ORIGINAL

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L-21381A-26-0001

NEW APPLICATION

Application

for a

Certificate of Environmental Compatibility

Vulcan Interconnection Project

Prepared for:

State of Arizona
Arizona Power Plant and Transmission Line Siting Committee

Submitted by:

Vulcan Solar Project, LLC

January 9, 2026

ACC - Docket Control - Received 1/9/2026 8:35 AM
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Table of Contents

Exhibits

List of Figures

Acronyms and Abbreviations

ACC	Arizona Corporation Commission
ARS	Arizona Revised Statutes
ASLD	Arizona State Land Department
BESS	battery energy storage system
BLM	Bureau of Land Management
CEC	Certificate of Environmental Compatibility
CEC Corridor	siting corridor
gen-tie line	generation tie transmission line
kV	kilovolt(s)
MW	megawatt(s)
POCO	point of change of ownership
Project	Vulcan Interconnection Project
ROW	right-of-way
Siting Committee	Arizona Power Plant and Transmission Line Siting Committee
SRP	Salt River Project
Vulcan Energy Center	Vulcan Solar Project, LLC (applicant)

Introduction

Pursuant to the Arizona Revised Statutes (ARS) Sections 40–360 et seq., Vulcan Solar Project, LLC (Vulcan Energy Center; the applicant), is seeking a Certificate of Environmental Compatibility (CEC) for the Vulcan Interconnection Project (Project). The applicant would construct an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation-tie transmission line (gen-tie line) that would deliver power from a proposed 800-megawatt (MW) solar and battery energy storage system (BESS) facility (collectively, the Energy Center) through a new on-site substation to the existing Salt River Project (SRP) 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within a 540 to 4,737-foot-wide (east to west) siting corridor (CEC Corridor).

The Project site is defined as the 200-foot-wide gen-tie ROW. The proposed CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south.

The Project's gen-tie line would traverse privately owned land and Arizona State Trust Land managed by the Arizona State Land Department (ASLD). From ASLD land, the gen-tie line would cross overhead into the Project's new substation, located on federal land administered by the Bureau of Land Management (BLM), in the vicinity of the Arlington community in unincorporated Maricopa County, Arizona. The applicant proposes to construct and operate the Project to connect the Energy Center to the regional grid. Although the Energy Center and new Project Substation are mentioned in this Application, the applicant is seeking a CEC for the Project only.

The applicant is requesting that the CEC be approved in two parts. CEC-A would be held by the applicant and would cover the portions of the gen-tie from the Project's Substation to the point of change of ownership (POCO) with SRP. The portion of the gen-tie from the Substation to the POCO would be constructed, owned, and operated by the applicant. CEC-B would be transferred to SRP for the portion of the gen-tie that SRP would own from the POCO to the Hassayampa Switchyard. This portion of the gen-tie would be constructed, owned, and operated by SRP.

The applicant is a wholly owned, indirect subsidiary of NextEra Energy Resources, LLC, which is a subsidiary of NextEra Energy, Inc. NextEra Energy Resources is one of the largest energy infrastructure companies in North America, fueling economic growth and innovation.

The Project was included in the applicant's 10-Year Plan, filed with the Arizona Corporation Commission (ACC) on January 31, 2025, in Docket E-99999A-25-0006. Project construction is anticipated to begin in late 2028, with an expected operation date in late 2029.

Project Overview

The Project's single-circuit, alternating current, 500-kV gen-tie line would connect a proposed new substation to the existing SRP-owned 500-kV Hassayampa Switchyard. The proposed route, depending on final design, would be approximately 4.3 miles long within an approximately 200-foot ROW, beginning at the new substation and terminating at the POCO. The POCO is the location where electrical and physical ownership of the transmission facilities would transition from the applicant to SRP and would be the line-side terminal connection on the Project's final dead-end structure (the POCO structure). The POCO structure would be owned and maintained by the applicant. All conductors, hardware, and facilities extending beyond the POCO structure, including the span and first SRP-owned structure, would be owned, operated, and maintained by SRP.

The Project is anticipated to be constructed using weathered or galvanized steel, single-circuit monopole structures, similar in design and height to the existing structures on adjacent Arizona Public Service 500-kV transmission lines. The structures are expected to have an above-ground height of up to 195 feet to maintain necessary clearances and would be spaced no more than 1,250 feet apart, depending on the final design. The Project would have an estimated 22 structures, subject to change pending detailed design. The structures would have a dulled gray or weatherized finish, and the conductors would have a non-specular finish to reduce visibility. The structure types are anticipated to include tangent monopoles, angle monopoles, and dead-end monopoles. Representative diagrams of the anticipated transmission structures are shown in **Exhibit G**.

Gen-Tie Route

The proposed gen-tie line would exit the north side of the new substation and continue east for approximately 2,223 feet (0.42 mile), before turning north and extending approximately 10,275 feet (1.95 miles) to a point approximately 665 feet (0.13 mile) southeast of the Southern Pacific Railroad. The gen-tie line then would extend northwest for approximately 900 feet (0.17 miles), crossing the railroad and continuing northeast for approximately 940 feet (0.18 miles) to a point parallel to and east of West Dobbins Road, an existing transmission line, and a railroad spur to the Palo Verde Nuclear Generating Station. The gen-tie line then would continue north for approximately 7,327 feet (1.4 miles), to tie into the existing SRP-owned Hassayampa Switchyard.

Requested CEC Corridor

The applicant is requesting approval of the CEC Corridor, shown on Figure 2, to achieve site-specific mitigation objectives, meet site-specific engineering requirements, and allow flexibility in obtaining the ROW for the proposed gen-tie line. The topography of the CEC Corridor is flat ground, with the prominent land cover classes being agricultural fields and open desert. Approximately 3.17 miles (73.31 percent) of the Project would be on ASLD property and approximately 1.09 miles (25.25 percent) will be on private property. About 0.06 mile (1.43 percent) of the Project site north of the new substation would cross federal land that is administered by the BLM.

Project Substation

The proposed Project Substation would be on an approximately 9.3-acre site (**Figure 2**). The new substation is expected to have nine power transformers with 500-kV breakers, switches, a control house, and a substation superstructure, within an approximately 6-foot-tall fenced enclosure. The new substation would be on federal land managed by the BLM, in Section 3, Township 2 South, Range 6 West. The substation would not be subject to the jurisdiction of the ACC or the Arizona Power Plant and Transmission Line Siting Committee (Siting Committee).

SRP Interconnection

The applicant is not requesting authorization for the interconnection to the Hassayampa Switchyard because of the current interpretation of the ACC and the Siting Committee that the connection from the POCO to the switchyard would not require a CEC under the definition of 'transmission line' in ARS 40-360(10).

Purpose and Need

The Project is needed to provide energy and capacity from the proposed Energy Center to the regional electric transmission grid. The purpose of this CEC Application is to secure approval for the Project, which would connect the Energy Center to the regional transmission system at the existing SRP-owned Hassayampa Switchyard via the POCO. The Energy Center was selected through SRP's 2025 All-Source Request for Proposal, to help meet summer peak capacity needs by summer 2031 and address approximately 2,700 MW of energy resource needs for the SRP network. Adding energy generation and storage would meet several objectives at the local, State, and federal levels, by enhancing grid reliability, providing dispatchable capacity, supporting system operations during peak demand periods, and promoting the efficient use of existing energy resources.

The Project site has been identified as an optimal location, based on the recognized need to interconnect energy generation sources and storage systems to local electrical utilities, the existence of compatible and adjacent nearby land uses, and the proximity to the existing SRP-owned Hassayampa Switchyard. This location would reduce the need for a long gen-tie in an area of existing compatible land uses.

Environmental and Public Siting Process

Siting Process

The applicant's siting process for the Project focused on identifying a reasonably direct route between the proposed Energy Center and the existing SRP Hassayampa Switchyard. The applicant sought to minimize environmental impacts and expenses by choosing a direct route where possible, while also considering existing land uses and infrastructure. The Project site is above ground and designed to cross and run adjacent to existing high voltage transmission lines.

The Project would be sited primarily on privately owned land in previously disturbed areas and State Trust land administered by the ASLD. Approximately 0.06 miles (1.43 percent) of the Project site is on federal land administered by the BLM. The small Project segment on BLM-administered land would be the overhead crossing of the gen-tie line into the new substation, and no gen-tie line structures are anticipated to be sited on BLM land. An environmental analysis was conducted within a 2-mile radius of the Project site; the analysis results are provided in the attached exhibits.

Public Outreach Process

The applicant's public involvement program was initiated to provide affected jurisdictions, relevant agencies, and community residents with the opportunity to relay information or potential concerns relevant to the Project. To reach the affected residents, agencies, and jurisdictions, the applicant and AECOM (as consultants to the applicant) instituted multiple public engagement initiatives. The public outreach efforts included the following:

- Newsletter (September 26, 2025)
- Project website (September 23, 2025)
- In-person open house (October 8, 2025)
- Virtual open house (September 26, 2025)
- Facebook post (September 24, 2025)
- Dedicated Project email to facilitate feedback from interested parties

Further information about the applicant's public outreach process is provided in **Exhibit J**.

Conclusions

The Project would deliver critical energy generation and capacity resources, including photovoltaic solar and BESS technology to meet Arizona's growing demand for energy. As further described in the attached exhibits, the Project would:

- disturb a very small amount of previously disturbed land;
- be compatible with existing plans in the Project vicinity;
- not disturb any areas of unique biological wealth or impact any special-status species;
- result in minimal visual effects;
- not disturb any known significant archaeological or historical sites;
- not affect any recreational opportunities in the area; and
- be sited adjacent to existing transmission infrastructure, reduce impacts from constructing new lines, and not anticipated to result in significant impacts associated with noise or signal interference.

This application includes the environmental evaluation and documentation relevant to the Project as specified in ACC Rule R14-3-219 (refer to Exhibit B). The Project is environmentally compatible and in the public interest because the Energy Center's contribution to meeting the need for an adequate, economical, and reliable supply of electric power and energy storage would outweigh the Project's impact on the environment and ecology of the State. Therefore, the applicant respectfully requests that the Siting Committee grant, and that the ACC approve, the requested CEC for construction of the Project.

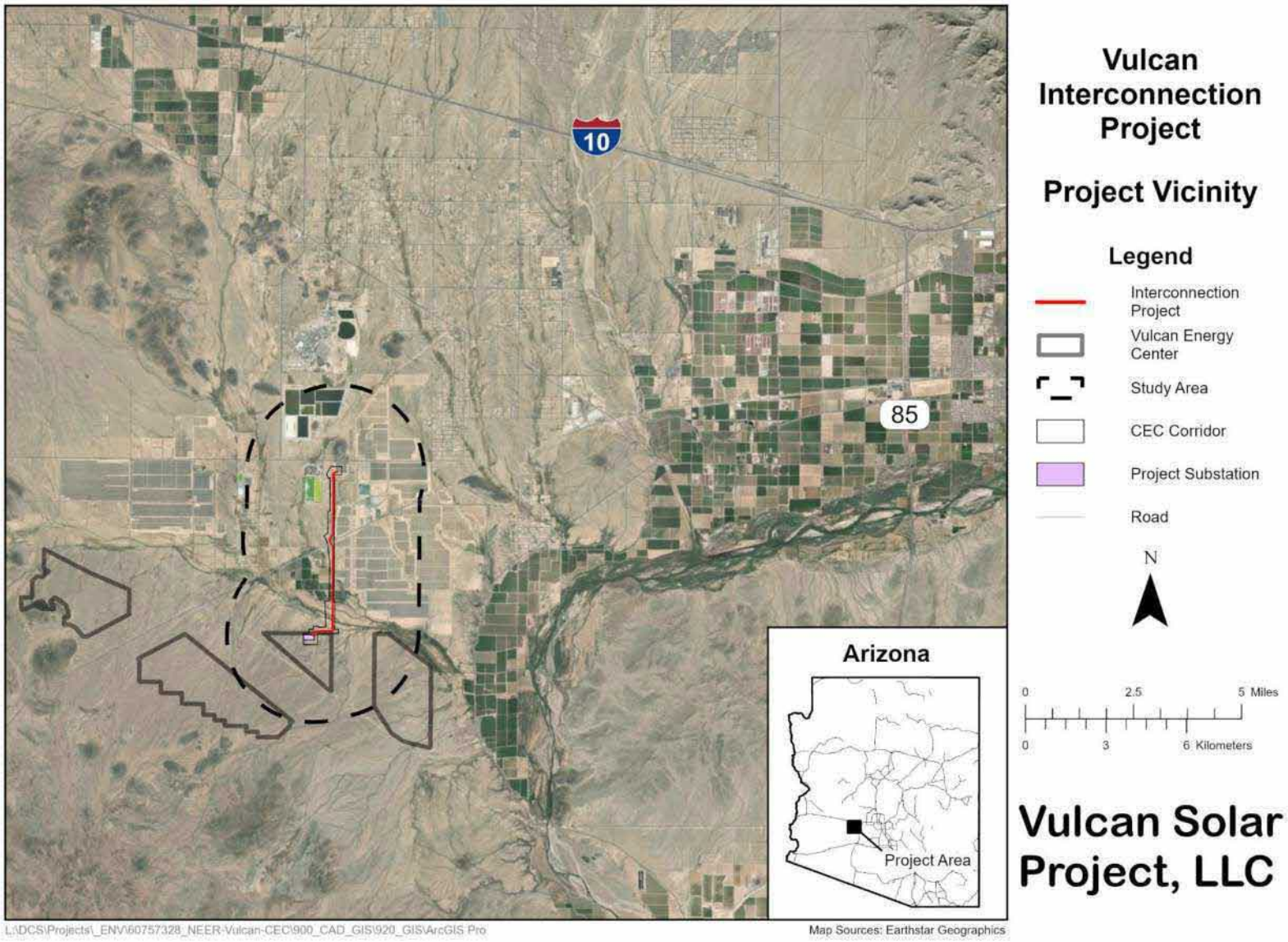
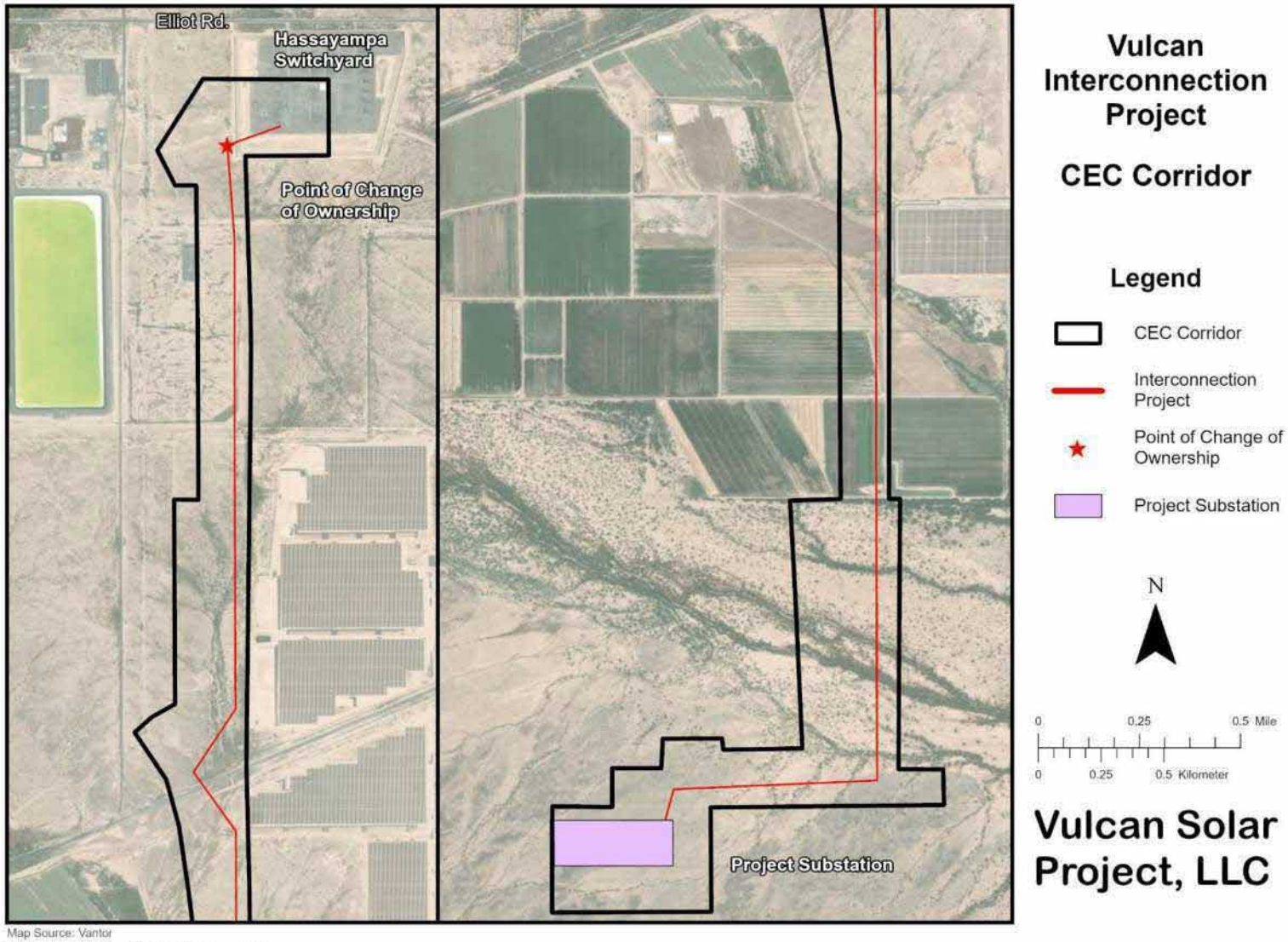


Figure 1. Project Vicinity



Map Source: Vantor

Figure 2. Requested CEC Corridor

APPLICATION FOR CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

(Pursuant to Arizona Corporation Commission Rules of Practice and Procedure, Sections 40-360.03 and 40-360.06)

1. **Name and address of the applicant**

   Vulcan Solar Project, LLC
   700 Universe Boulevard
   Juno Beach, FL 33408

2. **Name, address, and telephone number of a representative of the applicant who has access to technical knowledge and background information concerning this application, and who will be available to answer questions or furnish additional information**

   Trevor Thompson
   Project Director, Development
   Vulcan Solar Project, LLC
   700 Universe Boulevard
   Juno Beach, FL 33408
   1-518-226-1935
   Trevor.Thompson@nexteraenergy.com

3. **Date on which the applicant filed a 10-Year Plan in compliance with ARS Section 40-360.02, in which the facilities for which this application is made were described**

   The applicant filed a 10-Year Plan in Docket No. Docket E-99999A-25-0006 on January 31, 2025.

4. **Description of the proposed facility, including:**

   a. **With respect to an electric generating plant:**

      No electrical generating plants as defined in ARS 40-360(9) would be part of the Project.

   b. **With respect to a proposed transmission line:**

      i. **Nominal voltage for which the line is designed; description of the proposed structures and switchyards or substations associated therewith; and purpose for constructing said transmission line**

         (1) **Nominal voltage:**

         The nominal voltage for the Project's single-circuit transmission line would be 500-kV alternating current.

(2) Description of the proposed structures:

The Project is anticipated to be constructed using weathered or galvanized steel, single-circuit monopole structures, similar in design and height to the existing structures on the adjacent transmission line. The structures are expected to have an above-ground height of up to 195 feet, to maintain necessary clearances, and to be spaced no more than 1,250 feet apart, depending on the final design. The Project is expected to have approximately 22 structures, which would be subject to change pending detailed design. The structures would have a dulled gray or weatherized finish, and the conductors would have a non-specular finish to reduce visibility. Conceptual drawings showing the typical structures that may be used are provided in **Exhibit G**.

(3) Description of proposed switchyards and substations:

The proposed Project Substation would be on an approximately 9.3-acre site (**Figure 2**). The proposed substation is expected to include nine power transformers with 500-kV breakers, switches, a control house, and a substation superstructure, within an approximately 6-foot-tall fenced enclosure. The new substation would be on federal land managed by the BLM in Section 3, Township 2 South, Range 6 West. A conceptual drawing of the substation is provided in **Exhibit G**, but the applicant is not requesting a CEC for the substation. No switchyard is being proposed as part of the Project.

(4) Purpose for constructing said transmission line:

The purpose of the Project is to deliver electrical power, generated by a proposed 800 megawatt (MW) solar and battery energy storage system (BESS) facility (collectively, the Energy Center) to the electrical grid via the existing Salt River Project (SRP) Hassayampa Switchyard on West Elliot Road.

ii. Description of geographical points between which the transmission line will run the straight-line distance between such points and the length of the transmission line for each alternative route for which the application is made

(1) Description of geographical points between which the transmission line will run:

The Project would originate from the proposed Project Substation, which would be on federal land administered by the Bureau of Land Management (BLM) in the N1/2 of Section 3, Township 2 South, Range 6 West.

The Project would terminate at the existing SRP-owned Hassayampa Switchyard at 37135 West Elliot Road in Arlington, Arizona. The Hassayampa Switchyard is on Maricopa County tax assessor parcel number 401-43-029 on the south side of West Elliot Road, southeast of the Palo Verde Nuclear Generating Station.

Figures 1 and 2 show the Project vicinity and the requested CEC Corridor, respectively.

(2) Straight-line distance between such points:

The straight-line distance between the proposed Project Substation and the Point of Change of Ownership (POCO) structure would be approximately 3.8 miles.

(3) Length of the transmission line for each alternative route:

The applicant is not proposing any alternative routes.

iii. Nominal width of right-of-way required, nominal length of spans, maximum height of supporting structures and minimum height of conductor above ground

(1) Nominal width of right-of-way required:

The ROW would be approximately 200 feet wide within the requested variable-width CEC Corridor.

(2) Nominal length of spans:

The span length between structures would vary, depending on terrain, constraints, and other factors, but would be no more than 1,250 feet long.

(3) Maximum height of supporting structures:

The maximum height of the supporting structures is anticipated to be up to 195 feet to maintain the necessary clearances.

(4) Minimum height of conductor above ground:

The minimum height of the conductor above the existing grade would be 28.4 feet. All clearances would be in accordance with applicable codes and regulations.

iv. To the extent available, the estimated costs of proposed transmission line and route, stated separately. (If application contains alternative routes, furnish an estimate for each route and a brief description of the reasons for any variations in such estimates.)

The estimated cost of the Project is approximately $19 million.

No alternative route is being proposed.

v. Description of proposed route and switchyard locations. (If application contains alternative routes, list routes in order of applicant's preference with a summary of reasons for such order of preference and any changes such alternative routes would require in the plans reflected in (i) through (iv) hereof.)

The proposed Project route is described generally in 4(b)(ii) above and is shown on **Figure 1**. The applicant selected the proposed route to safely avoid existing and planned transmission lines, to safely cross existing roadway and railroad ROWs, to maintain existing land access, and to be adjacent to existing transmission lines and other linear infrastructure to the extent practicable.

No switchyard is being proposed as part of the Project. No alternative route is being proposed.

vi. **For each alternative route for which application is made, list the ownership percentages of land traversed by the entire route (federal, state, Indian, private, etc.).**

Approximately 3.17 miles (73.31 percent) of the Project site would be on Arizona State Trust land managed by the ASLD, approximately 1.09 miles (25.25 percent) would be on private property, and approximately 0.06 miles (1.43 percent) would be the overhead crossing into the proposed Project Substation on federal land administered by the BLM. No gen-tie line structures are anticipated to be sited on BLM land. No alternative routes are proposed in this application. Any necessary Project work on State or local road crossings would be coordinated with the appropriate agency.

5. **List the areas of jurisdiction [as defined in A.R.S. § 40-360(1)] affected by each alternative site or route and designate those proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of any of such areas of jurisdiction.**

The Project would traverse privately owned land, Arizona State Trust land, and federal land administered by the BLM in the vicinity of the Arlington community in unincorporated Maricopa County. Therefore, the areas of jurisdiction, as defined in ARS Section 40-360(1) are under Maricopa County, the ASLD, and BLM.

The proposed route for the Project is on land zoned by Maricopa County as (1) rural, dedicated/non-developable open space, (2) power plants, and (3) large lot residential. The Project would be consistent with designated future land uses and zoning designations[1]. The Arlington area has several existing power plants and solar generation facilities. The introduction of a new 500-kV transmission line within the existing utility infrastructure would not violate any current zoning ordinances of the relevant jurisdictions[2] (refer to **Exhibit A** for more information regarding land use).

[1] Maricopa County Planning and Development Department. 2023. *Maricopa County Zoning Ordinance*. Available: https://www.maricopa.gov/DocumentCenter/View/4785/Maricopa-County-Zoning-Ordinance-PDF. Accessed July 8, 2025.
[2] Ibid.

6. **Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion.**

   The applicant has evaluated available secondary and field data related to biological resources, visual resources, cultural resources, recreational resources, land use, noise levels, and communications signals to assess the potential impacts that may result from construction, operation, and maintenance of the Project. These evaluations are provided in Exhibits B, C, D, E, F, H, I, and J, attached to this Application.

Vulcan Solar Project, LLC

DocuSigned by:
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by Anthony Pedroni, Vice President

I HEREBY CERTIFY that on this 9th day of January 2026, I have delivered to the Arizona Corporation Commission seven copies of this Application for a Certificate of Environmental Compatibility.

Exhibit A

Location and Land Use Information

Exhibit A
Location and Land Use Information

As stated in the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1, the applicant presents the following location maps and land use information in this Exhibit A:

1. Where commercially available[1], a topographic map, 1:250,000 scale, showing the proposed plant site and the adjacent area within 20 miles thereof. If application is made for alternative plant sites, all sites may be shown on the same map, if practicable, designated by applicant's order of preference.
2. Where commercially available, a topographic map, 1:62,500 scale, of each proposed plant site, showing the area within two miles thereof. The general land use plan within this area shall be shown on the map, which shall also show the areas of jurisdiction affected and any boundaries between such areas of jurisdiction. If the general land use plan is uniform throughout the area depicted, it may be described in the legend in lieu of an overlay.

Land Use

The purpose of this land use assessment is to compile baseline data and determine potential land use impacts that may result from the construction, operation, and maintenance of the Vulcan Interconnection Project (Project). The applicant would construct an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation tie transmission line (gen-tie line) that would deliver power from a proposed 800-megawatt (MW) solar and battery energy storage system (BESS) facility (collectively, the Energy Center) through a new on-site substation to the existing Salt River Project (SRP) 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within a 540 to 4,737-foot-wide siting corridor (CEC Corridor). The Project site is defined as the 200-foot-wide gen-tie ROW. The proposed CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south, with a width varying between 540 and 4,737 feet east to west.

This land use analysis was conducted within the Study Area, defined as a 2-mile radius around the Project site. The Project site is in the vicinity of the Arlington Community in unincorporated Maricopa County, Arizona, in Sections 15, 22, 27, and 34 of Township 1 South, Range 6 West, and Section 3 of Township 2 South, Range 6 West, Gila and Salt River Base and Meridian, as shown on the Arlington, Arizona, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (**Figure A-1**). The land in the Study Area is privately owned, Arizona State Trust land

[1] If a topographic map is not commercially available, a map of similar scale reflecting prominent or important physical features of the area in the vicinity of the proposed site or route shall be substituted.

managed by the Arizona State Land Department (ASLD), and federal land administered by the Bureau of Land Management (BLM) (**Figure A-2**).

The following is a discussion of land use considerations and an analysis of existing and future uses relevant to the Project. The land use analysis is based on the most recently available data from various local and regional general or comprehensive plans relevant to the Study Area and GIS databases, including:

- Arizona Land Resource Information System (ASLD 2025a, 2025b)
- Maricopa County Vision 2030 Comprehensive Plan (Maricopa County 2016)
- Maricopa County Zoning Ordinance (Maricopa County 2023)
- Maricopa County ArcGIS Web Application (Maricopa County 2025)
- National Geologic Map Database, TopoView Interactive Map Viewer (USGS 2025)
- Old U.S. Highway 80 Area Plan (Maricopa County 2007)
- USGS National Land Cover Database (USGS 2019)

Existing Land Use and Zoning

Land use designations in the Study Area include rural, dedicated/non-developable open space; power plants; and large lot residential (Maricopa County 2007; **Figure A-3**). Zoning designations are Rural Residential (RU-190) and Heavy Industrial (IND-2) (Maricopa County 2023; **Figure A-4**). RU-190 allows one single-family dwelling per minimum lot area of 190,000 square feet (4.36 acres), and principal uses permitted in this zoning district include farm and non-farm residential uses as well as recreational and institutional uses. IND-2 allows the manufacture, compounding, processing, packaging, or treatment of materials that do not cause or produce objectionable effects, which would impose hazards to adjacent or other properties from smoke, soot, dust, radiation, odor, noise, vibration, heat, glare, toxic fumes, or other conditions that would adversely affect public health, safety, and general welfare (Maricopa County 2023).

Land zoned Rural (Rural-43) is adjacent north and east of the Study Area, but very few developed residential communities are present. The most notable is a residential community more than 2 miles northeast of the Project site. Because dwellings are limited to one per acre with Rural-43 zoning, no large-scale subdivisions have been built near the Project site. Several areas with a vacant land use designation are in the Study Area; nevertheless, recent aerial imagery of these areas shows solar sites are present (refer to **Figure A-3**). This discrepancy has occurred because land use designations and zoning classifications provide different purposes and often are updated on different timelines. Zoning classifications regulate what type of uses are permitted in a specific area. The land containing the solar sites is zoned IND-2, which allows utility-related or energy-generating facilities.

The land cover categories in the Study Area include barren land; cultivated crops; developed open space; developed low, medium, and high density; emergent herbaceous wetlands; grasslands/herbaceous; open water; shrub/scrub; and woody wetlands (ASLD 2025b; **Table A-1**). Privately owned land encompasses 53.5 percent of the Study Area, 22.3 percent is State Trust land, and 24.1 percent is federal land administered by the BLM. Between 2004 and 2024, 97.4 percent of

the land use in the Study Area did not change, with just over a 1.9 percent increase in urbanization or land development (USGS 2025).

Table A-1. Land Cover and Ownership in the Study Area

Category	Percent in the Study Area
Current Land Cover	
Barren Land	4.3%
Cultivated Crops	3.9%
Developed Land (Low, Medium, and High Density)	2.6%
Developed Open Space	1.1%
Emergent Herbaceous Wetlands	0.1%
Grasslands/Herbaceous	0.2%
Open Water	3.4%
Shrub/Scrub	83.6%
Woodly Wetlands	0.9%
Current Land Ownership	
Private Land	53.5%
Arizona State Trust Land	22.3%
BLM Land	24.1%
Land Usage Changes (2004 to 2024)	
No Change	97.4%
Increases in Urban Cover	1.9%

Sources: MRLC 2025; ASLD 2025b

Future Land Use and Zoning Compliance

Identification of future land uses in the Study Area included a review of the land use policy plans in the Old Highway 80 Area Plan and the Maricopa County Comprehensive Plan (Maricopa County 2007, 2016). Those plans indicate that the County's future land use goals in the Study Area are to promote efficient land development compatible with adjacent land uses, and to create orderly and functional development patterns. Future zoning in the Study Area is to remain RU-190 and IND-2, which include residential, agriculture, and heavy industrial uses (**Figure A-5**). The industrial zoning designation identifies locations for major employment centers, and uses permitted in this category include general warehousing, storage, distribution activities, and general manufacturing (Maricopa County 2023).

The Project would be consistent with the designated future land uses and zoning designations. The Arlington area has several power plants and solar generation facilities. The introduction of a new 500-kV transmission line within the existing utility infrastructure would be consistent with County land-use decisions. The plans consider continuance of the existing rural lifestyle, preservation of hillsides and floodplains, and compatibility with the natural environment to protect public health, safety, and general welfare. Compatibility with adjacent current and future land uses is an important consideration, and developments in this category would be subject to plan review and approval (Maricopa County 2023). The Project would be consistent with existing and future land uses, including the growth plans of Maricopa County.

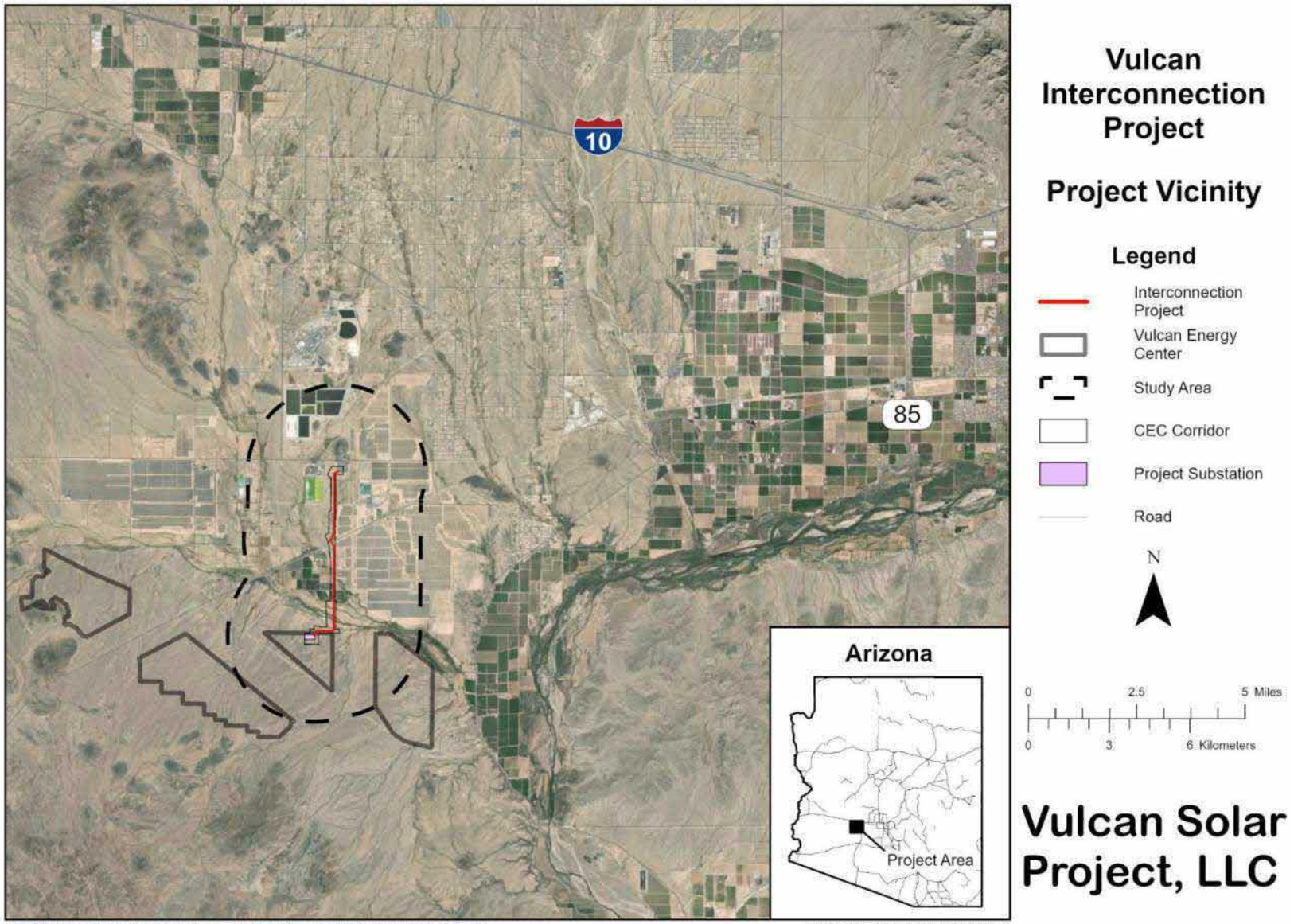
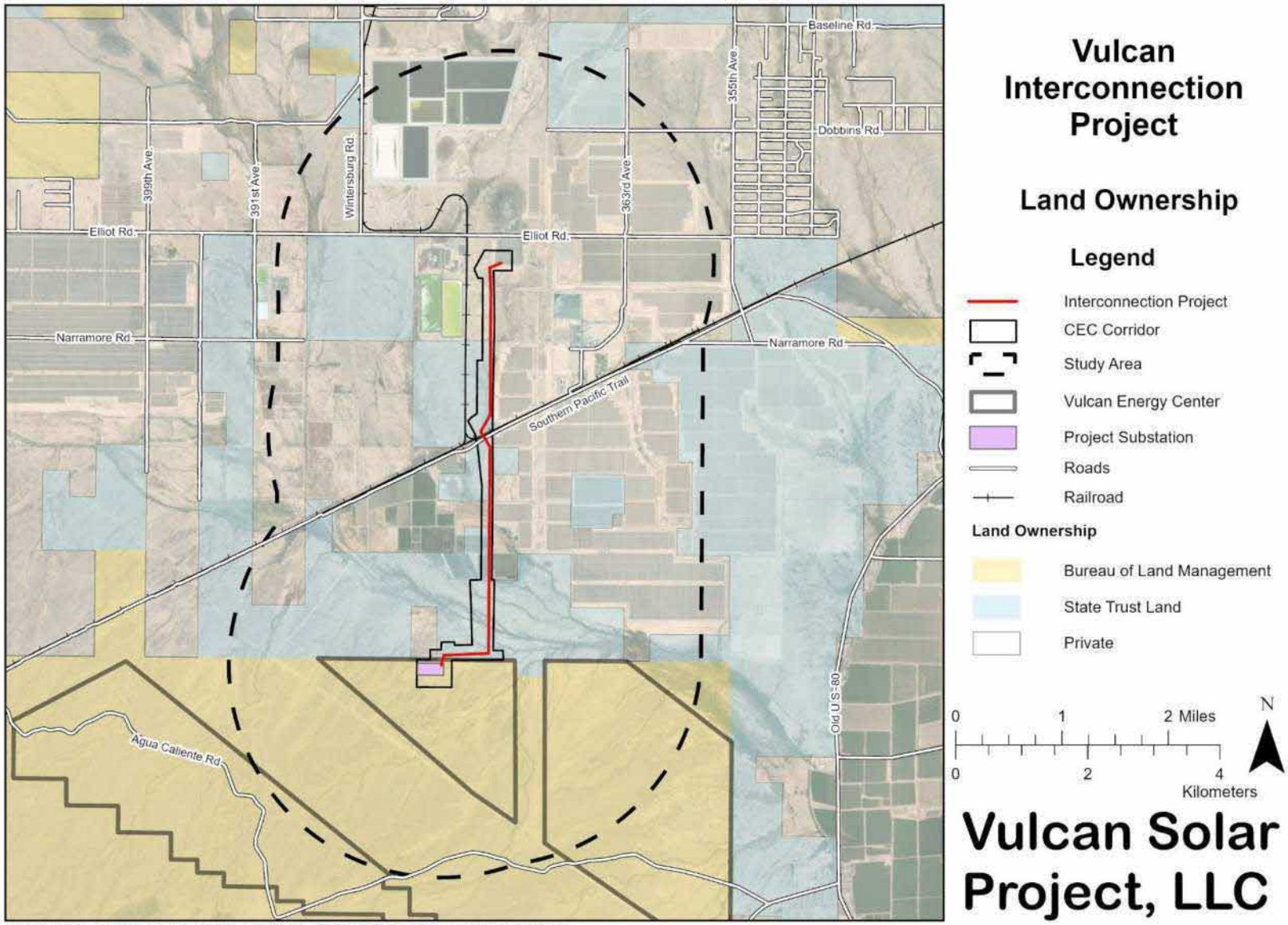
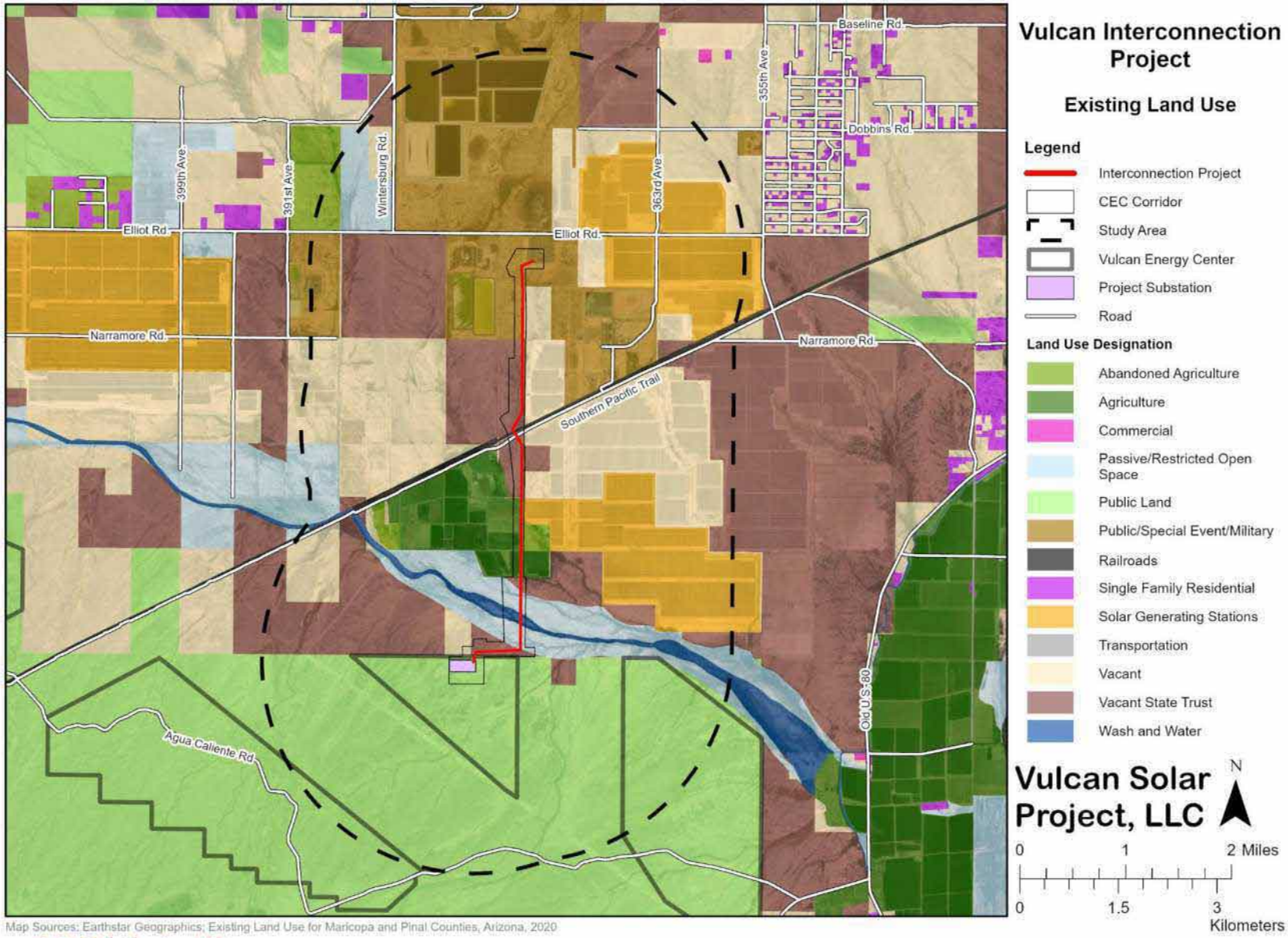


Figure A-1. Project Vicinity Map



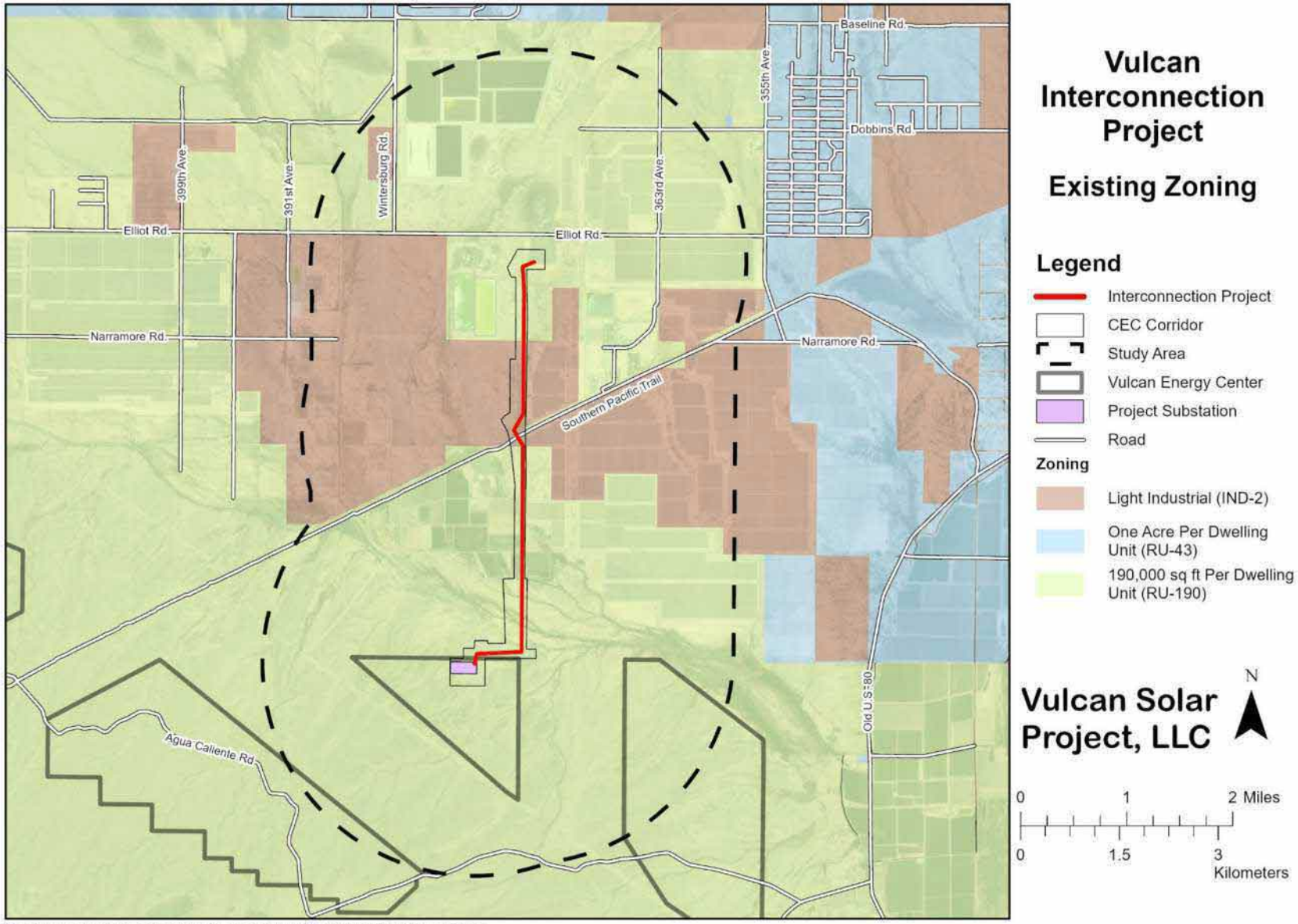
Map Sources: Bureau of Land Management National Surface Management Agency, Earthstar Geographics

Figure A-2. Land Ownership



Map Sources: Earthstar Geographics; Existing Land Use for Maricopa and Pinal Counties, Arizona, 2020

Figure A-3. Existing Land Uses



Map Sources: Earthstar Geographics; Maricopa County Planning and Development Zoning

Figure A-4. Existing Zoning

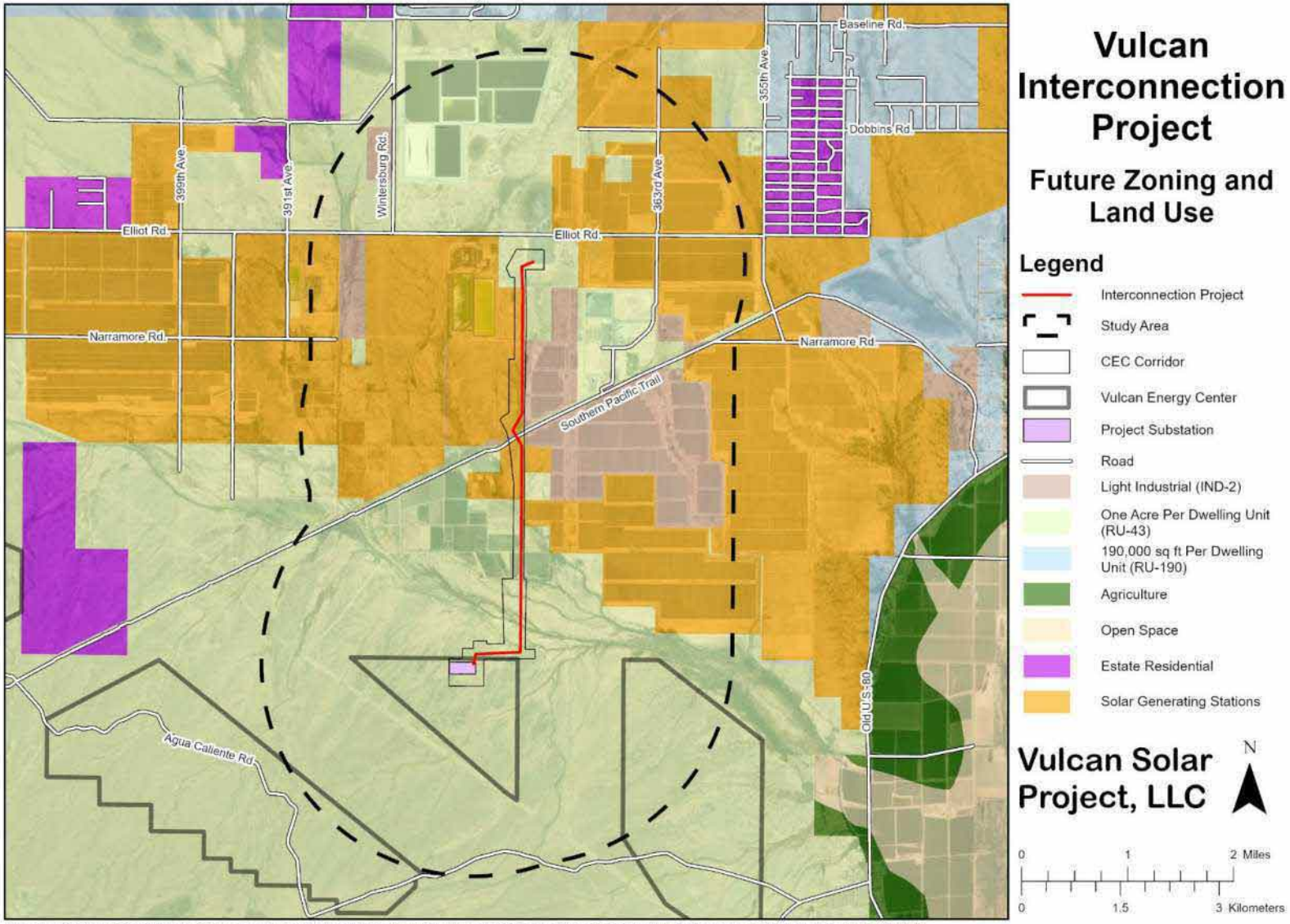


Figure A-5. Future Land Uses

References

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Exhibit B

Environmental Reports

Exhibit B
Environmental Reports

As stated in the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1:

> Attach any environmental studies which applicant has made or obtained in connection with the proposed site(s) or route(s). If an environmental report has been prepared for any federal agency or if a federal agency has prepared an environmental statement pursuant to Section 102 of the National Environmental Policy Act a copy shall be included as part of this exhibit.

Introduction

AECOM was retained by Vulcan Solar Project, LLC (Vulcan Energy Center or applicant) to complete environmental analyses for the Vulcan Interconnection Project (Project). The Project is an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation tie transmission line (gen-tie) that will deliver power from a proposed 800 megawatt (MW) solar and battery energy storage system (BESS) facility and a new on-site substation to the existing 500kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within a 540 to 4,737 foot-wide siting corridor (CEC Corridor). The Project is defined as the 200-foot-wide gen-tie ROW. The proposed CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south, with a width varying between 540 and 4,737 feet east to west.

The environmental analysis included an evaluation of land use and biological, visual, cultural, and recreation resources in the Study Area, defined as a 2-mile radius around the Project. The results of the environmental studies associated with the Project are discussed in previous and subsequent exhibits, as follows:

- **Exhibit A** describes land use.
- **Exhibits C** and **D** address potential impacts on sensitive biological resources.
- **Exhibit E** summarizes potential effects on scenic qualities and cultural resources.
- **Exhibit F** summarizes potential effects on recreational resources.
- **Exhibit H** describes how the Project could affect local plans.
- **Exhibit I** discusses the anticipated noise and interference impacts from Project implementation.

The Study Area is entirely within unincorporated Maricopa County, Arizona. The land is privately owned Arizona State Trust Land, managed by the Arizona State Land Department (ASLD), and federal land, administered by the Bureau of Land Management (BLM). The privately owned land encompasses 53.5 percent of the Study Area, 22.3 percent is State Trust land, and 24.1 percent is federal land, administered by BLM.

This exhibit describes additional environmental studies that have been conducted for the Project and the Vulcan Energy Center, not included in Exhibits A, C, D, E, F, H, and I of this application. Copies of those studies also are attached. Copies of the Aquatic Resources Assessment, Native Plant Survey, Biological Habitat Assessment, Monarch Butterfly Habitat Assessment, and Visual Resource Assessment that were conducted for the Project on federal land are appended (**Appendices B-1, B-2, B-3, B-4, and B-5**).

Bureau of Land Management National Environmental Policy Act Record of Decision

Because a segment of the Project is on federal land that is administered by the BLM, the Project is considered a "federal action" requiring review under the National Environmental Policy Act (NEPA) of 1969. Vulcan Energy Center developed a Plan of Development, and the BLM is developing a draft Environmental Impact Statement (EIS) for the Project, inclusive of the 103-acre ROW for the transmission interconnection components. The BLM has assigned a NEPA number (DOI-BLM-AZ-P020-2023-0006-EIS) and has performed the initial scoping. The BLM field office has reviewed the Draft EIS and is waiting for instructions from the U.S. Department of the Interior (DOI) for submittal for Secretarial review, per the July 2025 memorandum. Additional information is available at https://eplanning.blm.gov/eplanning-ui/project/2024466/510.

Arizona State Land Department Right-of-Way Permit

The 200-foot-wide transmission line ROW encompasses 103 acres, and the approximately 76 acres under the jurisdiction of the ASLD would require a specific ASLD ROW agreement. The ASLD has assigned a ROW Application number (14-125091-00-100).

Environmental Studies Made or Obtained in Connection with the Proposed Route

Vulcan Energy Center has completed the following five additional environmental studies in connection with the Project:

- **Aquatic Resources Assessment:** Vulcan Energy Center contracted Dudek to complete the Aquatic Resources Assessment. The Aquatic Resources Assessment Technical Memorandum, completed in February 2025, describes the desktop review and summarizes the aquatic resources data from field investigations, and it requests an Approved Jurisdictional Delineation (AJD) from the U.S. Army Corps of Engineers (USACE) for waters of the U.S. The information in this memorandum was used to coordinate with USACE, which provided an AJD letter. The Aquatic Resources Assessment Technical Memorandum and USACE AJD letter are provided in **Appendix B-1**.
- **ASLD Native Plant Inventory:** Vulcan Energy Center contracted Dudek to conduct native plant surveys per ASLD protocols, which were completed on April 11, 2025. The Native Plant Inventory involved estimating the number of native trees, shrubs, and cactus plants that would be removed from State lands by the Project. This estimate is to be used to calculate the fee that would need to be paid to the ASLD to compensate for the loss of vegetation from State lands. The Native Plant Inventory will support the Project's ASLD right-of-way application. The Native Plant Inventory is provided in **Appendix B-2.**

- **Biological Habitat Assessment.** Vulcan Energy Center contracted Dudek to conduct a desktop Biological Habitat Assessment[1] for the new medium-voltage (MV) line corridor alignment associated with the Vulcan Energy Center. The purpose of this assessment was to evaluate the existing biological conditions of the new MV line corridor alignment and compare them to the original MV line corridor alignment that previously was surveyed for the project. The Biological Habitat Assessment is provided in **Appendix B-3.**

- **Monarch Butterfly Habitat Assessment.** Vulcan Energy Center contracted SWCA Environmental Consultants to conduct a Monarch Butterfly Habitat Assessment for the new MV line corridor alignment for the Project. The Monarch Butterfly Habitat Assessment is provided in **Appendix B-4.**

- **Visual Resource Report.** Vulcan Energy Center contracted Dudek to prepare a Visual Resource Report (VRR) for the Project in April 2025. The VRR was prepared pursuant to BLM visual resource management objectives, defined in BLM Handbook 8400[2]. The VRR was submitted to the BLM as part of the NEPA analysis for the Project. The Visual Resource Report is provided in **Appendix B-5**.

[1] Dudek. 2025. *Biological Habitat Assessment for the New MW Line Corridor Alignment for the Vulcan Solar Project*. May 8, 2025.
[2] Bureau of Land Management. 1984. *Manual 8400 – Visual Resource Management*. Department of the Interior, Washington, D.C.

Appendix B-1.
Aquatic Resources Assessment

Aquatic Resources Delineation Report

Vulcan Solar Project
Maricopa County, Arizona

FEBRUARY 2025

Prepared for:

VULCAN SOLAR PROJECT, LLC
700 Universe Boulevard
Juno Beach, Florida 33408

Prepared by:

DUDEK

Contact: Michelle Leis

Table of Contents

SECTION **PAGE NO.**

TABLES

APPENDICES

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
APT	Antecedent Precipitation Tool
ARC	antecedent runoff condition
ARDR	Aquatic Resources Delineation Report
EBC	ephemeral braided channel
EPH	ephemeral channel
FACU	facultative upland
gen-tie	generation interconnection transmission line
HUC	Hydrologic Unit Code
IBC	intermittent braided channel
INT	intermittent channel
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PDSI	Palmer Drought Severity Index
RPWTNW	traditionally navigable water
UPL	upland
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WOTUS	Waters of the United States

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1 Executive Summary

This Aquatic Resources Delineation Report (ARDR) for the Vulcan Solar Project (project) was prepared in accordance with the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (USACE 1987), the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Regional Supplement; USACE 2008a) and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (OHWM Manual; USACE 2008b).

Dudek conducted a field delineation for the proposed project from October 15 to October 20, 2024, to identify aquatic resources in the 659-acre review area (598-acre generation interconnection transmission line (gen-tie) survey area and 61-acre medium-voltage [MV] line corridor) potentially subject to regulations in Sections 401 and 404 of the Clean Water Act. Table 1 summarizes the delineation findings.

Table 1. Summary of Aquatic Resources in the Review Area

Feature Type	Cowardin[a]	Acres[b]	Linear Feet
Non-Wetland Waters			
Ephemeral braided channel	R6	8.07	4,119.57
Intermittent braided channel	R4	3.48	935.62
Ephemeral channel	R6	3.72	14,375.73
Intermittent channel	R4	0.49	897.76
Non-Wetland Waters Subtotal		*15.75*	*20,328.68*
Other Waters			
Drainage ditches	N/A	0.39	1,883.79
Non-Wetland Waters and Other Waters Total		**16.14**	**22,212.47**

Notes: R6 = riverine, ephemeral, R4 = riverine, intermittent.

[a] Pursuant to Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) and the Cowardin Codes for ORM Data Entry (USACE 2024a).

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2 Introduction

This ARDR was prepared in accordance with the USACE Wetlands Delineation Manual (USACE 1987), the USACE Regional Supplement (USACE 2008a), and the OHWM Manual (USACE 2008b). This ARDR presents the results of the jurisdictional aquatic resources delineation conducted for the proposed project in Maricopa County, Arizona (Figure 1, Project Location; see Appendix A, ARDR Figures, for all figures in this ARDR). The delineation was conducted to identify and map existing aquatic resources potentially subject to the regulatory jurisdiction of USACE pursuant to Section 404 of the Clean Water Act (33 USC 1344) and waters of the state potentially subject to the regulatory jurisdiction of ADWR (collectively defined as jurisdictional aquatic resources).

2.1 Disclaimer Statement

This ARDR presents Dudek's best effort to quantify the extent of aquatic resources potentially regulated by USACE in the identified review area using the current regulations, written policies, and guidance from these regulating agencies.

2.2 Contact Information

Contact information from the project applicant and agent are provided in Table 2. Access to the review area is not restricted, but if a site visit is requested, the project applicant or agent will accompany regulatory staff to the review area. The client is the project applicant and landowner.

Table 2. Contact Information

Project Applicant	Vulcan Solar Project, LLC	**Agent**	Dudek
Contact Name	Alex Simons, Project Manager, Environmental Services NextEra Energy Resources, LLC	**Contact Name**	Michelle Leis
Address	700 Universe Boulevard, Juno Beach, Florida 33408	**Address**	605 3rd Street, Encinitas, California 92024
Phone	505.357.8960	**Phone**	760.815.3797
Email	Alex.Simons@nexteraenergy.com	**Email**	mleis@dudek.com

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3 Review Area Description and Landscape Setting

3.1 Location

The approximately 659-acre review area (598-acre gen-tie survey area and 61-acre MV line corridor) is in Maricopa County, Arizona, approximately 7 miles southwest of the unincorporated community of Arlington and north of the Gila Bend Mountains (see Figure 1). Of the 659-acre review area, 175 acres of private land could not be assessed during this survey (see Figure 2, Land Ownership). The site is on Arizona State Trust Land and Bureau of Land Management–administered public land under the jurisdiction of the Bureau of Land Management Lower Sonoran Field Office, as well as on private lands that were not included within this survey. The project site is within the Gillespie and Arlington U.S. Geological Survey 7.5-minute quadrangles (USGS 2024).

Specific location information is summarized as follows:

- **County:** Maricopa
- **Public Land Survey System (Gen-Tie Survey Area):** Gila and Salt River Meridian, Sections 15, 22, 27–28, 33–34; Township 1S, 2S; Range 6W
- **Public Land Survey System (MV Line Corridor):** Gila and Salt River Meridian, Sections 4–6, 8–11, 35–36; Township 1S, 2S; Range 6W, 7W
- **U.S. Geological Survey 7.5-Minute Quadrangles:** Gillespie and Arlington
- **Latitude, Longitude:** 33.31286858°, −112.8576032° (Centroid, Gen-Tie Survey Area); 33.2812308°, −112.8955001° (Centroid, MV Line Corridor)
- **Elevation Range:** 813.68 to 982.08 feet above mean sea level
- **Review Area (Gen-Tie Survey Area and MV Line Corridor):** 659 acres

3.2 Site Access

The review area is located approximately 8.9 miles south of Interstate 10, 7 miles southwest of the town of Arlington, 3.1 miles west of South Old US 80 Highway, and approximately 6.1 miles north of the Gila Bend Mountains. Access to the project site is provided via Agua Caliente Road, Narramore Road, and West Elliot Road.

3.3 Survey Limitations

The review area is on Arizona State Trust Land, Bureau of Land Management land, and private lands. Private lands in the review area were not accessible during the field survey and therefore were not able to be included in this delineation (see Figure 2).

3.4 Geology and Topography

Topography is gently sloping east-southeast toward Centennial Wash and the eastern end of the Gila Bend Range, with drainages flowing to the east. Elevation ranges from 813.68 to 982.08 feet above mean sea level.

3.5 Vegetation

Land cover in the review area consists of cultivated crops, barren non-vegetative land covers, and natural vegetation communities. Four vegetation communities are present in the review area: North American warm-desert xeric–riparian scrub, North American warm desert pavement, Sonora–Mojave creosotebush–white bursage desert scrub, and Sonoran paloverde–mixed cacti desert scrub. Two land cover types, agricultural and developed open space, are also present in the review area. Figures 3-1 through 3-3, Vegetation Communities and Land Cover – Gen-Tie Survey Area, and Figures 3-4 through 3-8, Vegetation Communities and Land Cover – MV Line Corridor, illustrate the distribution of vegetation communities and land covers in the review area. Tables 3 and 4 provide a summary of each vegetation community and land cover type extent in both the gen-tie survey area and the MV line corridor. Descriptions of these vegetation communities and land cover types are provided in detail following the tables.

Table 3. Vegetation Communities and Land Cover Types in the Gen-Tie Survey Area

Vegetation Community/Land Cover Type	Acres[a]
Vegetation Community	
Sonora–Mojave creosotebush–white bursage desert scrub	407.49
North American warm desert pavement	14.98
North American warm-desert xeric–riparian scrub	42.50
Vegetation Community Subtotal	*464.97*
Land Cover Type	
Agriculture	86.16
Developed–open space	46.44
Land Cover Subtotal	*132.60*
Total	**597.57**

Note: gen-tie = generation interconnection transmission line.
[a] Acreages may not sum precisely due to rounding.

Table 4. Vegetation Communities and Land Cover Types in the MV Line Corridor

Vegetation Community/Land Cover Type	Acres[a]
Vegetation Community	
Sonora–Mojave creosotebush–white bursage desert scrub	25.44
Sonoran paloverde–mixed cacti desert scrub	31.79
North American warm desert pavement	2.43
North American warm-desert xeric–riparian scrub	0.24
Vegetation Community Subtotal	*59.90*

Table 4. Vegetation Communities and Land Cover Types in the MV Line Corridor

Vegetation Community/Land Cover Type	Acres[a]
Land Cover Type	
Developed–open space	0.42
Land Cover Subtotal	*0.42*
Total	**60.32**

Notes: MV = medium-voltage.
[a] Acreages may not sum precisely due to rounding.

3.5.1 Vegetation Communities

Sonora–Mojave Creosote Bush–White Bursage Desert Scrub

This vegetation community forms a desert scrub matrix across broad valleys, lower bajadas, plains, and low hills in the Mojave and lower Sonoran Deserts (NatureServe 2024a). It is characterized by a sparse to moderately dense layer (2%–50% cover) of xeromorphic small- and broad-leaved shrubs. Creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are typically dominants, but many different shrubs, dwarf shrubs, and cacti may codominate or form typically sparse understories (NatureServe 2024a). Associated species may include triangle bur ragweed (*Ambrosia deltoidea*), fourwing saltbush (*Atriplex canescens*), desert holly (*Atriplex hymenelytra*), brittlebush (*Encelia farinosa*), Nevada jointfir (*Ephedra nevadensis*), ocotillo (*Fouquieria splendens*), water jacket (*Lycium andersonii*), and beavertail pricklypear (*Opuntia basilaris*) (NatureServe 2024a). The herbaceous layer is typically sparse but may have abundant seasonal ephemerals. Herbaceous species such as euphorbias (*Chamaesyce* spp.), desert trumpet (*Eriogonum inflatum*), low woollygrass (*Dasyochloa pulchella*), needlegrasses (*Aristida* spp.), cryptanthas (*Cryptantha* spp.), and phacelias (*Phacelia* spp.) are common (NatureServe 2024a). This community can often appear as very open sparse vegetation, with the mostly barren ground surface being the predominant feature.

In the review area, Sonora–Mojave creosotebush–white bursage desert scrub comprised most of the site, totaling 432.93 acres (407.49 acres in the gen-tie survey area, 25.44 acres in the MV line corridor). This community occurred throughout the entirety of the review area (see Photo 1 in Appendix B, Representative Photos). Associated species found within the review area included fourwing saltbush and brittlebush. Observed cacti included desert Christmas cholla (*Cylindropuntia leptocaulis*) and branched pencil cholla (*Cylindropuntia ramosissima*), with desert Christmas cholla being the most dominant. Common herbaceous species found in the review area included desert trumpet and popcornflower (*Cryptantha* sp.).

Sonoran Paloverde–Mixed Cacti Desert Scrub

This vegetation community occurs on hillsides, mesas, and upper bajadas in southern Arizona. The vegetation is characterized by a diagnostic sparse, emergent tree layer of saguaro (*Carnegiea gigantea*) (3 to 16 meters [10 to 52 feet] tall) and/or a sparse to moderately dense canopy of xeromorphic deciduous and evergreen tall shrubs codominated by foothill palo verde (*Parkinsonia microphylla*) and creosote bush, with mesquite (*Prosopis* spp., *Neltuna* spp.), desert ironwood (*Olneya tesota*), and ocotillo, which is usually less prominent (NatureServe 2024b). Other common shrubs and dwarf-shrubs include catclaw acacia (*Senegalia greggii*), triangle bur ragweed, white bursage (in drier sites), fairyduster (*Calliandra eriophylla*), sangre de cristo (*Jatropha cardiophylla*), littleleaf ratany (*Krameria erecta*), boxthorns (*Lycium* spp.), rough menodora (*Menodora scabra*), jojoba (*Simmondsia chinensis*),

and many cacti, including barrel cactus (*Ferocactus* spp.), *Echinocereus* spp., beavertail pricklypear, and chollas (*Cylindropuntia* spp.) (NatureServe 2024b). The sparse herbaceous layer is composed of perennial grasses and forbs, with annuals seasonally present and occasionally abundant. On slopes, plants are often distributed in patches around rock outcrops where suitable habitat is present (NatureServe 2024a).

In the review area, Sonoran paloverde–mixed cacti desert scrub comprises a total of 31.79 acres. This community occurred only within the MV line corridor (see Photo 2 in Appendix B). The emergent tree layer consisted of very sparse saguaro. Other cacti species were prevalent and consisted of branched pencil cholla. Evergreen tall shrubs included creosote bush, velvet mesquite (*Neltuna velutina*), and palo verde (*Parkinsonia* sp.).

North American Warm-Desert Xeric–Riparian Scrub

This vegetation community consists of variable vegetation of desert washes ranging from sparse and patchy to moderately dense, and typically occurs along the edges or in the channel bottoms (NatureServe 2024c). A woody layer is usually present and is typically intermittent to open and may be dominated by shrubs and small trees such as catclaw acacia, desertbroom (*Baccharis sarothroides*), sweetbush (*Bebbia juncea*), splitleaf brickellbush (*Brickellia laciniata*), desert-willow (*Chilopsis linearis*), California joint fir (*Ephedra californica*), black-stem rabbitbrush (*Ericameria paniculata*), Apache plume (*Fallugia paradoxa*), burrobrush (*Ambrosia salsola* var. *pentalepis*), singlewhorl burrobrush (*Ambrosia monogyra*), desert lavender (*Condea emoryi*), Arizona walnut (*Juglans major*), scale broom (*Lepidospartum squamatum*), desert ironwood, blue palo verde (*Parkinsonia florida*), mesquite, smoketree (*Psorothamnus spinosus*), desert almond (*Prunus fasciculata*), littleleaf sumac (*Rhus microphylla*), Mexican bladdersage (*Scutellaria mexicana*), greasewood (*Sarcobatus vermiculatus*), and/or netvein goldeneye (*Bahiopsis reticulata*) (NatureServe 2024c). A few known herbaceous communities dominate intermittent and ephemeral drainages and washes, with woody vegetation absent or only with scattered individuals present. Dominant species include buckwheats (*Eriogonum* spp.), desert wishbone-bush (*Mirabilis laevis*), beardtongues (*Penstemon* spp.), bulb panicgrass (*Panicum bulbosum*), shortawn foxtail (*Alopecurus aequalis*), and/or common wolfstail (*Lycurus phleoides*). This community occurs on intermittently flooded washes or arroyos that bisect bajadas, mesas, plains, and basin floors throughout the warm deserts of the western United States and northern Mexico (NatureServe 2024c). It can contain similar species to uplands but may have much denser vegetation and larger growth due to the increase of available water.

In the review area, North American warm-desert xeric–riparian scrub occurred along riparian corridors that were either associated with Centennial Wash or within the floodplain (see Photo 4 in Appendix B). This community covered a total acreage of 42.74 acres. Associated species found in the review area included moderately dense velvet mesquite, catclaw acacia, and paloverde. Ephemeral or floodplain areas classified under this community were evaluated based on the density of velvet mesquite present.

North American Warm Desert Pavement

The North American warm desert pavement community forms throughout much of the warm deserts of North America and is composed of unvegetated to very sparsely vegetated (due to extreme temperature and wind) land that develops ground surfaces of fine to medium gravel coated with “desert varnish.” Very low cover of desert scrub species such as creosote bush or California buckwheat (*Eriogonum fasciculatum*) is usually present. However, ephemeral herbaceous species may have high cover in response to seasonal precipitation, including rigid spineflower (*Chorizanthe rigida*), desert trumpet, and hairy desert sunflower (*Geraea canescens*) (Comer et al. 2003).

In the review area, North American warm desert pavement totaled 17.41 acres. This community was sparse throughout the review area and was predominantly focused on the northern and southern boundaries (see Photo 21 in Appendix B). Associated species found in the review area included creosote bush, which was either absent or very sparse. Herbaceous species, which had varying cover, included rigid spineflower and desert trumpet.

3.5.2 Land Cover Types

Agricultural

Agricultural land covers a total of 86.16 acres in the gen-tie survey area. Agricultural land is characterized by human impacts upon the landscape. This often takes the form of roads, structures, agricultural tilling and grading, and grazing. Within the review area, these lands take the form of tilled fields on Arizona State Trust Lands and private lands (see Photo 3 in Appendix B).

Developed–Open Space

Developed open space land covers a total of 46.86 acres within the gen-tie and MV corridor survey area and is characterized by areas with a mixture of constructed materials and vegetation (Dewitz 2021). This often takes the form of disturbed areas with roads and structures. In the review area, these lands take the form of compacted dirt roads, topsoil disturbance areas, and railway infrastructure.

3.6 Soils

According to the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey, 19 soil mapping units occur in the review area: Antho sandy loam 0% to 1% slopes, Casa Grande loam, Casa Grande sandy loam, Casa Grande–Laveen complex alkali, Dateland–Cuerda complex 0% to 3% slopes, Gilman fine sandy loam 0% to 2% slopes, Gilman loam 0% to 1% slopes, Gilman loam clayey subsoil variant moderately saline, Gilman loam saline–alkali, Gunsight–Chuckawalla complex 1% to 15% slopes, Gunsight–Rillito–Carrizo complex 1% to 15% slopes, Harqua complex 0% to 3% slopes, Harqua complex 3% to 8% slopes, Harqua–Gunsight complex 0% to 5% slopes, Laveen loam saline–alkali, Laveen sandy loam, Perryville loam saline–alkali, Rillito sandy loam 0% to 1% slopes, and Valencia sandy loam (Figures 4-1 through 4-3, Soils – Gen-Tie Survey Area, and Figures 4-4 through 4-8, Soils – MV Line Corridor) (USDA 2024a). None of the soils mapped in the review area is considered hydric (USDA 2024a, 2024b–2024n). Soil types in the gen-tie survey area are summarized in Table 5. Soil types in the MV line corridor are summarized in Table 6.

Table 5. Soils in the Gen-Tie Survey Area

Soil Map Unit Name	Landform	Drainage Class	Acres[a]	Hydric[b]
Antho sandy loam, 0% to 1% slopes	Alluvial fans and floodplains; volcanic, granitic, metamorphic and sedimentary rock	Somewhat excessively drained soils	0.35	No
Casa Grande loam	On nearly level fan terraces and relict basin floors	Well-drained soils	6.06	No
Casa Grande sandy loam	On nearly level fan terraces and relict basin floors	Well-drained soils	6.32	No
Casa Grande–Laveen complex, alkali	On nearly level fan terraces and relict basin floors	Well-drained soils	30.89	No

Table 5. Soils in the Gen-Tie Survey Area

Soil Map Unit Name	Landform	Drainage Class	Acres[a]	Hydric[b]
Dateland–Cuerda complex; 0% to 3% slopes	Alluvial fans, stream terraces, fan piedmonts or relict basin floors; floodplains	Well-drained soils	0.0.14	No
Gilman fine sandy loam, 0% to 2% slopes	Floodplains and alluvial fans	Well-drained soils	2.46	No
Gilman loam, 0% to 1% slopes	Floodplains and alluvial fans	Well-drained soils	167.32	No
Gilman loam, clayey subsoil variant, moderately saline	Floodplains and alluvial fans	Well-drained soils	1.10	No
Gilman loam, saline–alkali	Floodplains and alluvial fans	Well-drained soils	109.41	No
Gunsight–Chuckawalla complex, 1% to 15% slopes	Fan terraces and/or stream terraces	Somewhat excessively drained and well-drained soils	0.09	No
Harqua complex, 0% to 3% slopes	Fan terraces or stream terraces	Well-drained soils	72.82	No
Harqua complex, 3% to 8% slopes	Fan terraces or stream terraces	Well-drained soils	0.03	No
Laveen sandy loam	Relict basin floors, stream terraces and fan terraces	Well-drained soils	7.48	No
Laveen loam, saline–alkali	Relict basin floors, stream terraces and fan terraces	Well-drained soils	165.54	No
Perryville loam, saline–alkali	Alluvial fans and terraces	Well-drained soils	19.90	No
Rillito sandy loam, 0% to 1% slopes	Fan terraces or stream terraces	Somewhat excessively drained soils	6.14	No
Valencia sandy loam	Alluvial fans and flood plains	Well-drained soils	1.58	No
		Total	**597.62**	**N/A**

Source: USDA 2024a, 2024b–2024n.
Notes: gen-tie = generation interconnection transmission line; N/A = not applicable.
[a] Acreage may not sum precisely due to rounding from U.S. Department of Agriculture data.
[b] Hydric soil as defined by the U.S. Department of Agriculture (i.e., formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part), if hydric conditions are present within the soil unit.

Table 6. Soils in the MV Line Corridor (BLM)

Soil Map Unit Name	Landform	Drainage Class	Acres[a]	Hydric[b]
Dateland–Cuerda complex; 0% to 3% slopes	Alluvial fans, stream terraces, fan piedmonts or relict basin floors; floodplains	Well-drained soils	0.73	No
Gilman loam, 0% to 1% slopes	Floodplains and alluvial fans	Well-drained soils	1.16	No
Gunsight–Chuckawalla complex, 1% to 15% slopes	Fan terraces and/or stream terraces	Somewhat excessively drained and well-drained soils	31.20	No

Table 6. Soils in the MV Line Corridor (BLM)

Soil Map Unit Name	Landform	Drainage Class	Acres[a]	Hydric[b]
Gunsight–Rillito–Carrizo complex, 1% to 15% slopes	Fan terraces and/or stream terraces	Somewhat excessively drained and well-drained soils	19.73	No
Harqua complex, 0% to 3% slopes	Fan terraces or stream terraces	Well-drained soils	7.69	No
Harqua–Gunsight complex, 0% to 5% slopes	Fan terraces or stream terraces	Well-drained soils	0.67	No
		Total	**61.18**	**N/A**

Source: USDA 2024a, 2024b–2024n.
Notes: MV = medium-voltage; BLM = Bureau of Land Management; N/A = not applicable.
[a] Acreage may not sum precisely due to rounding from U.S. Department of Agriculture data.
[b] Hydric soil as defined by the U.S. Department of Agriculture (i.e., formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part), if hydric conditions are present within the soil unit.

3.7 Hydrology

The review area is within the Centennial Wash Subbasin (Hydrologic Unit Code [HUC] 8: 15070104). More specifically, the review area is within the Lower Harquahala Plains–Centennial Wash Watershed (HUC 10: 1507010407). The gen-tie survey area is within the South Tank Subwatershed (HUC 12: 150701040707) and the Jagow Tank Subwatershed (HUC 12: 150701040705), while the MV line corridor is within the Jagow Tank Subwatershed (HUC 12: 150701040705) and Petterson Tank–Centennial Wash Subwatershed (HUC 12: 150701040706) (see Figure 5, Hydrologic Setting). The Petterson Tank–Centennial Wash Subwatershed occupies 156,466.77 acres of the Southwest Maricopa County Region in Arizona. The Lower Harquahala Plains–Centennial Wash Watershed includes Centennial Wash as well as agricultural land, urban land, freshwater forested/shrub wetland, freshwater ponds, and barren land. One 6.9-mile reach of the lower Gila River, from Powers Butte to Gillespie Dam, has been determined to be a traditionally navigable water, or TNW. This region is known for agriculture, and the Gila River traverses thousands of acres of farmland in the Arlington and Buckeye Valleys before reaching Gillespie Dam, approximately 34 miles downstream from the confluence point of the Salt and Gila Rivers near Phoenix (USACE 2008c). At approximately 654 miles in length, the Gila River is one of the longest rivers in Arizona and runs in an area of high mountains and plateaus, flowing westward toward the Colorado River along the Arizona–California state line (USACE 2008c). Most Arizona rivers are tributaries to the Gila River, including the Salt River, Verde River, Santa Cruz River, San Pedro River, San Francisco River, San Simon River, Agua Fria River, Centennial Wash, San Carlos River, Queen Creek, Hassayampa River, and Waterman Wash (USACE 2008c).

The Gila River itself is classified as a Regulatory Floodway adjacent to the review area (FEMA 2024; Figure 3). Centennial Wash is classified as a special flood hazard area (SFHA), zone AE, with high flood risk. This area encompasses the southern gen-tie survey area and field overflow extending further NW into agricultural lands (see Figure 5). Other ephemeral channels (EPH) within both the gen-tie survey area and the MV line corridor are classified as 0.2% annual flood hazard areas with 1% annual chance, according to the Federal Emergency Management Agency's National Flood Hazard Layer data (FEMA 2024).

3.8 Current and Past Land Use or Alterations

The review area is composed primarily of undeveloped lands with areas previously disturbed by agricultural and industrial use. East of the review area are existing solar fields and the Arizona Public Service Redhawk Power Plant. To the west are agricultural croplands. Lands to the north include the Palo Verde Generating Station. Between the gen-tie line and the MV corridor, lands are undeveloped and fall within the Centennial Wash. The entire MV line corridor is on undeveloped land with cattle grazing and recreational use, with multiple off-highway vehicle (OHV) trails intersecting the site.

4 Precipitation Data and Analysis

The USACE-developed Antecedent Precipitation Tool (APT) was used to assess whether the delineation date occurred in a drier, average, or wetter than normal period (USACE 2024b). The information generated from the APT can help to determine whether normal hydrologic and/or climatic conditions were present during the site visit and assist with completing the Wetland Determination Data Form.

The APT provides three climatological parameters: Palmer Drought Severity Index (PDSI), season, and antecedent precipitation condition. The PDSI is a standardized index calculated monthly, with PDSI value outputs ranging from −4 (extreme drought) to +4 (very wet) (NOAA 2021) to assess drought conditions (i.e., PDSI Class). The APT determines wet vs. dry season based on related procedures provided in the applicable regional supplement for the review area. If the antecedent runoff condition (ARC) score is less than 10, conditions are classified as drier than normal; if the ARC score is 10 to 14, then conditions are normal; and if the ARC score is greater than 14, then conditions are wetter than normal (USACE 2024b).

Table 7 presents a summary of the key data extrapolated from the APT output: estimated drought conditions (PDSI Class), wet or dry season determination, ARC score, and antecedent precipitation condition. Based on the data provided in Appendix C, Antecedent Precipitation Tool Outputs, and summarized in Table 7, the precipitation and climatic conditions for both the gen-tie survey area and the MV line corridor were drier than normal during the October 2024 delineation.

Table 7. Antecedent Precipitation Tool Data for the Review Area

Last Date of Field Delineation	PDSI Class	Season	ARC Score	Antecedent Precipitation Condition	Project Location
10/15/2024	Mild drought	Dry season	6	Drier than normal	Review area

Source: USACE 2024b.
Notes: PDSI = Palmer Drought Severity Index; ARC = antecedent runoff condition.

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5 Investigation Methods

5.1 Desktop Analysis

Prior to conducting fieldwork for the project, Dudek performed a desktop analysis to review the following available resources to identify portions of the review area with a probability for containing potential jurisdictional aquatic resources:

- Antecedent Precipitation Tool (USACE 2024b)
- Federal Emergency Management Agency's National Flood Hazard Layer (FEMA 2024)
- Google Earth current and historical aerial imagery (Google Earth 2024)
- Southwest Regional Gap Analysis Project: Land Cover Data (Lowry et al. 2005)
- U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey (USDA 2024a)
- U.S. Environmental Protection Agency WATERSKMZ tool through the Watershed Assessment, Tracking, and Environmental Results System (WATERS) (EPA 2021)
- USFWS NWI Mapper (USFWS 2021)
- U.S. Geological Survey historical topographical map data (USGS 2020)
- U.S. Geological Survey National Hydrography Dataset (USGS 2021)

5.2 Field Delineation

The jurisdictional delineation was conducted by Dudek biologists Allison Johnson and Kristen Amicarelle from October 15 to October 20, 2024 (Table 8). Potential aquatic resources were delineated based on methodology described in the USACE Wetlands Delineation Manual (USACE 1987) and the USACE Regional Supplement (USACE 2008a). Non-wetland waters of the United States were delineated based on the OHWM Manual (USACE 2008b). Potential aquatic resources were recorded using Esri Field Maps on a mobile device. Following the field work, aquatic resources were digitized using ArcGIS.

Table 8. Survey Details and Conditions

Date	Personnel	Survey Time	Survey Conditions (Temperature, Wind, Skies)
10/15/2024	Allison Johnson, Kristen Amicarelle	8:06 a.m.–6:15 p.m.	74°F–92°F, 0–3 mph winds, 0% cc
10/16/2024	Allison Johnson, Kristen Amicarelle	8:25 a.m.–6:17 p.m.	83°F–94°F, 0–15 mph winds, 0%–30% cc
10/17/2024	Allison Johnson, Kristen Amicarelle	6:33 a.m.–7:02 p.m.	67°F–86°F, 0–4 mph winds, 0%–50% cc
10/18/2024	Allison Johnson, Kristen Amicarelle	6:36 a.m.–7:00 p.m.	67°F–71°F, 0–13 mph winds, 20%–30% cc
10/19/2024	Allison Johnson, Kristen Amicarelle	7:00 a.m.–7:30 p.m.	63°F–70°F, 0–12 mph winds, 0%–70% cc
10/20/2024	Allison Johnson	10:00 a.m.–1:00 p.m.	70°F –80°F, 0–7 mph winds, 10%–20% cc

Notes: °F= degrees Fahrenheit; mph= miles per hour; cc = cloud cover.

All plant species encountered were identified to the lowest taxonomic level needed to determine wetland plant indicator status. Latin names follow conventions in the PLANTS Database (USDA 2024o). These resources were further referenced to identify plant taxonomic level appropriate to determine species and wetland plant indicator status if needed. Wetland plant indicator status for each plant was determined using the National Wetland Plant List: Arid West Region (USACE 2022). Appendix D, Observed Plant Species Compendium, contains a complete list of plant species and their indicator status.

5.2.1 Wetland Indicator Assessment

Per the USACE Wetland Delineation Manual (USACE 1987), wetlands are defined by the follow three parameters:

- **Hydric Soils:** Soil characteristics that result from the influence of periodic or permanent inundation or soil saturation for extended periods that further affect anaerobic conditions (i.e., chemical reduction in the soils or hydric soils).
- **Hydrology:** The presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by groundwater or surface water.
- **Hydrophytic Vegetation:** A prevalence of vegetation typically adapted for life in saturated soil conditions.

Positive indicators of all three parameters are normally present in wetlands. The presence of primary and secondary wetland hydrology indicators was documented for each identified aquatic resource feature in the review area. Potential jurisdictional wetlands exhibiting atypical conditions were delineated in accordance with the USACE Wetland Delineation Manual (USACE 1987) for situations involving vegetation, soil, and hydrology that may be naturally problematic and/or significantly disturbed.

Dudek took a sample point (i.e., upland and wetland) on standardized wetland delineation datasheets to assess the potential for hydric soils, hydrophytic vegetation, and hydrology (see details in Chapter 6, Aquatic Resources). The sample point datasheets are included in this ARDR as Appendix E, Datasheets.

5.2.2 Ordinary High Water Mark Assessment

The OHWM, which was used to delineate rivers, streams, and other linear features in the review area, is based on the physical and biological signatures established and maintained at the boundaries of an active channel. Delineation of the active channel signature (i.e., the OHWM) was based largely on identification of three primary physical or biological indicators:

- Topographic break in slope
- Change in sediment characteristics
- Change in vegetation characteristics (species or cover)

6 Aquatic Resources

Aquatic resources delineated in the review area are described in this section and shown on Figure 6, Aquatic Resources Index Map, and Figures 6-1 through 6-47, Aquatic Resources.

6.1 Aquatic Resources Data Summary

Results from the sampling point and nine OHWM transects documented potentially jurisdictional aquatic resources within the review area. The data collected at the sample point and transects are summarized in Tables 9 and 10. Additionally, datasheets are compiled in Appendix E and the USACE spreadsheet listing the features is provided in Appendix F.

Table 9. Sample Point Summary

Sample Point	Wetland Determination Field Indicators			Location (Decimal Degrees)		Determination
	Vegetation	Soils	Hydrology	Latitude	Longitude	
SP-01	No	Yes	Yes	33.31712914	−112.858574	Upland

Notes: SP = sample point.

6.2 Sample Point Results

The sample point was taken in a concave depression area showing potential hydrologic indicators and change in vegetation (see Figure 6.5, Aquatic Resources). Hydrologic indicators included surface soil cracks and biotic crust, which are all primary hydrologic indicators in the arid west (see Photos 9–17 in Appendix B). During the October 2024 site visit, the depression was slightly saturated, with no surface water or water table present. NWI maps show that nearby features were anthropogenically created and that the area often floods, which is likely why hydrologic indicators are present. Historical aerial imagery shows that the area had last been cleared and tilled in 2014 (Google Earth 2024). Hydrophytic vegetation was not found during this delineation.

Anthropogenic soil disturbance in adjacent agricultural lands has likely caused water to start settling in this area. Redox presented in red parent material as soft masses with >5% concentrations and was found within the first 4 inches of soil, meeting the redox depressions (F8) hydric soil indicator. The application of irrigation water to upland areas can create wetland hydrology and, given adequate time, can induce the formation of hydric soil indicators (USACE 2008a). Therefore, this feature does not meet the three-parameter wetland standard. The datasheets associated with this feature are provided in Appendix E.

Table 10. Ordinary High Water Mark Transect Data Summary

Transect	OHWM Determination Field Indicators	Location		Determination
		Latitude	Longitude	
T-01	(EPH-003) Feature is dry. A natural line impressed on the bank, vegetation absent, sediment sorting, and bed and banks present. Feature is present within the National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD).	33.32293623	−112.8559619	Non-wetland water (NWW)

Table 10. Ordinary High Water Mark Transect Data Summary

Transect	OHWM Determination Field Indicators	Location		Determination
		Latitude	Longitude	
T-02	(DD-004) Feature is dry. Agricultural surface ditch with culverts. Shelving, Changes in the character of soil, Vegetation matted down/bent, scour, bed and banks and change in plant community cover present. Feature is present within the NWI and NHD.	33.31295519	−112.8570400	Other water
T-03	(IBC-002, Centennial Wash) Feature is dry. Moss present along banks. Natural line impressed on the bank, shelving, destruction of terrestrial vegetation, vegetation absent, sediment sorting, leaf litter disturbed or washed away, bed and banks, water staining, change in plant community and cover present. Feature is present within the NWI and NHD.	33.29543954	−112.8565272	NWW
T-04	(EBC-016) Feature is dry. Natural line impressed on the bank, shelving, changes in the character of soil, vegetation absent, sediment sorting, scour, and bed and banks present. Feature is present within the NWI and NHD.	33.29544589	−112.8607311	NWW
T-05	(EPH-019) Feature is dry. Natural line impressed on the bank, changes in the character of soil, vegetation absent, sediment sorting, scour, bed and banks, and change in plant community and cover present. Feature is present within the NWI and NHD.	33.29133896	−112.8557614	NWW
T-06	(EPH-002) Feature is dry. Natural line impressed on the bank, shelving, vegetation absent, sediment sorting, scour, bed and banks, water staining and change in plant community present. Feature is present within the NWI and NHD.	33.2791842	−112.897909	NWW
T-07	(EBC-010) Feature is dry. Natural line impressed on the bank, changes in the character of soil, vegetation absent, sediment sorting, scour, bed and banks and change in plant community present. Feature is present within the NWI and NHD.	33.2887767	−112.9123584	NWW

Table 10. Ordinary High Water Mark Transect Data Summary

Transect	OHWM Determination Field Indicators	Location		Determination
		Latitude	Longitude	
T-08	(EBC-012) Feature is dry. Natural line impressed on the bank, changes in the character of soil, vegetation absent, sediment sorting, bed and banks, and change in plant community present. Feature is present within the NWI and NHD.	33.28876909	−112.9241649	NWW

Notes: T = transect; OHWM = ordinary high water mark.

6.3 Waters of the United States (USACE)

Approximately 15.75 acres of non-wetland waters (i.e., aquatic resources) and 0.39 acres of other waters (drainage ditches) were delineated in the review area (Figure 6 and Figures 6.1 through 6.47). Water from Centennial Wash likely reaches Arlington Canal during large flow events; however, these events are not frequent enough to meet the relatively permanent waters (RPW) standard. Centennial Wash historically flowed directly to the Gila River but development of agricultural lands between Centennial Wash and the Gila River, including the Arlington Canal, blocked and rerouted flow to the Gillespie Dam (Heritage 2024). Flow regime (i.e., RPW status) and downstream connectivity were previously investigated to identify the potential jurisdictional status of aquatic features in the review area (Heritage 2024). Although channels exist to the downstream TNW, any drainage that is not an RPW (i.e., non-RPW) is not regulated, even if the drainage is tributary to a TNW. Thus, none of the features in the review area can be considered jurisdictional under the current USACE Waters of the United States (WOTUS) regulatory framework (Heritage 2024). Table 11 provides a summary of aquatic resources delineated in the review area, including Cowardin type (Cowardin et al. 1979; USACE 2024a), WOTUS status, location by transect number, and acreage and linear feet in the review area.

Table 11. USACE Aquatic Resource Summary for the Review Area

Feature ID	Cowardin Code[a]	WOTUS	Transect	Acres[b]	Linear Feet
Non-Wetland Waters					
EBC-001	R6	No	T-08	0.0057	44.78
EBC-003	R6	No	T-08	0.06	78.84
EBC-004	R6	No	T-08	0.03	56.34
EBC-005	R6	No	T-08	0.04	61.68
EBC-006	R6	No	T-08	0.18	139.09
EBC-007	R6	No	T-08	0.03	65.15
EBC-008	R6	No	T-08	1.06	356.96
EBC-009	R6	No	T-04	2.18	784.04
EBC-010	R6	No	T-07	0.09	83.58
EBC-011	R6	No	T-08	0.08	111.21
EBC-012	R6	No	T-08	0.24	136.98
EBC-013	R6	No	T-08	1.25	649.88

Table 11. USACE Aquatic Resource Summary for the Review Area

Feature ID	Cowardin Code[a]	WOTUS	Transect	Acres[b]	Linear Feet
EBC-014	R6	No	T-08	0.32	215.31
EBC-015	R6	No	T-03	0.93	492.40
EBC-016	R6	No	T-04	1.01	595.08
EBC-017	R6	No	T-07	0.57	248.65
EPH-001	R6	No	T-05	0.11	115.98
EPH-002	R6	No	T-06	0.05	67.31
EPH-003	R6	No	T-01	0.51	1,869.54
EPH-004	R6	No	T-05	0.68	500.13
EPH-005	R6	No	T-05	0.05	395.34
EPH-006	R6	No	T-05	0.03	252.59
EPH-007	R6	No	T-05	0.34	1,123.66
EPH-008	R6	No	T-05	0.05	172.56
EPH-009	R6	No	T-05	0.10	415.84
EPH-010	R6	No	T-01	0.04	284.54
EPH-011	R6	No	T-05	0.02	79.22
EPH-012	R6	No	T-05	0.01	110.61
EPH-013	R6	No	T-01	0.03	250.61
EPH-014	R6	No	T-01	0.01	80.54
EPH-015	R6	No	T-01	0.09	436.46
EPH-016	R6	No	T-01	0.03	208.29
EPH-017	R6	No	T-05	0.04	70.04
EPH-018	R6	No	T-01	0.02	233.88
EPH-019	R6	No	T-05	0.16	598.26
EPH-020	R6	No	T-05	0.01	42.69
EPH-021	R6	No	T-01	0.01	43.69
EPH-022	R6	No	T-05	0.07	189.72
EPH-023	R6	No	T-05	0.08	282.98
EPH-024	R6	No	T-05	0.07	259.57
EPH-025	R6	No	T-05	0.09	416.71
EPH-026	R6	No	T-05	0.12	637.33
EPH-027	R6	No	T-05	0.11	413.65
EPH-028	R6	No	T-05	0.23	917.88
EPH-029	R6	No	T-05	0.27	548.11
EPH-030	R6	No	T-05	0.10	256.50
EPH-031	R6	No	T-05	0.02	57.19
EPH-032	R6	No	T-05	0.07	207.32
EPH-033	R6	No	T-05	0.00	5.96
EPH-034	R6	No	T-05	0.01	44.98
EPH-035	R6	No	T-05	0.002	36.95
EPH-036	R6	No	T-05	0.01	44.98
EPH-037	R6	No	T-05	0.01	44.60

Table 11. USACE Aquatic Resource Summary for the Review Area

Feature ID	Cowardin Code[a]	WOTUS	Transect	Acres[b]	Linear Feet
EPH-038	R6	No	T-05	0.01	42.91
EPH-039	R6	No	T-05	0.001	16.38
EPH-040	R6	No	T-05	0.01	49.16
EPH-041	R6	No	T-05	0.002	22.17
EPH-042	R6	No	T-05	0.006	48.22
EPH-043	R6	No	T-05	0.01	43.02
EPH-044	R6	No	T-05	0.01	45.90
EPH-045	R6	No	T-05	0.03	201.47
EPH-046	R6	No	T-06	0.03	217.51
EPH-047	R6	No	T-05	0.002	39.58
EPH-048	R6	No	T-05	0.09	220.64
EPH-049	R6	No	T-05	0.002	40.18
EPH-050	R6	No	T-05	0.01	42.41
EPH-051	R6	No	T-05	0.002	41.04
EPH-052	R6	No	T-05	0.002	16.54
EPH-053	R6	No	T-05	0.04	123.37
EPH-054	R6	No	T-05	0.01	48.66
EPH-055	R6	No	T-05	0.01	109.59
EPH-056	R6	No	T-05	0.01	64.28
EPH-057	R6	No	T-05	0.01	106.17
EPH-058	R6	No	T-05	0.001	30.50
EPH-059	R6	No	T-05	0.02	153.47
EPH-060	R6	No	T-06	0.29	229.08
EPH-061	R6	No	T-05	0.06	473.26
EPH-062	R6	No	T-05	0.03	234.06
IBC-002	R4	No	T-03	3.48	935.62
INT-001	R4	No	T-03	0.49	897.76
		Non-Wetland Waters Subtotal		*15.75*	*20,329.13*
Other Waters					
DD-01	N/A	No	T-02	0.05	354.44
DD-02	N/A	No	T-02	0.06	478.97
DD-03	N/A	No	T-02	0.004	22.73
DD-04	N/A	No	T-02	0.14	335.97
DD-05	N/A	No	T-02	0.01	23.84
DD-06	N/A	No	T-02	0.05	329.83

Table 11. USACE Aquatic Resource Summary for the Review Area

Feature ID	Cowardin Code[a]	WOTUS	Transect	Acres[b]	Linear Feet
DD-07	N/A	No	T-02	0.09	338.00
			Other Waters Subtotal	*0.39*	*1,883.79*
			Total	**16.14**	**22,212.47**

Notes: USACE = U.S. Army Corps of Engineers; WOTUS = waters of the United States; EBC = ephemeral braided channel; R6 = riverine, ephemeral; T = Transect; R4 = riverine, intermittent; EPH = ephemeral channel; IBC = intermittent braided channel; INT = intermittent channel; DD = drainage ditch; N/A = not applicable.

[a] Pursuant to Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) and USACE Cowardin Codes for ORM Data Entry (USACE 2024a).

[b] Totals may not sum precisely due to rounding.

6.3.1 Non-Wetland Waters

Intermittent Channel

Two intermittent channels (INT-001 and Intermittent Braided Channel [IBC] 002) occur in the southern portion of the gen-tie survey area, comprising approximately 3.97 acres (1,833.38 linear feet) (see Figures 6.20 through 6.24) (Photo 5, Appendix B). These channels only have surface water flowing through them in direct response to precipitation events. Both intermittent channels are part of Centennial Wash and continue to run southeast and form a large, braided channel beyond the review area boundary. These channels flow southeast and then are redirected south by Arlington Canal. Upland vegetation included creosote bush (upland [UPL]) and velvet mesquite (facultative upland [FACU]), with bank vegetation composed of catclaw acacia (UPL), velvet mesquite (FACU), and graythorn (*Ziziphus obtusifolia*) (UPL), as well as an unidentifiable moss species. Both features had an OHWM width of 25 feet or less and displayed a natural line impressed on the bank, shelving, destruction of terrestrial vegetation, absence of vegetation in the channel, sediment sorting, leaf litter washed away, scour, bed and banks, and a change in plant community and cover.

