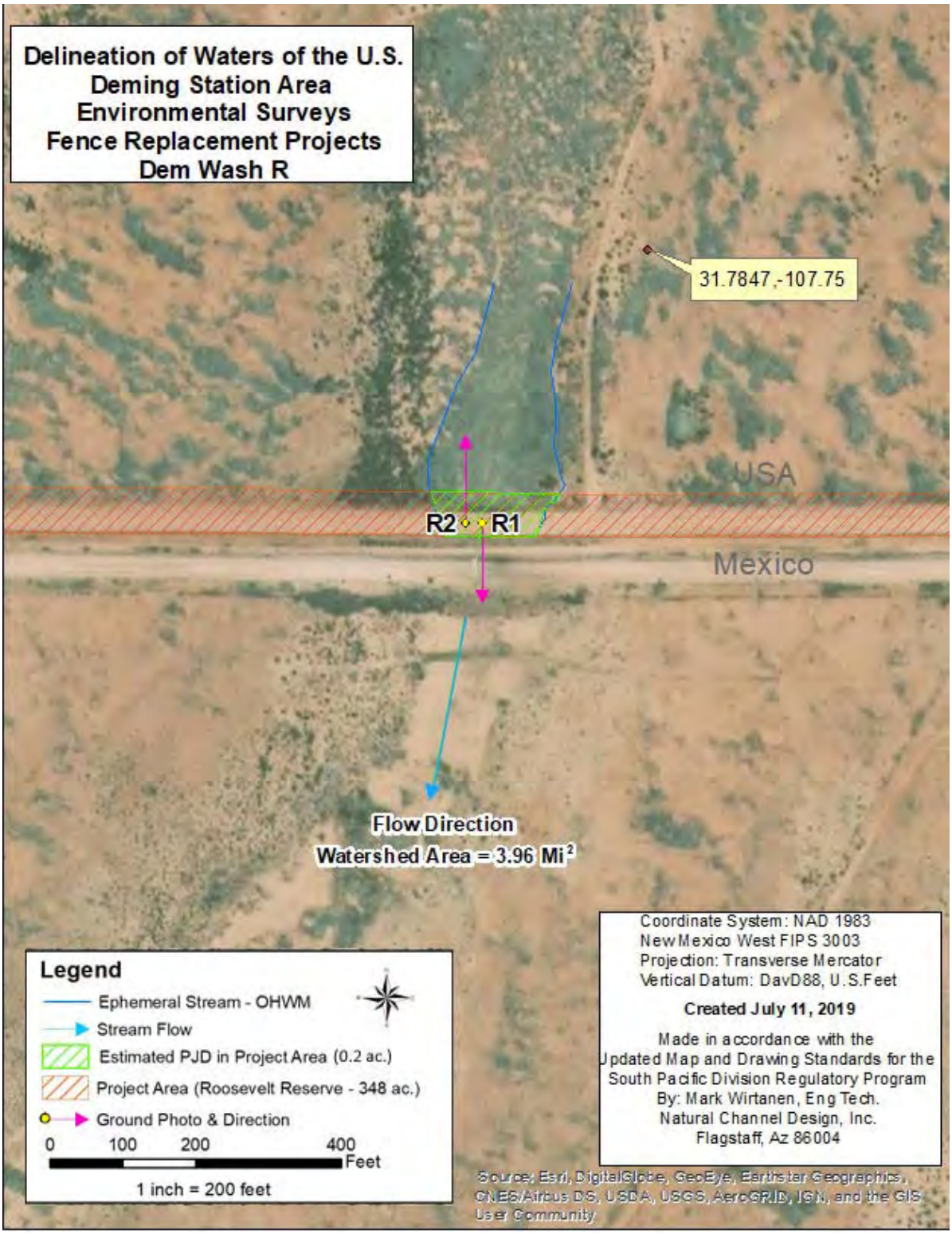

Figure 54 Aerial view of wash Deming R with photo points.

Figure 55 Photo Point R1, looking downstream into Mexico.

Figure 56 Photo Point R2, looking upstream into the U.S.