During large flow events connectivity to the Arlington Canal, which discharges into the Gila River (a TNW), could occur. However, these events do not occur frequently enough to meet the RPW standard. Therefore, these features would not be considered jurisdictional by USACE.

Ephemeral Braided Channel

A total of 16 ephemeral braided channels (EBC), comprising approximately 8.07 acres (4,119.57 linear feet), are present in the review area (see Photo 16, Appendix B). These are ephemeral channels (EPH) that are divided into multiple smaller ephemeral channels by temporary "islands," making them difficult to delineate due to their abundance and the seasonal variation of the features.

All the braided channels in the review area generally exhibited an OHWM, change in vegetation community and/or coverage (with no vegetation present in the channels), a natural line impressed on the bank, changes in soil character, sediment sorting, scour, and bed and banks. Bank species contained creosote bush (UPL), velvet mesquite (FACU), foothill palo verde (UPL), blue palo verde (UPL), catclaw acacia (UPL), white bursage (UPL), and common Mediterranean grass (*Schismus barbatus*) (UPL).

A braided channel, EBC-015, in the lower parcel of the southern gen-tie survey area exhibits changes in soil character, sediment sorting, scour, and absent emergent vegetation (see Photo 16, Appendix B). Canopy cover is reduced in comparison to the northern intermittent channels (INT) and contains allscale (*Atriplex polycarpa*) (UPL) along interspersed islands. Other upland and bank species include creosote bush (UPL), catclaw acacia (UPL), velvet mesquite (FACU), and common Mediterranean grass (UPL). Due to erosional conditions in the area, reduced vegetation coverage and lack of moss along the banks, this channel was deemed to be an ephemeral feature rather than intermittent.

The braided channels in the review area would not meet the RPW standard. Therefore, they would not be considered jurisdictional by USACE.

Ephemeral Channel

There are 62 ephemeral channels (EPH), comprising approximately 3.72 acres (14,375.73 linear feet), in the review area. These channels have surface water flowing or pooling only in direct response to precipitation. Most of the ephemeral channels in the review area are first- and second-order channels that combine to higher-order channels before reaching Centennial Wash.

Of the 62 ephemeral channels, 47 are characterized by exhibiting an OHWM ranging from 3 to 10 feet, change in vegetation community and/or coverage (with no vegetation present within the channels), a natural line impressed on the bank, changes in the character of soil, scour, sediment sorting, and bed and banks (see Photo 17, Appendix B). Upland and bank species include creosote bush (UPL), catclaw acacia (UPL), velvet mesquite (FACU), foothill palo verde (UPL), desert Indianwheat (*Plantago ovata*) (UPL), and common Mediterranean grass (UPL). Javelina (*Dicotyles tajacu*) and cattle (*Bos taurus*) trails/tracks are present in these channels.

Six channels (EPH-003, EPH-010, EPH-016, EPH-018, EPH-021, and EPH-015) in the surveyed northern portion of the gen-tie survey area exhibit a change in vegetation (see Figures 6.1 through 6.4, Appendix A, and Photo 18, Appendix B). These are generally shallow channels approximately 1 foot in depth and have OHWMs from 5 to 8 feet. They are characterized by a natural line impressed on the bank, absent vegetation, sediment sorting, and bed and banks. Upland and bank species include velvet mesquite (FACU), creosote bush (UPL), allscale (UPL), desert Indianwheat (UPL), and cactus species such as desert Christmas cholla (UPL).

Additionally, six channels (EPH-029, EPH-031, EPH-033, EPH-001, EPH-017, and EPH-30) are wide erosional overflow channels that change course with flooding events. These are found on the western gen-tie survey area boundary (see Figures 6.11, 6.13 and 6.14) (see Photo 19, Appendix B). OHWM widths range from 12 to 30 feet with a change in vegetation community and/or coverage (no vegetation present within the channels), a natural line impressed on the bank, changes in the character of soil, scour, sediment sorting, and bed and banks. Upland and bank species are consistent with creosote bush (UPL), catclaw acacia (UPL), velvet mesquite (FACU), and desert Indianwheat (UPL).

The remaining three channels (EPH-060, EPH-002, and EPH-046) are large ephemeral channels displaying OHWM widths ranging from 25 to 60 feet (see Photo 20, Appendix B). These are found within the MV line corridor (see Figures 6.30, 6.39, and 6.41) and exhibit a natural line impressed on bank, changes in soil character, sediment sorting, scour, and bed and banks. Bank species include creosote bush (UPL), velvet mesquite (FACU), foothill palo verde (UPL), blue palo verde (UPL), catclaw acacia (UPL), white bursage (UPL), and common Mediterranean grass (UPL). Emergent species are minimal but include rigid spineflower (UPL), desert Indianwheat (UPL), and common Mediterranean grass (UPL).

The ephemeral channels in the review area would not meet the RPW standard. Therefore, they would not be considered jurisdictional by USACE.

6.3.2 Other Waters

Drainage Ditches

Seven drainage ditches (DD) occur in the central gen-tie survey area, comprising approximately 0.39 acres (1,883.79 linear feet). These drainage ditches are constructed earthen channels in agricultural lands that flow through multiple concrete culverts. Most of the drainage ditches had standing water or saturation present during the field delineation (see Figures 6.7, 6.8, 6.10, 6.12, and 6.17). The drainage ditches in the review area are anthropogenically influenced and would not meet the RPW standard. Therefore, they would not be considered jurisdictional by USACE.

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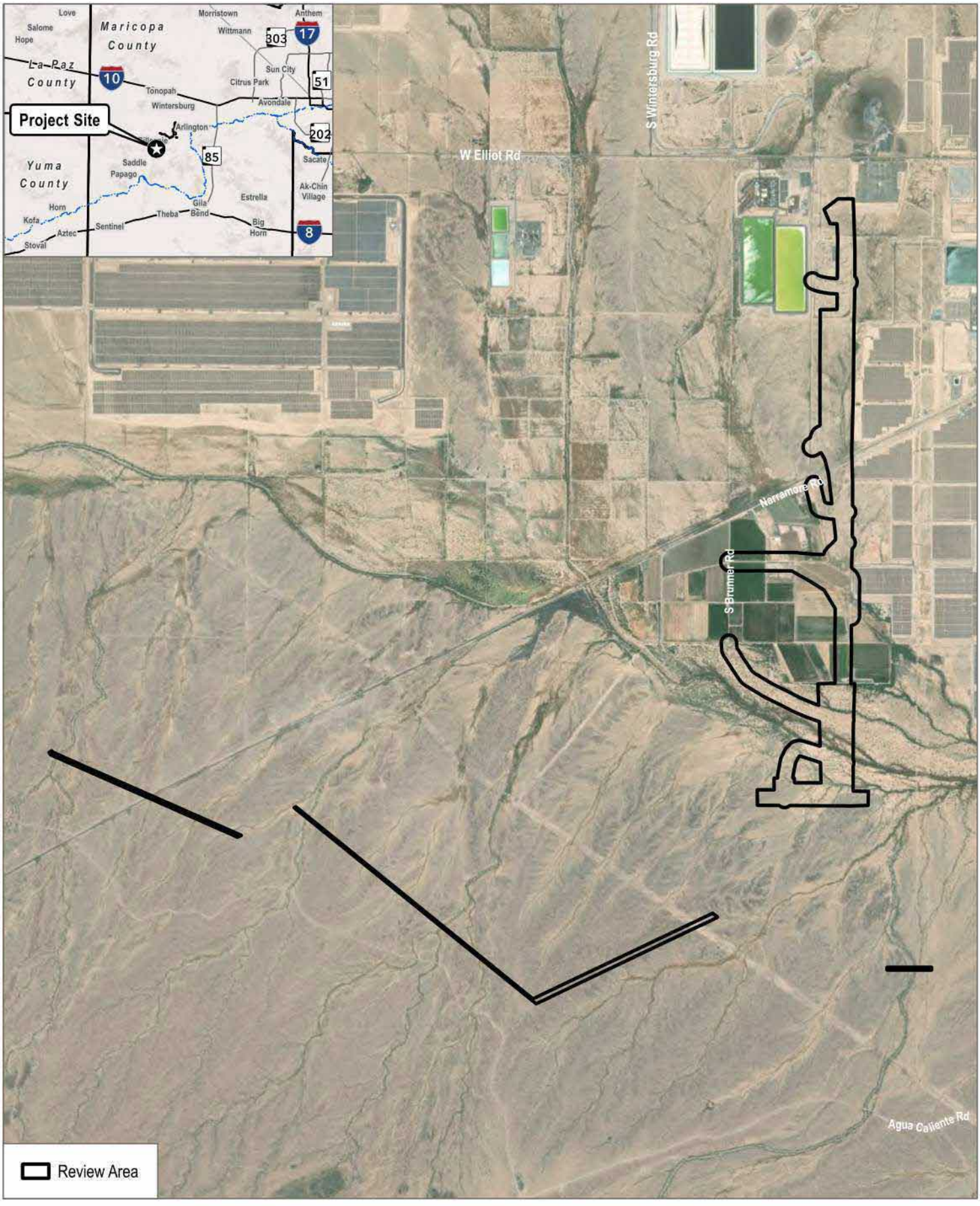
Appendix A
ARDR Figures



SOURCE: USGS National Map 2024

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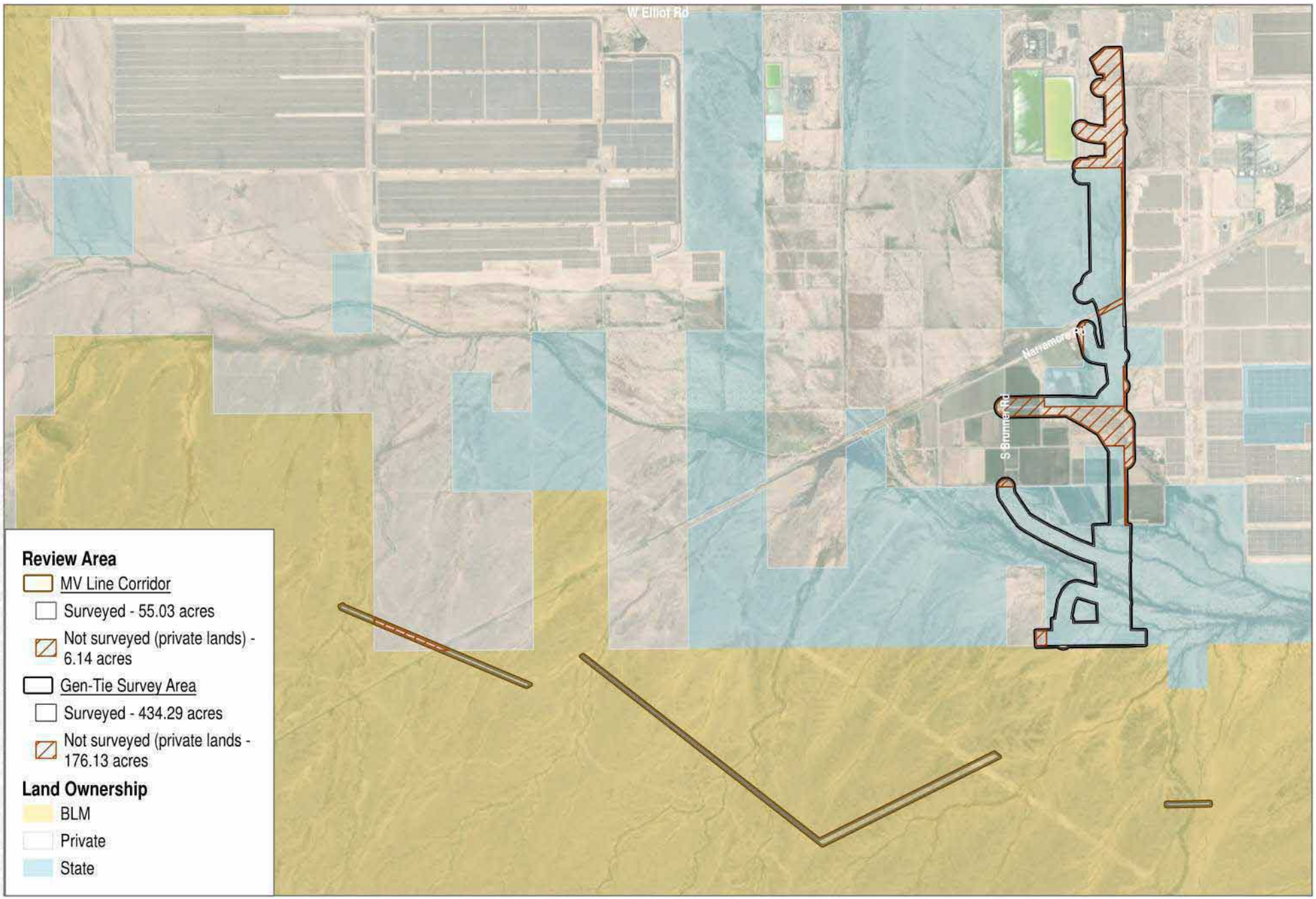
FIGURE 1

Project Location

Vulcan Solar Project



SOURCE: Bing Maps 2023; USDA NRCS 2024;

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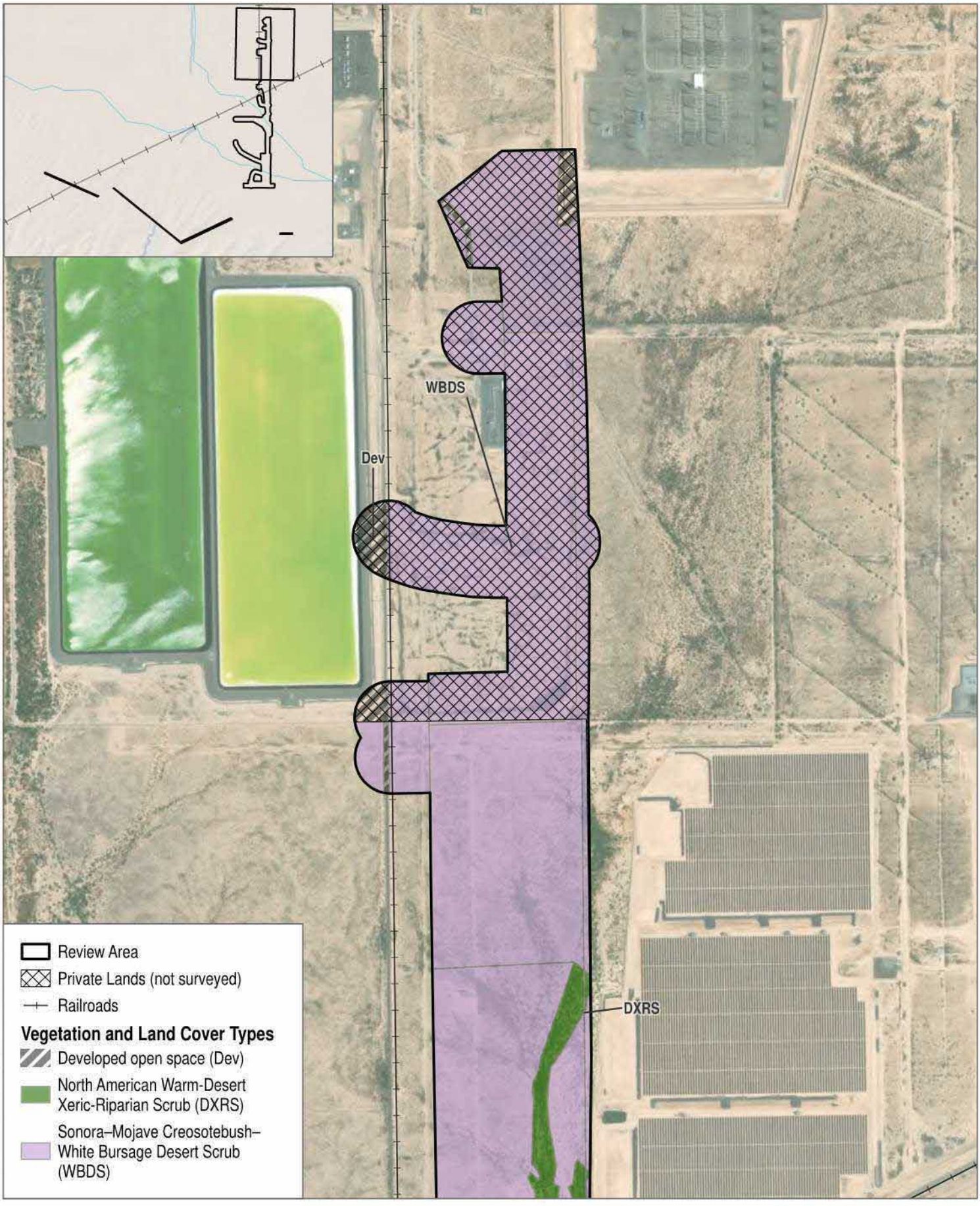
FIGURE 2

Land Ownership

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;I

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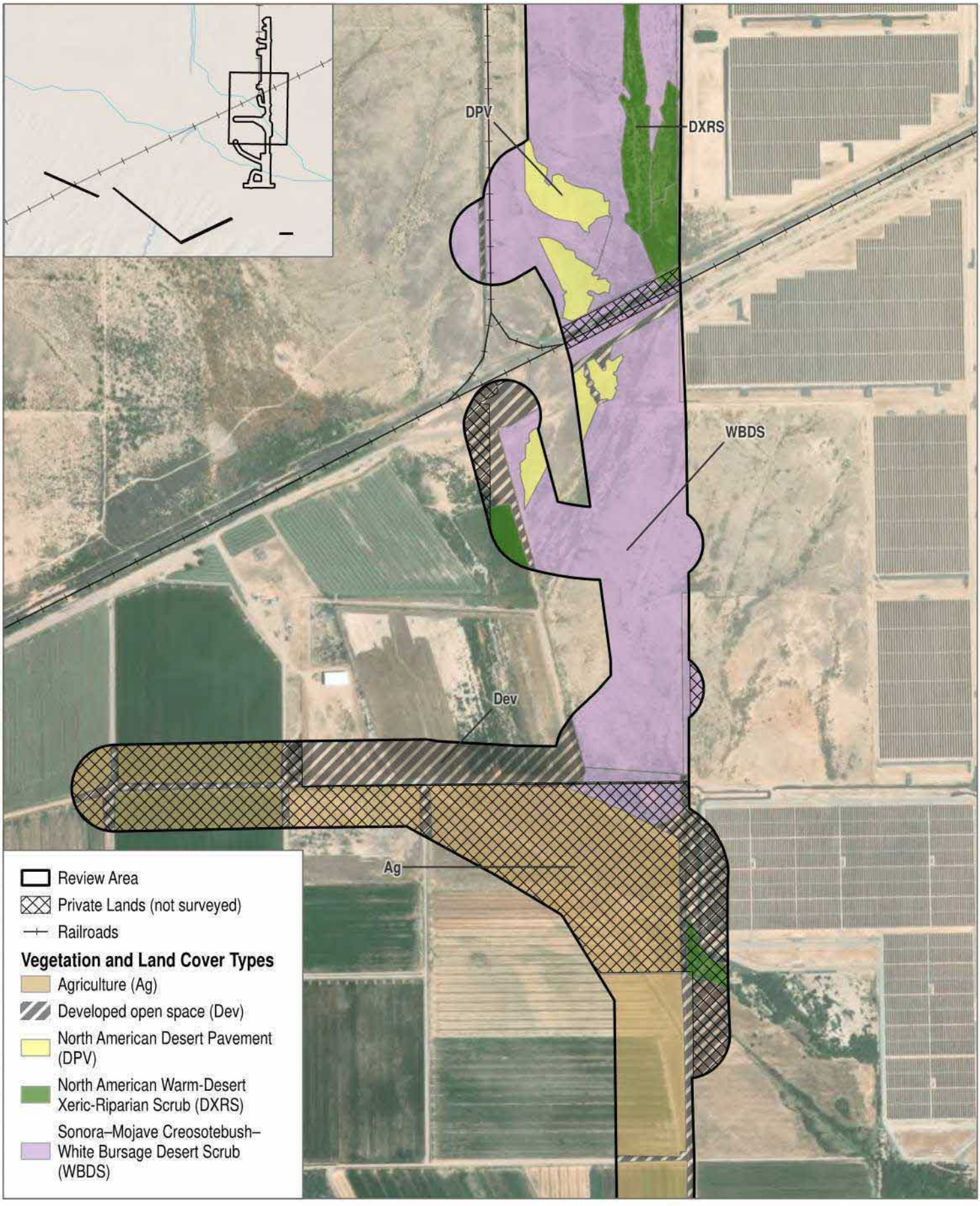
FIGURE 3-1

Vegetation Communities and Land Cover - Gen-Tie Survey Area

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;I

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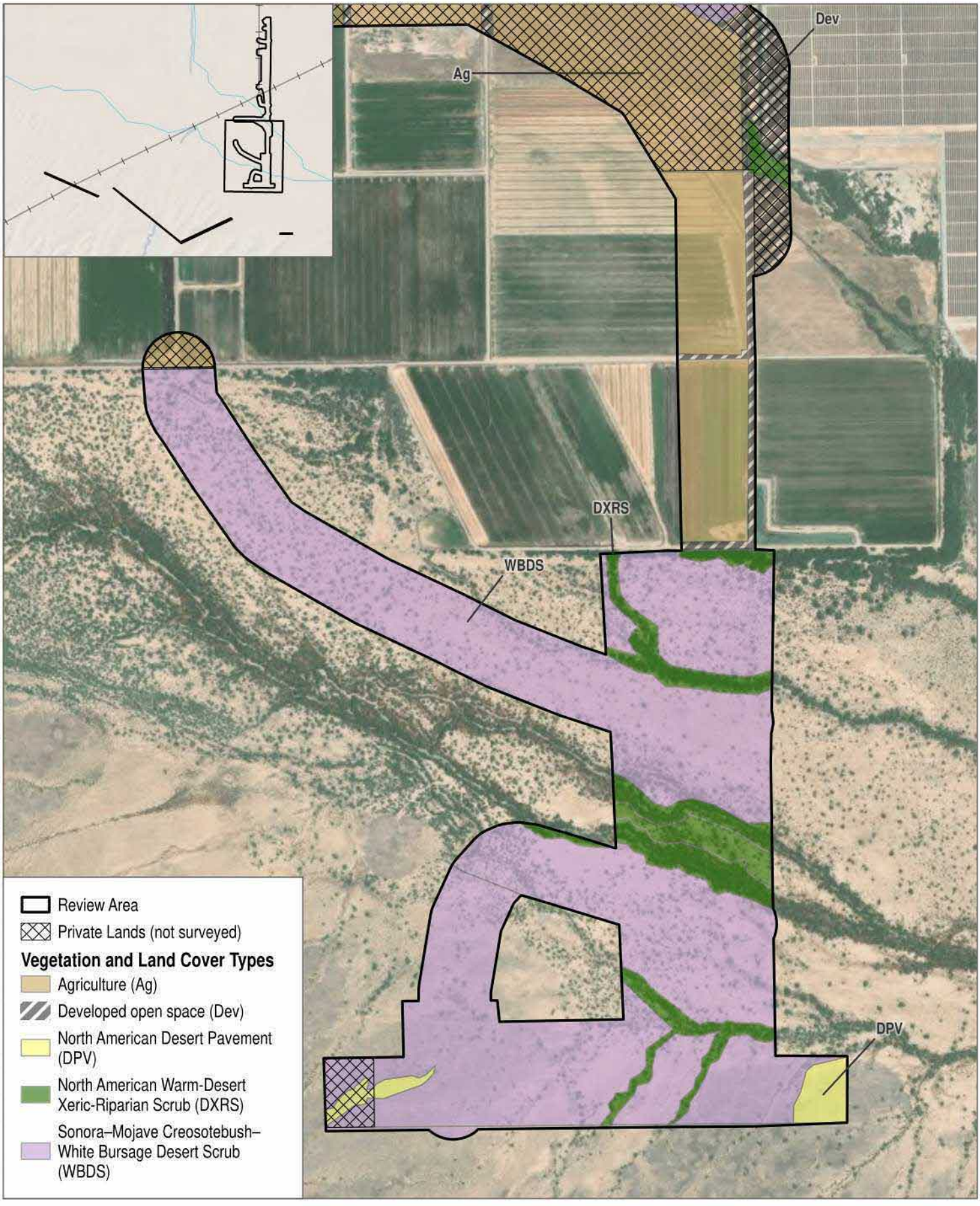
FIGURE 3-2

Vegetation Communities and Land Cover - Gen-Tie Survey Area

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;I

DUDEK

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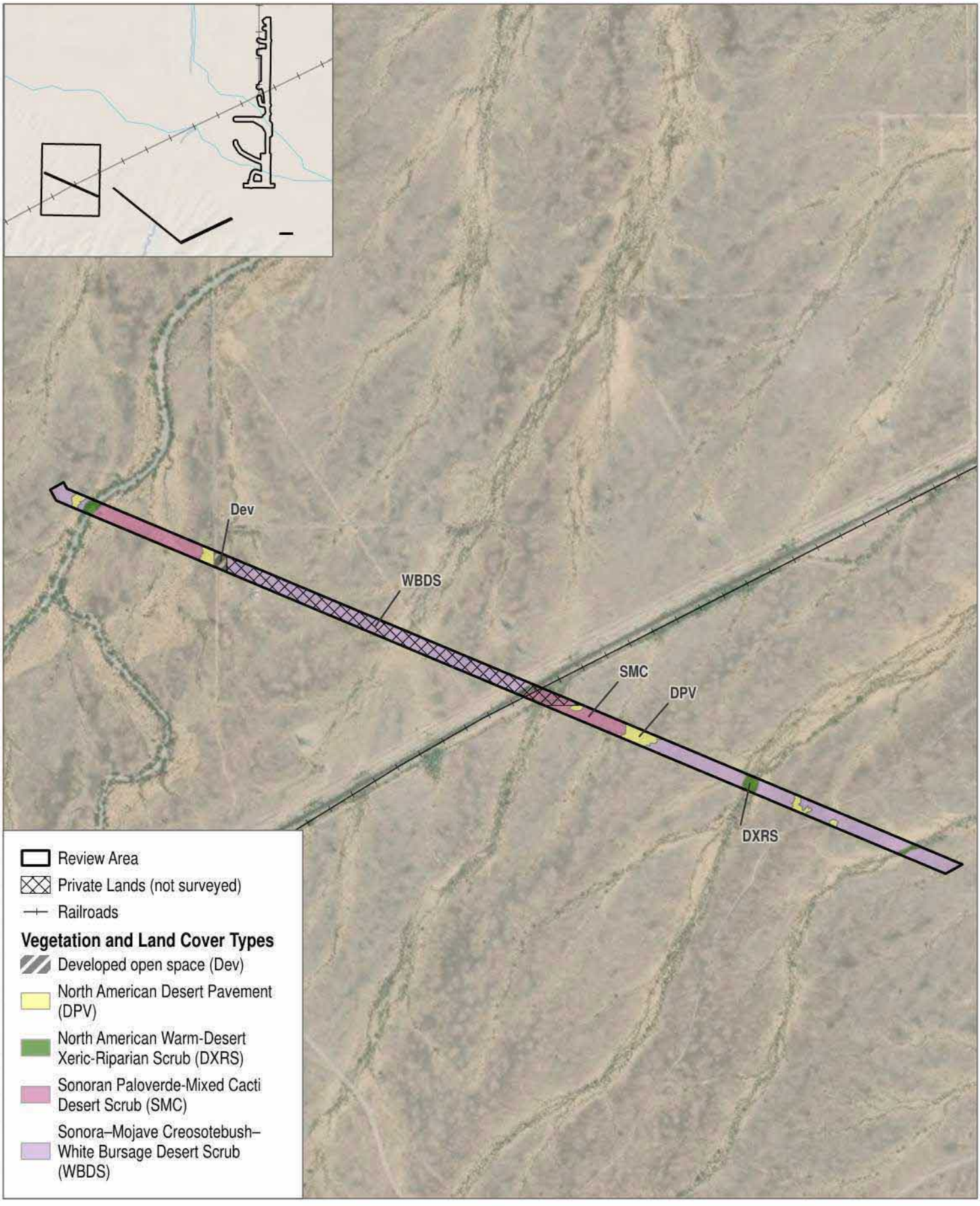
FIGURE 3-3

Vegetation Communities and Land Cover - Gen-Tie Survey Area

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;l

DUDEK

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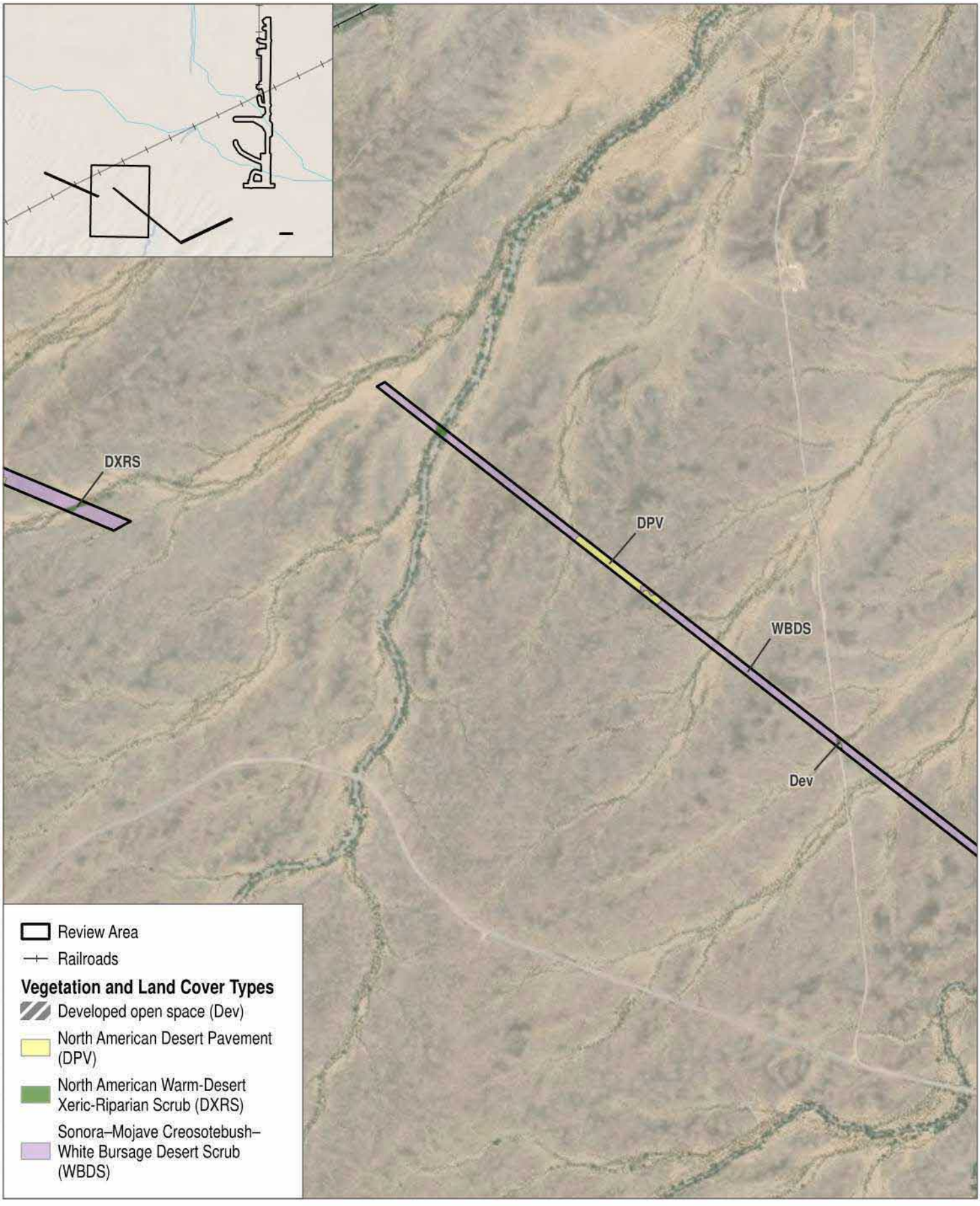
FIGURE 3-4

Vegetation Communities and Land Cover - MV Line Corridor

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;I

DUDEK

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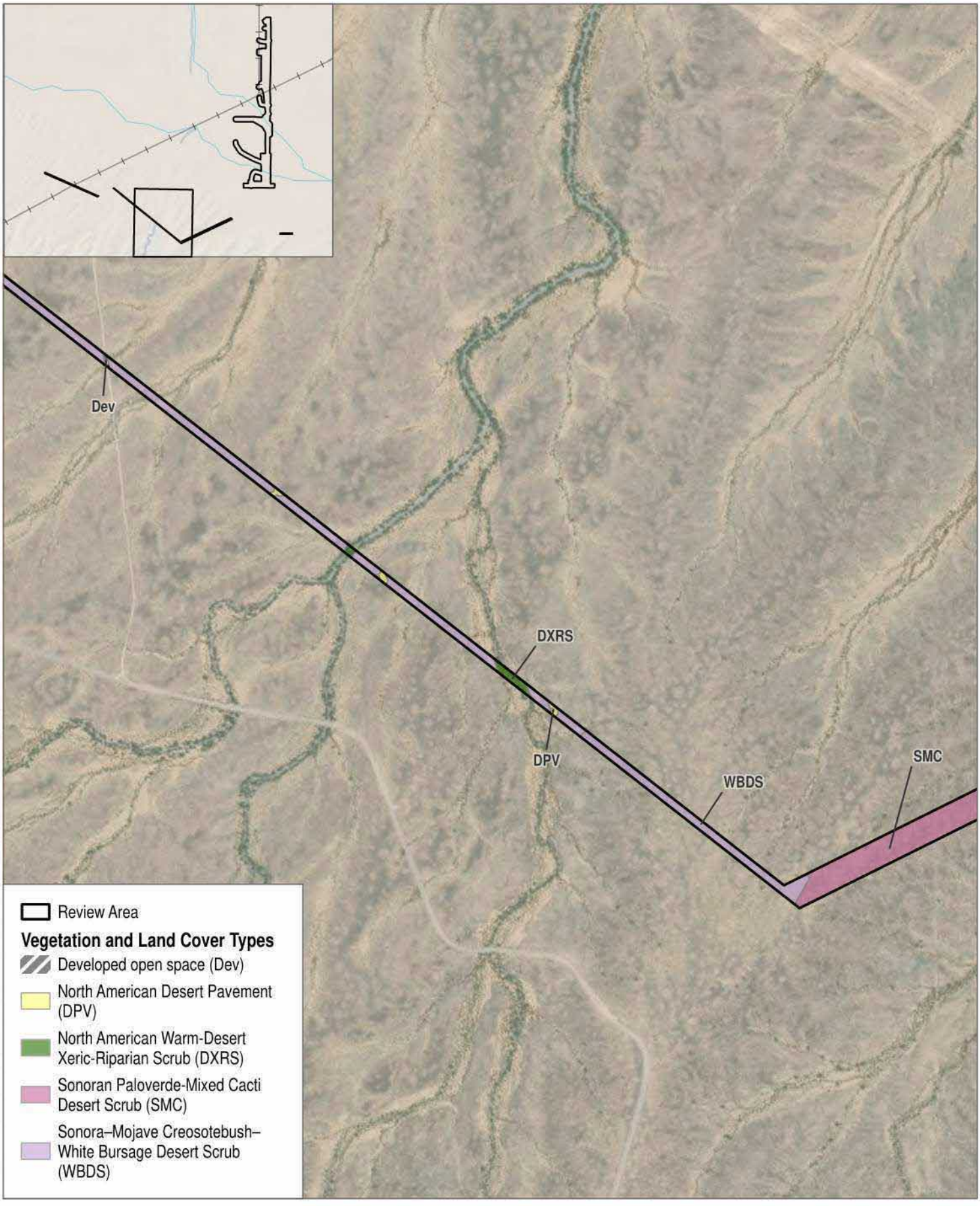
FIGURE 3-5

Vegetation Communities and Land Cover - MV Line Corridor

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;l

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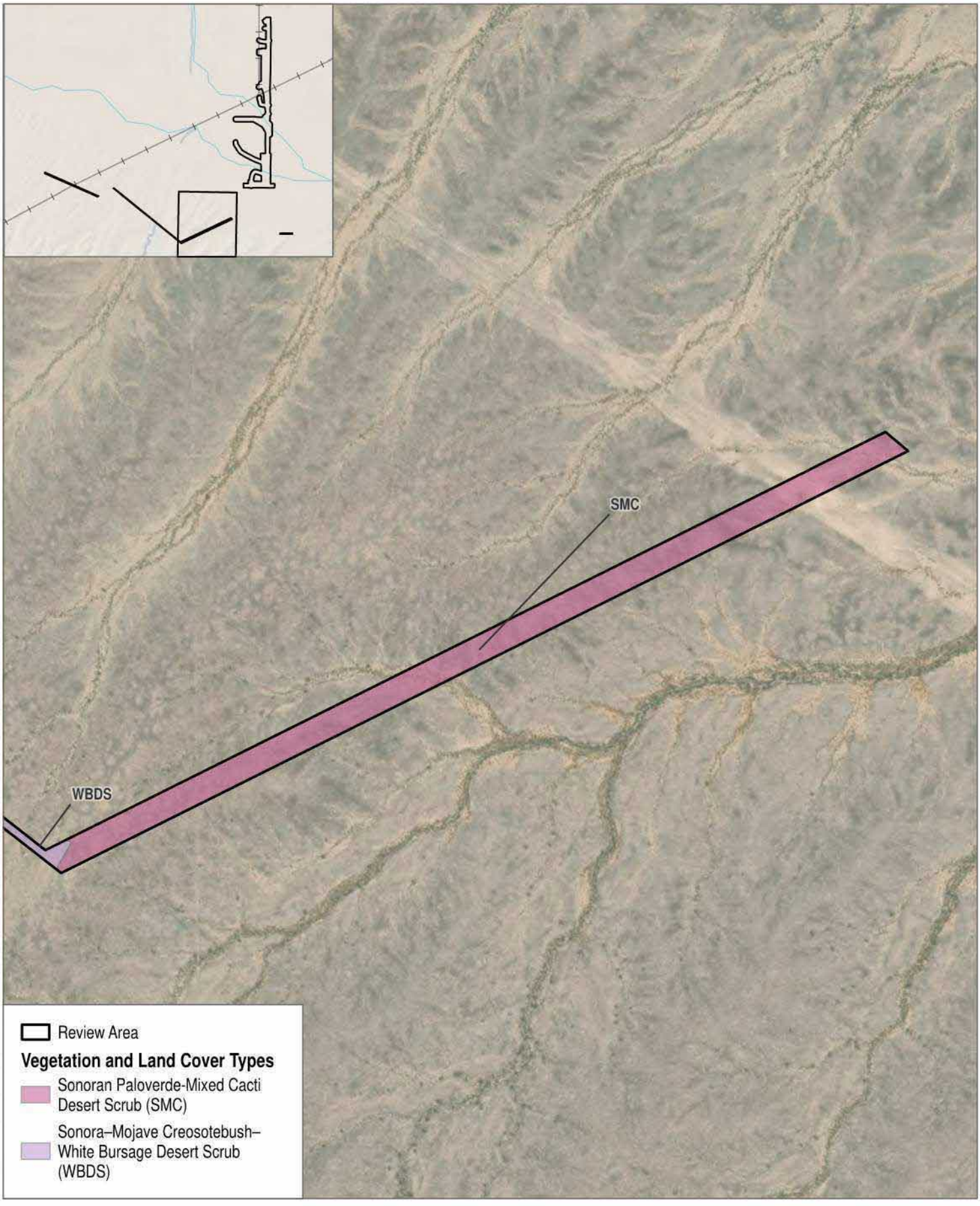
FIGURE 3-6

Vegetation Communities and Land Cover - MV Line Corridor

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;I

DUDEK

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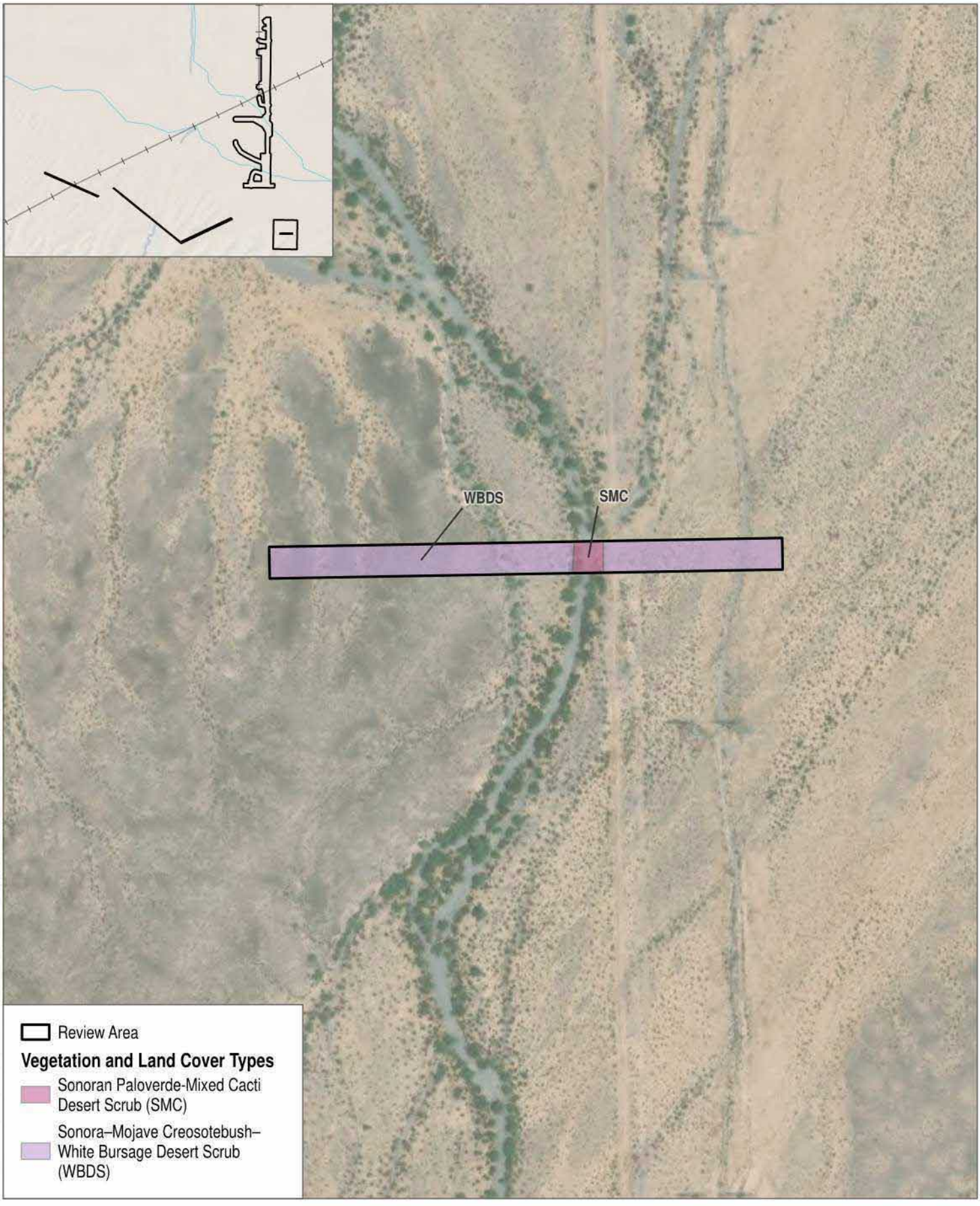
FIGURE 3-7

Vegetation Communities and Land Cover - MV Line Corridor

Vulcan Solar Project



SOURCE: Bing Maps 2023; SWReGAP 2016;I

DUDEK

0 195 390 Feet

FIGURE 3-8

Vegetation Communities and Land Cover - MV Line Corridor

Vulcan Solar Project

Review Area

Soil

- Cm: Casa Grande-Laveen complex, alkali
- Ge: Gilman fine sandy loam, 0 to 2 percent slopes
- Gh: Gilman loam, saline-alkali
- HAB: Harqua complex, 0 to 3 percent slopes
- Lb: Laveen sandy loam
- Ld: Laveen loam, saline-alkali
- Pb: Perryville loam, saline-alkali

SOURCE:

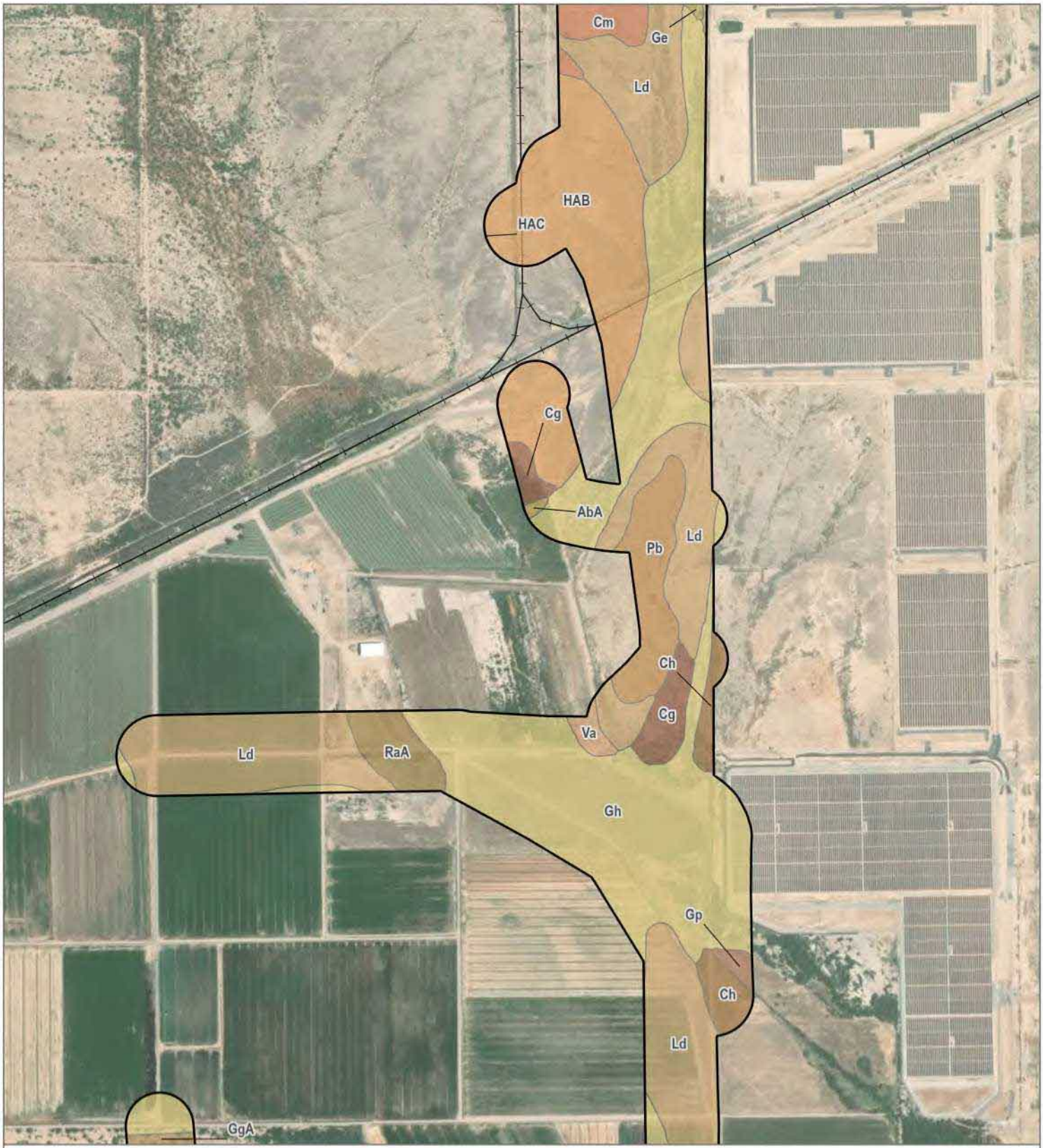
DUDEK

0 480 960 Feet

FIGURE 4-1

Soils - Gen-Tie Survey Area

Vulcan Solar Project



Review Area

Soil

- AbA: Antho sandy loam, 0 to 1 percent slopes
- Cg: Casa Grande sandy loam
- Ch: Casa Grande loam
- Cm: Casa Grande-Laveen complex, alkali
- Ge: Gilman fine sandy loam, 0 to 2 percent slopes
- GgA: Gilman loam, 0 to 1 percent slopes
- Gh: Gilman loam, saline-alkali
- Gp: Gilman loam, clayey subsoil variant, moderately saline
- HAB: Harqua complex, 0 to 3 percent slopes
- HAC: Harqua complex, 3 to 8 percent slopes
- Ld: Laveen loam, saline-alkali
- Pb: Perryville loam, saline-alkali
- RaA: Rillito sandy loam, 0 to 1 percent slopes
- Va: Valencia sandy loam

SOURCE:

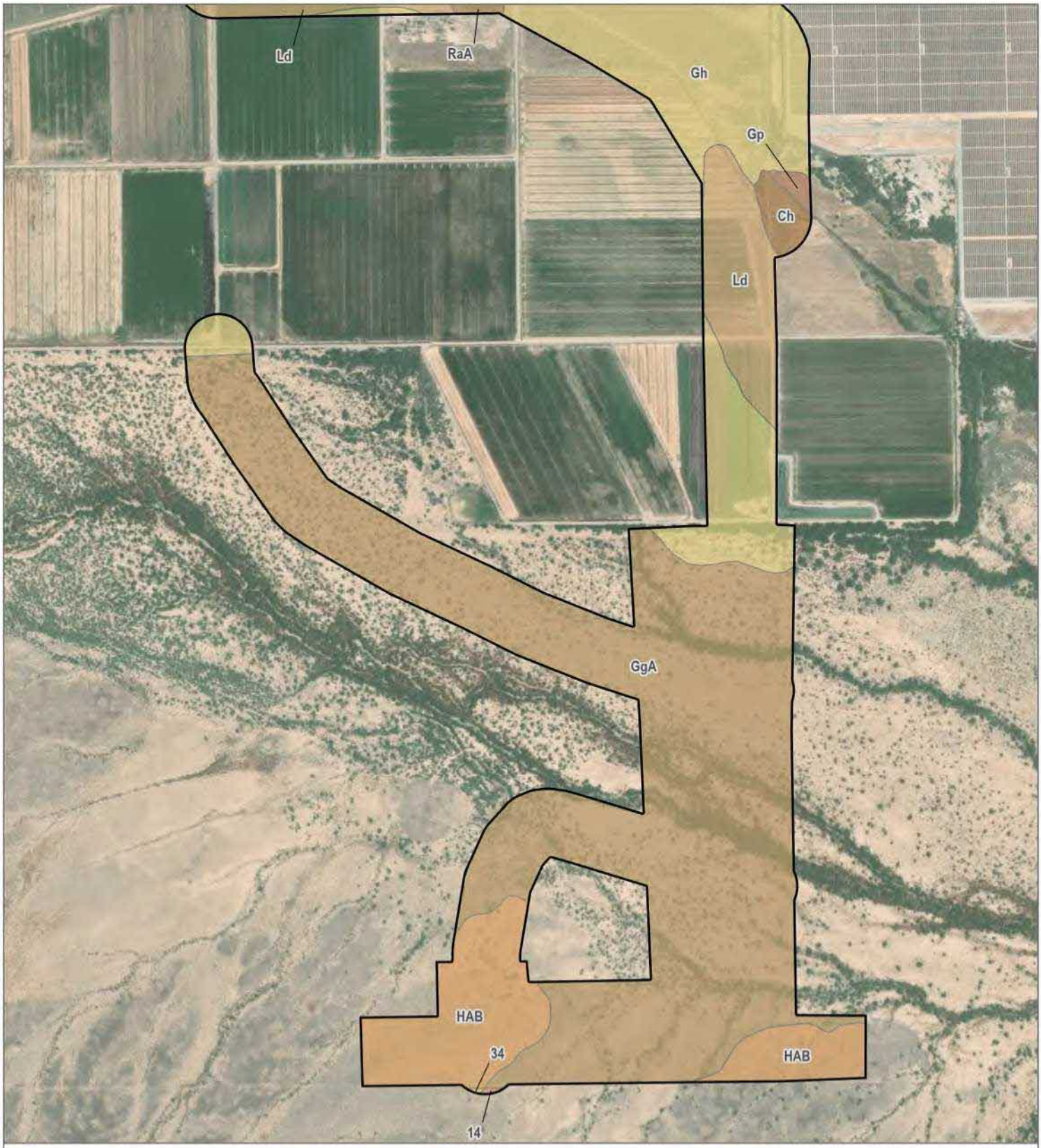
DUDEK

0 480 960 Feet

FIGURE 4-2

Soils - Gen-Tie Survey Area

Vulcan Solar Project



Review Area

Soil

- 14: Dateland-Cuerda complex, 0 to 3 percent slopes
- 34: Gunsight-Chuckawalla complex, 1 to 15 percent slopes
- Ch: Casa Grande loam
- GgA: Gilman loam, 0 to 1 percent slopes
- Gh: Gilman loam, saline-alkali
- Gp: Gilman loam, clayey subsoil variant, moderately saline
- HAB: Harqua complex, 0 to 3 percent slopes
- Ld: Laveen loam, saline-alkali
- RaA: Rillito sandy loam, 0 to 1 percent slopes

SOURCE:

DUDEK

0 480 960 Feet

FIGURE 4-3

Soils - Gen-Tie Survey Area

Vulcan Solar Project

Review Area

Soil

- 34: Gunsight-Chuckawalla complex, 1 to 15 percent slopes
- 37: Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes
- GgA: Gilman loam, 0 to 1 percent slopes
- HAB: Harqua complex, 0 to 3 percent slopes
- HLC: Harqua-Gunsight complex, 0 to 5 percent slopes

SOURCE:

DUDEK

0 480 960 Feet

FIGURE 4-4

Soils - MV Line Corridor

Vulcan Solar Project

Review Area

Soil

14: Dateland-Cuerda complex, 0 to 3 percent slopes

34: Gunsight-Chuckawalla complex, 1 to 15 percent slopes

37: Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes

SOURCE:

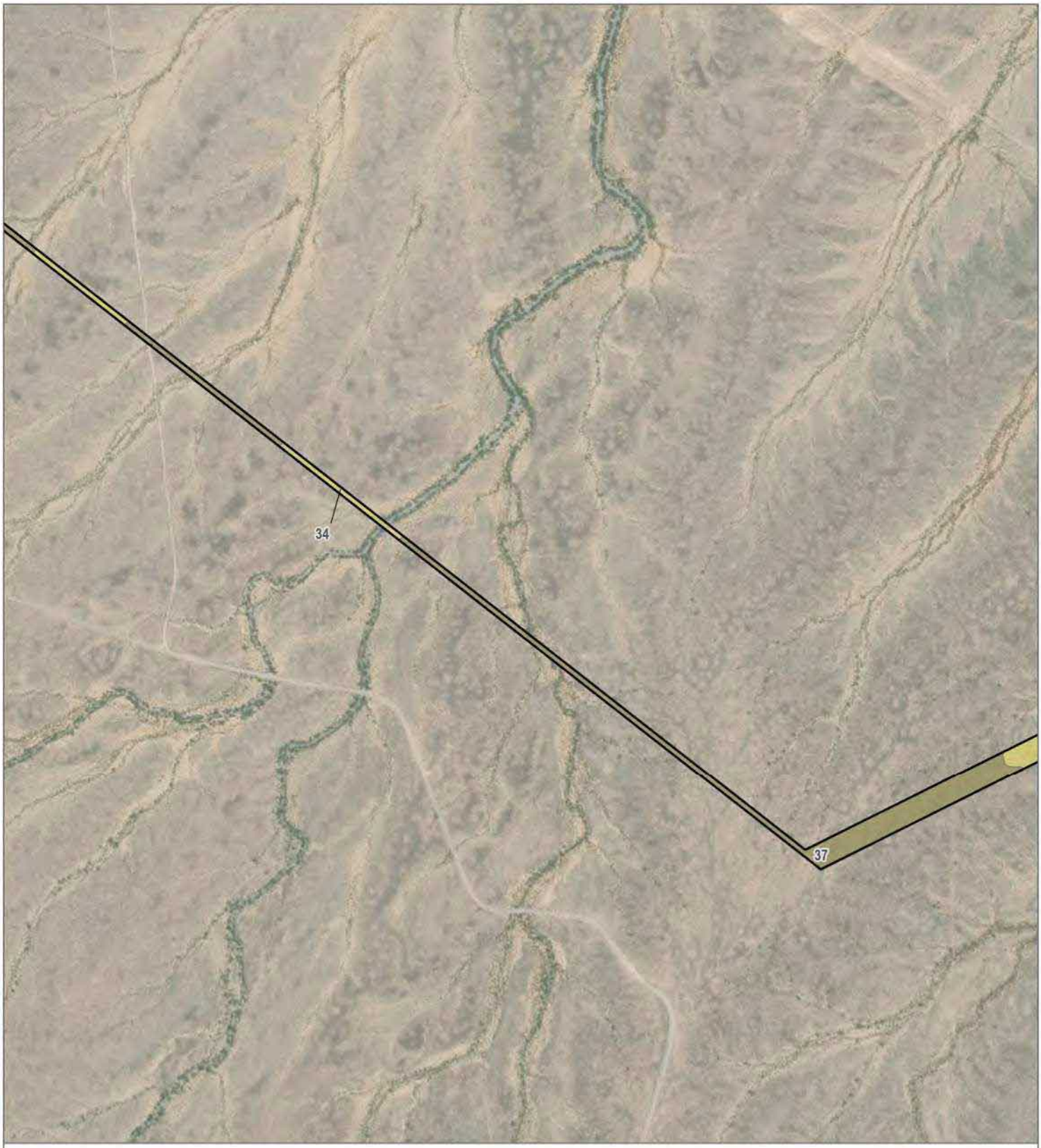
DUDEK

0 480 960 Feet

FIGURE 4-5

Soils - MV Line Corridor

Vulcan Solar Project



Review Area

Soil

34: Gunsight-Chuckawalla complex, 1 to 15 percent slopes

37: Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes

SOURCE:

DUDEK

0 480 960 Feet

FIGURE 4-6

Soils - MV Line Corridor

Vulcan Solar Project

Review Area

Soil

34: Gunsight-Chuckawalla complex, 1 to 15 percent slopes

37: Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes

SOURCE:

DUDEK

0 480 960 Feet

FIGURE 4-7

Soils - MV Line Corridor

Vulcan Solar Project

Review Area

Soil

14: Dateland-Cuerda complex, 0 to 3 percent slopes

37: Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes

SOURCE:

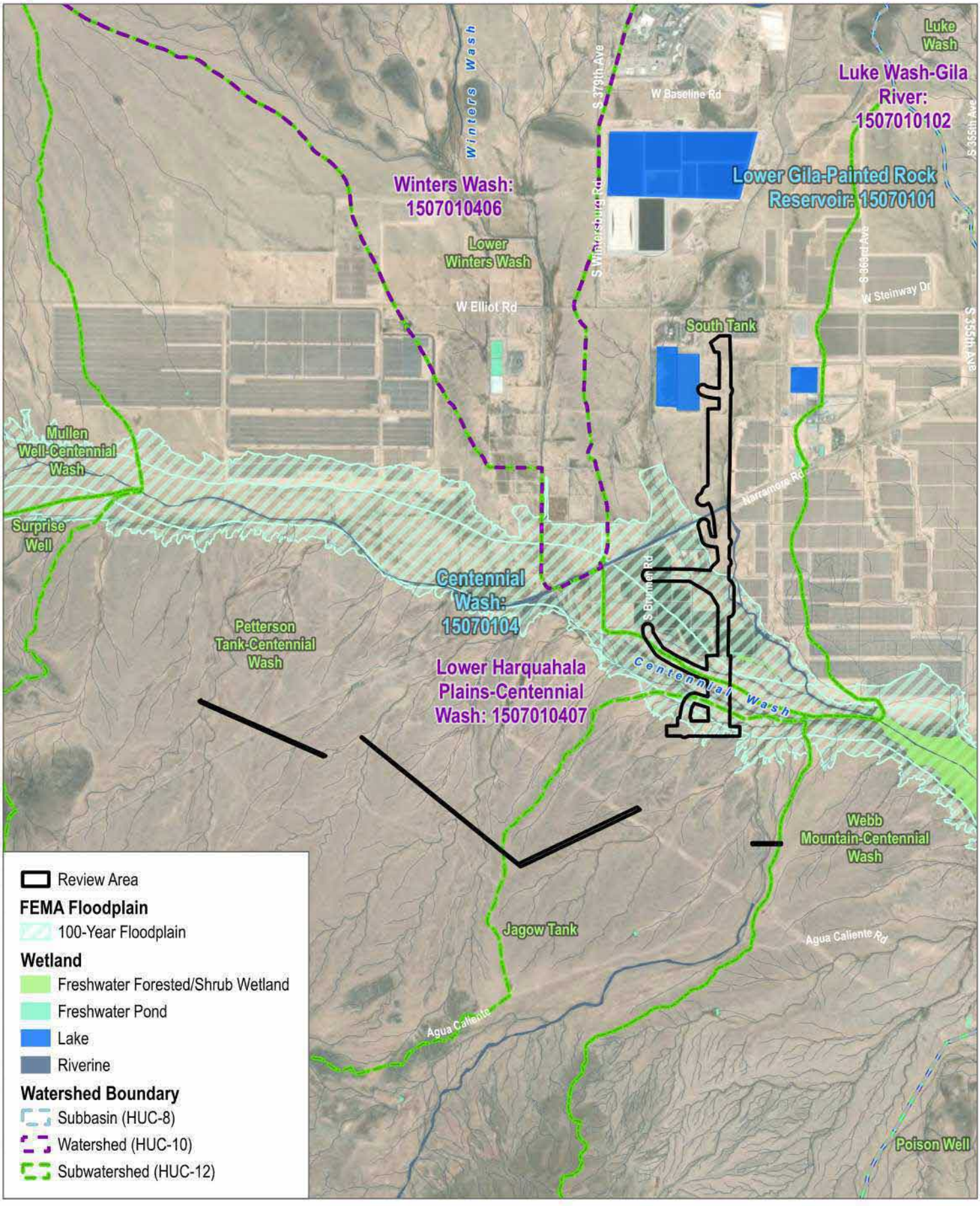
DUDEK

0 195 390 Feet

FIGURE 4-8

Soils - MV Line Corridor

Vulcan Solar Project



SOURCE: USGS 2019; USFWS 2019; FEMA 2023; ESRI World Imagery (accessed 2024)

DUDEK

0 3,000 6,000 Feet

FIGURE 5

Hydrologic Setting

Vulcan Solar Project

SOURCE: Bing Maps 2023; USDA NRCS 2024;

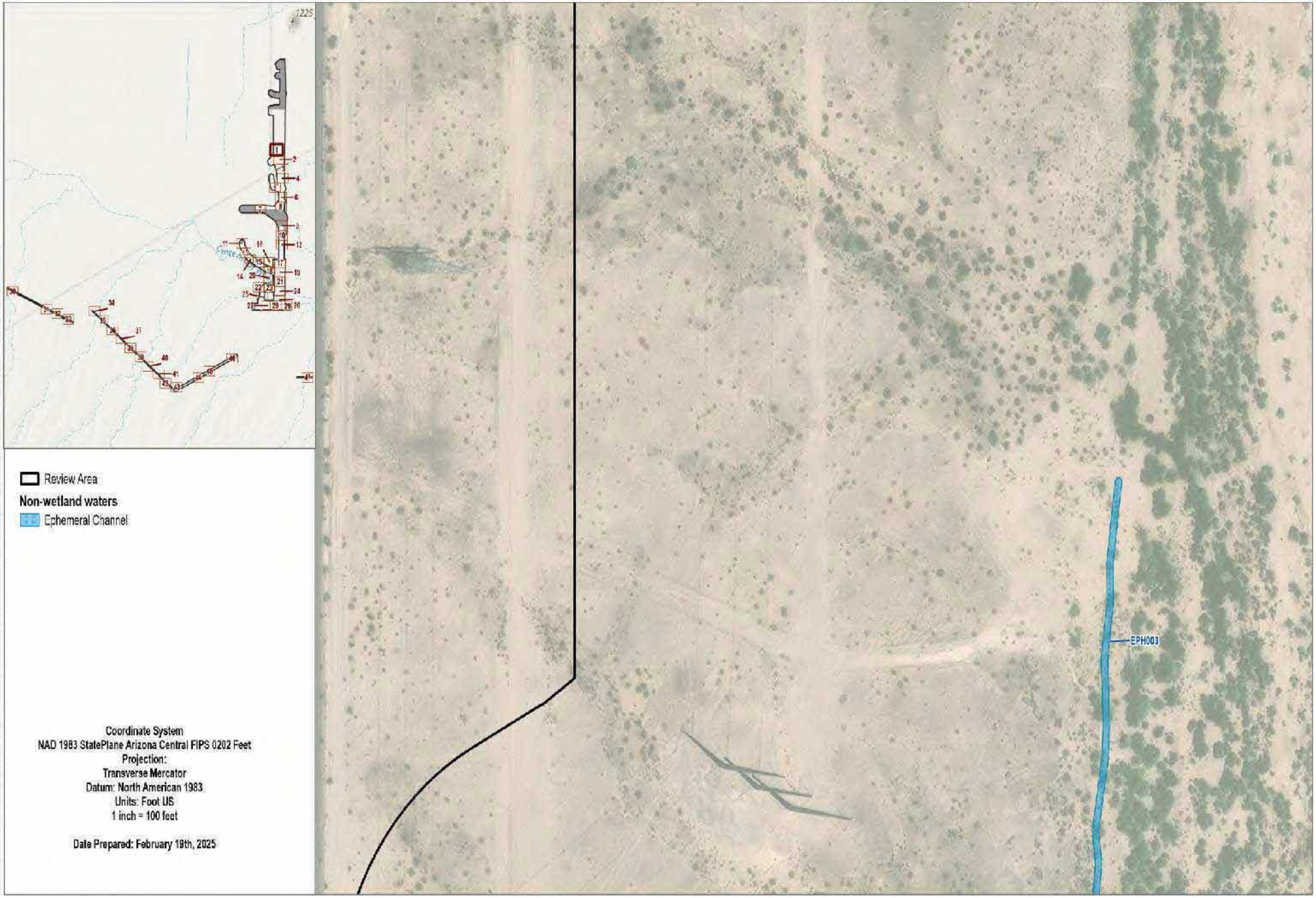
DUDEK

0 1,500 3,000 Feet

FIGURE 6

Aquatic Resources Index Map

Vulcan Solar Project



SOURCE: Bing Maps 2023;

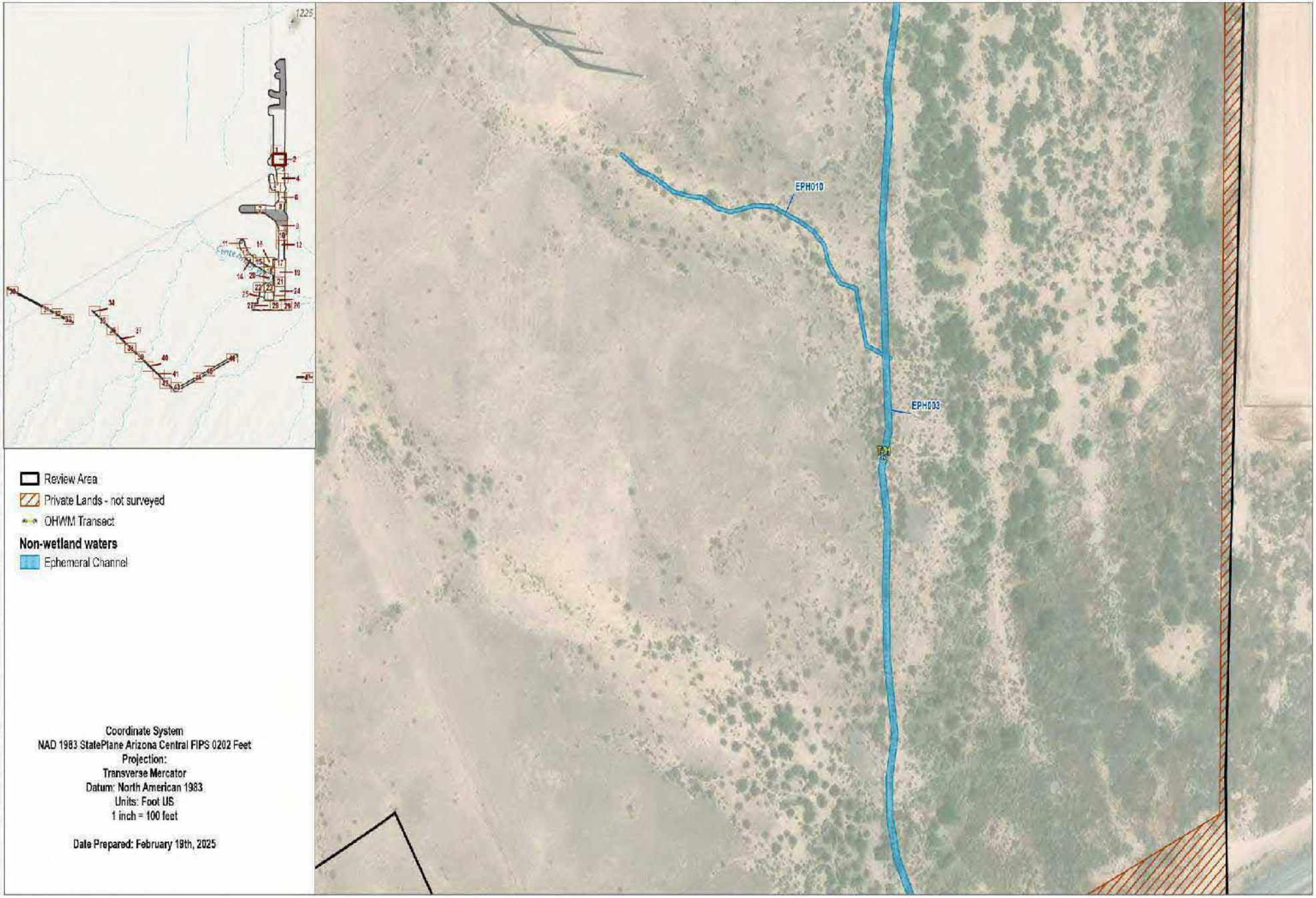
DUDEK

0 50 100 Feet

FIGURE 6-1

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

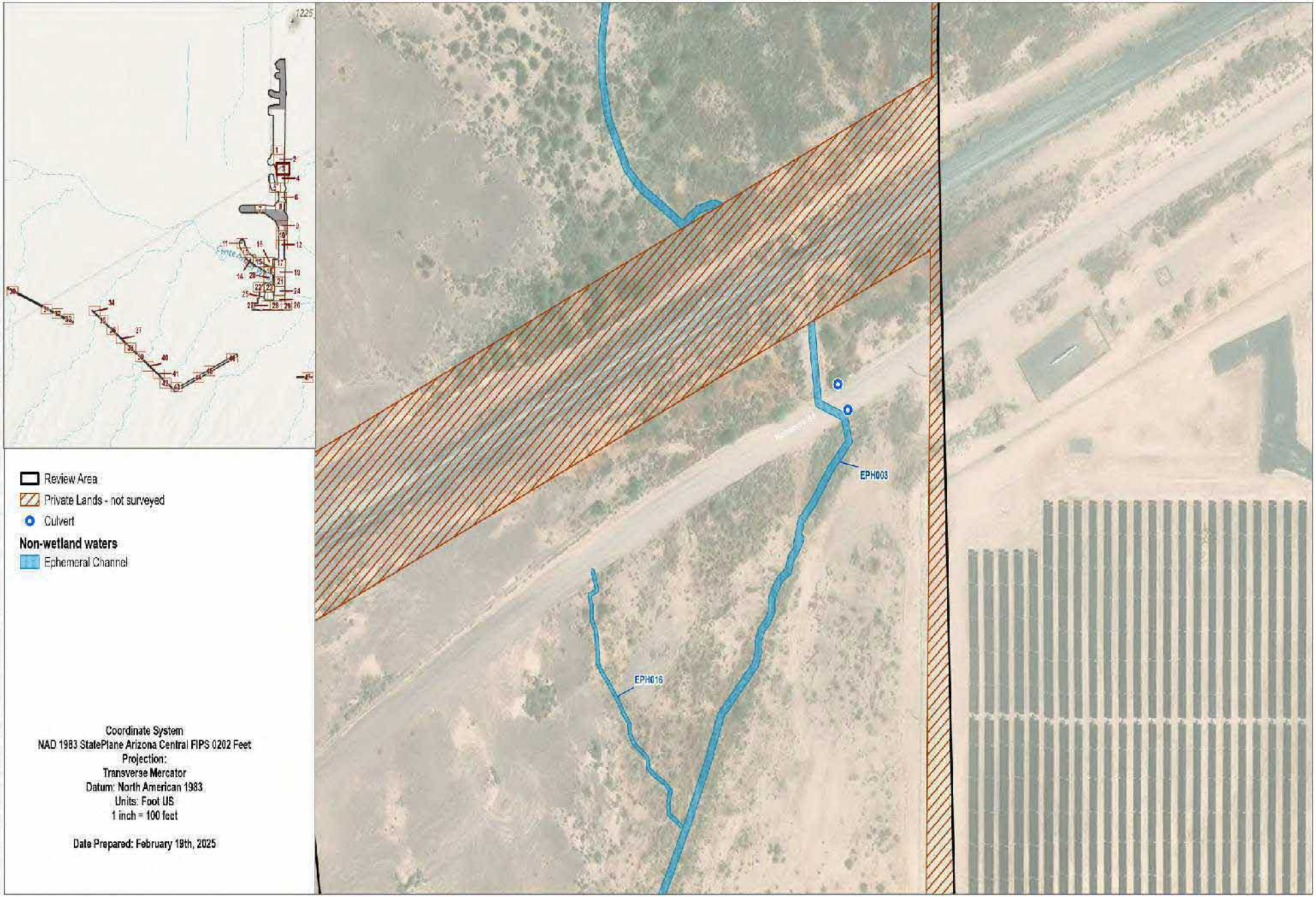
DUDEK

0 50 100 Feet

FIGURE 6-2

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

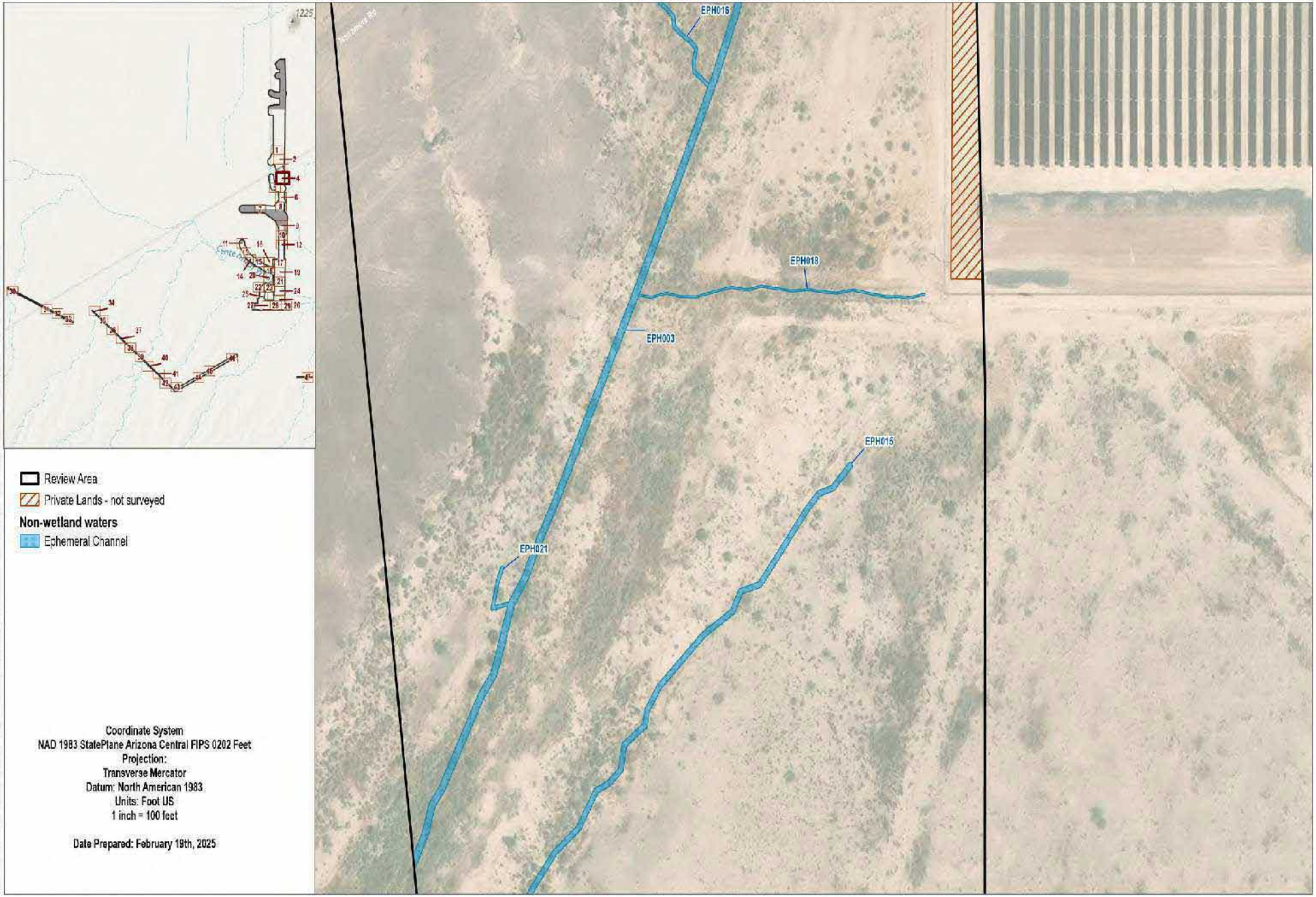
DUDEK

0 50 100 Feet

FIGURE 6-3

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

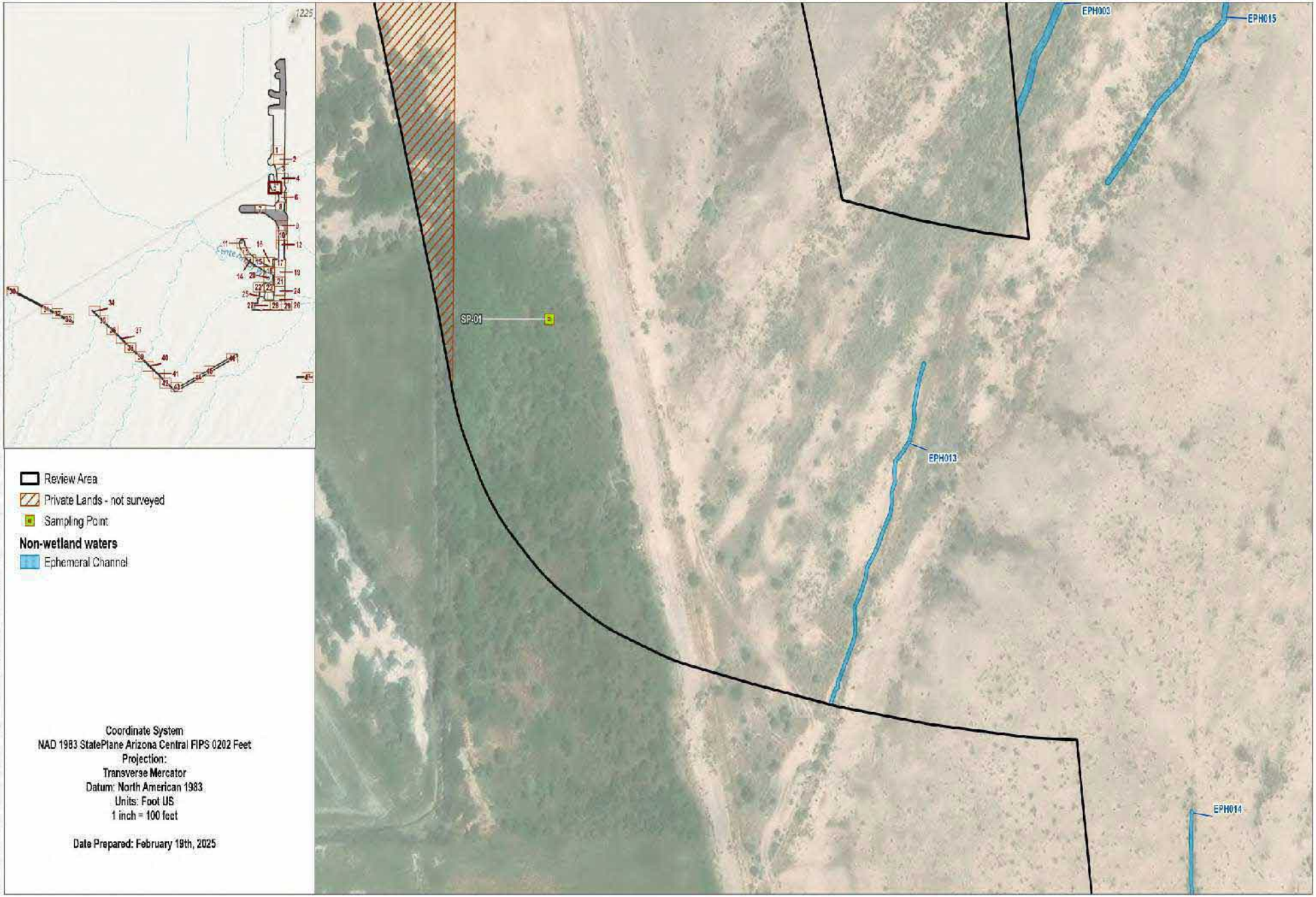
DUDEK

0 50 100 Feet

FIGURE 6-4

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

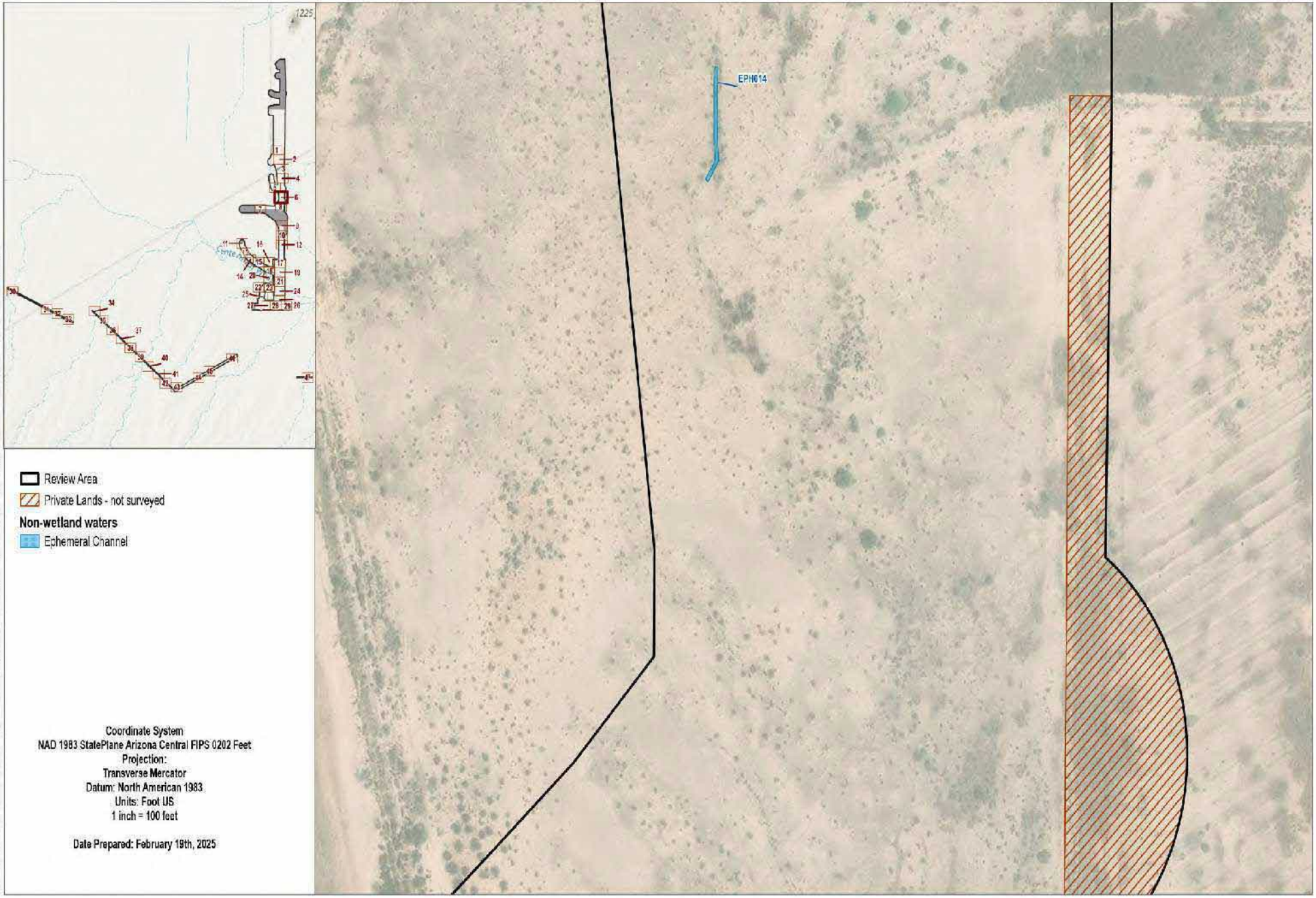
DUDEK

0 50 100 Feet

FIGURE 6-5

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

DUDEK

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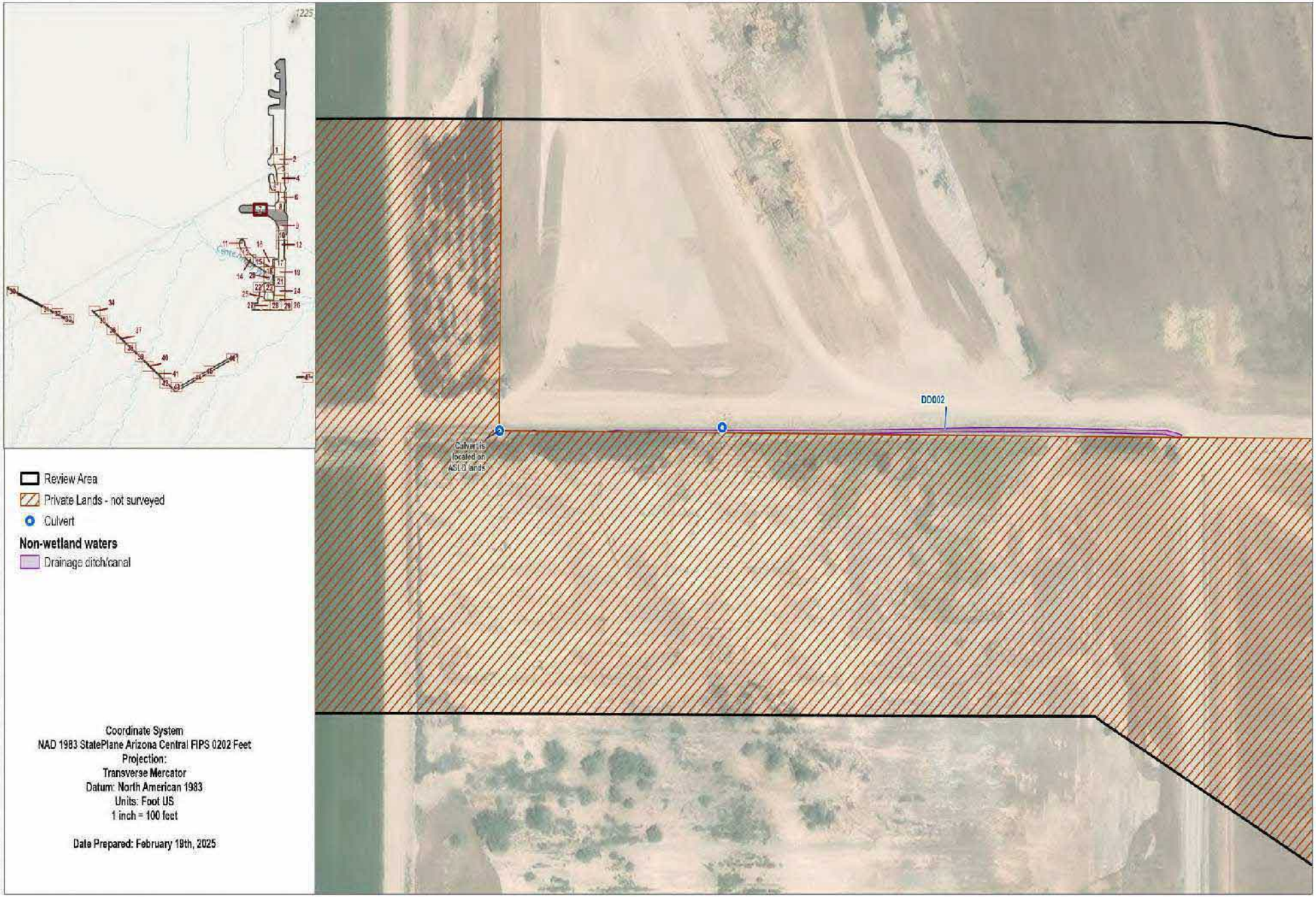
FIGURE 6-6

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023

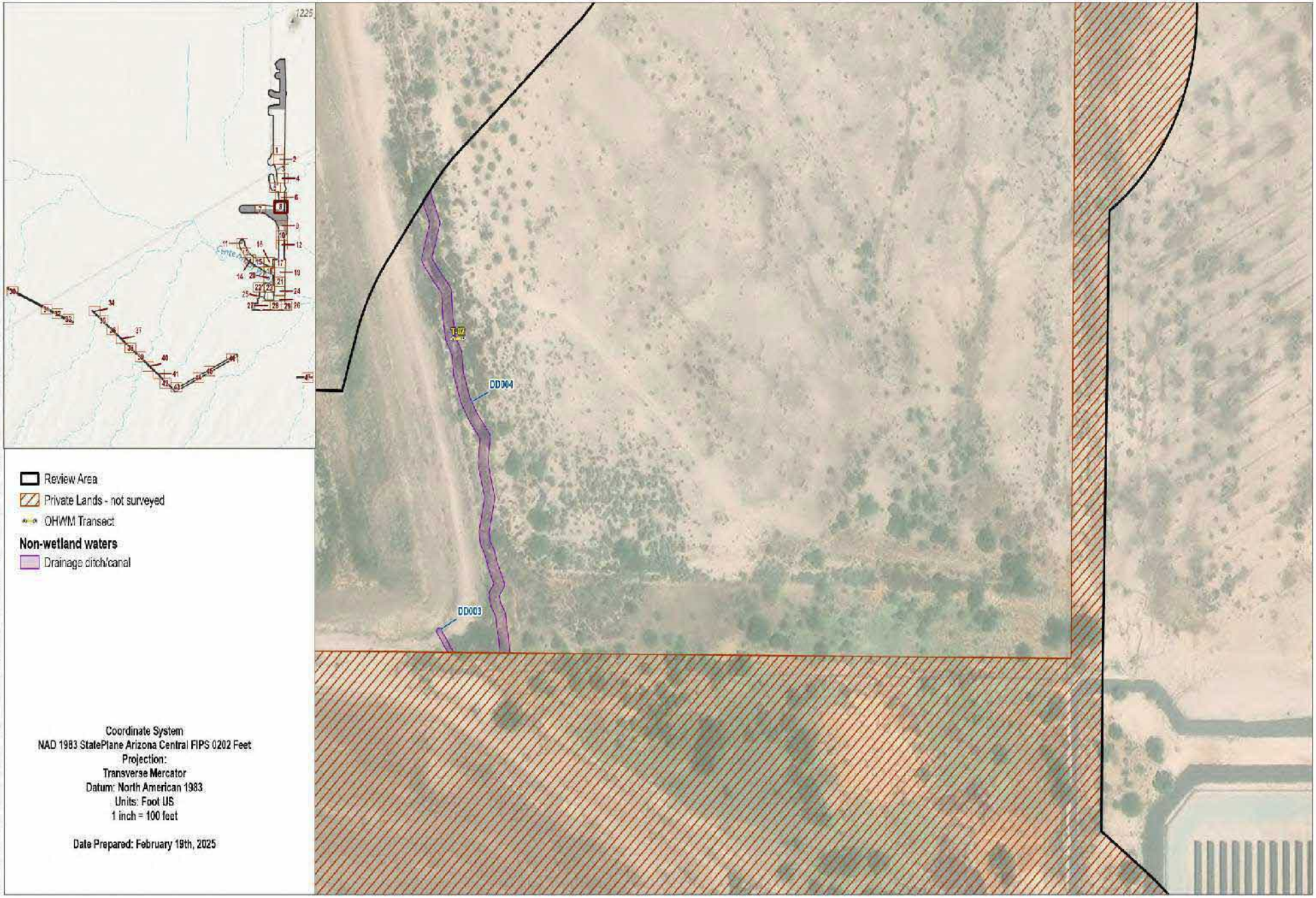
DUDEK

0 50 100 Feet

FIGURE 6-7

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

DUDEK

0 50 100 Feet

FIGURE 6-8

Aquatic Resources

Vulcan Solar Project

SOURCE: Bing Maps 2023;

DUDEK

0 50 100 Feet

FIGURE 6-9

Aquatic Resources

Vulcan Solar Project

SOURCE: Bing Maps 2023;

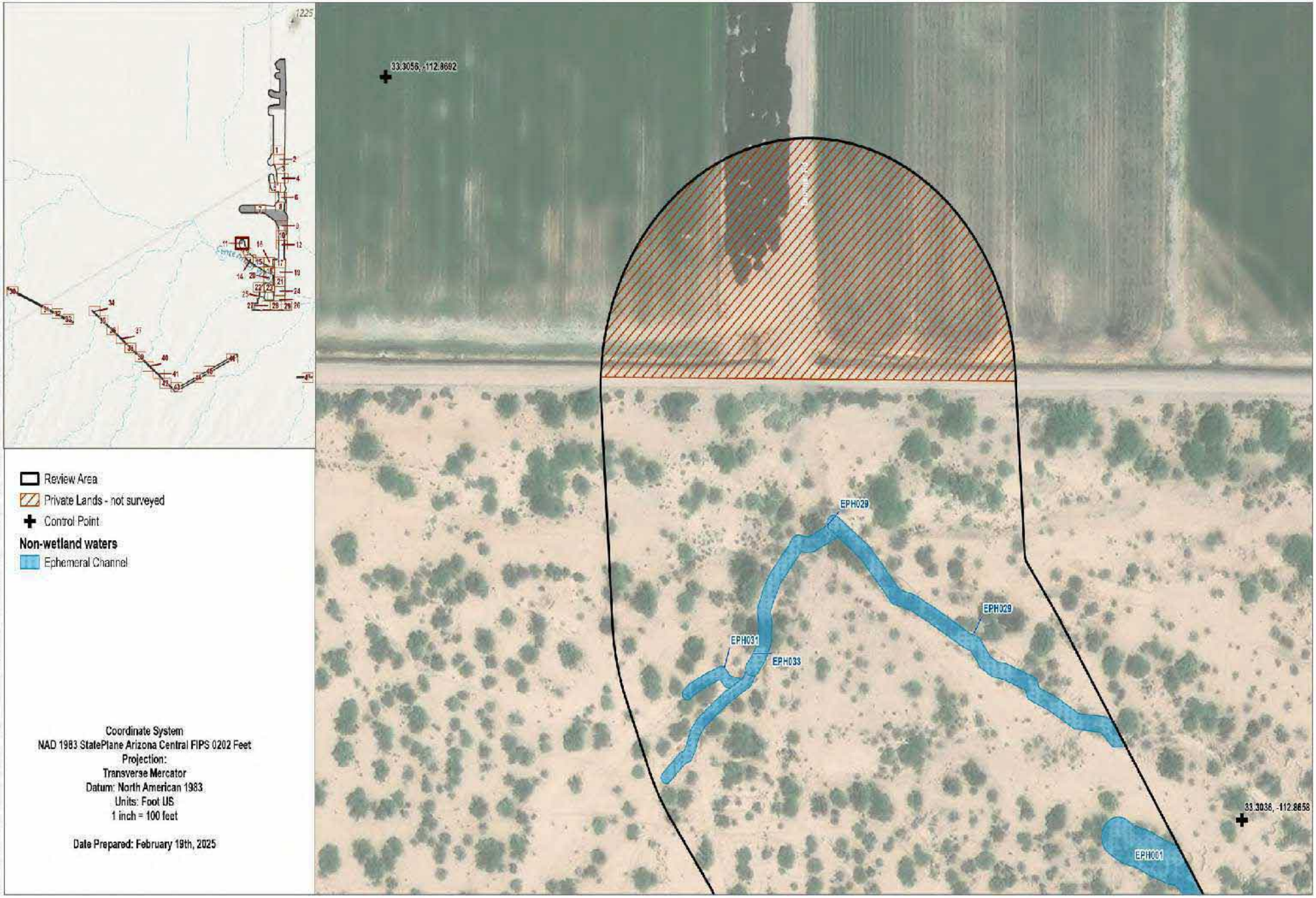
DUDEK

0 50 100 Feet

FIGURE 6-10

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

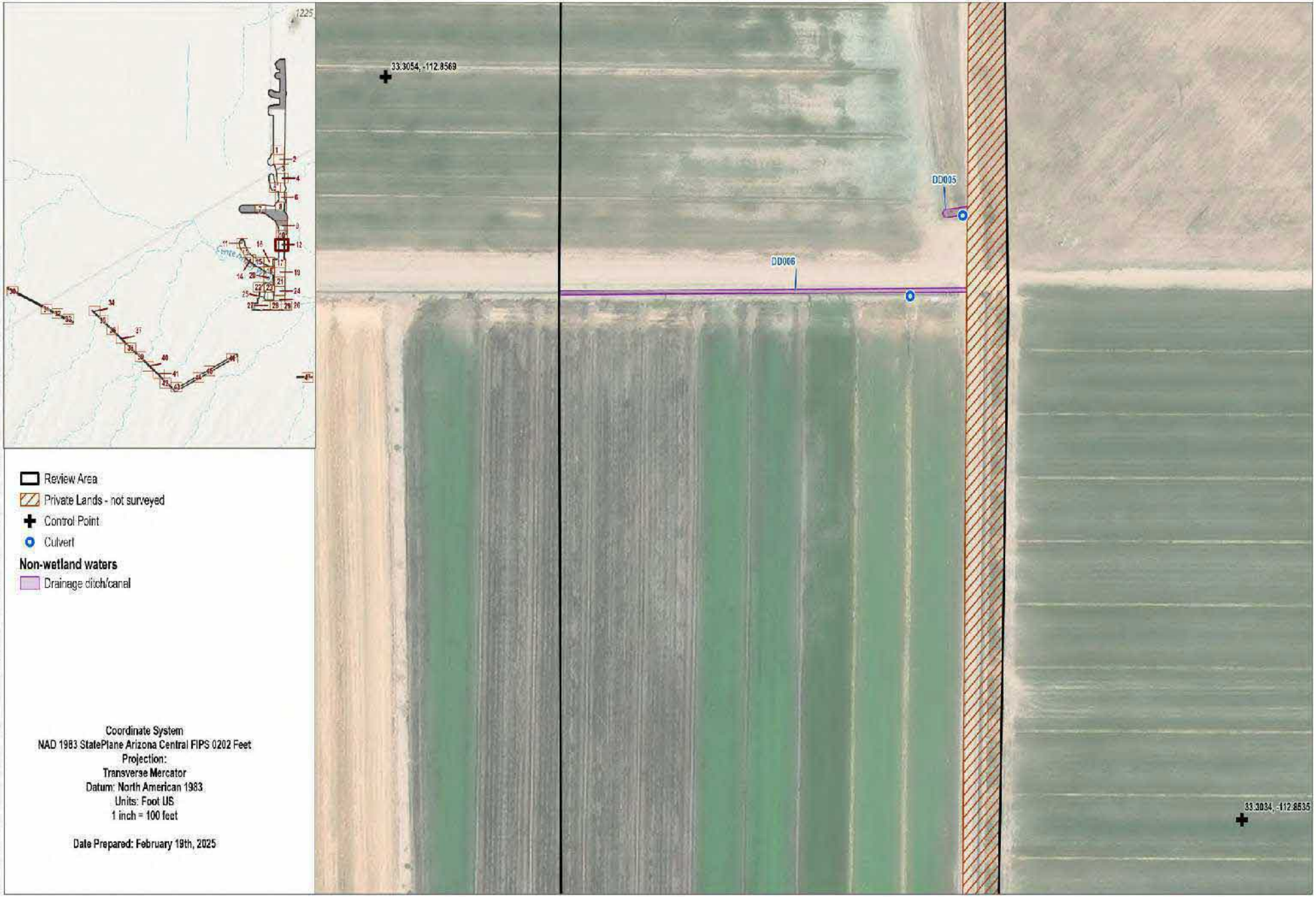
DUDEK

0 50 100 Feet

FIGURE 6-11

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

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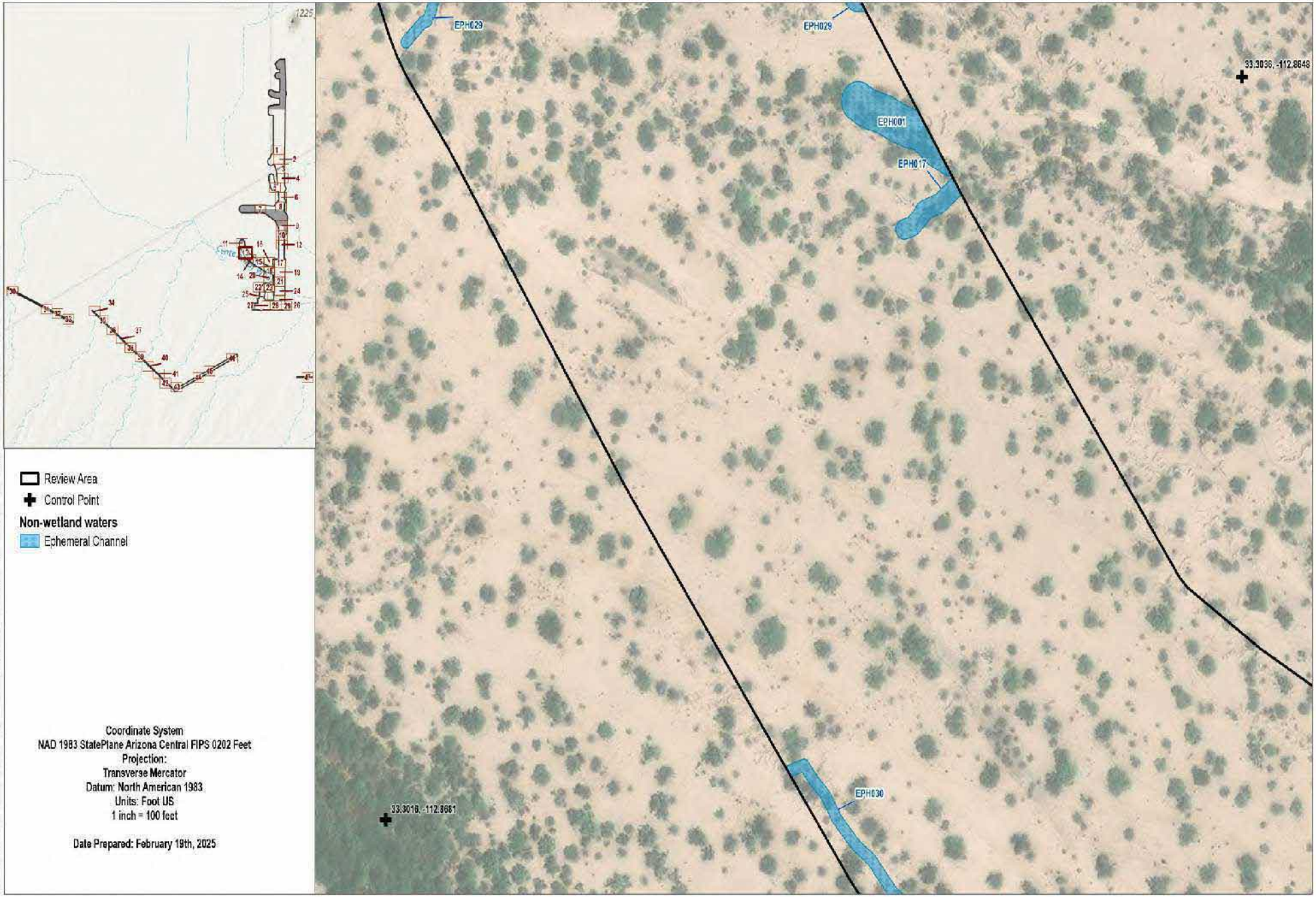
FIGURE 6-12

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

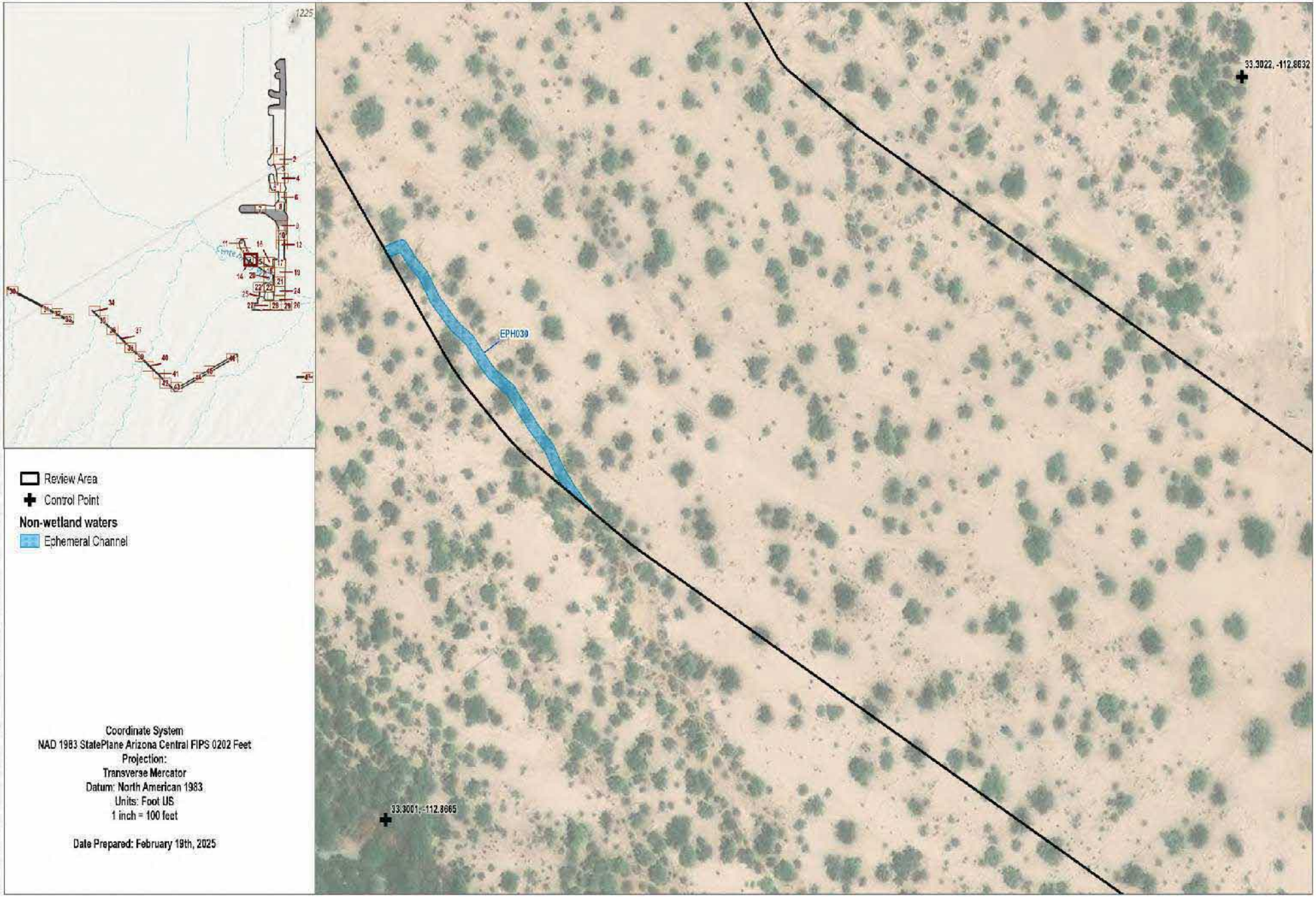
DUDEK

0 50 100 Feet

FIGURE 6-13

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

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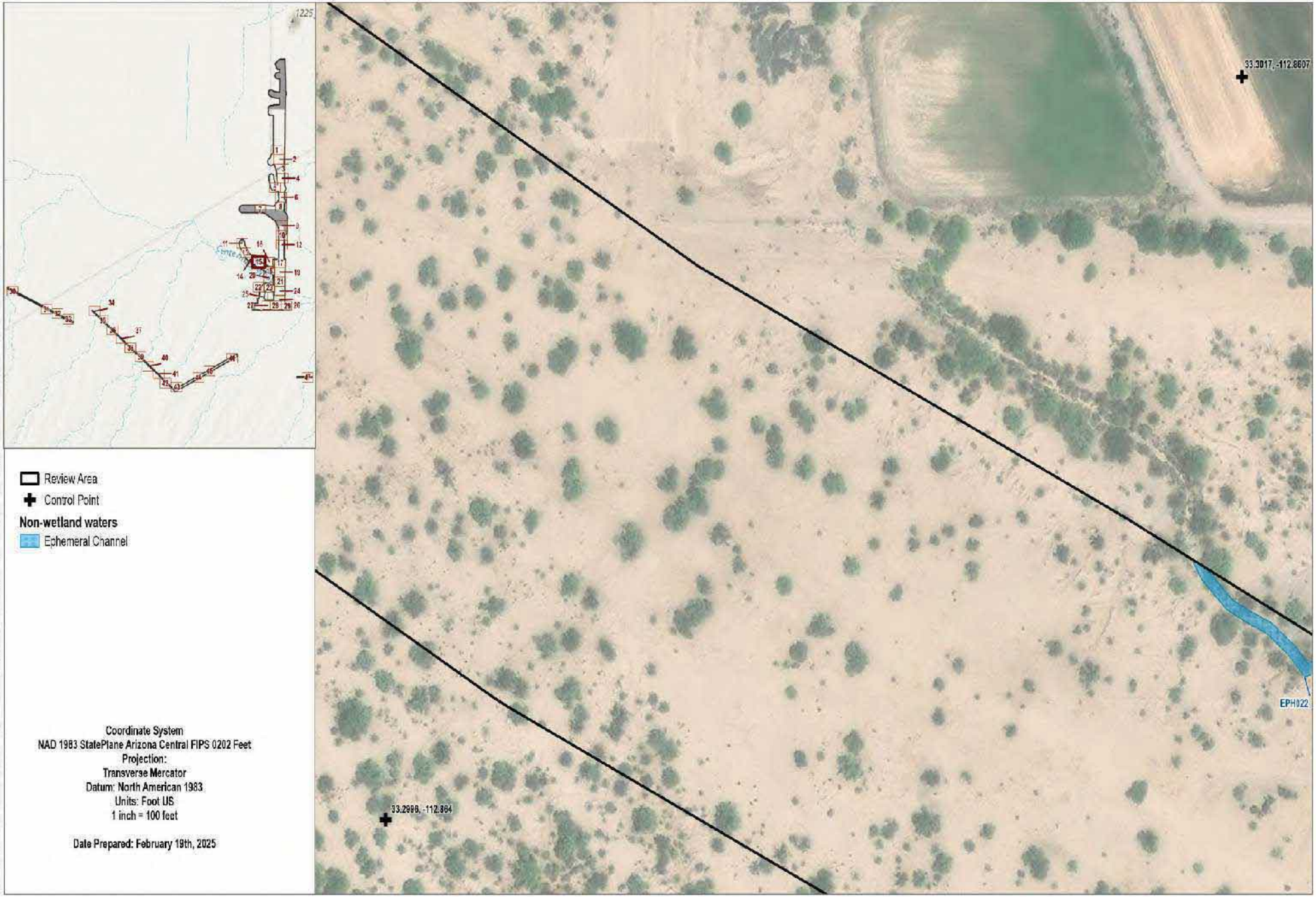
FIGURE 6-14

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

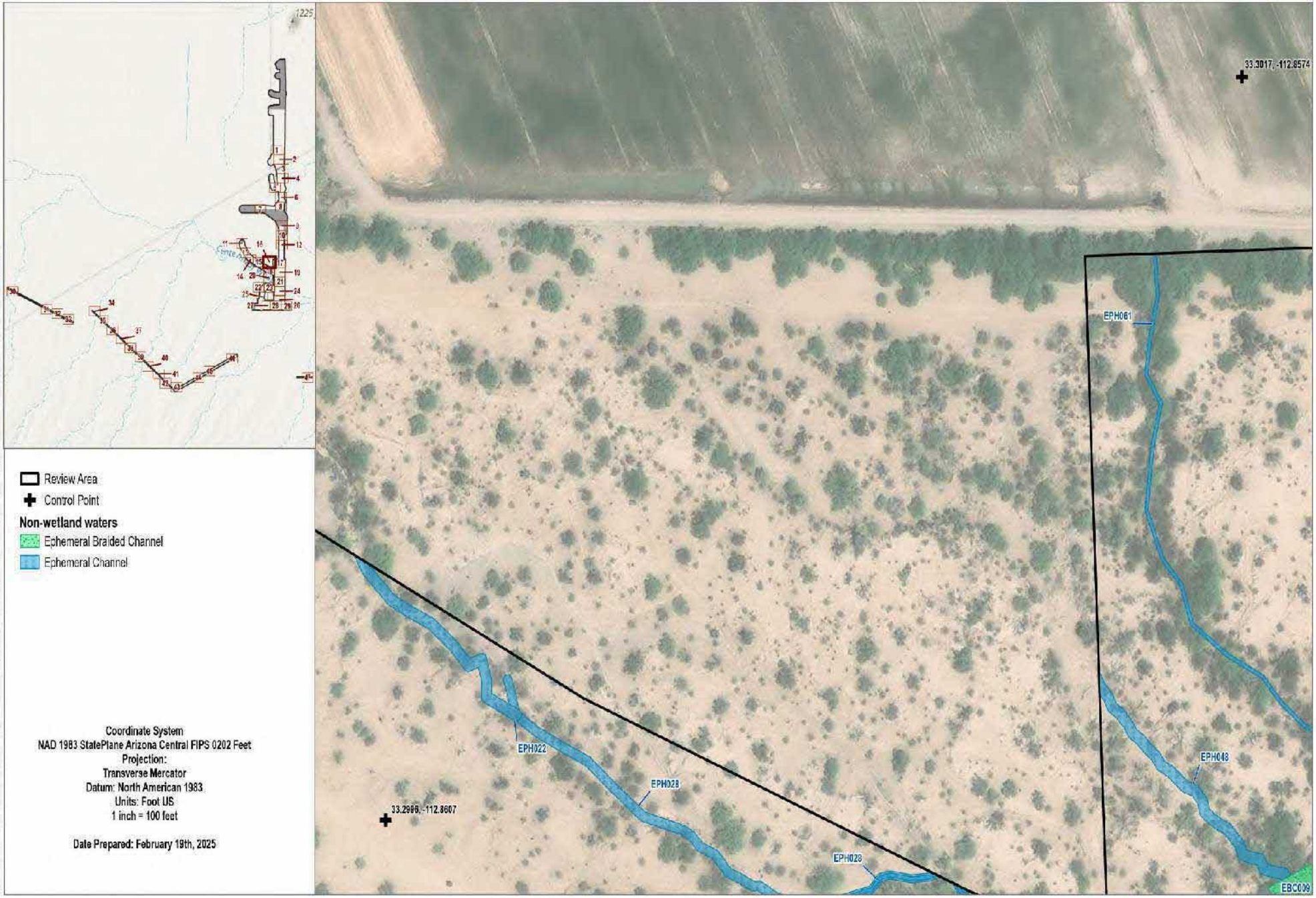
DUDEK

0 50 100 Feet

FIGURE 6-15

Aquatic Resources

Vulcan Solar Project



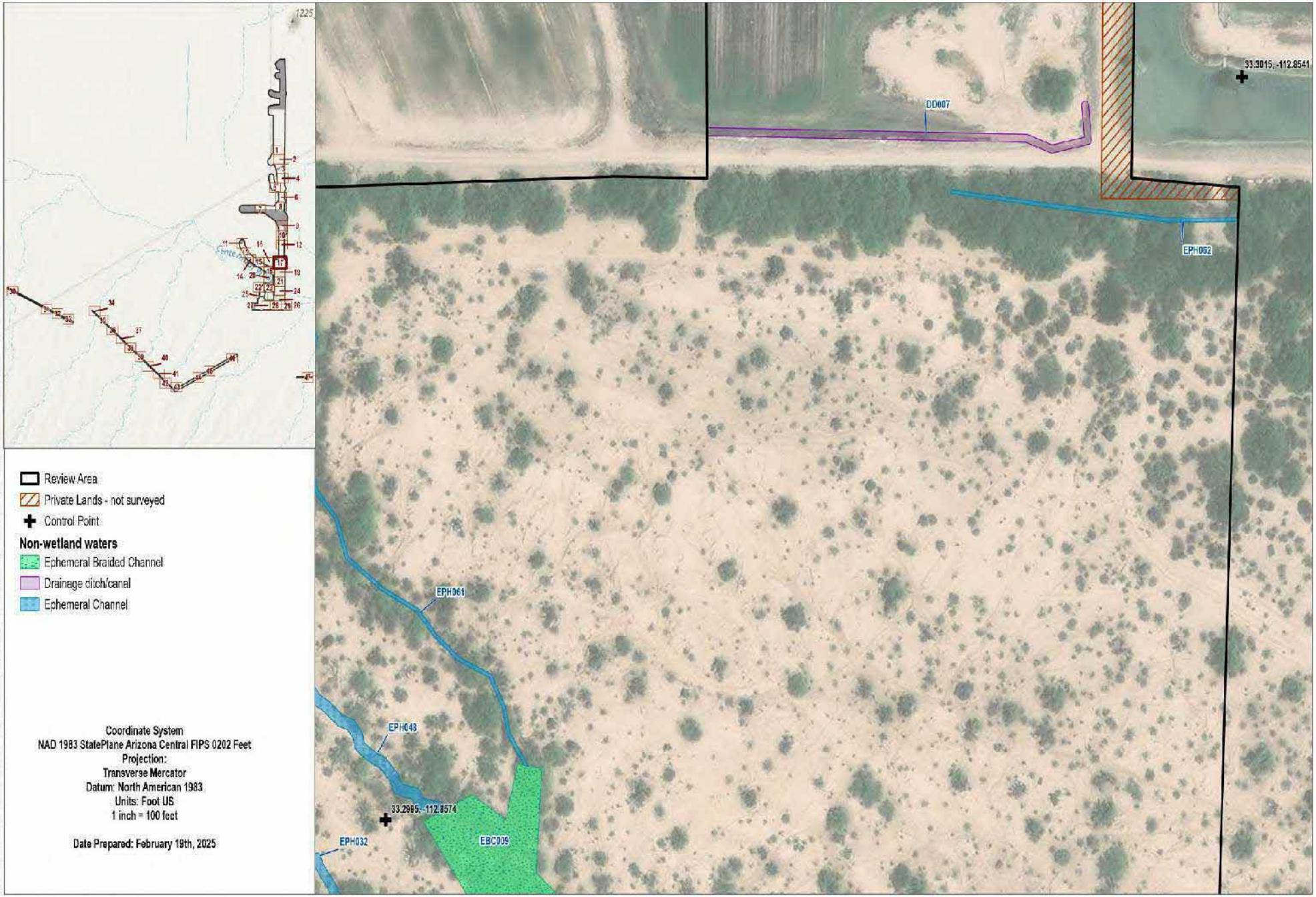
SOURCE: Bing Maps 2023;

DUDEK

FIGURE 6-16

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

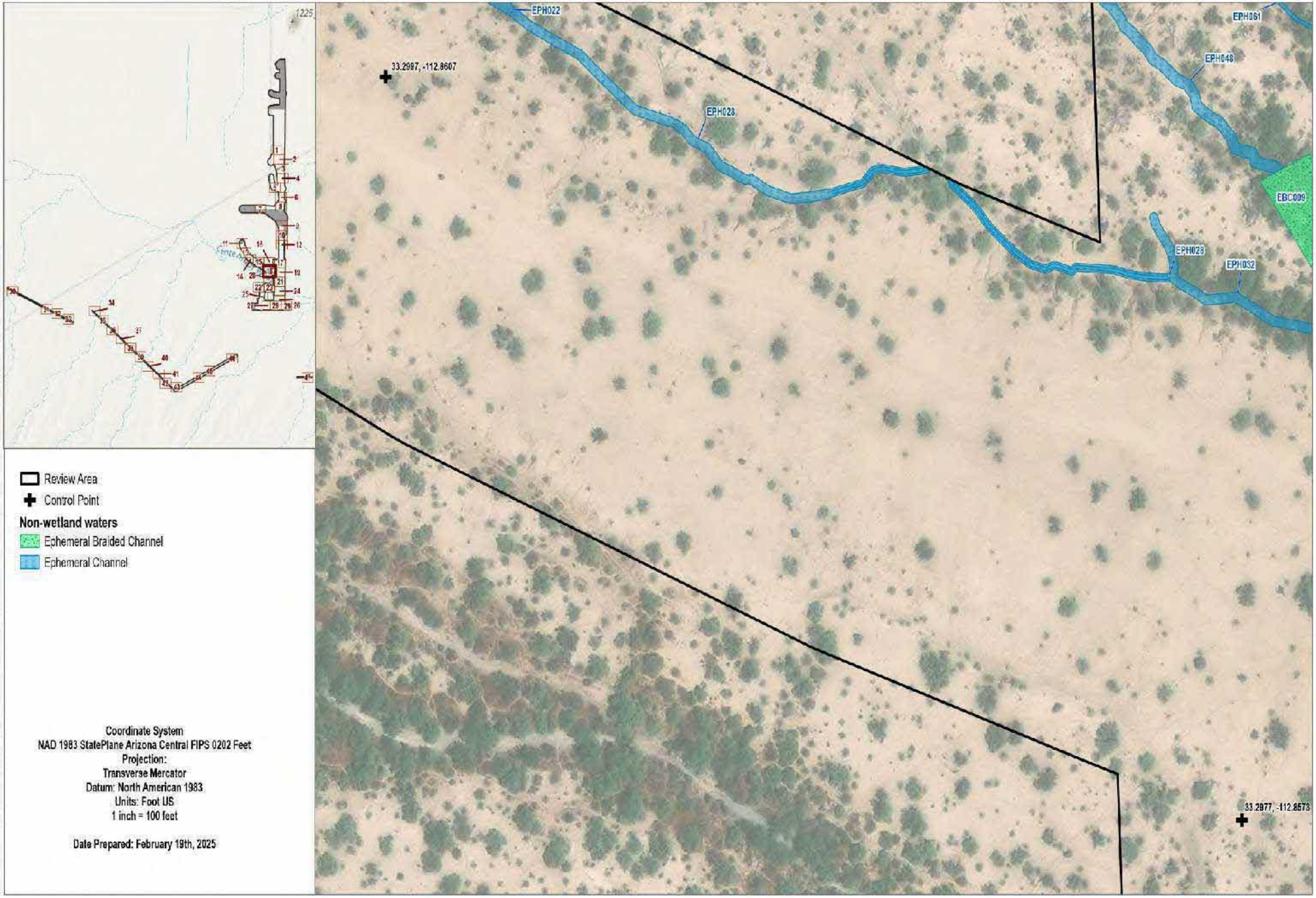
DUDEK

0 50 100 Feet

FIGURE 6-17

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

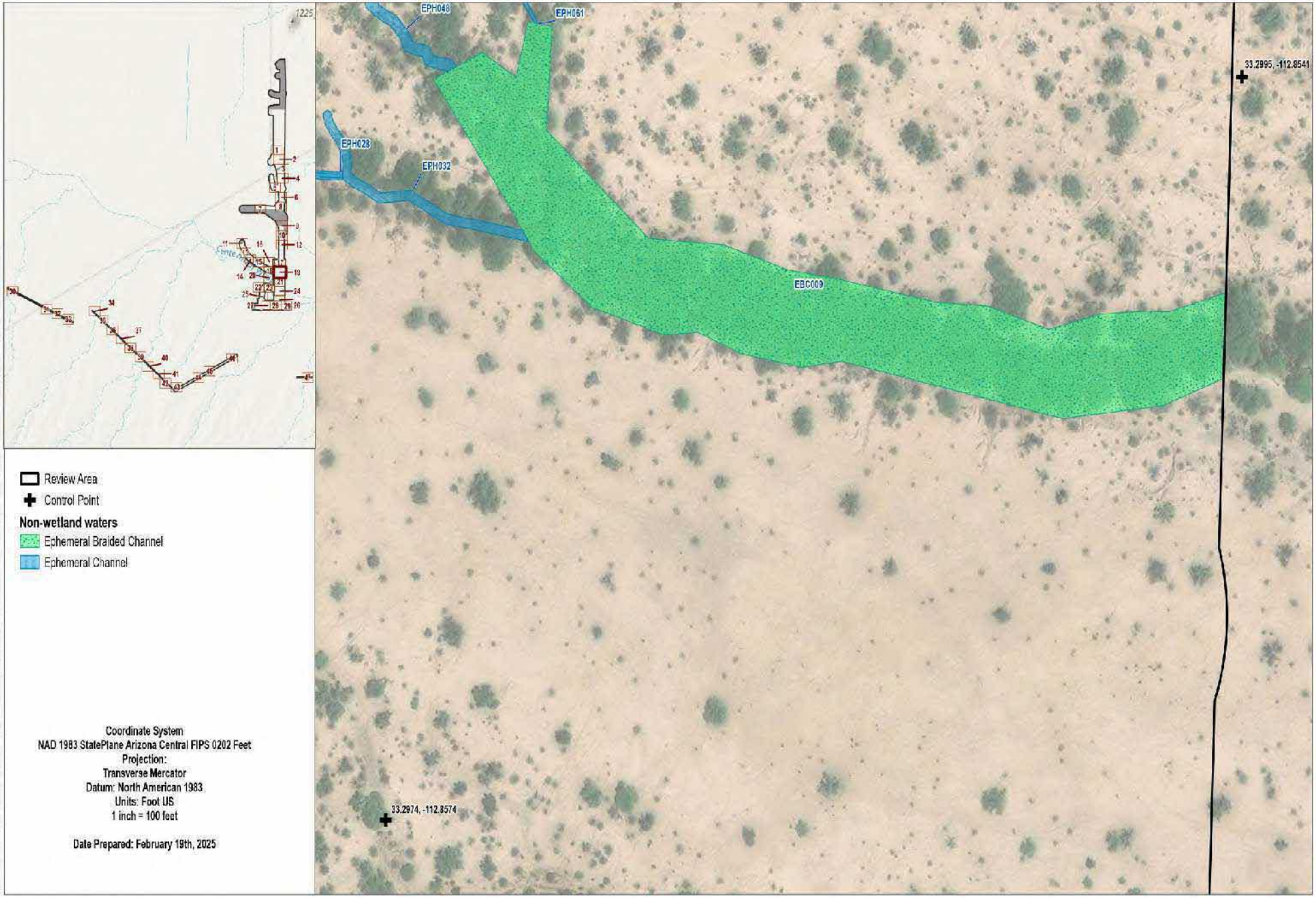
DUDEK

0 50 100 Feet

FIGURE 6-18

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

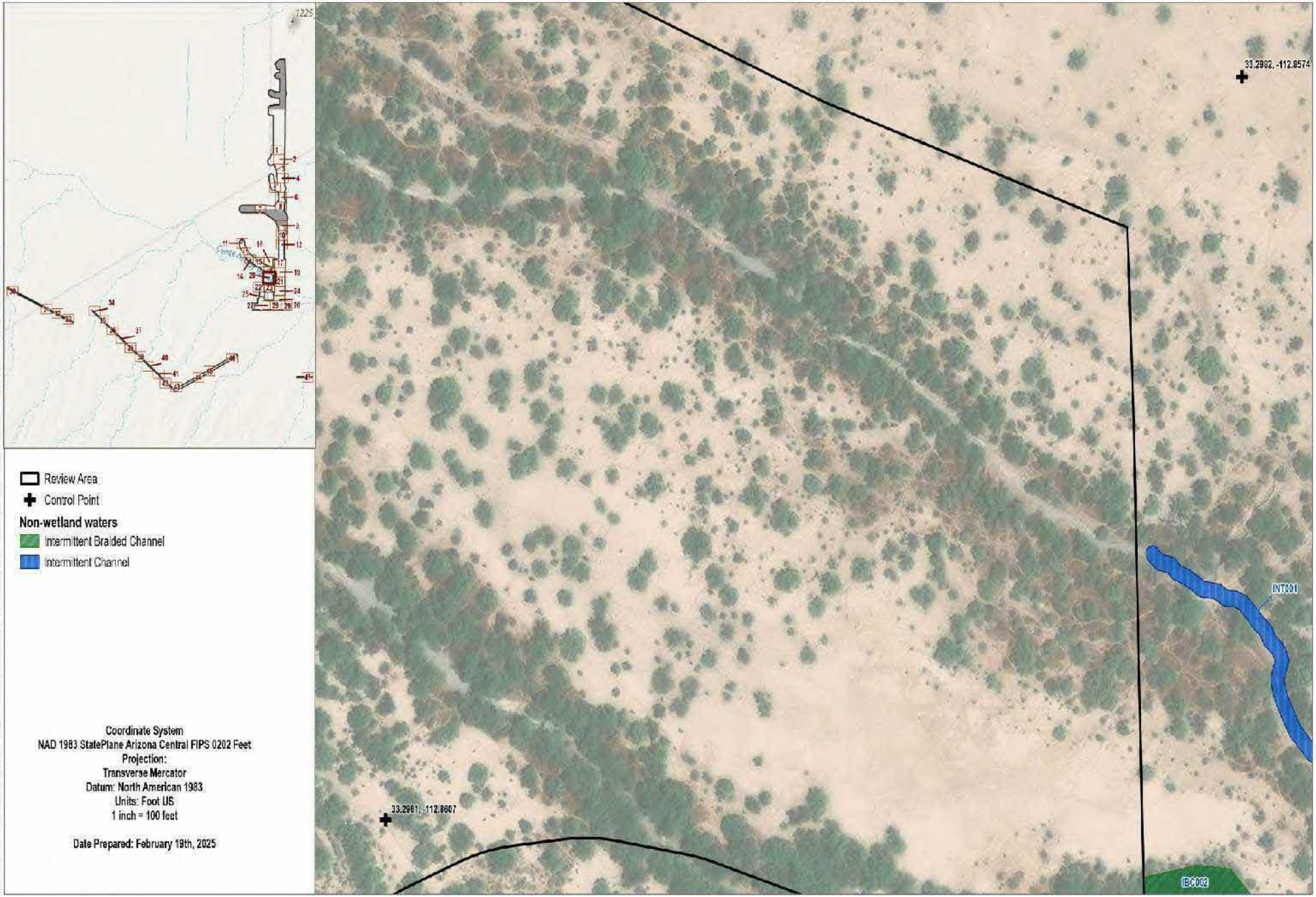
DUDEK

0 50 100 Feet

FIGURE 6-19

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

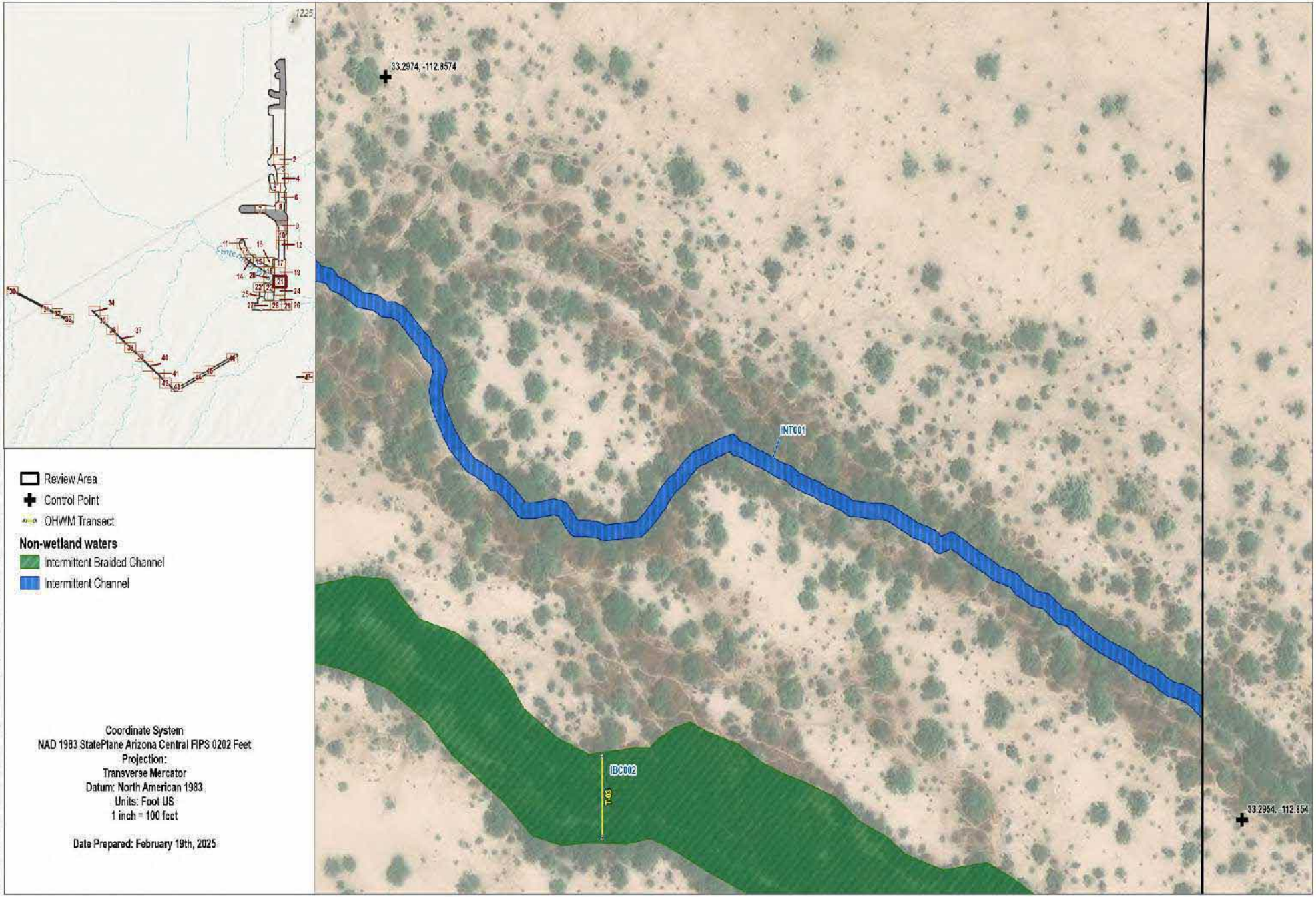
DUDEK

0 50 100 Feet

FIGURE 6-20

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

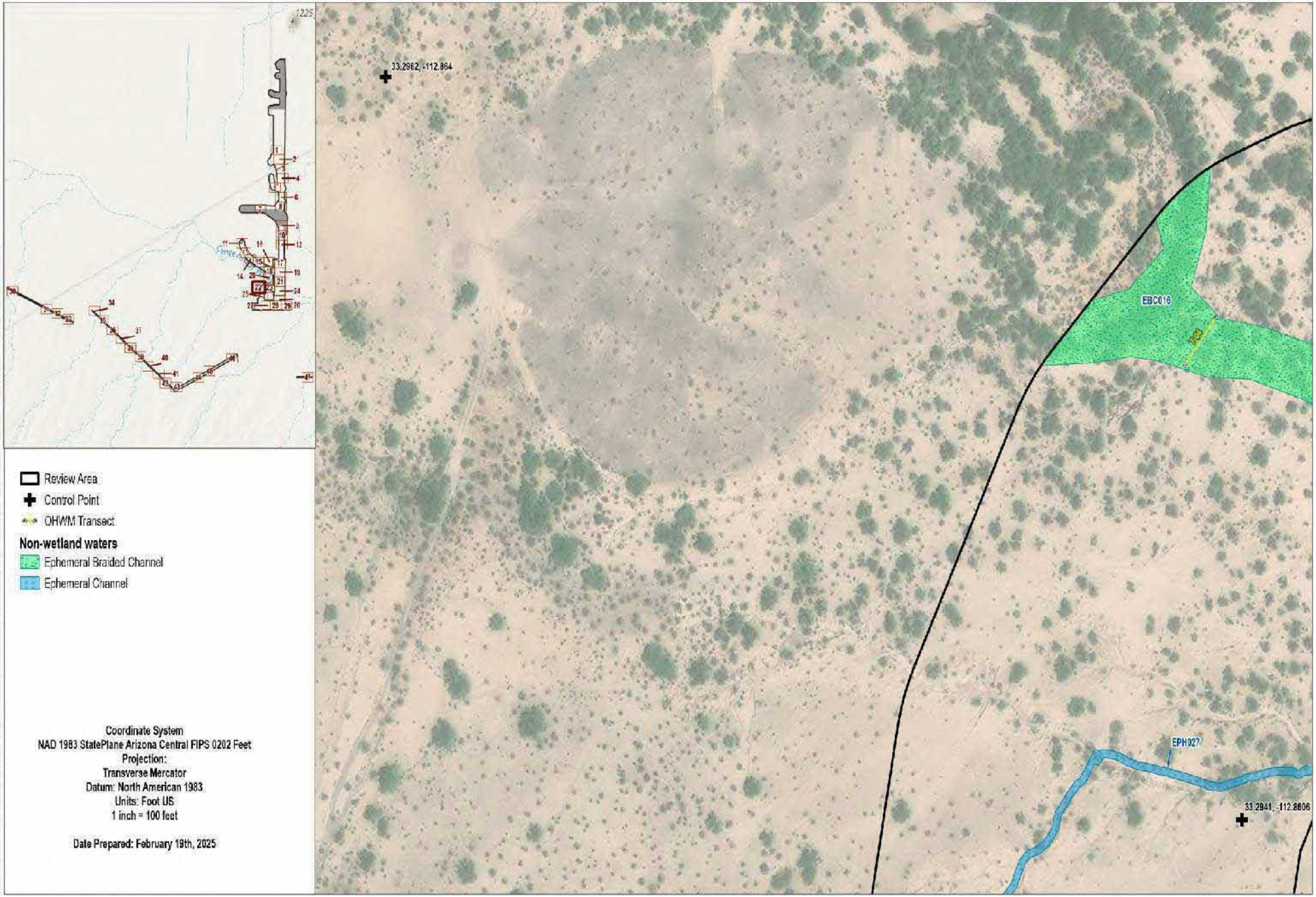
DUDEK

0 50 100 Feet

FIGURE 6-21

Aquatic Resources

Vulcan Solar Project



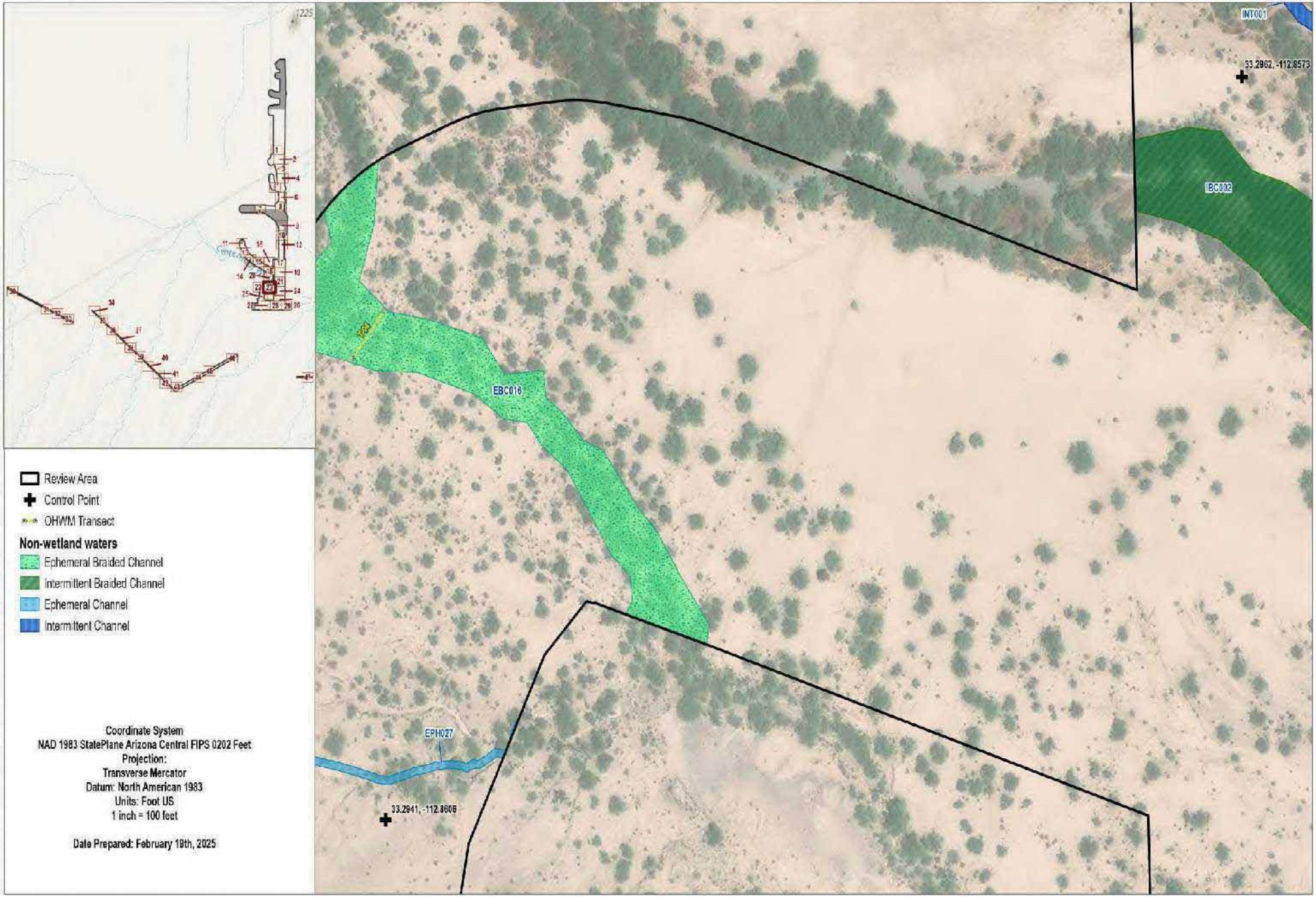
SOURCE: Bing Maps 2023;

DUDEK 0 50 100 Feet

FIGURE 6-22

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023

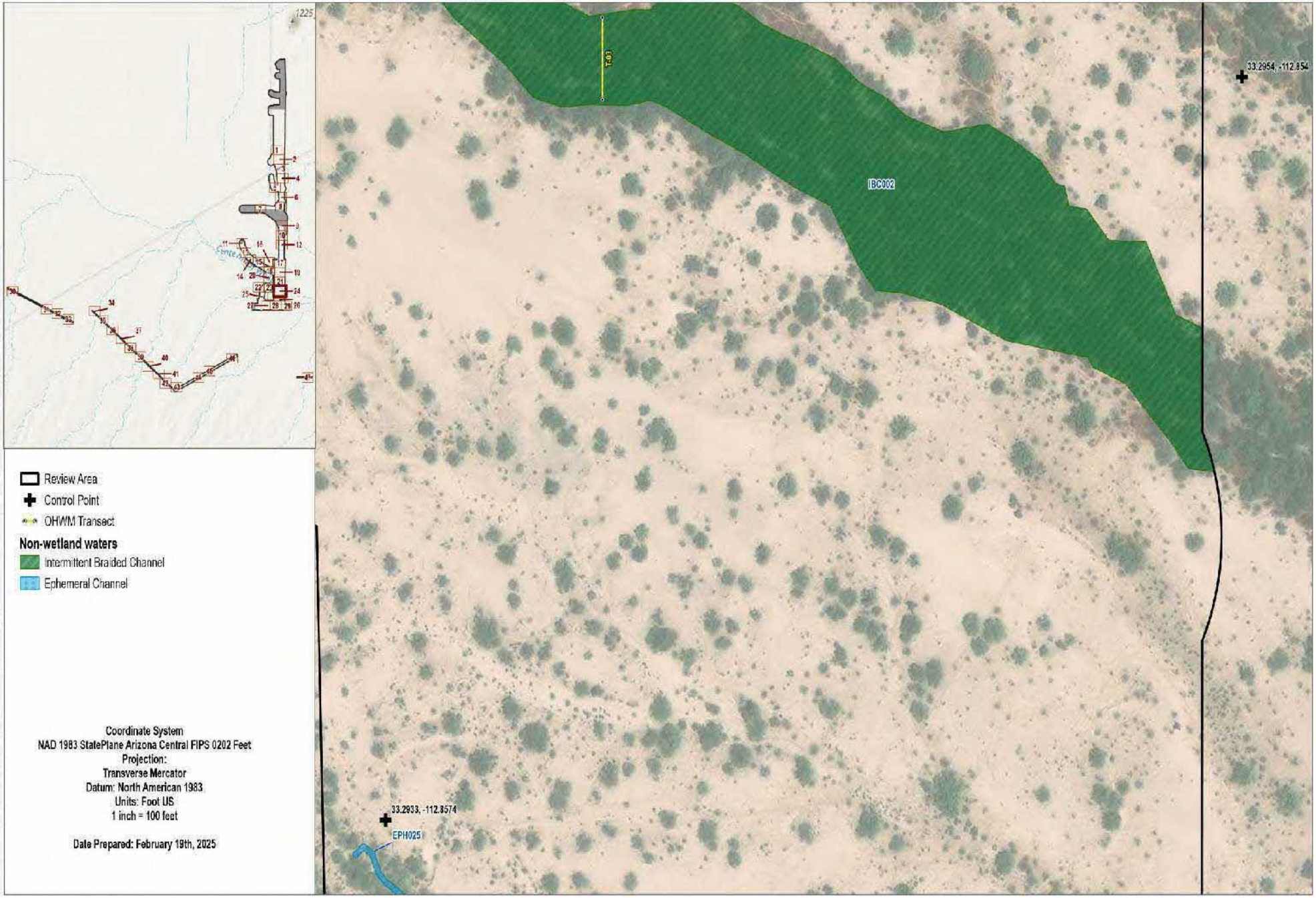
DUDEK

0 50 100 Feet

FIGURE 6-23

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

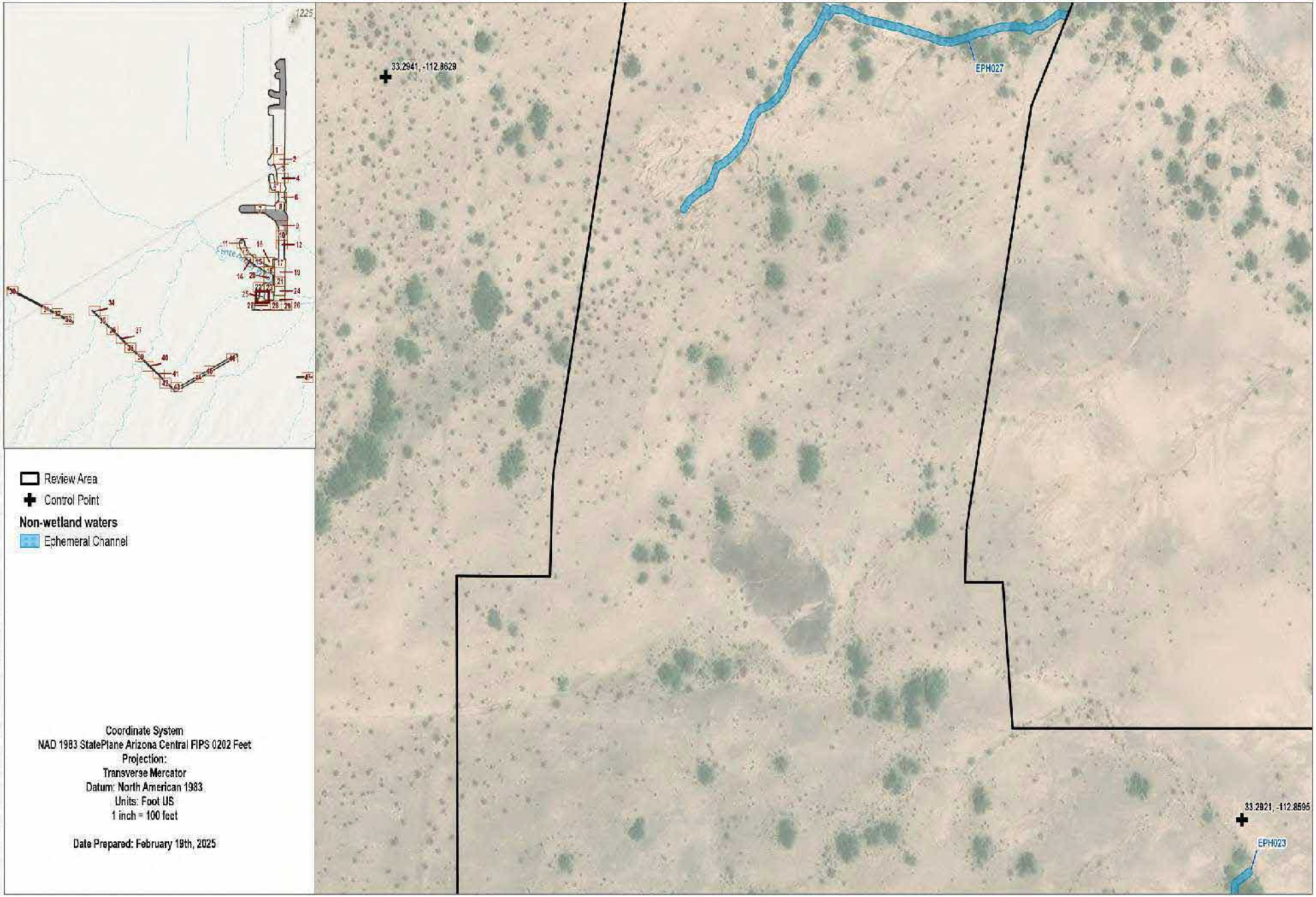
DUDEK

0 50 100 Feet

FIGURE 6-24

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

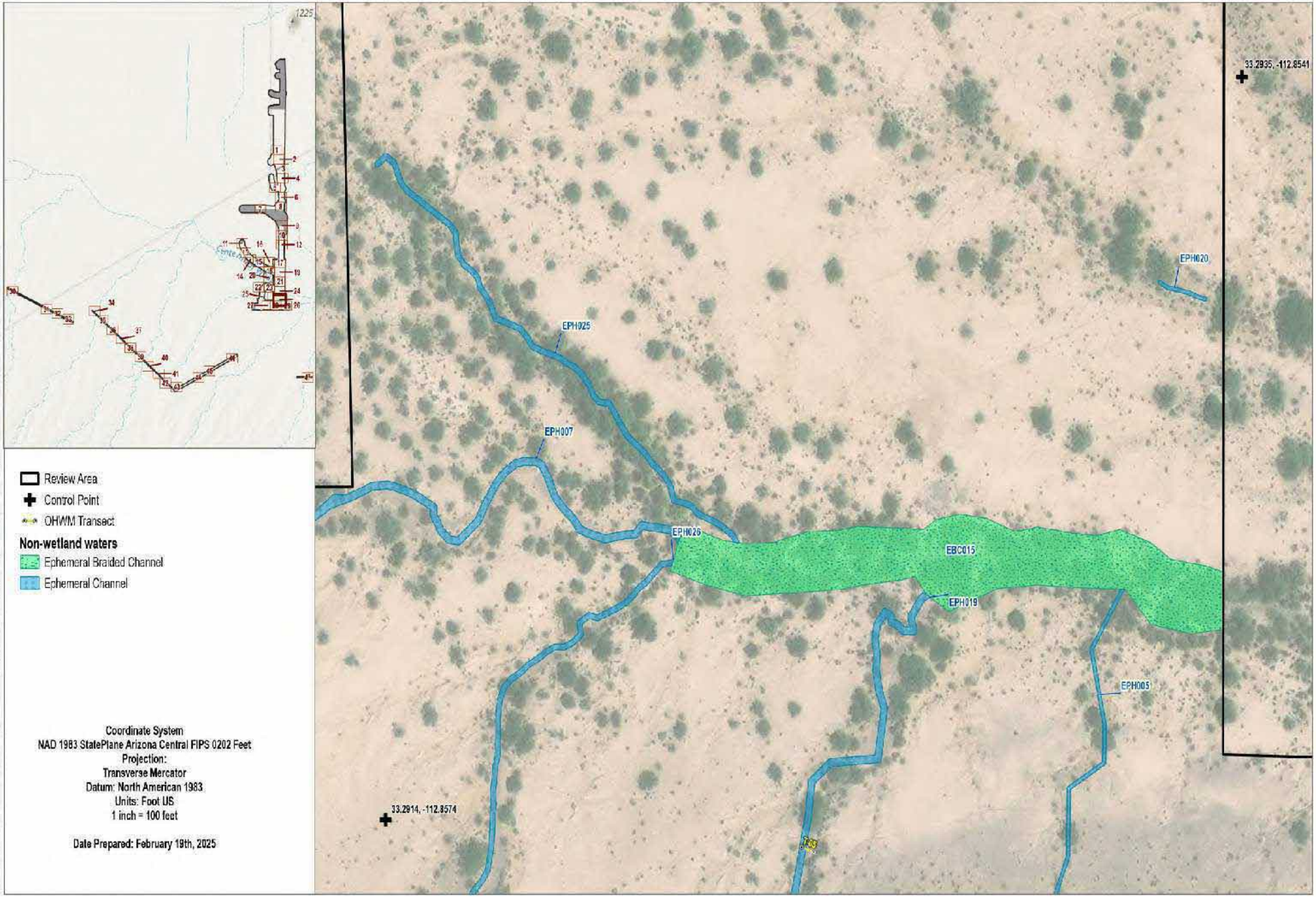
DUDEK

0 50 100 Feet

FIGURE 6-25

Aquatic Resources

Vulcan Solar Project



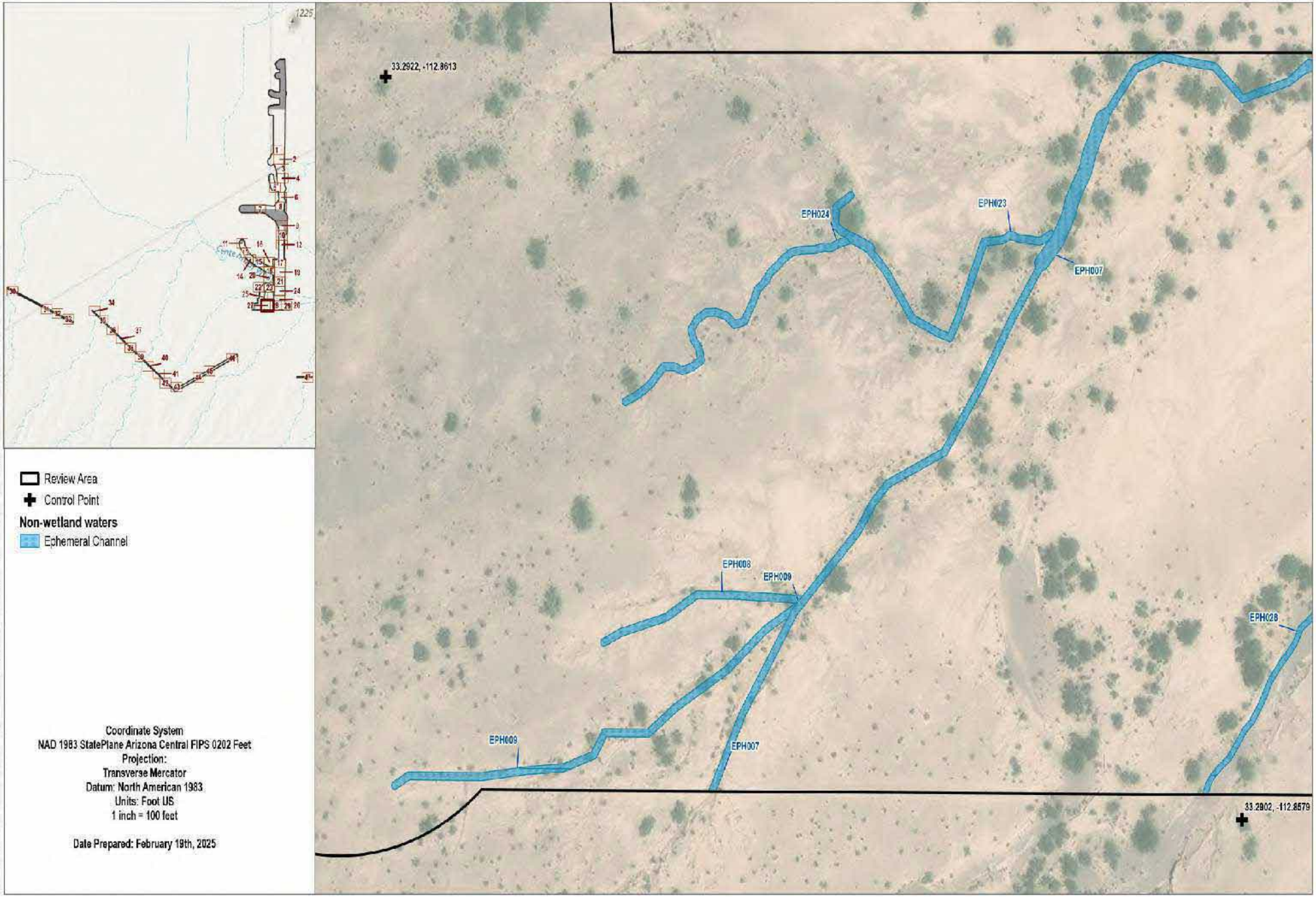
SOURCE: Bing Maps 2023;

DUDEK

FIGURE 6-26

Aquatic Resources

Vulcan Solar Project



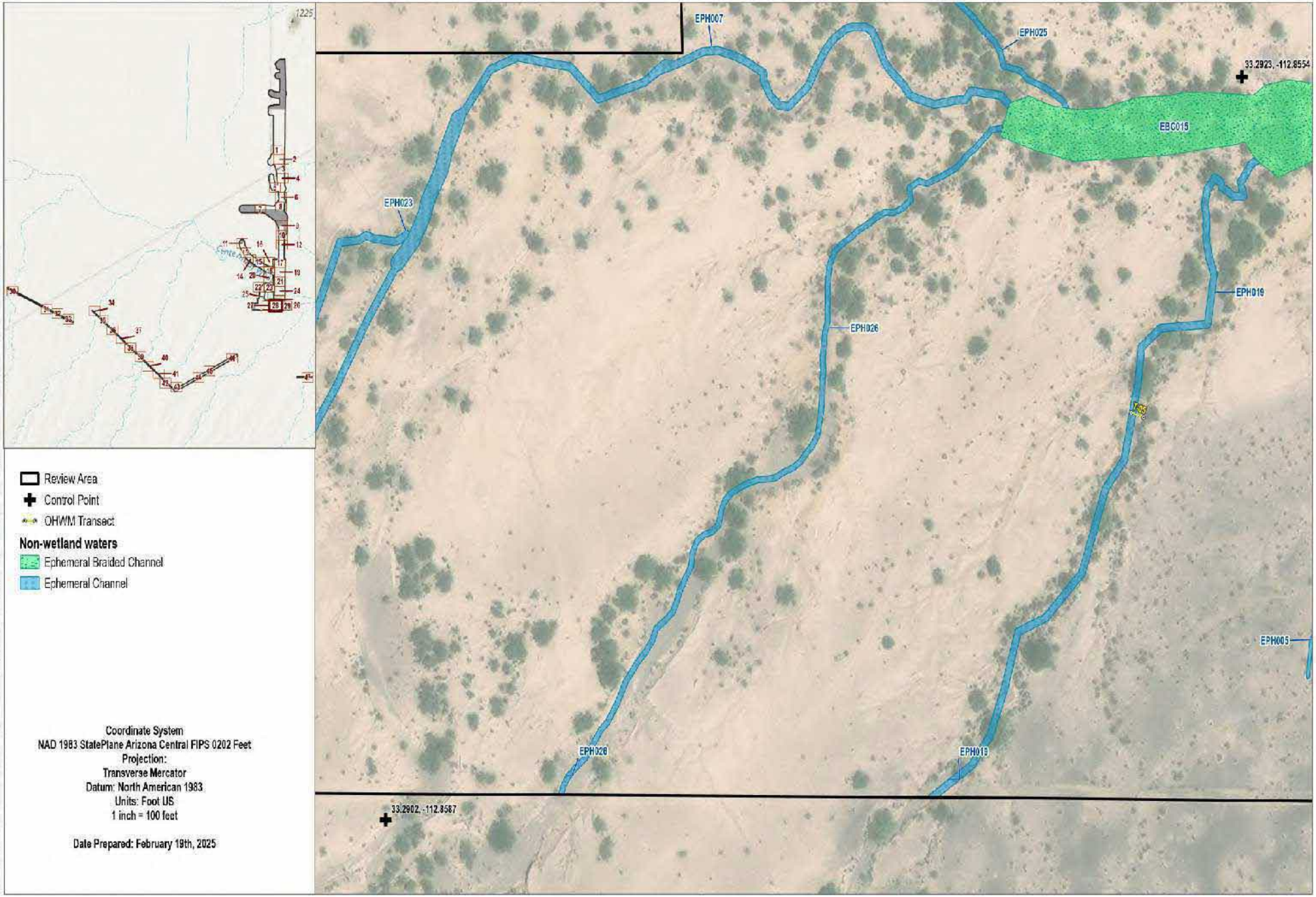
SOURCE: Bing Maps 2023;