Channel upstream is very flat and multiple channels spread across valley

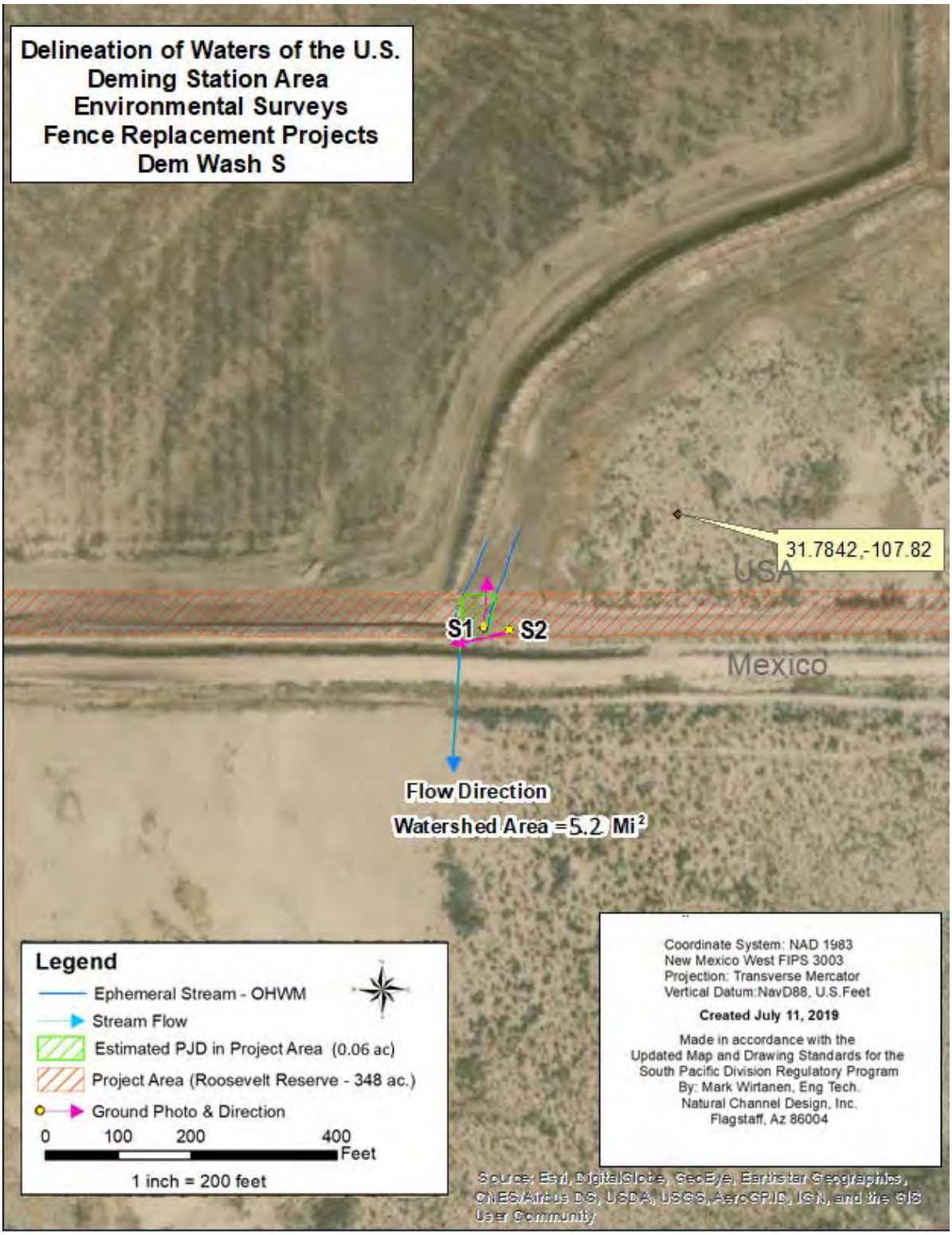

Figure 57 Aerial view of wash Deming S with photo points.

Watershed has been highly manipulated with channels, impoundments and ag fields.

Figure 58 Photo Point S1, looking upstream into the U.S.

Figure 59 Photo Point S2, looking west across channel S.