DUDEK 0 50 100 Feet

FIGURE 6-27

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

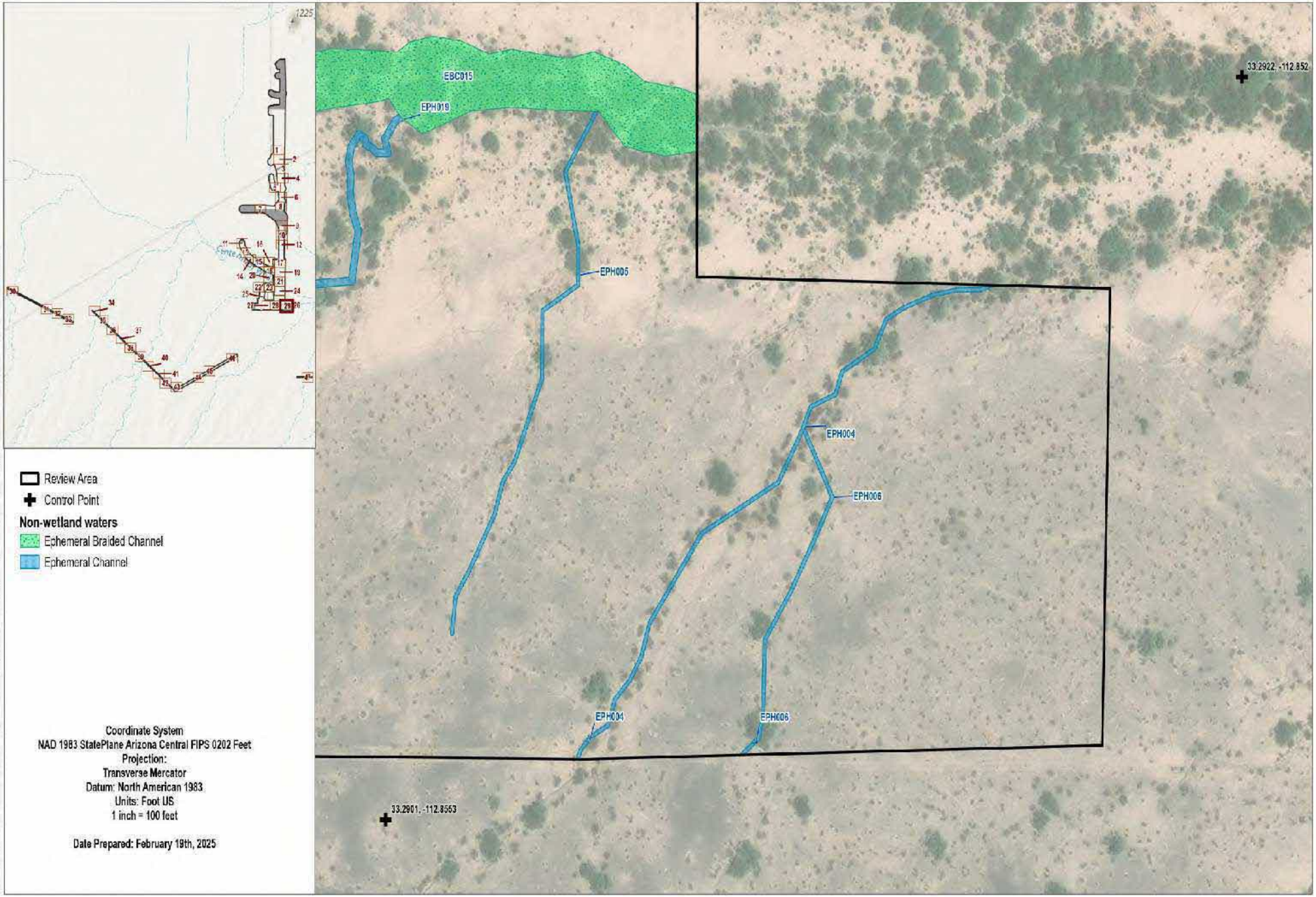
DUDEK

0 50 100 Feet

FIGURE 6-28

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

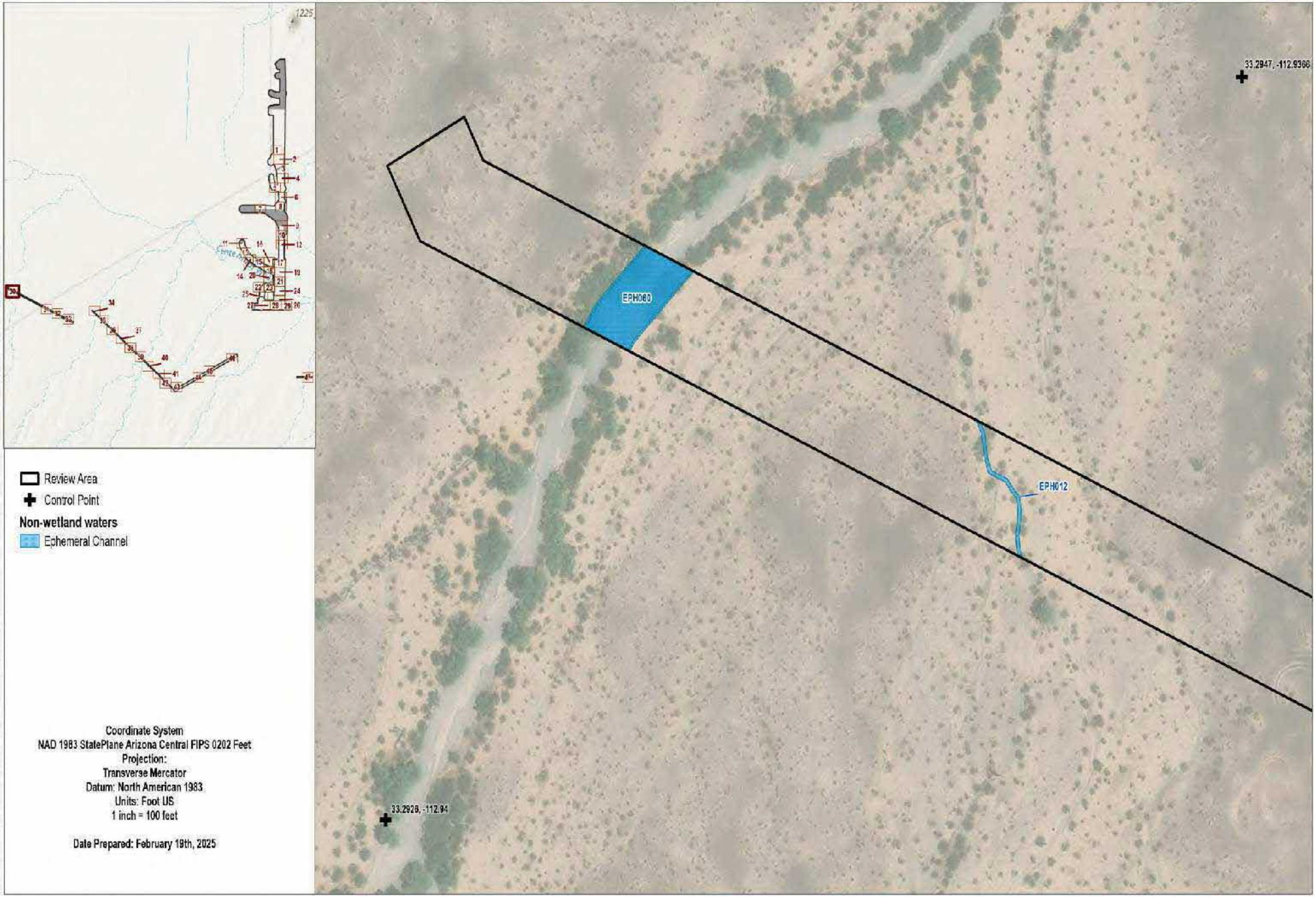
DUDEK

0 50 100 Feet

FIGURE 6-29

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

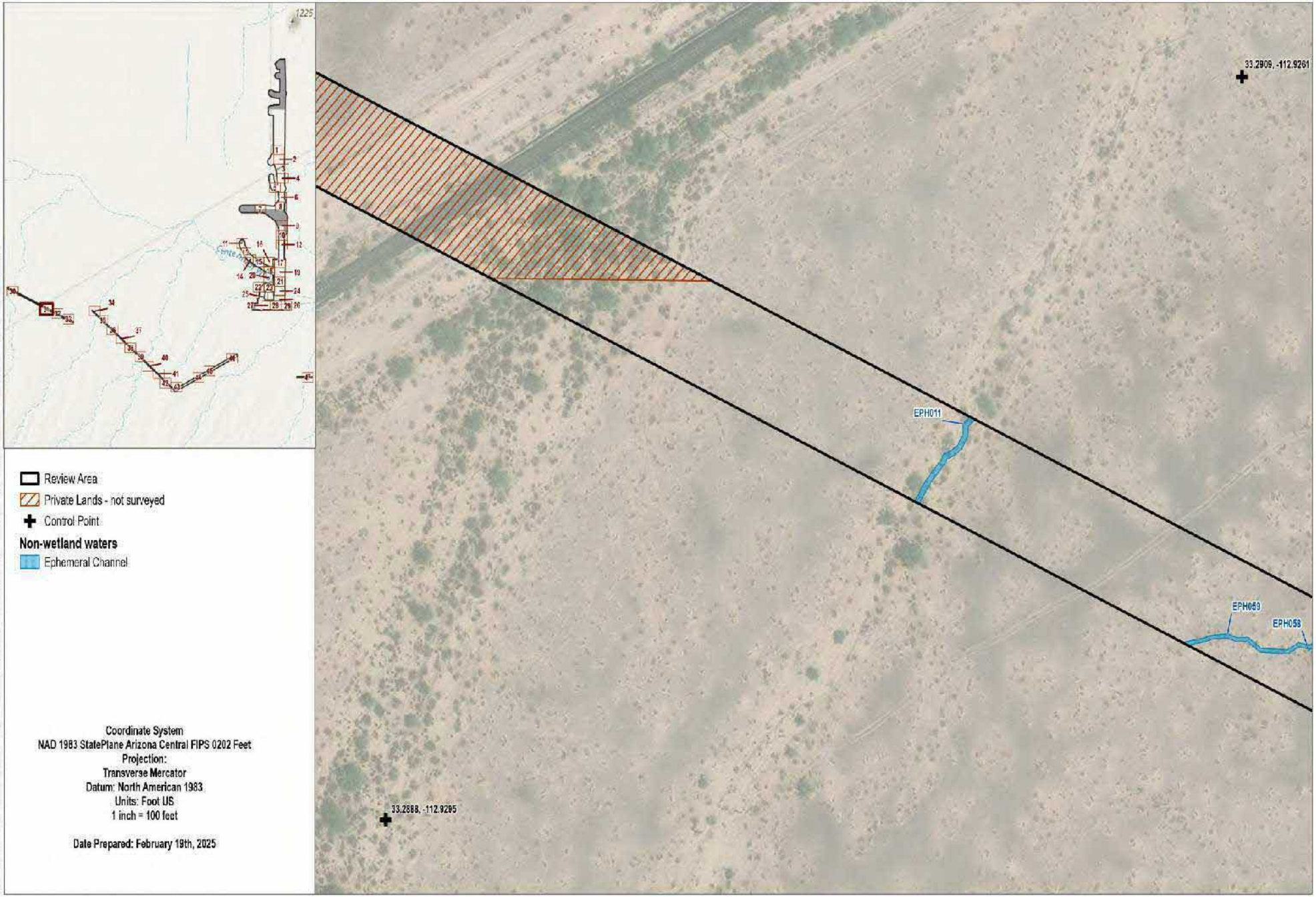
DUDEK

0 50 100 Feet

FIGURE 6-30

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

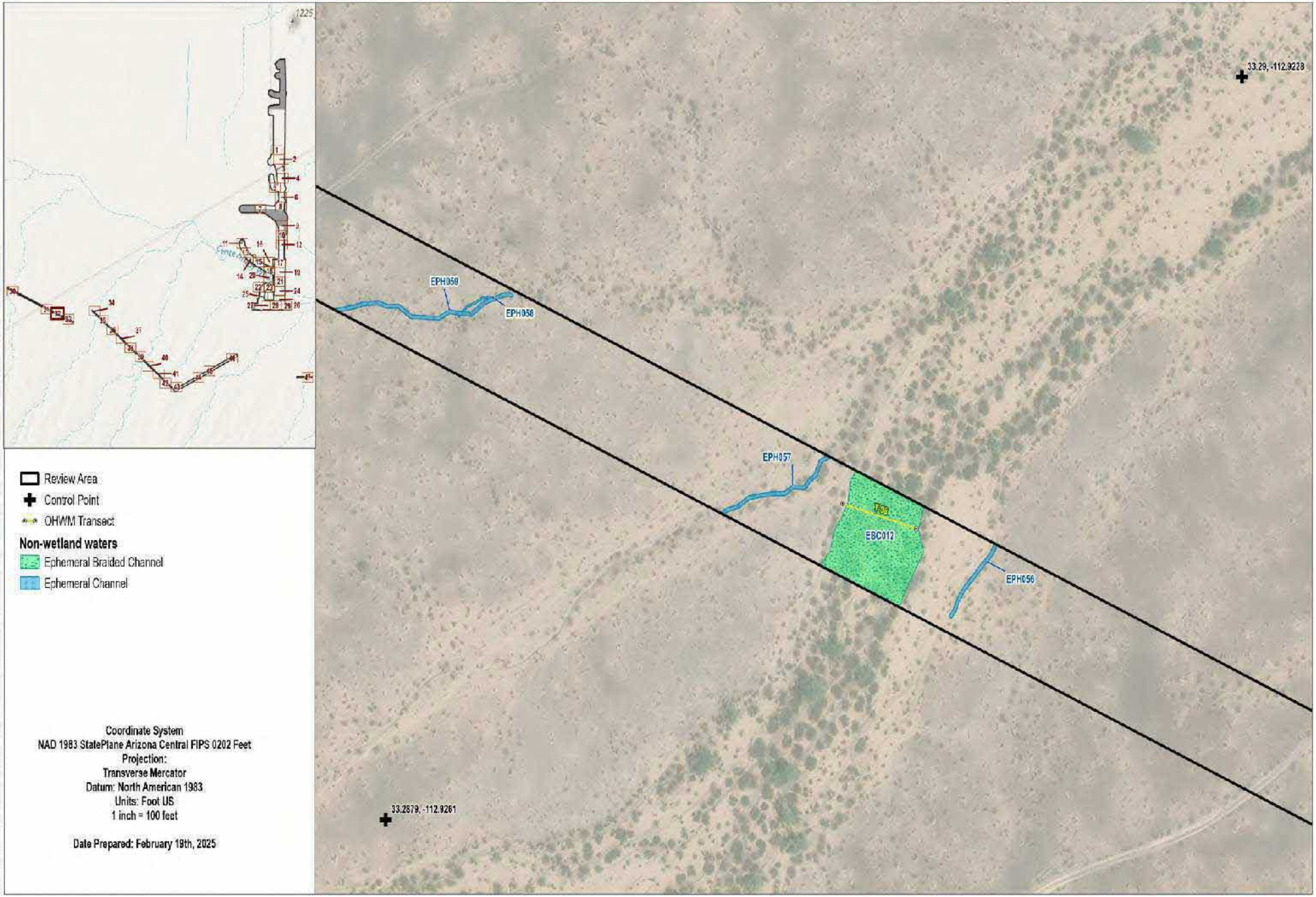
DUDEK

0 50 100 Feet

FIGURE 6-31

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

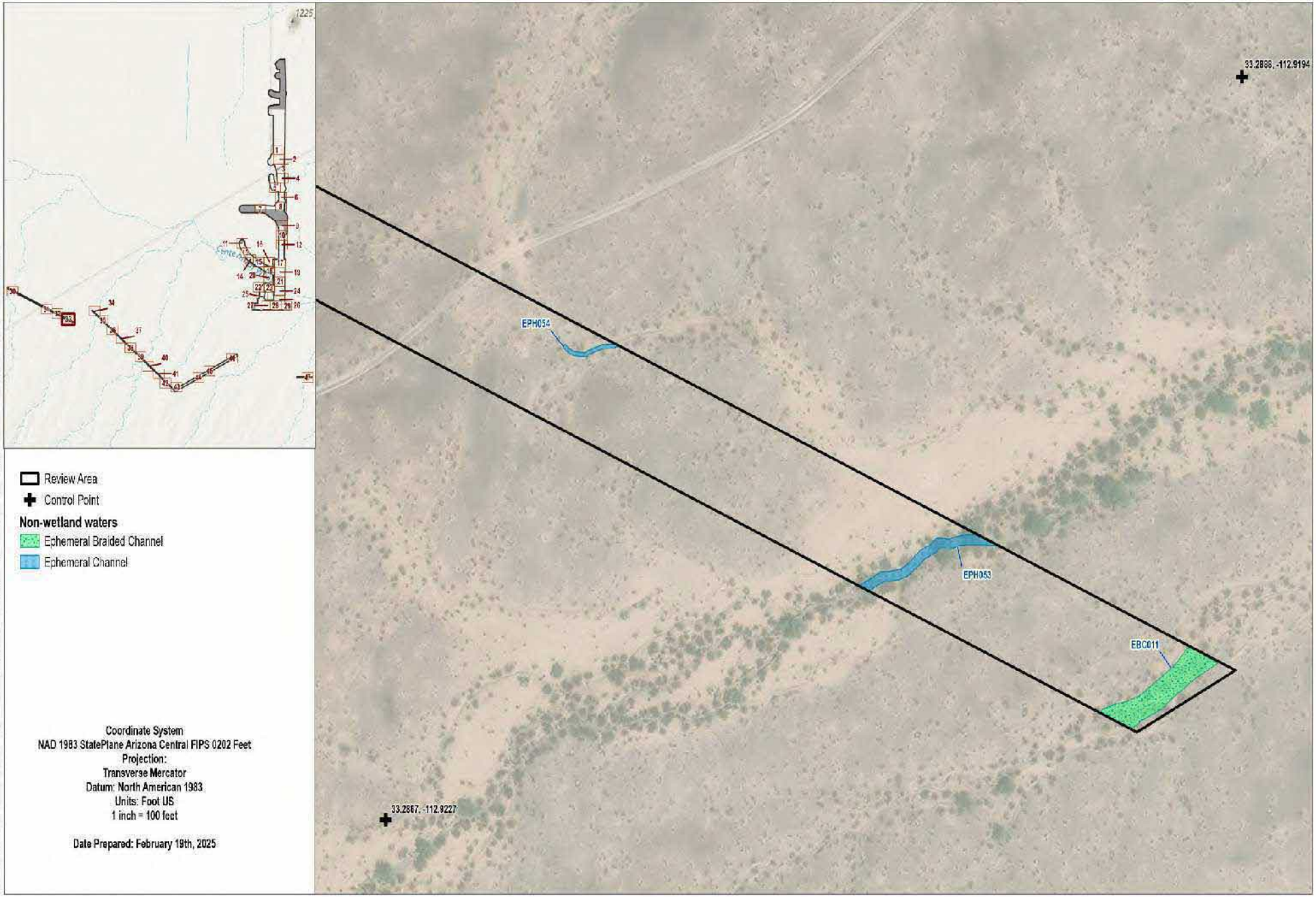
DUDEK

0 50 100 Feet

FIGURE 6-32

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

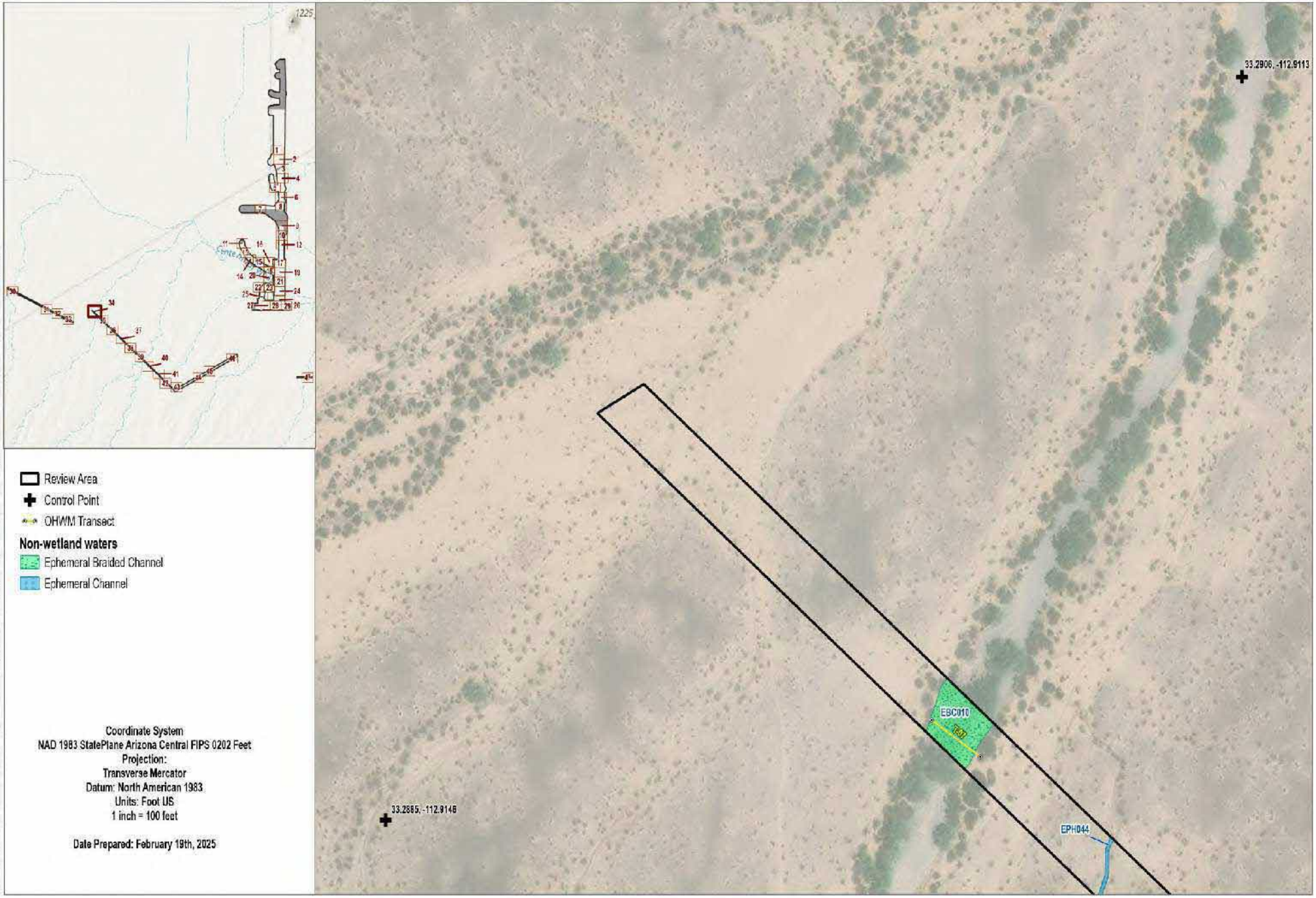
DUDEK

0 50 100 Feet

FIGURE 6-33

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

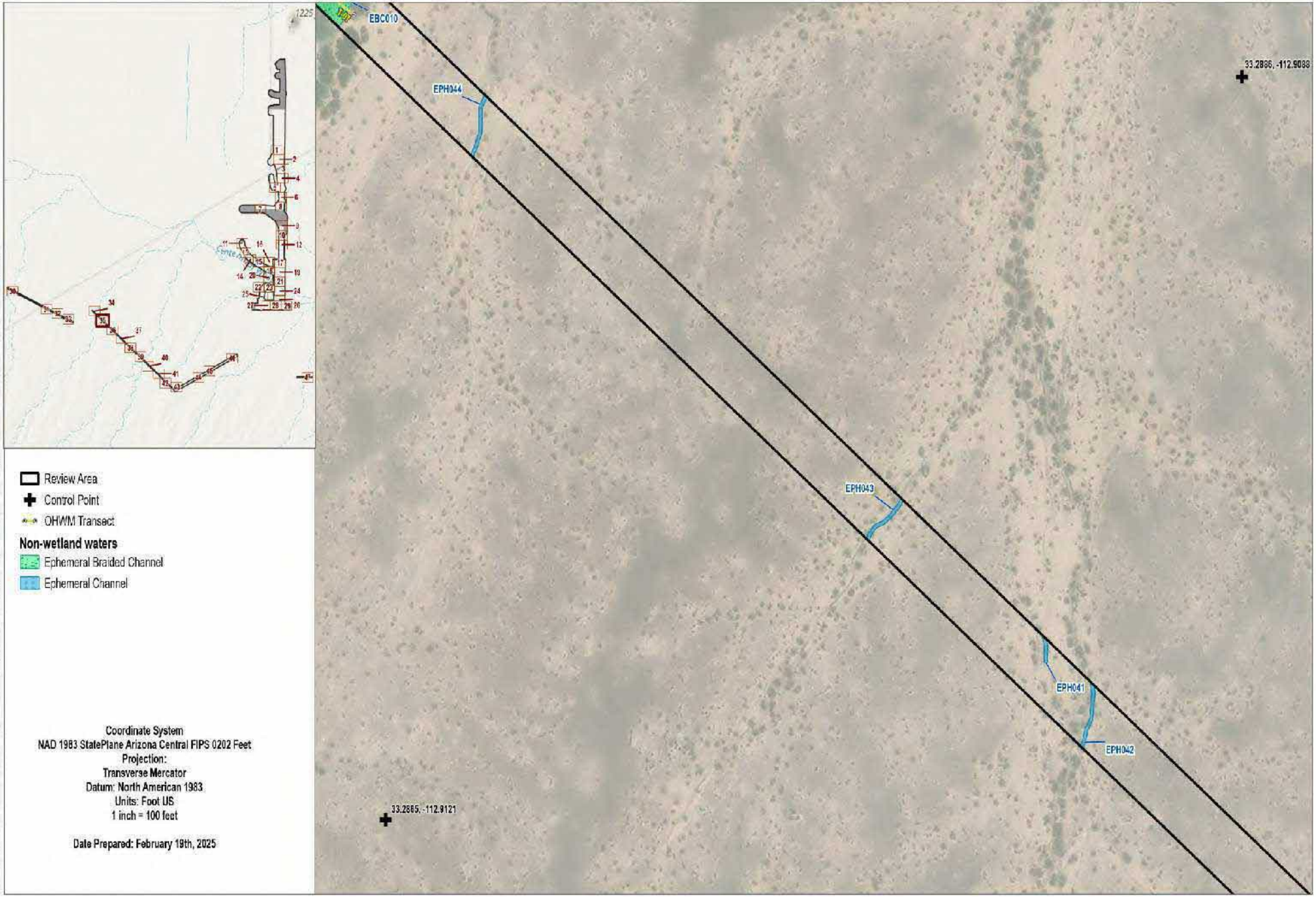
DUDEK

0 50 100 Feet

FIGURE 6-34

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

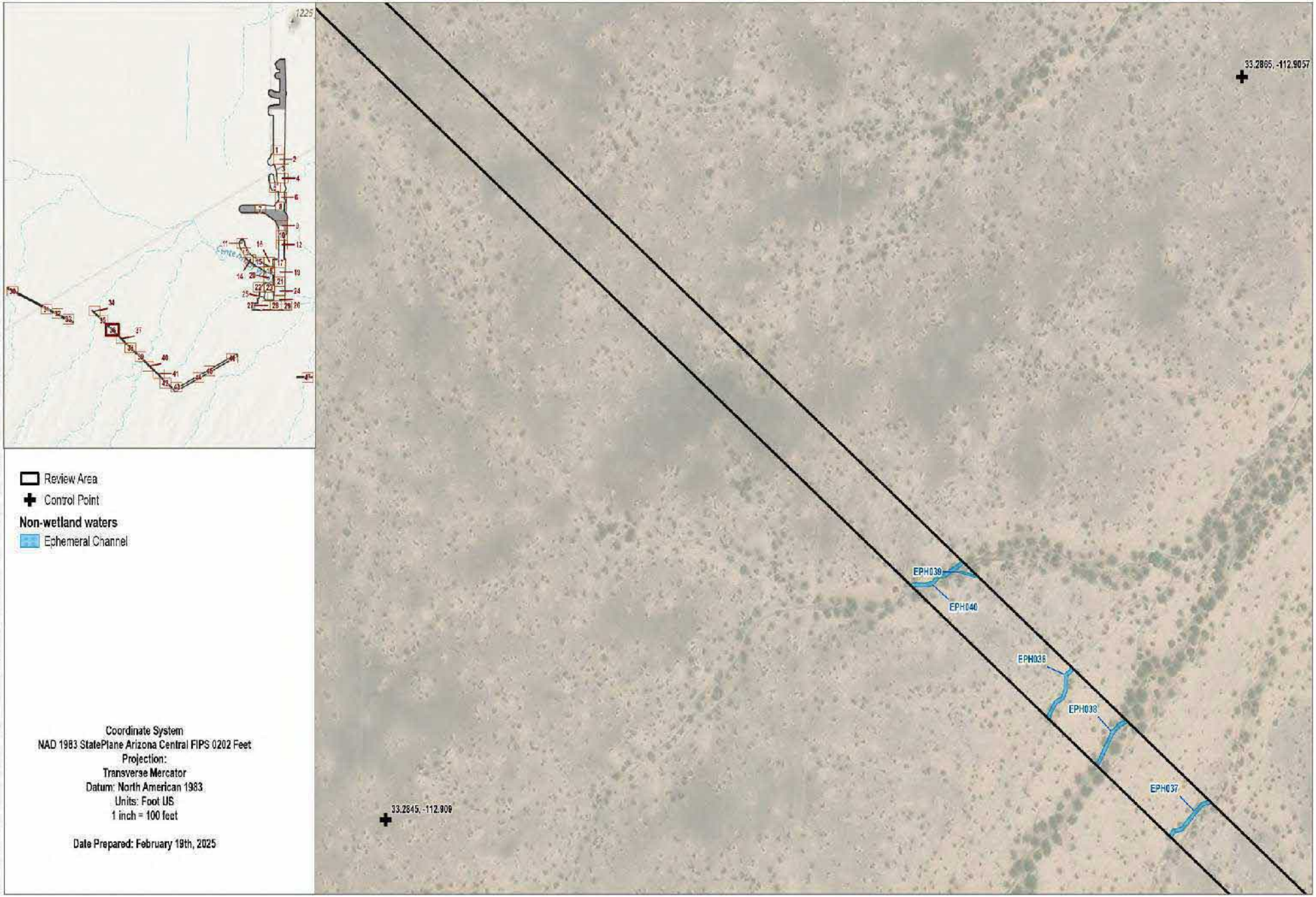
DUDEK

0 50 100 Feet

FIGURE 6-35

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

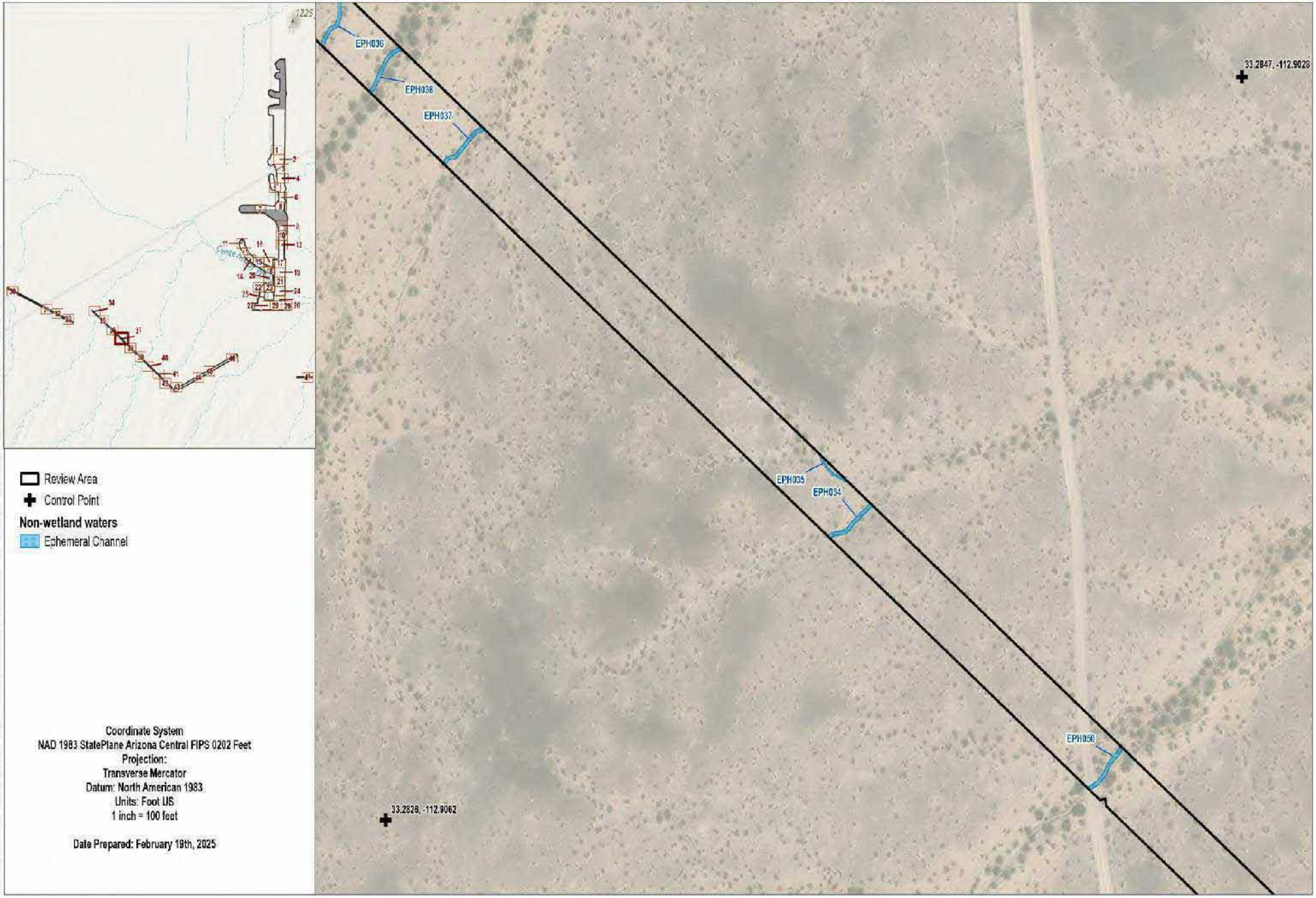
DUDEK

0 50 100 Feet

FIGURE 6-36

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

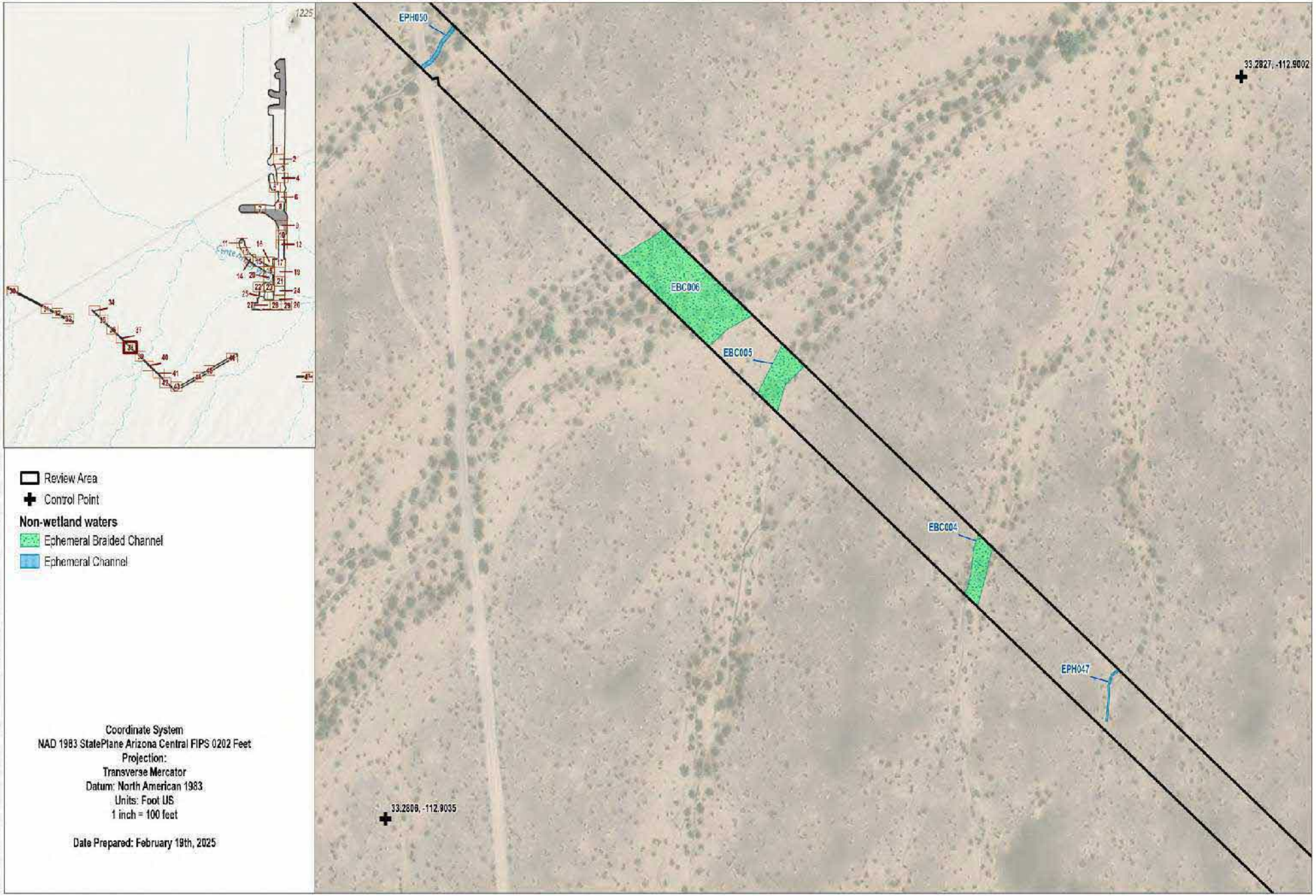
DUDEK

0 50 100 Feet

FIGURE 6-37

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

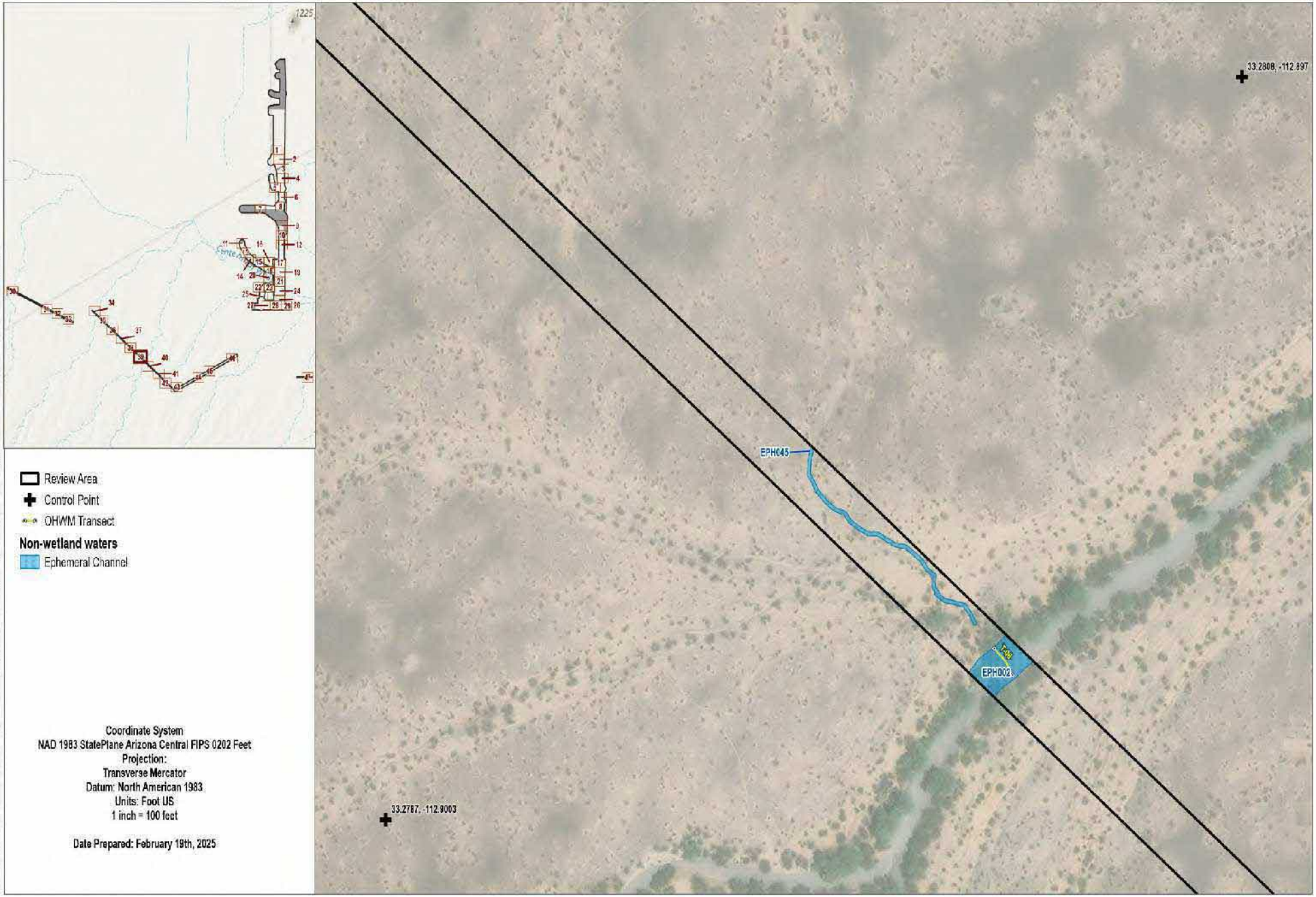
DUDEK

0 50 100 Feet

FIGURE 6-38

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

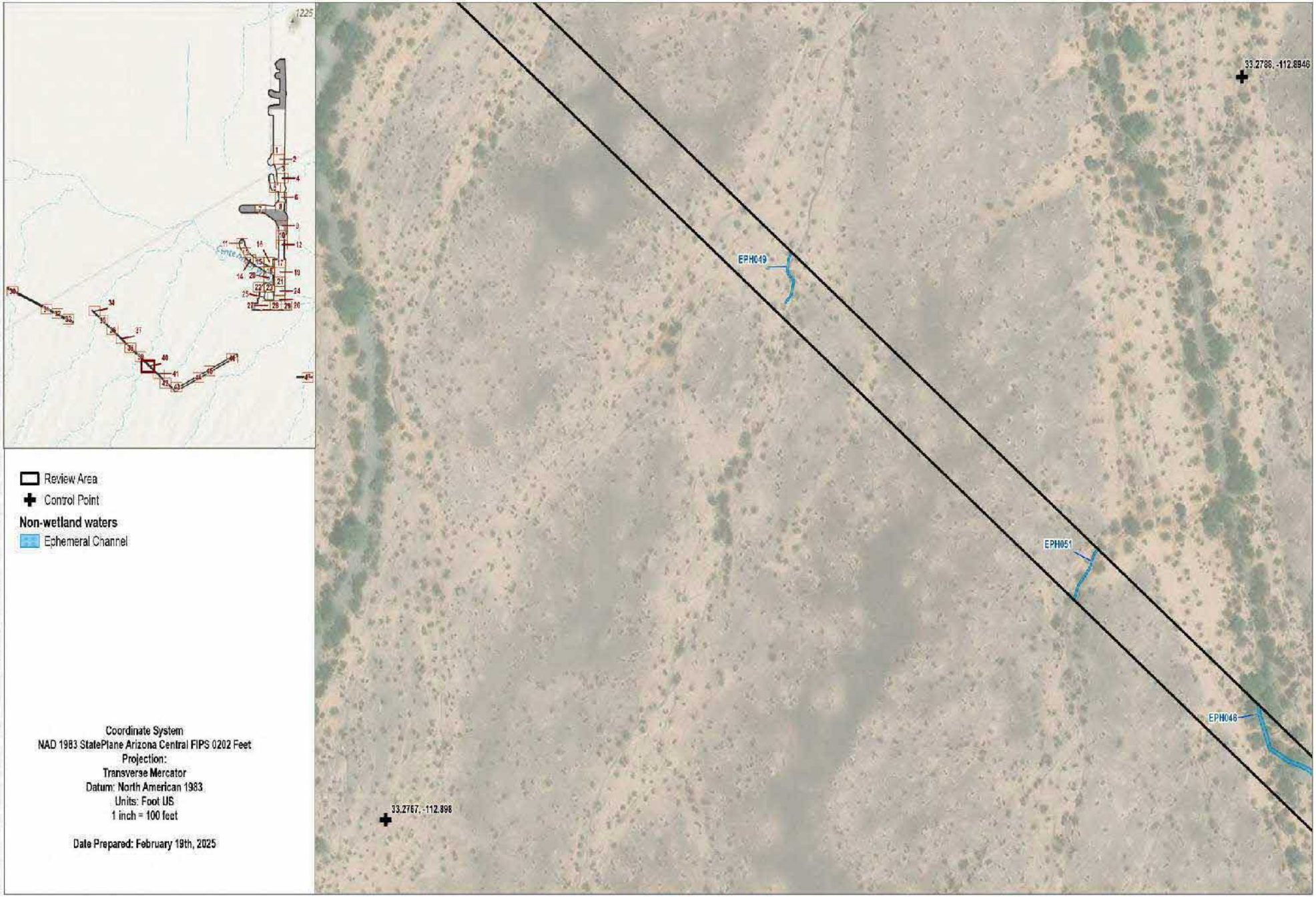
DUDEK

0 50 100 Feet

FIGURE 6-39

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

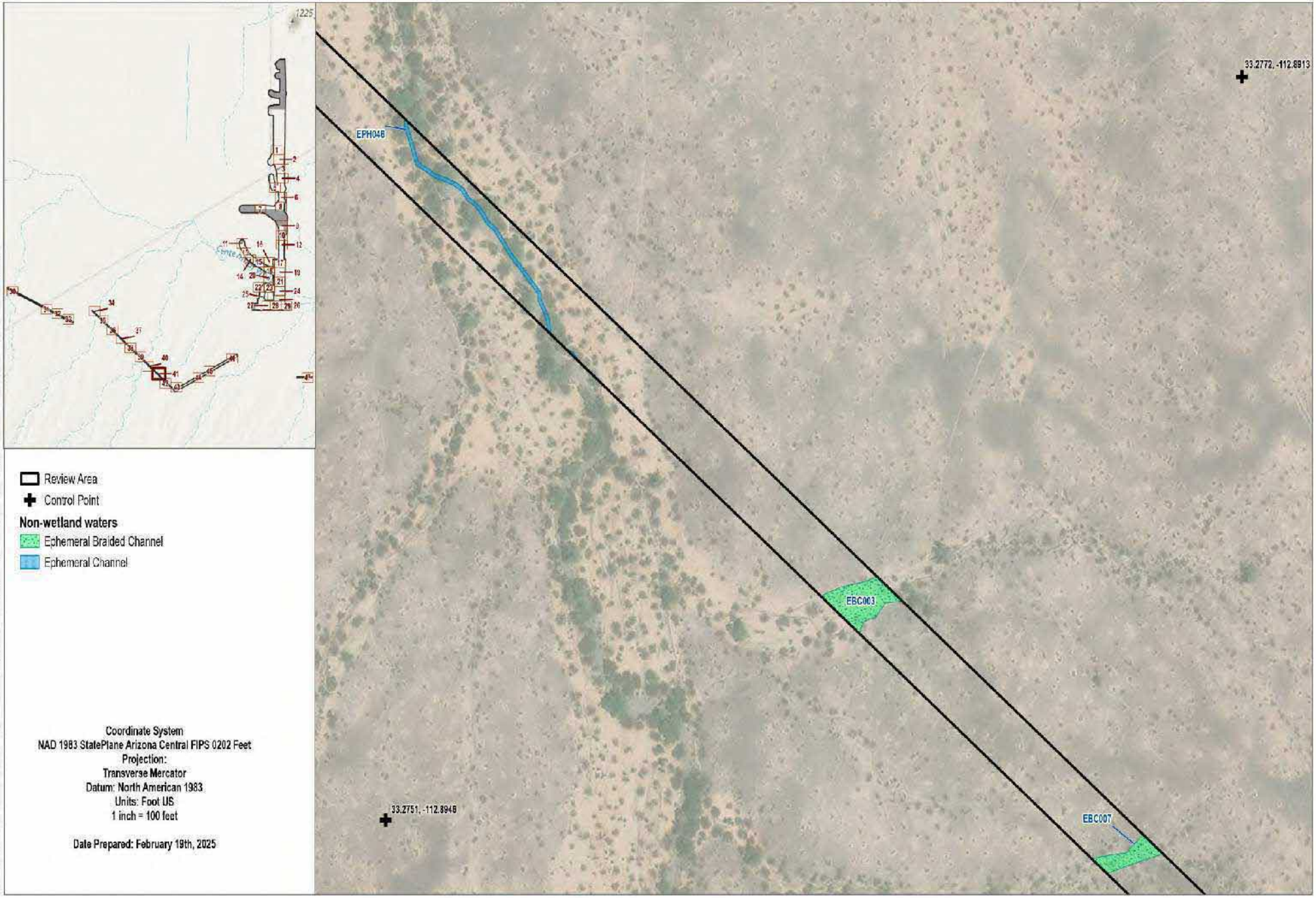
DUDEK

0 50 100 Feet

FIGURE 6-40

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

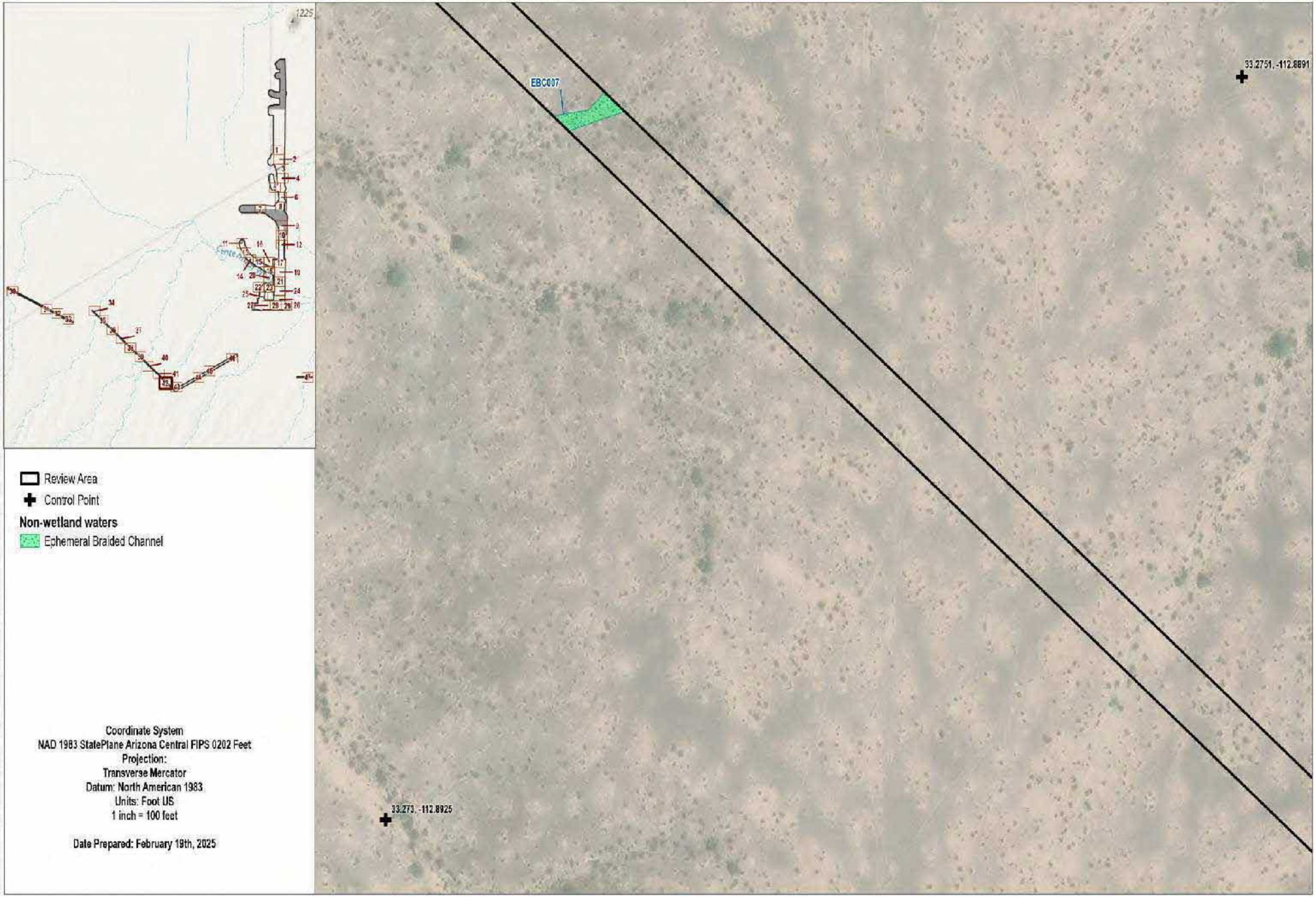
DUDEK

0 50 100 Feet

FIGURE 6-41

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

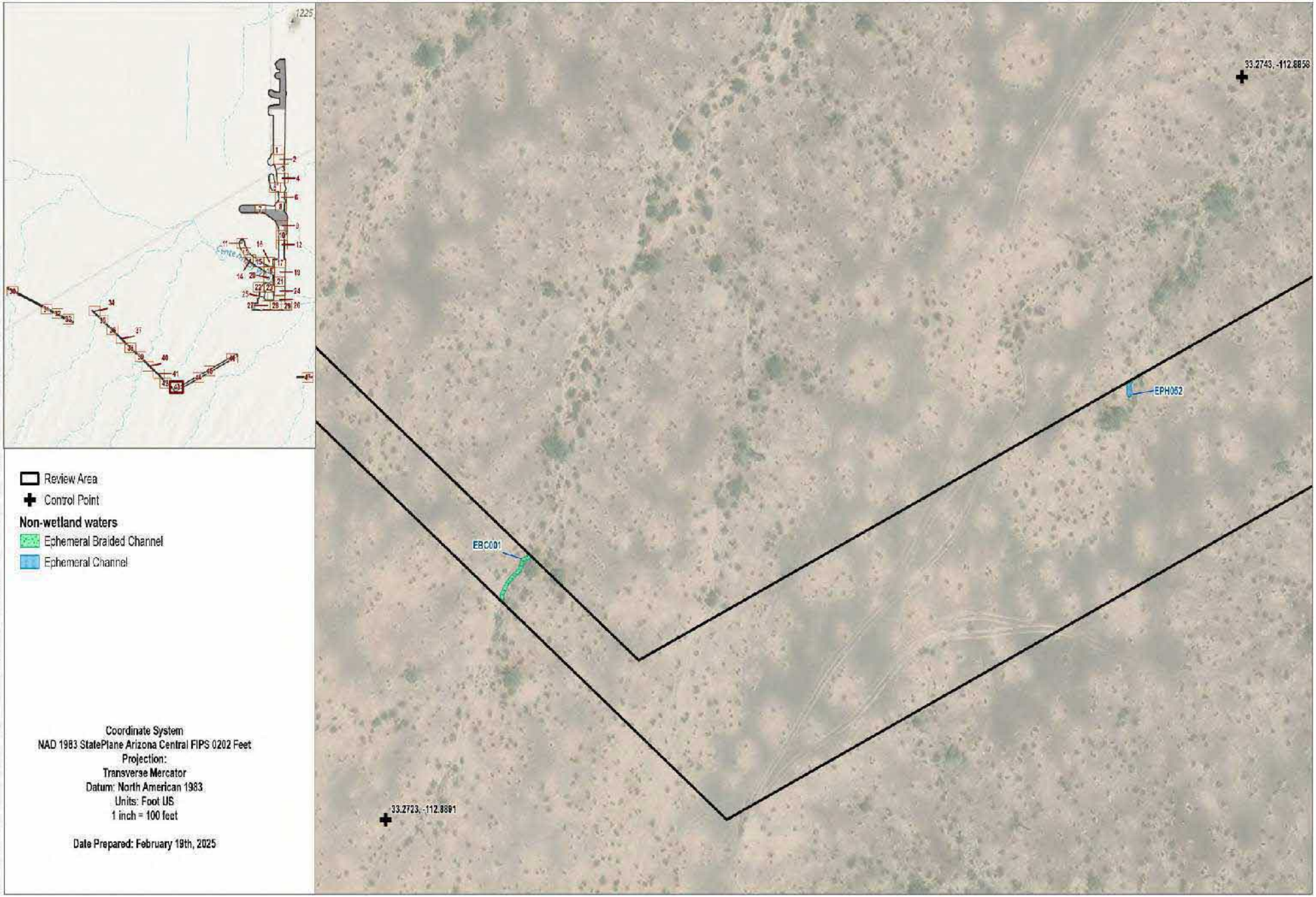
DUDEK

0 50 100 Feet

FIGURE 6-42

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

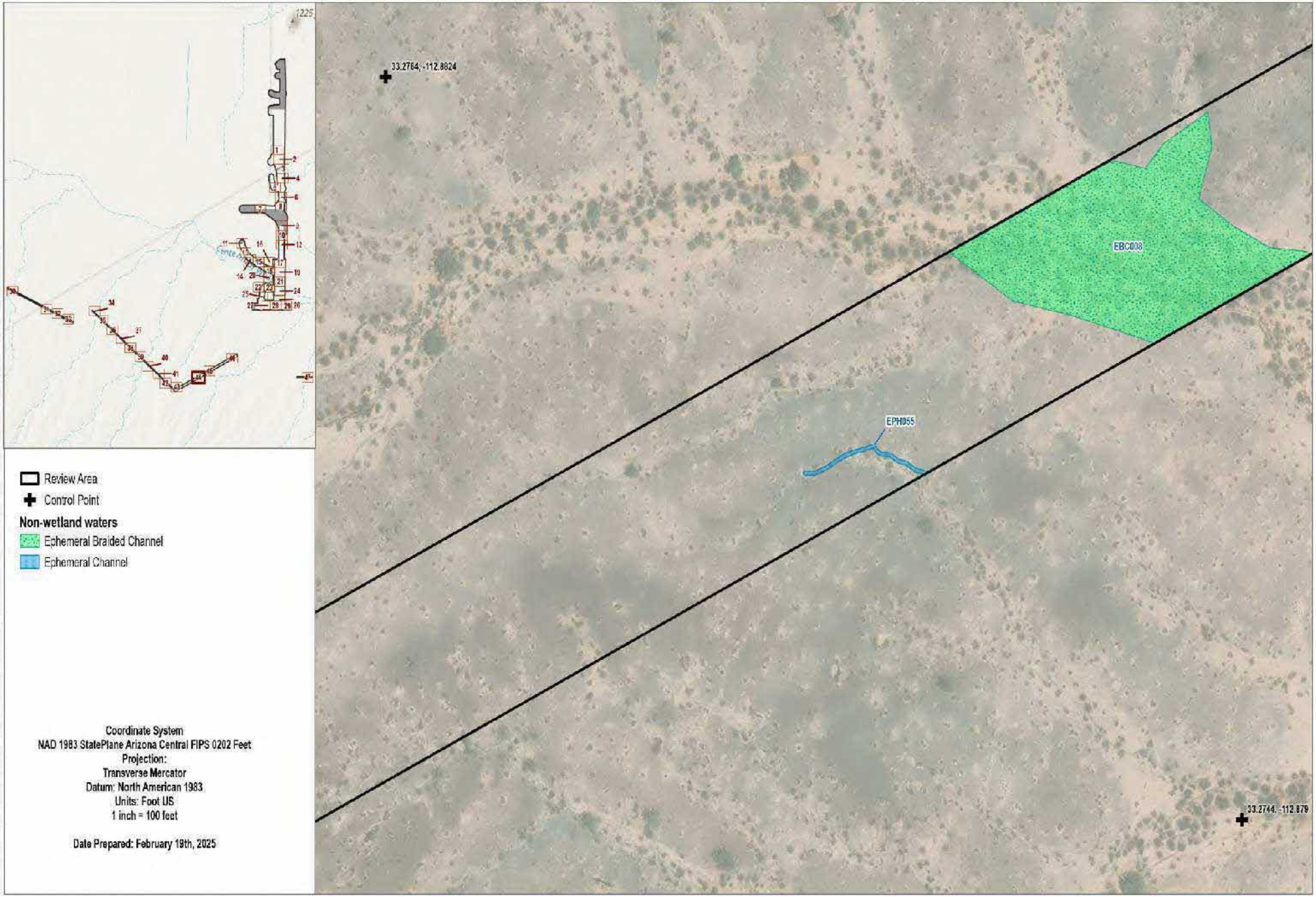
DUDEK

0 50 100 Feet

FIGURE 6-43

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

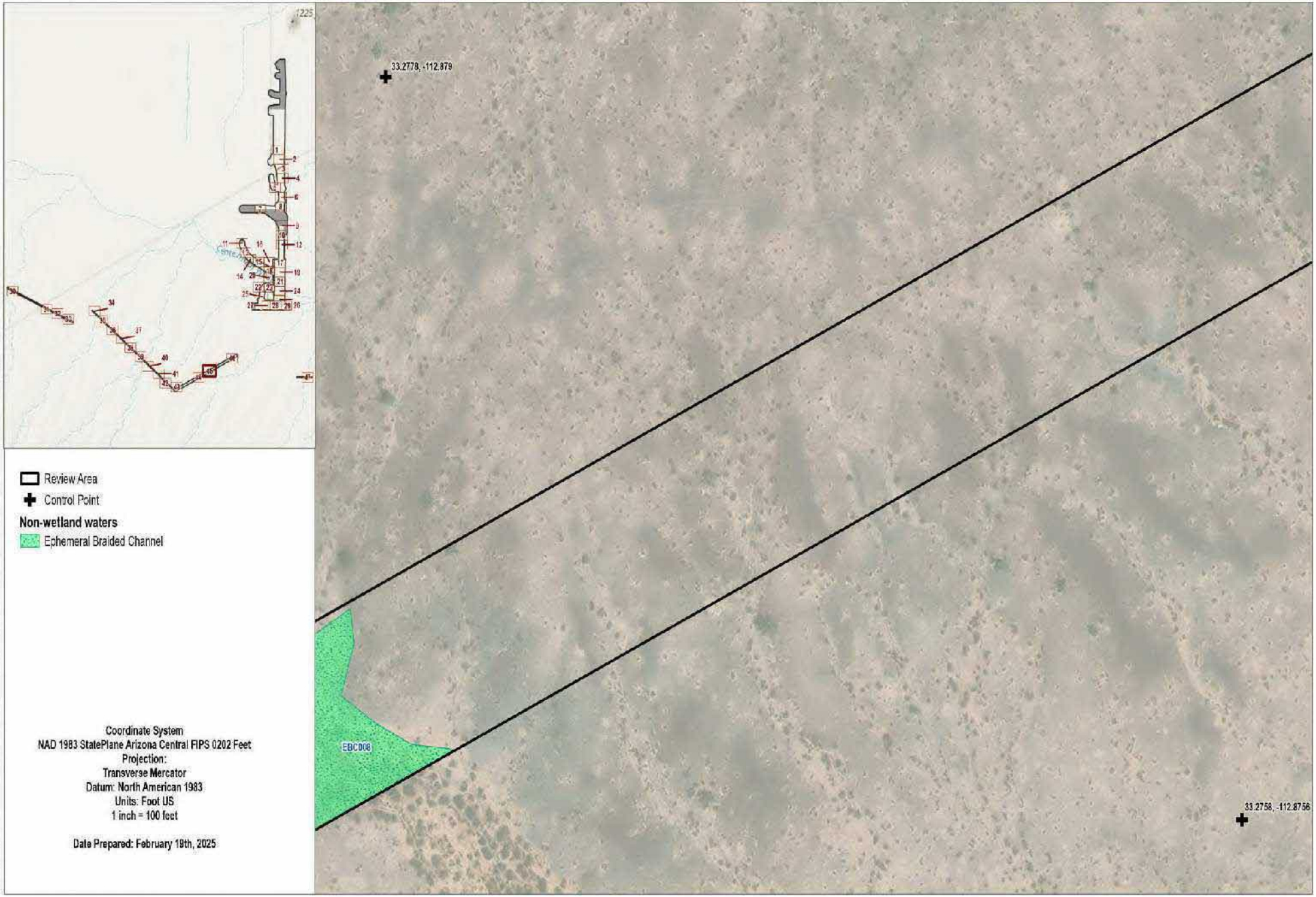
DUDEK

0 50 100 Feet

FIGURE 6-44

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023

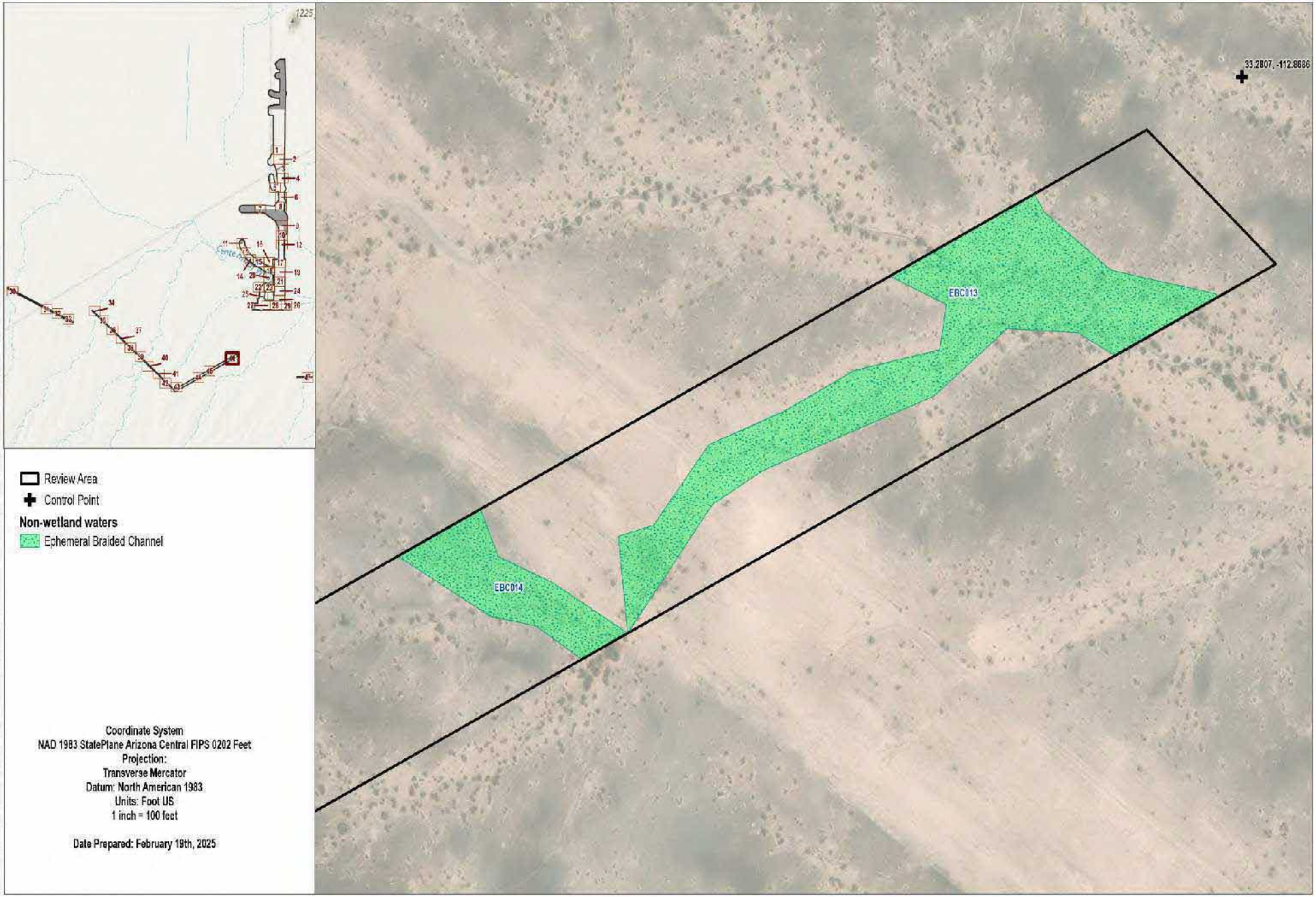
DUDEK

0 50 100 Feet

FIGURE 6-45

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

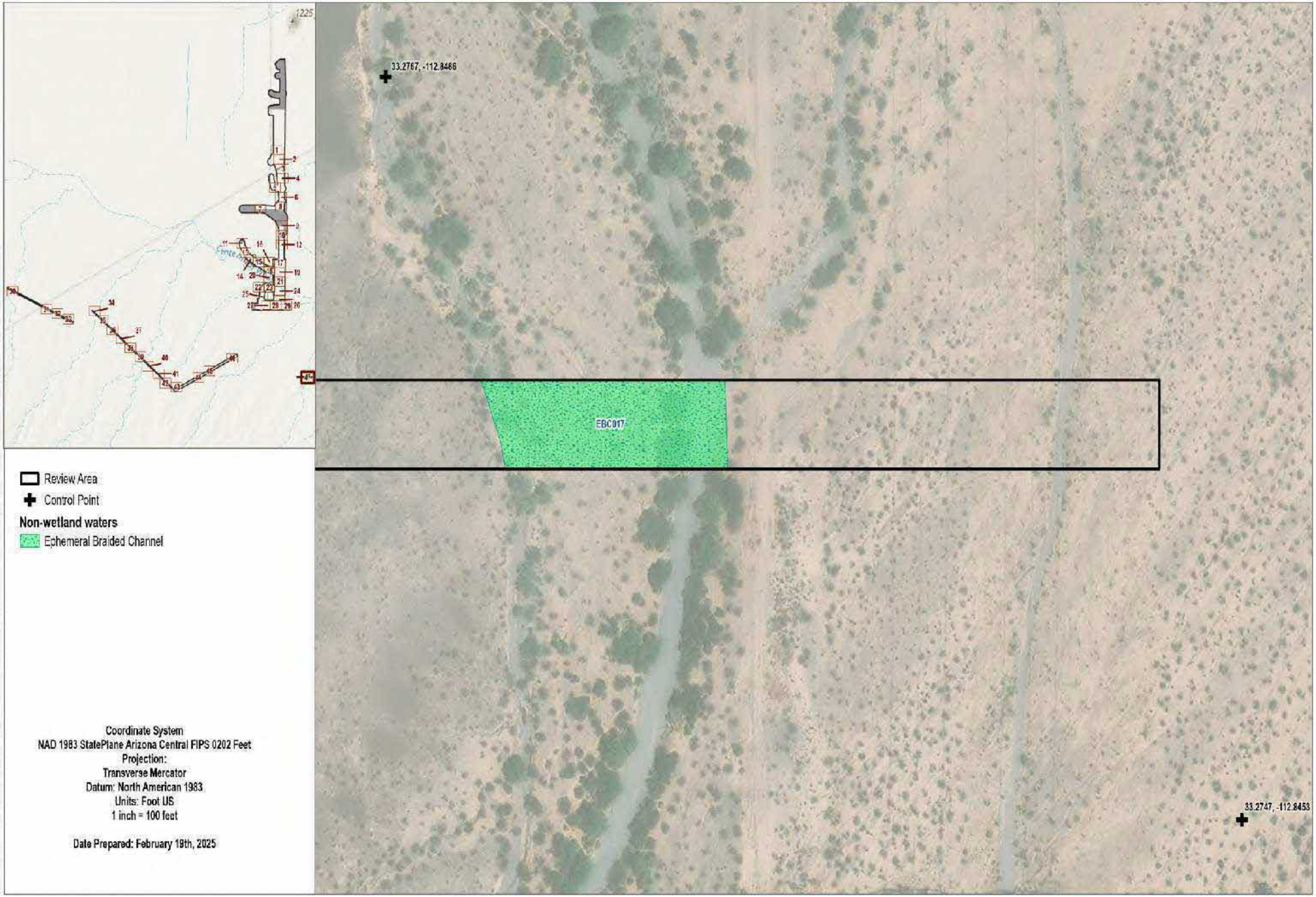
DUDEK

0 50 100 Feet

FIGURE 6-46

Aquatic Resources

Vulcan Solar Project



SOURCE: Bing Maps 2023;

DUDEK

0 50 100 Feet

FIGURE 6-47

Aquatic Resources

Vulcan Solar Project

Appendix B
Representative Photos

Photo 1. Sonora–Mojave creosotebush–white bursage desert scrub in the northern gen-tie survey area.

Photo 2. Sonoran paloverde–mixed cacti desert scrub in the northern gen-tie survey area

Photo 3. Agricultural land in the gen-tie survey area, showing recently tilled fields.

Photo 4. North American warm-desert xeric–riparian scrub in the MV line corridor.

Photo 5. Intermittent channel (INT-001, Centennial Wash) in the southern gen-tie survey area.

Photo 6. Moss present along INT-001 bank (Centennial Wash, southern gen-tie survey area).

Photo 7. Concrete drainage ditches bordering agrictural lands, showing multiple areas with shallow standing water.

Photo 8. Earthen drainage ditch (DD-002) showing saturated soils, bordering Arizona State Trust Land and private lands in the central gen-tie survey area.

Photo 9. Upland boundary of sampled area within the central gen-tie survey area.

Photo 10. Herbaceous understory within sampled area.

Photo 11. Hydrological indicator cracked soil within sampled area.

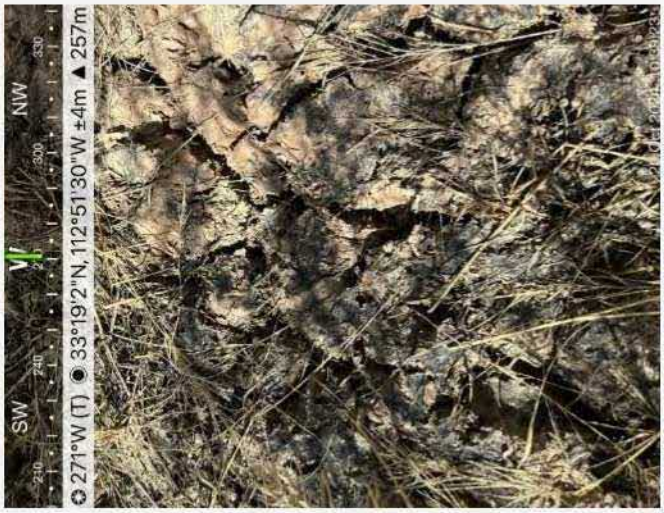


Photo 12. Hydrological indicator biotic crust within sampled area.

Photo 13. Sample pit location.

Photo 14. Sample pit soil profile; red parent material containing redox concentrations; (F8) hydric soil indicator.

Photo 15. Wetland pit soil profile; red parent material containing redox concentrations; (F8) hydric soil indicator.

Photo 16. Representative photo of ephemeral braided channel (EBC-015) in the southern gen-tie survey area.

Photo 17. Ephemeral channel (EPH-019) in the southern gen-tie survey area.

Photo 18. Ephemeral channel (EPH-003) in the northern portion of the gen-tie survey area, exhibiting a change in vegetation.

Photo 19. Large ephemeral erosional overflow channel (EPH) that changes course with flooding events; on the western gen-tie survey area boundary.

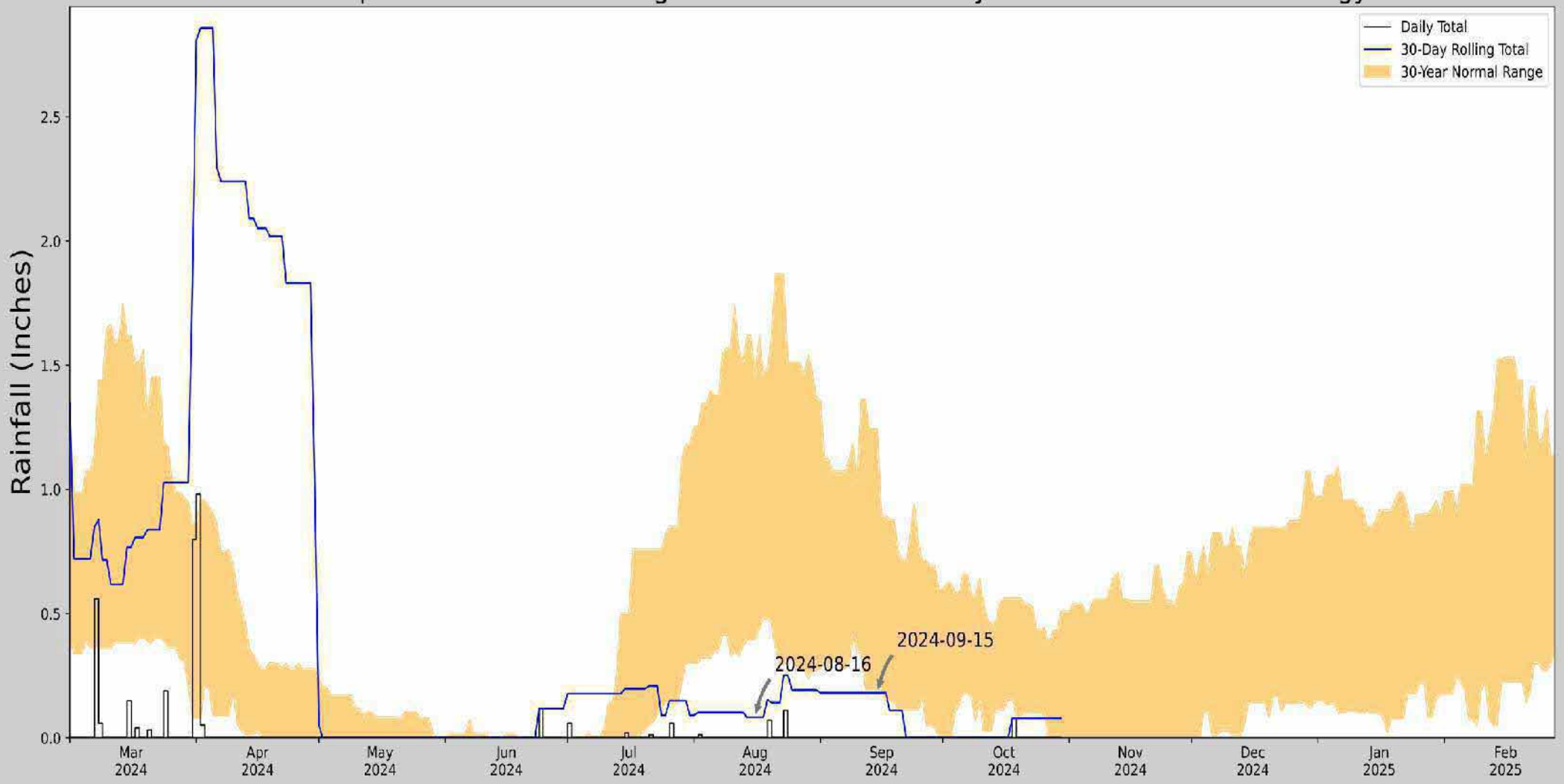
Photo 20. Large ephemeral feature (EPH-060) in the western MV line corridor.

Photo 21. North American warm desert pavement in the review area.

Appendix C

Antecedent Precipitation Tool Outputs

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	33.31286858, -112.8576032
Observation Date	2024-10-15
Elevation (ft)	837.759
Drought Index (PDSI)	Mild drought (2024-09)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-10-15	0.112205	0.543307	0.0	Dry	1	3	3
2024-09-15	0.195669	1.242913	0.181102	Dry	1	2	2
2024-08-16	0.395669	1.466142	0.082677	Dry	1	1	1
Result							Drier than Normal - 6

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TOLLESON 1 E	33.4519, -112.2433	1024.934	36.72	187.175	23.397	10141	76
TOLLESON 2.4 SSW	33.4174, -112.2622	980.971	2.621	43.963	1.295	75	0
PHOENIX 7.1 WNW	33.4692, -112.1932	1068.898	3.125	43.964	1.544	44	0
TOLLESON 3.1 SSW	33.4086, -112.2708	983.924	3.386	41.01	1.663	248	0
AVONDALE 3.8 NE	33.4743, -112.3017	1011.155	3.705	13.779	1.718	621	0
PHOENIX 6.7 WSW	33.4094, -112.181	1013.123	4.64	11.811	2.143	17	0
LITCHFIELD PARK 1.3 E	33.5047, -112.3367	1041.011	6.502	16.077	3.03	27	0
LITCHFIELD PARK 1.1 E	33.5041, -112.3399	1039.042	6.633	14.108	3.078	38	14
LITCHFIELD PARK	33.4992, -112.3631	1040.026	7.639	15.092	3.553	112	0
YOUNGTOWN	33.5944, -112.3006	1134.843	10.384	109.909	5.814	30	0

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Appendix D

Observed Plant Species Compendium

Vascular Species

Eudicots

ASTERACEAE – SUNFLOWER FAMILY

Ambrosia dumosa – white bursage (UPL)
Encelia farinosa – brittle bush (UPL)
Geraea canescens – hairy desert sunflower (UPL)
Isocoma acradenia – alkali goldenbush (FACU)
* *Oncosiphon pilulifer* – stinknet (FACU)
Pluchea sericea – arrow weed (FACW)

BORAGINACEAE – BORAGE FAMILY

Cryptantha sp. – popcorn flowers (FACU)

BRASSICACEAE – MUSTARD FAMILY

* *Lepidium latifolium* – perennial pepper weed (FAC)

CACTACEAE – CACTUS FAMILY

Carnegiea gigantea – saguaro (UPL)
Cylindropuntia acanthocarpa – buckhorn cholla (UPL)
Cylindropuntia echinocarpa – silver cholla (UPL)
Cylindropuntia leptocaulis – desert Christmas cholla (UPL)
Cylindropuntia ramosissima – branched pencil cholla (UPL)
Echinocereus engelmannii – Engelmann's hedgehog cactus (UPL)

CHENOPODIACEAE – GOOSEFOOT FAMILY

Atriplex canescens – fourwing saltbush (UPL)
Atriplex polycarpa – allscale (UPL)
* *Salsola tragus* – prickly Russian thistle (FACU)

FABACEAE – LEGUME FAMILY

Astragalus sp. – milkvetch (FAC)
Neltuna velutina – velvet mesquite (UPL)
Parkinsonia florida – blue palo verde (UPL)
Parkinsonia microphylla – foothill palo verde (UPL)
Senegalia greggii – catclaw acacia (FACU)

KRAMERIACEAE – RHATANY FAMILY

Krameria erecta – littleleaf ratany (UPL)

MALVACEAE – MALLOW FAMILY

Sphaeralcea ambigua – desert globemallow (UPL)

OROBANCHACEAE – BROOM-RAPE FAMILY

Aphyllon cooperi – desert broomrape (UPL)

PLANTAGINACEAE – PLANTAIN FAMILY

Plantago ovata – desert Indianwheat (FACU)

PAPAVERACEAE – POPPY FAMILY

Argemone pleiacantha – southwestern prickly poppy (UPL)

POLYGONACEAE – BUCKWHEAT FAMILY

Chorizanthe rigida – rigid spineflower (UPL)

Eriogonum inflatum – desert trumpet (UPL)

RHAMNACEAE – BUCKTHORN FAMILY

Ziziphus obtusifolia – graythorn (UPL)

SIMAROUBACEAE – QUASSIA OR SIMAROUBA FAMILY

Castela emoryi – Emory's crucifixion-thorn (UPL)

ZYGOPHYLLACEAE – CALTROP FAMILY

Larrea tridentata – creosote bush (UPL)

Monocots

POACEAE – GRASS FAMILY

* *Bromus rubens* – red brome (UPL)

* *Cynodon dactylon* – Bermudagrass (FACU)

Dasyochloa pulchella – low woollygrass (UPL)

Distichlis spicata – salt grass (FAC)

* *Echinochloa colona* – jungle rice (FAC)

Hilaria rigida – big galleta grass (UPL)

Leptochloa dubia – green sprangletop (UPL)

* *Phalaris aquatica* – harding grass (FACU)

* *Polypogon monspeliensis* – annual rabbitsfoot grass (FACW)

* *Schismus barbatus* – common Mediterranean grass (UPL)

* Signifies introduced (non-native) species.

Arid West Indicator Status Key

FAC – Facultative: Equally likely to occur in wetlands and non-wetlands
FACU – Facultative Upland: Usually occur in non-wetlands but occasionally found in wetlands
FACW - Facultative Wetland: Usually occur in wetlands but occasionally found in non-wetlands
UPL – Upland: Occur in wetlands in another region but occur almost always under natural conditions in non-wetlands in the region specified.

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Appendix E
Datasheets

OHWM DATA SHEET

Project: Vulcan Date: 10/15/2024 Transect: T-01

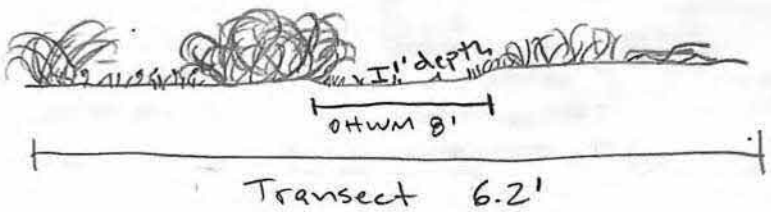
Investigator(s): Allison Johnson Feature Name: EPH-003

Site Location:
Geotic survey area, North parcel (ASLD)

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

View Facing: N



☐ Transect length
☒ OHWM width
☐ Channel depth
☒ Photo

Break in Slope at OHWM: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☒ Gentle (<30°)

☒ Natural line impressed on the bank	☒ Sediment sorting
☐ Shelving	☐ Leaf litter disturbed or washed away
☐ Changes in the character of soil	☐ Scour
☐ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☐ Water staining
☒ Vegetation matted down, bent, or absent	☐ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	80	10	8	2	–
Below OHWM	30	65	5	–	–

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	–	10	15	75
Below OHWM	–	–	2	98

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☒ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Larrea tridentata Atriplex polycarpa Schismus barbatus Oncosiphon piluliferum Plantago ovata	Schismus barbatus Oncosiphon piluliferum Atriplex polycarpa Larrea tridentata	Schismus barbatus

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
Cattle tracks/grazing sign throughout area, disturbed

Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☑ Dry

Avg. depth:
Min. depth:
Temp:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

Project: Vulcan Date: 10/15/2024 Transect: T-02

Investigator(s): Allison Johnson Feature Name: DD-004

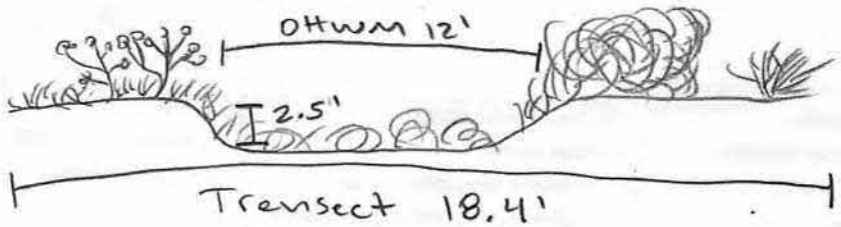
Site Location:

hen-tie survey area, central AG area

Feature Type: ☐ Ephemeral ☐ Intermittent ☐ Perennial ☒ Other

Transect (cross-section) drawing(s):

View Facing: NE



☒ Transect length
☒ OHWM width
☒ Channel depth
☒ Photo

Break in Slope at OHWM: ☐ Sharp (>60°) ☒ Moderate (30-60°) ☐ Gentle (<30°)

☐ Natural line impressed on the bank	☐ Sediment sorting
☒ Shelving	☐ Leaf litter disturbed or washed away
☒ Changes in the character of soil	☒ Scour
☐ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☐ Water staining
☒ Vegetation matted down, bent, or absent	☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	85	5	8	2	—
Below OHWM	70	26	4	—	—

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	—	20	5	75
Below OHWM	—	35	10	55

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☒ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
- Chrysothamnus viscidiflorus - Salsola tragus - Atriplex polycarpa - Prosopis velutina	- Chrysothamnus viscidiflorus - Atriplex polycarpa	- Schismus barbatus - Chrysothamnus viscidiflorus

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
Drainage ditch adjacent to AG field, disturbed soil w/ erosion along bank

Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:
Temp:
Min. depth:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

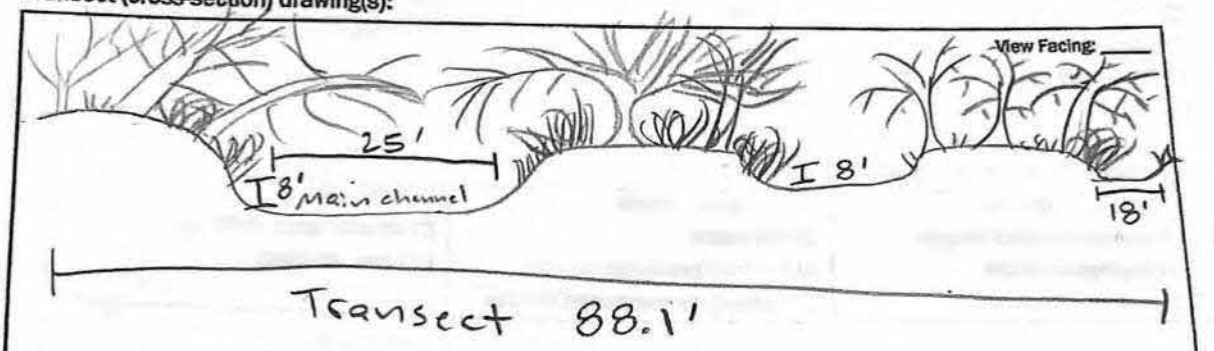
Project: Vulcan Date: 10/18/2024 Transect: T-03

Investigator(s): Allison Johnson Feature Name: BC-002 (Centennial Wash)

Site Location: hen-tic survey area, Southern parcel

Feature Type: ☐ Ephemeral ☒ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):



☒ Transect length - 88.1'
☒ OHWM width – 25'- 18'
☒ Channel depth - 8'
☒ Photo

Break in Slope at OHWM: ☒ Sharp (>60°) ☐ Moderate (30-60°) ☐ Gentle (<30°)

☒ Natural line impressed on the bank	☒ Sediment sorting
☒ Shelving	☒ Leaf litter disturbed or washed away
☐ Changes in the character of soil	☒ Scour
☒ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☒ Water staining
☒ Vegetation matted down, bent, or absent	☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	85	10	5	—	—
Below OHWM	5	90	5	—	—

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	45	15	5	35
Below OHWM	—	—	—	100

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☒ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	Emergent Species:
Prosopis velutina Larrea tridentata Senegalia greggii Schismus barbatus	Prosopis velutina Larrea tridentata Senegalia greggii Ziziphus obtusifolia	NA

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
moss along bank slope, game tracks along bank/bed, Centennial wash

Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:
Temp:
Min. depth:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☐ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

Project: Vulcan Date: 10/18/2024 Transect: T-04

Investigator(s): Allison Johnson Feature Name: BC-016

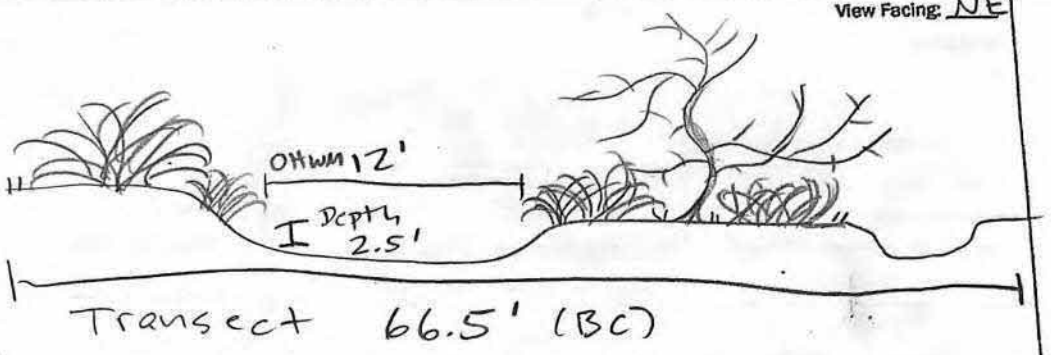
Site Location:

Gen-tie survey area South/West parcel

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

View Facing: NE



☒ Transect length
☒ OHWM width
☒ Channel depth
☒ Photo

Break in Slope at OHWM: ☐ Sharp (>60°) ☒ Moderate (30-60°) ☐ Gentle (<30°)

☒ Natural line impressed on the bank	☒ Sediment sorting
☒ Shelving	☐ Leaf litter disturbed or washed away
☒ Changes in the character of soil	☒ Scour
☐ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☐ Water staining
☒ Vegetation matted down, bent, or absent	☐ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	85	10	5	—	—
Below OHWM	70	30	—	—	—

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	2	31	2	65
Below OHWM	—	—	—	100

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☒ Late (herbs, shrubs, mature trees)

Upland Species:	Bank Species:	Emergent Species:
Larrea tridentata Atriplex canescens Prosopis Velutina Schismus barbatus	Larrea tridentata Atriplex canescens Prosopis velutina	NA

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
Cattle trails along upland, disturbed veg, Braided Channel

Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:
Temp:
Min. depth:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

- ☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
- ☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

Project: Vulcan Date: 10-16-2024 Transect: T-05

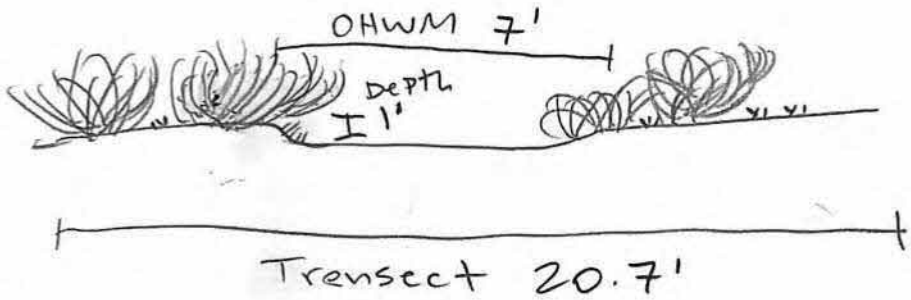
Investigator(s): Allison Johnson Feature Name: EPH-019

Site Location: Gen-tie survey area, southern parcel

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

View Facing: E



☒ Transect length
☒ OHWM width
☒ Channel depth
☒ Photo

Break in Slope at OHWM: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☒ Gentle (<30°)

☒ Natural line impressed on the bank	☒ Sediment sorting
☐ Shelving	☐ Leaf litter disturbed or washed away
☒ Changes in the character of soil	☒ Scour
☐ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☐ Water staining
☒ Vegetation matted down, bent, or absent	☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	80	15	5	—	—
Below OHWM	20	70	10	—	—

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	1	30	4	65
Below OHWM	—	—	—	100

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Larrea tridentata	Larrea tridentata	NIA
Ambrosia dumosa	Ambrosia dumosa	
Schismus barbatus	Atriplex Canescens	
Atriplex Canescens	Prosopis velutina	

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
Atriplex present only along bank, cattle tracks along upland

Hydrology:
- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:
Temp:
Min. depth:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

- ☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
- ☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

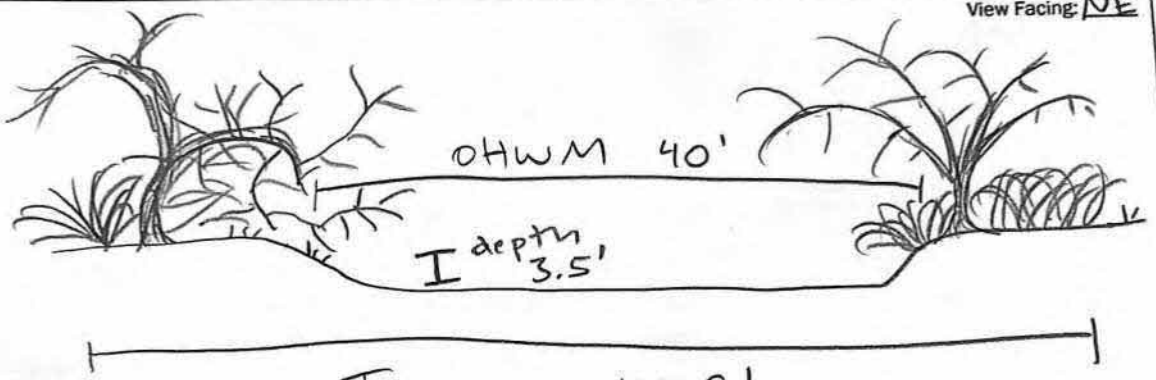
Project: Vulcan Date: 10/18/2024 Transect: T-06

Investigator(s): Allison Johnson, Kristen A Feature Name: EPH - 002

Site Location:
MV line corridor, East side of rail

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):



☒ Transect length
☒ OHWM width
☒ Channel depth
☒ Photo

Break in Slope at OHWM: ☐ Sharp (>60°) ☒ Moderate (30-60°) ☐ Gentle (<30°)

☒ Natural line impressed on the bank	☒ Sediment sorting
☒ Shelving	☐ Leaf litter disturbed or washed away
☐ Changes in the character of soil	☒ Scour
☐ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☒ Water staining
☒ Vegetation matted down, bent, or absent	☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	75	15	5	5	—
Below OHWM	—	80	15	5	—

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	25	15	5	55
Below OHWM	—	—	—	100

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Larrea tridentata Schismus barbatus	Larrea tridentata Parkinsonia florida Parkinsonia microphylla Schismus barbatus Encelia farinosa Senegelia greggii	N/A

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
Large wash, palo verde only along banks, cattle trails along upland and tracks within bed

Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:
Temp:
Min. depth:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

- ☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
- ☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

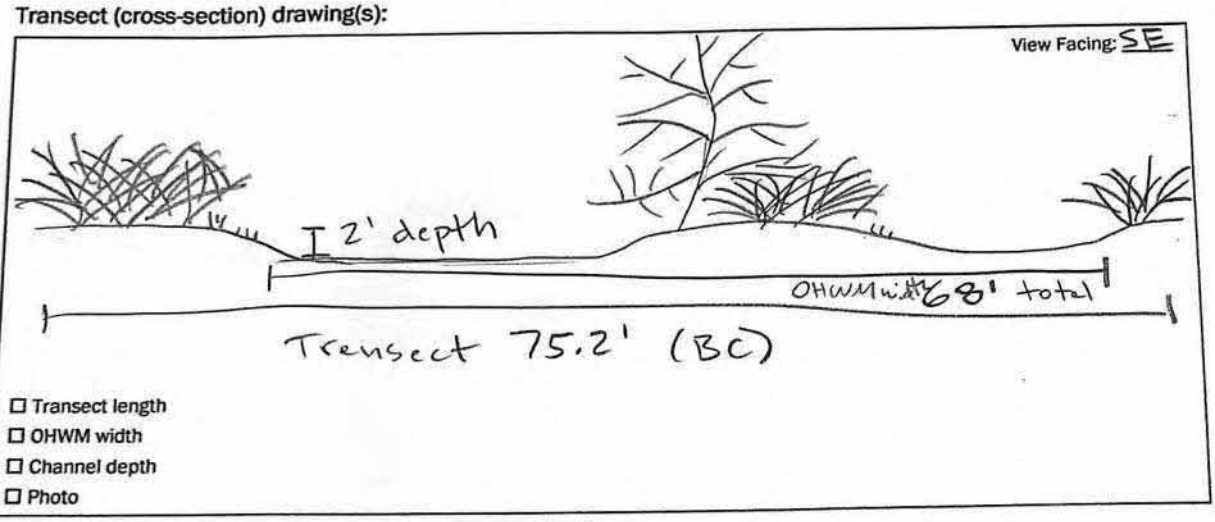
Project: Vulcan Date: 10/18/2024 Transect: T-07

Investigator(s): Allison Johnson Feature Name: BC-010

Site Location: MV corridor, Middle west parcel

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):



☐ Transect length
☐ OHWM width
☐ Channel depth
☐ Photo

Break in Slope at OHWM: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☒ Gentle (<30°)

☒ Natural line impressed on the bank	☒ Sediment sorting
☐ Shelving	☐ Leaf litter disturbed or washed away
☒ Changes in the character of soil	☐ Scour
☐ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☐ Water staining
☒ Vegetation matted down, bent, or absent	☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	80	20	—	—	—
Below OHWM	—	70	25	5	—

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	35	10	5	40
Below OHWM	—	—	—	100

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☒ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Larrea tridentata Parkinsonia florida Parkinsonia microphylla Senegalia greggii Schismus barbatus	Larrea tridentata Parkinsonia florida Parkinsonia microphylla Senegalia greggii	N/A

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
Large wash, cattle tracks present, no moss or hydrophytic veg

Hydrology:
- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:
Temp:
Min. depth:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

- ☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
- ☐ Low flow channel or other representative section (OHWM datasheet)

OHWM DATA SHEET

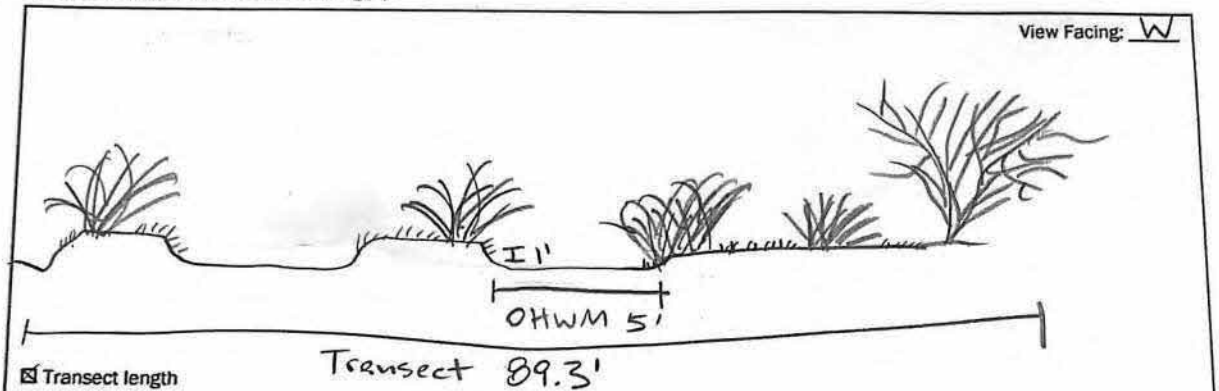
Project: Vulcan Date: 10/19/2024 Transect: T-08

Investigator(s): Allison Johnson, Kristen Anicarelle Feature Name: BC

Site Location: MV corridor, western parcel (east side of tracks)

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):



☒ Transect length
☒ OHWM width
☒ Channel depth
☒ Photo

Break in Slope at OHWM: ☐ Sharp (>60°) ☐ Moderate (30-60°) ☒ Gentle (<30°)

☒ Natural line impressed on the bank	☒ Sediment sorting
☐ Shelving	☐ Leaf litter disturbed or washed away
☒ Changes in the character of soil	☒ Scour
☐ Destruction of terrestrial vegetation	☐ Deposition
☐ Presence of litter and debris	☒ Bed and banks
☐ Wracking	☐ Water staining
☒ Vegetation matted down, bent, or absent	☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	80	15	5	—	—
Below OHWM	—	85	10	5	—

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	1	10	5	84
Below OHWM	—	—	—	100

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☒ Late (herbs, shrubs, mature trees)

Upland Species:	*Bank Species:*	*Emergent Species:*
Larrea Tridentata Schismus barbatus	Larrea tridentata Schismus barbatus Encelia farinosa Parkinsonia florida	N/A

OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):
grazing/ Cattle area, mule deer seen in area, cattle tracks within bed

Hydrology:

☐ Flowing water
☐ Standing water
☐ Saturated
☒ Dry

Avg. depth:
Temp:
Min. depth:
Max. depth:

Checklist of resources (if available):

☒ Aerial photography	☒ Vegetation maps	☒ GPS unit
☐ Remotely-sensed images	☒ Soil maps	☐ Stream gage data
☒ Topographic maps	☒ Rainfall/precipitation data	☐ Other studies:
☐ Geologic maps	☐ Existing delineation(s) for site	

Other drawings (plan view), notes:

N/A

Other forms related to this feature: ☐ Yes ☒ No

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
☐ Low flow channel or other representative section (OHWM datasheet)

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Vulcan | City/County: Maricopa | Sampling Date: 10/20/2024
Applicant/Owner: | State: AZ | Sampling Point: SP-01
Investigator(s): Allison J | Section, Township, Range:
Landform (hillslope, terrace, etc): AG, mesquite grassland | Local relief (concave, convex, none): concave | Slope (%): 2
Subregion (LRR): | Lat: 33.31713664348555 | Long: -112.8586108424821 | Datum: WGS_1984
Soil Map Unit Name: | NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)
Are Vegetation Yes, Soil Yes, or Hydrology Yes significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X		
Hydric Soil Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?**	Yes ___ No X
Wetland Hydrology Present?	Yes X	No ___		

Remarks: AG development causing non-normal conditions, drier than normal for time of year

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prosopis velutina* / Velvet mesquite	30	Yes	FACU
2.			
3.			
4.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Prosopis velutina* / Velvet mesquite	20	Yes	FACU
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5-ft)			
1. *Leptochloa dubia* / Green sprangletop	75	Yes	NI
2. *Polypogon monspeliensis* / Annual beard grass, Annual bear	65	Yes	FACW
3. *Cynodon dactylon* / Bermuda grass	25	No	FACU
4. *Eragrostis superba* / Wilman lovegrass	10	No	NI
5.			
6.			
7.			
8.			
	175	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 4 | % Cover of Biotic Crust 45

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	65	x 2 =	130
FAC species	0	x 3 =	0
FACU species	75	x 4 =	300
UPL species	85	x 5 =	425
Column Totals:	225 (A)		855 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

Due to the time of year being drier than normal and location (AG area),FACW species could be more dominate in wetter time of year. Soil is slightly saturated starting below vegetation layer but contains no high-water table.

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 4/4	100	5YR 3/4	6	C	M	Clay Loam	Soft masses
6-20	7.5YR 4/3	100		0			Sandy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Vegetation

Depth (inches): 2

Hydric Soil Present? Yes X No ___

Remarks: >2% redox concentrations as soft masses present within first 12in and within a layer >4in thick, within red parent material (7.5yr),

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- X Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Mild drought

Remarks:

Appendix F

USACE Aquatic Resources Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
Braided Channel (BC)-01	Arizona	R6	RIVERINE	Area	0.0057	ACRE	ISOLATE	33.27294091	-112.8886064
BC-02	Arizona	R4	RIVERINE	Area	3.48	ACRE	ISOLATE	33.29522168	-112.8557363
BC-03	Arizona	R6	RIVERINE	Area	0.06	ACRE	ISOLATE	33.27570319	-112.8927506
BC-04	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.28134934	-112.9011779
BC-05	Arizona	R6	RIVERINE	Area	0.04	ACRE	ISOLATE	33.28187794	-112.9019688
BC-06	Arizona	R6	RIVERINE	Area	0.18	ACRE	ISOLATE	33.28212473	-112.9023445
BC-07	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.27500488	-112.8916859
BC-08	Arizona	R6	RIVERINE	Area	1.06	ACRE	ISOLATE	33.27598702	-112.8794672
BC-09	Arizona	R6	RIVERINE	Area	2.18	ACRE	ISOLATE	33.29890098	-112.8557714
BC-10	Arizona	R6	RIVERINE	Area	0.09	ACRE	ISOLATE	33.28881588	-112.9123521
BC-11	Arizona	R6	RIVERINE	Area	0.08	ACRE	ISOLATE	33.28708002	-112.9196761
BC-12	Arizona	R6	RIVERINE	Area	0.24	ACRE	ISOLATE	33.28870309	-112.9241736
BC-13	Arizona	R6	RIVERINE	Area	1.25	ACRE	ISOLATE	33.27989689	-112.8698631
BC-14	Arizona	R6	RIVERINE	Area	0.32	ACRE	ISOLATE	33.27925846	-112.8714971
BC-15	Arizona	R6	RIVERINE	Area	0.93	ACRE	ISOLATE	33.29212961	-112.8551585
BC-16	Arizona	R6	RIVERINE	Area	1.01	ACRE	ISOLATE	33.29529436	-112.8603829
BC-17	Arizona	R6	RIVERINE	Area	0.57	ACRE	ISOLATE	33.27573643	-112.8477507
Ephemeral Channel (EPH)-01	Arizona	R6	RIVERINE	Area	0.11	ACRE	ISOLATE	33.30350938	-112.8661537
EPH-02	Arizona	R6	RIVERINE	Area	0.05	ACRE	ISOLATE	33.2791708	-112.8979234
EPH-03	Arizona	R6	RIVERINE	Area	0.51	ACRE	ISOLATE	33.3212415	-112.8558333
EPH-04	Arizona	R6	RIVERINE	Area	0.68	ACRE	ISOLATE	33.29104717	-112.85383
EPH-05	Arizona	R6	RIVERINE	Area	0.05	ACRE	ISOLATE	33.29134887	-112.8547738
EPH-06	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.29030754	-112.8539119
EPH-07	Arizona	R6	RIVERINE	Area	0.34	ACRE	ISOLATE	33.2917665	-112.8582834
EPH-08	Arizona	R6	RIVERINE	Area	0.05	ACRE	ISOLATE	33.29076896	-112.8600255
EPH-09	Arizona	R6	RIVERINE	Area	0.10	ACRE	ISOLATE	33.2903007	-112.8609197
EPH-10	Arizona	R6	RIVERINE	Area	0.04	ACRE	ISOLATE	33.32354637	-112.8564235
EPH-11	Arizona	R6	RIVERINE	Area	0.02	ACRE	ISOLATE	33.28982401	-112.9272652
EPH-12	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.29354093	-112.9375541
EPH-13	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.31653758	-112.8572533
EPH-14	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.3156215	-112.8560171
EPH-15	Arizona	R6	RIVERINE	Area	0.09	ACRE	ISOLATE	33.31818934	-112.8557114
EPH-16	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.32021285	-112.8558166
EPH-17	Arizona	R6	RIVERINE	Area	0.04	ACRE	ISOLATE	33.30326419	-112.8660068
EPH-18	Arizona	R6	RIVERINE	Area	0.02	ACRE	ISOLATE	33.31929885	-112.8552911
EPH-19	Arizona	R6	RIVERINE	Area	0.16	ACRE	ISOLATE	33.29029834	-112.8565168
EPH-20	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.29289772	-112.8543012
EPH-21	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.31845866	-112.8564009
EPH-22	Arizona	R6	RIVERINE	Area	0.07	ACRE	ISOLATE	33.30011581	-112.8605208
EPH-23	Arizona	R6	RIVERINE	Area	0.08	ACRE	ISOLATE	33.29172177	-112.8591234
EPH-24	Arizona	R6	RIVERINE	Area	0.07	ACRE	ISOLATE	33.29157986	-112.8599125
EPH-25	Arizona	R6	RIVERINE	Area	0.09	ACRE	ISOLATE	33.29271166	-112.8567867
EPH-26	Arizona	R6	RIVERINE	Area	0.12	ACRE	ISOLATE	33.2902969	-112.8580095

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
EPH-27	Arizona	R6	RIVERINE	Area	0.11	ACRE	ISOLATE	33.2941381	-112.8610005
EPH-28	Arizona	R6	RIVERINE	Area	0.23	ACRE	ISOLATE	33.2993168	-112.8582753
EPH-29	Arizona	R6	RIVERINE	Area	0.27	ACRE	ISOLATE	33.30385939	-112.8679189
EPH-30	Arizona	R6	RIVERINE	Area	0.10	ACRE	ISOLATE	33.30139517	-112.8661457
EPH-31	Arizona	R6	RIVERINE	Area	0.02	ACRE	ISOLATE	33.30398214	-112.8679027
EPH-32	Arizona	R6	RIVERINE	Area	0.07	ACRE	ISOLATE	33.29913814	-112.8573401
EPH-33	Arizona	R6	RIVERINE	Area	0.00	ACRE	ISOLATE	33.30406298	-112.8677329
EPH-34	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28345296	-112.9043373
EPH-35	Arizona	R6	RIVERINE	Area	0.002	ACRE	ISOLATE	33.28360137	-112.9044181
EPH-36	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28482906	-112.9063886
EPH-37	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28448622	-112.9058773
EPH-38	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28469902	-112.9061938
EPH-39	Arizona	R6	RIVERINE	Area	0.001	ACRE	ISOLATE	33.28515605	-112.9067539
EPH-40	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28514761	-112.906877
EPH-41	Arizona	R6	RIVERINE	Area	0.002	ACRE	ISOLATE	33.28698881	-112.9095153
EPH-42	Arizona	R6	RIVERINE	Area	0.006	ACRE	ISOLATE	33.28680656	-112.9093394
EPH-43	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28734234	-112.9101527
EPH-44	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28842093	-112.9117637
EPH-45	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.27951221	-112.8983782
EPH-46	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.27672927	-112.8942497
EPH-47	Arizona	R6	RIVERINE	Area	0.002	ACRE	ISOLATE	33.28100983	-112.9006569
EPH-48	Arizona	R6	RIVERINE	Area	0.09	ACRE	ISOLATE	33.29972911	-112.857573
EPH-49	Arizona	R6	RIVERINE	Area	0.002	ACRE	ISOLATE	33.27819019	-112.896419
EPH-50	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28277865	-112.903324
EPH-51	Arizona	R6	RIVERINE	Area	0.002	ACRE	ISOLATE	33.27737982	-112.8952454
EPH-52	Arizona	R6	RIVERINE	Area	0.002	ACRE	ISOLATE	33.27348272	-112.8861849
EPH-53	Arizona	R6	RIVERINE	Area	0.04	ACRE	ISOLATE	33.28743756	-112.9206104
EPH-54	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28800443	-112.9219391
EPH-55	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.27538457	-112.8804963
EPH-56	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28859496	-112.9237967
EPH-57	Arizona	R6	RIVERINE	Area	0.01	ACRE	ISOLATE	33.28883993	-112.9245634
EPH-58	Arizona	R6	RIVERINE	Area	0.001	ACRE	ISOLATE	33.28934681	-112.9257648
EPH-59	Arizona	R6	RIVERINE	Area	0.02	ACRE	ISOLATE	33.28933051	-112.925962
EPH-60	Arizona	R6	RIVERINE	Area	0.29	ACRE	ISOLATE	33.29405414	-112.9390065
EPH-61	Arizona	R6	RIVERINE	Area	0.06	ACRE	ISOLATE	33.30034853	-112.8574667
EPH-62	Arizona	R6	RIVERINE	Area	0.03	ACRE	ISOLATE	33.30117372	-112.8546291
Intermittent Channel (INT)-01	Arizona	R4	RIVERINE	Area	0.49	ACRE	ISOLATE	33.29627765	-112.8560227
Drainage Ditch (DD)-01	Arizona	NA	NA	Area	0.05	ACRE	Other	33.30783765	-112.8550791
(DD)-02	Arizona	NA	NA	Area	0.06	ACRE	Other	33.31209212	-112.8615979
(DD)-03	Arizona	NA	NA	Area	0.004	ACRE	Other	33.31211716	-112.857086
(DD)-04	Arizona	NA	NA	Area	0.14	ACRE	Other	33.3127213	-112.8569964
(DD)-05	Arizona	NA	NA	Area	0.01	ACRE	Other	33.3050806	-112.8546533
(DD)-06	Arizona	NA	NA	Area	0.05	ACRE	Other	33.30485498	-112.85541

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
(DD)-07	Arizona	NA	NA	Area	0.09	ACRE	Other	33.30137407	-112.8553475
Seasonal Wetland (SW)-01	Arizona	Seasonal	DEPRESS	Area	1.44	ACRE	ISOLATE	33.3168384	-112.8585705

INTENTIONALLY LEFT BLANK

APPENDIX B-2.
Arizona State Land Department Native Plant Inventory

MEMORANDUM

To:	Taylor Suiter, Rights-of-Way Project Leader; Arizona State Land Department
From:	Michelle Leis, Biologist; Dudek
Subject:	Native Plant Inventory Survey Results for Arizona State Trust Lands -- Vulcan Solar Project
Date:	April 11, 2025
cc:	Alex Simons, David Brown, Lori Browne; Vulcan Solar Project LLC
	Jeffrey Zuczek, Project Manager; Dudek
Attachments:	Figures
	A, Native Plant Exhibits A, B, and C
	B, Representative Photos
	C, Plant Species Compendium
	D, Native Plant Inventory Data
	E, Native Plant Disposition and Valuation
	F, Notice of Intent to Clear Land Form

1 Introduction

This memorandum presents the findings of the native plant inventory assessment conducted by Dudek biologists for the Vulcan Solar Project (project). The purpose of this assessment is to complete a native plant inventory for project components that traverse Arizona State Land Department (ASLD)–administered lands, which include the project's proposed generation interconnection transmission (gen-tie) line, pulling sites, and access roads.

2 Project Overview

The project would consist of an up to 800-megawatt alternating-current solar photovoltaic facility, an up to 800-megawatt battery energy storage system, subsurface medium-voltage electrical collection corridors, an on-site substation, an operations and maintenance facility, access roads, and ancillary facilities (collectively referred to as the solar facility). The project would also include an up to 4.3-mile-long 500-kilovolt generation interconnection transmission (gen-tie) line that would connect the solar facility from the new on-site substation to the existing 500-kilovolt Hassayampa Substation via a 200-foot-wide long-term right-of-way corridor.

The solar facility is proposed for siting on federal public land totaling approximately 6,483 acres administered by the U.S. Bureau of Land Management, Phoenix District Office, Lower Sonoran Field Office, and approximately 6 acres of private land under County of Maricopa jurisdiction. The 103-acre gen-tie line right-of-way would occupy approximately 76 acres of State Trust land under ASLD jurisdiction, and approximately 27 acres under County of Maricopa jurisdiction.

3 Project Location

The project site is in Maricopa County, Arizona, approximately 5 miles southwest of the unincorporated community of Arlington and north of the Gila Bend Mountains (see Figure 1, Project Location). Access to the project site is provided via Agua Caliente Road, Narramore Road, and West Elliot Road (Google Earth 2024).

4 Methods

Dudek biologists Allison Johnson and Kristen Amicarelle conducted a native plant inventory within the survey area (ASLD lands only) on October 17, 18, and 19, 2024. Survey conditions are provided in Table 1.

Table 1. Survey Details and Conditions

Date	Personnel (Dudek)	Survey Conditions (Temperature, Wind, Skies)
10/17/24	Allison Johnson, Kristen Amicarelle	67°F–86°F, 0 mph to 4 mph winds, 0%–50% cc
10/18/24	Allison Johnson, Kristen Amicarelle	67°F–71°F, 0 mph to 13 mph winds, 20%–30% cc
10/19/24	Allison Johnson, Kristen Amicarelle	63°F–70°F, 0 mph to 12 mph winds, 0%–70% cc

Notes: °F = degrees Fahrenheit; mph = miles per hour; cc = cloud cover.

4.1 Transect Data

To provide a reasonable estimate of the number of native trees, cacti, and succulents that would be removed to accommodate the project, the Native Plant Survey Protocol for Large Scale Projects (see Attachment A, Exhibit A) was followed for this survey. Preliminary/generalized vegetation classes from the GAP data—namely Sonora–Mojave creosote bush, white bursage desert scrub, and North American warm desert xeric-riparian scrub—were mapped within the survey area (see Figure 2, Vegetation Communities and Land Cover – Gen-Tie Survey Area). Vegetation was then overlaid on U.S. Department of Agriculture soil data (see Figure 3, Soils – Gen-Tie Survey Area) to identify areas with unique combinations of soil and vegetation types (USDA 2024). Random sample points were generated within these areas that were used to create transect lines that extended in the direction of the farthest end of the specific soil/vegetation combination for that randomized point. Starting and ending photos for each transect were taken and are provided in Attachment B, Representative Photos. At each sample point, native trees and cacti were inventoried and measured in caliper inches using diameter tape and/or calipers and recorded within ArcGIS. All transect locations were approved by ASLD prior to completing fieldwork (Suiter, pers. comm., 2024). Additionally, invasive and noxious weed species (AZDA 2024; AZ-WIPWG 2024) and Endangered Species Act–listed plant species for Maricopa County were documented if encountered. Transect locations with associated vegetation community and soil type are provided in Table 2 and shown in Figure 4, Transect Locations.

Table 2. Transect Survey Data

Transect	Latitude	Longitude	Associated Vegetation Community	Associated Soil Type
T-01	33.33170091	-112.8555602	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Perryville loam, saline-alkali

Table 2. Transect Survey Data

Transect	Latitude	Longitude	Associated Vegetation Community	Associated Soil Type
T-02	33.33104746	-112.8559526	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Perryville loam, saline-alkali
T-03	33.33110128	-112.8559965	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Perryville loam, saline-alkali
T-04	33.32936658	-112.8554271	North American Warm Desert Xeric-Riparian Scrub	Casa Grande-Laveen complex, alkali
T-05	33.32924804	-112.8555175	North American Warm Desert Xeric-Riparian Scrub	Casa Grande-Laveen complex, alkali
T-06	33.32970478	-112.8564317	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Laveen loam, saline alkali
T-07	33.32746204	-112.856763	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande-Laveen complex, alkali
T-08	33.32743085	-112.8570336	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande-Laveen complex, alkali
T-09	33.32836489	-112.85471	North American Warm Desert Xeric-Riparian Scrub	Gilman fine sandy loam, 0% to 2% slopes
T-10	33.32834592	-112.8547449	North American Warm Desert Xeric-Riparian Scrub	Gilman fine sandy loam, 0% to 2% slopes
T-11	33.3283272	-112.8551327	North American Warm Desert Xeric-Riparian Scrub	Laveen loam, saline alkali
T-12	33.32424145	-112.855921	North American Warm Desert Xeric-Riparian Scrub	Laveen loam, saline alkali
T-13	33.32304545	-112.8553074	North American Warm Desert Xeric-Riparian Scrub	Gilman loam, saline-alkali
T-14	33.32248609	-112.8552095	North American Warm Desert Xeric-Riparian Scrub	Gilman loam, saline-alkali
T-15	33.32347376	-112.8561782	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Laveen loam, saline alkali
T-16	33.32319125	-112.8573517	North American Warm Desert Pavement	Harqua complex, 0%–3% slopes
T-17	33.32288087	-112.8572022	North American Warm Desert Pavement	Harqua complex, 0%–3% slopes
T-18	33.31538226	-112.8548586	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Laveen loam, saline-alkali and Gilman loam, saline-alkali
T-19	33.31707015	-112.8583301	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Laveen loam, saline-alkali and Gilman loam, saline-alkali
T-20	33.31707464	-112.8583313	North American Warm Desert Xeric-Riparian Scrub	Gilman loam, saline-alkali
T-21	33.31653248	-112.8580482	North American Warm Desert Xeric-Riparian Scrub	Gilman loam, saline-alkali
T-22	33.31730286	-112.8585936	North American Warm Desert Xeric-Riparian Scrub	Casa Grande sandy loam

Table 2. Transect Survey Data

Transect	Latitude	Longitude	Associated Vegetation Community	Associated Soil Type
T-23	33.3169199	-112.8584856	North American Warm Desert Xeric-Riparian Scrub	Gilman loam, saline-alkali
T-24	33.3169977	-112.8585163	North American Warm Desert Xeric-Riparian Scrub	Antho sandy loam, 0% to 1% slopes
T-25	33.31596441	-112.8558136	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Perryville loam, saline-alkali
T-26	33.31425203	-112.8545176	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande loam
T-27	33.31264942	-112.8545883	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande loam
T-28	33.31367077	-112.85531	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande sandy loam
T-29	33.31225906	-112.8560829	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande sandy loam and Laveen loam, saline-alkali
T-30	33.3122051	-112.8569149	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Laveen loam, saline-alkali and Valencia sandy loam
T-31	33.31209225	-112.8569683	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Valencia sandy loam
T-32	33.31240065	-112.85472	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande loam
T-33	33.31237312	-112.8547179	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande loam
T-34	33.29818165	-112.8583368	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Gilman loam, 0% to 1% slopes
T-35	33.29893121	-112.8556668	North American Warm Desert Xeric-Riparian Scrub	Gilman loam, 0% to 1% slopes
T-36	33.2941222	-112.8575537	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Gilman loam, 0% to 1% slopes
T-37	33.2920913	-112.8554647	North American Warm Desert Xeric-Riparian Scrub	Gilman loam, 0% to 1% slopes
T-38	33.29254253	-112.8608749	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Gilman loam, 0% to 1% slopes and Harqua complex, 0% to 3% slopes
T-39	33.31270633	-112.8555876	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Casa Grande sandy loam
T-40	33.31410483	-112.8546751	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Gilman loam, saline-alkali
T-41	33.32221532	-112.8597341	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Harqua Complex, 3%–8% slopes
T-42	33.32229753	-112.8597619	Sonora-Mojave Creosote Bush and White Bursage Desert Scrub	Harqua Complex, 3%–8% slopes

Source: USDA 2024

4.2 Valuation Calculations

To determine the valuation for the project, a preliminary disturbance footprint was used to calculate the number of plants that may be impacted during construction (see Figure 5, Disturbance Calculation Footprint). Number of plants found within the transects representing each vegetation/soil combination were extrapolated using the acreage of the preliminary disturbance footprint to get an estimate of total plants that may be impacted and the total ASLD valuation.

5 Results

A total of 42 species of vascular plants were recorded during the survey (see Attachment C, Plant Species Compendium). Seven species listed under the Arizona Native Plant Law–protected plants and other native Arizona plants (i.e., trees, cacti, and succulents) listed in the 2011 ASLD protocol (see Attachment A, Exhibit C) were recorded within the survey area (see Figure 6, Native Plants on ASLD Lands). The total counts of native trees, cacti, and succulents, along with protection status, are listed below (AZDA 2017). A complete native plant inventory, per transect line, is provided in Attachment D.

- 2 jumping cholla (*Cylindropuntia fulgida*); salvage restricted
- 24 Christmas cactus (*Cylindropuntia leptocaulis*); salvage restricted
- 2 strawberry hedgehog cactus (*Echinocereus engelmannii*); salvage restricted
- 18 branched pencil cholla (*Cylindropuntia ramosissima*); salvage restricted
- 6 crucifixion thorn (*Castela emoryi*); salvage restricted
- 816 velvet mesquite (*Prosopis velutina*); salvage assessed and harvest restricted
- 3 blue palo verde (*Parkinsonia florida*); salvage assessed

5.1 Arizona State Land Department Valuation

A full summary of the species counts, protection status, ASLD value fee per plant, and cost analysis (per Attachment E, Native Plant Disposition and Valuation) is provided in Table 3.

Table 3. Plant Species, Counts, and Values for the Survey Area

Scientific Name	Common Name (size classification)	Protected Native Plant Status	Number of Plants Recorded	ASLD Value Fee per Plant	Extrapolated Cost
Cylindropuntia ramosissima	Branched pencil cholla (small)	SR	8	$4.50	$1,255.50
Cylindropuntia ramosissima	Branched pencil cholla (medium)	SR	9	$9.00	$1,764.00
Cylindropuntia ramosissima	Branched pencil cholla (large)	SR	1	$13.50	$270.00
Cylindropuntia fulgida	Jumping cholla (small)	SR	2	$4.50	$36.00

Table 3. Plant Species, Counts, and Values for the Survey Area

Scientific Name	Common Name (size classification)	Protected Native Plant Status	Number of Plants Recorded	ASLD Value Fee per Plant	Extrapolated Cost
Cylindropuntia leptocaulis	Christmas cactus (small)	SR	4	$4.50	$157.50
Cylindropuntia leptocaulis	Christmas cactus (medium)	SR	20	$9.00	$1,593.00
Echinocereus engelmannii	Hedgehog (small)	SR	1	$3.75	$112.50
Echinocereus engelmannii	Hedgehog (medium)	SR	1	$7.50	$52.50
Parkinsonia florida	Blue paloverde (0 to 3 c.i.)	SA	2	$20.00	$380.00
Parkinsonia florida	Blue paloverde (3 to 4 c.i.)	SA	1	$40.00	$400.00
Prosopis velutina	Velvet mesquite (0 to 3 c.i.)	SA/HR	107	$10.00	$9,370.00
Prosopis velutina	Velvet mesquite (3 to 4 c.i.)	SA/HR	454	$25.00	$145,975.00
Prosopis velutina	Velvet mesquite (4 to 6 c.i.)	SA/HR	157	$100.00	$239,700.00
Prosopis velutina	Velvet mesquite (6 to 8 c.i.)	SA/HR	64	$150.00	$191,700.00
Prosopis velutina	Velvet mesquite (8 to 10 c.i.)	SA/HR	22	$225.00	$36,450.00
Prosopis velutina	Velvet mesquite (10 to 12 c.i.)	SA/HR	2	$300.00	$29,100.00
Prosopis velutina	Velvet mesquite (12 to 14 c.i.)	SA/HR	2	$400.00	$1,600.00
Prosopis velutina	Velvet mesquite (14 to 16 c.i.)	SA/HR	5	$500.00	$8,500.00
Prosopis velutina	Velvet mesquite (16 to 18 c.i.)	SA/HR	6	$625.00	$26,875.00
Prosopis velutina	Velvet mesquite (18 to 20 c.i.)	SA/HR	1	$750.00	$3,000.00
		Total	869	N/A	**$698,291.00**

Notes:
ASLD = Arizona State Land Department
c.i. = caliper inches
HR = Harvest Restricted – Permits are required to remove plant byproducts (fuel-wood).
SA = Salvage Assessed – These plants require a permit for removal.
SR = Salvage Restricted – These plants require a permit for removal and/or destruction; collection is allowed only with a permit.

According to the animal unit (AU) map, the proposed survey area is located in the 0 to 5 AU category (83.57 acres × $75.00 per acre), with a total value of $6,267.75. Therefore, for the proposed survey area, **the total cost for both the ANPL-Protected Native Plants ($698,291.00) and the AU-associated value ($6,267.75) is $704,558.80.**

5.2 Endangered Species

No threatened or endangered species listed by the U.S. Fish and Wildlife Service are present within the survey area.

5.3 Noxious Weeds and Non-Native Invasives

Invasive plant species are regulated through Arizona Administrative Code (AAC) R3-4-245, R3-4-101, and R3-4-201, and Arizona Revised Statues (ARS) 3-201. These statutes require the Arizona Department of Agriculture to determine which non-native species are defined as invasive or "noxious," and require regulation for control. All invasive and noxious non-native plant species that were observed on site are ranked using the categories provided by the Arizona Department of Agriculture (Class A, B, and C) and the Arizona Wildlands Invasive Plant Working Group (low, medium, and high) (AZDA 2024; AZ-WIPWG 2024). Rankings are listed in Table 4.

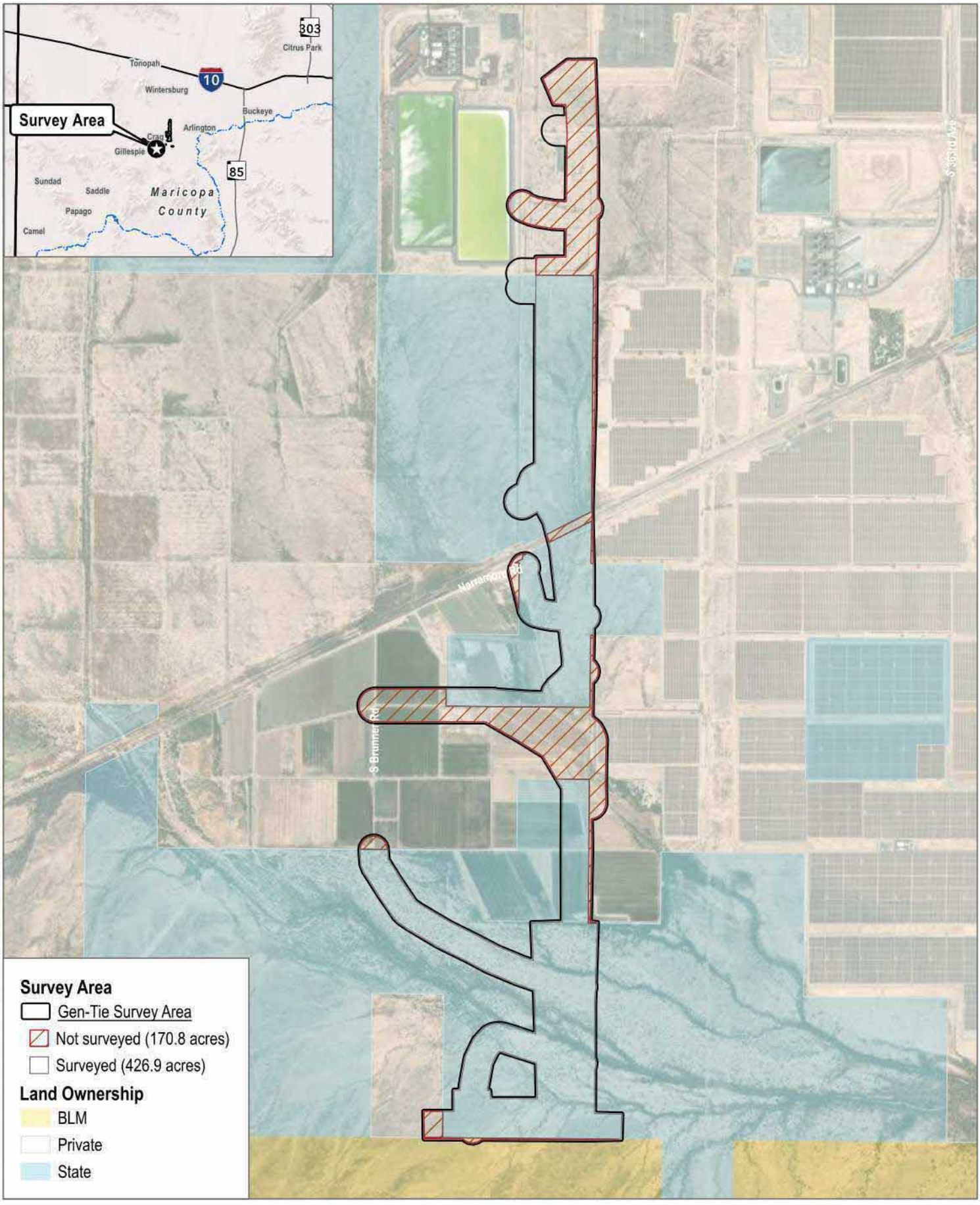
Table 4. Invasive and Noxious Non-Native Plant Species Observed

Scientific Name	Common Name	AZDA/AZ-WIPWG Threat Level Ranking
Bromus rubens	red brome	Class C/High
Cynodon dactylon	Bermuda grass	None assigned/Medium
Echinochloa colona	jungle rice	None assigned/None assigned
Lepidium latifolium	perennial pepper weed	None assigned/None assigned
Phalaris aquatica	harding grass	None assigned/None assigned
Oncosiphon pilulifer	stinknet	Class B
Polypogon monspeliensis	annual rabbitsfoot grass	None assigned/None assigned
Salsola tragus	prickly Russian thistle	None assigned/Medium
Schismus barbatus	common Mediterranean grass	None assigned/Medium
Tamarix ramosissima	saltcedar	Class C/High

Sources: AZDA 2024; AZ-WIPWG 2024
Notes:
AZDA = Arizona Department of Agriculture
AZ-WIPWG = Arizona Wildlands Invasive Plant Working Group
Class B = Noxious weed categorized as a species of plant that is known to occur but of limited distribution in the state and may be a high-priority pest for quarantine, control, or mitigation if a significant threat to a crop, commodity, or habitat is known to exist (Arizona Administrative Code R3-4-245).
Class C = Noxious weed categorized as a species of plant that is widespread but may be recommended for active control based on risk assessment (Arizona Administrative Code R3-4-245).
Medium = Invasive, non-native plants with substantial and apparent ecological impacts on ecosystems, plant and animal communities, and vegetational structure by AZ-WIPWG.
High = Invasive, non-native plants with severe ecological impacts on ecosystems, plant and animal communities, and vegetational structure by AZ-WIPWG.

6 Conclusion

The current intended disposition of protected native plants that are present within the disturbance footprint is **$704,558.80**. A Vegetation on State Trust Land Form (Attachment A, Exhibit C) should be filled out and submitted for the project prior to construction with a Notice of Intent to Clear Land Form (Attachment F) filed with the Arizona Department of Agriculture 60 days prior to initiating land-clearing activities.



SOURCE: Bing Maps 2023;

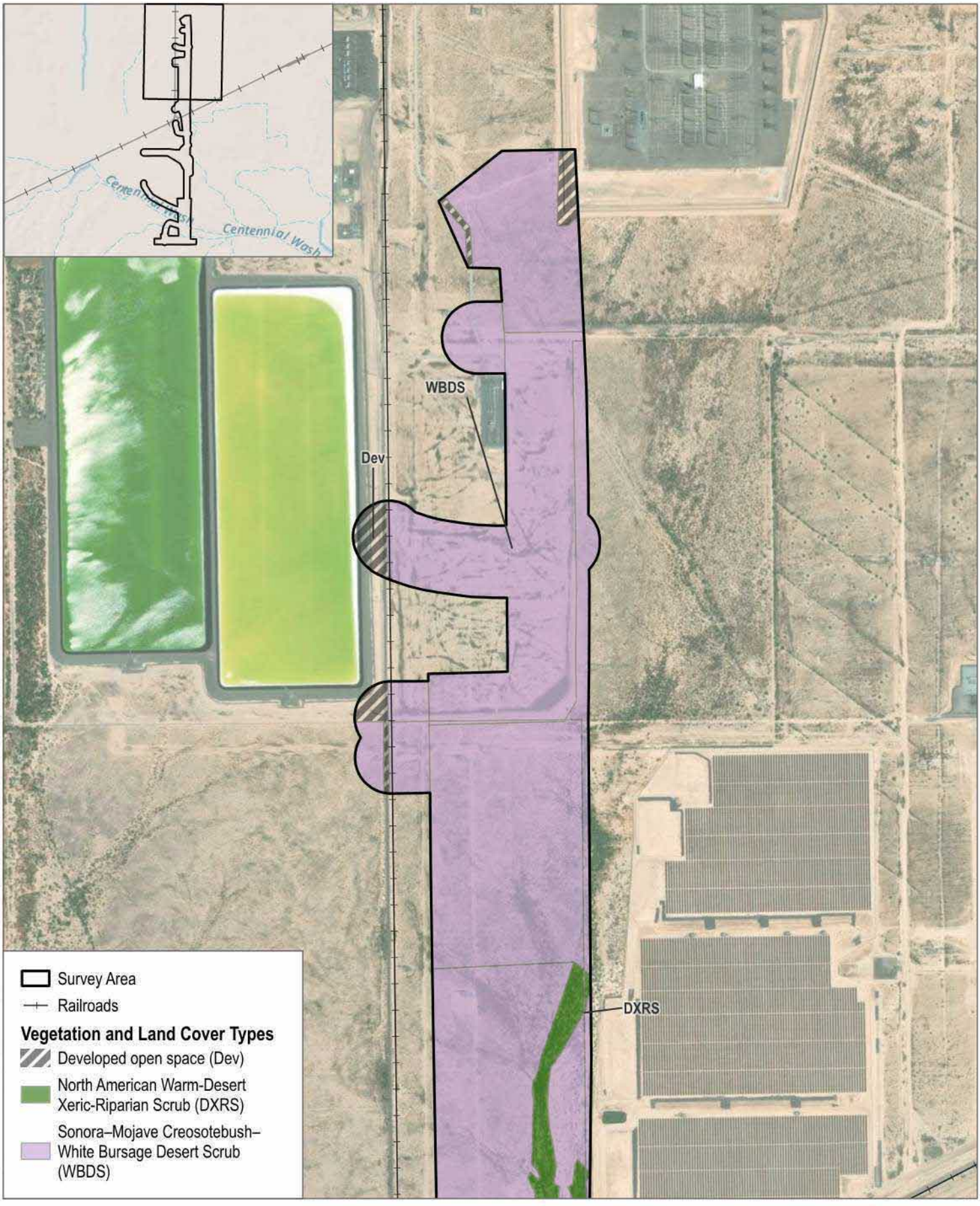
DUDEK

0 1,250 2,500 Feet

FIGURE 1

Project Location

Vulcan Solar Project



SOURCE: Bing Maps 2023;

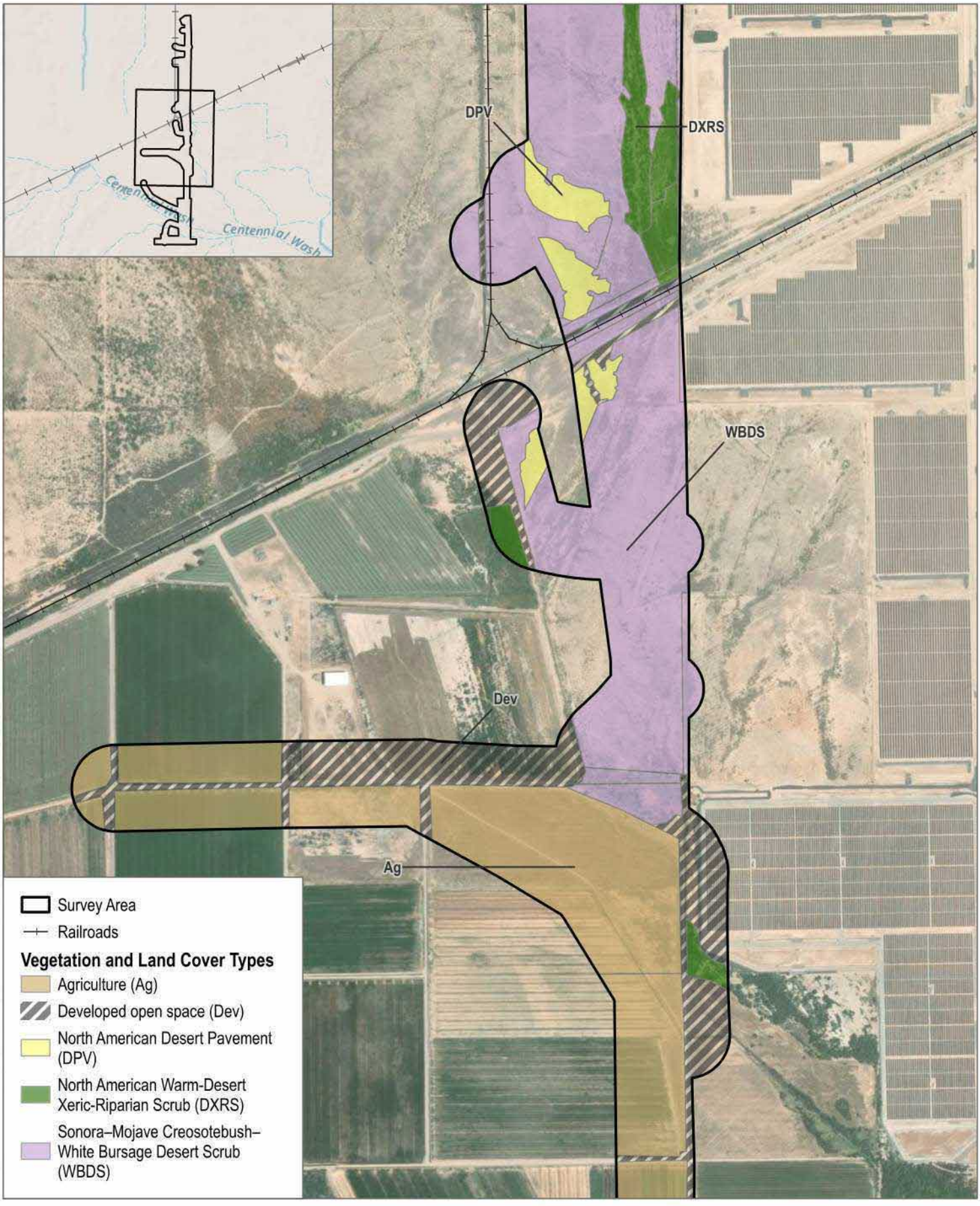
DUDEK

0 485 970 Feet

FIGURE 2-1

Vegetation Communities and Land Cover

Vulcan Solar Project



SOURCE: Bing Maps 2023;

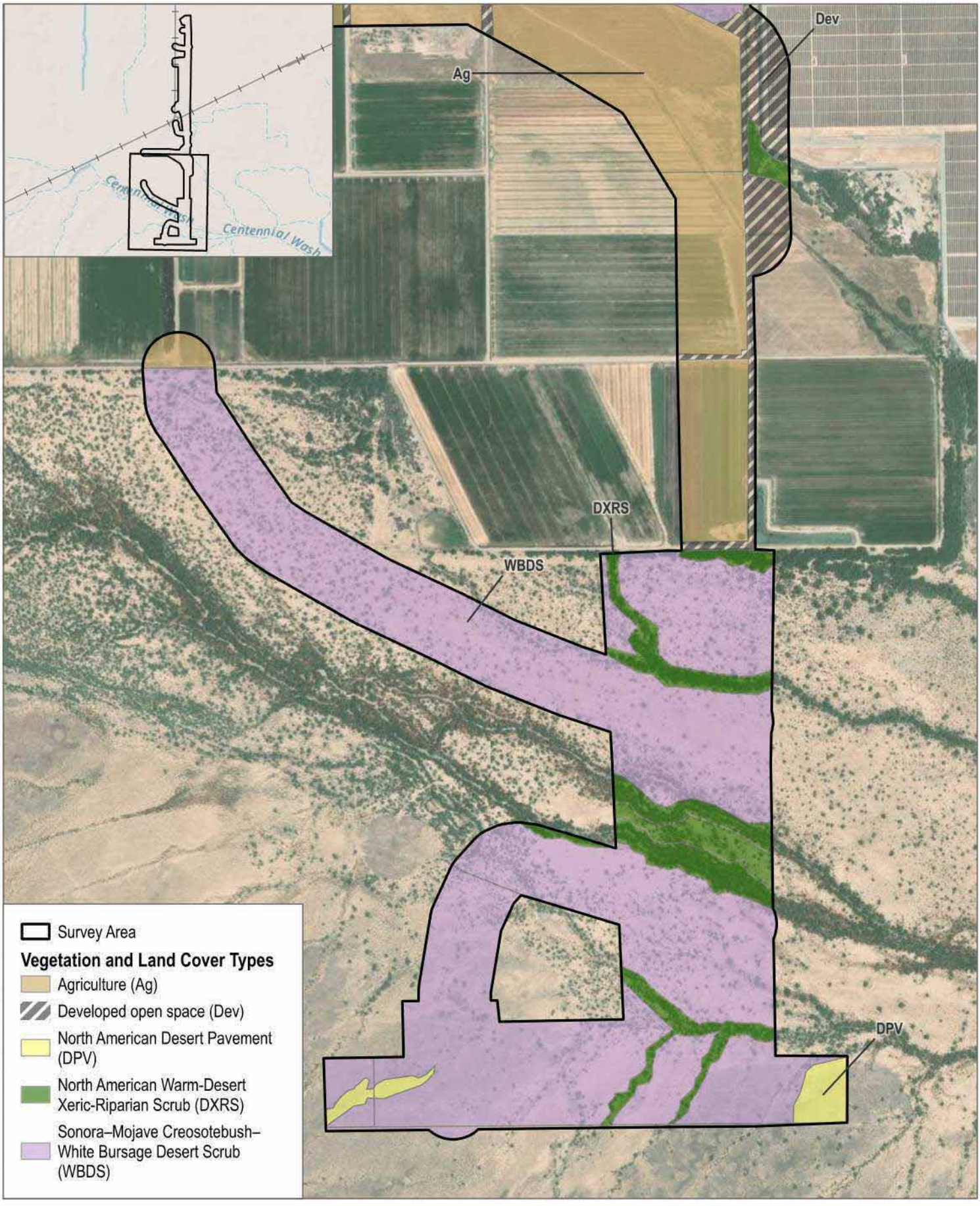
DUDEK

0 485 970 Feet

FIGURE 2-2

Vegetation Communities and Land Cover

Vulcan Solar Project



SOURCE: Bing Maps 2023;

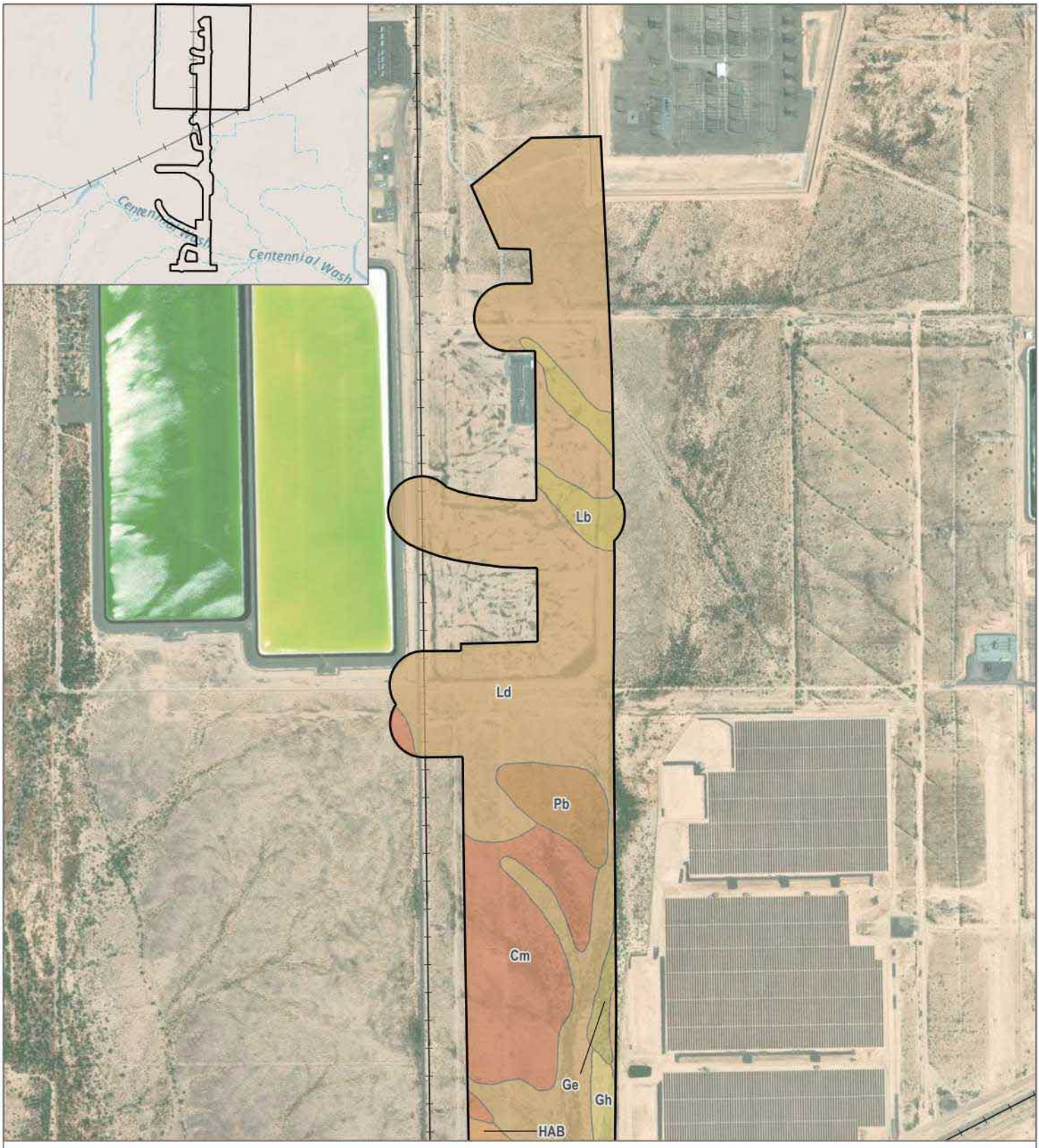
DUDEK

0 485 970 Feet

FIGURE 2-3

Vegetation Communities and Land Cover

Vulcan Solar Project



Survey Area

Soil

- Cm: Casa Grande-Laveen complex, alkali
- Ge: Gilman fine sandy loam, 0 to 2 percent slopes
- Gh: Gilman loam, saline-alkali
- HAB: Harqua complex, 0 to 3 percent slopes
- Lb: Laveen sandy loam
- Ld: Laveen loam, saline-alkali
- Pb: Perryville loam, saline-alkali
- Railroads

SOURCE: Bing Maps 2023; USDA 2023;

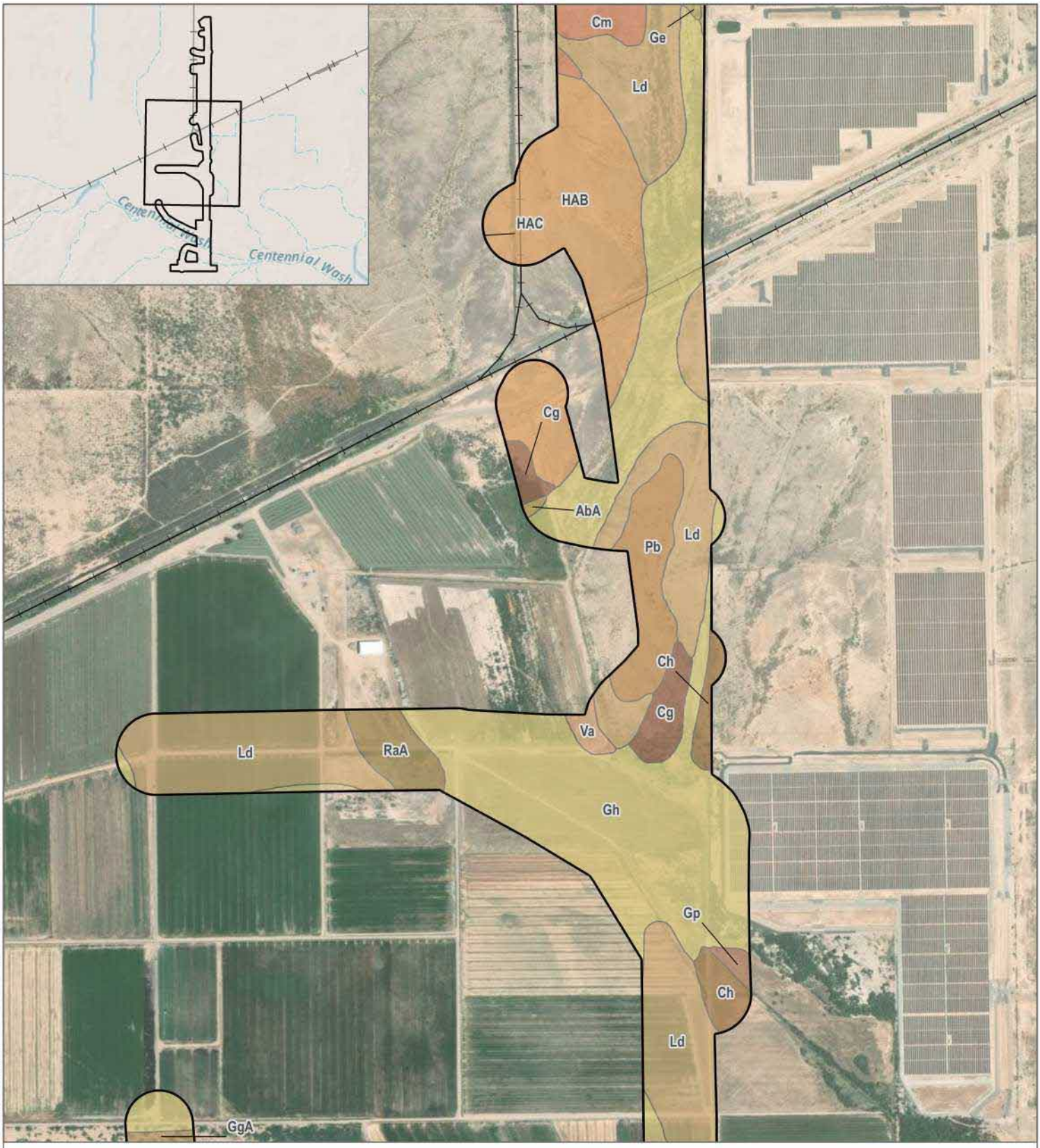
DUDEK

0 480 960 Feet

FIGURE 3-1

Soils

Vulcan Solar Project



Survey Area

Soil

- AbA: Antho sandy loam, 0 to 1 percent slopes
- Cg: Casa Grande sandy loam
- Ch: Casa Grande loam
- Cm: Casa Grande-Laveen complex, alkali
- Ge: Gilman fine sandy loam, 0 to 2 percent slopes
- GgA: Gilman loam, 0 to 1 percent slopes
- Gh: Gilman loam, saline-alkali
- Gp: Gilman loam, clayey subsoil variant, moderately saline
- HAB: Harqua complex, 0 to 3 percent slopes
- HAC: Harqua complex, 3 to 8 percent slopes
- Ld: Laveen loam, saline-alkali
- Pb: Perryville loam, saline-alkali
- RaA: Rillito sandy loam, 0 to 1 percent slopes
- Va: Valencia sandy loam
- Railroads

SOURCE: Bing Maps 2023; USDA 2023;

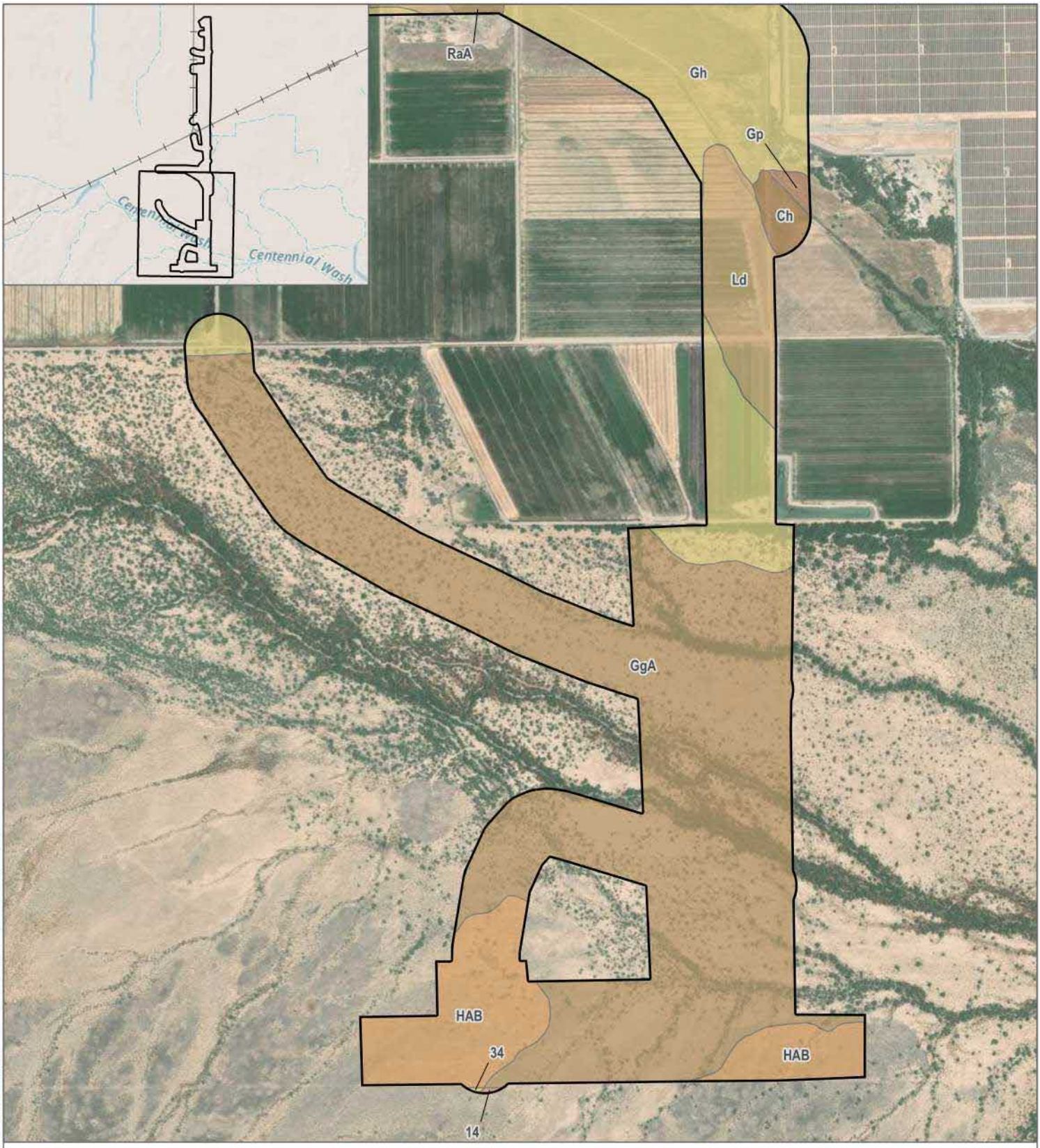
DUDEK

0 480 960 Feet

FIGURE 3-2

Soils

Vulcan Solar Project



SOURCE: Bing Maps 2023; USDA 2023;

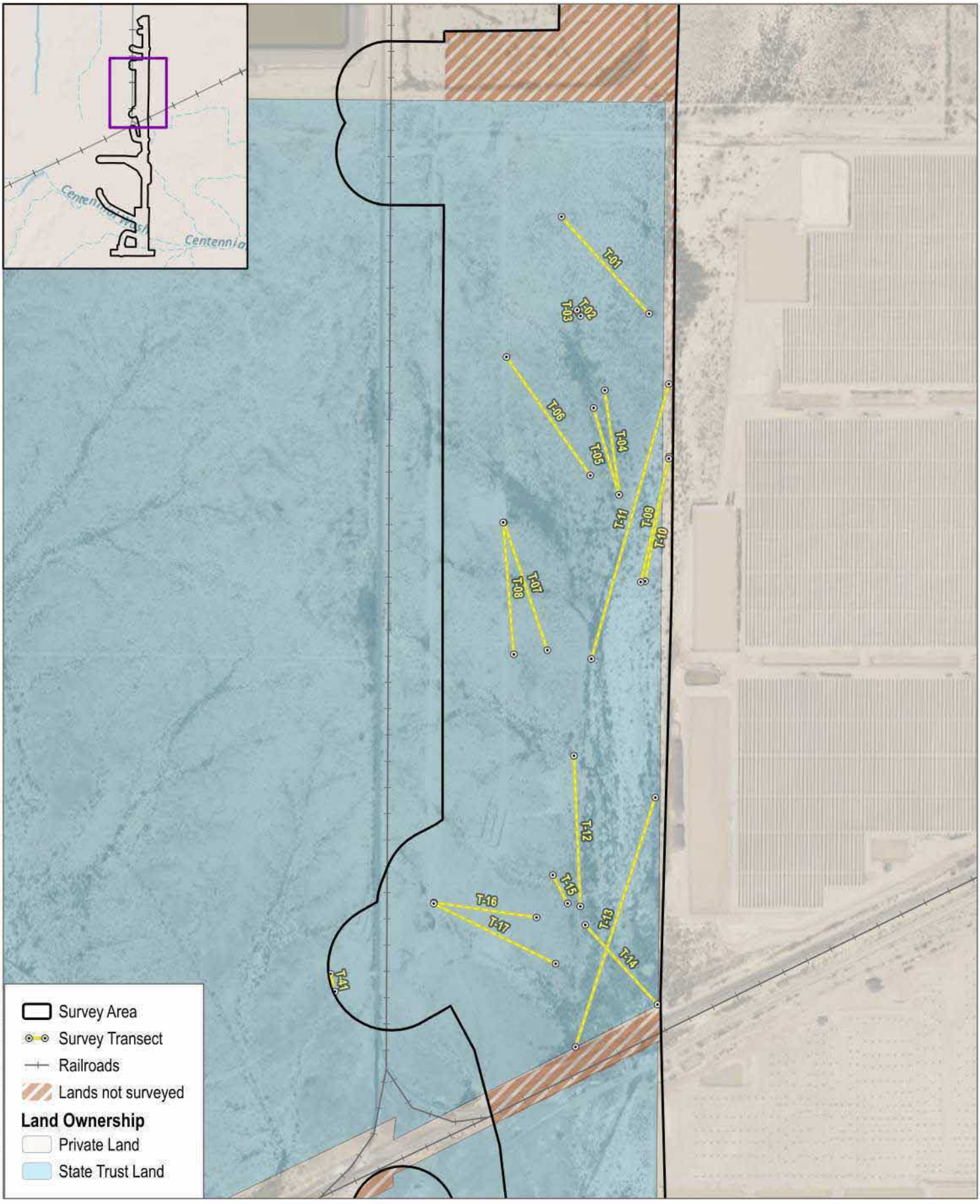
DUDEK

0 480 960 Feet

FIGURE 3-3

Soils

Vulcan Solar Project



SOURCE: Bing Maps 2023; BLM 2024;

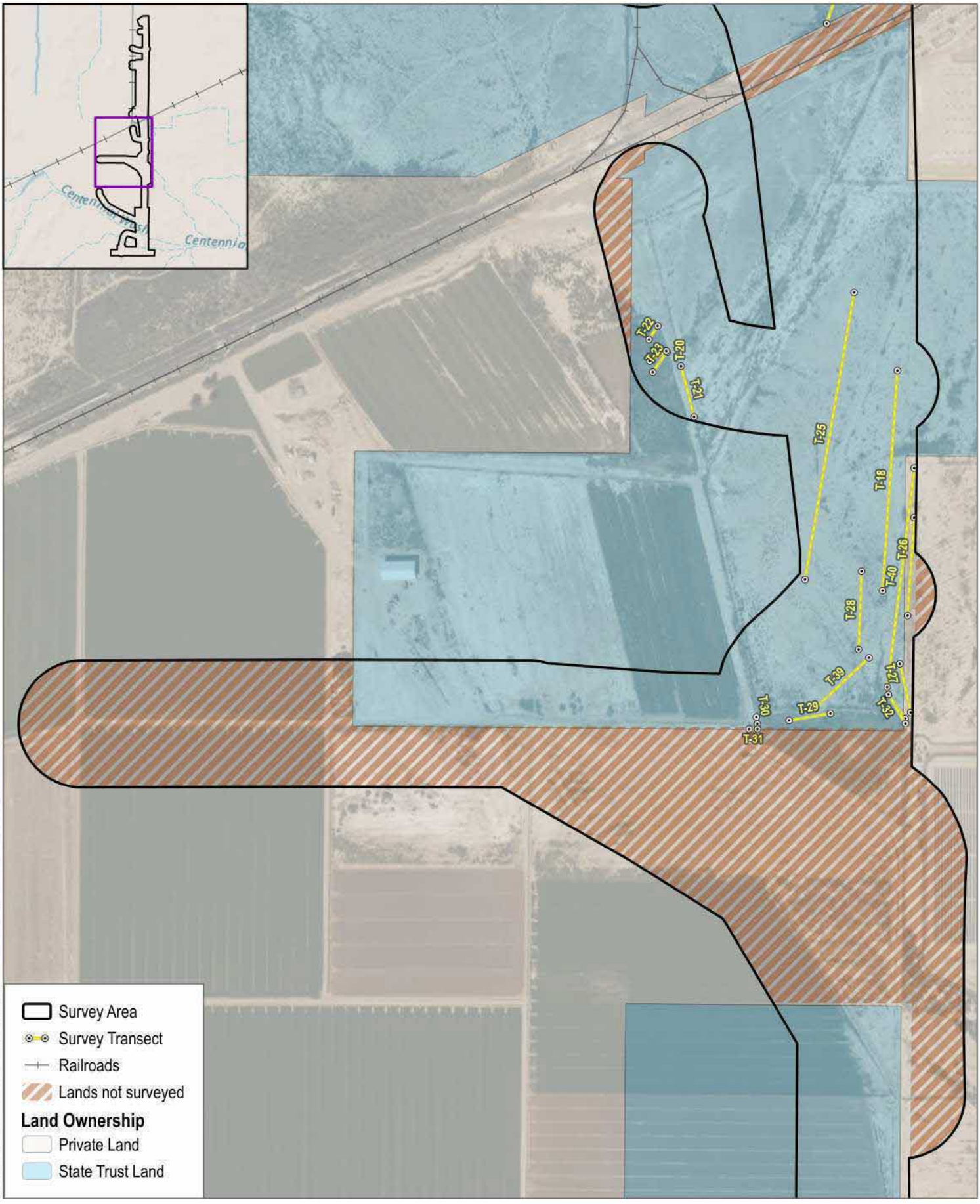
DUDEK

0 300 600 Feet

FIGURE 4A

Transect Locations

Vulcan Solar Project



SOURCE: Bing Maps 2023; BLM 2024;

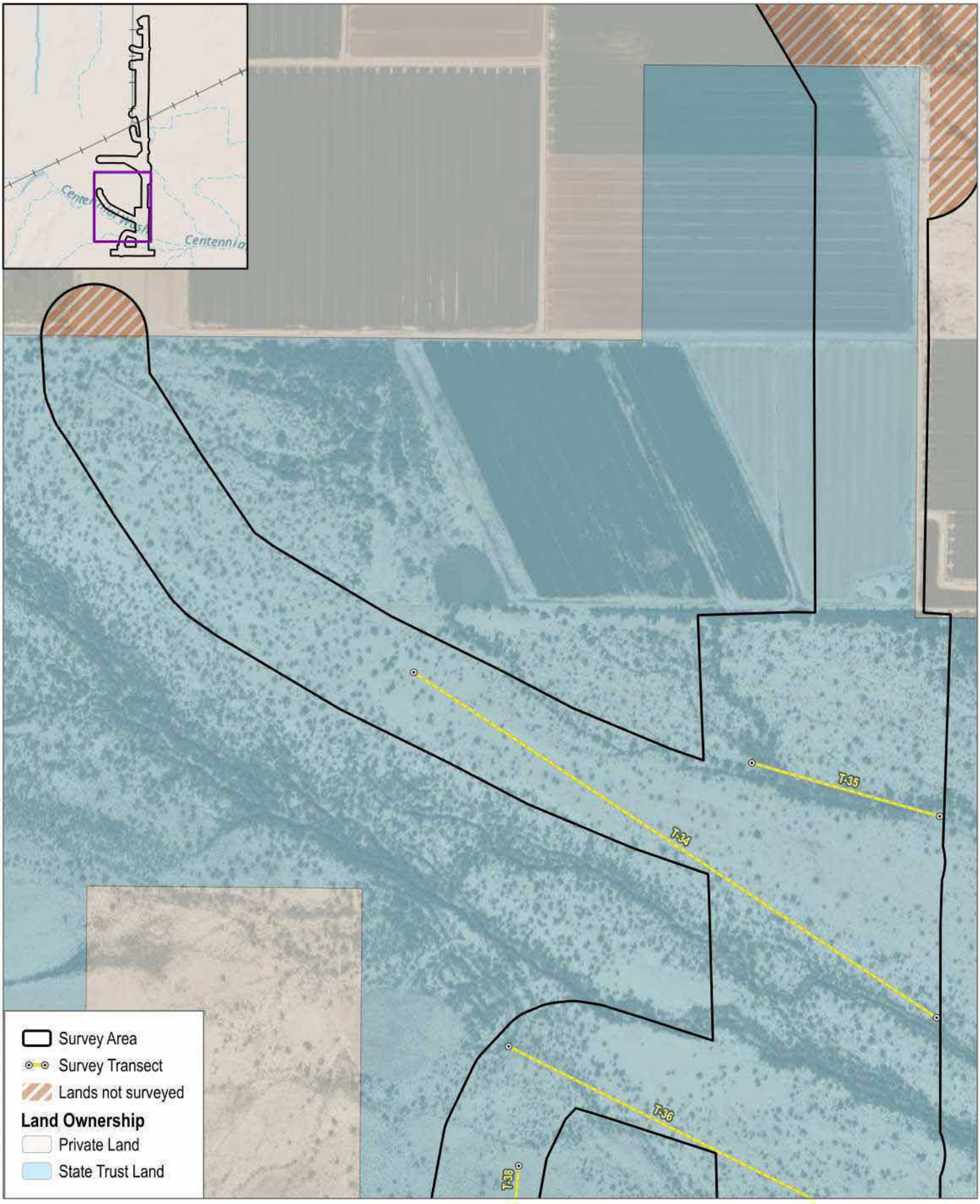
DUDEK

0 300 600 Feet

FIGURE 4B

Transect Locations

Vulcan Solar Project



SOURCE: Bing Maps 2023; BLM 2024;

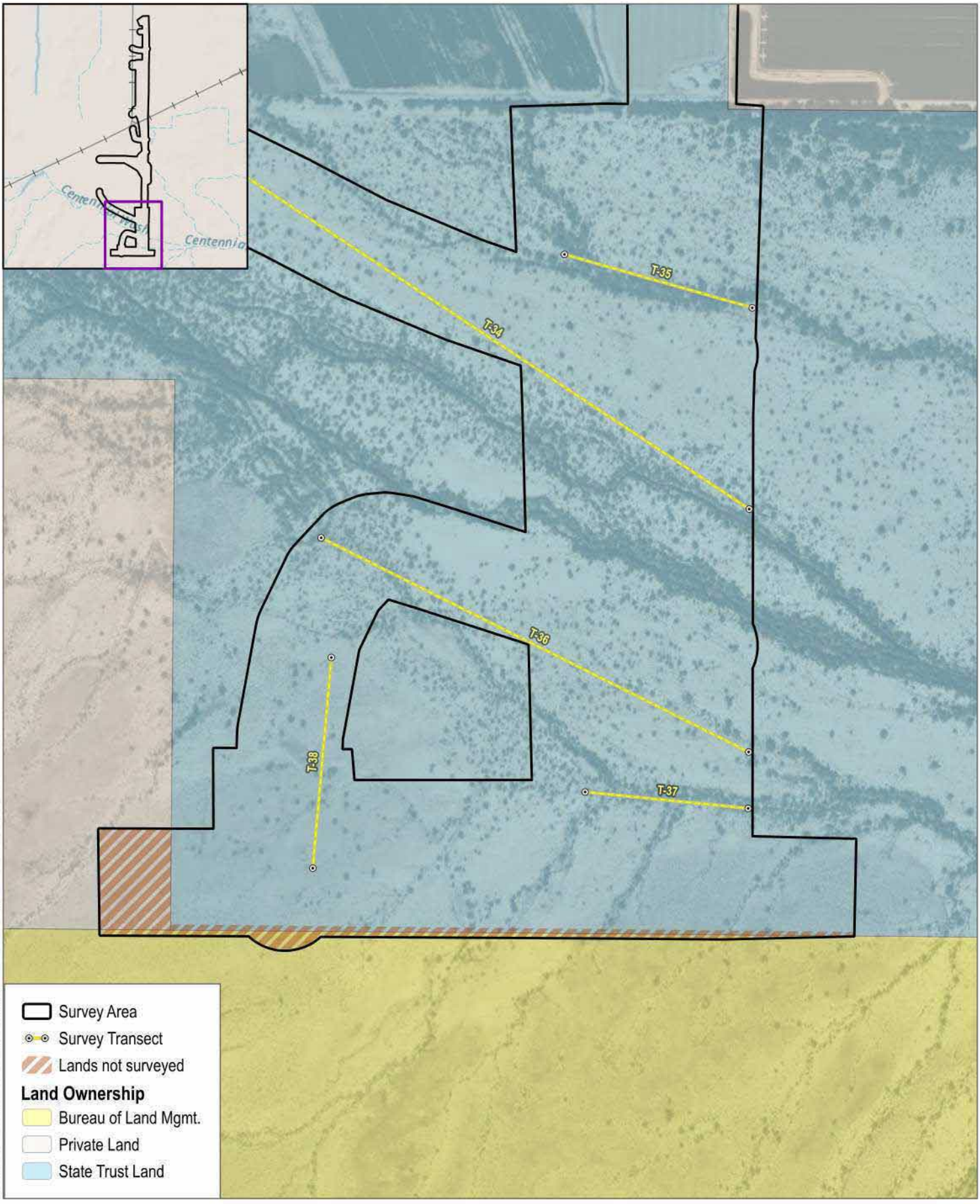
DUDEK

0 300 600 Feet

FIGURE 4C

Transect Locations

Vulcan Solar Project



SOURCE: Bing Maps 2023; BLM 2024;

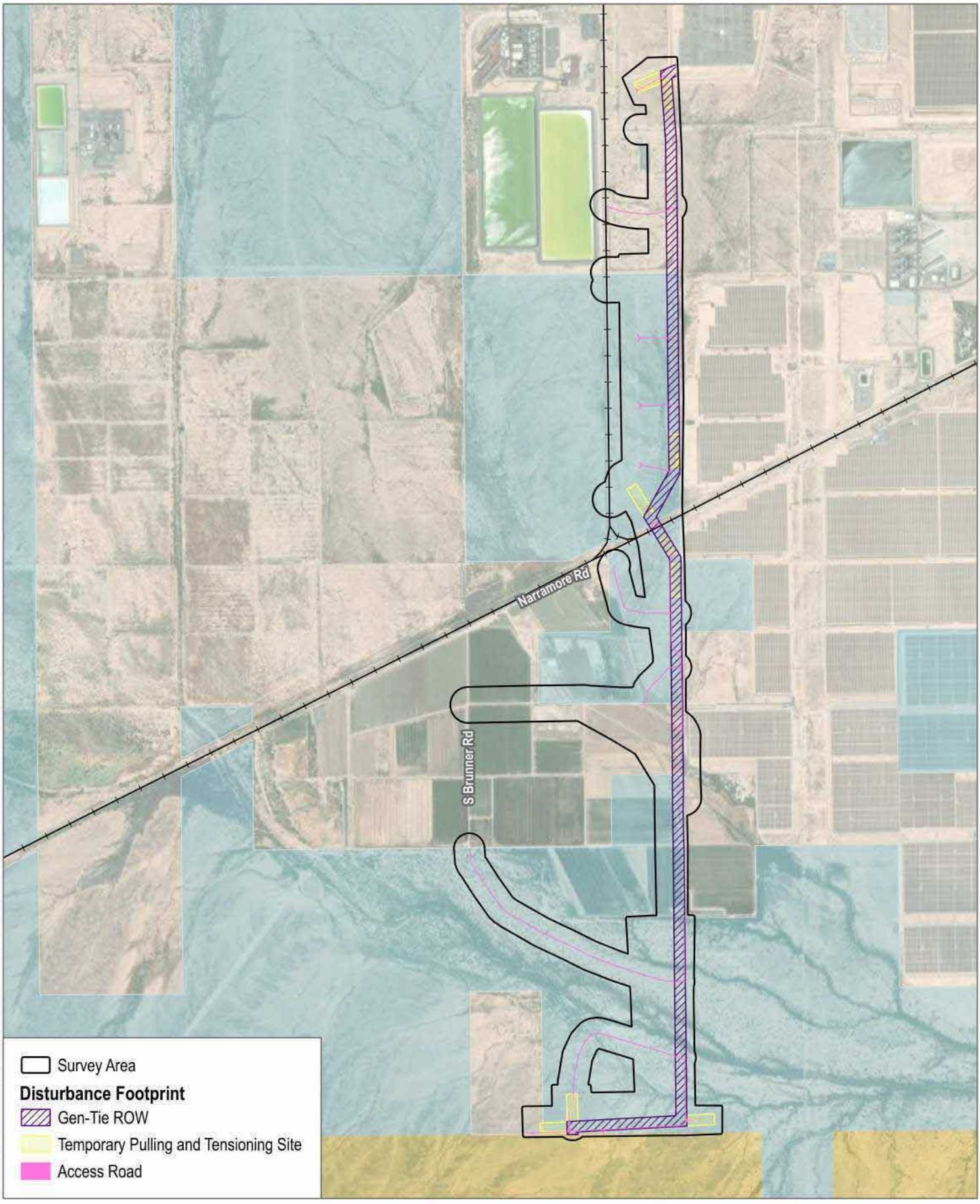
DUDEK

0 300 600 Feet

FIGURE 4D

Transect Locations

Vulcan Solar Project



SOURCE: Bing Maps 2023;

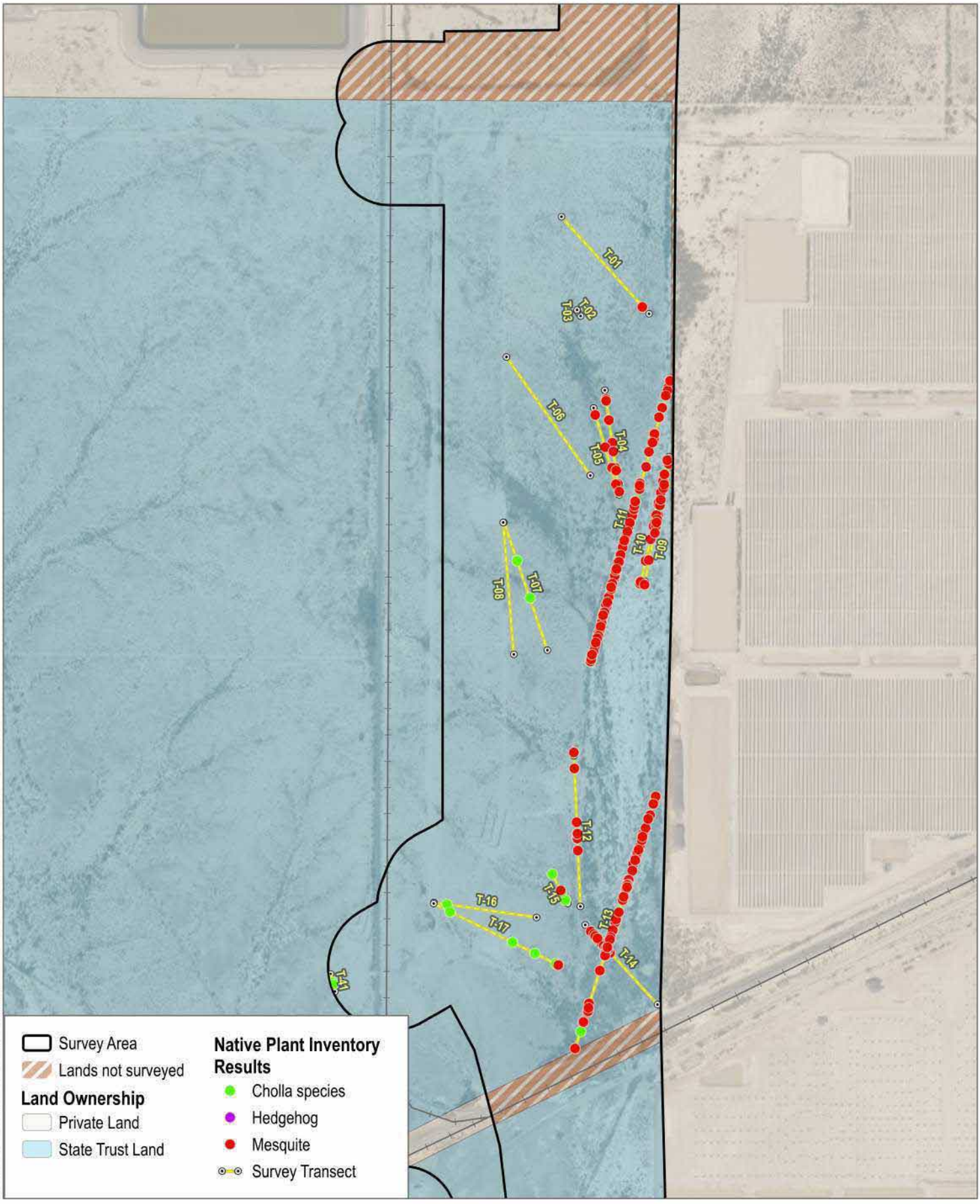
DUDEK

0 1,000 2,000 Feet

FIGURE 5

Disturbance Calculation Footprint

Vulcan Solar Project



SOURCE: Bing 2023; BLM 2023

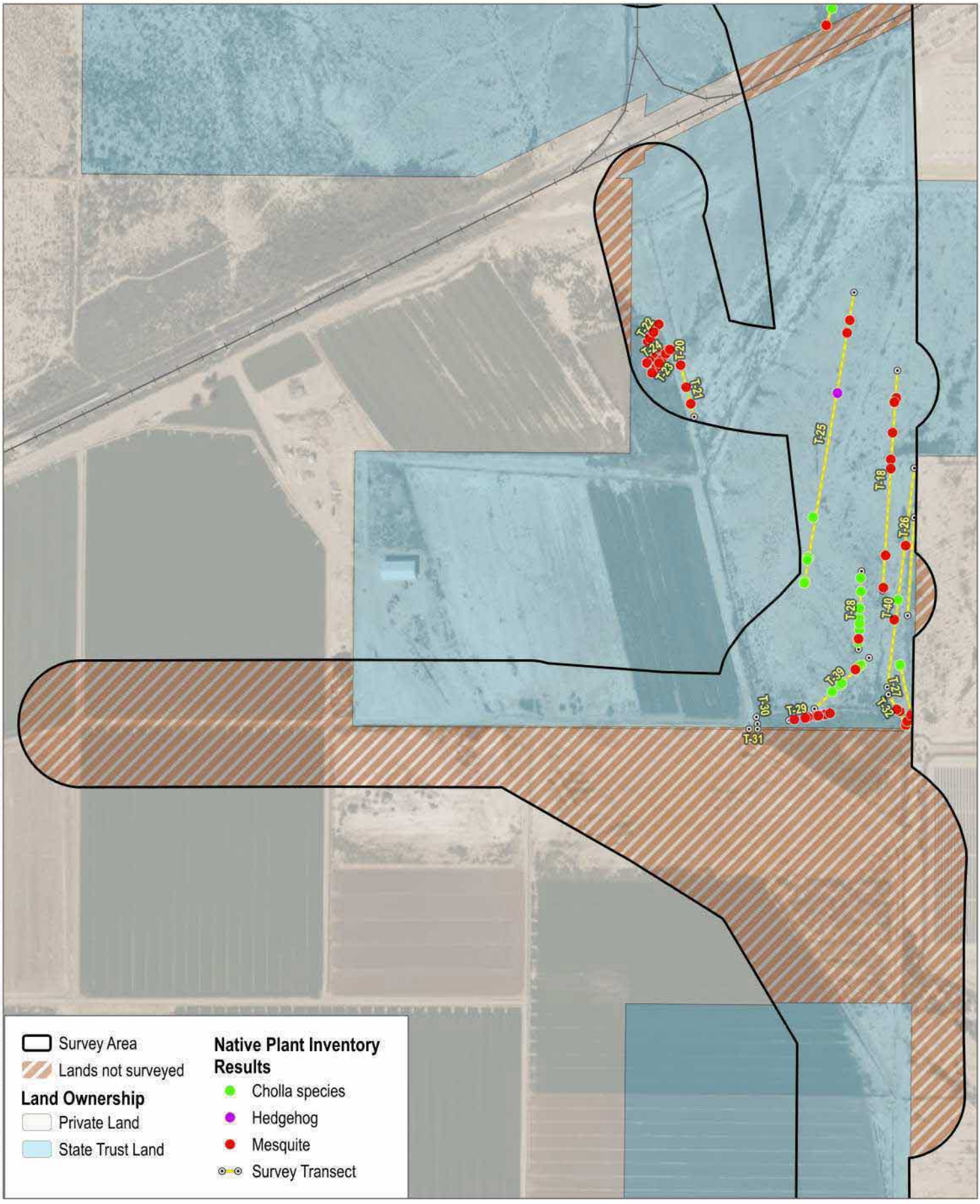
DUDEK

0 300 600 Feet

FIGURE 6A

Native Plants on ASLD Lands

Vulcan Solar Project



SOURCE: Bing 2023; BLM 2023

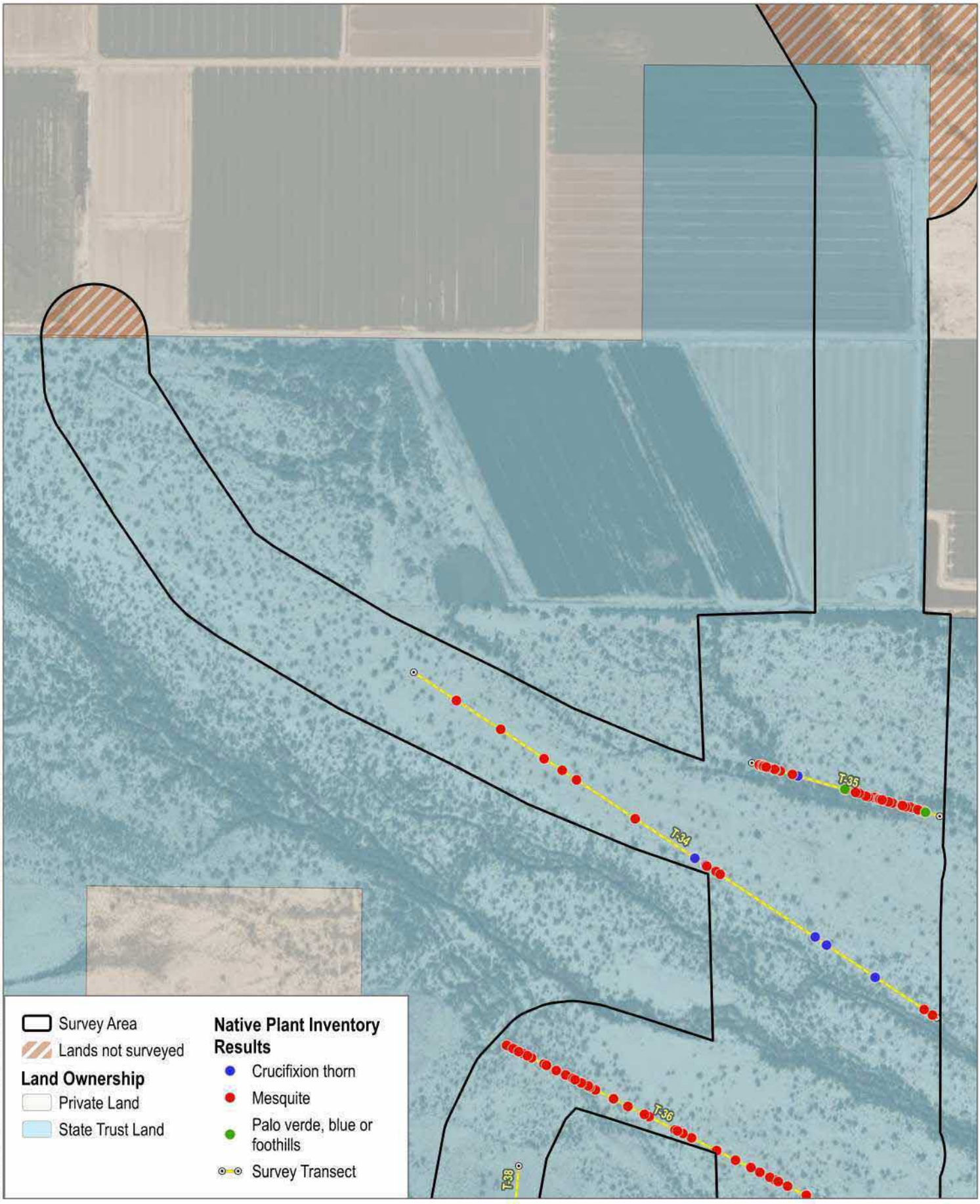
DUDEK

0 300 600 Feet

FIGURE 6B

Native Plants on ASLD Lands

Vulcan Solar Project



SOURCE: Bing 2023; BLM 2023

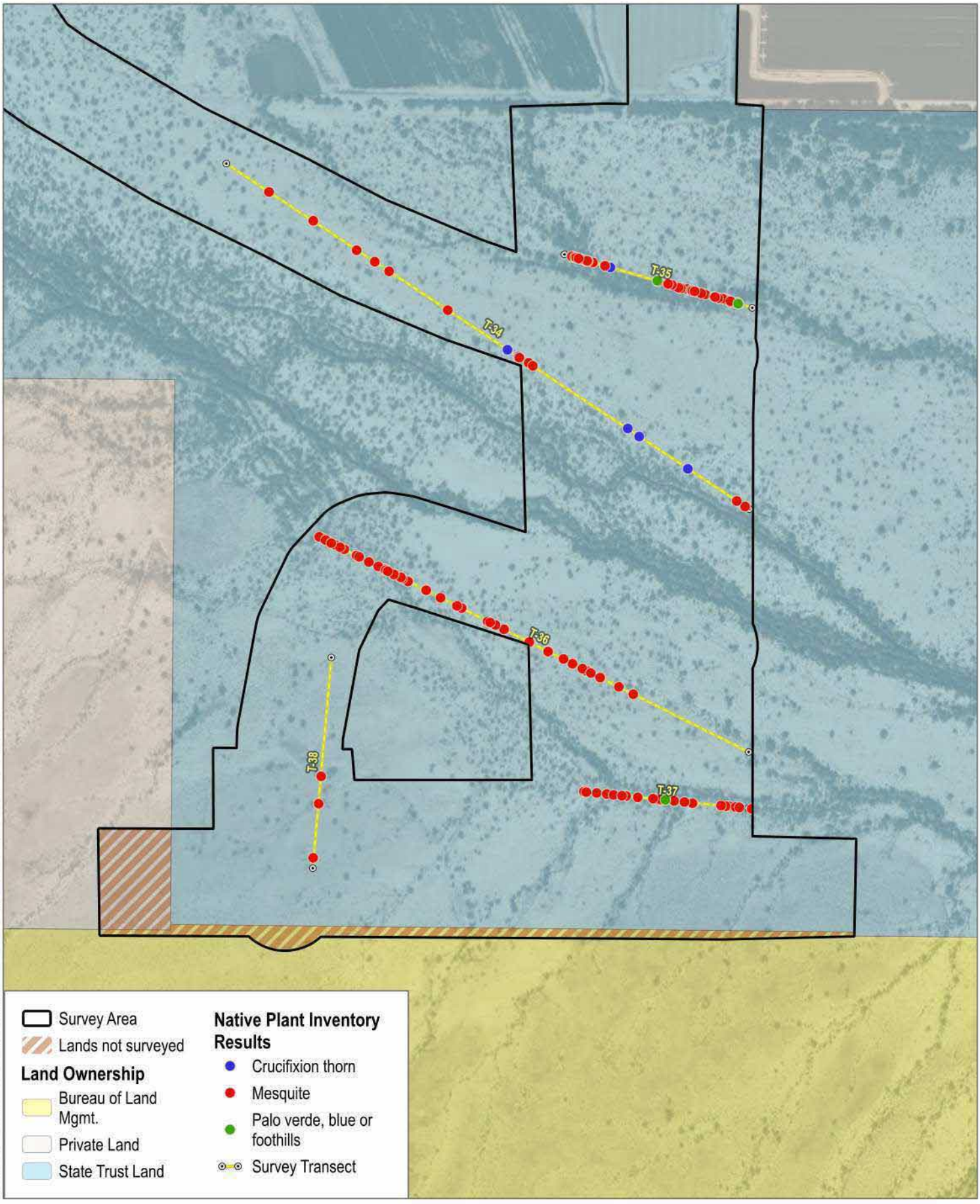
DUDEK

0 300 600 Feet

FIGURE 6C

Native Plants on ASLD Lands

Vulcan Solar Project



SOURCE: Bing 2023; BLM 2023

DUDEK

0 300 600 Feet

FIGURE 6D

Native Plants on ASLD Lands

Vulcan Solar Project

Attachment A

Native Plant Exhibits A, B, and C

EXHIBIT A: Native Plant Survey Protocol for Large Scale Projects

Beneficiaries must be compensated for the loss of vegetation from Arizona State Trust Lands. Many projects are too large to require a 100% inventory, so this sampling protocol has been developed to provide a reasonable estimate of the number of native trees, cacti and succulents that will be removed. Shrubs, sub-shrubs, forbs and grasses are assessed on a per acre basis.

- A minimum of 2 sample points for each soil type/soil slope combination within a vegetative community (as mapped by Brown, et. al. or USGS Gap Land Cover Analysis), randomly placed within the project area are required. The survey direction will be designated as that direction that allows the farthest distance from the random point that stays in the soil type/slope combination.

- Field reconnaissance prior to conducting the sampling is highly recommended in order to avoid sampling ecotones or anomalies.

- A photograph will be taken into the start of the sample point. UTM coordinates (NAD83 HARN) will be collected for the starting point.

- At each sample point, native trees and cacti will be inventoried (complete count) for a distance beyond which no new species are added to the inventory. To do this, a species accumulation curve will be plotted in the field for each inventory (modified Relevé).

- A list of plant species will be gathered as workers walk in the designated direction from the survey start point. The point at which an asymptote is reached is the endpoint for the plant inventory at that survey point and will be flagged.

- A photograph will be taken from the endpoint back to the starting point.

- Plants will be individually identified, measured, and categorized by size class and health. UTM's will be recorded for special status species.

- Data must be provided in Microsoft Excel format. Photographs may be submitted in an electronic format.

- The field crew should rely on visual evaluation for changes in vegetative community based on factors not evident in the stratification process (anomalies) and set supplemental sample points as needed.

- The total number of plants, identified by species and categorized according to health will then be extrapolated for all State Lands on the entire project and provided to the State Land Department.

AZ PROTECTED NATIVE PLANTS		Examples include:	Size Classification	Fair Market Value	Assessment	ASLD Value
	Highly Safeguarded Protected	All plants included on this list will be independently evaluated and assessed.				tbd
	Salvage Restricted Protected Native Plants	agave (not highly safeguarded nor salvage assessed)	small ++	$35.00	15%	$5.25
			medum ++	$75.00	15%	$11.25
			large ++	$150.00	15%	$22.50
		barrel cacti	small (< 2')	$50.00	15%	$7.50
			medium (2' to 4')	$100.00	15%	$15.00
			large (4' to 6')	$200.00	15%	$30.00
			multiple heads	$250.00	15%	$37.50
		cholla, all species	small ++	$30.00	15%	$4.50
			medium ++	$60.00	15%	$9.00
			large ++	$90.00	15%	$13.50
		hedgehog (not highly safeguarded)	small ++	$25.00	15%	$3.75
			medium ++	$50.00	15%	$7.50
			large ++	$100.00	15%	$15.00
		pincushions (not highly safeguarded)	all	$35.00	15%	$5.25
		ocotillo	up to 20 canes	$60.00	15%	$9.00
			20 to 40 canes	$115.00	15%	$17.25
			40 to 60 canes	$190.00	15%	$28.50
			60+ canes	$375.00	15%	$56.25
		organ pipe	6 arms ~ 10' tall	$300.00	15%	$45.00
			10 arms ~ 6' tall	$600.00	15%	$90.00
		saguaro	height plus total length of arms	$55.00 per lf	15%	$8.25 per lf
		senita	6 arms ~ 10' tall	$200.00	15%	$30.00
			10 arms ~ 6' tall	$400.00	15%	$60.00
		sotol	small ++			$5.00
			medium ++	$75.00	15%	$11.25
			large ++	$160.00	15%	$24.00
			x-large ++	$200.00	15%	$30.00
		vauquelina (rosewood)	small ++			$2.00
			medium ++	$10.00	15%	$2.00
			large ++	$40.00	15%	$6.00
			x-large ++	$200.00	15%	$30.00
		yucca (not harvest restricted)	small ++	$75.00	15%	$11.25
			medium ++	$100.00	15%	$15.00
			large ++	$150.00	15%	$22.50
		yucca, joshua tree	2-3 heads	$200.00	15%	$30.00
			5 heads	$300.00	15%	$45.00

AZ PROTECTED NATIVE PLANTS		Examples include:	Size Classification	Fair Market Value	Assessment	ASLD Value
	Salvage Assessed Protected Native Plants	desert willows and smoke trees	< 3 c.i.			$20.00
			3 to 4 c.i.	$200.00	20%	$40.00
			4 to 6 c.i.	$400.00	20%	$80.00
			6 to 8 c.i.	$700.00	20%	$140.00
			8 - 10 c.i.	$1,100.00	20%	$220.00
			10 - 12 c.i.	$1,400.00	20%	$280.00
			12 - 14 c.i.	$1,700.00	20%	$340.00
			larger than 14"	priced individually		
		palo verde, blue or foothills	< 3 c.i.			$20.00
			3 to 4 c.i.	$200.00	20%	$40.00
			4 to 6 c.i.	$400.00	20%	$80.00
			6 to 8 c.i.	$700.00	20%	$140.00
			8 - 10 c.i.	$1,100.00	20%	$220.00
			10 - 12 c.i.	$1,400.00	20%	$280.00
			12 - 14 c.i.	$1,700.00	20%	$340.00
			14 - 16 c.i.	$2,200.00	20%	$440.00
			16 - 18 c.i.	$2,300.00	20%	$460.00
			18 - 20 c.i.	$3,000.00	20%	$600.00
			20 - 24 c.i.	$3,600.00	20%	$720.00
		ironwood *	< 3 c.i.			$40.00
			3 to 4 c.i.	$300.00	25%	$75.00
			4 to 6 c.i.	$500.00	25%	$125.00
			6 to 8 c.i.	$700.00	25%	$175.00
			8 - 10 c.i.	$1,200.00	25%	$300.00
			10 - 12 c.i.	$1,500.00	25%	$375.00
			12 - 14 c.i.	$1,900.00	25%	$475.00
			14 - 16 c.i.	$2,400.00	25%	$600.00
			16 - 18 c.i.	$2,900.00	25%	$725.00
			18 - 20 c.i.	$3,400.00	25%	$850.00
			20 - 24 c.i.	$4,000.00	25%	$1,000.00
	Salvage Assessed Protected Protected Native Plants	mesquite (all species)**	< 3 c.i.			$10.00
			3 to 4 c.i.	$100.00	25%	$25.00
			4 to 6 c.i.	$400.00	25%	$100.00
			6 to 8 c.i.	$600.00	25%	$150.00
			8 - 10 c.i.	$900.00	25%	$225.00
			10 - 12 c.i.	$1,200.00	25%	$300.00
			12 - 14 c.i.	$1,600.00	25%	$400.00
			14 - 16 c.i.	$2,000.00	25%	$500.00
			16 - 18 c.i.	$2,500.00	25%	$625.00
			18 - 20 c.i.	$3,000.00	25%	$750.00
			20 - 24 c.i.	$3,400.00	25%	$850.00

Instructional Memo 12.05 EXHIBIT B November 2011

AZ PROTECTED NATIVE PLANTS		Examples include:	Size Classification	Fair Market Value	Assessment	ASLD Value
	Harvest Restricted Protected Native Plants	nolina species	small ++	$12.00	25%	$3.00
			medium ++	$45.00	25%	$11.25
			large ++	$160.00	25%	$40.00
		bananna yucca	small ++	$75.00	25%	$18.75
			medium ++	$100.00	25%	$25.00
			large ++	$150.00	25%	$37.50
		Mohave yucca	small ++	$75.00	25%	$18.75
			medium ++	$100.00	25%	$25.00
			large ++	$150.00	25%	$37.50
		ironwood *			25%	see above
		mesquite (all species) **			25%	see above
OTHER ARIZONA NATIVE PLANTS		Examples:	Size Classification	Fair Market Value	Assessment	ASLD Value
		all other trees (not highly safeguarded)	< 3 c.i.			$10.00
			3 to 4 c.i.	$200.00	10%	$20.00
			4 to 6 c.i.	$400.00	10%	$40.00
			6 to 8 c.i.	$700.00	10%	$70.00
			8 - 10 c.i.	$1,100.00	10%	$110.00
			10 - 12 c.i.	$1,400.00	10%	$140.00
			12 - 14 c.i.	$1,700.00	10%	$170.00
			14 - 16 c.i.	$2,200.00	10%	$220.00
			16 - 18 c.i.	$2,300.00	10%	$230.00
			18 - 20 c.i.	$3,000.00	10%	$300.00
			20 - 24 c.i.	$3,600.00	10%	$360.00
		shrubs, sub-shrubs, forbs, grasses (not highly safeguarded)	based on AUs/Section per ASLD GIS			per acre
			commercial / ag class			$ 75.00
			0 - 5 AUs ++			$ 75.00
			5 - 7.5 AUs			$125.00
			7.5 - 10 AUs			$150.00
			10 - 15 AUs			$175.00
			15+ AUs			$200.00

AU = animal unit ++ adjusted to reflect variance in plant density 0-5 AUs
c.i. = caliper inch
lf = linear foot
tbd = to be determined
for mulit-stem trees, use sum of caliper inch

++ small = 1 gallon container
++ medium = 3-5 gallon container
++ large = 10-15 gallon container
++ x-large = 24" box

* ironwood is both Salvage Assessed and Harvest Restricted
** mesquite is both Salvage Assessed and Harvest Restricted

EXHIBIT C: CHECKLIST – VEGETATION ON STATE TRUST LAND

To be completed and submitted to administrator prior to any surface disturbance.

I. Plant Inventory

A. Complete inventory of all plant species (identified by both common & scientific names) to be impacted as a result of applicant's activities.

B. Identify plants listed by the AZ. Department of Agriculture (ADOA) as protected, of commercial value, or noxious / invasive species.

II. Protected Native Plants

☐ No protected native plants will be disturbed.

☐ Protected native plants present and will be disturbed

Circle one

A. Applicant will transplant all protected plant species onto adjacent State Trust land and will commit to irrigating plants and other measures to insure at least 75% survival, after 3 years.

B. Applicant will provide ADOA with a copy of the protected plant inventory and request ADOA to notify nurseries of available plants for sale.

C. Applicant will purchase protected plants and transplant onto private land (ADOA permit tags required) or leave on site.

III. Threatened or Endangered, Species listed by the U.S. Fish & Wildlife Service for Arizona

☐ No threatened, endangered, or species present within area to be disturbed.

☐ Species present within area, but will not be impacted (preserved in place).

☐ Species present on area to be disturbed and will be impacted.

A. List species affected:

_____

_____

B. Proposed Mitigation:

_____

_____

IV. Noxious Weeds (NW) and Non-native Invasives (NNI)

Noxious weeds are listed at www.azda.gov/PSD/quarantine5.htm

Invasive species are listed at www.usgs.nau.edu/SWEPIC/SWVMA

☐ No noxious weeds or known invasive species recorded.

☐ Noxious weeds and / or Non-native Invasive Species present.

A. Species & distribution (spot, scattered, patch, etc.): provide locations on maps.

B. Weed management plan

_____

_____

_____

Attachment B

Representative Photos

Photo 1. Representative photo of Sonora-Mojave Creosotebush-White Bursage Desert Scrub.

Photo 2. Representative photo of North American Warm Desert Pavement.

Photo 3. Representative photo of agricultural land.

Photo 4. Representative photo of North American Warm-Desert Xeric-Riparian Scrub.

Photo 5. Transect 1 start.

Photo 6. Transect 1 end.

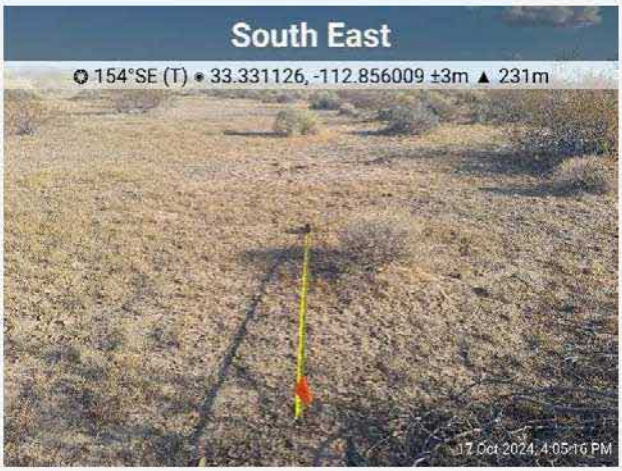


Photo 7. Transect 2 start.

Photo 8. Transect 2 end.

Photo 9. Transect 3 start.

Photo 10. Transect 3 end.

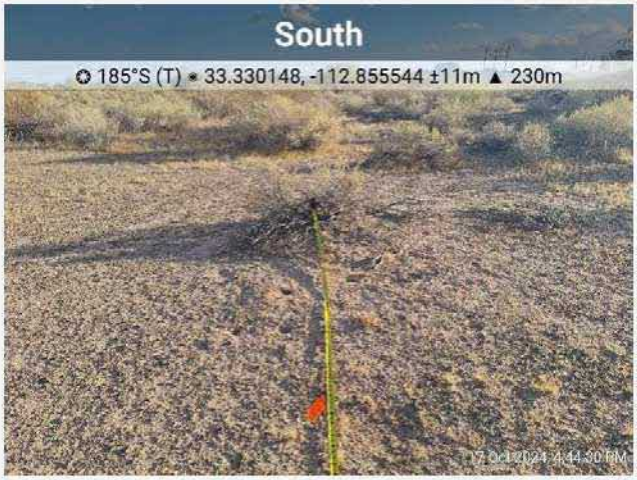


Photo 11. Transcect 4 start.

Photo 12. Transect 4 end.

Photo 13. Transect 5 start.

Photo 14. Transect 5 end.

Photo 15. Transect 6 start.

Photo 16. Transect 6 end.

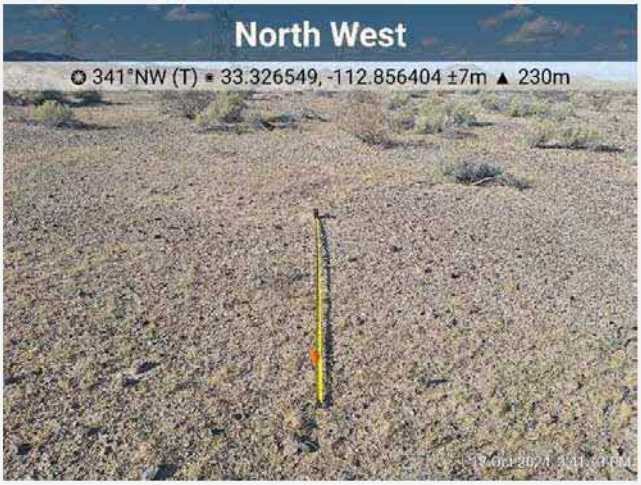


Photo 17. Transect 7 start.

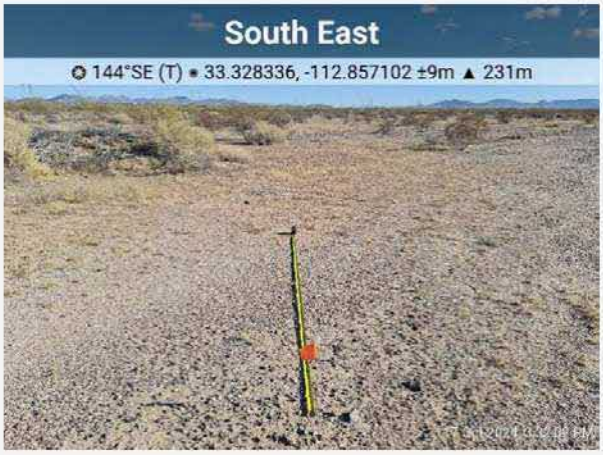


Photo 18. Transect 7 end.

Photo 19. Transect 8 start

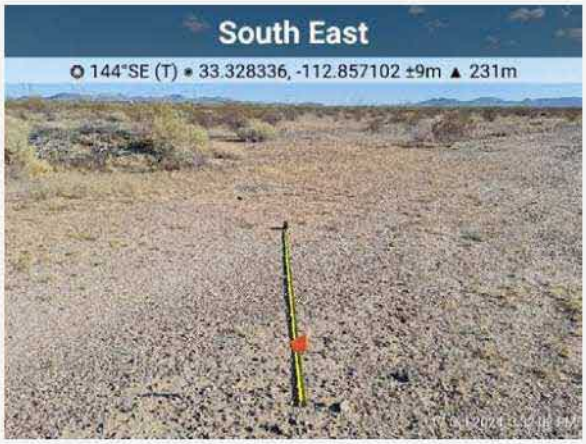


Photo 20. Transect 8 end.

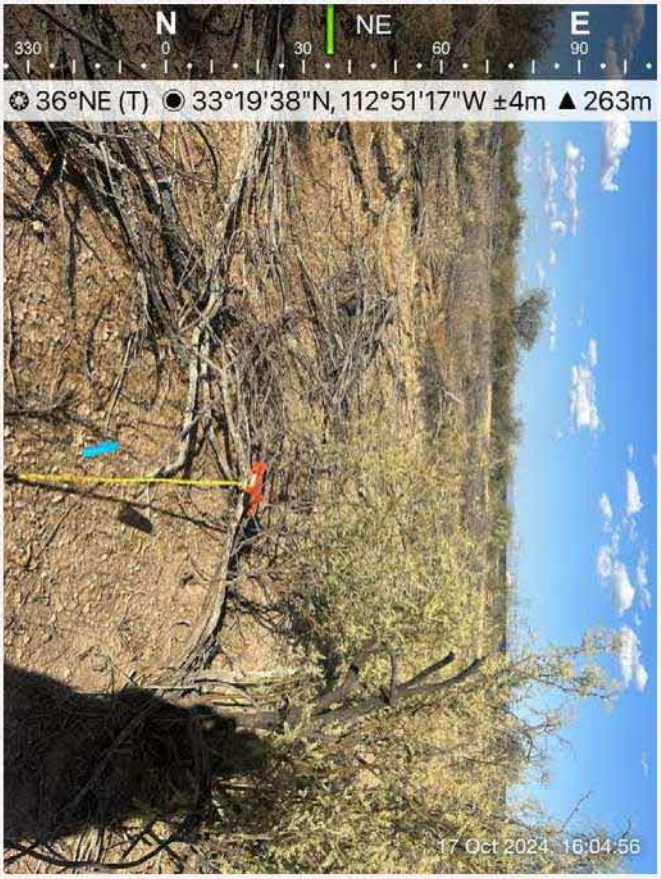


Photo 21. Transcript 9 start.

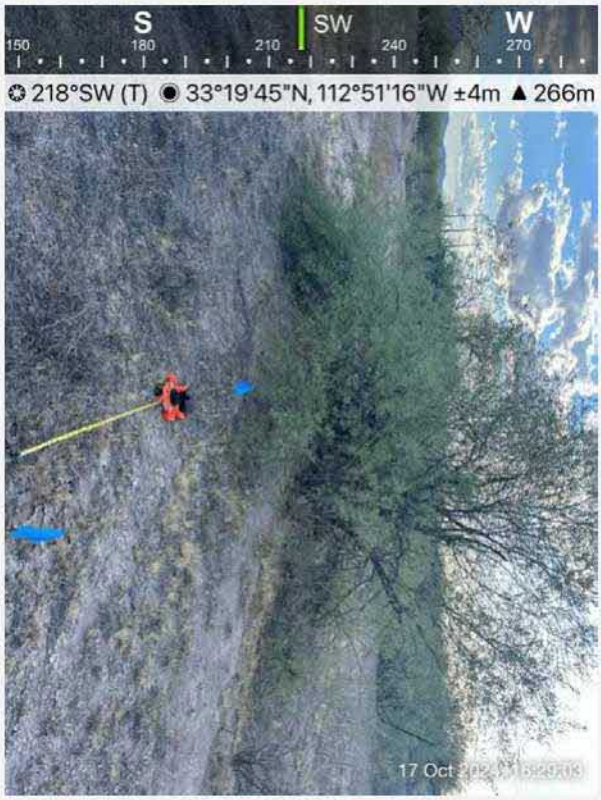


Photo 22. Transcript 9 end.

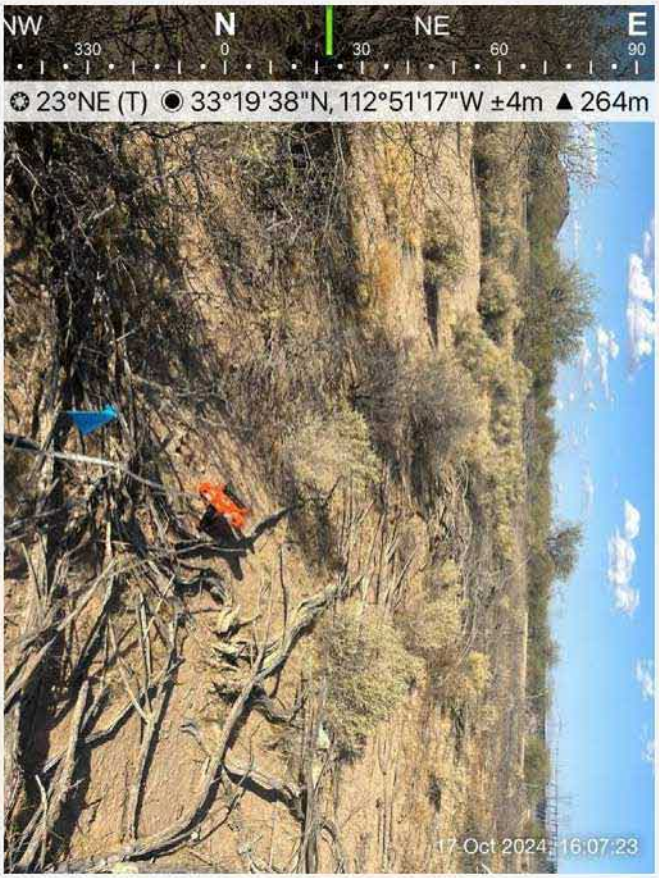


Photo 23. Transcect 10 start.

Photo 24. Transcect 10 end.

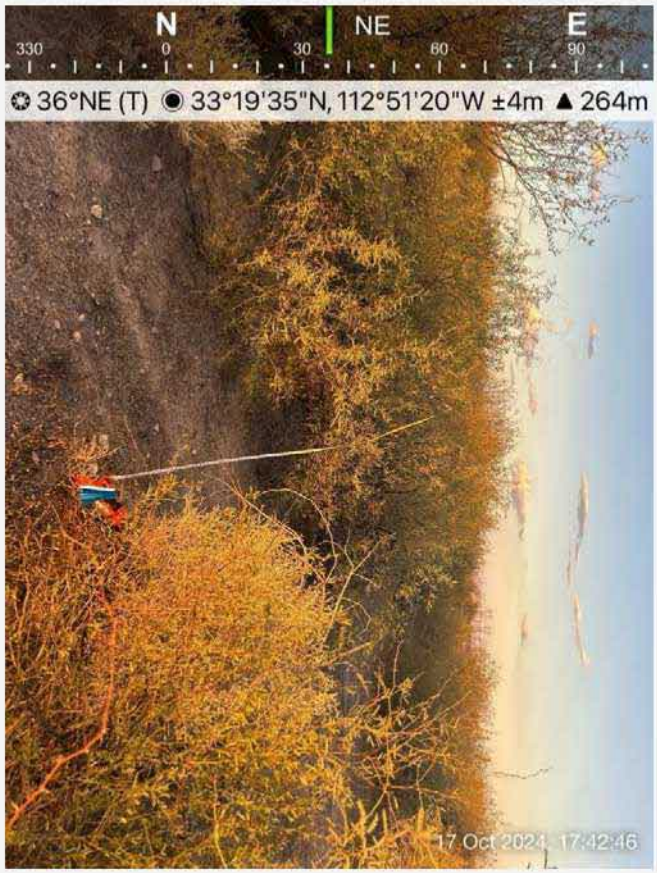


Photo 25. Transcect 11 start.

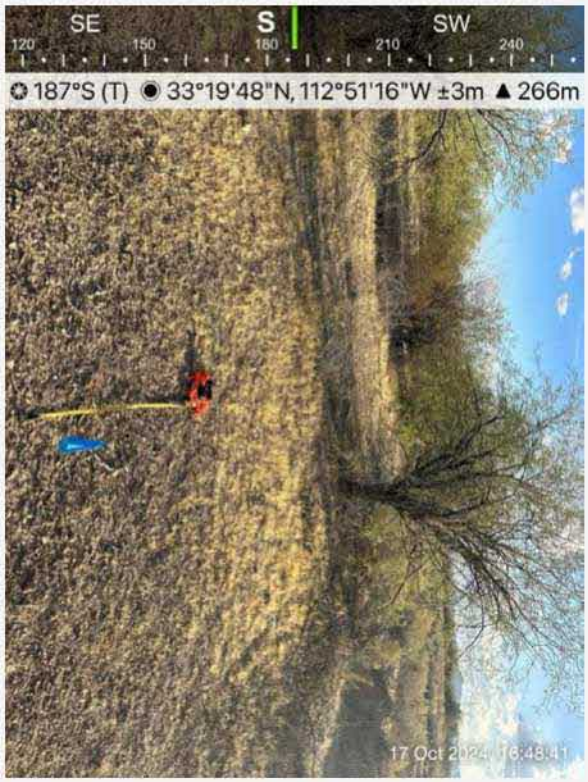


Photo 26. Transect 11 end.

Photo 27. Transcect 12 start.

Photo 28. Transcect 12 end.

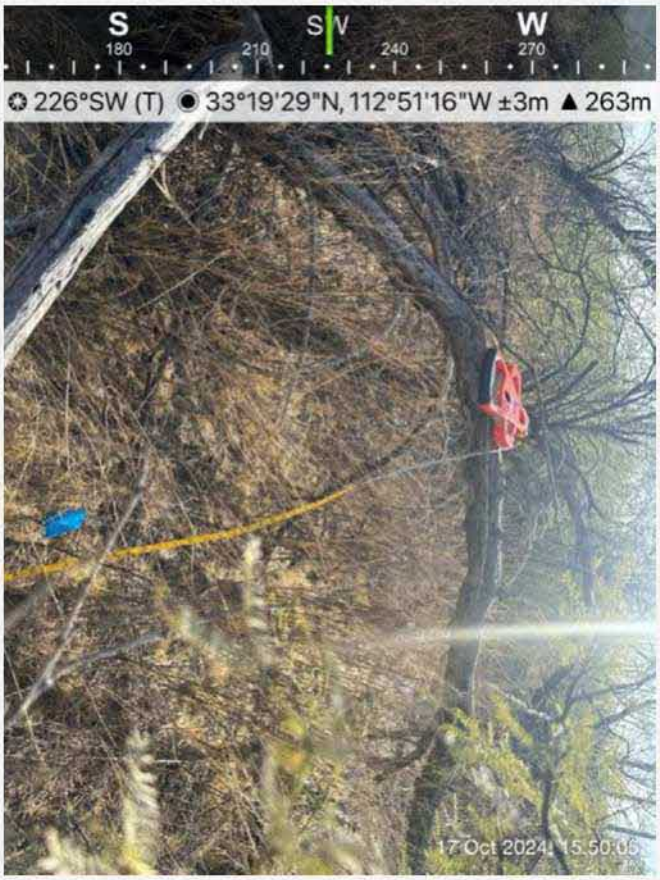


Photo 29. Transcect 13 start.

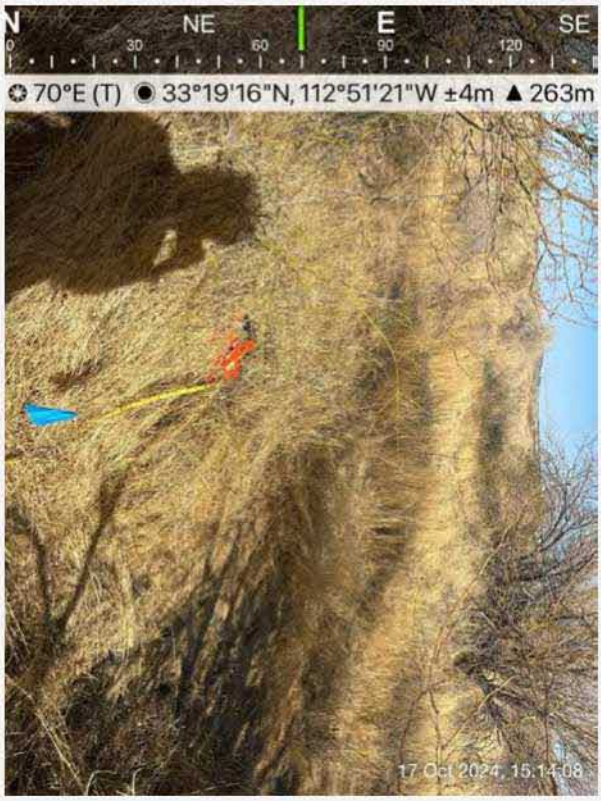


Photo 30. Transect 13 end.

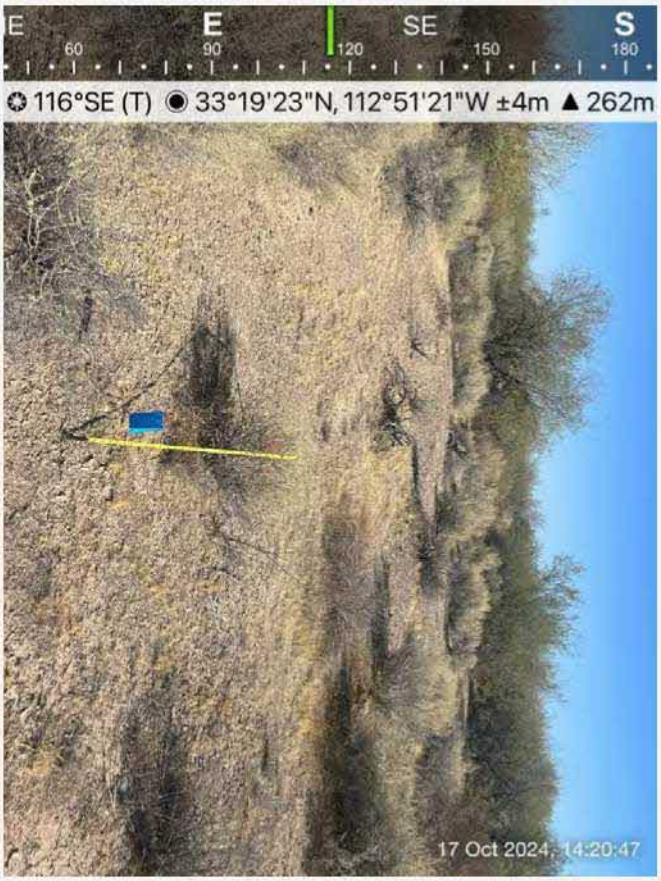


Photo 31. Transcect 14 start.

Photo 32. Transect 14 end.

Photo 33. Transect 15 start.

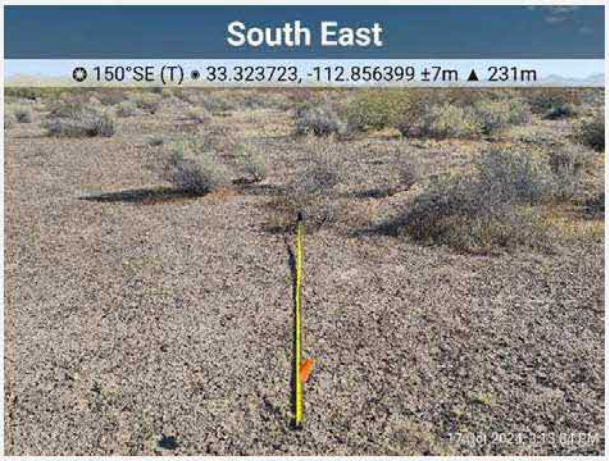


Photo 34. Transect 15 end.

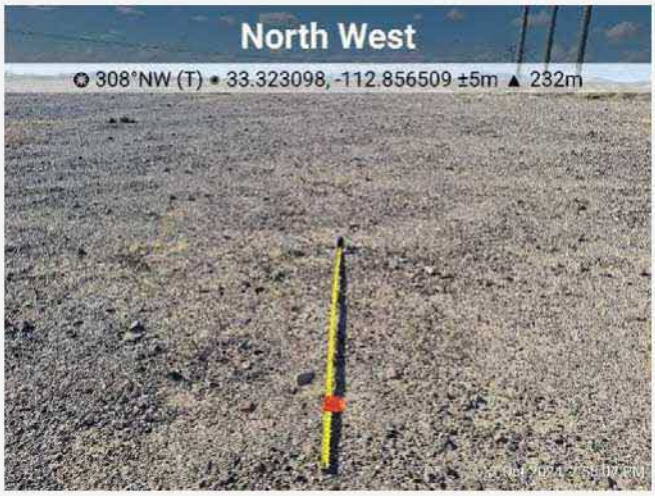


Photo 35. Transect 16 start.

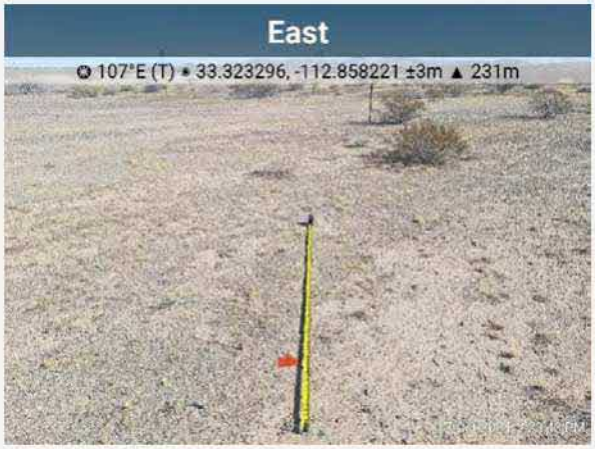


Photo 36. Transect 16 end.

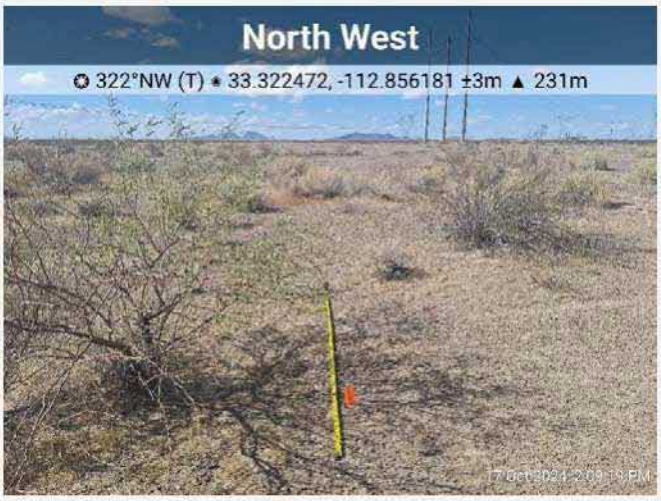


Photo 37. Transect 17 start.

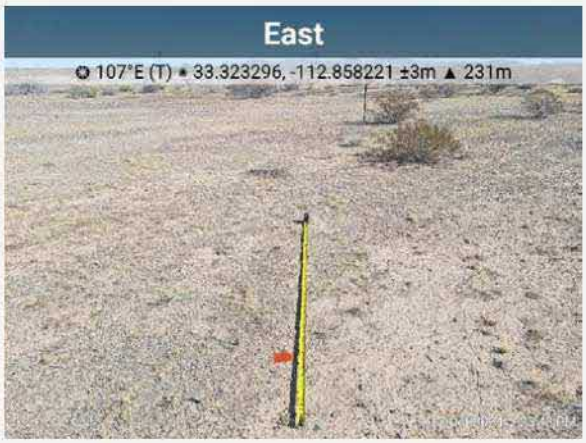


Photo 38. Transect 17 end.

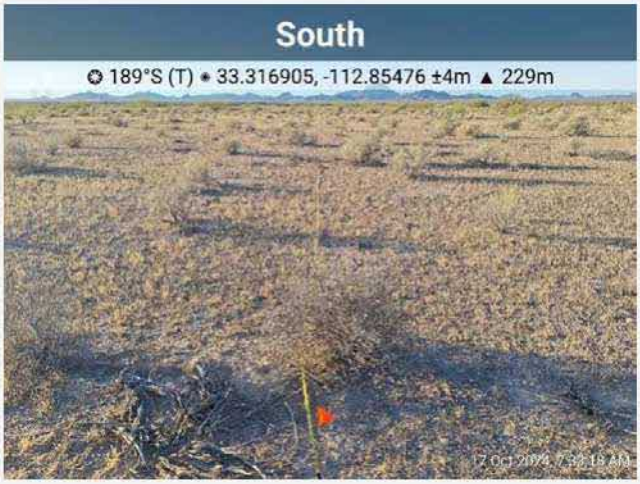


Photo 39. Transect 18 start.

Photo 40. Transect 18 end.

Photo 41. Transect 19 start.

Photo 42. Transect 19 end.

Photo 43. Transect 20 start.

Photo 44. Transect 20 end.

Photo 45. Transect 21 start.

Photo 46. Transect 21 end.

Photo 47. Transcect 22 start.

Photo 48. Transect 22 end.

Photo 49. Transect 23 start.

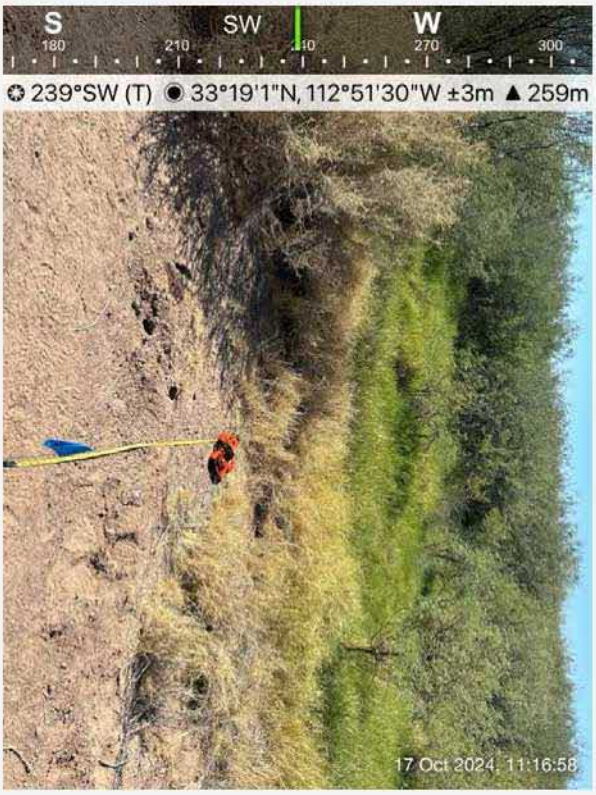


Photo 50. Transect 23 end.

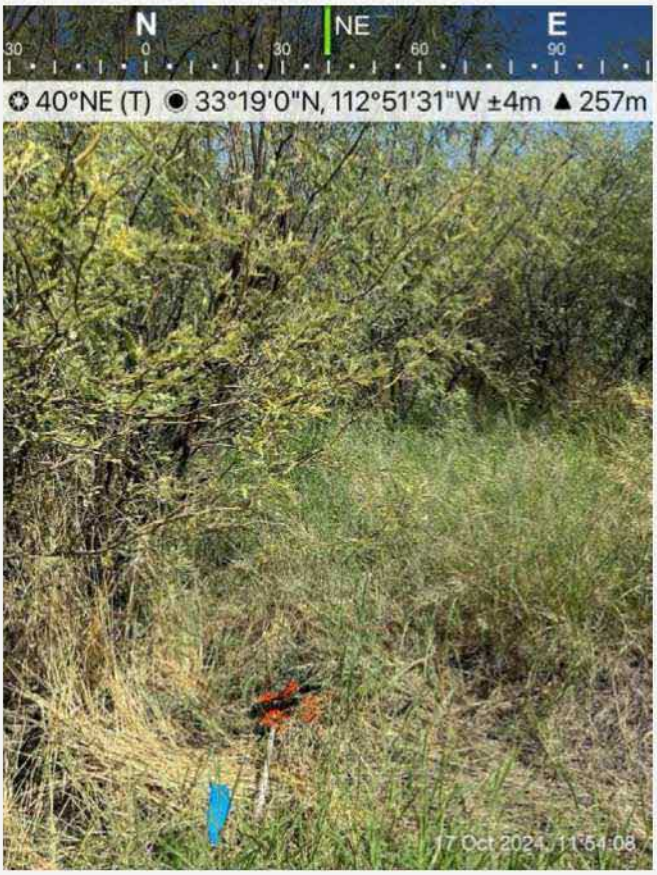


Photo 51. Transcect 24 start.

Photo 52. Transect 24 end.

Photo 53. Transcect 25 start.

Photo 54. Transcect 25 end.

Photo 55. Transcect 26 start.

Photo 56. Transcect 26 end.

Photo 57. Transcribe start.

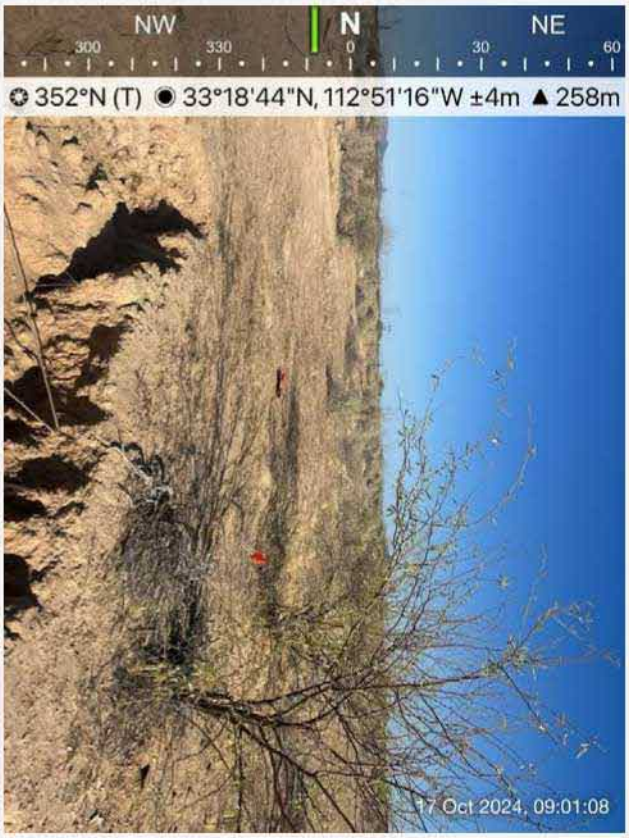


Photo 58. Transcribe end.

Photo 59. Transcect 28 start.

Photo 60. Transect 28 end.

Photo 61. Transect 29 start.

Photo 62. Transect 29 end.

Photo 63. Transcribe start.

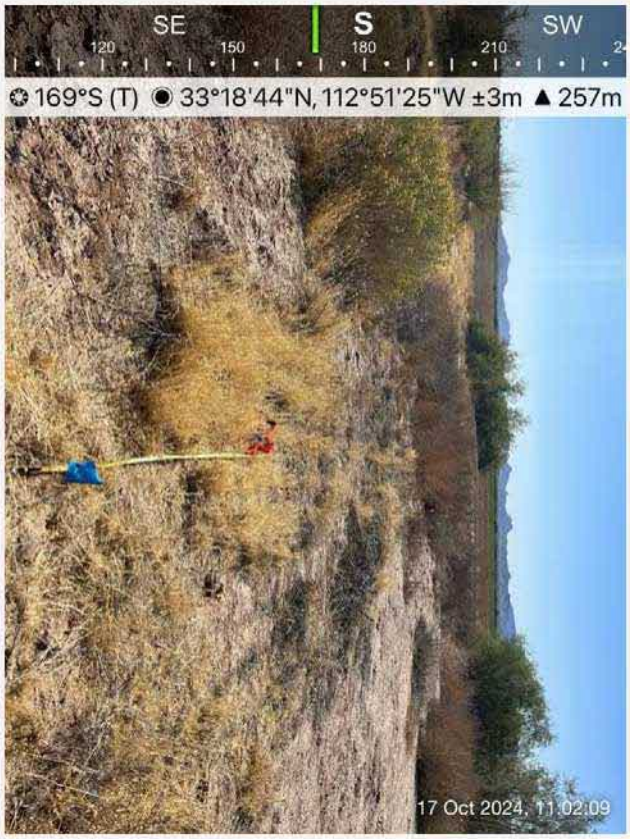


Photo 64. Transcribe end.