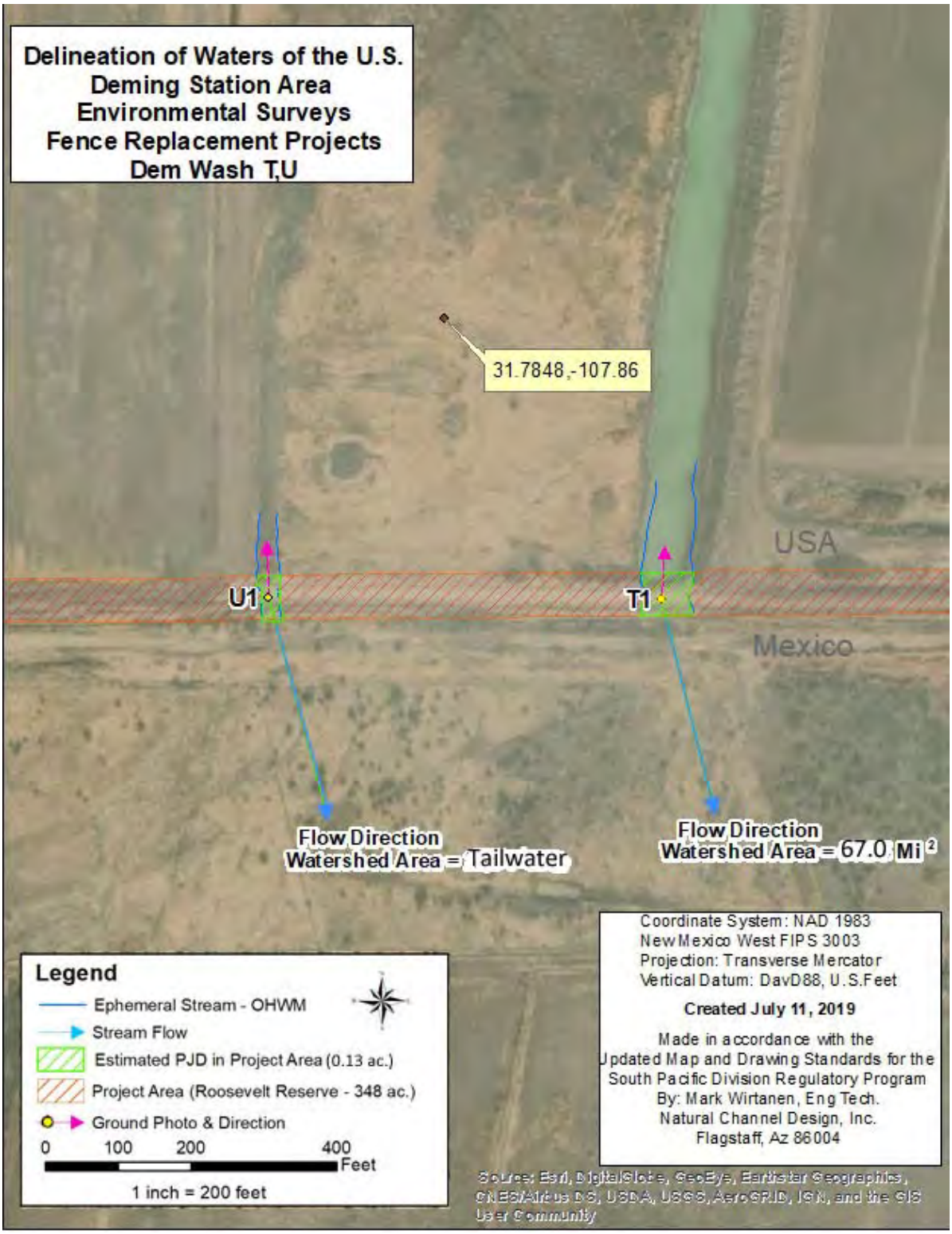

Figure 60 Aerial view of washes Deming T & U with photo points.

Figure 61 Photo Point T1, looking upstream into the U.S.
The water gets ponded by the road.

Figure 62 Photo Point U1, looking upstream into the U.S.
Again, water is ponded by road crossing. Appears to be fed by field tailwater.

Table 2. Potential WOUS Summary

Site Name	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated Acreage in Project Area	Type of Resource
Dem A	31.7837	-107.10989	0.31	Isolated, riverine, Interstate Waters
Dem B	31.7837	-107.1503	0.04	Isolated, riverine, Interstate Waters
Dem C	31.7837	-107.184	0.04	Isolated, riverine, Interstate Waters
Dem D	31.7837	-107.2013	0.07	Isolated, riverine, Interstate Waters
Dem E	31.7837	-107.205	0.066	Isolated, riverine, Interstate Waters
Dem F	31.7837	-107.2228	0.09	Isolated, riverine, Interstate Waters
Dem G	31.7837	-107.2345	0.05	Isolated, riverine, Interstate Waters
Dem H	31.7837	-107.2368	0.04	Isolated, riverine, Interstate Waters
Dem I	31.7837	-107.2769	0.05	Isolated, riverine, Interstate Waters
Dem J	31.7837	-107.3878	0.09	Isolated, riverine, Interstate Waters
Dem K	31.7837	-107.418	0.26	Isolated, riverine, Interstate Waters
Dem L	31.7837	-107.687	0.04	Isolated, riverine, Interstate Waters
Dem M	31.7837	-107.7007	0.09	Isolated, riverine, Interstate Waters
Dem N	31.7837	-107.7264	0.017	Isolated, riverine, Interstate Waters
Dem O	31.7837	-107.7271	0.016	Isolated, riverine, Interstate Waters
Dem P	31.7837	-107.7361	0.014	Isolated, riverine, Interstate Waters
Dem Q	31.7837	-107.7441	0.023	Isolated, riverine, Interstate Waters
Dem R	31.7837	-107.7535	0.2	Isolated, riverine, Interstate Waters
Dem S	31.7837	-107.8269	0.06	Isolated, riverine, Interstate Waters
Dem T	31.7837	-107.8658	0.09	Isolated, riverine, Interstate Waters
Dem U	31.7837	-107.8675	0.038	Isolated, riverine, Interstate Waters
		Total WOUS in Project Area (acres)	1.694	