Photo 65. Transect 31 start.

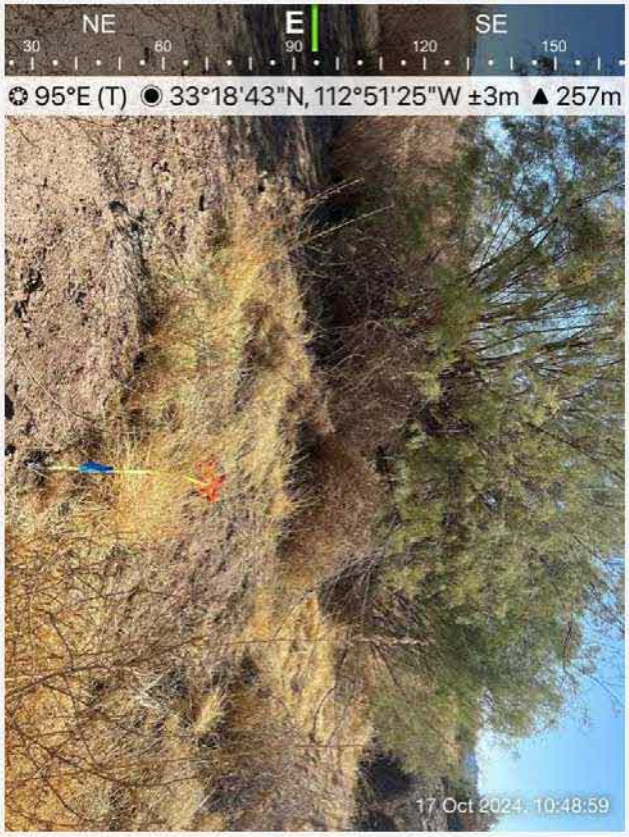


Photo 66. Transect 31 end.

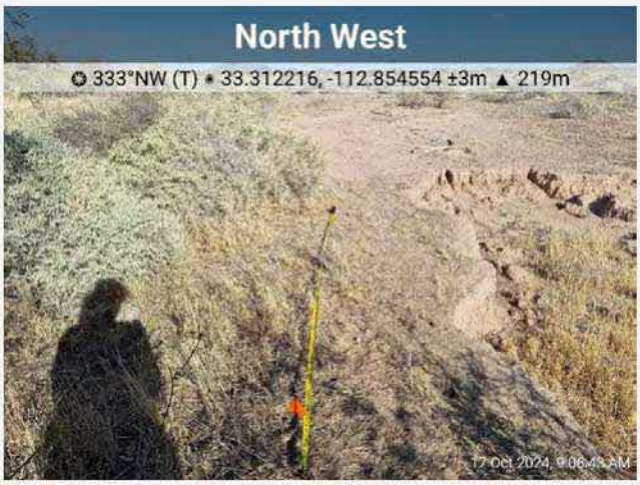


Photo 67. Transect 32 start.

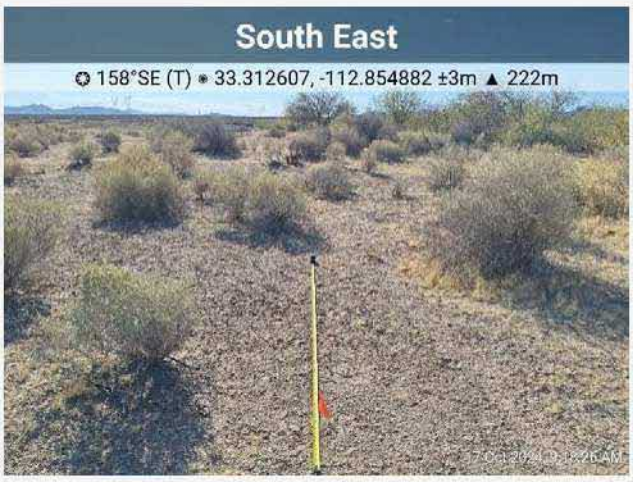


Photo 68. Transect 32 end.

Photo 69. Transect 33 start.

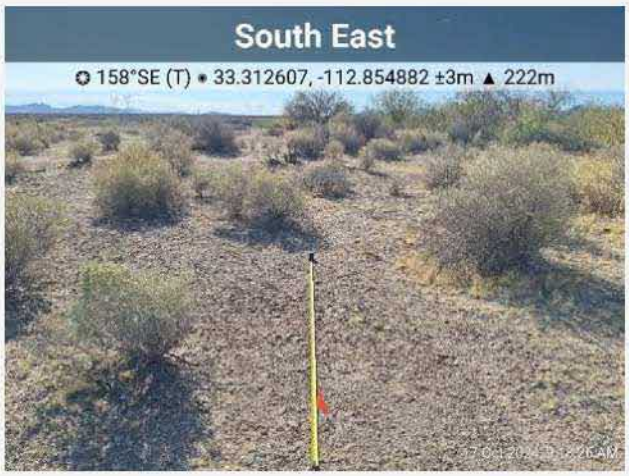


Photo 70. Transect 33 end.

Photo 71. Transect 34 start.

Photo 72. Transect 34 end.

Photo 73. Transect 35 start.

Photo 74. Transect 35 end.

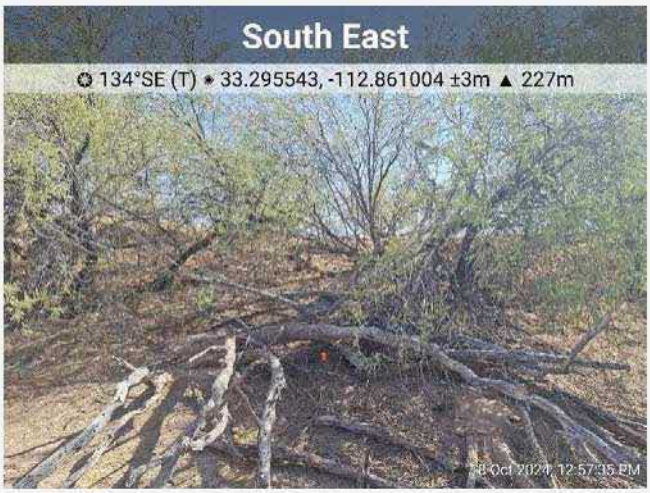


Photo 75. Transect 36 start

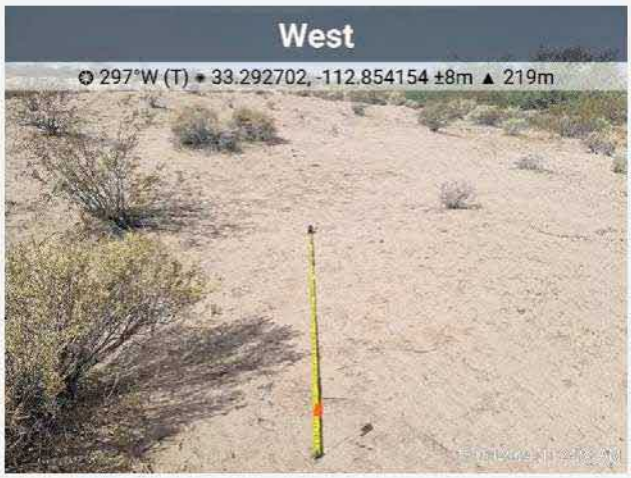


Photo 76. Transect 36 end

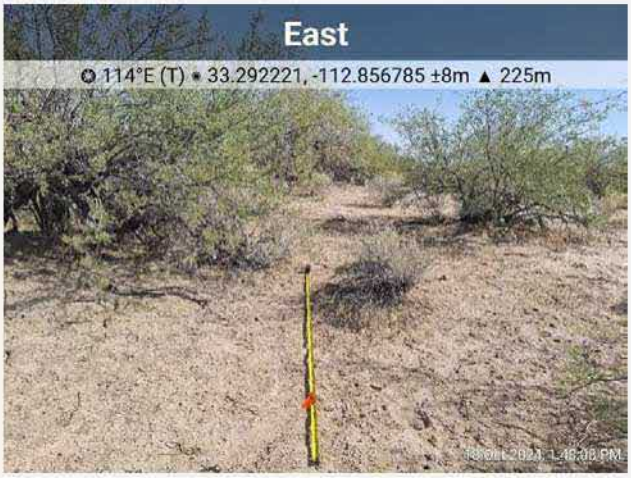


Photo 77. Transect 37 start.

Photo 78. Transect 37 end.

Photo 79. Transect 38 start.

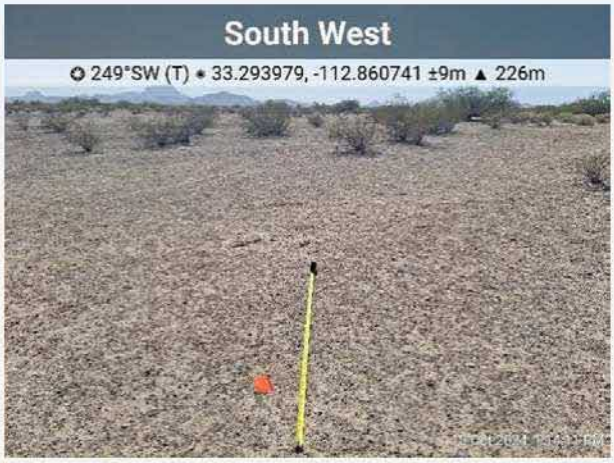


Photo 80. Transect 38 end.

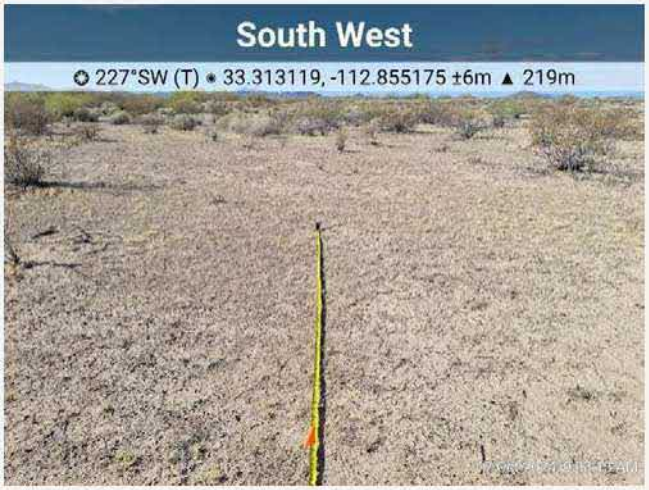


Photo 81 Transect 39 start.

Photo 82. Transect 39 end.

Photo 83. Transect 40 start.

Photo 84. Transect 40 end.

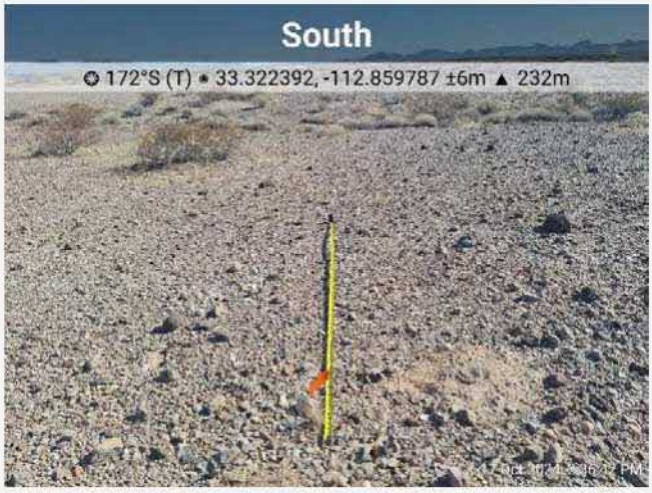


Photo 85. Transect 41 start.

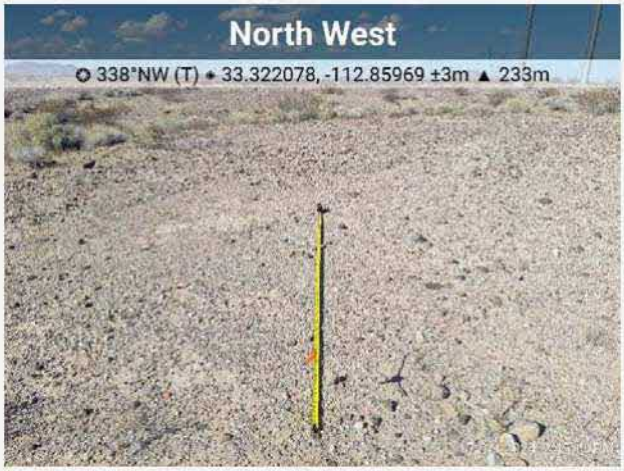


Photo 86. Transect 41 end.

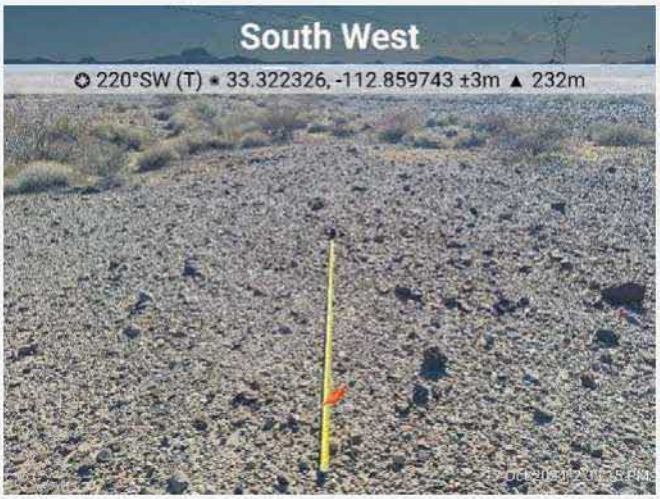


Photo 87. Transect 42 start.

Photo 88. Transect 42 end.

Attachment C

Plant Species Compendium

Vascular Species

Eudicots

ASTERACEAE – SUNFLOWER FAMILY

Ambrosia dumosa – white bursage
Encelia farinosa – brittle bush
Geraea canescens – hairy desert sunflower
Isocoma acradenia – alkali goldenbush
* *Oncosiphon pilulifer* – stinknet
Pluchea sericea – arrow weed

BORAGINACEAE – BORAGE FAMILY

Cryptantha sp. – popcorn flowers

BRASSICACEAE – MUSTARD FAMILY

* *Lepidium latifolium* – perennial pepper weed

CACTACEAE – CACTUS FAMILY

Carnegiea gigantea – saguaro
Cylindropuntia ramosissima – branched pencil cholla
Cylindropuntia fulgida – jumping cholla
Cylindropuntia leptocaulis – desert Christmas cholla
Echinocereus engelmannii – Engelmann's hedgehog cactus

CHENOPODIACEAE – GOOSEFOOT FAMILY

Atriplex canescens – fourwing saltbush
Atriplex polycarpa – allscale
* *Salsola tragus* – prickly Russian thistle

FABACEAE – LEGUME FAMILY

Astragalus sp. – milkvetch
Parkinsonia florida – blue palo verde
Parkinsonia microphylla – foothill palo verde
Prosopis velutina – velvet mesquite
Senegalia greggii – catclaw acacia

KRAMERIACEAE – RHATANY FAMILY

Krameria erecta – littleleaf ratany

MALVACEAE – MALLOW FAMILY

Sphaeralcea ambigua – desert globemallow

OROBANCHACEAE – BROOM-RAPE FAMILY

Aphyllon cooperi – desert broomrape

PLANTAGINACEAE – PLANTAIN FAMILY

Plantago ovata – desert Indianwheat

PAPAVERACEAE – POPPY FAMILY

Argemone pleiacantha – southwestern prickly poppy

POLYGONACEAE – BUCKWHEAT FAMILY

Chorizanthe rigida – rigid spineflower

Eriogonum inflatum – desert trumpet

RHAMNACEAE – BUCKTHORN FAMILY

Ziziphus obtusifolia – graythorn

SIMAROUBACEAE – QUASSIA OR SIMAROUBA FAMILY

Castela emoryi – Emory's crucifixion-thorn

ZYGOPHYLLACEAE – CALTROP FAMILY

Larrea tridentata – creosote bush

MONOCOTS

POACEAE – GRASS FAMILY

* *Bromus rubens* – red brome

* *Cynodon dactylon* – Bermudagrass

Dasyochloa pulchella – low woollygrass

Distichlis spicata – salt grass

* *Echinochloa colona* – jungle rice

* *Eragrostis superba*---wilman lovegrass

Hilaria rigida – big galleta grass

Leptochloa dubia – green sprangletop

* *Polypogon monspeliensis* – annual rabbitsfoot grass

* *Schismus barbatus* – common Mediterranean grass

* Signifies introduced (non-native) species.

Attachment D

Native Plant Inventory Data

Transect ID	Species	Plant Count	Plant Size
T-01	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-02	N/A	N/A	N/A
T-03	N/A	N/A	N/A
T-04	*Prosopis velutina* - velvet mesquite	1	14-16 c.i
T-04	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-04	*Prosopis velutina* - velvet mesquite	1	14-16 c.i
T-04	*Prosopis velutina* - velvet mesquite	1	16-18 c.i
T-04	*Prosopis velutina* - velvet mesquite	1	16-18 c.i
T-04	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-04	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-04	*Prosopis velutina* - velvet mesquite	1	14-16 c.i
T-04	*Prosopis velutina* - velvet mesquite	1	12-14 c.i
T-05	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-05	*Prosopis velutina* - velvet mesquite	1	12-14 c.i
T-05	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-05	*Prosopis velutina* - velvet mesquite	1	14-16 c.i
T-06	N/A	N/A	N/A
T-07	*Cylindropuntia ramosissima* - branched pencil cholla	1	sm (1 gal container)
T-07	*Cylindropuntia ramosissima* - branched pencil cholla	1	sm (1 gal container)
T-08	N/A	N/A	N/A
T-09	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	6	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-09	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-09	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-09	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-09	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-10	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-10	*Prosopis velutina* - velvet mesquite	7	3-4 c.i
T-10	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-10	*Prosopis velutina* - velvet mesquite	2	6-8 c.i
T-10	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-10	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-10	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-10	*Prosopis velutina* - velvet mesquite	4	< 3 c.i
T-10	*Prosopis velutina* - velvet mesquite	5	4-6 c.i
T-10	*Prosopis velutina* - velvet mesquite	3	< 3 c.i

Transect ID	Species	Plant Count	Plant Size
T-10	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-10	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-10	*Prosopis velutina* - *velvet* mesquite	1	< 3 c.i
T-10	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-10	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	15	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	16	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	13	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	10	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	4	4-6 c.i

Transect ID	Species	Plant Count	Plant Size
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	8	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	8	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-11	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	10	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	< 3 c.i
T-11	*Prosopis velutina* - velvet mesquite	6	< 3 c.i
T-12	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-12	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-12	*Prosopis velutina* - velvet mesquite	1	10-12 c.i
T-12	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-12	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-12	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-12	*Prosopis velutina* - velvet mesquite	1	< 3 c.i

Transect ID	Species	Plant Count	Plant Size
T-13	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-13	*Echinocereus engelmannii* - strawberry hedgehog cactus	1	sm (1 gal container)
T-13	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	3	6-8 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	4-6 c.i

Transect ID	Species	Plant Count	Plant Size
T-13	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-13	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-13	*Prosopis velutina* - velvet mesquite	3	6-8 c.i
T-13	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-14	*Prosopis velutina* - velvet mesquite	2	6-8 c.i
T-14	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-14	*Prosopis velutina* - velvet mesquite	3	6-8 c.i
T-14	*Prosopis velutina* - velvet mesquite	4	6-8 c.i
T-14	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-14	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-14	*Prosopis velutina* - velvet mesquite	3	6-8 c.i
T-14	*Prosopis velutina* - velvet mesquite	6	6-8 c.i
T-14	*Prosopis velutina* - velvet mesquite	2	6-8 c.i
T-14	*Prosopis velutina* - velvet mesquite	2	6-8 c.i
T-14	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-15	*Cylindropuntia ramosissima* - branched pencil cholla	1	med (3-5 gal container)
T-15	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-15	*Cylindropuntia ramosissima* - branched pencil cholla	4	sm (1 gal container)
T-15	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-16	*Cylindropuntia leptocaulis* - christmas cholla	1	
T-17	*Cylindropuntia ramosissima* - branched pencil cholla	2	med (3-5 gal container)
T-17	*Cylindropuntia ramosissima* - branched pencil cholla	1	med (3-5 gal container)
T-17	*Cylindropuntia ramosissima* - branched pencil cholla	1	lg (10-15 gal container)
T-17	*Cylindropuntia ramosissima* - branched pencil cholla	3	med (3-5 gal container)
T-17	*Prosopis velutina* - velvet mesquite	1	
T-18	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-18	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-18	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-18	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-18	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-18	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-18	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-19	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-19	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-20	N/A	N/A	N/A
T-21	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-21	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-21	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-22	*Prosopis velutina* - velvet mesquite	1	3-4 c.i

Transect ID	Species	Plant Count	Plant Size
T-22	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-22	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-22	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-22	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-22	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-22	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-22	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-22	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-22	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-22	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-23	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-23	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-23	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-23	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-23	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-24	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-24	*Prosopis velutina* - velvet mesquite	8	< 3 c.i
T-24	*Prosopis velutina* - velvet mesquite	10	3-4 c.i
T-24	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-24	*Prosopis velutina* - velvet mesquite	3	< 3 c.i
T-24	*Prosopis velutina* - velvet mesquite	5	3-4 c.i
T-24	*Prosopis velutina* - velvet mesquite	6	4-6 c.i
T-24	*Prosopis velutina* - velvet mesquite	4	< 3 c.i
T-24	*Prosopis velutina* - velvet mesquite	10	3-4 c.i
T-24	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-24	*Prosopis velutina* - velvet mesquite	5	4-6 c.i
T-24	*Prosopis velutina* - velvet mesquite	8	8-10 c.i
T-25	*Cylindropuntia ramosissima* - branched pencil cholla	1	sm (1 gal container)
T-25	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-25	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-25	*Cylindropuntia leptocaulis* - christmas cholla	1	sm (1 gal container)
T-25	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-25	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)

Transect ID	Species	Plant Count	Plant Size
T-25	*Echinocereus engelmannii* - strawberry hedgehog cactus	1	med (3-5 gal container)
T-25	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-25	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-26	N/A	N/A	N/A
T-27	*Cylindropuntia leptocaulis* - christmas cholla	2	med (3-5 gal container)
T-27	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-28	*Cylindropuntia leptocaulis* - christmas cholla	3	med (3-5 gal container)
T-28	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-28	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-28	*Cylindropuntia leptocaulis* - christmas cholla	1	sm (1 gal container)
T-28	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-28	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-28	*Cylindropuntia leptocaulis* - christmas cholla	1	sm (1 gal container)
T-28	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	
T-29	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-29	*Prosopis velutina* - velvet mesquite	1	10-12 c.i
T-30	N/A	N/A	N/A
T-31	N/A	N/A	N/A
T-32	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-32	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-33	*Prosopis velutina* - velvet mesquite	1	18-20 c.i
T-33	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-34	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-34	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-34	*Castela emoryi* - crucifixion thorn	1	crucifixion thorn, 3< ci.

Transect ID	Species	Plant Count	Plant Size
T-34	*Castela emoryi* - crucifixion thorn	1	crucifixion thorn, 3-4 ci. branch base
T-34	*Castela emoryi* - crucifixion thorn	1	crucifixion thorn, 3< ci.
T-34	*Castela emoryi* - crucifixion thorn	1	crucifixion thorn, 3-4 ci. branch base
T-34	*Castela emoryi* - crucifixion thorn	1	crucifixion thorn, 3-4 ci. branch base
T-35	*Prosopis velutina* - velvet mesquite	2	< 3 c.i
T-35	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-35	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-35	*Prosopis velutina* - velvet mesquite	4	< 3 c.i
T-35	*Prosopis velutina* - velvet mesquite	7	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-35	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	4	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	8	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-35	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	16-18 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	3	< 3 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	16-18 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	4	< 3 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	14-16 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	16-18 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-35	*Prosopis velutina* - velvet mesquite	3	< 3 c.i

Transect ID	Species	Plant Count	Plant Size
T-35	*Prosopis velutina* - velvet mesquite	3	3-4 c.i
T-35	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-35	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-35	*Castela emoryi* - crucifixion thorn	1	crucifixion thorn, 3< ci.
T-35	*Parkinsonia florida* - blue palo verde	1	< 3 c.i
T-35	*Parkinsonia florida* - blue palo verde	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-36	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-36	*Prosopis velutina* - velvet mesquite	2	6-8 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	2	4-6 c.i

Transect ID	Species	Plant Count	Plant Size
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-36	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-37	*Prosopis velutina* - velvet mesquite	2	6-8 c.i
T-37	*Prosopis velutina* - velvet mesquite	3	< 3 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	16-18 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	< 3 c.i
T-37	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-37	*Prosopis velutina* - velvet mesquite	2	3-4 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	4-6 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-37	*Prosopis velutina* - velvet mesquite	3	4-6 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	8-10 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-37	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-37	*Parkinsonia florida* - blue palo verde	1	< 3 c.i
T-38	*Prosopis velutina* - velvet mesquite	1	6-8 c.i
T-38	*Prosopis velutina* - velvet mesquite	1	
T-38	*Prosopis velutina* - velvet mesquite	3	6-8 c.i
T-39	*Cylindropuntia leptocaulis* - christmas cholla	2	med (3-5 gal container)
T-39	*Cylindropuntia ramosissima* - branched pencil cholla	1	med (3-5 gal container)
T-39	*Cylindropuntia ramosissima* - branched pencil cholla	1	med (3-5 gal container)
T-39	*Cylindropuntia ramosissima* - branched pencil cholla	1	sm (1 gal container)
T-39	*Cylindropuntia fulgida* - jumping cholla		sm (1 gal container)
T-39	*Cylindropuntia fulgida* - jumping cholla	1	
T-39	*Prosopis velutina* - velvet mesquite	2	
T-40	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-40	*Prosopis velutina* - velvet mesquite	1	3-4 c.i
T-40	*Prosopis velutina* - velvet mesquite	2	4-6 c.i
T-41	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)
T-41	*Cylindropuntia leptocaulis* - christmas cholla	1	med (3-5 gal container)

Attachment E

Native Plant Disposition and Valuation

Arizona
State Land Department

INSTRUCTIONAL MEMO NO. 12.05

Natural Resources Division

SECTION 12.05 Native Plant Disposition and Valuation

Issued: May 1, 2011

Approved: SLC: /s/ **Last Amended:** November 21, 2011

PURPOSE:

The purpose of this instructional memo is to establish procedures for the implementation of State Land Department Policy Memo No. P79-1 (Disposition of Natural Products) in consort with the Department's Strategic Plan Goal II: "Manage Trust Resources to protect and enhance the long term value of the assets, land and resources."

The subject of valuation was previously covered in Instructional Memo 14.02.

RESPONSIBILITIES:

The Natural Resources Division has the responsibility to review and maintain this Instructional Memo and associated exhibits.

The Natural Resource Conservation Section Manager shall review all plant surveys, prepare a billing statement for same, and forward it to the appropriate administrator.

The current Arizona Department of Agriculture's *Fair Market Value of Protected Native Plants* list shall be used as the primary source for values.

The Land Department Chief Appraiser will review and approve values as submitted.

Amended: 08/30/11; 11/21/11
text: ++ comment added to AU = animal unit; shrub value
form: Exhibit B, p. 3

PROCEDURES:

Removal of Vegetation Incidental to Permitted Uses:

1) A native plant survey shall be conducted for all permitted uses of Trust land that involve surface disturbance, other than provided for under Policy Memo P79-1, and except for disturbances on grazing and commercial leases which are processed under "Application to Place Improvements" or "Land Treatment Applications." The survey must indicate how much of the area will be disturbed. A survey *Sampling Protocol* (Exhibit A) may be utilized for large scale projects. Large scale projects are defined as greater than 20 acres in size. On site specific surveys, the survey shall indicate which trees, cacti and succulents will be removed, preserved in place or salvaged.
2) All data shall be supplied to the administrator in an electronic spreadsheet format, in addition to a printed report. The data shall be retained in the respective lease file(s). The United States Department of Agriculture Natural Resources Conservation Service "Plants" database will be used for nomenclature.
3) The Trust shall be compensated per the *Plant Value List* (Exhibit B). The assessment will be based on the total land under application. Exceptions are urban commercial uses which may include undisturbed buffers, greenways, etc., and overhead transmission lines where only the areas of planned disturbance require a survey (e.g. a 50' radius around wood poles or a 100' radius around large towers and all new access / construction roads within the right-of-way, or where vegetation may be cleared for safety purposes).
4) The applicant shall submit a *Vegetation Checklist* (Exhibit C) with the plant survey.
5) The billing shall reflect the application number and be posted to "09-Unscheduled Royalty."
6) Compensation to the Trust may be adjusted subject to an approved reclamation plan, a reclamation bond and a performance bond.

Removal or damage of Vegetation associated with unpermitted activities:

1) An assessment of vegetated lands, similar to the damaged lands, may be used to ascertain the approximate numbers, sizes and types of plants removed.
2) Retail native plant prices, including prices for shrubs, sub-shrubs, forbs and grasses, shall be used for curing defaults and settling trespass cases. Arizona State Land Department reserves the right to exceed the attached price list under special circumstances including but not limited to the following examples: the trees are of commercial value, are 'old growth,' are removed from riparian areas or located in an urban setting where local standards / restrictions may apply.

Removal of cordwood and / or timber:

Commercial and personal cordwood sales and timber sales are not covered in this instructional memo.

Removal of Vegetation for Scientific Research, etc.

Under certain limited circumstances such as scientific research and small scale seed collection, Special Land Use Permits may be issued for removal of natural products when the true value of the product is less than the costs: (1) of advertising (ten weeks); (2) the public auction, and; (3) the administrative cost, per State Land Department Policy Memo No. P79-1.

Attachment F

Notice of Intent to Clear Land Form

Arizona Department of Agriculture (AZDA)
Central Licensing
Physical Location: 1010 W Washington St., Phoenix, AZ 85007
Mailing Address: 1802 W Jackson St., #78 Phoenix, AZ 85007
Phone: (602) 542-6408 Fax: (602)542-0466
Website: https://agriculture.az.gov Email: licensing@azda.gov

Notice of Intent to Clear Land — ARS § 3-904

Pursuant to A.R.S. § 3-904 the undersigned, as Owner of the Property described herein, gives this Notice of Intent to Clear Land of protected native plants.

1. **Owner/landowner's agent.** The owner or landowner's agent of the Property upon which protected native plants will be affected:

   Owner's Name _____ Phone _____

   Address _____

   Agent's Name _____ Phone _____

   Address _____

2. **Property.** The description and location of the Property upon which protected native plants will be affected:

   County _____

   Name of Property/Project _____

   Address _____

   Physical Location (attach map) _____

   (Note: Map must also show surrounding land for 1/2 mile in each direction)

   Tax Parcel ID Nos. _____

   Legal Description (or attach copy) _____

   Number of Acres to be Cleared _____

3. **Owner's Intent.** Landowner's intentions when clearing private land of protected native plants.

   ☐ Owner intends to allow salvage of the plants, and agrees to be contacted by native plant salvagers.

   ☐ Owner intends to transplant the plants onto the same property, or to another property he also owns.

   ☐ Owner has already arranged for salvage of the plants.

   ☐ Owner does not intend to allow salvage of the plants.

   ☐ Other _____

4. **Approximate starting date.** _____
   (See notice period listed on reverse side)

   The information contained in this application is true and accurate to the best of my knowledge. I understand that providing false information is a felony in Arizona

Signature _____ **Date** _____

Notice to salvagers: Consent of the landowner is required before entering any lands described in this notice.

Explanation Of This Form

1. **Notice of Intent to Clear Land.**
   The majority of the desert plants fall into one of four groups specially protected from theft, vandalism or unnecessary destruction. They include all of the cacti, the unique plants like Ocotillo, and trees like Ironwood, Palo Verde and Mesquite. In most cases the destruction of these protected plants may be avoided if the private landowner gives prior notice to the Arizona Department of Agriculture.

2. **Notice Period.**
   When properly completed, this form is to be sent to the Department within the time periods described below. Landowners/ developers are encouraged to salvage protected native plants whenever possible.

3. **Information to Interested Parties.**
   The information in this notice will be posted in the applicable state office of the Department and mailed to those parties (salvage operators, revegetation experts) who have an interest in these plants and may approach the landowner with the possibility of saving the plant(s) from unnecessary destruction.

Notice to Landowner:

1. The owner may not begin destruction of protected native plants until he receives confirmation from the Arizona Department of Agriculture and the time prescribed below has elapsed. The "Confirmed" stamp only verifies that the Notice has been filed.

Size of area over which the Destruction of Plants will occur	**Length of Notice Period**
Less than one acre	20 days, oral or written
One acre or more, but less than 40 acres	30 days, written
40 acres or more	60 days, written

2. If you are clearing land over an area of less than one acre, oral notice may be given by calling the applicable state office at the telephone number given below.
3. If the land clearing or plant salvage does not occur within one year, a new Notice is required.

This Notice must be sent to the applicable state office of the Department of Agriculture at the address given below:

Central Licensing
Physical Location: 1010 W Washington St., Phoenix, AZ 85007
Mailing Address: 1802 W Jackson St., #78 Phoenix, AZ 85007
Email: licensing@azda.gov

Notice to salvagers: Consent of the landowner is required before entering any lands described in this notice.

APPENDIX B-3.
Biological Habitat Assessment

MEMORANDUM

To:	Alex Simons (NextEra)
From:	Michelle Leis (Dudek)
Subject:	Biological Habitat Assessment for the New MV Line Corridor Alignment for the Vulcan Solar Project
Date:	May 8, 2025
cc:	David Brown and Lori Browne (NextEra) Allison Rice and Jeffrey Zuczek (Dudek)
Attachments:	A – Figures 1–6 B – USFWS IPaC Search Results C – AZGFD Heritage Data Management System SGCN for Maricopa County D – BLM Phoenix District Office Sensitive Species List

1 Introduction

This memo presents the findings of a desktop biological habitat assessment conducted by Dudek for the new medium-voltage (MV) line corridor alignment for the Vulcan Solar Project (project) in Maricopa County, Arizona. The purpose of this assessment is to evaluate the existing biological conditions of the new MV line corridor alignment and how they compare to the original MV line corridor alignment previously surveyed for the project (Dudek 2025a).

1.1 Project Location

The review area consists of 95.45 acres of undeveloped Bureau of Land Management (BLM) lands in Maricopa County, Arizona (Figure 1, Project Location; all figures are presented in Attachment A).

- **County:** Maricopa
- **U.S. Geological Survey 7.5-Minute Quadrangle:** Arlington and Gillespie
- **Latitude, Longitude:** 33.28120°, -112.89875° (Centroid)
- **Elevation Range:** 853–962 feet above mean sea level
- **Review area:** 95.45 acres

2 Methods

Dudek biologists familiar with resources found within the vicinity of the review area conducted a desktop review of the new MV line corridors to evaluate if the change in the footprint of the MV line corridors would result in any impacts to biological resources that were not accounted for in the previous surveys conducted (Figure 2, Review Area). As part of the evaluation, Dudek completed a literature review, vegetation community and land cover mapping, and a special-status plant and wildlife species assessment.

Literature Review

The following data sources were reviewed to assist with the assessment of biological resources:

- Aerial photographs (Google Earth 2025)
- Arizona Game and Fish Department (AZGFD) Heritage Data Management System (AZGFD 2025a)
- Arizona Environmental Review Tool (AZGFD 2025b)
- U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey (USDA 2025)
- U.S. Geological Survey National Hydrography Dataset and Watershed Boundary Dataset (USGS 2023)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (USFWS 2025a)
- USFWS Critical Habitat and Species Occurrence Data (USFWS 2025b)
- USFWS Information for Planning and Consultation (IPaC) (USFWS 2025c)
- Habitat Assessment Report for the Vulcan Solar Project in Maricopa County, Arizona (Dudek 2025a)
- Aquatic Resources Delineation Report for the Vulcan Solar Project in Maricopa County, Arizona (Dudek 2025b)
- Vulcan Solar Project Biological Survey Report (Heritage Environmental Consultants 2024)

Vegetation Community and Land Cover Mapping

Dudek reviewed the AZGFD Online Environmental Review Tool (AZGFD 2025b), the previously mapped vegetation for the MV line corridor (Dudek 2025a, 2025b), and aerial imagery to digitize vegetation communities and land cover within the review area. Once in ArcGIS, the acreage of each vegetation community and land cover type within the review area was determined.

Special-Status Plant and Wildlife Species Assessment

Site-specific information was reviewed to assess special-status species' potential to occur within the review area. The location of the review area, vegetation communities and land covers, each species' known range, species' habitat preferences, and knowledge of the species' relative distributions in the area were considered when assessing potential to occur. For the purpose of this report, special-status species include the following:

1. Species that are currently listed, proposed for listing, or candidates for listing under the Endangered Species Act by USFWS that have the potential to occur within the review area as identified by the IPaC tool (see Attachment B, USFWS IPaC Search Results)
2. AZGFD Species of Greatest Conservation Need (see Attachment C, AZGFD Heritage Data Management System SGCN for Maricopa County)
3. Species designated as sensitive by BLM (2017) due to the review area's proximity to BLM lands (see Attachment D, BLM Phoenix District Office Sensitive Species List)
4. Species protected under the Bald and Golden Eagle Protection Act

3 Results

3.1 Terrain and Soil

The elevation across the review area ranges from approximately 853 feet above mean sea level to 962 feet above mean sea level.

According to the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey, six soil types occur within the review area (Figure 3, Soils). The soil types and characteristics found within the review area are summarized in Table 1. All soils in the review area were present in the previous MV line corridor alignment (Dudek 2025a).

Table 1. Summary of Soil Units in the Review Area

Soil Map Unit Name	Landform	Land Use	Drainage Class	Acres
Dateland-Cuerda Complex, 0%–3% slopes	Alluvial fans, stream terraces, fan piedmonts, or relict basin floors; floodplains	Livestock grazing and wildlife habitat	Well-drained soils	0.57
Gilman Loam, 0%–1% slopes	Floodplains and alluvial fans	Livestock grazing and irrigated cropland	Well-drained soils	2.67
Gunsight-Chuckawalla Complex, 1%–15% slopes	Fan terraces and/or stream terraces	Livestock grazing and recreation; watersheds	Somewhat excessively drained and well-drained soils	50.04
Gunsight-Rillito-Carizzo Complex, 1%–15% slopes	Fan terraces and/or stream terraces	Livestock grazing and recreation; watersheds	Somewhat excessively drained and well-drained soils	32.64
Harqua Complex, 0%–3% slopes	Fan terraces or stream terraces	Irrigated areas planted for alfalfa, cotton, small grains, and other crops	Well-drained soils	7.75
Harqua-Gunsight Complex, 0%–5% slopes	Fan terraces or stream terraces	Irrigated areas planted for alfalfa, cotton, small grains, and other crops	Well-drained soils	1.77
			Total	**95.44***

Source: USDA 2025.
* may not sum precisely due to rounding

3.2 Hydrology

The review area is within the Centennial Wash Subbasin (Hydrologic Unit Code [HUC] 8: 15070104). More specifically, the review area is within the Lower Harquahala Plains–Centennial Wash Watershed (HUC 10: 1507010407). National Wetlands Inventory data for the review area shows several networks of channels that are associated with Centennial Wash, a large channel located north of the review area. None of the review area is classified as a floodplain or flood hazard area per the Federal Emergency Management Agency National Flood Hazard Layer (FEMA 2025) (see Figure 4, Hydrologic Setting).

3.2.1 Aquatic Resources

Dudek completed a jurisdictional delineation of the original MV line corridor in October 2024. Aquatic resources delineated within the original MV line corridor included ephemeral channels and braided ephemeral channels (Dudek 2025b). Due to the minimal change in the corridor alignment and a review of aerial imagery (Google Earth 2025), it is anticipated that any aquatic resources that would intersect the review area would be extensions of

previously mapped ephemeral features, which do not meet the relatively permanent standard and do not have connectivity to a water of the United States as required to be considered a water of the United States under the current U.S. Environmental Protection Agency definition.

3.3 Vegetation Communities and Land Cover

Dudek reviewed the vegetation communities and land covers that were mapped for the original MV corridor alignment (Dudek 2025a). Based on the original mapping and a review of aerial imagery associated with the mapped vegetation communities and land cover, Dudek was able to extrapolate the results to the review area with no additional vegetation communities or land cover types anticipated to occur (see Figure 5, Vegetation Communities and Land Cover Types). Table 2 summarizes the vegetation communities and land cover types within the review area with full descriptions of these communities found in the habitat assessment previously completed by Dudek (2025a).

Table 2. Vegetation Communities and Land Cover Within the Review Area

Vegetation Community	Acres
Sonora–Mojave Creosotebush–White Bursage Desert Scrub	44.60
Sonoran Paloverde–Mixed Cacti Desert Scrub	41.46
North American Warm-Desert Xeric-Riparian Scrub	8.78
North American Warm Desert Pavement	0.45
Developed	0.16
Total	**95.45**

3.4 Special-Status Plant Species

According to a literature review including the USFWS IPaC report, AZGFD Heritage Data Management System, AZGFD Environmental Review Tool, and BLM sensitive species list for the Phoenix District Office, 11 special-status plant species could potentially occur within the review area (see Attachments B, C, and D). Based on the previous biological surveys performed by Dudek in this area (Dudek 2025a), none of these species were found to have potential to occur due to the review area being outside of the known population occurrences, outside the species elevation ranges, and/or outside of suitable vegetation and/or soil habitat. Based on the proximity of the previous biological survey results and the general homogenous nature of the review area, it is unlikely that any special-status plant species are present.

3.4.1 Native Plants

Native plants are likely to occur based on the vegetation communities present within the review area. Any protected native plants may not be legally possessed, taken, or transported from the growing site without a permit.

3.4.2 Noxious and Invasive Plant Species

Invasive plant species are regulated through Arizona Administrative Code Sections R3-4-245, R3-4-101, and R3-4-201, as well as Arizona Revised Statutes 3-201. These statutes require the Arizona Department of Agriculture to

determine which non-native species are defined as invasive or noxious, requiring regulation for control. Based on vegetation communities present within the review area, it is likely invasive and noxious non-native plant species are present.

3.5 Special-Status Wildlife Species

According to the USFWS IPaC report, AZGFD Heritage Data Management System, and BLM sensitive species list for the Phoenix District Office, 51 special-status wildlife species could potentially occur within review area (see Attachments B, C, and D). Based on the previous biological surveys performed by Dudek in this area (Dudek 2025a), 13 special-status species have a low to high potential to occur, roost, or nest in the review area. The proximity of the previous biological survey results combined with the general homogenous nature of the review area makes it unlikely that any additional special-status wildlife species would have the potential to occur. Table 3 summarizes the special-status wildlife species with potential to occur within the review area.

Table 3. Special-Status Wildlife Species with Potential to Occur within the Review Area

Scientific Name	Common Name	Status (Federal/State)
Anaxyrus microscaphus	Arizona toad	SS/SGCN
Smilisca fodiens	lowland burrowing tree frog	SS/SGCN
Rana yavapaiensis	lowland leopard frog	SS/SGCN
Gopherus morafkai	Sonoran desert tortoise	SS/SGCN
Glaucidium brasilianum cactorum	cactus ferruginous pygmy-owl	SS/SGCN
Colaptes chrysoides	gilded flicker	SS/SGCN
Toxostoma lecontei	Le Conte's thrasher	SS/SGCN
Empidonax traillii extimus	southwestern willow flycatcher	FE/SGCN
Athene cunicularia hypugaea	western burrowing owl	SS/SGCN
Coccyzus americanus	western yellow-billed cuckoo	FT/SGCN
Rallus obsoletus (=longirostris) yumanensis	Yuma Ridgway's (Clapper) rail	FE/SGCN
Canis lupus baileyi	Mexican gray wolf	FE/SGCN
Antilocapra americana sonoriensis	Sonoran pronghorn	EXPN/SGCN

Source: Attachments B, C, and D.
Status Legend
Federal
EXPN: Experimental population, non-essential
FE: Federally listed as endangered
FT: Federally listed as threatened
SS: Bureau of Land Management sensitive species
State
SGCN: Arizona Game and Fish Department Species of Greatest Conservation Need

3.5.1 Migratory Birds

The review area supports suitable habitat for nesting bird species. Nesting birds are protected under the Migratory Bird Treaty Act, and compliance with these regulations is required. Removal of vegetation considered suitable for nests has the potential to impact these species.

3.6 Other Areas of Conservation Concern

Dudek reviewed the AZGFD Online Environmental Review Tool for listed critical habitat within the review area. The review area is not within or adjacent to any other habitat conservation plan areas or designated conservation areas. Aquatic resources are considered a sensitive community and are discussed in above in Section 3.2.1, Aquatic Resources, and in the aquatic resources delineation report for the project (Dudek 2025b). No other sensitive communities, including USFWS-designated critical habitat or National Oceanic and Atmospheric Administration essential fish habitat, were identified during the literature review or during the previous biological survey.

Dudek reviewed BLM habitat categories and mitigation recommendations on Sonoran desert tortoise (*Gopherus morafkai*). The proposed review area is not within Sonoran desert tortoise-designated habitat (see Figure 6, BLM Sonoran Desert Tortoise Habitat). However, the Sonoran desert tortoise is a candidate species and managed as a BLM sensitive species, and BLM is concerned about two main issues when mitigating impacts to Sonoran desert tortoise, especially on construction projects: (1) "avoiding, minimizing or eliminating loss or degradation of habitat" and (2) "avoiding or minimizing take of tortoises" (BLM 2012). The intent of the BLM mitigation policy is "to maintain habitat in order to ensure the existence of viable populations and thus reduce the need for listing the species" (BLM 2012).

4 Survey Results from Adjacent Bureau of Land Management Lands

Heritage Environmental Consultants previously performed protocol surveys for the solar array sub areas (see Figure 1) associated with the project. The survey plan was submitted and approved by AZGFD on July 27, 2022, and approved by BLM on March 28, 2023. The results of the surveys are captured in the Vulcan Solar Project Biological Survey Report (Heritage Environmental Consultants 2024), which has been submitted and approved by BLM. As part of the approved survey plan, qualified biologists performed biological surveys within 50 feet of ephemeral drainages concurrently with jurisdictional water surveys and within 150 feet of the avian point count survey locations for the following pertinent resources:

- Sonoran desert tortoise
- Desert kit fox (*Vulpes macrotis arsipus*) and burrowing owl (*Athene cunicularia*)
- Sonoran pronghorn (*Antilocapra americana sonoriensis*)

Additionally, thrasher surveys and avian point counts, as well as quantitative botanical surveys, were conducted as part of the approved survey plan. A summary of the results of these surveys is presented in further detail below.

4.1 Sonoran Desert Tortoise

There is potentially suitable habitat for Sonoran desert tortoise, but no individual tortoises or characteristic sign were observed during the survey conducted in October 2022, during additional surveys conducted within 150 feet of avian point count locations in March and May 2023, or during the protocol surveys conducted in August 2023. Data suggests that tortoises do not occupy the solar array sub areas (Heritage Environmental Consultants 2024).

4.2 Desert Kit Fox and Burrowing Owl

No kit fox individuals or active burrows were observed during the survey conducted in October 2022 or the survey conducted in August 2023. One kit fox was observed incidentally crossing Agua Caliente Road immediately east of the solar array sub areas in the early morning by surveyors performing February 2023 avian point count surveys. There were 79 potential kit fox burrows or burrow complexes observed during the survey efforts with some displaying older fox sign.

A total of 79 potentially suitable burrowing owl burrows were recorded during the survey. However, no burrowing owl individuals or owl sign were observed during the survey efforts conducted in October 2022; during the surveys conducted in March, May, and August 2023; incidentally during other field survey efforts; or while driving to and from site (Heritage Environmental Consultants 2024). However, during the field biological survey performed by Dudek in October 2024, two individuals were observed within the generation tie right-or-way with one of the owls observed flushing from a burrow (Dudek 2025a). No other incidental or direct observations of burrowing owl have been observed.

4.3 Sonoran Pronghorn

Suitable habitat for Sonoran pronghorn exists within the solar array sub areas, and telemetry data shows that pronghorn have been detected in the vicinity of the review area as recently as 2016 (Haan 2022). No Sonoran pronghorn individuals were observed during the jurisdictional waters survey conducted in October 2022; during the surveys conducted in March, May, and August 2023; incidentally during other field survey efforts; or while driving to and from site (Heritage Environmental Consultants 2024).

4.4 Thrasher Surveys and Avian Point Counts

Surveys were conducted to determine thrasher use and other avian species use of the review area. Thrasher surveys were completed concurrently with the avian surveys. Surveys were conducted in February, March, May, and June of 2023.

Thrasher Surveys

A total of 49 thrashers were detected during the four avian point count surveys; all four target thrasher species were detected at least once (Heritage Environmental Consultants 2024). The four thrasher species included Bendire's thrasher (*Toxostoma bendirei*), Crissal thrasher (*Toxostoma crissale*), curve-billed thrasher (*Toxostoma curvirostre*), and LeConte's thrasher (*Toxostoma lecontei*).

Avian Point Counts

Avian diversity and abundance during the May survey was lower than the February, March, and June surveys. While the February and March surveys had a higher diversity of species than the June survey, they had a lower abundance. Avian abundance was highest during the June survey. A total of 51 identified species and 893 individuals were observed and recorded over the course of the surveys. The white-crowned sparrow (*Zonotrichia leucophrys*) was the most frequently observed bird species, followed by mourning dove (*Zenaida macroura*) and ash-throated flycatcher (*Myiarchus cinerascens*). Verdins (*Auriparus flaviceps*), common ravens (*Corvus corax*), and chipping

sparrows (*Spizella passerina*) also accounted for a large number of the observations. Ash-throated flycatchers, mourning doves, and white-crowned sparrows were observed at 15 of the 18 survey points over the course of the surveys (Heritage Environmental Consultants 2024).

4.5 Quantitative Botanical Surveys (AIM Plots)

Eight Assessment, Inventory, and Monitoring (AIM) plots were surveyed to estimate the percentage of foliar cover, bare ground cover, and basal cover, as well as density (for woody and invasive species), species richness, and vegetation composition of each plot. There was an average foliar cover of 21.25% with an average bare ground percentage of 37.17%. Species richness, the number of different species observed for a given area, is the best indicator of plant diversity. A total of 30 species were encountered in the eight AIM plots for a richness of 5.36 species per acre. The common desert shrub creosote bush (*Larrea tridentata*) was encountered at all plots, as were annual plants, such as desert Indianwheat (*Plantago ovata*) and rigid spineflower (*Chorizanthe rigida*). Other common desert shrubs, such as white bursage (*Ambrosia dumosa*) and triangle bur ragweed (*Ambrosia deltoidea*), were observed in several AIM plots.

The belt transects associated with the AIM plots were used to calculate plant density per acre by counting the total number of plants of a certain species or group in each belt transect then dividing that by the total acreage of the belt transect. The average number of individual annual plants was calculated to be approximately 55,799 annual plants per acre. The average number of individual woody shrubs and cacti was calculated to be approximately 611 annual plants per acre.

All these data combined reflect what would be expected for the Sonoran Desert habitat: sparse plant cover (small canopies dominated by shrubs), low plant diversity (low species numbers), relatively short height (shrubs but few trees), and lots of non-vegetated space in between (large gaps between plants) occupied by desert pavement and other non-vegetative cover (Heritage Environmental Consultants 2024).

5 Conclusions

5.1 Vegetation Surveys

The majority of the review area is composed of Sonora–Mojave creosote bush–white bursage desert and Sonoran paloverde–mixed cacti desert scrub. Vegetation surveys were completed on the adjacent BLM lands (Heritage Environmental Consultants 2024), and vegetation mapping was completed for the previous MV line corridor alignment (Dudek 2025a). Given the similarities in species distribution and soil types observed for the solar array sub areas and the previous MV line corridor alignment, it is unlikely that surveys of the review area would result in a different relative percentage of native vs non-native species, diversity, and/or richness. Therefore, additional vegetation surveys are not likely to yield different results.

5.2 Special-Status Wildlife Species

5.2.1 Sonoran Desert Tortoise

Similar to the adjacent BLM lands and the previous MV line corridor alignment, the review area exhibits the same fairly homogenous vegetation communities. Since no evidence of Sonoran desert tortoise was observed during the

previously performed protocol surveys (Heritage Environmental Consultants 2024) or the 2024 habitat assessment (Dudek 2025a), it is reasonable to extrapolate that no sign would be detected within the review area were further surveys performed.

5.2.2 Avian Species

Of the 13 special-status wildlife species that were determined to have potential to occur within the review area, 7 of them were avian species. During thrasher surveys and avian point counts, two of those special-status wildlife species and three additional thrasher species were confirmed present within the adjacent BLM lands: Bendire's thrasher, Crissal thrasher, curve-billed thrasher, LeConte's thrasher, and gilded flicker (*Colaptes chrysoides*). No other special-status avian species, including western burrowing owl (*Athene cunicularia hypugaea*), was observed during protocol surveys or the avian surveys. One incidental observation of burrowing owls did occur within the generation tie during the previous habitat assessment, as detailed in Section 4.2, Desert Kit Fox and Burrowing Owl, but given the distance from the review area, the observation does not warrant any additional avian-specific surveys. Given the similarities in vegetation communities, nesting opportunities, and prey base between the adjacent BLM lands and the review area, it is reasonable to extrapolate that the same avian diversity would be documented using the review area if additional surveys were performed.

6 References

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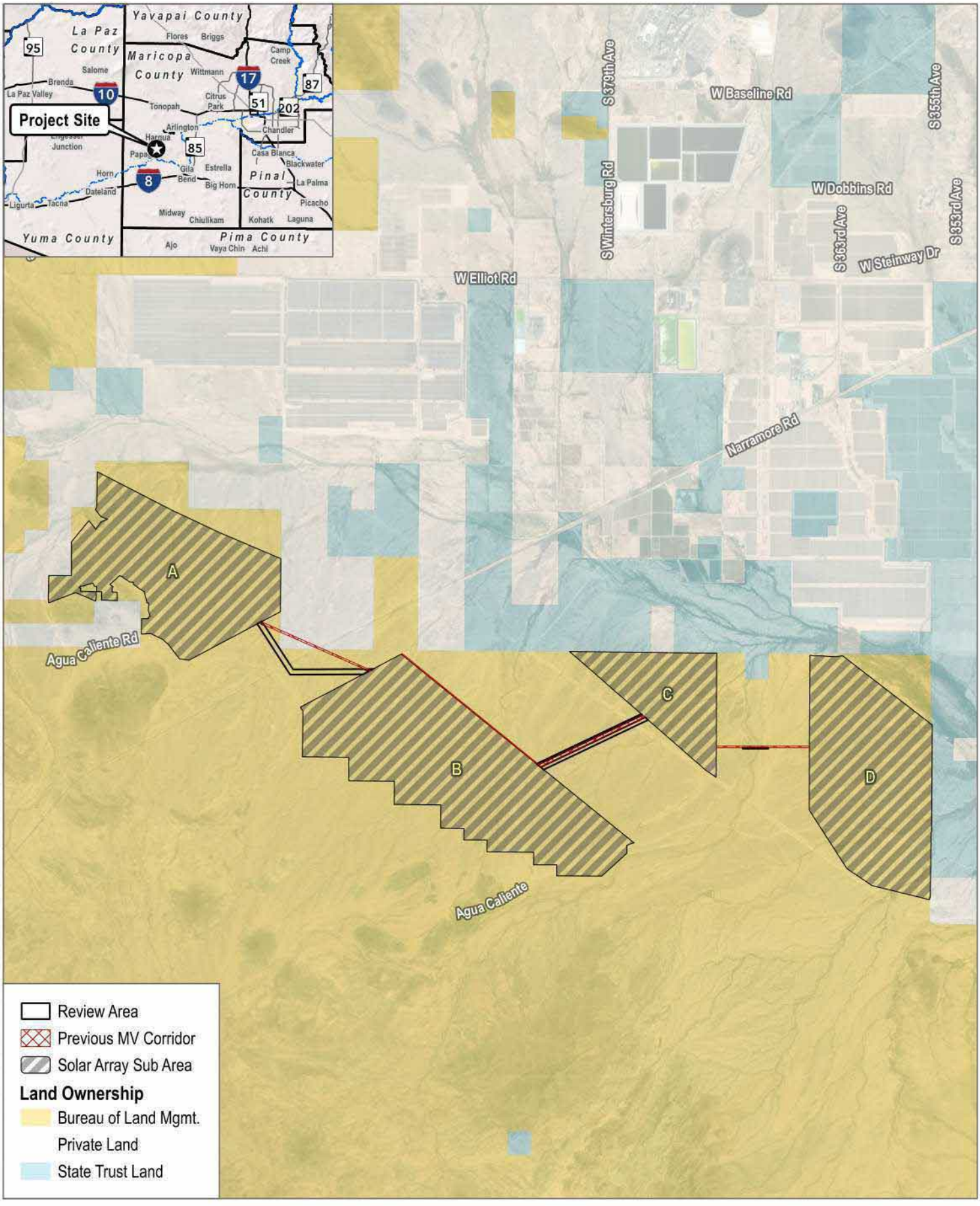
Attachment A

Figures 1–6



SOURCE: ESRI Aerial Imagery;

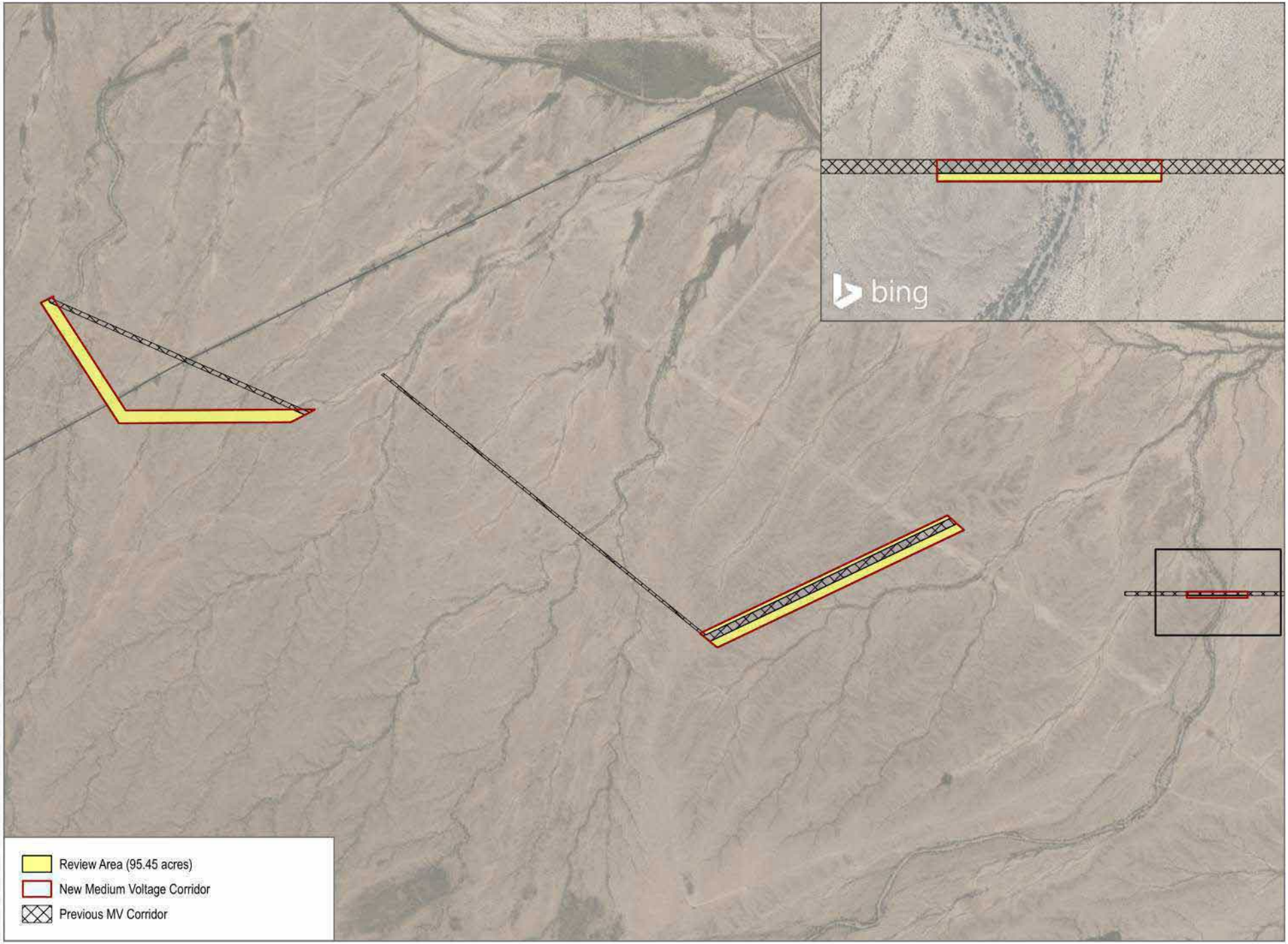
DUDEK

0 3,750 7,500 Feet

FIGURE 1

Project Location

Vulcan Solar Project



SOURCE: BLM 2016; Bing Maps 2023;

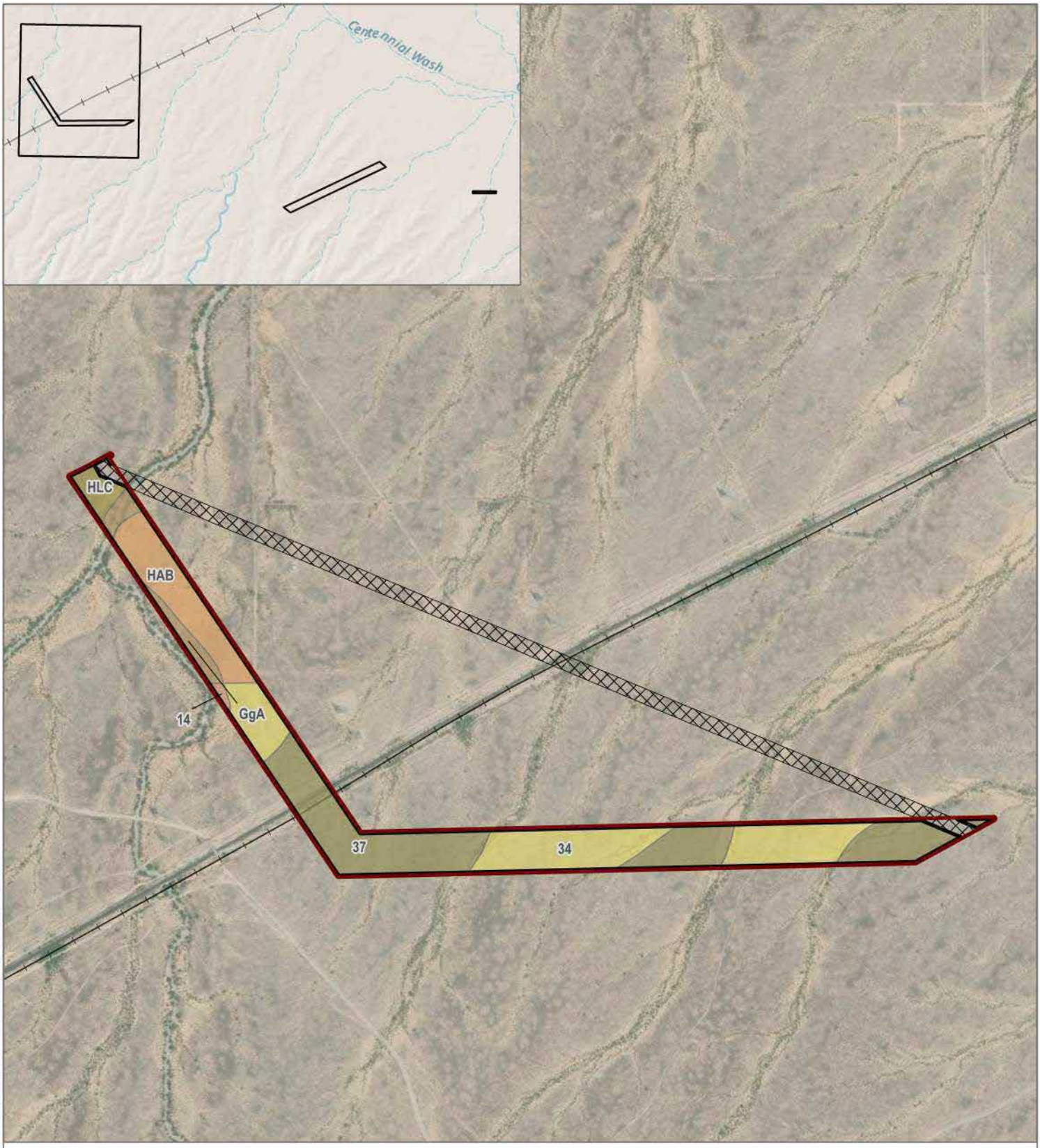
DUDEK

0 2,000 4,000 Feet

FIGURE 2

Review Area

Vulcan Solar Project



SOURCE: Bing Maps 2023; USDA 2023;

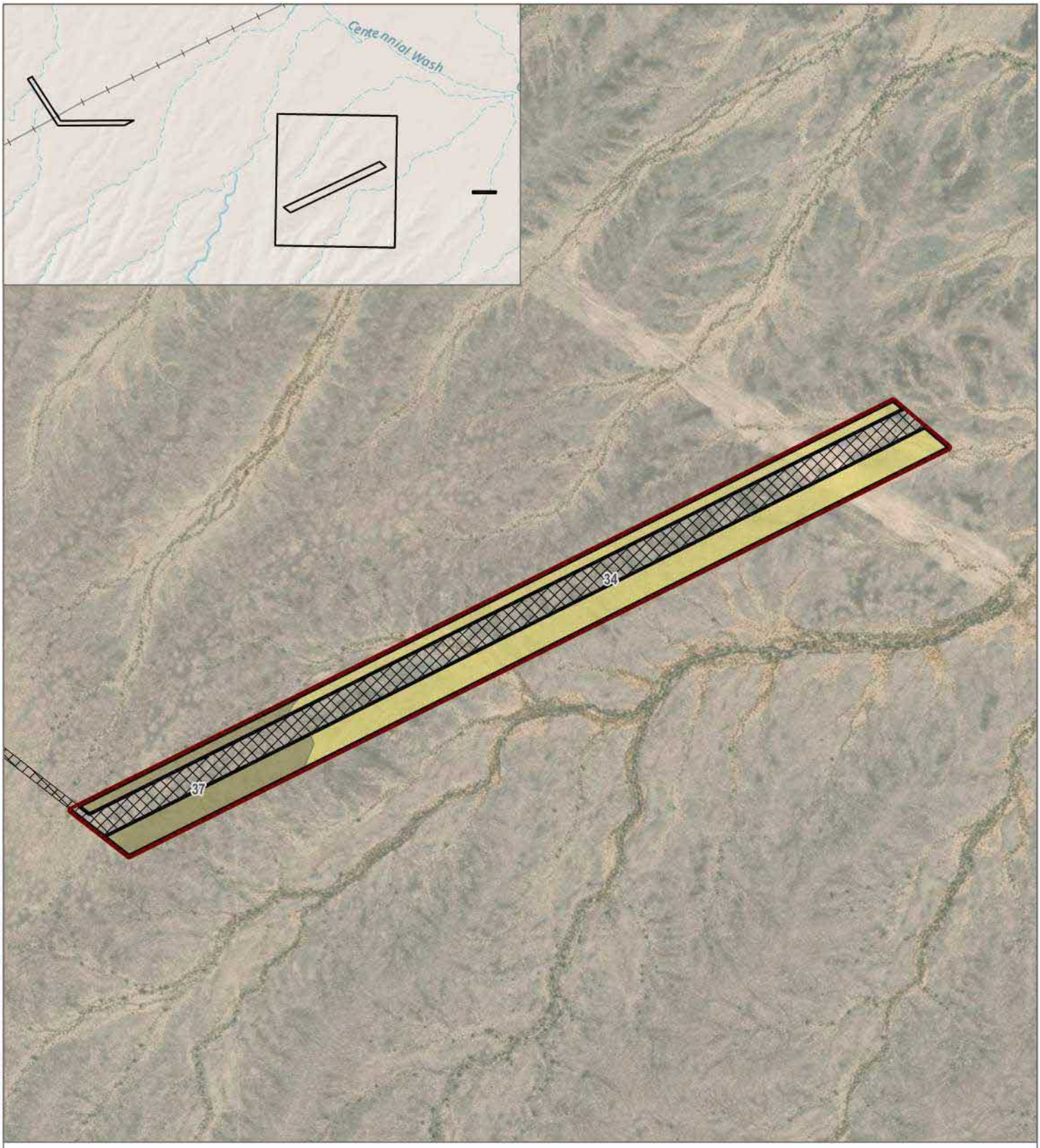
DUDEK

0 480 960 Feet

FIGURE 3-1

Soils - MV Line Corridor

Vulcan Solar Project



SOURCE: Bing Maps 2023; USDA 2023;

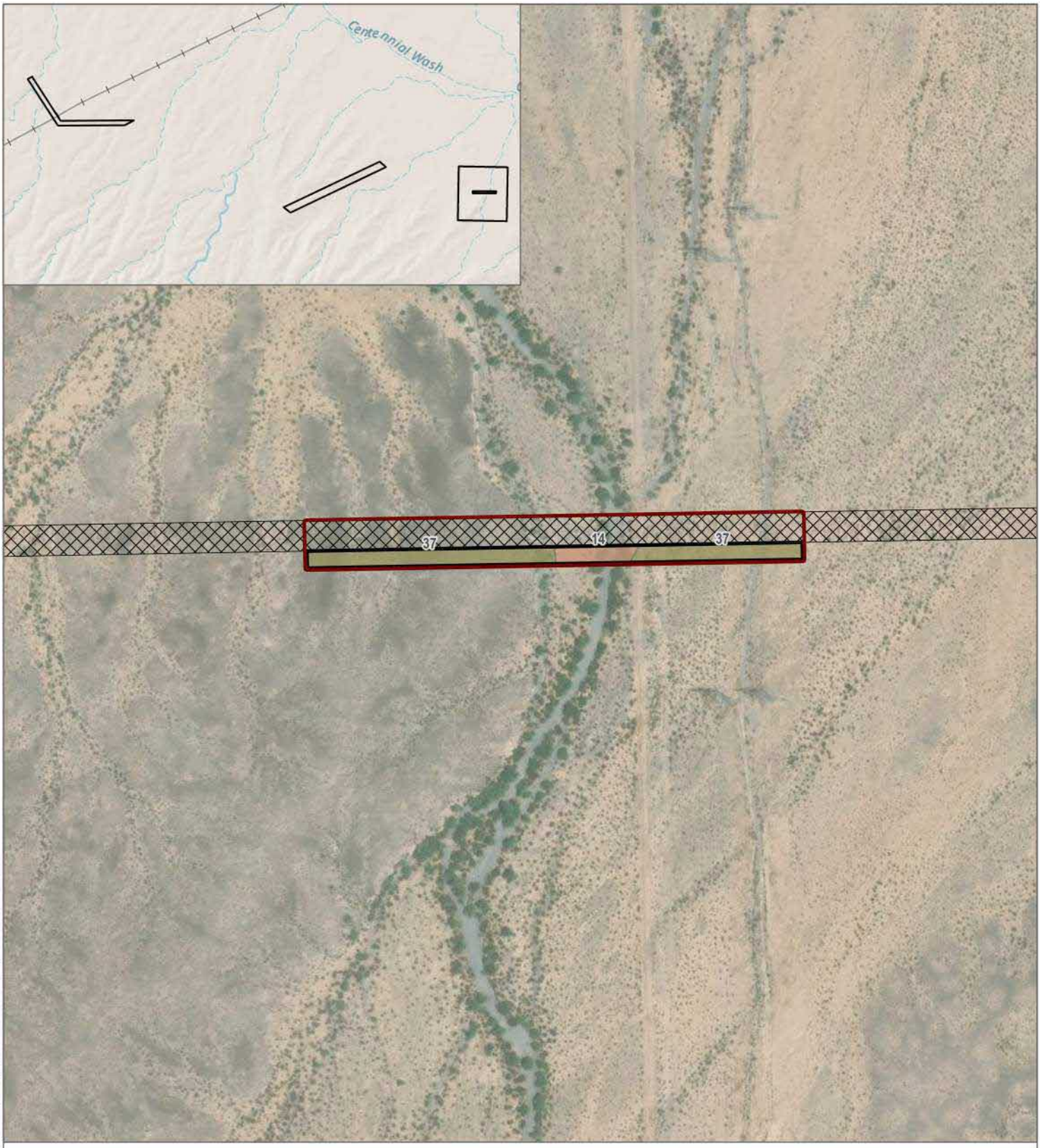
DUDEK

0 480 960 Feet

FIGURE 3-2

Soils - MV Line Corridor

Vulcan Solar Project



SOURCE: Bing Maps 2023; USDA 2023;

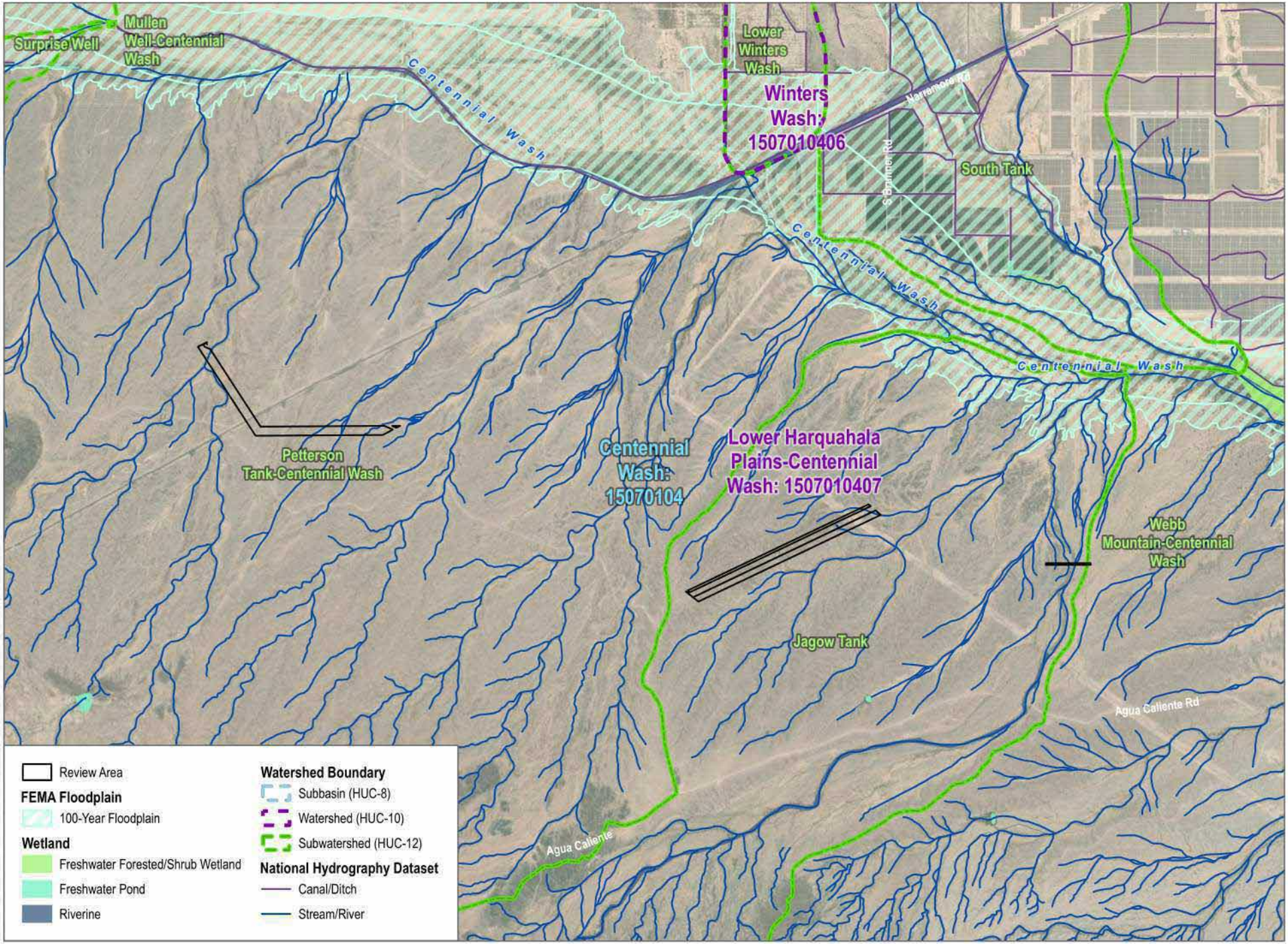
DUDEK

0 195 390 Feet

FIGURE 3-3

Soils - MV Line Corridor

Vulcan Solar Project



SOURCE: USGS 2019; USFWS 2019; FEMA 2023; ESRI World Imagery (accessed 2024)

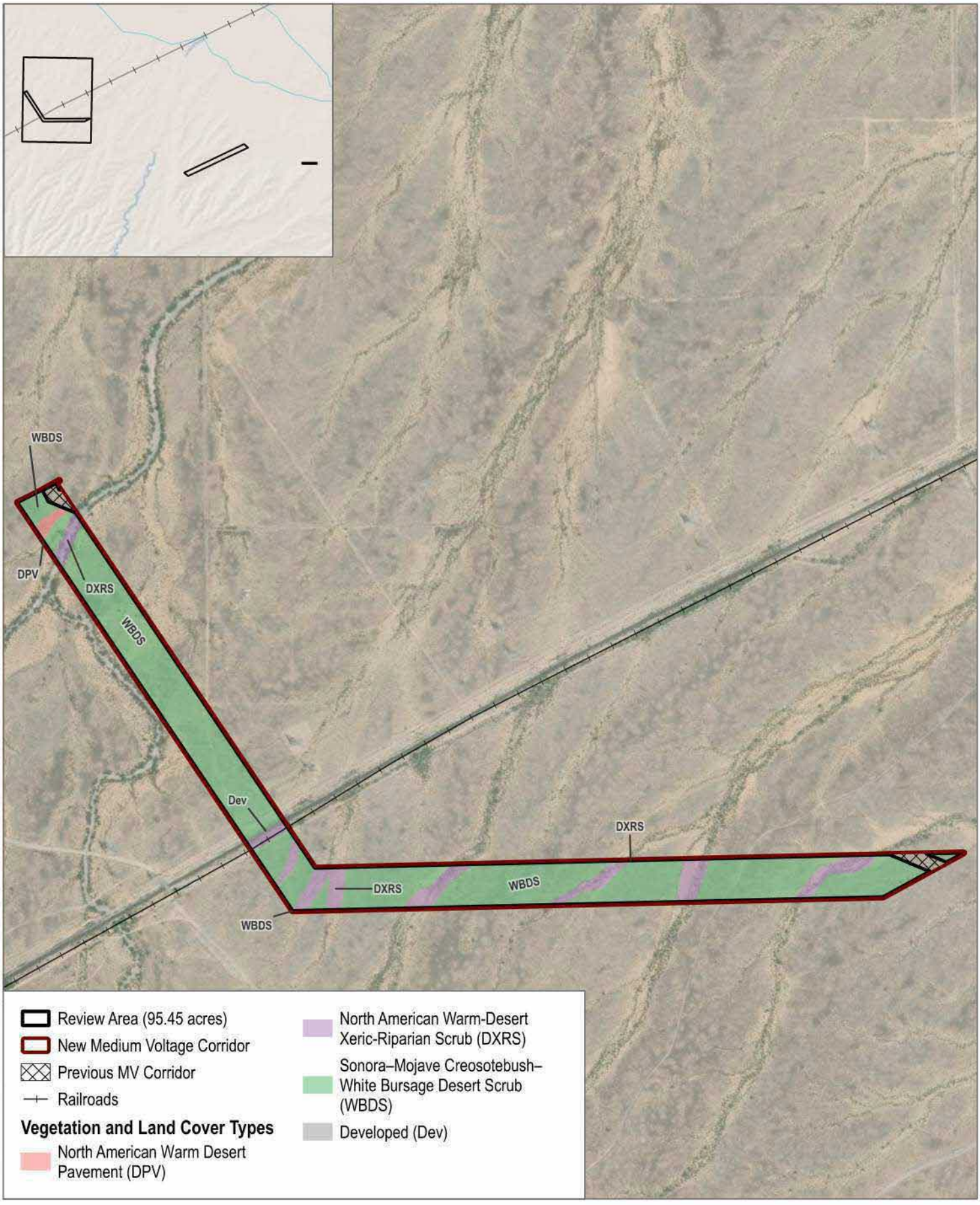
DUDEK

0 3,000 6,000 Feet

FIGURE 4

Hydrologic Setting

Vulcan Solar Project



SOURCE: Bing Maps 2023;

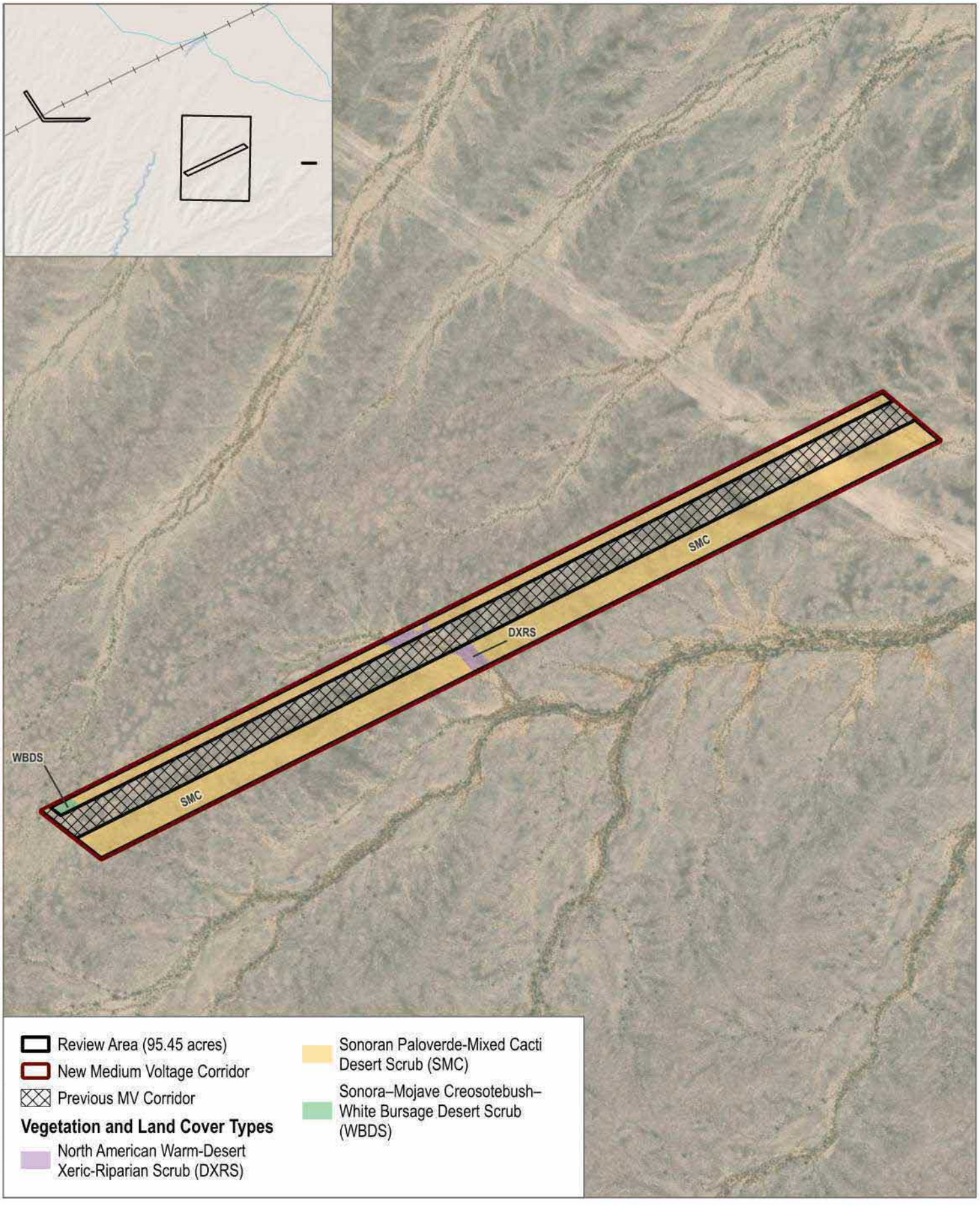
DUDEK

0 485 970 Feet

FIGURE 5-1

Vegetation Communities and Land Cover

Vulcan Solar Project



SOURCE: Bing Maps 2023;

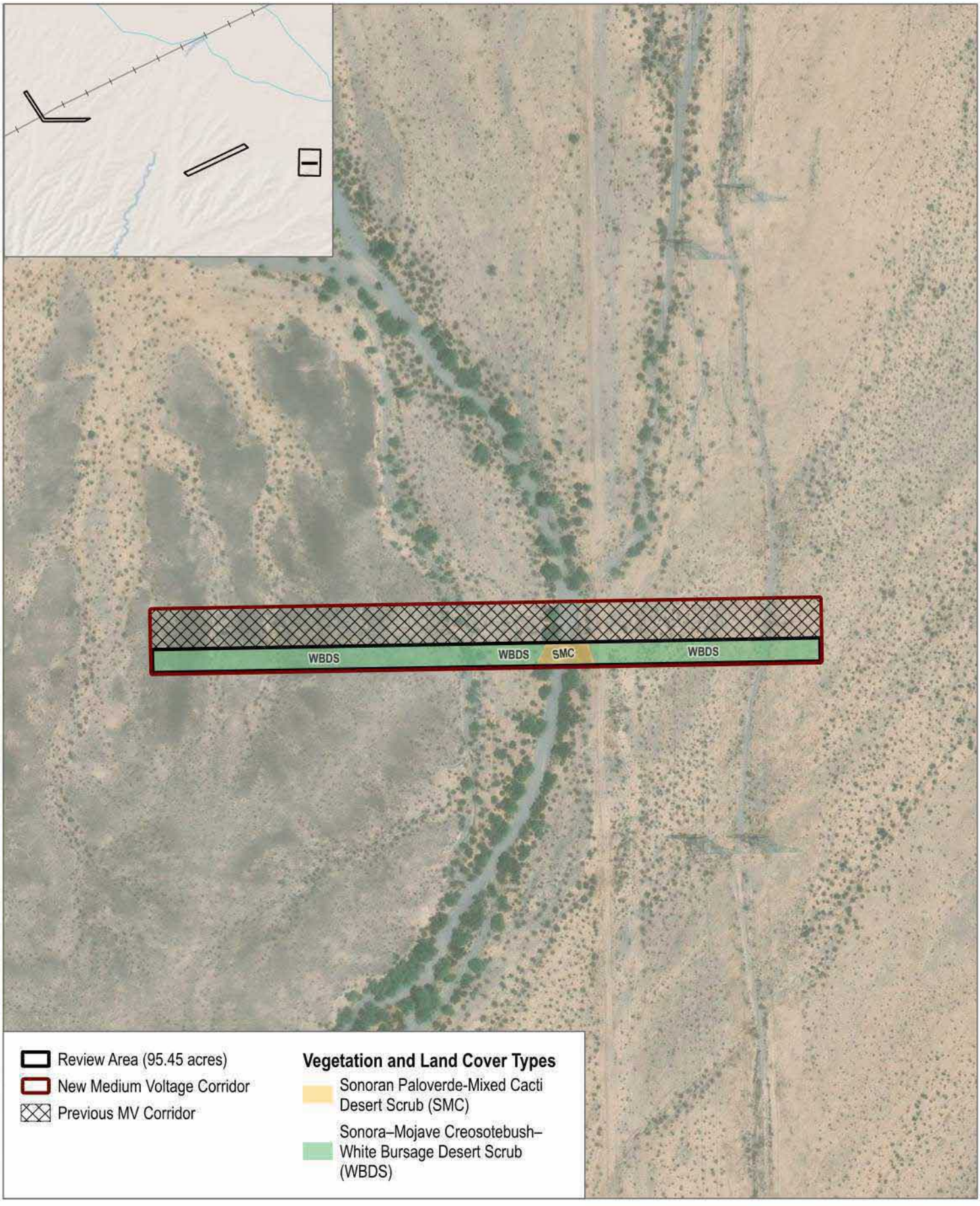
DUDEK

0 485 970 Feet

FIGURE 5-2

Vegetation Communities and Land Cover

Vulcan Solar Project



SOURCE: Bing Maps 2023;

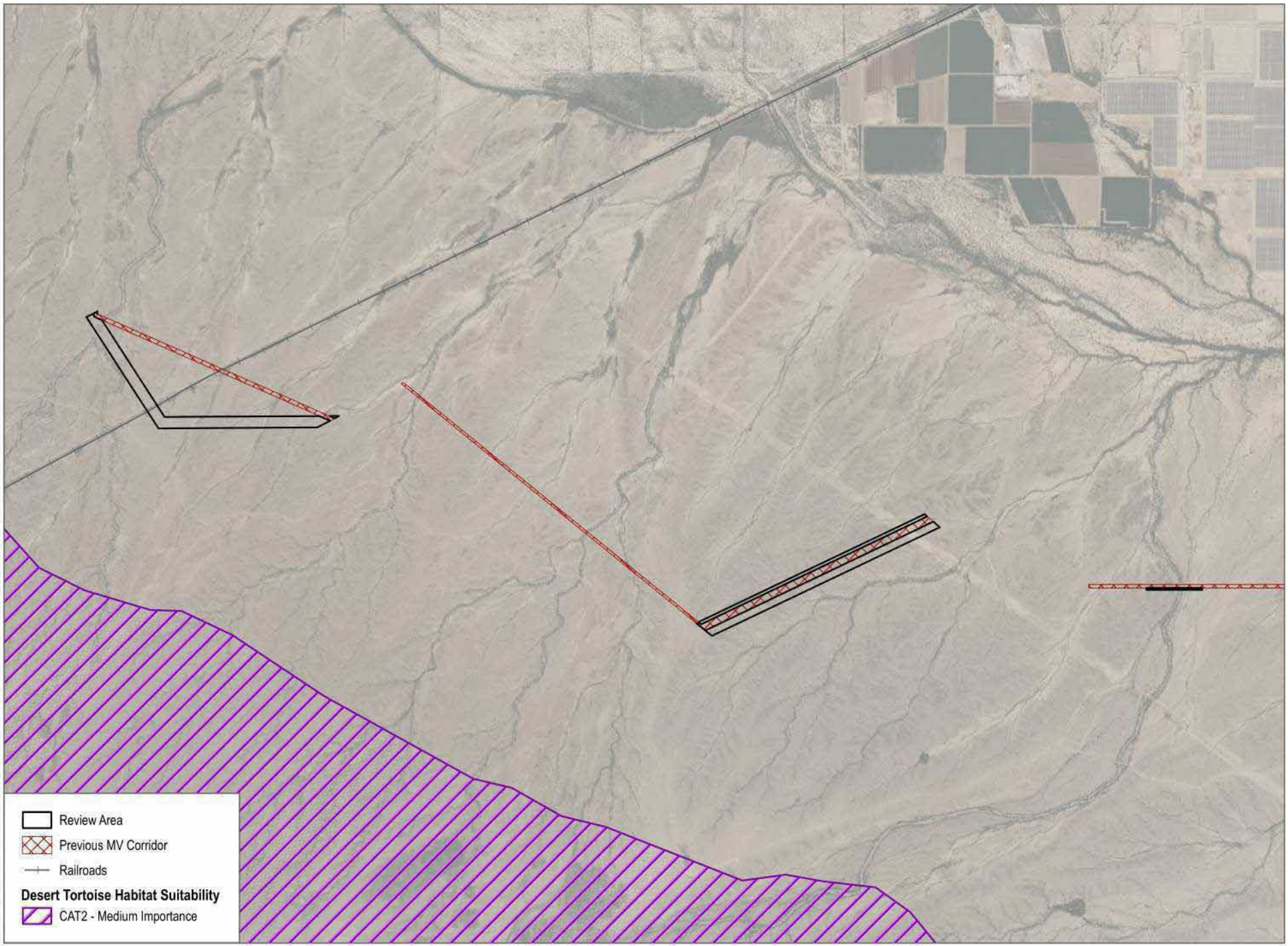
DUDEK

0 150 300 Feet

FIGURE 5-3

Vegetation Communities and Land Cover

Vulcan Solar Project



SOURCE: BLM 2016; Bing Maps 2023;

DUDEK

0 2,500 5,000 Feet

FIGURE 6

BLM Sonoran Desert Tortoise Habitat

Vulcan Solar Project

Attachment B

USFWS IPaC Search Results

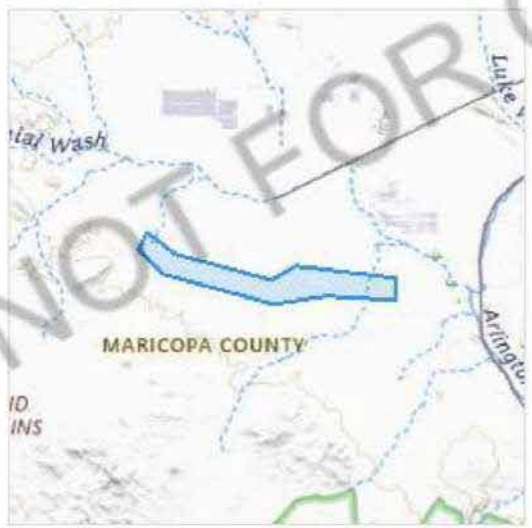
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Maricopa County, Arizona



Local office

Arizona Ecological Services Field Office

(602) 242-0210
(602) 242-2513

9828 North 31st Ave

#c3
Phoenix, AZ 85051-2517

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Sonoran Pronghorn Antilocapra americana sonoriensis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4750	EXPN

Birds

NAME	STATUS
Cactus Ferruginous Pygmy-owl Glaucidium brasilianum cactorum Wherever found There is **final** critical habitat for this species. https://ecos.fws.gov/ecp/species/1225	Threatened
California Least Tern Sternula antillarum browni Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8104	Endangered
Southwestern Willow Flycatcher Empidonax traillii extimus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened
Yuma Ridgway's Rail Rallus obsoletus yumanensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3505	Endangered

Fishes

NAME	STATUS

Gila Topminnow (incl. Yaqui) Poeciliopsis occidentalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1116	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Bald and Golden Eagle information is not available at this time

Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (FWS). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The FWS interprets the MBTA to prohibit incidental take.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management

- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Migratory bird information is not available at this time

Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that

subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, *please see the* FAQ "Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

R4SBC

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment C

AZGFD Heritage Data Management System SGCN for Maricopa County

Special Status Species by County, Taxonomic Group, Scientific Name Arizona Game and Fish Department, Heritage Data Management System Updated: 7/30/2024

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ESA	CRITHAB	BLM	USFS	NESL	MEXFED	SGCN	NPL	SRANK	GRANK	TRACK	ELCODE
Maricopa	Amphibian	Anaxyrus microscaphus	Arizona Toad	SC		S				2		S3	G3G4	Y	AAABB01110
Maricopa	Amphibian	Anaxyrus retiformis	Sonoran Green Toad			S			PR	2		S3	G4	Y	AAABB01140
Maricopa	Amphibian	Gastrophryne mazatlanensis	Sinaloan Narrow-mouthed Toad			S				2		S3	G4	Y	AAABE01030
Maricopa	Amphibian	Rana chiricahuensis	Chiricahua Leopard Frog	LT	Y	S			A	1		S2S3	G3?	Y	AAABH01080
Maricopa	Amphibian	Rana yavapaiensis	Lowland Leopard Frog	SC		S	S		PR	1		S2S3	G4	Y	AAABH01250
Maricopa	Amphibian	Smilisca fodiens	Lowland Burrowing Treefrog			S				2		S2	G4	Y	AAABC06010
Maricopa	Animal Assemblage	Bat Colony										SU	GNR	Y	OBATCOLONY
Maricopa	Animal Assemblage	Bat Foraging Area	High Netting Concentration									SU	GNR	P	OBATFORAG1
Maricopa	Bird	Aquila chrysaetos	Golden Eagle			S		3	A	2		S4	G5	P	ABNKC22010
Maricopa	Bird	Ardea alba	Great Egret									S1B,S4N	G5	P	ABNGA04040
Maricopa	Bird	Ardea herodias	Great Blue Heron						|			S5	G5	N	ABNGA04010
Maricopa	Bird	Asio otus	Long-eared Owl							2		S2B,S3S4N	G5	P	ABNSB13010
Maricopa	Bird	Athene cunicularia hypugaea	Western Burrowing Owl	SC		S	S	4	PR	2		S3	G4T4	Y	ABNSB10012
Maricopa	Bird	Bubulcus ibis	Cattle Egret									S2B,S4N	G5	P	ABNGA07010
Maricopa	Bird	Buteo albonotatus	Zone-tailed Hawk						PR			S4	G4	N	ABNKC19090
Maricopa	Bird	Buteo lineatus	Red-shouldered Hawk						PR			S1B,S3N	G5	P	ABNKC19030
Maricopa	Bird	Buteo swainsoni	Swainson's Hawk						PR	2		S3B,S4N	G5	P	ABNKC19070
Maricopa	Bird	Buteogallus anthracinus	Common Black Hawk						PR	2		S3B	G4G5	P	ABNKC15010
Maricopa	Bird	Cathartes aura	Turkey Vulture									S5	G5	N	ABNKA02010
Maricopa	Bird	Catharus ustulatus	Swainson's Thrush							2		S1B	G5	P	ABPBJ18100
Maricopa	Bird	Charadrius nivosus nivosus	Western Snowy Plover						A	2		S1B	G3T3	P	ABNNB03031
Maricopa	Bird	Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	Y	S	S	2		1		S3	G5	P	ABNRB02020
Maricopa	Bird	Dendrocygna autumnalis	Black-bellied Whistling-Duck							2		S2B,S3N	G5	P	ABNJB01040
Maricopa	Bird	Egretta thula	Snowy Egret							3		S2B,S4N	G5	P	ABNGA06030
Maricopa	Bird	Empidonax traillii extimus	Southwestern Willow Flycatcher		Y	S		2	E	1		S2S3B	G5T2	Y	ABPAE33043
Maricopa	Bird	Falco peregrinus anatum	American Peregrine Falcon			S	S		PR	1		S4	G4T4	P	ABNKD06071
Maricopa	Bird	Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl			S	S			1		S1S2	G5T2	Y	ABNSB08041
Maricopa	Bird	Haliaeetus leucocephalus	Bald Eagle			S	S	2	P	1		S2S3,S4N	G5	P	ABNKC10010
Maricopa	Bird	Haliaeetus leucocephalus (wintering pop.)	Bald Eagle - Winter Population			S	S	2	P			S4N	G5TNRQ	P	ABNKC10015
Maricopa	Bird	Himantopus mexicanus	Black-necked Stilt									S2	G5	P	ABNND01010
Maricopa	Bird	Icterus bullockii	Bullock's Oriole							2		S3S4B,S2M	G5	W	ABPBX99220
Maricopa	Bird	Icterus pustulatus	Streak-backed Oriole									S1B,S3N	G4G5	P	ABPBX99130
Maricopa	Bird	Ictinia mississippiensis	Mississippi Kite						PR	2		S2B	G5	P	ABNKC09010
Maricopa	Bird	Ixobrychus exilis	Least Bittern						PR	3		S3	G4	P	ABNGA02010
Maricopa	Bird	Larus fuscus	Lesser Black-backed Gull									SNA	G5	P	ABNNM03150
Maricopa	Bird	Megaceryle alcyon	Belted Kingfisher					4				S2B,S5N	G5	P	ABNXD01020
Maricopa	Bird	Mniotilta varia	Black-and-white Warbler									S1	G5	P	ABPBX05010
Maricopa	Bird	Pandion haliaetus	Osprey									S2B,S4N	G5	P	ABNKC01010
Maricopa	Bird	Parabuteo unicinctus	Harris's Hawk						PR	2		S4B	G5	P	ABNKC16010
Maricopa	Bird	Rallus obsoletus yumanensis	Yuma Ridgway's Rail			S			P	1		S3	G3T3	P	ABNME0501A
Maricopa	Bird	Strix occidentalis lucida	Mexican Spotted Owl		Y	S		3	A	1		S3	G3G4T3T4	P	ABNSB12012
Maricopa	Bird	Toxostoma lecontei	LeConte's Thrasher			S				2		S3	G4	Y	ABPBK06100
Maricopa	Bird	Tyrannus forficatus	Scissor-tailed Flycatcher									SNA	G5	Y	ABPAE52100
Maricopa	Fish	Agosia chrysogaster chrysogaster	Gila Longfin Dace			S			A	2		S3S4	G4T3T4	P	AFCJB37151
Maricopa	Fish	Catostomus clarkii	Desert Sucker			S	S			2		S3S4	G3G4	Y	AFCJC02040
Maricopa	Fish	Catostomus insignis	Sonora Sucker			S	S		P	2		S3	G3G4	Y	AFCJC02100
Maricopa	Fish	Cyprinodon macularius	Desert Pupfish		Y	S			P	1		S1	G1	Y	AFCNB02060
Maricopa	Fish	Gila elegans	Bonytail Chub		Y	S		1	E	1		S1	G1	Y	AFCJB13100
Maricopa	Fish	Gila robusta	Roundtail Chub			S	S	2	A	1		S2S3	G3	Y	AFCJB13152
Maricopa	Fish	Poeciliopsis occidentalis occidentalis	Gila Topminnow			S			A	1		S1S2	G3	Y	AFCNC05021
Maricopa	Fish	Ptychocheilus lucius	Colorado Pikeminnow					2	E	1		S1	G1	Y	AFCJB35020
Maricopa	Fish	Rhinichthys osculus	Speckled Dace			S			E			S3S4	G5	Y	AFCJB37050
Maricopa	Fish	Xyrauchen texanus	Razorback Sucker		Y	S		2	P	1		S1	G1	Y	AFCJC11010
Maricopa	Invertebrate	Cicindela oregona maricopa	Maricopa Tiger Beetle									S3	G5T3	W	IICOL02362
Maricopa	Invertebrate	Danaus plexippus	Monarch			S			PR			S2S4N	G4	P	IILEPP2010
Maricopa	Invertebrate	Eremarionta rowelli	Eastern Desertsnail							3		SNR	G3G4	Y	IMGASB9100
Maricopa	Invertebrate	Heterocampa amanda	A Notodontid Moth		P							S1	G2G3	Y	IILEY0V160
Maricopa	Invertebrate	Limenitis archippus obsoleta	Obsolete Viceroy Butterfly									S4	G5T3T4	N	IILEPL3024
Maricopa	Invertebrate	Maricopella allynsmithi	Phoenix Talussnail							2		S3	G3	Y	IMGASC9010
Maricopa	Invertebrate	Megathymus ursus deserti	Desert Yucca borer									S1	G4G5T2T3	Y	IILEP88073
Maricopa	Invertebrate	Sonorella ashmuni	Richinbar Talussnail							2		S2	G2	Y	IMGASC9060
Maricopa	Invertebrate	Sonorella rooseveltiana	Roosevelt Talussnail							2		S1	G1	Y	IMGASC9510
Maricopa	Invertebrate	Sonorella sp. 1	A Talussnail							3		S1	GNR	Y	IMGASC9740
Maricopa	Invertebrate	Sonorella superstitionis	Superstition Mountains Talussnail							2		S1S2	G2	Y	IMGASC9570
Maricopa	Invertebrate	Tryonia porrecta	Desert Tryonia							1		S1	G3	Y	IMGASJ7050
Maricopa	Mammal	Antilocapra americana sonoriensis	Sonoran Pronghorn			S			P	1		S1	G5T1	Y	AMALD01012
Maricopa	Mammal	Antrozous pallidus	Pallid Bat									S4	G4	P	AMACC10010
Maricopa	Mammal	Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat			S	S	4		1		S3S4	G4T3T4	P	AMACC08014
Maricopa	Mammal	Eumops perotis californicus	Greater Western Bonneted Bat			S				2		S2S3	G4G5T4	Y	AMACD02011
Maricopa	Mammal	Lasiurus cinereus	Hoary Bat							2		S4	G3G4	Y	AMACC05032
Maricopa	Mammal	Lasiurus frantzii	Desert Red Bat				S			2		S3	G4	Y	AMACC05080
Maricopa	Mammal	Lasiurus xanthinus	Western Yellow Bat				S			2		S2S3	G4G5	Y	AMACC05070
Maricopa	Mammal	Leptonycteris yerbabuenae	Lesser Long-nosed Bat			S			Pr	1		S2S3	G3	Y	AMACB03030
Maricopa	Mammal	Lepus alleni	Antelope Jackrabbit						|	2		S3	G5	Y	AMAEB03070
Maricopa	Mammal	Macrotus californicus	California Leaf-nosed Bat			S				2		S3	G3G4	P	AMACB01010
Maricopa	Mammal	Myotis auriculus	Southwestern Myotis							2		S3	G5	P	AMACC01080
Maricopa	Mammal	Myotis californicus	California Myotis									S4	G5	P	AMACC01120
Maricopa	Mammal	Myotis velifer	Cave Myotis			S				2		S3S4	G4G5	P	AMACC01050
Maricopa	Mammal	Myotis yumanensis	Yuma Myotis							2		S3S4	G5	P	AMACC01020
Maricopa	Mammal	Nyctinomops femorosaccus	Pocketed Free-tailed Bat							2		S3S4	G5	Y	AMACD04010
Maricopa	Mammal	Parastrellus hesperus	Canyon Bat									S5	G5	P	AMACC03010
Maricopa	Mammal	Tadarida brasiliensis	Brazilian Free-tailed Bat							2		S3S4	G5	P	AMACD01010
Maricopa	Plant	Abutilon parishii	Pima Indian Mallow			S	S				SR	S3S4	G3	Y	PDMAL020E0
Maricopa	Plant	Acacia farnesiana	Sweet Acacia									S2,SNA	G5	P	PDFAB021V0
Maricopa	Plant	Agave delamateri	Tonto Basin Agave				S				HS	S2	G2	Y	PMAGA010W0
Maricopa	Plant	Agave murpheyi	Hohokam Agave			S	S				HS	S2?	G2?	Y	PMAGA010F0
Maricopa	Plant	Agave toumeyana var. bella	Toumey Agave								SR	S3	G3T3	W	PMAGA010R1
Maricopa	Plant	Agave x arizonica	Arizona agave								HS	SNA	GNA	N	PMAGA01030
Maricopa	Plant	Allium bigelovii	Bigelow Onion								SR	S2S3	G3	Y	PMLIL02070
Maricopa	Plant	Berberis harrisoniana	Kofa Mountain Barberry			S						S1	G2	Y	PDBER02030
Maricopa	Plant	Camissonia pusilla	Washoe Suncup									S1	G3G4	Y	PDONA031C0
Maricopa	Plant	Camissoniopsis micrantha	Miniature Suncup									SNR	G3?	N	PDONA03100
Maricopa	Plant	Colubrina californica	Las Animas Nakedwood									S2S3	G4	Y	PDRHA05030
Maricopa	Plant	Cryptantha ganderi	Gander's Cryptantha									S1	G3?	Y	PDBOR0A120
Maricopa	Plant	Cuscuta denticulata	Desert Dodder									S2	G4G5	Y	PDCUS010H0
Maricopa	Plant	Cylindropuntia echinocarpa	Golden Cholla								SR	S5	G5	N	PDCAC002W0
Maricopa	Plant	Dieteria bigelovii var. bigelovii	Bigelow's Tansy-aster									S2	G4G5T3T4	Y	PDAST64071
Maricopa	Plant	Echinocereus yavapaiensis	Yavapai Hedgehog Cactus								SR	S2S3	G2G3	Y	PDCAC060T0
Maricopa	Plant	Echinomastus erectocentrus var. acunensis	Acuna Cactus		Y	S			P		HS	S1	G3QT1T2Q	Y	PDCAC0J0E1
Maricopa	Plant	Echinomastus johnsonii	Johnson's Fishhook Cactus								SR	S2	G3G4Q	Y	PDCAC0J0H0
Maricopa	Plant	Eleocharis montana	Mountain Spikerush									S2S3	G5	Y	PMCYP09130
Maricopa	Plant	Eleocharis parvula	Little-head Spike-rush									S2	G5	Y	PMCYP091G0
Maricopa	Plant	Enicameria brachylepis	Rayless Turpentine Bush									S4	G4	N	PDAST3L030
Maricopa	Plant	Erigeron lobatus	Lobed Fleabane									S4	G4	N	PDAST3M2C0
Maricopa	Plant	Erigeron piscaticus	Fish Creek Fleabane			S	S				SR	S1	G1	Y	PDAST3M4X0
Maricopa	Plant	Erigeron pringlei	Pringle's Fleabane									S2	G2	Y	PDAST3M3C0
Maricopa	Plant	Eriogonum ripleyi	Ripley Wild-buckwheat				S				SR	S2	G2	Y	PDPGN08520

Maricopa	Plant	Euphorbia trachysperma	San Pedro River Sandmat								S4	G4	N	POEUP0D2E0
Maricopa	Plant	Ferocactus cylindraceus	Desert Barrel Cactus					PR		SR	S4	G5	N	PDCAC08080
Maricopa	Plant	Ferocactus emoryi	Emory's Barrel-cactus							SR	S1S2	G4	Y	PDCAC08090
Maricopa	Plant	Fremontodendron californicum	Flannel Bush		S					SR	S2S3	G4	Y	PDSTE03010
Maricopa	Plant	Heuchera eastwoodiae	Senator Mine Alumroot			S					S3	G3	Y	POSAX0E0B0
Maricopa	Plant	Hymenoxys ambigens var. ambigens	Pinaleno Mountain Rubberweed								S1?	G3T1?	Y	PDAST530T1
Maricopa	Plant	Justicia candicans	Arizona Water-willow								S2	G4	P	PDACA0E0L0
Maricopa	Plant	Lepidium integrifolium	Thickleaf Pepperwort								S1	G2G3	Y	PDBRA1M1F0
Maricopa	Plant	Leucosyris arida	Desert Tansy-aster								S3	G3G4	Y	POAST64040
Maricopa	Plant	Lotus alamosanus	Sonoran Bird's-foot Trefoil			S					S1	G3G4	Y	PDFAB2A020
Maricopa	Plant	Lotus mearnsii var. equisolensis	Horseshoe Deer Vetch			S					S1	G3T1	Y	PDFAB2A0Q1
Maricopa	Plant	Ludwigia palustris	Marsh Purslane								S1	G5	Y	PDONA0B0H0
Maricopa	Plant	Lupinus lemmonii	Lemmon's Lupine			S					S1	G1Q	Y	PDFAB2B2A0
Maricopa	Plant	Mabrya acerifolia	Mapleleaf False Snapdragon			S					S2	G2	Y	PDSCR2L010
Maricopa	Plant	Malacothamnus fremontii	Round-leaved bush mallow								S1	G4	Y	PDMAL0Q0P0
Maricopa	Plant	Mammillaria viridiflora	Varied Fishhook Cactus							SR	S4	G4	N	PDCAC0A0D0
Maricopa	Plant	Menzelia longiloba var. longiloba	Dune Blazingstar								S2	G5TNR	Y	PDLOA030W1
Maricopa	Plant	Muhlenbergia dumosa	Bamboo Muhly								S3	G3G4	W	PMPOA480H0
Maricopa	Plant	Myosurus nitidus	Western Mousetail								S2	G3G4	Y	PDRAN0H040
Maricopa	Plant	Opuntia engelmannii var. flavispina	Cactus Apple							SR	S3	G5T3?	Y	PDCAC0D224
Maricopa	Plant	Perityle gilensis var. gilensis	Gila Rock Daisy								S2	G2T2	Y	POAST700D1
Maricopa	Plant	Perityle saxicola	Roosevelt Dam Rockdaisy			S					S1	G1	Y	POAST700P0
Maricopa	Plant	Plagiobothrys pringlei	Pringle Popcorn-flower								S2	G3G4	Y	PDBOR0V0V0
Maricopa	Plant	Psathyrotes ramosissima	Velvet Brittle-stem								S2S3	G5	Y	PDAST7N030
Maricopa	Plant	Purshia subintegra	Arizona Cliff Rose		S					HS	S2	G2	Y	PDROS1E0B0
Maricopa	Plant	Rhinotropis rusbyi	Rusby's Milkwort			S					S3	G3	Y	PDPGL021H0
Maricopa	Plant	Salvia davidsonii	Davidson Sage								S2	G2	Y	PDLAM150E0
Maricopa	Plant	Selaginella eremophila	Desert Spike Moss								S3S4	G4	N	PPSEL010G0
Maricopa	Plant	Senecio arizonicus	Arizona Groundsel								S4	G4	N	POAST8H070
Maricopa	Plant	Solanum heterodoxum	Melonleaf Nightshade								S4	G4G5	N	POSOL0Z0X0
Maricopa	Plant	Stenocereus thurberi	Organ Pipe Cactus							SR	S4	G5	N	PDCAC10020
Maricopa	Plant	Tetracoccus fasciculatus var. hallii	Hall Shrub Spurge								S3S4	G4T4	N	PDEUP1C021
Maricopa	Plant	Tumamoca macdougalii	Tumamoc Globeberry		S	S				SR	S3	G4	Y	PDCUC0S010
Maricopa	Plant	Vauquelinia californica ssp. sonorensis	Arizona Sonoran Rosewood		S						S1S2	G4T2T3	Y	PDROS1R024
Maricopa	Reptile	Aspidoscelis pai	Pai Striped Whiptail								S1	G5T3T4	Y	ARACJ02300
Maricopa	Reptile	Aspidoscelis stictogrammus	Giant Spotted Whiptail			S			2		S2	G4	Y	ARACJ02011
Maricopa	Reptile	Aspidoscelis xanthonotus	Red-backed Whiptail			S			2		S2	G3	Y	ARACJ02012
Maricopa	Reptile	Chionactis annulata	Resplendent Shovel-nosed Snake								S3	G5	Y	ARADB05013
Maricopa	Reptile	Chionactis occipitalis	Western Shovel-nosed Snake						3		S3S4	G5	N	ARADB05011
Maricopa	Reptile	Coleonyx variegatus	Western Banded Gecko					PR			S5	G5	W	ARACD01030
Maricopa	Reptile	Cnemidophorus tigris	Great Basin Collared Lizard								S4	G5	N	ARACF04010
Maricopa	Reptile	Crotaphytus nebrius	Sonoran Collared Lizard						2		S3S4	G4	W	ARACF04050
Maricopa	Reptile	Gopherus morafkai	Sonoran Desert Tortoise		S	S		A	1		S4	G4	Y	ARAAF01013
Maricopa	Reptile	Heloderma suspectum	Gila Monster					A	1		S4	G4	Y	ARACE01010
Maricopa	Reptile	Hypsiglena chlorophaea chlorophaea	Sonoran Nightsnake								S5	G5T5	N	ARADB18021
Maricopa	Reptile	Kinosternon arizonense	Arizona Mud Turtle						2		S2	G4	Y	ARAAE01060
Maricopa	Reptile	Lichanura roseofusca	Rosy Boa								S3S4	G4	W	ARADA01030
Maricopa	Reptile	Lichanura trivirgata	Three-Lined Boa					A	2		S1S2	G4G5	Y	ARADA01020
Maricopa	Reptile	Phrynosoma hernandesi	Greater Short-horned Lizard								S4	G5	N	ARACF12080
Maricopa	Reptile	Phyllorhynchus browni	Saddled Leaf-nosed Snake					PR	2		S5	G5	N	ARADB25010
Maricopa	Reptile	Plestiodon gilberti rubricaudatus	Western Red-tailed Skink					PR			S3S4	G5T4	Y	ARACH01065
Maricopa	Reptile	Sauromalus ater	Common Chuckwalla				4	PR			S4	G5	P	ARACF13010
Maricopa	Reptile	Tantilla hobartsmithi	Smith's Black-headed Snake								S5	G5	N	ARADB35140
Maricopa	Reptile	Thamnophis eques megalops	Northern Mexican Gartersnake	Y	S	S		A	1		S2	G4T3	Y	ARADB36061
Maricopa	Reptile	Trimorphodon lambda	Sonoran Lyresnake								S2	G5	Y	ARADB37011
Maricopa	Reptile	Xantusia bezyi	Bezy's Night Lizard			S			2		S2	G2	Y	ARACK01060

Attachment D

BLM Phoenix District Office Sensitive Species List

Bureau of Land Management, Arizona - Bureau Sensitive Species List (February 2017)

INVERTEBRATES

Common Name	Scientific Name	Status	PDO	Habitat/Notes
Arizona Cave Amphipod	*Stygobromus arizonensis*	BLMS		wet caves and mines
Bylas Springsnail	*Pyrgulopsis arizonae*	BLMS		springs **(Positive 90-day Finding)**
Desert Springsnail	*Pyrgulopsis deserta*	BLMS		springs along the Virgin River
Gila Tryonia	*Tryonia gilae*	BLMS		springs **(Positive 90-day Finding)**
Grand Wash Springsnail	*Pyrgulopsis bacchus*	BLMS		springs **(Positive 90-day Finding)**
Kingman Springsnail	*Pyrgulopsis conica*	BLMS		springs **(Positive 90-day Finding)**
Monarch Butterfly	*Danaus plexippus plexippus*	BLMS	v	**(Positive 90-day Finding)**
Sonoran Talussnail	*Sonorella magdalenensis*	BLMS		talus slopes **(Positive 90-day Finding)**

FISH

Common Name	Scientific Name	Status	PDO	Habitat/Notes
Bluehead Sucker	*Catostomus discobolus*	BLMS		**Conservation Agreement**
Bonytail Chub	***Gila elegans***	**FE w/CH**		**See Federal Register & Recovery Plan**
Desert Pupfish	***Cyprinodon macularius***	**FE**	**v**	**See Federal Register & Recovery Plan**
Desert Sucker	*Catostomus clarki*	BLMS	v	aquatic
Flannelmouth Sucker	*Catostomus latipinnis*	BLMS		**Conservation Agreement**
Gila Chub	***Gila intermedia***	**FE w/CH**	**v-CH**	**See Federal Register & Recovery Plan**
Gila Topminnow	***Poeciliopsis occidentalis occidentalis***	**FE**	**v**	**See Federal Register & Recovery Plan**
Little Colorado Spinedace	***Lepidomeda vittata***	**FT**		**See Federal Register & Recovery Plan**
Little Colorado Sucker	*Catostomus* sp.	BLMS		**Conservation Agreement**
Loach Minnow	***Tiaroga cobitis***	**FE w/CH**		**See Federal Register & Recovery Plan**
Longfin Dace	*Agosia chrysogaster*	BLMS	v	aquatic
Razorback Sucker	***Xyrauchen texanus***	**FE w/CH**		**See Federal Register & Recovery Plan**
Roundtail Chub	***Gila robusta***	***p* T BLMS**		**Conservation Agreement, See Federal Register**
Sonora Sucker	*Catostomus insignis*	BLMS	v	aquatic
Speckled Dace	*Rhinichthys osculus*	BLMS	v	aquatic
Spikedace	***Meda fulgida***	**FE w/CH**	**h**	**See Federal Register & Recovery Plan**

Virgin River Chub	***Gila seminuda***	**FE w/CH**		**See Federal Register & Recovery Plan**
Virgin Spinedace	*Lepidomeda mollispinis mollispinis*	BLMS		**Conservation Agreement (Positive 90-day Finding)**
Woundfin	***Plagopterus argentissimus***	**FE w/CH**		**See Federal Register & Recovery Plan**

AMPHIBIANS

Common Name	Scientific Name	Status	PDO	Habitat/Notes
Arizona Toad	*Anaxyrus microscaphus*	BLMS	v	mid elevation riparian/wetlands **(Positive 90-day Finding)**
Chiricahua Leopard Frog	***Lithobates chiricahuensis***	**FT w/CH**		**See Federal Register & Recovery Plan**
Great Plains Narrow-mouthed Toad	*Gastrophryne olivacea*	BLMS	v	healthy grasslands
Lowland Burrowing Treefrog	*Smilisca fodiens*	BLMS	v	healthy grasslands
Lowland Leopard Frog	*Lithobates yavapaiensis*	BLMS	v	wetlands
Northern Leopard Frog	*Lithobates pipiens*	BLMS	h	wetlands
Plains Leopard Frog	*Lithobates blairi*	BLMS		wetlands
Relict Leopard Frog	*Lithobates onca*	BLMS		**Conservation Agreement, See Federal Register (12 Month Finding)**
Sonoran Green Toad	*Anaxyrus retiformis*	BLMS	v	healthy grasslands

REPTILES

Common Name	Scientific Name	Status	PDO	Habitat/Notes
Arizona Striped Whiptail	*Aspidoscelis arizonae*	BLMS		healthy grasslands, north end of Wilcox Playa **(Positive 90-day Finding)**
Desert Massasauga	*Sistrurus catenatus edwarsii*	BLMS		healthy grasslands (Positive 90-day Finding)
Desert Ornate Box Turtle	*Terrapene ornata*	BLMS		healthy grasslands
Flat-tailed Horned Lizard	*Phrynosoma mcallii*	BLMS		**Conservation Agreement**
Mojave Desert Tortoise	***Gopherus agassizii***	**FT w/CH**		**See Federal Register & Recovery Plan**
Mojave Fringe-toed Lizard	*Uma scoparia*	BLMS		sand
Narrow-headed Gartersnake	***Thamnophis rufipunctatus***	**FT w/*p* CH**		**See Federal Register**
New Mexico Ridge-nosed Rattlesnake	***Crotalus willardi obscurus***	**FT**		**See Federal Register & Recovery Plan**
Northern Mexican Gartersnake	***Thamnophis eques megalops***	**FT w/*p* CH**	**h-*p* CH**	**See Federal Register**

Slevin's Bunchgrass Lizard	*Sceloporus slevini*	BLMS		healthy grasslands
Sonoran Desert Tortoise	*Gopherus morafkai*	BLMS	v	**Conservation Agreement**
Sonora Mud Turtle	*Kinosternon sonoriense sonoriense*	BLMS	v	Riparian/aquatic
Yuman Desert Fringe-toed Lizard	*Uma rufopunctata*	BLMS		sand **(Positive 90-day Finding)**

BIRDS (breeding)

Common Name	Scientific Name	Status	PDO	Habitat/Notes
American Peregrine Falcon	*Falco peregrinus anatum*	BLMS	v	cliffs
Arizona Botteri's Sparrow	*Peucaea botterii arizonae*	BLMS		healthy grasslands
Arizona Grasshopper Sparrow	*Ammodramus savannarum ammolegus*	BLMS		healthy grasslands
Bald Eagle	*Haliaeetus leucocephalus*	BLMS	v	**Conservation Agreement [BGEPA]**
Cactus Ferruginous Pygmy-Owl	*Glaucidium brasilianum cactorum*	BLMS	v	dense Sonoran scrub washes
California Black Rail	*Laterallus jamaicensis coturniculus*	BLMS		marshes
California Condor	***Gymnogyps californianus***	**FE/NEP**	**h**	**See Federal Register, Recovery Plan & 10(j) Rule**
California Least Tern	***Sterna antillarum browni***	**FE**	**h**	**See Federal Register & Recovery Plan**
Desert Purple Martin	*Progne subis hesperia*	BLMS	v	saguaro cacti
Ferruginous Hawk	*Buteo regalis*	BLMS	h	healthy grasslands
Gilded Flicker	*Colaptes chrysoides*	BLMS	v	saguaro cacti
Golden Eagle	*Aquila chrysaetos*	BLMS	v	**[BGEPA]**
Le Conte's Thrasher	*Toxostoma lecontei*	BLMS	v	remote creosote scrub
Mexican Spotted Owl	***Strix occidentalis lucida***	**FT w/CH**	**h**	**See Federal Register & Recovery Plan**
Northern Aplomado Falcon	***Falco femoralis septentrionalis***	**FE/NEP**		**See Federal Register, Recovery Plan & 10(j) Rule**
Northern Goshawk	*Accipiter gentilis atricapillus*	BLMS	h	healthy forests
Pinyon Jay	*Gymnorhinus cyanocephalus*	BLMS	v	healthy pinyon pine
Southwestern Willow Flycatcher	***Empidonax traillii extimus***	**FE w/CH**	**h**	**See Federal Register & Recovery Plan**
Western Burrowing Owl	*Athene cunicularia hypugaea*	BLMS	v	grasslands, undeveloped valley bottoms
Western Yellow-billed Cuckoo (DPS)	***Coccyzus americanus***	**FT w/*p* CH**	**v-*p* CH**	**See Federal Register**
Yuma Ridgway's (Clapper) Rail	***Rallus obsoletus (=longirostris) yumanensis***	**FE**	**v**	**See Federal Register & Recovery Plan**

MAMMALS

Common Name	Scientific Name	Status	PDO	Habitat/Notes
Allen's Big-eared Bat	*Idionycteris phyllotis*	BLMS	h	caves, mines
Arizona Myotis	*Myotis occultus*	BLMS	h	caves, mines

Banner-tailed Kangaroo Rat	*Dipodomys spectabilis*	BLMS		healthy grasslands
Black-tailed Prairie Dog	*Cynomys ludovicianus*	BLMS		healthy grasslands
California Leaf-nosed Bat	*Macrotus californicus*	BLMS	v	caves, mines
Cave Myotis	*Myotis velifer*	BLMS	v	caves, mines
Greater Western Mastiff Bat	*Eumops perotis californicus*	BLMS	v	caves, mines
Gunnison's Prairie Dog	*Cynomys gunnisoni*	BLMS	h	healthy grasslands
Houserock Valley Chisel-toothed Kangaroo Rat	*Dipodomys microps leucotis*	BLMS		Atriplex scrub
Hualapai Mexican Vole	***Microtus mexicanus hualpaiensis***	**FE *p* Delist**		**See Federal Register & Recovery Plan**
Jaguar	***Panthera onca***	**FE w/CH**		**See Federal Register & Recovery Plan**
Lesser Long-nosed Bat	***Leptonycteris curasoae yerbabuenae***	**FE pDelist**	**v**	**See Federal Register & Recovery Plan**
Mexican Gray Wolf	***Canis lupus baileyi***	**FE/NEP**	**h**	**See Federal Register, Recovery Plan & 10(j) Rule**
Mexican Long-tongued Bat	*Choeronycteris mexicana*	BLMS		caves/mines
Ocelot	***Leoparus pardalis***	**FE**		**See Federal Register & Recovery Plan**
Sonoran Pronghorn	***Antilocapra americana sonoriensis***	**FE/NEP**	**v**	**See Federal Register, Recovery Plan & 10(j) Rule**
Spotted Bat	*Euderma maculatum*	BLMS	h	caves/ mines
Townsend's Big-eared Bat	*Corynorhinus (=Plecotus) townsendii*	BLMS	v	caves/mines

PLANTS

Common Name	Scientific Name	Status	PDO	Habitat/Notes
Acuna Cactus	***Echinomastus erectocentrus var. acunensis***	**FE w/CH**	**v-CH**	**See Federal Register**
Aquarius Milkvetch	*Astragalus newberryi* var. *aquaria*	BLMS		narrow range, limestone deposits, Burro Creek area
Aravaipa Sage	*Salvia amissa*	BLMS		narrow range, floodplain terraces in shady canyons
Aravaipa Woodfern	*Thelypteris puberula* var. *sonorensis*	BLMS	h	few scattered springs
Arizona Cliffrose	***Purshia subintegra***	**FE**		**See Federal Register & Recovery Plan**
Arizona Eryngo	*Eryngium sparganophyllum*	BLMS		Arid land springs, cienegas
Arizona Hedgehog Cactus	***Echinocereus triglochidiatus var. arizonicus***	**FE**	**h**	**See Federal Register**
Arizona Sonoran Rosewood	*Vauquelinia californica* ssp. *sonorensis*	BLMS	v	relict species in shady canyons
Bartram Stonecrop	*Graptopetalum bartramii*	BLMS		narrow range, rocky outcrops in canyons w/Madrean Woodland **(Positive 90-day Finding)**
Blue Sand Lily	*Triteleiopsis palmeri*	BLMS		sand dunes and sandy soils

Brady Pincushion Cactus	***Pediocactus bradyi***	**FE**		**See Federal Register & Recovery Plan**
California Flannelbush	*Fremontodendron californicum*	BLMS	v	relict populations in shady canyons
Chihuahua Breadroot (Scurfpea)	*Pediomelum pentaphyllum*	BLMS		Healthy grasslands **(Positive 90-day Finding)**
Clifton Rock Daisy	*Perityle ambrosiifolia*	BLMS		narrow range, cliff faces of Gila Conglomerate
Dalhouse Spleenwort	*Asplenium (=Ceterach) dalhousiae*	BLMS		cliff face seeps, Mule Mountains
Diamond Butte Milkvetch	*Astragalus toanus* var. *scidulus*	BLMS		narrow range, Moenkopi Formation badlands w/red soils
Fickeisen Plains Cactus	***Pediocactus peeblesianus var. fickeiseniae***	**FE w/CH**	**v-CH**	**See Federal Register**
Fish Creek Fleabane	*Erigeron piscaticus*	BLMS		narrow range, floodplain terraces shady canyons **(Positive 90-day Finding)**
Gentry Indigo Bush	*Dalea tentaculoides*	BLMS		narrow range, floodplain terraces in shady canyons
Giant Sedge	*Carex spissa*	BLMS	v	springs
Gierisch Mallow	***Sphaeralcea gierischii***	**FE w/CH**		**See Federal Register**
Grand Canyon Rose	*Rosa stellata* var. *abyssa*	BLMS		narrow range, limestone cliff rims
Holmgren (Paradox) Milk Vetch	***Astragalus holmgreniorum***	**FE w/CH**		**See Federal Register & Recovery Plan**
Huachuca Golden Aster	*Heterotheca rutteri*	BLMS		narrow range, Plains Grassland, LCNCA
Huachuca Milkvetch	*Astragalus hypoxylus*	BLMS		narrow range
Huachuca Water Umbel	***Lilaeopsis schaffneriana ssp. recurva***	**FE w/CH**		**See Federal Register**
Jones Cycladenia	***Cycladenia humilis var. jonesii***	**FT**		**See Federal Register**
Joshua Tree	*Yucca brevifolia*	BLMS	v	**(Positive 90-day Finding)**
Kaibab (Paradine) Plains Cactus	*Pediocactus paradinei*	BLMS		**Conservation Agreement**
Kearney's Blue Star	***Amsonia kearneyana***	**FE**		**See Federal Register & Recovery Plan**
Kearney Sumac	*Rhus kearneyi* ssp. *kearneyi*	BLMS		relict species in shady canyons
Kofa Mountain Barberry	*Berberis harrisoniana*	BLMS	v	relict species in shady canyons
Marble Canyon Indigo Bush	*Psorothamnus arborescens* var. *pubescens*	BLMS		narrow range, red soils of Moenkopi Formation, Marble Canyon
Marble Canyon Milkvetch	*Astragalus cremnophylax* var. *hevronii*	BLMS		narrow range, limestone cliff rims, Marble Canyon
Mt Trumbull Beardtongue	*Penstemon distans*	BLMS		narrow range, limestone soils
Murphey Agave	*Agave murpheyi*	BLMS	v	low numbers, desert foothills, central AZ
Nichol Turk's Head Cactus	***Echinocactus horizonthalonius var. nicholii***	**FE**		**See Federal Register & Recovery Plan**

Paria Plateau (Siler) Fishhook Cactus	*Sclerocactus sileri*	BLMS		narrow range, sandy soils, Paria Plateau
Parish Phacelia	*Phacelia parishii*	BLMS		narrow range, limestone deposits, Burro Creek area, dry lake beds, Red Lake
Parish Wild Onion	*Allium parishii*	BLMS		narrow range, higher elevation desert mountains, Mohave Mountains
Peebles Navajo Cactus	***Pediocactus peeblesianus var. peeblesianus***	**FE**		**See Federal Register & Recovery Plan**
Pima Indian Mallow	*Abutilon parishii*	BLMS	h	rocky slopes, desert mountains
Pima Pineapple Cactus	***Coryphantha scheeri var. robustispina***	**FE**		**See Federal Register**
Pinto Beardtongue	*Penstemon bicolor*	BLMS		narrow range, desert washes, Black Mountains
Purple-spike Coralroot	*Hexalectris warnockii*	BLMS		few populations, leaf litter under Madrean Woodland, Mule Mtns
Round-leaf Broom	*Errazurizia rotundata*	BLMS		narrow range, Shinarump Hills, Holbrook area
San Pedro River Wild Buckwheat	*Eriogonum terrenatum*	BLMS		narrow range, limestone and clay soils of St. David Formation, SPRNCA
Sand Food	*Pholisma sonorae*	BLMS		sand dunes, Yuma area
Scaly Sand Food	*Pholisma arenarium*	BLMS		sand dunes, Cactus Plain
Schott Wire-lettuce	*Stephanomeria exiqua* ssp. *exiqua*	BLMS	h	sand dunes, sandy soils
September 11 Stickleaf	*Mentzelia memorabilis*	BLMS		narrow range, gypsum soils of Harrisburg Formation
Siler Pincushion Cactus	***Pediocactus sileri***	**FT**		**See Federal Register & Recovery Plan**
Silverleaf Sunray	*Enceliopsis argophylla*	BLMS		narrow range, gypsum soils of Moenkopi Formation
Smooth Catseye	*Cryptantha semiglabra*	BLMS		extremely narrow range
Sticky Wild Buckwheat	*Eriogonum viscidulum*	BLMS		narrow range, sandy loam soils, Virgin River Valley
Three-cornered Milkvetch	*Astragalus geyeri* var. *triquetrus*	BLMS		narrow range, sandy loam soils, Virgin River Valley
Tumamoc Globeberry	*Tumamoca macdougalii*	BLMS	v	few populations, Sonoran Desert plains
Welch's Milkweed	***Asclepias welshii***	**FT**		**See Federal Register & Recovery Plan**
White-margined Penstemon	*Penstemon albomarginatus*	BLMS		narrow range, sandy loam soils

Status and Occurrence Abbreviations:

Abbreviation	Definition
FE	Federally Endangered
***p* E**	Proposed Endangered
FT	Federally Threatened

***p* T**	Proposed Threatened
CH	Designated Critical Habitat
***p* CH**	Proposed Critical Habitat
***p* Delist**	Proposed for Delisting
NEP	Nonessential Experimental Population designated pursuant to Section 10(j) of the ESA
DPS	Distinct Population Segment
C	Federal Candidate
BLMS	Arizona Bureau of Land Management Sensitive
BGEPA	Bald and Golden Eagle Protection Act of 1940
v	Known Occurrence within the last 10 years
h	Historic or Potential Occurrence
Positive 90-day Finding	Petition for listing was found to contain substantial information indicating listing may be warranted.
PDO	Phoenix District Office: [Hassayampa Field Office including Agua Fria NM & Lower Sonoran Field Office including Sonoran Desert NM]

APPENDIX B-4.
Monarch Butterfly Habitat Assessment

SWCA
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TECHNICAL MEMORANDUM

To: David Brown
Manager, Environmental Services
NextEra Energy Resources, LLC

From: David Kahrs, Senior Biologist

Date: April 17, 2025

Re: **Vulcan Solar Project Monarch Butterfly and Habitat Assessment**

PROJECT SUMMARY

Vulcan Solar Project, LLC (Applicant), a wholly-owned subsidiary of NextEra Energy Resources, LLC, is proposing to construct, operate, maintain, and decommission the Vulcan Solar Project (Project) on Bureau of Land Management (BLM)–administered land in Maricopa County, Arizona, approximately 47 miles southwest of Phoenix and 7 miles southwest of the unincorporated community of Arlington, Arizona (Figure 1). The Project consists of an up to 800-megawatt alternating current solar photovoltaic facility, an up to 800-megawatt battery energy storage system, a subsurface medium voltage electrical collection system, an on-site substation, an operations and maintenance facility, access roads, and ancillary Project facilities (collectively referred to as the generation and storage facility). The Project also includes an approximately 4.3-mile-long 500-kilovolt generation interconnection transmission line (gen-tie) that would connect the generation and storage facility from the new on-site substation to the existing 500-kilovolt Hassayampa Substation via a 200-foot-wide right-of-way (ROW) corridor. The generation and storage facility is proposed for siting on federal public land totaling 6,560 acres administered by the BLM, Phoenix District Office, Lower Sonoran Field Office. The 103-acre gen-tie ROW would occupy approximately 76 acres of State Trust land under Arizona State Land Department jurisdiction and approximately 27 acres under Maricopa County jurisdiction.

PURPOSE

A notice of intent to prepare an environmental impact statement (EIS) for the Project was released in July 2023 (*Federal Register* 88:43380). Analysis of the Project's potential impacts under the National Environmental Policy Act (NEPA) has been initiated, and publication of a draft EIS is anticipated in 2025. The BLM has responsibilities under BLM policies, NEPA, and the Endangered Species Act (ESA) to address the impacts of their actions (i.e., granting a ROW to the Applicant for this Project) on species listed under the ESA, species that are proposed or candidates for listing, and proposed or designated critical habitat for any of those species. This technical memorandum was prepared to aid the BLM in its assessment of the potential for monarch butterfly to occupy the generation and storage facility.

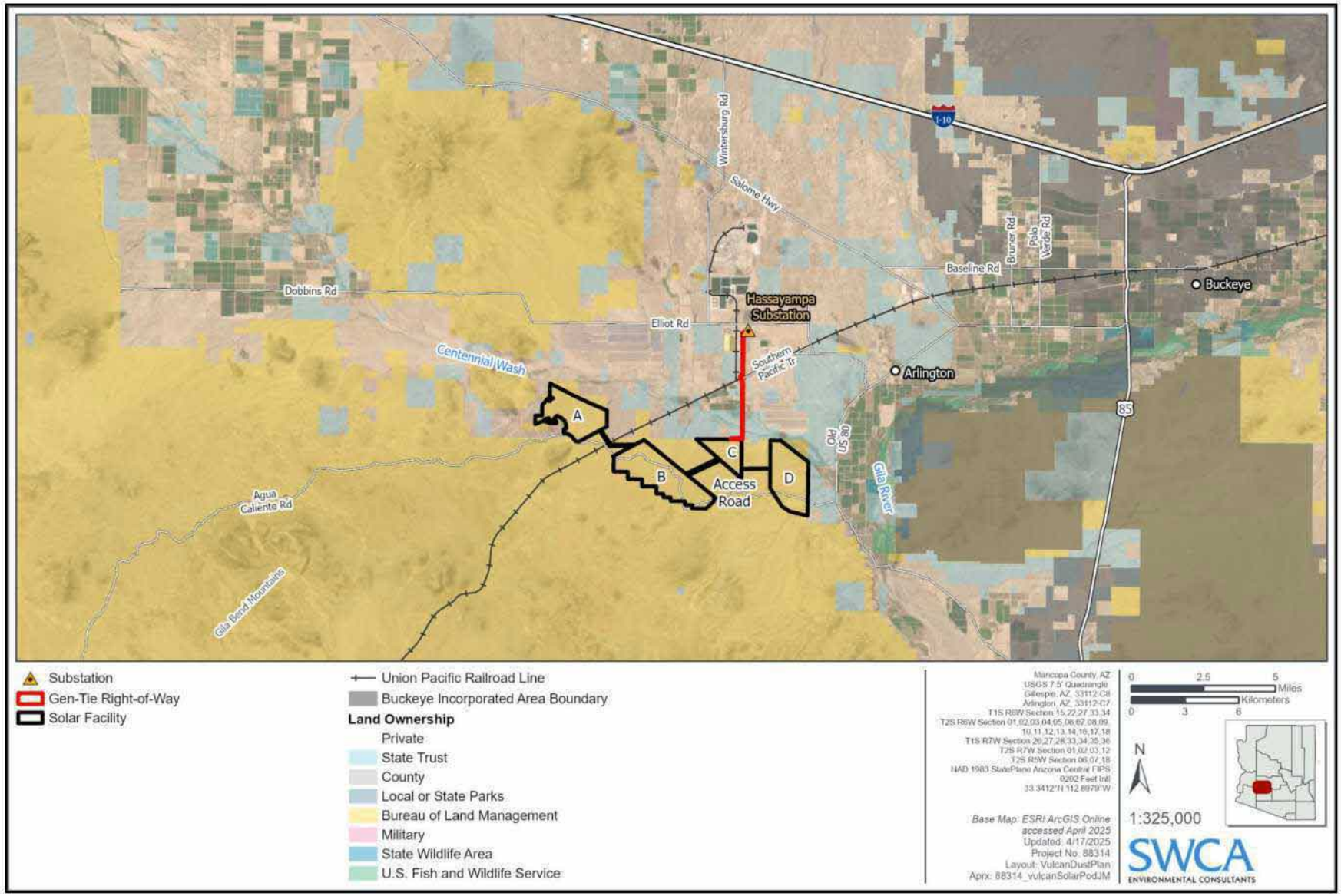

Figure 1. Vulcan Solar Project area.

MONARCH BUTTERFLY

Regulatory Background

In response to a petition to list the monarch butterfly (*Danaus plexippus*) as threatened or endangered under the ESA, the U.S. Fish and Wildlife Service (USFWS) determined in 2020 that listing was warranted but precluded by other listing priorities, and added the monarch butterfly as a candidate for ESA listing (USFWS 2020). In 2024, the USFWS issued a proposed rule to list the monarch butterfly as threatened with critical habitat (limited to wintering locations in California) and a special rule under Section 4(d) of the ESA defining prohibited types of "take" of the species and exempting certain activities from being considered take (USFWS 2024a). Supporting the proposed listing rule, the USFWS also issued a species status assessment report that summarizes the current body of knowledge for the biology of the species, causes of population declines, and modeled future population trends (USFWS 2024b). At this time, the proposed rule has not been finalized, and the species is not currently protected under the ESA.

The following activities that could otherwise be considered to result in take of monarch butterflies may be exempted from take prohibitions under the proposed rule:

- Habitat restoration and management
- Livestock grazing and routine ranching activities
- Routine agricultural activities
- Fire and fuels management
- Forest management, with implementation of best management practices
- Management of milkweed (family Asclepiadaceae) plants and nectar sources on residential and developed properties
- Vegetation management conducted at times of the year when monarch butterflies are not present
- Activities conducted under a qualifying conservation plan for monarch butterflies
- Management of overwintering habitat under an approved plan
- Vehicle strikes
- Multiple aspects of captive rearing and scientific collecting

Under the proposed rule, impacts to monarch butterflies related to vegetation and land management and resulting from the types of activities listed above may only be exempted from the definition of take if the activity does "not result in conversion of native or naturalized grassland, shrubland, or forested habitats." It should be noted that the USFWS has requested public comments on the proposed rule, including on the special rule and take exemptions, and aspects of the proposed rule may be modified prior to finalization in response to public comments or other information.

Species Background

The monarch butterfly is globally distributed throughout 90 countries, islands, and island groups, with the two largest migratory populations east and west of the Rocky Mountains in North America (USFWS 2024b). These two populations are well-known for their long-distance migrations and represent the historical and current core of the species, the ancestral lineage of the species, and a unique source of genetic and ecological diversity (USFWS 2024b). Long-term declines in abundance at overwintering sites has been observed for both North American populations, which have generally been declining over the past two decades (USFWS 2024b). USFWS identified the major threats to the monarch butterfly as habitat loss, in particular the availability, distribution, and quality of host plant and nectar resources; introduction of invasive plant species that could replace suitable native vegetation; insecticide and pesticide exposure; and climate change.

Within the continental United States, monarch butterflies occur in at least three populations, including the two migratory populations (western population, eastern population), with the Rocky Mountains acting as the general divider, and a non-migratory population in southern Florida. The North American migratory populations begin migrating in the fall to their respective overwintering sites, flying south to the mountainous regions of central Mexico or to groves along the California coast and northern Baja California (USFWS 2024b). In early spring (February–March), surviving monarch butterflies break diapause and begin the breeding season by mating at the overwintering sites before dispersing (USFWS 2024b). Adult monarch butterflies require a diversity of blooming nectar resources to feed on throughout their migration routes and breeding grounds from spring to fall and require milkweed for egg laying and larval feeding (USFWS 2024b).

Arizona is located between the two primary migratory populations, and individuals associated with both the western and eastern migratory populations have been tagged in Arizona and recaptured farther north. Monarch butterflies in Arizona have not been subject to the level of study associated with the northern reproductive range of the species or primary overwintering locations, and a single study (Morris et al. 2015) summarizes and presents much of the primary peer-reviewed information for the species in Arizona.

Monarch butterflies are present and seasonally abundant in Arizona, having been recorded in every month of the year when seasonal temperatures are conducive. In warm winter years without a hard freeze (defined as temperatures less than or equal to -2.7° Celsius [27.14° Fahrenheit]), monarch butterflies were most commonly reported from September until mid-May in the lower desert elevations, including the Phoenix, Tucson, Yuma, Parker, and Lake Havasu areas. Several small recurring overwintering populations are present in Arizona, primarily along the Colorado River in forest patches similar to primary overwintering locations for the western population. In years with a hard freeze, monarch butterflies were seldom observed until late March through May, when a small number of monarch butterflies were observed. In Arizona, monarch butterflies are only documented overwintering at riparian locales. Monarch butterflies often occur near riparian areas or other locations that contain water, including around ciénegas, creeks, washes, roadside ditches, and irrigated gardens. Monarch butterflies favor riparian areas and rivers for migration, as well as human-augmented water and nectar sources in urbanized areas (Morris et al. 2015). Urban areas may be particularly important to support migration during unusually dry conditions.

Monarch butterflies are known to migrate northward and southward through low desert habitat in Arizona, and primarily reproduce in low deserts during southward (fall) migration, although spring reproduction has been infrequently recorded. Summer monsoon rainstorms support the growth of several species of milkweed plants, and one evergreen milkweed species is also present in the region. Morris et al. (2015) notes that reproduction attempts may be common at low elevations, but the authors do not provide any summary data on reproductive success, while noting that reproduction can fail in response to excessive temperatures in late summer. The intermittent and unpredictable nature of summer rainfall in the Sonoran Desert can result in extreme variation in temperature and humidity.

MILKWEED SPECIES

This section discusses the three native species of milkweed that have the greatest potential to be present in the Project area. Several other species of native milkweeds are present regionally, but are primarily associated with higher elevations, rocky slopes, and other habitat types not present in the Project area (e.g., whitestem milkweed [*Asclepias albicans*], horsetail milkweed [*Asclepias subverticillata*], and others). One species of introduced ornamental milkweed (*Asclepias curassavica*) can have negative impacts on monarch butterflies, but this species is unlikely to be invasive in the Sonoran Desert and would not be present in the Project area.

Mojave Milkweed

Species Background

Mojave milkweed (*Asclepias nyctaginifolia*) is a perennial plant growing up to 18 inches tall with large dark green, triangle-shaped leaves. During times of drought and outside the primary growing season, the aboveground stems and leaves may die back and the plant will live as an underground tuber (Arizonensis 2015). The plant typically flowers from April until October, producing clusters of whitish-green flowers along its stems. The fruits can be smooth or lightly hairy pods up to 4 inches long and produce seeds with plumes that allow the seeds to travel long distances on the wind.

Mojave milkweed is found in a variety of habitats ranging from 1,500 to 6,500 feet above mean sea level, primarily from the Mogollon Rim southwest into the Mojave and Sonoran Desert in Arizona (SEINet 2025a). In low dry deserts, records of the species are uncommon, but the plant can occasionally be found in sandy or gravelly washes, particularly after abundant monsoon rains (SEINet 2025a). Mojave milkweed is a favored larval host plant for monarch butterfly, particularly during the fall when abundant monsoon rains have occurred (Morris et al. 2015).

Presence in Project Area

This species has been observed in one location within the Project area, in an ephemeral wash with at least two plants present in approximately the same location (Heritage Environmental Consultants 2024). The authors of that report did not provide an identification to species, but *A. nyctaginifolia* appears to be the likely identification and is the only broad-leafed milkweed likely to be present in the Project area. The next-nearest observation is from the Eagle Tail Mountains approximately 25 miles west of the Project area (SEINet 2025a).

Rush Milkweed

Species Background

Rush milkweed (*Asclepias subulata*) is an evergreen perennial plant growing up to 6 feet tall. The plant produces sparse thin leaves along the stems only when enough moisture is present and is often leafless throughout the year. Rush milkweed is capable of producing flowers and fruits year-round during favorable conditions (Flora of North America [FNA] 2025a). Flowers are whiteish-green colored and are produced in clusters at the ends of branches. The fruits are smooth narrow pods 2 to 4 inches long (FNA 2025a) and produce seeds with plumes that allow the seeds to travel long distances on the wind.

Rush milkweed is found almost exclusively in the Sonoran Desert, with few populations extending into the southeastern part of the Mojave Desert (FNA 2025a). In Arizona, rush milkweed can be found in the central and western counties of Maricopa, Pinal, Mojave, La Paz, and Yuma (U S. Department of Agriculture 2025). Rush milkweed is most frequently found in desert scrub habitats on dry slopes, mesas and plains, and washes and arroyos between sea level and 3,000 feet (SEINet 2025b; Southwest Desert Flora 2016). In low dry deserts where it occurs, rush milkweed is a favored larval host plant for monarch butterfly larvae (Morris et al. 2015).

Presence in Project Area

This species has not been observed in the Project area. The Project area does contain suitable habitat in the form of dry slopes, washes, and arroyos. Several observations have been recorded in the region surrounding the Project area, with occurrences approximately 40 miles west, 20 miles south, and 18 miles northeast of the Project area (iNaturalist 2025a; SEINet 2025b).

Fringed Twinevine

Species Background

Fringed twinevine (*Funastrum cynanchoides*) is a plant in the milkweed family (Asclepidaceae) and is closely related to true milkweeds (genus *Asclepias*). Fringed twinevine is a perennial vine with stems that can grow up to 6 feet long, sometimes growing in dense tangled masses throughout shrubs or on fences (FNA 2025b; SEINet 2025c). Similar to Mojave milkweed, fringed twinevine produces an underground tuber that allows aboveground vegetation to die back during times of drought (SEINet 2025c). Fringed twinevine has arrow-shaped leaves that can vary significantly in width. The plant produces clusters of white to dark purple flowers along the stems between April and October. Fruits are slender pods with short fine hairs that grow between 1 and 4 inches long and produce seeds with plumes that allow the seeds to travel long distances on the wind.

Fringed twinevine is found throughout the southwest in desert habitats and disturbed areas from 500 to 5,500 feet above mean sea level, primarily from the Mogollon Rim southwest into the Mojave and Sonoran Deserts in Arizona, as well as through the Colorado River gorge in and near the Grand Canyon (SEINet 2025c). Fringed twinevine is common in the Sonoran Desert in areas that collect moisture, such as washes and fence rows (Arizonensis 2020). While not a preferred larval host plant for monarch butterfly, some observations exist of the plant being used by the insect when other preferred host plants are not available (Nature Collective 2025).

Presence in Project Area

This species has not been observed in the Project area. The Project area does contain suitable habitat in the form of washes and fence lines. The closest observation is approximately 9 miles northeast of the Project area (iNaturalist 2025).

NECTAR SOURCES

Flowering plants are present in the Project area that can provide nectar resources for migrating monarch butterflies. Of the plant species identified during general Project surveys (Heritage Environmental Consultants 2024), seven of these species are listed as valuable nectar sources for monarch butterflies in Arizona and the Southwest (Southwest Monarch Study n.d.; Xerces Society 2018), although this does not preclude the potential for monarch butterflies to use other flowering plants that are also present. The following species were identified as valuable nectar plants:

- Blue paloverde (*Parkinsonia florida*)
- Yellow paloverde (*Parkinsonia microphylla*)
- Velvet mesquite (*Prosopis velutina*)
- Desertbroom (*Baccharis sarothroides*)
- Water jacket (*Lycium andersonii*)
- Milkweed (*Asclepias* sp., presumed *A. nyctaginafolia*)
- Desert globemallow (*Sphaeralcea ambigua*)

Of these seven species, desert globemallow is the species least associated with xeroriparian wash habitat and most likely to be present across uplands within the Project area. The other species may also be present in uplands but are generally associated with and experience their greatest growth in or near washes in response to higher water availability.

MONARCH BUTTERFLY HABITAT ASSESSMENT

Morris et al. (2015) presented summary information on monarch butterfly habitat use across elevations in Arizona, but generally did not provide the original data behind the discussion. Thus, the summarized information presented by the authors regarding habitat use in low deserts may not directly represent conditions similar to those within the Project area. In particular, the authors discussed in generalized terms observed patterns of monarch butterfly observations, but did not discuss areas where habitat may be less suitable or unsuitable. No information has been developed regarding nectar needs of monarch butterflies during migration at finer scales, with respect to supporting assessments related to habitat loss interrupting or reducing the value of migratory corridors, or variation in monarch butterfly migratory pathways during periods of drought and low nectar availability.

Some of the primary data gaps relating to monarch butterfly habitat assessment in low desert settings, such as the Project area, include the following:

- Migration pathways during spring migration, and responses to high annual variability in winter rainfall and subsequent nectar availability.
- Reproductive success at low elevations during summer and fall when temperature and humidity can rapidly change.
- Within the region and Lower Colorado River Valley Subdivision of Sonoran Desertscrub, patterns of monarch butterfly distribution, habitat use in general, and reproduction.
- Requirements and preferences for reproduction in low desert, such as milkweed density and species response to annual variability (i.e., whether reproduction is attempted freely as a low investment, or represents a higher investment potentially more responsive to resource availability).

Within the Project area, following surveys conducted during the growing season in a summer with adequate rainfall to trigger plant growth, a single location (likely two plants present, based on photographs in Heritage Environmental Consultants [2024]) with milkweed plants is known in the Project area. The incidental observation occurred during surveys of potentially jurisdictional waters, which covered xeroriparian washes in the Project area. Rush milkweed is more likely than Mojave milkweed or fringed twinevine to be present in upland habitat, although none have been observed in or reliably reported near the Project area to date. Nectar plants are present within the Project area, although likely concentrated along ephemeral washes.

In consideration of available regional information on monarch butterfly distribution and reproduction, and the nectar and host plant presence on the site, the Project area can be assumed to provide potential habitat for monarch butterflies during migration. However, low-elevation, highly arid valley bottoms largely dominated by creosote bush (*Larrea tridentata*), such as the Project area, are less likely to provide high-quality foraging habitat. Habitat modeling across the range of the monarch butterfly has indicated that low-elevation Sonoran Desert is of low importance to the species in both spring and fall migration, with higher-value habitat in the region associated with urbanized areas (McIntyre et al. 2024). Nectar sources within the Project area are likely to be concentrated along xeroriparian washes and very limited in availability in years with low winter rainfall (reducing nectar availability for spring migration) or low summer monsoon season rainfall (reducing nectar availability for fall migration).

The Project area may support monarch butterfly reproduction, although surveys to date indicate that the density of suitable milkweed host plants within the Project area is very low. The majority of the vegetation community within the Project area is dominated by creosote bush on desert pavement or sandy soils, where milkweed species are unlikely to be present. Mojave milkweed is uncommon and associated with washes at low elevations, rush milkweed is often associated with rockier slopes and diverse desertscrub unlike the majority of the Project area, and fringed twinevine is also uncommon and

associated with washes. Additionally, a regional map product that includes monarch butterfly records by life stage, as well as milkweed plant locations, does not identify records of reproduction in or near the Project area (Western Monarch Milkweed Mapper 2025).

DISCUSSION

In summary, while the monarch butterfly has the potential to occupy the Project area during migration, the species has not been recorded in the Project area. There are flowering plants present in the Project area that can provide nectar resources for migrating monarch butterfly; however, these are concentrated along washes and are not the overall dominant vegetation type, and the Project has been designed to avoid large washes. While there is a potential for monarch butterflies to reproduce in the Project area, the availability of suitable host plants is very low.

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APPENDIX B-5.
Visual Resource Report

Visual Resources Report

Vulcan Solar Project
Maricopa County, Arizona

APRIL 2025

Prepared for:

VULCAN SOLAR PROJECT, LLC
700 Universe Boulevard
Juno Beach, Florida 33408

For Submittal to:

BUREAU OF LAND MANAGEMENT
Lower Sonoran Field Office
Phoenix, Arizona 85022

Prepared by:

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605 Third Street
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Table of Contents

SECTION **PAGE NO.**

TABLES

FIGURES

APPENDIX

Acronyms and Abbreviations

Acronym	Abbreviation
2012 Western Solar Plan	*Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States*
AC	alternating current
ACEC	Area of Critical Environmental Concern
BESS	battery energy storage system
BLM	U.S. Bureau of Land Management
BMP	best management practice
DC	direct current
DF	Design Feature
FEMA	Federal Emergency Management Agency
gen-tie line	generation interconnection transmission line
HDD	horizontal directional drilling
I	Interstate
KOP	key observation point
kV	kilovolt
Lower Sonoran RMP	*Lower Sonoran Record of Decision and Approved Resource Management Plan*
MV	medium voltage
MW	megawatt
NEPA	National Environmental Policy Act
O&M	operations and maintenance
Project	Vulcan Solar Project
PV	photovoltaic
RDEP	*Renewable Arizona: Restoration Design Energy Project: Record of Decision and Approved Resource Management Plan Amendments*
RMP	Resource Management Plan
ROW	right-of-way
SEZ	solar energy zone
SMS	solar meteorological station
VRI	Visual Resource Inventory
VRM	Visual Resource Management
VRR	Visual Resources Report

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Executive Summary

The Vulcan Solar Project (Project) is located in rural Maricopa County, Arizona in the valley between the Gila Bend Mountains to the southeast and Centennial Wash to the northeast. The area is a relatively flat desert floor, and the surrounding mountain ranges are prominent visual features; Webb Mountain, which is situated south of the Project site, dominates the view from much of the Project site. The Project area is located approximately 47 miles southwest of Phoenix and approximately 7 miles southwest of Arlington, Arizona. The Project site is used primarily for grazing and some recreational use. General vegetation consists primarily of Sonora–Mojave creosotebush–white bursage desert scrub with areas of Sonoran paloverde–mixed cacti desert scrub interspersed. The Project site is crossed by several ephemeral, intermittent, and braided channels as well as drainage ditches. The local desert valley is typified by low, spreading desert shrubs, including those presenting colors of green, yellow, and greyish, depending on the season. Vegetation is taller and denser along washes and mature trees are occasionally present in these areas. Although the local landscape presents as primarily natural in character and contains adjacent features (i.e., hills and mountains) considered to be scenic, it also includes visual remnants of prior agricultural operations/lands and existing high-voltage transmission lines supported by tall (i.e., 100 feet or taller) steel lattice towers. In addition, existing solar and other generation/industrial facilities are present in the broader valley landscape. Lastly, the Project site encompasses public lands managed by the U.S. Bureau of Land Management (BLM) in accordance with Visual Resource Management (VRM) Class IV and III objectives, which are defined in BLM Handbook 8400 as follows:

> **VRM Class IV.** The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and may be the major focus of viewer attention. However, the impact of these activities should be minimized through careful siting, minimal disturbance, and repeating the basic elements of form, line, color, and texture within the existing setting.
>
> **VRM Class III.** To partially retain the existing character of the landscape. Allowed Level of Change: The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

The purpose of this Visual Resources Report (VRR) is to document existing visual resources and views in and around the Project site, perform an assessment of potential effects to existing visual quality and character associated with Project development, and detail anticipated visual change and contrast in accordance with the BLM VRM system. This VRR concludes that construction and operation of the Project as proposed would conform with VRM Class IV and III objectives as defined in BLM Handbook 8400. As experienced from BLM-approved key observation points (or KOPs) where solar panels would be located in the immediate foreground–middleground viewing distance of motorists, Project components (primarily solar panels as viewed from the segment of Agua Caliente Road located within the Project boundary) would dominate views and would be a major focus of viewer attention. With increased distance from Agua Caliente Road, solar panels would attract attention, but with maintenance of existing intervening vegetation and a perceived lower apparent scale of solar panels, Project elements would not dominate views. While visual effects would be limited to the extent feasible and the Project Applicant would implement applicable design features from the BLM's 2012 *Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States* (Western Solar Plan) and best management practices (BMPs)

from the BLM's 2013 *Renewable Arizona: Restoration Design Energy Project: Record of Decision and Approved Resource Management Plan Amendments* (RDEP), the Project would result in strong or moderate visual contrast. Despite these changes, VRM Class IV allows major modification of existing landscape character and Class III allows management activities that attract attention but do not dominate the view of the casual observer. Based on the degree of visual change depicted in visual simulations, the Project would comply with the applicable VRM objectives for the Project site.

1 Introduction

This Visual Resources Report (VRR) documents existing visual resources and views in and around the Vulcan Solar Project (Project) site, presents an assessment of potential effects to existing visual quality and character associated with Project development, and details anticipated visual change and contrast in accordance with the U.S. Bureau of Land Management (BLM) Visual Resource Management (VRM) system. Specifically, anticipated visual change and contrast is evaluated and documented in accordance with BLM Manual 8431 – Visual Resource Contrast Rating (BLM 1986a), photo simulations are provided in figures at the end of this VRR, and visual contrast rating worksheets are provided in Appendix A to this VRR.

1.1 Project Overview

The Project consists of an up to 800-megawatt (MW) alternating current (AC) photovoltaic (PV) solar facility, an up to 800 MW battery energy storage system (BESS), a subsurface medium-voltage (MV) electrical collection system, an on-site substation, an operations and maintenance (O&M) facility, access roads, and ancillary Project facilities (collectively referred to as the solar facility). The Project also includes an approximately 4.3-mile-long 500-kilovolt (kV) generation interconnection transmission (gen-tie) line that would connect the solar facility from the new on-site substation to the existing 500 kV Hassayampa Substation via a 200-foot-wide right-of-way (ROW) corridor.

The Project location is depicted on Figure 1 and a site layout for the Project is provided on Figure 2.

1.2 Project Location

The Project is located in Maricopa County, Arizona, approximately 7 miles southwest of the unincorporated community of Arlington between the Gila Bend Mountains (southwest) and Centennial Wash (northeast) (see Figure 2). Four subareas of land would be used to site the solar facility, utilizing the following amounts of BLM-administered land: Subarea A (1,624 acres), Subarea B (2,363 acres), Subarea C (683 acres), and Subarea D (1,730 acres) (see Figures 1 and 2). Agua Caliente Road would serve as the primary access road through the Project site. The approximately 4.3-mile-long gen-tie line would traverse state and private land from the northeast corner of Subarea C to the Hassayampa Substation.

The solar facility is proposed for siting on federal public land totaling approximately 6,483 acres administered by the BLM, Phoenix District Office, Lower Sonoran Field Office and approximately 6 acres of private land under Maricopa County jurisdiction. The 103-acre gen-tie ROW would occupy approximately 76 acres of State Trust land under Arizona State Land Department jurisdiction and approximately 27 acres under Maricopa County jurisdiction.

1.3 Project Description

The typical characteristics of the Project components are summarized below and detailed in Table 1.

- Up to 800 MW AC PV solar facility
- Up to 800 MW BESS
- 34.5 kV subsurface MV electrical collection system within and between Project subareas

- 9.3-acre on-site substation
- 2-acre O&M facility (including O&M building, parking area, and storage)
- An approximately 4.3-mile-long 500 kV gen-tie line extending from the on-site substation to the 500 kV Hassayampa Substation within an up to 200-foot-wide ROW
- Access roads (including existing roads, improved roads, and new roads)
- Permanent solar meteorological stations (SMSs) to be installed within the solar arrays
- Permanent ancillary facilities would consist of the following:
  - Stormwater drainage facilities (retention basins and berms)
  - Distribution line or generator (to be determined)
  - Groundwater well and lined storage ponds (to be determined)

The following temporary Project features would also be required for construction:

- Construction laydown areas
- Temporary overland travel construction access paths
- Structure work areas around gen-tie line towers
- Pulling and tensioning sites associated with the gen-tie line

The Project would result in both temporary disturbance areas (which would be reclaimed immediately following construction) and permanent disturbance areas (which would remain disturbed until decommissioning and final reclamation).

Table 1 provides an overview of the anticipated dimensions of Project components and estimated temporary and permanent ground disturbance.

The Project site plan and disturbance estimates may be updated in future versions of the VRR, following further environmental and engineering analysis and revisions to the Project design.

Table 1. Project Facilities and Facility Dimensions, Temporary Disturbance, and Permanent Disturbance

Project Facilities	Temporary Disturbance (Acres)[a]	Permanent Disturbance (Acres)[a]
Solar Facility (800 MW)		
800-MW PV solar arrays	3,583.4[b]	1.9[c]
Temporary disturbance for Subarea C facilities (including BESS, substation, and O&M facility)	7.8	—
800 MW BESS	—	62.1
On-Site Substation	—	9.3
O&M Facility (including O&M building, parking area, and storage)[d]	—	2.0
Inverters	56.8	1.3
34.5 kV MV collection corridors within subareas (includes 8-foot-wide buffer on each side of corridor)	68.9	—

Table 1. Project Facilities and Facility Dimensions, Temporary Disturbance, and Permanent Disturbance

Project Facilities	Temporary Disturbance (Acres)[a]	Permanent Disturbance (Acres)[a]
34.5 kV MV collection corridors between subareas (includes 20-foot-wide buffer on each side of corridor to accommodate temporary overland travel construction access)	94.0	—
Solar meteorological stations	—	<0.1
Access roads – improved primary (from 15 feet wide to 20 feet wide, plus 3-foot clear zone on each side of road)	1.8	2.3
Access roads – new primary (20 feet wide plus 3-foot clear zone on each side of road) (provides access to Subarea C)	0.9	3.1
Access roads – secondary existing demolition (incorporated into solar array disturbance)	—	—
Access roads – new secondary (20 feet wide plus 3-foot clear zone on each side of road)[e]	33.3	111.5
Access road – new secondary to substation (20 feet wide plus 6-foot clear zone on each side of road)	1.7	2.9
Stormwater drainage basins	—	155.4
Stormwater berms	—	83.7
Groundwater well pads	—	0.3
Groundwater storage ponds, if applicable (designed as future basins)	1.0	—
Perimeter clear zone inside perimeter fence (10 feet wide)	—	63.1
Fencing – permanent (2 feet wide)	—	15.3
Temporary construction laydown yards	24.1	—
Total solar facility	**3,873.7**	**514.2**
Gen-Tie Line		
Access roads – improved primary (from 15 feet wide to 20 feet wide)	—	2.8
Access roads – new primary (20 feet wide)	—	11.8
Access road – temporary (20 feet wide)	0.9	—
Guard structures	1.1	—
Mid-span splicing	2.9	—
Structure work areas (200 × 200 feet temporary / 25 × 25 feet permanent)	16.5	0.3
Pulling and tensioning sites	19.8	—
Total gen-tie line	**41.2**	**14.9**

Source: SWCA 2024.
Notes: MW = megawatt; PV = photovoltaic; BESS = battery energy storage system; O&M = operations and maintenance; kV = kilovolt; MV = medium voltage.

[a] Where disturbance areas overlap, the disturbance is not double counted. For example, if a permanent road overlaps a temporary structure work area, the disturbance associated with the permanent road is subtracted from the temporary disturbance area.

[b] The temporary disturbance within the solar array areas includes approximately 1,332.4 acres of grading and 2,251.0 acres drive and crush/clear and cut (see Section 2.4.8 of the Plan of Development for details on site preparation methods).
[c] The permanent disturbance acreage of the solar arrays assumes 0.13% of the total array acreage would be occupied by the support structures.
[d] The size of the O&M building is only approximately 0.1 acres; however, it is anticipated that a 2-acre area surrounding the building would be needed for storage and parking during operations. This permanent disturbance area would occur over the temporary construction laydown yard currently sited in Subarea C.
[e] The size of the O&M building is only approximately 0.1 acres; however, it is anticipated that a 2-acre area surrounding the building would be needed for storage and parking during operations. This permanent disturbance area would occur over the temporary construction laydown yard currently sited in Subarea C.

1.3.1 Solar Facility

The solar facility would include an up to 800 MW nameplate capacity PV solar array, up to 800 MW BESS, MV collectors, on-site substation, O&M facility, internal access roads, and other ancillary facilities. Most Project components would be sited within the boundaries of the four solar subareas (see Figures 1 and 2). Portions of the MV collection system and access roads would be constructed outside the subareas.

Solar Arrays

The Project would use PV solar technology that converts the sun's light energy into direct current (DC) electrical energy within the PV solar panels/modules (referred to interchangeably in this VRR). Over 90% of solar modules are now manufactured to include an anti-reflective coating to improve performance and durability (Law et al. 2023); the PV modules installed for this Project would have an anti-reflective coating. The PV modules can be mounted together in different configurations, depending on the equipment selected, on a common support framework. The modules are arranged in series to effectively increase output voltage to approximately 1,500 volts. These series of modules (called "strings") provide the basic building block of power conversion in the solar array. The strings would be oriented north–south based on the mounting structure design; however, exact module support structure types would be determined during the final Project design.

The modules would be grouped together in solar arrays within four solar subareas (see Figures 1 and 2). The size of the array would be based on the capacity of the equipment selected and is intended to generate the desired overall voltage and current output. The dimensions, size, and weight of each module would depend on the manufacturer and available technology. Options for a tracker that uses one or two modules in portrait format are available, with the latter being favored if bifacial PV modules are used. At this time, up to 2,300,000 PV modules are estimated to be required to generate up to 800 MW. The exact number of modules may fluctuate as it can only be determined once modules are procured. Because solar energy technologies continue to evolve at a rapid rate, the exact arrangement and nature of the PV systems would be determined during the final design, and appropriate updates would be made to this VRR prior to construction if needed.

Solar Trackers and/or Fixed Support Structures

The completed assembly of PV modules mounted on a framework structure is called a "tracker," as it tracks the sun from east to west. The tracking system would be supported, when practical, by steel piers (piles) directly embedded into the ground without cement or aggregate to the extent possible, and horizontal racking that would be parallel to the ground. Difficult soil conditions may require some cement backfill for remediation purposes. The system would rotate slowly throughout the day at a range of ±60° facing east to west in order to stay perpendicular to incoming solar rays and to optimize solar production. Tracker systems also allow for the modules to pitch horizontal–vertical to allow for direct facing of the sun throughout the calendar year.

Module layout and spacing would be optimized to balance energy production vs. peak capacity and would depend on the sun's angle and shading caused by the horizon surrounding the Project. The spacing between the rows of trackers is dependent on site-specific features and tracker selection. Spacing would be identified in the final design; the current anticipated configuration includes spacing that is approximately 16.5 feet between rows (post to post). Existing vegetation that is not removed during grading activities may be trimmed to 12 to 18 inches high in areas where the vegetation could impede proper functioning of the PV modules. In some areas, the modules may be designed as high as 11 to 16 feet above ground level; however, design at this height would be limited to the greatest extent feasible.

Inverter Stations

The DC output from the PV arrays would be transmitted to inverters through a combination of aboveground and underground DC electrical cables. Aboveground 1,500-volt string wiring would run along the backside of the panels, and aboveground 1,500-volt DC collection wiring would run along the sides of array roads before extending underground to the inverters. The inverter stations are where the energy is converted to AC and then stepped up to an intermediate voltage of 34.5 kV.

There are 284 inverters currently sited within the solar arrays (subject to change with final design), with an additional 160 and 180 inverters within the BESS. Each inverter station would be approximately 20 to 40 feet long × 13 feet high, typically open air, and well suited for arid environments. The stations consist of DC collection equipment, utility-scale inverters, and a low-voltage to MV transformer. The number of modules connected to each inverter would depend on the specific model of modules, inverters, and their capacities, which would be selected in the final design.

Based on the current conceptual design, each inverter block is intended to produce a net power output of approximately 4 MW (as AC). The conceptual Project design's overall capacity is achieved with sufficient AC inverter subareas to deliver up to 800 MW at the point of interconnection.

On-Site Substation

The on-site substation would be sited within an approximately 9-acre area in the northeast corner of Subarea C. The tallest pole in the substation would lead to the first gen-tie tower and would be approximately 105 feet high; the remaining equipment in the substation would be approximately 40 feet high, pending final equipment selection. The purpose of the on-site substation is to step up the electricity generated by the solar array to a voltage necessary to transmit the electricity through the transmission grid. The on-site substation would step up to 500 kV via multiple step-up transformers to transmit the electricity at the same voltage as the point of interconnect (the 500 kV Hassayampa Substation). It would consist of parallel sets of internal power distribution systems (e.g., buses and circuit breakers, disconnect switches, and multiple step-up transformers). The on-site substation would also include a control house, which would be designed and constructed consistent with applicable state and local building codes. The supervisory control and data acquisition (SCADA) system would likely be located within the control house. A microwave tower may be needed for communications.

Battery Energy Storage System

The BESS would be located adjacent to the on-site substation in Subarea C. It would be designed to convert electrical energy to chemical energy, and vice versa. The BESS would have an output capacity no greater than that of the solar facility (up to 800 MW) and would be designed to store up to 4 hours of energy for later release

during periods of peak demand. The batteries in the BESS would be grouped together into modules and then grouped into sub-assemblies of vertical racks (also called packs or cabinets). The racks are then strung together in strings within an enclosure (container) to form an energy storage system. The BESS would be connected using an AC-coupled system.

In an AC-coupled system, the BESS enclosures are grouped together at a single site adjacent to the on-site substation. Between 650 and 700 enclosures are currently anticipated for the Project, pending final design and manufacturer selection. Each enclosure would be approximately 40 feet long × 8 feet wide × 9 feet high and mounted on a concrete pad or on steel piles/piers. The Project's fire protection design would comply with the National Fire Protection Association's 855 Standard for the Installation of Stationary Energy Storage Systems or Chapter 12 (Energy Systems) of the International Fire Code, as required by Maricopa County. It is the Applicant's intent that the batteries used in this Project undergo large-scale fire testing in accordance with UL 9540A, the Standard Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems. This test method was developed to minimize the risk of thermal runaway to address safety concerns about battery storage equipment raised by fire departments and building officials in the United States. Compliance with these standards and certification includes a battery management system that detects high temperatures at the battery cell or battery module level and automatically shuts down the battery rack. Furthermore, installation of battery units would follow manufacturer specifications for the spacing of batteries and clearance distances to further prevent a thermal runaway event. Each unit would also be equipped with thermal management systems to regulate the temperature of the batteries. The cabinets housing batteries are also designed with deflagration control in accordance with the National Fire Protection Association's 855 Standard. Power to the thermal management system would be provided via a connection to the on-site substation. The battery supplier(s) would be selected prior to Project construction, subject to market conditions and an industry-standard prequalification process.

Operations and Maintenance Facility

The 2-acre O&M facility would be located along a main access road within Subarea C of the solar facility, near the BESS and on-site substation (see Figure 2). The O&M facility would include a 5,000-square-foot O&M building, which would be a single-story metal building containing administrative offices, a break room, restrooms, a control room, a maintenance area, and a storage area. The O&M facility would also include a gravel parking area and exterior storage area. Buildings would be painted using a color selected from the BLM's standard environmental color tool in coordination with the BLM.

Access Roads

Primary and secondary permanent access roads are proposed for the solar facility and would be used for construction and O&M of the Project. Descriptions of the primary, secondary, and temporary roads are provided below. All new and improved primary and secondary access roads would be designed and constructed in accordance with RDEP requirements (see Attachment 4 of the Project Plan of Development [POD; SWCA 2024]). New roads would be 20 feet wide and constructed of compacted aggregate material. This road width was selected to provide sufficient space for fire and emergency vehicles.

A 3-foot-wide clear zone would extend beyond the aggregate surface on each side of the road to prevent construction equipment from being damaged. The clear zone of the substation road would extend 6 feet beyond the surface of each side of the road. Small brush would remain in the clear zone but large vegetation over 18 inches would be removed or trimmed. No grading is anticipated for these areas. The area contained within the clear zone of access roads has been included in the temporary disturbance acreage.

Descriptions of gen-tie line access roads are provided in the "Gen-Tie Line" subsection below. As required by the RDEP (see Attachment 4 of the Project POD [SWCA 2024]), the Applicant has also prepared a Traffic and Transportation Management Plan (Appendix D of the Project POD [SWCA 2024]) that discusses Project-related transport and traffic from Interstate (I) 10 (north) and I-8 (south) to Agua Caliente Road. An Access Road Siting and Management Plan would also be developed prior to construction.

Solar Meteorological Stations

Temporary SMSs were installed by the previous applicant and removed. No additional temporary SMSs are anticipated to be needed. SMSs typically measure solar irradiance, ambient temperature, wind speed and direction, humidity, and other atmospheric parameters.

Two or more permanent SMSs would be installed on posts within the system of solar arrays. The SMSs would be approximately 15 feet high within the Project site and would remain for the duration of Project operations until final decommissioning. Each SMS would generate approximately 400 square feet of permanent disturbance. The exact quantity and location of meteorological towers would be determined by requirements in the Large Generator Interconnection Agreement and/or power purchase agreements.

The permanent SMSs would provide real-time data and information on Project performance. The SMSs can help predict maintenance needs, improve production forecasts, provide real-time data for model validation, and fulfill regulatory requirements for environmental monitoring and reporting.

Medium-Voltage Collection System

Power from the inverter stations would be transferred to the on-site substation via a system of 34.5- kV MV collection corridors between Subareas A and B, B and C, and C and D (see Figure 2). The collector lines would be buried in trenches with an 8-foot separation between each MV collector. In areas where the collectors cannot be directly trenched into the ground, horizontal directional drilling (HDD) would be used to install them deeper underground (i.e., where the collectors would cross under a railroad, pipeline, or Federal Emergency Management Agency [FEMA]–mapped flood zones; see below).

Union Pacific Railroad Crossing

The MV collection corridor between Subareas A and B would traverse below an inactive section of the Union Pacific Railroad ROW (see Figure 2); HDD would be used in place of open trenches in this area to install the electrical wiring.

El Paso Natural Gas Pipeline Crossing

The MV collection corridor between Subareas B and C would traverse a buried section of the El Paso Natural Gas locally designated corridor, which contains natural gas pipelines (see Figure 2); HDD would be used in place of open trenches in this area to install the electrical wiring.

FEMA-Mapped Flood Zone A Crossing

The MV collection system that routes though Subareas A, B, C, and D would traverse some FEMA-mapped flood zones; HDD would be used in place of open trenches in these areas to install the electrical wiring.

Gen-Tie Line

Interconnection Facilities

Electrical power from the on-site substation would be transmitted through an approximately 4.3-mile-long 500 kV gen-tie line for delivery to the regional transmission grid via the existing 500 kV Hassayampa Substation (see Figures 1 and 2). Up to 22 tubular steel monopole structures would be used, depending on Project needs and resource requirements. The gen-tie towers are not expected to exceed 180 feet in height and would be tubular steel structures. Final hardware design, including tower height, would be determined during final engineering of the gen-tie line.

Gen-Tie Access Roads

Access to the gen-tie line ROW and pole structures would be required for construction and long-term maintenance. Existing paved and dirt roads would be used to transport material and equipment to and from the gen-tie line ROW and pole structures to the greatest extent practicable. The gen-tie would be accessed from I-10 via existing paved and dirt roads totaling approximately 18 miles. Gen-tie line construction would require improvements of an additional 4.6 miles of access roads. Approximately 5 miles of new permanent access roads would be needed for gen-tie line construction and O&M. These roads would consist of compacted soil or matting and would be approximately 20 feet wide. Approximately 0.5 miles of temporary roads would be needed to access pulling and tensioning sites and other portions of the gen-tie line that are not needed for long-term O&M (see Figure 2). Following construction, the temporary access road segments would be reclaimed to their original condition. The location and level of improvement of gen-tie line access roads are shown in Attachment 1 of the Project POD (SWCA 2024). For inspections and maintenance following construction, the gen-tie line would be accessed via all-terrain vehicles or by reinstalling temporary roads, if needed. Culverts or other drainage structures would be installed only if necessary to move heavy equipment across drainages.

Structure Work Areas

The installation of a 500 kV gen-tie line pole structure requires a temporary work area of approximately 200 × 200 feet. The structure work areas would be cleared and leveled with heavy equipment to support construction activities. In areas with site constraints (e.g., challenging terrain, sensitive resources), work areas may differ in shape or size to accommodate safe construction methods. Tower Structures 4 and 5 would be sited within Centennial Wash (see Figure 2). After construction, the structures would occupy a permanent 25 × 25–foot area.

Pulling and Tensioning Sites

During installation of the gen-tie line conductors and optical ground wire (or all-dielectric self-supporting fiber-optic cable), temporary work areas for line pulling and tensioning and mid-span splicing would be established at regular intervals along the gen-tie line. The pulling and tensioning sites would be needed at every dead-end structure and at angle structures where the gen-tie line alignment turns by more than 3°. Distances between the pulling and tensioning sites may also vary depending on the ROW alignment, terrain, and sensitive resource locations. Each pulling and tensioning site and mid-span splice site would temporarily disturb an area of approximately 250 × 600 feet. Where pulling and tensioning sites are located outside the permanent ROW, vegetation would be cleared as needed for stringing equipment and crews to operate.

Site Security and Fencing

The solar arrays, BESS, and on-site substation would be permanently fenced to restrict public access during construction and operations. Wildlife-friendly fencing would be installed around the site perimeter and around washes and will feature a six- to eight- inch gap at the bottom of the fence. Chain-link security fencing would be installed between the Project site and access roads, including Agua Caliente Road; on-site substation; and other areas requiring controlled access. All fence posts would be set in concrete or driven into the ground. Perimeter chain-link and all wildlife friendly fencing would be approximately 7 feet tall and consist of a 6-foot-tall chain-link fence with approximately 1 foot of barbed wire (three strands) mounted on 45° extension arms. Substation security chain-link fencing will be approximately 8 feet tall and consist of a 7-foot-tall chain-link fence with approximately 1 foot of barbed wire (three strands) mounted on 45° extension arms. All fencing would have a dulled galvanized finish to reduce the galvanized steel's potential for glare and contrast with the surrounding landscape. An estimated 63.7 miles of fencing would be required to fence an estimated 5,075.3 acres within the four solar subareas. This would require approximately 15.4 acres of permanent disturbance. Temporary disturbance associated with fence construction would occur within the permanent fire break for the Project (see Section 1.4.9 of the Project POD [SWCA 2024]). The exact measurements of the security fence would be determined as part of the final design.

Controlled access gates (swing or rolling access design) would installed be at all facility entrances. The solar facility is currently anticipated to include 48 entrances (see Section 1.4.1.8.3 of the Project POD [SWCA 2024]). Additional entrances may be added in the final design. The main facility entrance may be staffed to check in and approve visitors. If an entrance is not staffed by Project personnel, access would require an electronic swipe card to prevent unaccompanied visitors from accessing the facility. All facility personnel, contractors, agency personnel, and visitors would be logged into and out of the facility. Visitors and non-employees (except agency personnel on government business) would be allowed entry only with approval from a staff member at the facility. Additional security may be provided through the use of closed-circuit video surveillance cameras and anti-intrusion systems, as required, for protection of the power production facility.

The Applicant would coordinate the location of fencing and fence design with the BLM and wildlife agencies. Wildlife-friendly fencing would be installed across major washes (see Section 6.3.4.1 of the Project POD [SWCA 2024]) to allow for surface water flow and wildlife movement. Potential impacts to visual resources would are addressed in this VRR and best management practices (BMPs) would be used to minimize viewshed impacts.

Lighting

Permanent, low-elevation (less than 14 feet) controlled security lighting would be installed at all access gates, the on-site substation, and the entrance to the BESS enclosures. Some portable lighting may also be required for maintenance activities that must be performed at night. Lighting would be kept to the minimum required for safety and security. Sensors, switches, and timers would be used to keep lighting turned off when not required, and all lights would be hooded and directed downward to minimize backscatter and off-site light. Lighting would be attached to structural supports where possible or affixed to ground-mounted poles that are approximately 15 to 20 feet high. In accordance with the RDEP (see Attachment 4 of the Project POD [SWCA 2024]), the Applicant has prepared a Lighting Plan for the Project (Appendix G of the Project POD [SWCA 2024]). This plan describes how lighting will be designed and installed to minimize night sky impacts during facility construction and operations phases and incorporates the planning principles described in Technical Note 457, *Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM-Managed Lands* (BLM 2023), which

provides technical guidance on practical methods for reducing the impacts from artificial outdoor lighting associated with proposed projects or activities.

Signage

A sign would be installed at the main entry to the Project. The sign would be no larger than 8 × 4 feet and would read "Vulcan Solar Project." In addition, required safety signs would be installed on the fence near the entrance to identify the presence of high voltage within the facility and to provide information for emergency services.

1.3.2 Construction of Facilities

A preliminary schedule of Project construction is provided in the Project POD, Table 8 (SWCA 2024). The Applicant anticipates that the Project would be built in two to four phases and would require between 36 and 48 months total to complete. The Project may be constructed in its entirety within that timeframe or phased as commercially necessary to meet contractual requirements; phasing could occur over a period of 6 to 8 years. If phased, the individual phases would be sized in 250 MW to 550 MW increments, with Phase I currently anticipated to be 250 MW (but not yet finalized). Construction of the first phase would begin after the BLM issues a notice to proceed and completion of other federal, state, and local permits and approvals.

Construction of Phase I would include groundwater well development, pre-construction fencing and species relocation/native plant salvage, mobilization and staging, site preparation, substation and BESS yard grading and substation equipment installation, gen-tie line construction, and solar array installation.

The Phase I solar array is anticipated to be installed closest to the substation and BESS yard. Phase I is anticipated to require approximately 1,500 to 2,000 acres of the Project site and take 15 months to construct. Subsequent phases, if constructed, would consist of adding more solar arrays, adding more substation equipment to the existing on-site substation, and adding more BESS units to the existing BESS yard. The subsequent phases are expected to use the remainder of the Project site and would require up to 33 additional months to finish construction. The Project construction duration could be as long as 6 to 8 years following the BLM notice to proceed, depending on the execution of contractual requirements.

The scheduling of construction activities would be subject to geotechnical results, design and environmental considerations, and commercial agreements. The details of each phase are subject to change in future iterations of this VRR.

2 Regulatory Background

2.1 National Environmental Policy Act

There are several applicable regulations, policies, and procedures that pertain to visual resources. The Council on Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA) identify aesthetic effects as a type of impact to be addressed in NEPA reviews, which should include discussion of the design of the built environment (Title 40, Sections 1502.16 and 1508.1, of the Code of Federal Regulations). The regulations also require discussion of possible conflicts of a proposed action with the objectives of federal, regional, state, local, and tribal land use plans and policies, such as those pertaining to management of visual resources. The Council on Environmental Quality regulations do not include more specific direction about aesthetic impact issues to be considered or specify a means for evaluating aesthetic impacts

2.2 Federal Lands Management Policy Act

The Federal Land Policy and Management Act of 1976 mandates the management of public lands including the identification and protection of their scenic quality and values (Title 43, Section 1701 et. seq. and Sections 102[a][8], 103[c], and 201[a], of the United States Code), while allowing for multi-use. ROW grants on federal lands must contain terms and conditions that would minimize damage to scenic quality and aesthetic values (Section 505[a]). BLM consideration of visual resource issues associated with ROW grants is generally based on the visual resource provisions of standard BLM policies and procedures developed for land use planning and NEPA compliance.

Visual Resource Management System

The BLM uses a VRM system, defined in BLM Manual 8400, to classify visual values of landscapes on federal lands, adopt management objectives to either preserve existing conditions or allow for different levels of modification, and evaluate if land use decisions would conform or conflict with the adopted management objectives (BLM 1984). Visual values are first evaluated by completing a Visual Resource Inventory (VRI) process according to the guidelines in BLM Manual Handbook H-8410-1 (BLM 1986b). Four different VRM classes are then assigned to landscapes through the BLM's RMP process that define management objectives for visual conditions regardless of the values identified during the VRI process.

The following VRM classes and objectives have been established in BLM Manual 8400 (BLM 1984):

- **Class I:** The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **Class II:** The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **Class III:** The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention

but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

- **Class IV:** The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The BLM's current VRM classes assigned to the Project site and surrounding region are shown on Figure 3 (BLM 2012). The Project site is mostly within VRM Class IV, with the exception of portions of Subarea B that are within VRM Class III.

2.3 Lower Sonoran Resource Management Plan

The 2012 Lower Sonoran RMP provides management guidance and identifies land use decisions for management of approximately 930,000 acres of public lands mostly in Maricopa County but also includes portions of Pinal, Pima, Yuma, and Gila counties. The Project is entirely located on BLM land within the Lower Sonoran RMP planning area. The RMP includes specific land use allocations and management direction within the planning area, including development of minerals, ROWs, land tenure, recreation opportunities, access, grazing, wildlife habitat, cultural resources, and other special areas with natural resource preservation objectives.

The 2012 Lower Sonoran RMP includes the following policies related to visual resources:

- **VR-1.1.3:** All surface-disturbing projects or activities, regardless of size or potential impact, will incorporate visual design considerations consistent with the Visual Resource Contrast Rating Manual H-8431-1 to meet VRM class objectives for the area. Even activities in VRM Class IV will consider designs that help reduce visual contrast between a proposed project and landscape settings (color, texture, line, and form).
- **VR-1.1.4:** Measures to mitigate potential visual impacts could include the use of natural materials, screening, painting, project design, location sighting, or restoration.
- **VR-2.1.2:** Development on public lands will be required to use dark-sky-friendly technologies in VRM Classes I through IV and in the Sentinel Plain area to provide opportunities for stargazers and amateur astronomers and to maintain conditions favorable to nighttime military operations. Measures may include, but will not be limited to, directing all light downward, using shielded lights, using only the minimum illumination necessary, using lamp types such as sodium lamps (less prone to atmospheric scattering), using circuit timers, using motion sensors, or using flight proximity detectors.

2.4 Solar Energy Program

The Lower Sonoran RMP was amended by two programmatic land use planning efforts that apply to solar energy development on BLM-administered land: the 2012 Western Solar Plan (BLM 2012) and the RDEP (BLM 2013). These plans are described below as they relate to visual resource management.

2012 Western Solar Plan

The Project overlaps two renewable energy designations from the 2012 Western Solar Plan (BLM 2012) (see Figures 1 and 2; see also Section 3.3, Key Observation Points, of this VRR). All of Subareas A, C, and D and a portion of Subarea B overlap BLM-administered land designated as a solar variance area (see Figure 2). Solar variance areas are available for utility-scale solar energy development with special stipulations. An estimated 1,871 acres of Subarea B also overlaps the Gillespie Solar Energy Zone (SEZ) (see Figure 2). A SEZ is defined by the BLM as an area well suited for solar development.

Solar development in designated solar variance areas and designated SEZs generally follow BLM policies and requirements established by the 2012 Western Solar Plan (BLM 2012). The previous project Applicant, Naturgy, prepared a Variance Factors Analysis for the 650 MW Vulcan 2 project minus the land designated as the Gillespie SEZ on a total of 5,360 acres of BLM-administered land (Naturgy 2022). Solar applications in Arizona are generally subject to the policies and requirements established by the RDEP (discussed below).

RDEP

All four solar subareas overlap 4,494 acres of a Renewable Energy Development Area that was designated by the BLM Arizona State office as part of the RDEP (BLM 2013) (see Figure 2). Renewable Energy Development Areas are lands within designated solar variance areas that have met some factors to be considered for project siting, "including providing areas identified as suitable for solar energy development in areas of low resource conflict, opportunities for combining Federal and non-federal lands, and opportunities for projects to be developed on disturbed lands" (BLM 2013, pp. 2–5). The BLM manages Renewable Energy Development Areas in accordance with the goals, objectives, management actions, design features, and BMPs described in the RDEP.

Design Features

The applicable design features (DF) for visual resources excerpted from the RDEP are consolidated in Attachment 4 of the Project POD (SWCA 2024) and are listed below. The design features for visual resources would be adhered to during siting, construction, and operation of the project:

- **RDEP DF Visual Resources – 78/POD DF # 67:** "Project developers shall exhaust opportunities of projects to be sited outside the viewsheds of KOPs [key observation points], or if facilities must be sited within view of KOPs then they shall be sited as far away as possible, since visual impacts generally diminish as viewing distance increases."
- **RDEP DF Visual Resources – 80/POD DF # 68:** "A Lighting Plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operations phases. Lighting for facilities shall not exceed the minimum number of lights and brightness required for safety and security and shall not cause excessive reflected glare. Full cut-off luminaires shall be utilized to minimize uplighting. Lights shall be directed downward or toward the area to be illuminated. Light fixtures shall not spill light beyond the project boundary. Lights in high-illumination areas not occupied on a continuous basis shall have switches, timer switches, or motion detectors so that the lights operate only when the area is occupied. Where feasible, vehicle-mounted lights shall be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting shall be kept off when not in use. The Lighting Plan shall include a process for promptly addressing and mitigating complaints about potential lighting impacts."
    - This plan has been prepared by the Applicant and appended to the Project POD as Appendix L.

- **RDEP DF Visual Resources – 80/POD DF # 69:** "A study to assess accurately and to quantify potential glinting and glare effects and to determine potential health, safety, and visual impacts associated with glinting and glare effects shall be conducted by qualified individuals using appropriate and commonly accepted software and procedures. The study results must be made available to the BLM in advance of project approval. If the project design is changed during the siting and design process such that substantial changes to glinting and glare effects may occur, glinting and glare effects shall be recalculated, and the study results made available to the BLM."
  - This study has been prepared by the Applicant and is submitted under separate cover.
- **RDEP DF Visual Resources – 82/POD DF# 70:** "Commercial symbols or signs and associated lighting on buildings or other structures shall be prohibited."

BMPs

In addition to the design features listed above, the BLM's Arizona State Office recommended BMPs for visual resources as part of the RDEP process (BLM 2013). All agreed-upon RDEP BMPs for visual resources would be implemented by contractor(s) during construction, O&M, and decommissioning of the Project, as applicable, and appended to a future iteration of this VRR.

3 Environmental Setting

3.1 Landscape Setting

The Project is located on BLM-administered land in a relatively undeveloped and rural part of southwest Maricopa County, Arizona. The closest local rural residences are located about 1 mile east of the Project site along Old U.S. Highway 80. The Project site is used primarily for grazing and some recreational use and is located within the Sonoran Basin and Range Physiographic Province (also known as the Basin and Range Province), consisting of alternating patterns of steep mountain ranges and flat basins (NPS 2020). More specifically, the Project site is located within the Arlington Valley of the Sonoran Desert Ecoregion (NPS 2023) and is covered by grassland/shrubland characteristic of a warm, semi-arid desert, comprising of 87% Sonora–Mojave creosotebush–white bursage desert scrub and 6% Sonoran paloverde–mixed cacti desert scrub vegetation communities (Heritage Environmental Consultants 2024). Arlington Valley lies between the Palo Verde Hills to the north and the Eagle Tail Mountains to the south. Elevation in the area ranges from 800 to 1,000 feet above mean sea level. The topography is relatively flat with braided, shallow ephemeral washes that cross the site flowing north-northeast toward tributaries draining to the Gila River.

Field surveys conducted within the Project site in 2022 found relatively homogeneous vegetation with generally flat terrain interspersed with multiple desert washes. The northwestern portion of the Project site contains more varied terrain with flat to rolling hills and more diversity of cactus species than other portions of the Project site (Heritage Environmental Consultants 2023). Mapped communities were field-verified with the addition of North American warm desert xeric–riparian scrub communities found along the larger ephemeral washes (Heritage Environmental Consultants 2024). This community consists of variable vegetation of desert washes ranging from sparse and patchy to moderately dense, and it typically occurs along the edges or in the channel bottoms.

3.2 Viewshed and Visual Analysis Area

The visual environment can be vast; therefore, for purposes of analyzing impacts, boundaries must be placed on it. The area within those boundaries is commonly referred to as the viewshed. A viewshed is composed of all the surface areas visible from an observer's viewpoint and within a defined study area. Viewshed for this Project were prepared using geographic information system (GIS) software and depicts potential/theoretical areas of Project visibility within a 10-mile radius centered on the Project site. The rasters of theoretical visibility for select project components including solar arrays, project substation, O&M facility, and gen-tie poles, are shown on Figures 4A through 4D, Viewshed Results, and is based on existing terrain as well as an assumed Project component height of up to 16 feet above mean sea level (amsl) for solar arrays, 40 feet amsl for the substation building and 105 feet amsl for the tallest substation tower, 20 feet amsl for the O&M building, and 180 feet amsl for the gen-tie support poles. Note that the viewsheds do not account for or consider potential screening associated with vegetation or existing structures, including development, that may occur between a given location or a representative vantage point, including selected KOPs.

The viewshed analysis results identify areas as "visible" where there is a higher potential (darker color) for views of the proposed solar arrays within the 10-mile analysis area, whereas areas that are not identified as visible indicate where there is a lower or no potential (lighter color) for views. Actual visibility and whether the project features would be noticeable or draw viewer attention in the landscape depends on various factors, including visibility conditions (e.g., lighting, air quality, weather), angle of view (e.g., relative viewer position and view orientation), duration of view (in time or distance), and scale and spatial relationship (degree of contrast) of the project (BLM 1986a, 1984).

As shown on Figure 5, Key Observation Points, available views to the Project site and Project components may extend to areas beyond the immediate surrounding landscape. Specifically, views to the Project may be available from select locations including elevated terrain within the 10-mile analysis area. It should also be noted that BLM Special Designation lands are included in (or near) the analysis area and include two Areas of Critical Environmental Concern (ACECs), two national wilderness areas, and the Sonoran Desert National Monument.

The Saddle Mountain ACEC overlaps the Saddle Mountain Special Recreation Management Area and is located about 0.13 miles north of the Project site (specifically, the northernmost point of Solar Subarea A). The Lower Gila Terraces and Historic Trails ACEC is located about 0.5 miles east of Solar Subarea C, and the ACEC contains historic trails and petroglyphs along the western side of the lower Gila River. The viewshed results depict pockets of high to moderate potential solar array visibility extending into these specially designated areas; however, there are no known routes of travel or public use (recreational or otherwise) in the areas with moderate to high solar array visibility. Accordingly, KOPs were not proposed or selected for these areas, consistent with guidelines outlined in BLM policy (BLM 1986a).

Signal Mountain Wilderness (federally designated wilderness) is located approximately 3.5 miles south of Solar Subarea D. This wilderness is located north adjacent to the northwestern portion of Woolsey Peak Wilderness, which is also located approximately 3.5 miles to the south of Solar Subarea D. The viewshed results depict pockets of high potential solar array visibility extending to elevated terrain in the northern portions of these federally designated wildernesses; however, similar to the ACECs, there are no known routes of travel or public use in the areas overlapping potential high solar array visibility areas. Accordingly, KOPs were not proposed or selected for these areas consistent with BLM policy identified above.

Lastly, the western boundary of the Sonoran Desert National Monument is located approximately 11 miles to the southeast of Solar Subarea C. Located within the boundary of the national monument, the North Maricopa Mountains Wilderness is located approximately 11.5 miles southeast of Solar Subarea D. The nearest formal recreation site, Margie's Cove West Campground, is located approximately 14.5 miles east of Solar Subarea D. Based on the viewshed results, potential solar array visibility does not extend to the national monument.

3.3 Key Observation Points

The study of visual conditions, viewer experience, and viewer response involves identifying and selecting KOPs. These KOPs adhere to BLM guidelines, emphasizing commonly traveled routes or other likely observation points around projects, as outlined in BLM Manual 8431 (BLM 1986a). Six KOPs were selected by Dudek and approved by the BLM Project Team for detailed analysis of the Project and preparation of visual simulations. Of the six KOPs, four are focused on the various development subareas of the proposed solar facility and the remaining two are focused on the proposed gen-tie line and the proposed gen-tie line interconnection to the existing 500 kV Hassayampa Substation. For further details, refer to Table 2, which outlines viewer categories and their characteristics, along with location and proximity to the Project site at each KOP.

The six KOPs selected for analysis are depicted on Figure 5. While the viewshed analyses present theoretical visibility of Project components extending throughout a 5 to 10-mile radius area around project components (see Figures 4A through 4D), there are no known routes of travel or public use in the areas (i.e., federal wilderness, ACECs, and recreation management areas) overlapping potential high solar array visibility areas. Further, the special designation areas in the Project area landscape tend to encompass remote terrain and lands lacking formal

public facilities or access points. Given the lack of formal access and unknown frequency of use of areas by the public, KOPs were not established in the nearby special designation lands.

Table 2. Key Observation Points

KOP	KOP Location	Latitude	Longitude	Elevation (Feet amsl)	VRM Class	Distance from Project Site (Approximate)	Represented Viewer Categories
1	Eastbound Agua Caliente Road	33.172824	112.272671	965	Class IV	50 feet to Project Boundary Solar Subarea A (75 feet to nearest solar panel/array	▪ Recreational travel route ▪ Dispersed recreation area
2	Eastbound Elliot Road	33.205413	112.512471	895	Class IV	780 feet to 500 kV Hassayampa Substation (1,680 feet to gen-tie line)	▪ Local travel route
3	Southern Pacific Trail	33.191124	112.512655	850	Class IV	865 feet west of existing Agave Solar Plant (0.2 miles to proposed gen-tie centerline	▪ Recreational trail
4	Westbound Agua Caliente Road	33.154529	112.494050	825	Class IV	0.2 miles to Project Boundary Solar Subarea C (0.30 miles to nearest solar panels)	▪ Local travel route Recreational travel route
5	Westbound Agua Caliente Road	33.153776	112.521478	940	Class IV	Adjacent to Project Boundary Solar Subarea B (85 feet to nearest solar panels)	▪ Local travel route ▪ Recreational travel route
6	Westbound Agua Caliente Road	33.153364	112.532621	970	Class III	0.25 miles to Project Boundary Solar Subarea B (0.35 mile to nearest visible solar panels in Subarea B)	▪ Local travel route ▪ Recreational travel route

Notes: KOP = Key Observation Point; amsl = above mean sea level.

3.4 Field Investigations

Dudek conducted a field investigation of the KOPs and views toward Project components from public roads in September 2024 to document existing conditions and collect photographs. Visual conditions at the KOPs are described in the following sections. Dudek also prepared visual simulations of the proposed Project using traditional methodology, including use of survey control points in their 3D computer model for location accuracy.

3.5 Viewer Characteristics

3.5.1 Overview

In consultation with the BLM, six KOPs were selected to analyze the proposed Project. As previously mentioned, the viewshed analyses present theoretical visibility of Project components extending throughout a 5 to 10-mile radius area around project components (see Figures 4A through 4D). However, as there are no known routes of travel or public use in the areas (i.e., federal wilderness, ACECs, and recreation management areas) overlapping potential high solar array visibility areas, KOPs were not established in the nearby special designation lands. At all selected KOPs, viewer responses to landscape changes depend on a variety of factors including prominence of landscape modifications, existing visual character, duration of available view, nature of viewer activities (e.g., travel, recreation), and viewer expectations. Two primary types of viewing areas and viewer groups occur in the Project area: vehicular travel routes and recreation areas. While all KOPs are located on public roads or trails, they are also representative of views available to viewer groups other than motorists, as noted in Sections 3.5.2 and 3.5.3.

- **Vehicular Routes.** Vehicular travel route KOPs for the Project are located along local roads used by origin/destination travelers, and users accessing designated recreation areas. These KOPs approximate the view of local motorists. Local motorists use smaller roads with lower traffic volume and slower speeds. They have higher expectations for preserving the existing landscape character, resulting in low to moderate visual sensitivity.
- **Recreation Areas.** Identified Recreation Area KOPs (i.e., Southern Pacific Trail) are situated on lands/areas provided for dispersed recreation. For purposes of this report, dispersed recreation includes low intensity recreational activities (e.g., trail-based recreation/hiking) that occur throughout a large area as opposed to a specific place/recreational facility or attraction. Recreationists who frequent these sites generally exhibit a moderate to high sensitivity to visual changes that is influenced by their expectation of encountering natural, open landscapes.

The Project KOPs in each viewer category and the represented viewing areas are discussed in this section.

Six KOPs were selected to illustrate areas where the Project may be visible to casual observers. Points are located along roads and trails, including Agua Caliente Road (KOP 1, KOPs 4–6), Elliot Road (KOP 2), and the Southern Pacific Trail (KOP 3). In addition, photos taken at each KOP were used to create visual simulations that portray the impact of the Project on existing visual conditions. According to these simulations, the Project is visible from each KOP. Further discussion of the level of impacts at each KOP is discussed in the following section.

3.5.2 Vehicular Travel Routes

Vehicular travel routes include recreational travel routes, regional travel routes, and local travel routes. KOPs located along local roads and recreational travel routes include the following:

- KOP 1 (Eastbound Aqua Caliente Road)
- KOP 2 (Eastbound Elliot Road)
- KOP 4 (Westbound Agua Caliente Road)
- KOP 5 (Westbound Agua Caliente Road)
- KOP 6 (Westbound Agua Caliente Road)

3.5.3 Recreation Areas

Recreation areas include dispersed recreation areas. KOPs selected within recreation areas include the following:

- KOP 3 (Southern Pacific Trail)

3.6 Night Sky Qualities

The Lower Sonoran RMP does not include night sky management objectives; however, existing night sky quality and a project's potential impacts due to the introduction of new lighting sources can be considered during project planning. Night sky qualities are understood as issues that affect nighttime visibility and the opportunities for stargazing, which can be affected by natural atmospheric conditions and artificial lighting. Valued night sky qualities generally occur in undeveloped areas with minimal lighting sources. On the Project site, nighttime sky glow from outdoor lighting and vehicle traffic is generally limited due to the Project site's distance from established roads and developed communities. In addition, there are several residences located within one mile of the Project site and the town of Arlington that is located approximately 4 miles away. This includes facilities such as electrical substations, natural gas power plants, and the Palo Verde Generating Station that are sources of night lighting in the area. Special designation areas in proximity to the Project site do not contain stationary sources of nighttime lighting and thus, do not substantively contribute to the existing night sky lighting environment.

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4 Impact Analysis

4.1 Methodology

4.1.1 Visual Simulations

Visual simulations are included and used in this analysis for representing the relative scale and extent of change to the existing visual environment anticipated to occur because of Project implementation. Visual simulations were prepared from six representative vantage points (KOPs) in the surrounding area and depict the Project at completion of construction. Photo simulations include existing site photographs as background image and true-scale 3D models of the Project rendered onto the existing photographs. Background photographs were taken during the September 2024 site visit conducted by Dudek from selected KOPs. Using available topography, a 3D surface was created for the existing terrain then imported into Autodesk 3ds Max. This 3D surface was used to camera-match the background photos to the terrain model. 3D models were then created for all proposed facilities that would be visible from the selected KOPs. The visual simulations present an estimated real view to the Project that would be experienced by the public from a publicly accessible location. At several KOPs, visibility of Project features would continue beyond the extent shown in the visual simulations. The visual simulations are representative illustrations of Project views at a precise location and view direction. The view directions shown in the simulations were selected in collaboration with the BLM to capture views of Project components that would be experienced by casual viewers.

Existing conditions photographs and visual simulations of Project features as experienced from identified KOPs are presented on Figures 6 through 11.

4.2 Visual Contrast

The analysis presented in this VRR is based on the BLM's Visual Contrast Rating system (BLM 1986a). The basic philosophy underlying the system is that the degree to which a management activity (i.e., development project) affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. To determine the severity of visual change, BLM notes that the contrast can be measured by comparing a project's features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by a project. A visual contrast rating system provides a means for determining visual impacts and identifying measures to mitigate these impacts.

Consistent with BLM's VRM contrast rating system, a Proposed Action (i.e., the Project) is analyzed for its anticipated contrasts with features (i.e., landform, vegetation, development) within the existing landscape. The contrast is measured by comparing a project's features with the major features in the existing landscape, and more specifically, the form, line, color, and texture presented by major features. This assessment process provides a means for determining visual impacts and identifying measures to mitigate these impacts. At each KOP, both the existing landscape and a Proposed Action's effect on the landscape are characterized using BLM's Visual Resources Contrast Rating Manual (Manual 8431; BLM 1986a).

In addition to the major landscape features and character elements that are assessed in the visual contrast rating forms, elements that are considered in visual contrast evaluations include screening of a project's components by

intervening vegetation, landforms, and development; placement of structures relative to existing vegetation, landforms, and other structures; viewing angle and orientation relative to a project; distance between a viewer and a project; view exposure/duration; atmospheric conditions; frequency of use/number of viewers at a KOP; and relative or apparent scale of a project. Once the degree of anticipated contrast is determined (contrast is described as either strong, moderate, weak, or none), a conclusion on the overall level of visual change and effect is presented (ranging from very low to high). Lastly, a determination of a project's conformance with the VRM Class Objectives is provided. Visual contrast rating forms for the proposed Project are provided in Appendix A to this VRR.

Under the BLM's VRM system, an adverse visual effect occurs within a public view when (1) an action/project perceptibly changes existing features of the landscape such that they (landscapes) no longer appear to be characteristic of the subject locality or region, (2) an action introduces new features to the landscape that are perceptibly uncharacteristic of the region or area, and/or (3) aesthetic features of the landscape are blocked or obscured by Project components/features/activities. Uncharacteristic changes are those that are perceived as out of place, discordant, or distracting, and the severity of a visual impact depends on how noticeable the change or contrasts may be.

In accordance with BLM guidelines (BLM 1986a), visual contrast is defined as follows:

- **None**. The element contrast is not visible or perceived.
- **Weak.** The element contrast can be seen but does not attract attention.
- **Moderate.** The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong**. The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

The contrast rating results for the Project are summarized in Section 4.3, Project Impacts. Contrast Rating Forms are included as Appendix A to this VRR.

4.3 Project Impacts

4.3.1 Visual Contrast and Conformance with BLM Management Objectives

Overview

The Project's visual impacts were evaluated to determine if the Project would conform with VRM IV and III objectives as defined in BLM Manual 8400, which considers level of visible contrast, extent of proposed landscape alterations, and how noticeable the landscape alterations would be to the casual viewer during construction, operation, and decommissioning of the Project.

Construction

Major project construction is expected to occur over an approximately 36- to 48-month period and would occur in a phased approach. Construction activities would result in short-term impacts on views related to the presence of equipment, materials, vehicles, and personnel in the landscape (at the solar facility site, along the gen-tie line route, and along project area roads) and the generation of dust from ground disturbance and general vehicular movement. Construction would generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be

necessary to make up schedule deficiencies or to complete critical or ancillary construction activities, including night work. Hot weather may require alternative start and stop times. During the startup phase, and for some work during the production phase, some construction activities (e.g., transformer oil filling/processing, equipment, and system testing) may occur outside normal work hours. All work activities would comply with all applicable Arizona labor laws and Maricopa County's Hours of Construction Ordinance (Maricopa County 2004).

While construction activities could degrade existing scenic quality due to gradual contrasts in color, line, and textures as viewed from KOPs and other vantage points in the surrounding area, view effects due to temporary construction activities including vehicle/equipment/worker presence would be fleeting and would not result in substantial, prolonged obstruction or interruption of views to scenic resources (including mountainous terrain) in the surrounding area. Construction of the Project may entail the use of cranes, forklifts, drones/helicopters (for gen-tie line stringing), heavy equipment including tractors, bulldozers, graders, concrete trucks, truck-mounted drill rigs, and pan scrapers, temporary storage and operations facilities, and temporary laydown and staging areas. Construction activities would include site preparation and grading and construction of the following Project components: new access roads (internal and external), a 500 kV gen-tie line, MV collector lines, an electrical substation, an O&M facility, a microwave tower, solar tracker/mounting assemblies and arrays, inverters, transformers, and BESS enclosures. In addition, the construction of the gen-tie line (during Phase 1 of construction) would involve access road improvement, clearing and grading of pole sites, foundation preparation, pole installation, conductor stringing, and site reclamation. The equipment, vehicles, and workforce involved with these activities (and components associated with the various phases of construction) would be most visible from Agua Caliente Road (particularly the segment through/near the Project site; KOPs 1, 4, 5, and 6) and from the Southern Pacific Trail (KOP 3). As summarized in Table 3, contrasts resulting from Project construction would range from none/weak to strong depending on viewing location. Visual contrasts during the construction phase were estimated based on proximity of KOPs and clarity of views to the Project site and project components, as well as visual change from construction occurring within the same areas where permanent project facilities are shown in the visual simulations prepared for Project operations. Generally, contrasts during construction are expected to be slightly greater than during the operational phase since viewers would experience gradual change across the site as well as the juxtaposition of permanent facilities and active construction activities.

Once construction is complete, permanent facilities would cover the Project's development footprint and would be the focus of viewer attention and perceptible landscape contrasts. Although construction activities would result in weak to strong contrasts that would be noticeable to casual observers at KOPs (specifically, KOPs 1, 4, 5, and 6), construction contrasts with VRM Class III and Class IV objectives would be temporary due to the short-term nature of activities and, more generally, the construction phase.

Table 3. Degree of Visual During Construction, Operations, and Maintenance

KOP	Location Name	Construction	Operations and Maintenance	Decommissioning [a]
1	Eastbound Agua Caliente Road	Strong	Moderate–Strong	Strong
2	Eastbound Elliot Road	Weak	Weak	Weak
3	Southern Pacific Trail	Moderate–Strong	Moderate	Moderate–Strong
4	Westbound Agua Caliente Road	Strong	Moderate–Strong	Strong

Table 3. Degree of Visual During Construction, Operations, and Maintenance

KOP	Location Name	Construction	Operations and Maintenance	Decommissioning [a]
5	Westbound Agua Caliente Road	Strong	Strong	Strong
6	Westbound Agua Caliente Road	Moderate	Moderate	Moderate

Notes: KOP = Key Observation Point.
[a] Visual contrast during decommissioning is anticipated to be similar to visual contrasts during construction.

Operations and Maintenance

Once the Project has been constructed and is operational, the Project would create strong visual contrasts when viewed from most identified KOPs. Visible contrast would primarily result from the presence of numerous new solar arrays in the broad, desert landscape, and contrasts would generally be most severe at KOPs located within the foreground viewing distance of new solar arrays (i.e., KOPs 1, 4, and 5). At these KOPs, strong contrasts are anticipated; however, major modifications creating particularly noticeable and strong contrasts are permissible within and on VRM Class IV lands. At KOP 6, wherein visible panels to the northwest would be located on VRM Class III lands, color contrast associated with solar panels would begin to attract the attention of casual observers but because panels would be low to the ground and set back from observers, visible solar panels would not dominate the view. Thus, at KOP 6, Project visual change would conform to VRM Class III objectives that permit activities that may attract attention but should not dominate the view of the casual observer.

Design measures to reduce contrast are derived from BLM BMPs and are presented in Appendix A (Visual Contrast Rating Forms). The recommended measures would reduce contrast to some degree, but moderate and strong contrast would persist and visible features of the Project would continue to attract attention at KOPs 1, 4, 5, and 6. Despite these anticipated levels of contrast, Project visual change would conform to VRM Class IV objectives. For the portions of Solar Subarea B managed as VRM Class III lands by the BLM, the Applicant will implement a best management practice (BMP) associated with site preparation that would aim (to the extent feasible and in conformance with the Project Grading Plan and Project Habitat Restoration and Integrated Vegetative Management Plan (HRIVMP) to retain some existing vegetation or, where grading would result in temporary impacts to vegetation, would entail revegetating areas with appropriate plant materials. The overall contrast rating results for O&M and conformance with VRM class objectives are summarized in Table 4.

Table 4. Contrast Rating Results for Operation and Maintenance and Conformance with VRM Class Objectives

KOP	Location Name	Degree of Visual Contrast	Conforms with VRM Class?	Analysis
1	Eastbound Agua Caliente Road	Moderate-Strong	Class IV: Yes	The solar project near KOP 1, located approximately 50 feet from the Project Boundary of Solar Subarea A and 150 feet from the nearest solar panel, would be highly visible. The chain-link fence and dark solar panels would dominate the view and much of the valley terrain and mountain peaks, with strong form, line, and color contrasts attracting attention. See Figure 6, KOP 1 – Eastbound

Table 4. Contrast Rating Results for Operation and Maintenance and Conformance with VRM Class Objectives

KOP	Location Name	Degree of Visual Contrast	Conforms with VRM Class?	Analysis
				Agua Caliente Road Existing and Proposed Conditions.
2	Eastbound Elliot Road	Weak	Class IV: Yes	KOP 2, located approximately 780 feet northwest of the Hassayampa Substation and 1,680 feet northwest of the gen-tie line, is situated among existing electrical lines and substation structures. Although the project would be visible, it would blend in with the existing setting and not dominate the southerly view due to the distance, existing structures, and the presence of rugged mountains in the background. See Figure 7, KOP 2 – Eastbound Elliot Road Existing and Proposed Conditions (Figure 7a provides a redline version for clarity).
3	Southern Pacific Trail	Moderate	Class IV: Yes	KOP 3 is located about 0.2 miles west of the gen-tie line, within the foreground of existing electrical lines and substation structures. With implementation of the Project, a simple yet visually prominent, greyish vertical pole and numerous horizontal/concave conductor lines would be visible against the broad desert sky. While the single pole would not be central to the view, its scale and proximity to KOP 3 would attract attention and viewer's focus. The Project pole and conductor lines would generally be consistent with the existing setting that is populated with more complex electrical transmission structures and energy generating facilities (e.g., solar power plant and natural gas power plant). See Figure 8, KOP 3 – Southern Pacific Trail Existing and Proposed Conditions.
4	Westbound Agua Caliente Road	Moderate-Strong	Class IV: Yes	KOP 4 is located about 0.20miles from the Project Boundary at Solar Subarea C, where the majority of the Project is visible across the flat desert valley terrain. While relatively low in scale, rows of solar panels would block most of the middleground valley terrain from view and would also block most mountain peaks from view of motorists. With visible panel color and repeating, long rows of rectangular solar panels, strong form, line, and color contrasts would be created, and these elements would dominate the view at KOP 4. See Figure 9, KOP 4 – Westbound Agua Caliente Road Existing and Proposed Conditions.

Table 4. Contrast Rating Results for Operation and Maintenance and Conformance with VRM Class Objectives

KOP	Location Name	Degree of Visual Contrast	Conforms with VRM Class?	Analysis
5	Westbound Agua Caliente Road	Strong	Class IV: Yes	KOP 5 is located adjacent to Project Boundary Solar Subarea D, approximately 85 feet from the nearest solar panels, where the majority of the Project is visible across the flat desert valley terrain. The Project perimeter chain-link fence would parallel Agua Caliente Road and would be in the immediate foreground of KOP 5. A narrow setback from the fence line would be incorporated and the closest row of panels would be clear and distinct. Specifically, the rectangular row of panels would stretch across the view and the dark surface of panels would include vertical, light colored seams and a grid-like finish. Multiple support piles/posts would be mostly obscured but visible near the ground plane beneath panels. At KOP 5, dark solar panels would be noticeable, attract the attention of casual observers, and would tend to dominate the available view. See Figure 10, KOP 5 – Westbound Agua Caliente Road Existing and Proposed Conditions.
6	Westbound Agua Caliente Road	Moderate	Class III: Yes	KOP 6 is adjacent to the Project Boundary of Solar Subarea D, approximately 150 feet from the nearest solar panel, with more distant panels to the northwest visible in the middleground across the flat desert valley terrain. From this vantage point, solar panels would be setback from viewers and sit low in the landscape. However, due to the dark color and greyish vertical lines on panel surfaces, color contrast associated with solar panels would begin to attract the attention of casual observers. Despite the anticipated color contrasts, panels would be low to the ground, and rugged mountains would still dominate the view of a casual observer. The entirety of the VRM Class III area that overlaps Subarea B was identified as a Solar Energy Zone and preferred location for utility-scale solar energy development in the BLM's 2012 Western Solar Plan (BLM 2012) and as lands available for application for solar energy development in the 2024 update to the Solar Plan (BLM 2024). See Figure 11, KOP 6 – Westbound Agua Caliente Road Existing and Proposed Conditions.

Notes: VRM = Visual Resource Management; KOP = Key Observation Point.

Decommissioning

Effects to views and scenic resources during decommissioning are anticipated to be similar to the temporary, short-term effects expected during the construction phase. Decommissioning would involve removal of the solar arrays and other facilities with some buried components (such as cabling) potentially remaining in place. Following decommissioning, the solar site would be reclaimed and restored according to applicable regulations at the time. A final decommissioning plan would be prepared in coordination with the BLM and implemented at end of Project. While restoration is intended to reduce vegetative contrasts across the site when viewed with the context of surrounding desert areas, revegetation in dry, desert locations is typically a slow process and therefore, during this period, the Project site would appear disturbed and create perceptible line, color, and texture contrasts with surrounding vegetated areas. The severity of contrasts associated with the reclaimed site would diminish over time as restoration achieves success, visual quality improves, and the site begins to resemble a natural (as opposed to developed) condition.

Night Sky Qualities

Permanent, low-elevation (less than 14 feet) controlled security lighting would be installed at all access gates, the on-site substation, and the entrance to the BESS enclosures. Some portable lighting may also be required for maintenance activities that must be performed at night. Lighting would be kept to the minimum required for safety and security. Sensors, switches, and timers would be used to keep lighting turned off when not required, and all lights would be hooded and directed downward to minimize backscatter and off-site light. Lighting would be attached to structural supports where possible or affixed to ground-mounted poles that are approximately 15 to 20 feet high. The Applicant has prepared a Lighting Plan for the Project that describes how lighting will be designed and installed to minimize night sky impacts during facility construction and operations phases and incorporates the planning principles described in Technical Note 457, *Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM-Managed Lands* (BLM 2023), which provides technical guidance on practical methods for reducing the impacts from artificial outdoor lighting associated with proposed projects or activities.

In addition to several residences located within one mile of the Project site and the town of Arlington that is located approximately 4 miles away, facilities including electrical substations, natural gas power plants, and the Palo Verde Generating Station are existing sources of night lighting in the area. Construction of the Project may require nighttime work that would necessitate the use of temporary lighting fixtures, including but not limited to vehicle headlights and mobile/portable overhead lighting. In instances of use, nighttime lighting would be required to ensure compliance with state and federal worker safety regulations. To the extent practicable, nighttime lighting sources would be directed downward, onto the active area of construction, and would be shielded to reduce potential for unnecessary (and potentially, adverse) light trespass and sky glow. Nighttime construction and use of portable/mobile lighting sources is anticipated to be infrequent during the approximately 36- to 48-month construction period and to further reduce the potential for temporary nighttime lighting impacts, a Lighting Management Plan, which is appended to the Project POD as Attachment L (SWCA 2024), would be implemented during construction.

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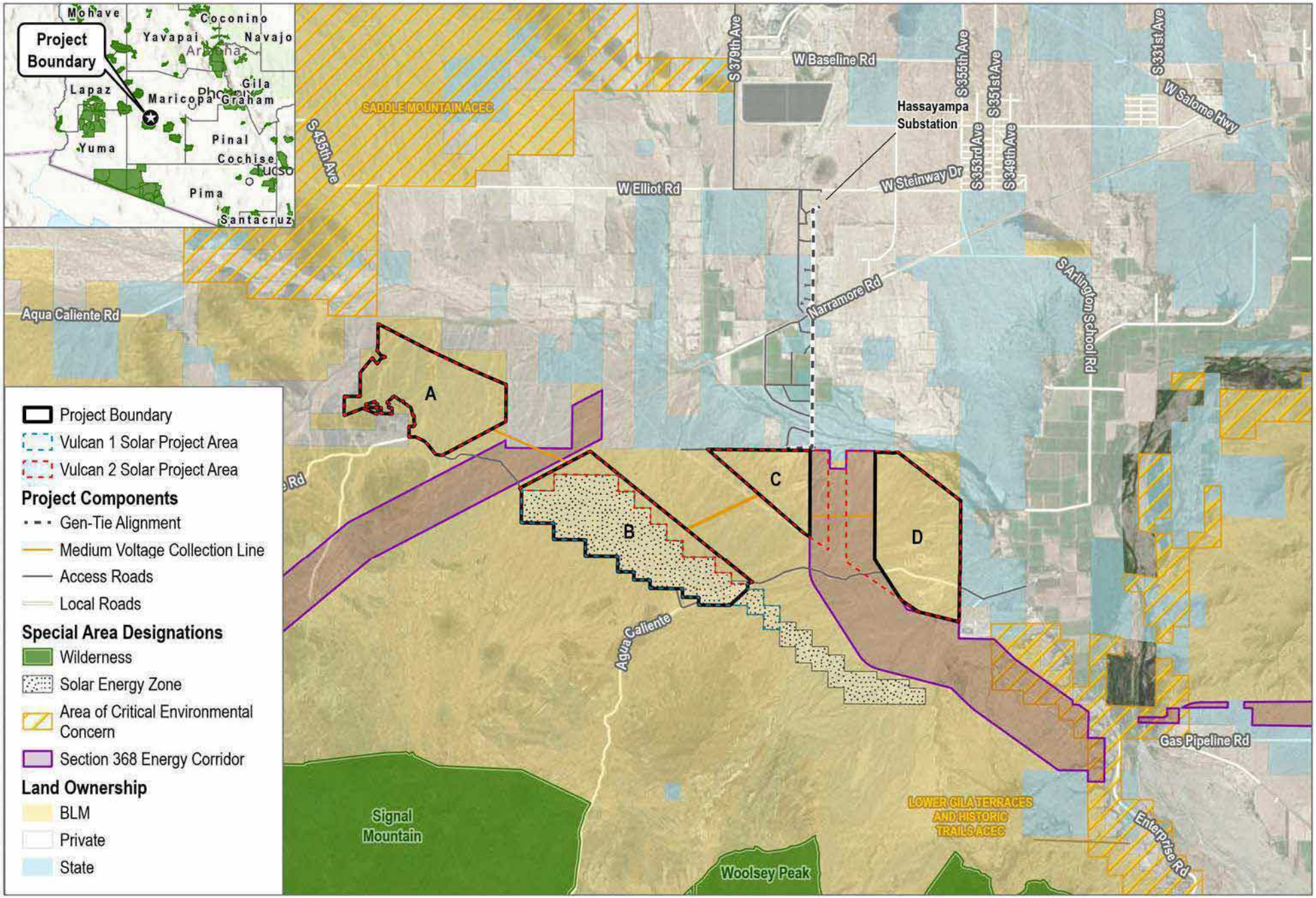

SOURCE: Bing Maps 2023; BLM 2024; Maricopa County 2024

DUDEK

0 5,000 10,000 Feet

FIGURE 1

Project Location

Vulcan Solar Project

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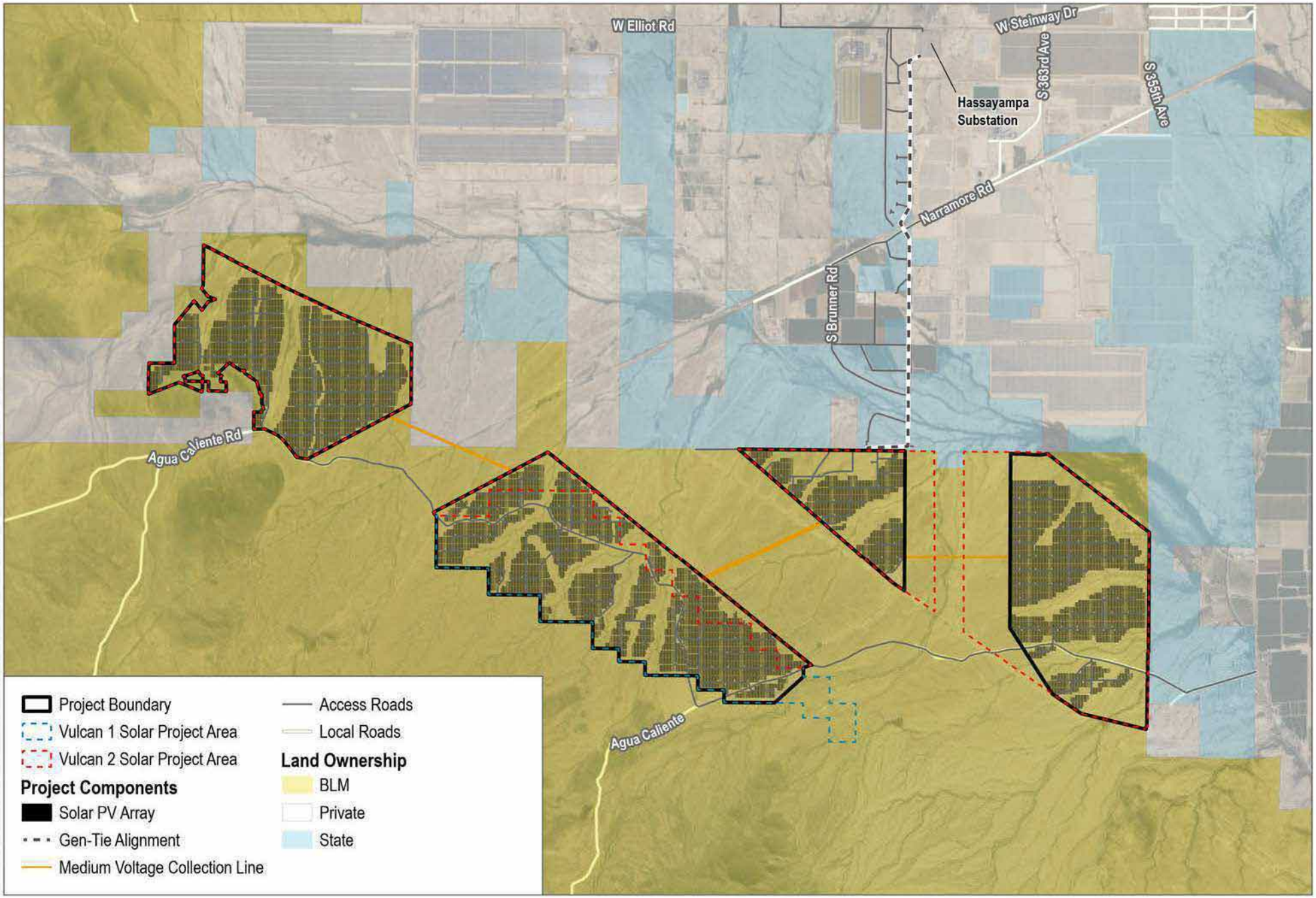

SOURCE: Bing Maps 2023; BLM 2024

DUDEK

0 3,000 6,000 Feet

FIGURE 2

Project Layout

Vulcan Solar Project

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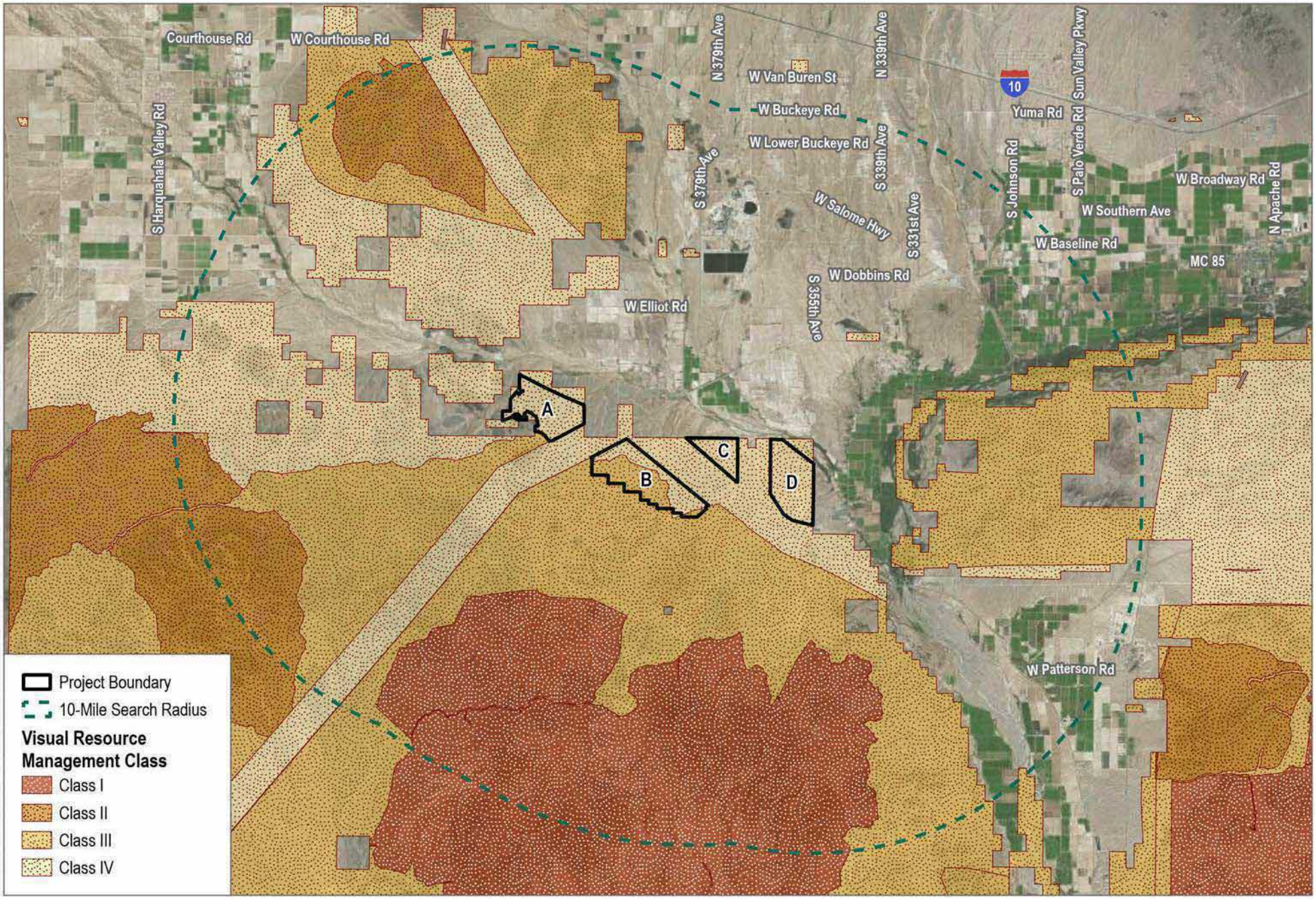

SOURCE: BLM 2024, Bing Maps 2023

DUDEK

0 10,305 20,610 Feet

FIGURE 3

VRM Classes in Project Area

Vulcan Solar Project

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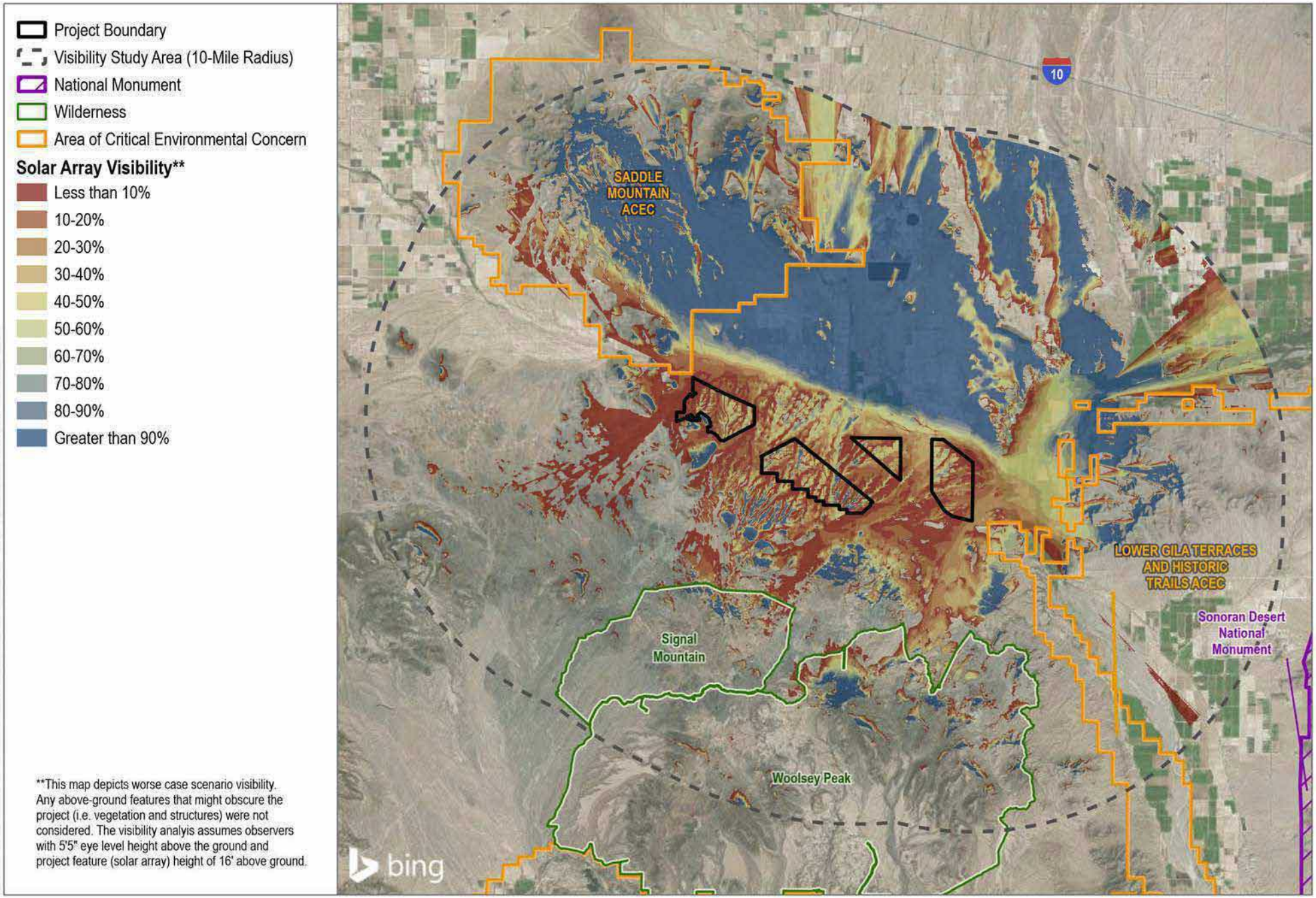

SOURCE: USGS 2019; BLM 2024;

DUDEK

0 2.5 5 Miles

FIGURE 4A

Viewshed Results - Solar Arrays

Vulcan Solar Project

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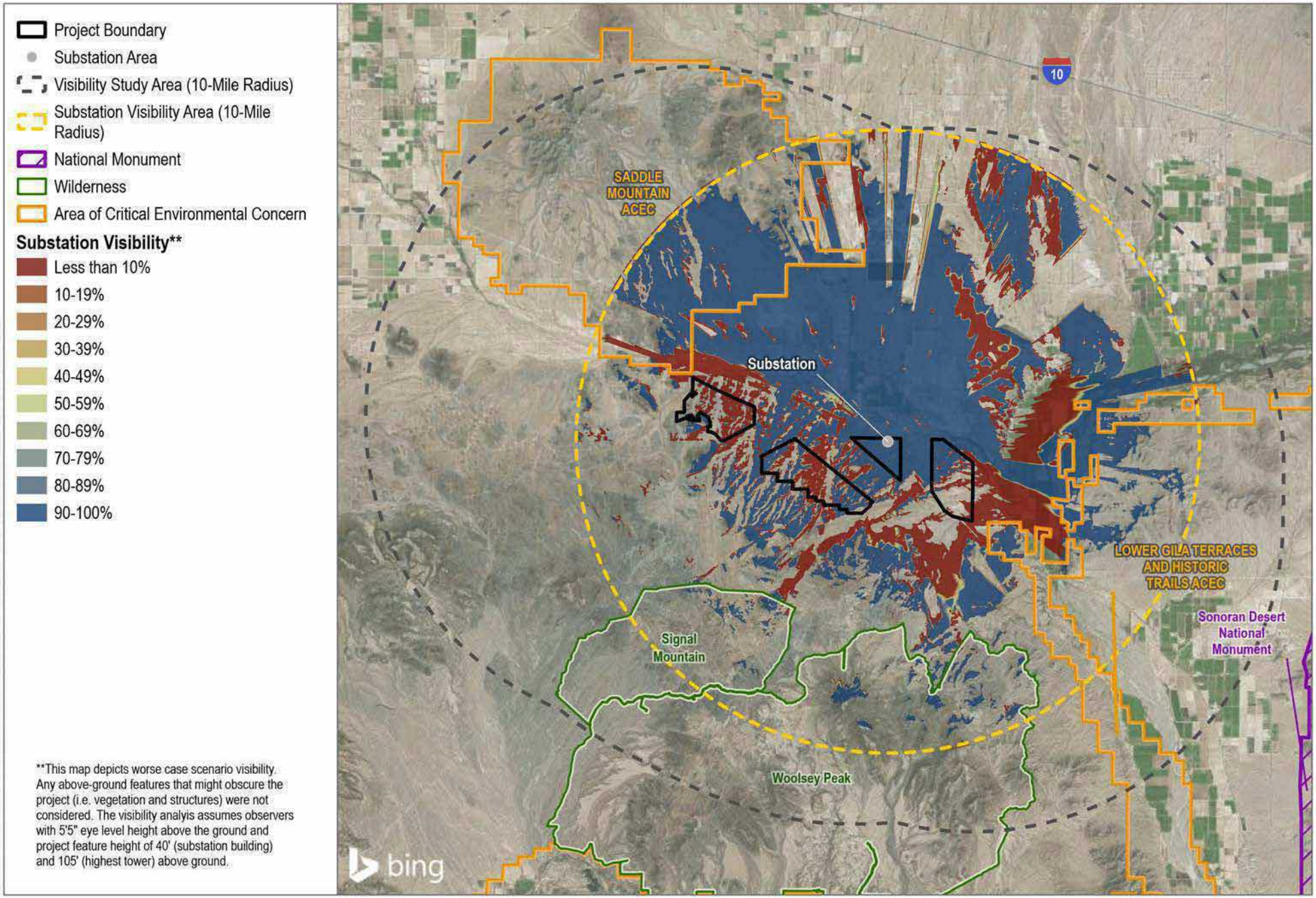

SOURCE: USGS 2019; BLM 2024;

DUDEK

0 2.5 5 Miles

FIGURE 4B

Viewshed Results - Substation

Vulcan Solar Project

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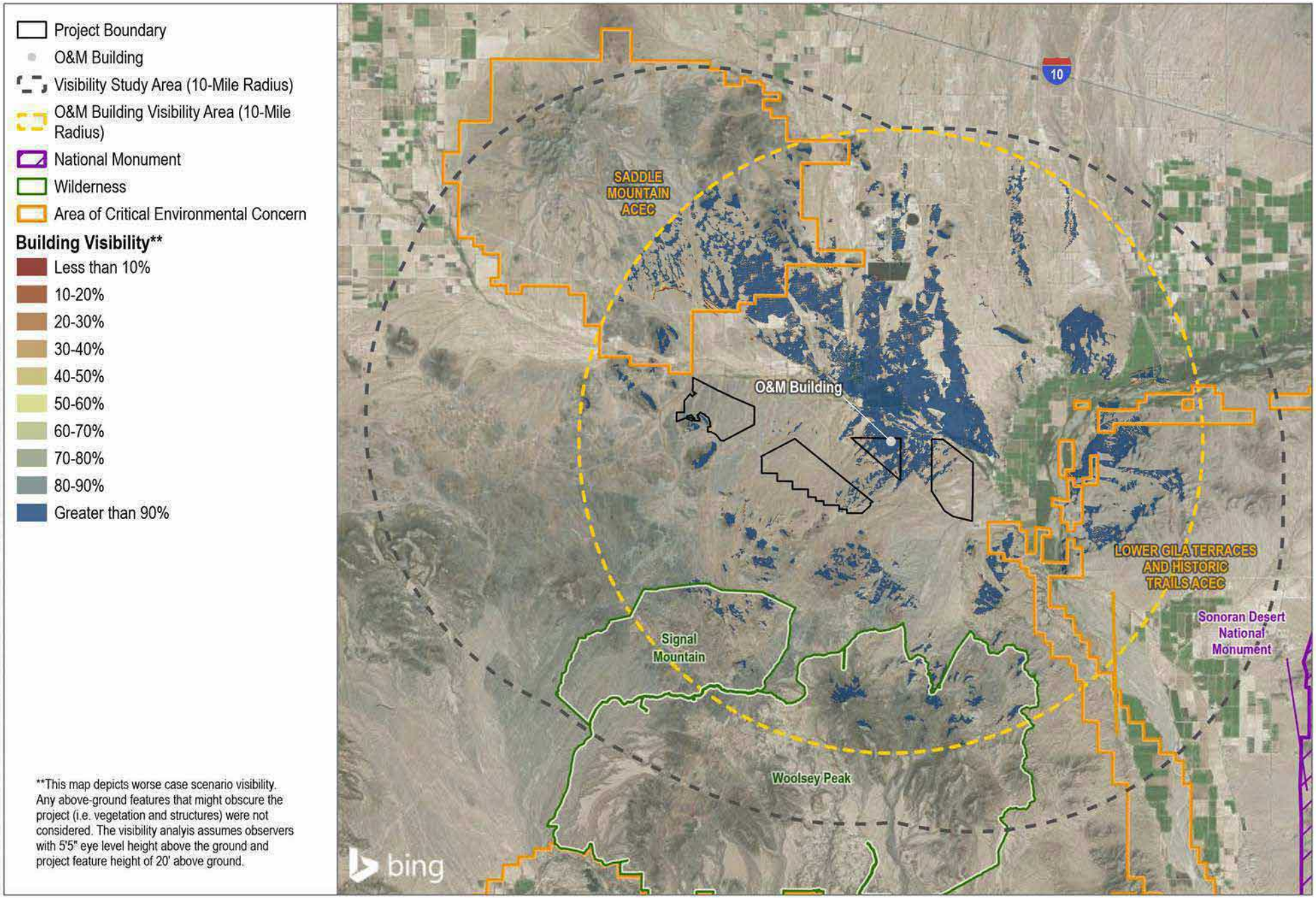

SOURCE: USGS 2019; BLM 2024;

DUDEK

0 2.5 5 Miles

FIGURE 4C

Viewshed Results - O&M Building

Vulcan Solar Project

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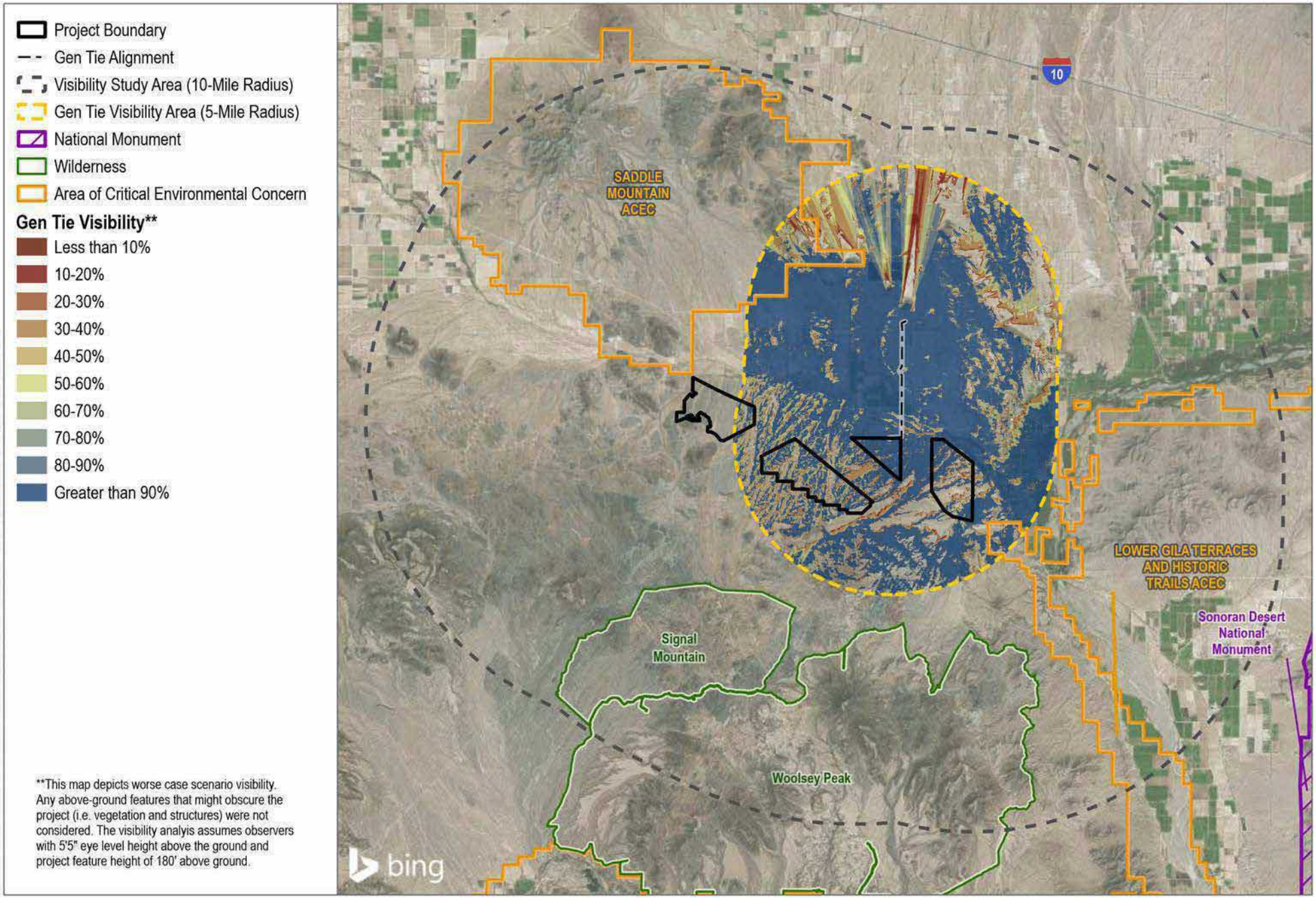

SOURCE: USGS 2019; BLM 2024;

DUDEK

0 2.5 5 Miles

FIGURE 4D

Viewshed Results - Gen Tie

Vulcan Solar Project

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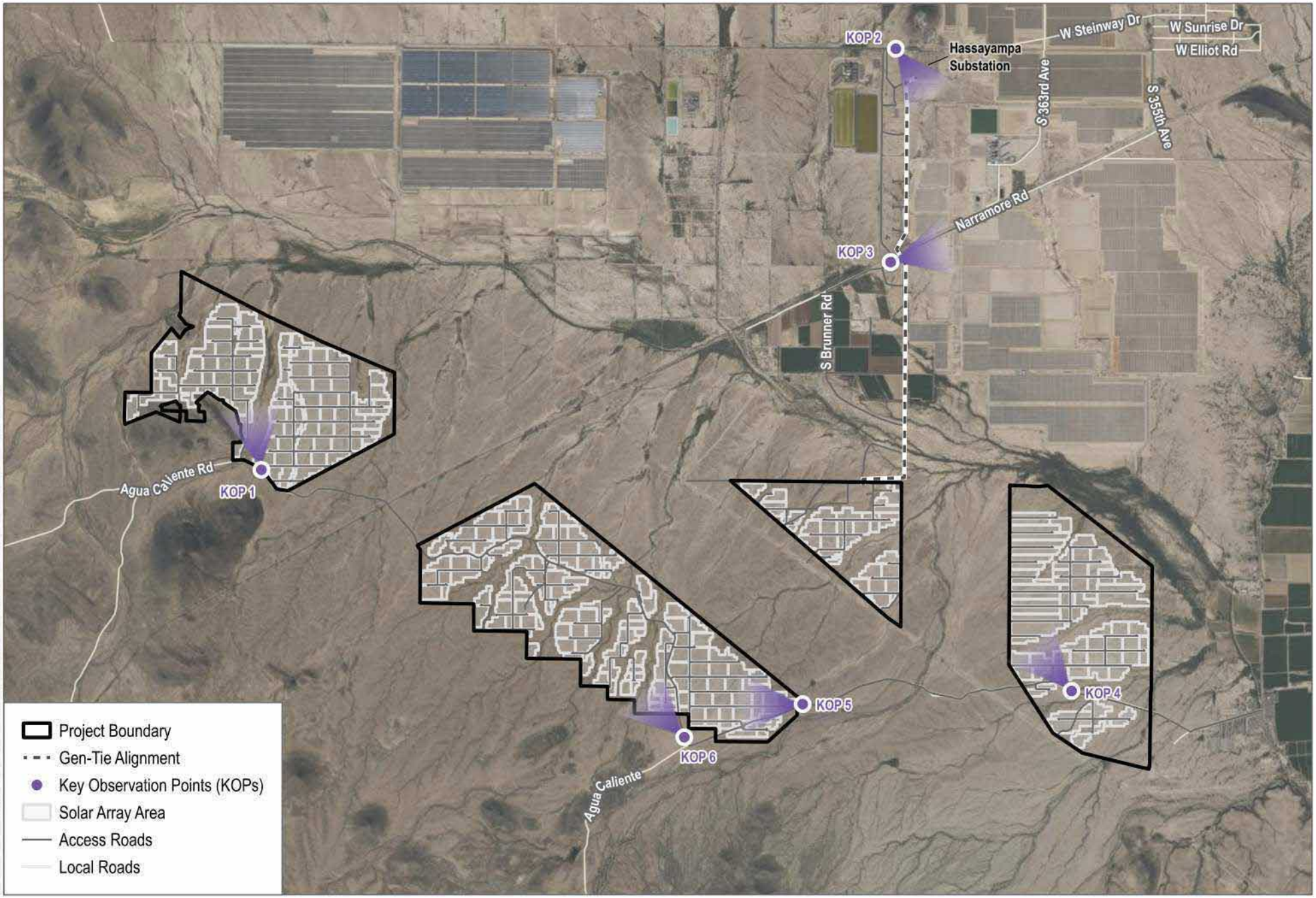

SOURCE: Bing Maps 2023;

DUDEK

0 3,000 6,000 Feet

FIGURE 5

Key Observation Points

Vulcan Solar Project

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Existing Conditions

Proposed Conditions

FIGURE 6

KOP 1- Eastbound Agua Caliente Road Existing and Proposed Conditions

Vulcan Solar Project Visual Resources Report

DUDEK

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Existing Conditions

Proposed Conditions

FIGURE 7

KOP 2- Eastbound Elliot Road Existing and Proposed Conditions

Vulcan Solar Project Visual Resources Report

DUDEK

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Existing Conditions

Proposed Conditions (Redline Version for Clarity)

FIGURE 7a

KOP 2- Eastbound Elliot Road Existing and Proposed Conditions

Vulcan Solar Project Visual Resources Report

DUDEK

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Existing Conditions

Proposed Conditions

FIGURE 8

KOP 3- Southern Pacific Trail Existing and Proposed Conditions

Vulcan Solar Project Visual Resources Report

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Existing Conditions

Proposed Conditions

FIGURE 9

KOP 4- Westbound Agua Caliente Road Existing and Proposed Conditions

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Existing Conditions

Proposed Conditions

FIGURE 10

KOP 5- Westbound Agua Caliente Road Existing and Proposed Conditions

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Existing Conditions

Proposed Conditions

FIGURE 11

KOP 6- Westbound Agua Caliente Road Existing and Proposed Conditions

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Appendix A

Visual Contrast Rating Forms

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date
October 2024

District
Phoenix District Office

Resource Area
Lower Sonoran Field Office

Activity (program)
Solar (Photovoltaic) Facility with Battery Storage and Gen-Tie

SECTION A. PROJECT INFORMATION

1. Project Name
Vulcan Solar Project

2. Key Observation Point
KOP 1 – Eastbound Agua Caliente Road (Recreational Travel Route, Dispersed Recreation Area)

3. VRM Class
Class IV (Project Site)

4. Location

Township _____

Range _____

Section _____

5. Location Sketch
Latitude: 36.173124
Longitude: 112.272671

50 feet to Project Boundary Solar Block A (approximately 75 feet to nearest solar panel/array)

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Foreground (FG): flat rugged valley land; middleground (MG): flat valley land lacking detail; background (BG): series of layered, undulating to tall, rugged and angular mountains	Creosote shrubs in the immediate FG are short, rough, and complex with limited tall and narrow cacti; MG and BG vegetation is indistinct	Flat, horizontal, and long rows of dark and bright/slightly reflective solar panels stretch along confluence of valley and mountain terrain in the distant FG/MG; other indeterminant structures visible beyond solar panels in distant FG/MG
LINE	Faint, discernable lines in the immediate FG become indistinct in more distant FG/MG; horizontal lines distinguish between the confluence of flat valley and the angular mountains in the BG	Spreading, low, and irregular shrubs in immediate FG becoming softer and smoother in the more distant FG/MG (ultimately becoming indistinct in BG valley); a few scattered, upright cacti in FG/MG	Horizontal, straight, flat solar panels running parallel with the horizontal valley in the distant FG/MG
COLOR	Valley land in the immediate FG/MG (i.e., surface of Agua Caliente Road) is greyish tan with lighter bands of tan/sandy brown in the immediate FG; BG mountains are dark cool brown to light greyish brown	Vegetation in immediate FG has dark to light grey branches and yellowish green foliage; vegetation in more distant FG/MG is a dull olive green intermixed with tan/rust pockets	Patch of dark solar panels are somewhat faint in distant FG/MG; more reflective solar panels present as bright, blue-tinted white; indistinct, scattered structures are mostly white/off-white
TEXTURE	Valley land in FG is mostly coarse/granular with lines of visible rocks; some patches of flatter, fine soils are present in the immediate FG; more distant FG/MG terrain is obscured by vegetation and distance; BG mountains are smooth	Shrubs are uniformly sparse in the immediate FG, becoming denser in the distant FG/MG; cacti are few and randomly distributed in the FG/MG	Solar panels are smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Valley land remains flat but terrain in distant FG/MG is blocked by Project components; a few mountain peaks in BG remain visible	Vegetation cleared along fence line and internal access roads; vegetation beneath solar panels mostly retained	A chain link fence runs diagonal across the view in the immediate FG/MG; numerous rows of rectangular solar panels spread across the FG/MG landscape
LINE	Valley terrain in immediate FG remains horizontal and flat; a few rugged and angular peaks visible above solar panels in FG	Perceived changes to line of remaining vegetation is weak; more distant vegetation in FG/MG is mostly blocked from view by solar panels	Fence is slightly complex with repeating sections of overlapping diagonal lines; solar panels are tilted, rectangular with short, vertical support racks
COLOR	No perceived changes to color of land in immediate FG/MG	Vegetation loss resulting in less browns, greens in the visible landscape	Fence is dark to lighter grey; solar panels have a dark blue/grey surface, light grey backing and metallic support racks
TEXTURE	The Project will result in at least a weak contrast change of the texture of the landscape due to surface disturbance and other site preparation techniques and the presence of solar panels, roads, and other infrastructure.	Remaining vegetation have no perceived changes to texture.	Solar panels are smooth, fence is smooth, with some sharpness detected on the three horizontal strands of barbed wire at the top of fence

SECTIOND. CONTRAST RATING ☐SHORT TERM ☒LONG TERM

1. DEGREE OF CONSTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒Yes ☐No (Explain on reverse side)
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Evaluator's Names: Josh Saunders and Eden Vitakis Date: October 2024
ELEMENTS	Form		X				X			X				
	Line			X					X	X				
	Color		X					X		X				
	Texture			X					X		X			

EVALUATION – KOP 1 (Comments from Item 2)

KOP 1 is located approximately 50 feet from the Project Boundary of Solar Block A, and approximately 75 feet to nearest solar panel. A portion of the Project is visible and occurs in the foreground viewing distance across the flat and broad desert valley terrain. As shown in the visual simulation prepared from KOP 1, the Project perimeter chain-link fence and dark solar panels would be noticeable, attract the attention of casual observers, and would dominate the available view due to the inclusion of numerous solar panels spread across the nearby valley terrain. Panels would block most of the distant foreground/middleground valley terrain from view and would also block most mountain peaks. Due to the dark color of visible panel surfaces and the repeating, long rows of rectangular solar panels, strong form, line, and color contrasts would be created, and these elements would dominate the view.

As experienced from KOP 1, the visible portion of Solar Block A would create strong structure contrasts but would conform with VRM Class IV objectives.

ADDITIONAL MITIGATION MEASURES (Comments from Item 3)

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Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date
October 2024

District
Phoenix District Office

Resource Area
Lower Sonoran Field Office

Activity (program)
Solar (Photovoltaic) Facility with Battery Storage and Gen-Tie

SECTION A. PROJECT INFORMATION

1. Project Name
Vulcan Solar Project

2. Key Observation Point
KOP 2 – Eastbound Elliot Road (Recreational travel route, dispersed recreation area)

3. VRM Class
Class IV (Project Site)

4. Location

Township _____

Range _____

Section _____

5. Location Sketch
Latitude: 33.205413
Longitude: 112°51'24.71

780 feet west of the existing 500 kV Hassayampa Switching Substation (1,680 feet to nearest segment of proposed gen-tie)

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Foreground (FG): flat rugged valley land; middleground (MG): flat valley land lacking detail; background (BG): Tall, rugged, and angular mountains create the distant horizon	Shrubs in the immediate FG are short, rough and complex with variation in height; MG and BG vegetation is indistinct	Numerous complex and tall, steel lattice and tubular structures dominate the FG/MG, numerous horizontal lines connect the structures; hard wall is erected along the perimeter of the visible electrical substation; cylindrical and tall, vertical stacks occur in the distance (beyond the substation and at the nearby Redhawk Natural Gas Power Plant)
LINE	Faint, discernable lines in the immediate FG/MG become indistinct in more distant FG/MG; hard, horizontal line separates the flat valley and distant, dark mountains	Spreading, low, and irregular shrubs in immediate FG becoming softer, smoother, and more numerous in the distant FG/MG	Lattice structures are bold and complex, with horizontal, vertical, and diagonal lines. Lines between lattice and tubular structures are slightly undulating and simple. Substation wall is simply, low, and rectangular.
COLOR	Patch of greyish/whitish rock visible in immediate FG/MG; remaining FG/MG comprised of tan/brown soils with tinges of yellow; flat access road to east is greyish rock; BG mountains are light greyish brown	Vegetation in immediate FG ranges from light green foliage to brown/grey woody branches to tinges of indeterminant rust components, vegetation in more distant FG/MG is most grey/dull with occasionally yellowish banding	Lattice and tubular steel structures are dark grey/brow; substation wall is light tan/peach; visible cylindrical structure is tan with white dome, stacks (at Redhawk Natural Gas Power Plant) and remaining indeterminant structures are dark
TEXTURE	Valley land in FG is mostly coarse/granular with clumps of visible rocks; some lines of flatter, fine soils are present; BG mountains are seemingly smooth	Shrubs are concentrated in patch in the immediate FG/MG, becoming denser in the more distant FG/MG beyond the visible line of the curving access road	Electrical transmission infrastructure is smooth and somewhat orderly; substation wall and more distant structures are smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Valley land remains flat but terrain in distant FG/MG is minimally interrupted by Project components	No perceived changes to the form of shrubs and vegetation	Additional tall and thin, vertical poles and a horizontal gen-tie line added to the FG/MG (i.e., south of the substation)
LINE	Valley terrain in immediate FG remains horizontal and flat	No perceived changes to the lines of shrubs or other vegetation	Gen-tie poles are thin and vertical (similar to existing transmission infrastructure in view); gen-tie line is lost amongst other visible conduit in view
COLOR	No perceived color changes to the landscape	No perceived color changes to the vegetation	Dark grey
TEXTURE	No perceived texture changes to the landscape	No perceived changes in texture of vegetation	Smooth gen-tie poles and line

SECTION D. CONTRAST RATING ☐SHORT TERM ☒LONG TERM

1. DEGREE OF CONSTRAST		FEATURES											
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				X				X			X	
	Line				X				X			X	
	Color				X				X			X	
	Texture				X				X			X	

2. Does project design meet visual resource management objectives? ☒Yes ☐No (Explain on reverse side)

3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: Josh Saunders and Eden Vitakis
Date: October 2024

EVALUATION – KOP 2 (Comments from Item 2)

KOP 2 is located approximately 780 feet northwest of the Hassayampa Substation and 1,680 feet northwest of the nearest segment of the proposed gen-tie line. Views from the vantage point occurs consist of electrical transmission and other energy generating infrastructure within a modified desert valley landscape (multiple steel lattice and tubular steel structures supporting electrical transmission lines are visible and numerous lines are interconnected to the existing Hassayampa Switching Substation). Additional facilities are located beyond the walled substation and include vertical racks and bays as well as a distinct, wide cylindrical domed structures and several vertical stacks. A few simple vertical poles and horizontal lines of the Vulcan Solar Project would be visible from KOP 2 but would blend in with the numerous complex lattice structures and simple tubular steel structures that dominate the foreground/middleground landscape. While the Project would be visible to casual observers, it is unlikely to be distinguishable from existing electrical transmission infrastructure in the view. Project poles and line would add new forms and lines to the scene; however, these elements would not dominate the view.

As experienced from KOP 2, the visible portion of the gen-tie line would create weak contrasts and would conform with VRM Class IV objectives.

ADDITIONAL MITIGATION MEASURES (Comments from Item 3)

US. GOVERNMENT PRINTING OFFICE: 1985-461-988/33094

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date
October 2024

District
Phoenix District Office

Resource Area
Lower Sonoran Field Office

Activity (program)
Solar (Photovoltaic) Facility with Battery Storage and Gen-Tie

SECTION A. PROJECT INFORMATION

1. Project Name
Vulcan Solar Project

2. Key Observation Point
KOP 3 – Southern Pacific Trail (Recreational trail and local Travel Route)

3. VRM Class
Class IV (Project Site including Gen-Tie Alignment)

4. Location

Township _____

Range _____

Section _____

5. Location Sketch
Latitude: 33.191124
Longitude: 112.512655

Approximately 865 feet west of existing Agave Solar Plant (located south of Southern Pacific Trail) (0.2 mile to proposed gen-tie alignment)

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Foreground (FG): mostly flat rugged valley land with visible rise to north towards bermed land supporting RR tracks; straight to curving dirt road in immediate FG disappears in distance; middleground (MG): isolated mounded hills/mountains; background (BG): faint silhouette of distant hazy mountains	Shrubs in the immediate FG are sparse, becoming more distinct and numerous to the north of the trail/road (and near the distinct curvature of the trail); visible shrubs are low to moderate in height, mounded and spreading	A series of grouped, tall steel lattice towers crosses the view from south to north in the FG/MG; lower scale and narrow poles near the Agave Solar Plant line the near perimeter of the plant and continue to the east along the Southern Pacific Trail; angular racks and four tall and cylindrical stacks/generating units to the north of the RR track attract attention; Agave Power Plant solar panels are horizontal
LINE	Straight to gradually curving line created by trail/road in immediate FG (isolated tire ruts are visible); mounded land and RR tracks create straight, discontinuous line; FG.MG hills/mountains create mounded to undulating line	Spreading, low, and irregular shrubs becoming softer, smoother, and more numerous in the more distant FG/MG	Lattice structures are complex, with soft horizontal, vertical, and diagonal lines. Lower-scale poles are simple and straight. Conductor/lines between towers and poles are horizontal/slightly concave. Solar panels are low, horizontal, with numerous short vertical piles; stacks/generating units are tall and cylindrical
COLOR	Valley land in the FG/MG is a reddish tan with lighter bands of tan and whitish in the immediate FG and at bermed terrain to the north of the trail/road; some dark color is present near RR tracks and at MG mountains	Shrubs are greyish to yellow green with bright to dull green shrubs occurring near curve in trail/road	Greyish transmission infrastructure; dark solar panels and piles, stacks/generating units at Redhawk facility are reddish/orange
TEXTURE	Valley land in immediate FG is mostly coarse/granular with bands of smooth soil; terrain to the north and south of the trail/road is mostly granular with patches of smooth	Shrubs are uniformly sparse in the immediate FG, becoming denser in the FG/MG to the north of the trail/road	Structures are smooth and range from orderly to jumbled

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Valley land remains flat but mountain terrain in distant BG is slightly interrupted by Project components (i.e., single tall and visually prominent pole in immediate FG/MG)	No perceived changes	A simple, tall, prominent, vertical pole with several horizontal conductor lines in immediate FG
LINE	Gen-tie pole interrupts ridgeline of distant mountains in BG	No perceived changes	Relatively bold, regular lines create by pole and conductors
COLOR	No perceived color changes to the landscape	No perceived color	Greyish pole and darker grey conductor/lines
TEXTURE	No perceived texture changes to the landscape	No perceived changes	Smooth pole and conductor

SECTIOND. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONSTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)
ELEMENTS	Form				X				X		X			Evaluator's Names: Josh Saunders and Eden Vitakis Date: October 2024
	Line				X				X		X			
	Color				X				X			X		
	Texture				X				X			X		

EVALUATION – KOP 3 (Comments from Item 2)

KOP 3 is located approximately 865 feet from the western boundary of the nearby Agave Solar Plant facility and 0.2 mile to the west of the proposed gen-tie line alignment. Under existing conditions, the easterly view from the Southern Pacific Trail includes a desert valley landscape featuring mostly scattered and low shrubs, an existing solar PV facility, multiple steel lattice structures and power poles (i.e., thin and narrow lines), and substation facilities and vertical/cylindrical stacks (generating units) of the nearby Redhawk Natural Gas Power Plant. In addition to a distinct grouping of mountains in the FG/MG (in the center of the view), the faint silhouette of distant mountains are visible. With implementation of the Project, a simple yet visually prominent, greyish vertical pole and numerous horizontal/concave conductor lines would be visible against the broad desert sky. While the single pole would not be central to the view, its scale and proximity to KOP 3 would attract attention and viewer's focus. The Project pole and conductor lines would generally be consistent with the existing setting that is populated with more complex electrical transmission structures and energy generating facilities (e.g., solar power plant and natural gas power plant). The Project would be visible to trail/road users and would create moderate form and line contrast due to its scale and proximity to KOP 3; however, it would conform with VRM Class IV objectives.

ADDITIONAL MITIGATION MEASURES (Comments from Item 3)

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(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date
October 2024

District
Phoenix District Office

Resource Area
Lower Sonoran Field Office

Activity (program)
Solar (Photovoltaic) Facility with Battery Storage and Gen-Tie

SECTION A. PROJECT INFORMATION

1. Project Name
Vulcan Solar Project

2. Key Observation Point
KOP 4 – Westbound Agua Caliente Road (Local travel route, and recreational travel route)

3. VRM Class
Class IV (Project Site)

4. Location

Township _____

Range _____

Section _____

5. Location Sketch
Latitude: 33.154529
Longitude: 112.494050

Approximately 0.2 mile to Project Boundary Solar Block C (0.30 mile to nearest solar panels)

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Foreground (FG): flat rugged horizontal valley rising to a low but yet visible ridge in the FG/middleground (MG); ridge is elevated but mostly horizontal; background (BG): low and mounded silhouettes of limited mountains in the distance	Shrubs are short and mounded; scattered trees are tall with rounded crowns	Simple, metal post and wire fence stretches horizontally across the immediate FG
LINE	Valley is mostly straight and horizontal; visible ridge in FG/MG is slightly undulating but mostly horizontal; distant mountains are low and mounded/rounded	Rugged, irregular, and jagged shrubs in FG, becoming softer and smoother in the more distant FG/MG	Weak horizontal fence wire (multiple strands) and more distinct, straight and vertical fence poles
COLOR	Valley terrain ranges from greyish at the extents of Agua Caliente Road in the immediate FG to tan/reddish tan in FG/MG; some visible pockets of brown/tan soils are clustered around the base of vegetation in FG/MG	Vegetation in immediate FG has dark brown woody branches/stems and yellowish green foliage; tufted low shrubs in FG/MG depression as greyish green; scattered trees have light green foliage	Dark fence posts with multiple strands of greyish wire
TEXTURE	Valley land in FG is rocky/granular with narrow areas of patchy smoothness; some striation in terrain in immediate FG/MG is visible; distant mountains are smooth	Shrubs are sparse in immediate FG, becoming denser in the more distant FG/MG; trees are scattered in the view (a total of four are visible)	Fence components are smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Valley land remains flat but terrain in distant FG/MG including low ridge) is blocked by Project components; tops of distant mountain in BG are visible	Vegetation beneath solar panels mostly retained	A chain link fence runs diagonal across the view in the FG; numerous rows of rectangular/angled solar panels spread across the FG/MG landscape
LINE	Valley terrain in immediate FG remains horizontal and flat; a few rugged and angular peaks visible above solar panels in FG	Perceived changes to line vegetation is weak; more distant vegetation in FG/MG is mostly blocked from view by solar panels	Fence is slightly complex with repeating sections of overlapping diagonal lines; solar panels are tilted, rectangular with short, vertical support racks and poles
COLOR	No perceived changes to color of land	Vegetation loss resulting in less browns, greens in the visible landscape	Fence is dark to lighter grey; solar panels have a dark blue/grey surface, light grey backing and metallic support racks
TEXTURE	Rocky valley terrain replaced with smooth solar panels, roads, and other infrastructure	No perceived changes	Solar panels are smooth, fence is smooth, with some sharpness detected on the three horizontal strands of barbed wire at the top of fence

SECTION D. CONTRAST RATING ☐SHORT TERM ☒LONG TERM

1. DEGREE OF CONSTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒Yes ☐No (Explain on reverse side)
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Evaluator's Names: Josh Saunders and Eden Vitakis Date: October 2024
ELEMENTS	Form		X				X			X				
	Line			X					X	X				
	Color		X					X		X				
	Texture			X					X			X		

EVALUATION – KOP 4 (Comments from Item 2)

KOP 4 is located on westbound Agua Caliente Road and is approximately 0.2 mile to the Solar Block C Project Boundary. The available view is relatively short in extent (focused on the immediate foreground/middleground) but a few distant peaks in the background are visible. The local landscape is relatively flat with some undulation and low and spreading creosote shrubs are spread across the terrain at varying densities. Once implemented and operational, numerous rows of solar panels in the FG/MG distance would be visible. As shown in the visual simulation prepared from KOP 4, the Project perimeter chain-link fence and dark solar panels would be noticeable, attract the attention of casual observers, and would tend to dominate the available view. While relatively low in scale, rows of solar panels would block most of the middleground valley terrain from view and would also block most mountain peaks from view of motorists. With visible panel color and repeating, long rows of rectangular solar panels, strong form, line and color contrasts would be created, and these elements would dominate the view at KOP 4.

As experienced from KOP 4, the visible portion of Solar Block C would create structure strong contrasts but would conform with VRM Class IV objectives.

ADDITIONAL MITIGATION MEASURES (Comments from Item 3)

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date
October 2024

District
Phoenix District Office

Resource Area
Lower Sonoran Field Office

Activity (program)
Solar (Photovoltaic) Facility with Battery Storage and Gen-Tie

SECTION A. PROJECT INFORMATION

1. Project Name
Vulcan Solar Project

2. Key Observation Point
KOP 5 – Westbound Agua Caliente Road (Local travel route, and recreational travel route)

3. VRM Class
Class IV (Project Site)

4. Location

Township _____

Range _____

Section _____

5. Location Sketch
Latitude: 33.153776
Longitude: 112.521478

Adjacent to Project Boundary Solar Block D (85 feet to nearest solar panels)

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Foreground (FG): flat rugged horizontal valley rising to a low but yet visible ridge in the FG/middleground (MG); ridge is elevated but mostly horizontal; background (BG): broad and mounded and narrow/pyramidal mountains in the distance	Shrubs are short and mounded; visible trees are low but have mostly rounded crowns	Few faint lattice structures visible in BG (portions of lattice structures are skylined)
LINE	Valley is mostly straight and horizontal; visible ridge in FG/MG is slightly undulating but mostly horizontal; distant mountains are mounded to sharp/pyramidal between the confluence of flat valley and the angular hard	Rugged, irregular, and jagged shrubs in FG, becoming softer and smoother in the more distant FG/MG	Faint, vertical, and complex lattice structures
COLOR	Valley terrain ranges from greyish at the extents of Agua Caliente Road in the immediate FG to tan/reddish tan in FG/MG; some visible pockets of brown/tan soils are clustered around the base of vegetation in FG/MG; mountains are dark/brown	Vegetation in immediate FG has dark brown woody branches/stems and yellowish green foliage; tufted low shrubs in FG/MG depression as greyish green; trees have light green foliage.	Faint, greyish lattice structures in the distance
TEXTURE	Valley land in FG is rocky/granular with narrow areas of patchy smoothness; distant mountains are smooth	Shrubs are sparse in immediate FG, becoming denser in the more distant FG/MG; trees are mostly scattered along an indistinct depression/low point in landscape	Lattice structures are smooth and distant

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Valley land remains flat but terrain in distant FG/MG is blocked by Project components; a few mountain peaks in BG remain visible	Vegetation cleared along fence line and internal access roads; vegetation beneath solar panels mostly retained	A chain link fence runs parallel to Agua Caliente Road in the immediate FG; numerous rows of rectangular solar panels with grided surfaces spread across the FG/MG landscape
LINE	Valley terrain in immediate FG remains horizontal and flat but most of the view occupied by solar panels; a few rugged and angular peaks visible above solar panels	Perceived changes to line of remaining vegetation are weak; more distant vegetation in FG/MG is mostly blocked from view by solar panels	Fence is slightly complex with repeating sections of overlapping diagonal lines, solar panels are tilted, rectangular with short, vertical support racks and grided surfaces
COLOR	No perceived changes to color of land; however, presence of solar panels results in more dark tones in the view	Vegetation loss resulting in less browns, greens in the visible landscape	Fence is dark to lighter grey; solar panels have a dark blue/grey surface with numerous light/greyish horizontal and vertical lines, metallic support racks
TEXTURE	The Project will result in at least a weak contrast change of the texture of the landscape due to surface disturbance and other site preparation techniques and the presence of solar panels, roads, and other infrastructure.	No perceived changes	Solar panels and racking components are smooth, fence is smooth, with some sharpness detected on the three horizontal strands of barbed wire at the top of fence

SECTION D. CONTRAST RATING ☐SHORT TERM ☒LONG TERM

1. DEGREE OF CONSTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒Yes ☐No (Explain on reverse side)
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)
ELEMENTS	Form		X					X		X				Evaluator's Names: Josh Saunders and Eden Vitakis Date: October 2024
	Line			X					X	X				
	Color			X				X		X				
	Texture			X					X		X			

EVALUATION – KOP 5 (Comments from Item 2)

KOP 5 is located on Agua Caliente Road and adjacent to Project Boundary Solar Block D, approximately 85 feet to nearest proposed solar panels. Similar to the visible landscape at KOP 4, the KOP 5 landscape is mostly limited to the foreground/middleground distance zone but includes dark to hazy mountains in the distance. The foreground terrain is mostly flat and low with visible undulating that creates a soft, rolling form and line. The immediate foreground rises to form a low horizontal ridge in the foreground/middleground. Distant mountains are at times broad and mounded to somewhat narrow and pyramidal. Terrain is routinely tan/brown with light tones in the foreground and darker tones in the background. Vegetation is generally low and spreading (creosote with olive green/yellow foliage is commonplace) and larger trees with darker green foliage are scattered in the foreground middleground. As shown in the visual simulation prepared from KOP 5, the Project perimeter chain-link fence would parallel Agua Caliente Road and be located in the immediate foreground of KOP 5. A narrow setback from the fence line would be incorporated and the closest row of panels would be clear and distinct. Specifically, the rectangular row of panels would stretch across the view and the dark surface of panels would include vertical, light colored seams and a grid-like finish. Multiple support piles/posts would be mostly obscured but visible near the ground plane beneath panels. Numerous other rows of panels would be visible beyond the closest row and nearly cover the desert floor.

At KOP 5, dark solar panels would be noticeable, attract the attention of casual observers, and would tend to dominate the available view. Panels would block most of the foreground/middleground desert valley terrain from view and would also block some mountain peaks from view of motorists. With visible panel color and repeating, long rows of rectangular solar panels, strong form, line, and color contrasts associated with structures would be created, and these elements would dominate the view.

As experienced from KOP 5, the visible portion of Solar Block A would create strong contrasts but would conform with VRM Class IV objectives.

ADDITIONAL MITIGATION MEASURES (Comments from Item 3)

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UNITED STATES
DEPARTMENT OF THE
INTERIOR BUREAU OF LAND
MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date
October 2024

District
Phoenix District Office

Resource Area
Lower Sonoran Field Office

Activity (program)
Solar (Photovoltaic) Facility with Battery Storage and Gen-Tie

SECTION A. PROJECT INFORMATION

1. Project Name
Vulcan Solar Project

2. Key Observation Point
KOP 6 – Westbound Agua Caliente Road (Local travel route Recreational travel route)

3. VRM Class
Class III (Project Site)

4. Location

Township _____

Range _____

Section _____

5. Location Sketch
Latitude: 33.153364
Longitude: 112.532621

Adjacent to Project Boundary Solar Block D (150 feet to nearest solar panels)

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Foreground (FG): flat rugged valley land; middleground (MG): flat valley land with visible, gradual rise in elevation near base of nearest mountains; background (BG): layered series of undulating tall rugged angular mountains	FG shrubs are short and spreading; distant trees are mounded, circular	Low and random posts in the foreground; indeterminant lines and features (light colored) in the distance FG/MG to BG (to the north)
LINE	Flat, horizontal line created by Agua Caliente Road in immediate foreground separated by remaining valley terrain by low berm; valley is mostly flat with gradual rise in elevation in FG/MG; several perpendicular lines adjacent o Agua Caliente Road; mountains are broad and occasionally angular	Spreading, low, and irregular shrubs in immediate FG becoming softer, smoother, and less distinct in the more distant FG/MG	Low, vertical posts; indeterminant structures are mostly horizontal
COLOR	Agua Caliente Road is greyish with visible band of tan at edge, valley is mostly tan/brown with random pockets of dark grey; mountains are dark brown to hazy to light grey	Vegetation in immediate FG has dark to light greyish branches and yellowish green foliage; vegetation in more distant FG/MG is a dull olive green	Low posts are dark brown; indeterminant structures to the north are white/light in color
TEXTURE	Agua Caliente Road and adjacent berm are rocky; valley terrain is mostly rocky with smooth areas intermixed, distant FG/MG terrain and BG mountains are smooth	Shrubs are uniformly sparse in the immediate FG, becoming denser with distance from KOP	Structures are limited in number but smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDWATER	2. VEGETATION	3. STRUCTURES
FORM	Valley land remains flat but terrain in distant FG/MG is partially interrupted by Project components (solar panels)	Perceived changes to form of vegetation is weak	Flat, low, horizontal, and long rows of dark solar panels in distant FG/MG
LINE	Valley terrain in immediate FG remains horizontal and flat	Clumped, rounded line of trees in FG/MG blocked by solar panels	Horizontal, straight, flat solar panels with short, vertical greyish lines
COLOR	Light tans of terrain in the FG/MG replaced by dark solar panels	Vegetation loss resulting in less greens in the visible landscape	Dark solar panels with light vertical bands/lines
TEXTURE	The Project will result in at least a weak contrast change of the texture of the landscape due to surface disturbance and other site preparation techniques and the presence of solar panels, roads, and other infrastructure.	No perceived changes	Solar panels are smooth

SECTION D. CONTRAST RATING ☐SHORT TERM ☒LONG TERM

1. DEGREE OF CONSTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒Yes ☐No (Explain on reverse side)
		LANDWATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side)
ELEMENTS	Form			X				X				X		Evaluator's Names: Josh Saunders and Eden Vitakis Date: October 2024
	Line			X				X				X		
	Color		X					X			X			
	Texture			X				X				X		

EVALUATION – KOP 6 (Comments from Item 2)

KOP 6 is adjacent to the Project Boundary of Solar Block D, and approximately 1,380 feet to nearest solar panel shown in the visual simulation. Project elements (mostly solar panels) are visible and occur in the distant foreground/middleground viewing distance across the mostly flat and broad desert valley terrain.

As indicated in the visual simulations from KOP 6, solar panels would be setback over 1,300 feet from the KOP and would sit low to the ground. Due to the dark color and greyish vertical lines on panel surfaces, color contrast associated with solar panels would begin to attract the attention of casual observers from KOP 6. Despite the anticipated color contrasts, panels would be low to the ground and rugged mountains and existing infrastructure such as high-voltage transmission lines in existing utility corridors would still dominate the view of a casual observer. The entirety of the VRM Class III area that overlaps Subarea B was identified as a Solar Energy Zone and preferred location for utility-scale solar energy development in the BLM's 2012 Western Solar Plan (BLM 2012) and as lands available for application for solar energy development in the 2024 update to the Solar Plan (BLM 2024).

Based on the anticipated weak to moderate contrast that would be created by the Project in the VRM Class III area, the additional visual BMPs that would be applied in VRM Class III areas (see mitigation section below), and that the BLM previously identified the area as suitable for utility-scale solar energy development in the Western Solar Plan, it is expected that the Project would meet the BLM's management objectives for the portion of VRM Class III that overlaps the Project Area.

ADDITIONAL MITIGATION MEASURES (Comments from Item 3)

The following best management practices (BMPs) from the BLM's 2013 *BMP Guidelines for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands*, is recommended to reduce visual impacts:

- Avoid complete removal of vegetation in the project area.

This BMP shall be implemented to ensure consistency with the Project grading plan and the Project Habitat Restoration and Integrated Vegetation Management Plan.

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Exhibit C

Areas of Biological Wealth

Exhibit C
Areas of Biological Wealth

As stated in the Arizona Corporation Commission (ACC) Rules of Practice and Procedure (R-14-3-219), Exhibit 1:

> Describe any areas in the vicinity of the proposed site or route which are unique because of biological wealth or because they are habitats for rare or endangered species. Describe the biological wealth or species involved and state effects, if any, the proposed facilities will have thereon.

Introduction

Exhibit C analyzes biological wealth resources and impacts related to the construction and operation of the Vulcan Interconnection Project (Project). This exhibit addresses species protected by federal and State laws and policies because of their conservation status (i.e., endangered and threatened species, or Species of Greatest Conservation Need), and whether any areas protected for conservation purposes (i.e., wildlife movement corridors) are present. Furthermore, this exhibit discusses whether identified species or their habitat or other protected areas may be present or affected by the Project.

The applicant would construct an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation tie transmission line (gen-tie line) that would deliver power from a proposed 800-megawatt (MW) solar and battery energy storage system (BESS) facility (collectively, the Energy Center) through a new on-site substation to the existing Salt River Project (SRP) 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within a 540 to 4,737-foot-wide siting corridor (CEC Corridor). The Project site is defined as the 200-foot-wide gen-tie ROW. The proposed CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south, with a width varying between 540 and 4,737 feet east to west.

The Applicant is requesting approval of the CEC Corridor within which to locate the gen-tie and ROW to achieve site-specific mitigation objectives and/or meet site-specific engineering requirements. The areas of biological wealth analysis was conducted within the Study Area, defined as a 2-mile radius around the Project site. The Project site is in the vicinity of the Arlington Community in unincorporated Maricopa County, Arizona, in Sections 15, 22, 27, and 34 of Township 1 South, Range 6 West, and Section 3 of Township 2 South, Range 6 West, Gila and Salt River Base and Meridian, as shown on the Arlington, Arizona, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (**Figure C-1**). The average elevation in the Study Area is approximately 850 feet above mean sea level, and the topography of the surrounding area is flat ground, with the prominent land cover classes being agricultural fields and open desert. Phoenix is approximately 47 miles to the northeast, and the city of Buckeye is approximately 16 miles to the east. The Gila River flows approximately 4.5 miles east of the Project site, and Centennial Wash flows northwest to southeast across the Project site and into the Gila River.

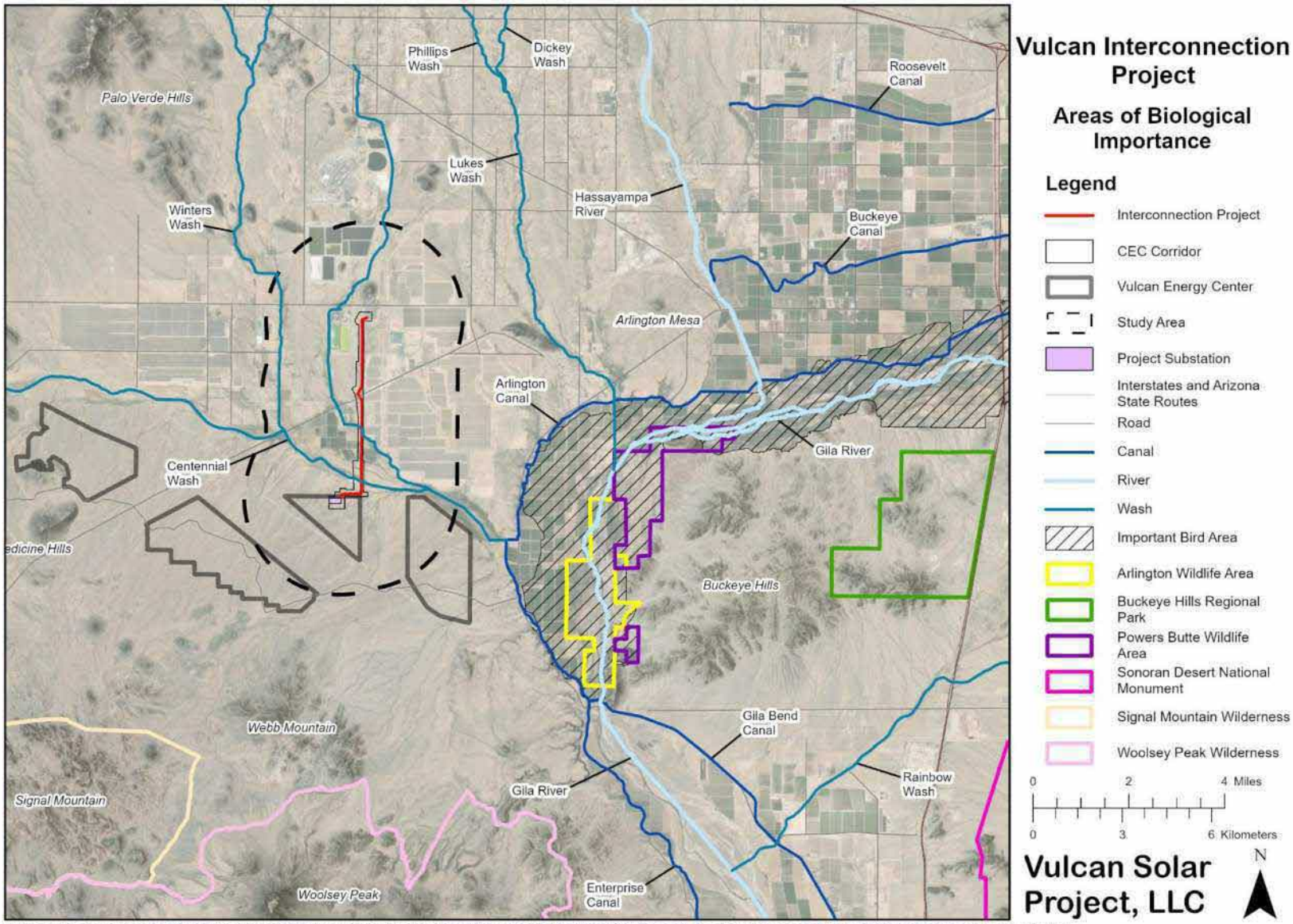

Figure C-1: Areas of Biological Importance

The Study Area is in the Lower Colorado River Valley subdivision of the Sonoran Desertscrub biome, which is the most arid subdivision of the Sonoran Desert and is characterized by high temperatures and low precipitation (Brown 1994). The Study Area is highly developed, with few native desert components remaining. The three vegetation communities within the Study Area include Sonora-Mojave creosote bush-white bursage desertscrub, Sonoran Paloverde–Mixed cacti desertscrub, and North American warm desert xeric-riparian scrub (Heritage Environmental Consultants 2024).

Native vegetation that is typical of the Study Area includes low, open stands of creosote bush (*Larrea tridentata*), dominated by velvet mesquite (*Prosopis velutina*) and white bursage (*Ambrosia dumosa*). Blue palo verde (*Parkinsonia florida*) is present but not abundant. Cacti—including jumping cholla (*Cylindropuntia fulgida*), hedgehog (*Echinocereus engelmannii*), Christmas cactus (*Cylindropuntia leptocaulis*), branched pencil cholla (*Cylindropuntia ramosissima*), and fishhook barrel cactus (*Ferocactus wislizeni*)—are less abundant than in regions with upland desertscrub vegetation. Also typical of the Study Area are smaller areas of low, undrained, and salt-affected soils, commonly dominated by four-wing saltbush (*Atriplex canescens*) and catclaw acacia (*Acacia greggii*). Other conspicuous species in a typical Sonoran Desertscrub community include desert broom (*Baccharis sarothroides*), chuparosa (*Justicia californica*), ironwood (*Olneya tesota*), and blue paloverde (Brown 1994; USGS 2005).

Applicable Laws and Policies

Applicable laws and policies regarding plant and wildlife species, including special-status species, in Arizona, include the following:

- The U.S. Fish and Wildlife Service (USFWS) administers the **Endangered Species Act of 1973 (ESA),** as amended (16 U.S. Code [USC] 1531 et seq.), which protects wildlife species listed as threatened or endangered from "take." However, the ESA does not provide the same protection for listed plant species (except on federal land), nor does it provide the same protection to species considered candidates for listing. The ESA also allows for the designation of critical habitat for listed species, although designation of critical habitat is not required. Critical habitat is an administrative designation of a defined area with specific characteristics that are important to the survival and recovery of a listed species. Designation of critical habitat can affect federal actions but not state or private actions without a federal nexus.
- The **Migratory Bird Treaty Act of 1918 (MBTA)** (16 USC 703–712) provides for the protection of migratory birds and prohibits their unlawful take or possession. The act bans "taking" any protected native birds; "taking" can mean killing a wild bird or possessing parts of a wild bird, including feathers, nests, or eggs. Exceptions are allowed for hunting game birds and research purposes, both of which require permits. A small number of native bird species, including quails, grouse, and their relatives in Arizona, are not protected under the MBTA.
- The **Bald and Golden Eagle Protection Act of 1940 (BGEPA)** (1 USC 668–668d or 50 Code of Federal Regulations [CFR] 22) prohibits any form of possession or taking of bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*). A 1962 amendment to the MBTA created a specific exemption for possession of an eagle or eagle parts (e.g., feathers) for religious purposes of Native American tribes. The amendment

provides for the preservation of not only the golden eagle but also Native American cultural practices.

- Arizona prepared the **Arizona Wildlife Conservation Strategy (AWCS)**: **2022–2032**, through a State and federal partnership and grant program, with the first version of the plan (then titled Comprehensive Wildlife Conservation Strategy), approved in 2006. The AWCS was updated in 2022 ([AZGFD 2022). The AWCS, which serves as the official State Wildlife Action Plan (SWAP), identifies **Species of Greatest Conservation Need (SGCN)** in several tiers.

  Tier 1 species are those that the AZGFD has deemed vulnerable and fall into a category of either federally listed as endangered or threatened under the ESA; those that have been recently removed from the ESA and require post-delisting monitoring; those specifically covered under a signed agreement such as a Candidate Conservation Agreement (CCA), Candidate Conservation Agreement with Assurances (CCAA), Conservation Strategy and Assessment, or Strategic Conservation Plan; or those for which the AZGFD has determined that the protection of a closed season is warranted.

  Tier 2 represents the remainder of the species meeting the AZGFD's vulnerability criteria, including species that are not listed but are regionally rare or declining, species with a U.S. range primarily in Arizona that are dependent on conservation efforts within the state, and other species with identified conservation issues that may warrant management action and do not meet the criteria for Tier 1 listing.

  Tier 3 species are those for which existing data is insufficient to score one or more vulnerability criteria because of substantial data gaps or unknown conservation status, but where conservation concern may be warranted. Species that were identified as **Wildlife of Special Concern** in 1996 are included as SGCNs in the SWAP and are shown as SGCNs in **Table C-2** and addressed in the Species of Greatest Conservation Need section below.

- Native plants in Arizona are managed by the Arizona Department of Agriculture (AZDA) under the **Arizona Native Plant Law** (ANPL) (Arizona Revised Statutes 3-903; AAC R3-3-208), which regulates harvest, salvage, and transport of plants on nonfederal lands. Harvest or salvage of most plant species may be permitted or required, and fees may be assessed. Plants listed in the "Highly Safeguarded" category may be taken or salvaged only for scientific or conservation purposes. The ANPL identifies a lengthy list of plant species—mainly cacti, agave, yucca, and desert trees—that are susceptible to removal for collection, landscaping, sale, or other commercial uses. The ANPL states that "these plants shall not be taken, transported, or possessed from any nonfederal land without permission and a permit from the AZDA and notification of intent to clear land form," submitted and approved by AZDA before clearing private land of native plants.

- The AZDA administers the **State Noxious Weed Law** under AAC R3-4-245. Arizona maintains a list of noxious weeds in three categories: Class A, Class B, and Class C (AZDA 2025). Class A species are those that are not known to occur in Arizona; are of limited distribution; and have a high priority for quarantine, control, or mitigation. Class B noxious weeds are species known to occur but are of limited distribution in Arizona, and they may be high-priority pests for quarantine, control, or mitigation if a significant threat to crop,

commodity, or habitat exists. Class C noxious weeds are plant species that are widespread but may be recommended for active control, based on risk assessment.

Inventory

A habitat assessment, biological resources survey, and native plant inventory were conducted for the Project, portions of the Study Area, and adjacent BLM lands (Dudek 2025a, 2025b; Heritage Environmental Consultants 2024). All plants and wildlife that were observed were recorded during the survey. In addition, the biologists documented existing conditions and noted any habitat features that may be important to special-status species or related to areas of biological wealth in the Project site and Study Area.

An official USFWS list of ESA-listed species with the potential to occur in the Project site was obtained in November 2025 (USFWS 2025b; **Appendix C-1**). In addition, the AZGFD Online Environmental Review Tool (ERT) was queried to generate a list of special-status species with records within 5 miles of the Study Area (predetermined ERT buffer) and a list of SGCNs with modeled suitable habitat intersecting the Project site (AZGFD 2025a; **Appendix C-2**).

Descriptions of federal and State designations are as follows:

Federal Designations

- **Endangered:** species in danger of extinction throughout all or a significant portion of their range
- **Threatened:** species likely to become endangered in the foreseeable future
- **Proposed:** species recommended for listing under Section 4 of the ESA
- **Candidate:** species that USFWS proposes as endangered or threatened under the ESA, but a formal listing is precluded by other higher priority listing activities (candidate species are not protected under the ESA, but for this report, they are discussed in the same manner as threatened or endangered species)
- **Species of Concern:** an informal category referring to those species that USFWS believes may need concentrated conservation actions (conservation actions, such as monitoring, vary depending on the health of the populations and degree and types of threats. USFWS Species of Concern receive no legal protection under the ESA, and the use of the term does not necessarily mean that the species eventually will be proposed for listing as a threatened or endangered species)
- **MBTA:** certain bird species that are protected under the MBTA (1918; 16 USC 703-712), and the Bald and Golden Eagle Protection Act (1940; 16 USC 668-668d). Any person or organization planning to conduct activities that may result in impacts on migratory birds, eagles, and their habitats need to follow applicable regulations and consider implementing appropriate conservation measures. USFWS provides the Birds of Conservation Concern (BCC) list and a list of their breeding seasons and probability of presence for a defined study area in the Information for Planning and Consultation (IPaC) report (USFWS 2025a).

State Designations

- **AZGFD SGCN:** a State designation for species determined to be vulnerable in at least one of the following eight criteria: extirpated from Arizona, federal or State status, declining status, disjunct status, demographic status, concentration status, fragmentation status, and distribution status, as described by the AZGFD's listing of SGCN in the SWAP.
- **ANPL:** plants that include four protection categories: Highly Safeguarded, Salvage Restricted, Salvage Assessed, and Harvest Restricted. Landowners have the right to destroy or remove native plants growing on their land but are required to notify the AZDA 20 to 60 days before the destruction of any protected native plants. The notification period depends on the number of acres to be cleared. At the time of the notification, the landowner can state whether they would allow salvage companies an opportunity to retrieve the plants, or if they intend to destroy the plants. Removal of protected native plants from a site would require tags/permits from the AZDA. The landowner is allowed to transplant healthy native trees within the site without a permit or notification.

Biological Resources Summary

The USFWS and AZGFD online databases identified several federally listed and other special-status species that are known to occur or have the potential to occur in the region. Special areas, special-status species, and the likelihood of their being present in the Project vicinity are addressed in the following six sections.

Areas of Biological Wealth

Neither the Project site nor the Study Area intersect any designated or proposed critical habitat, wildlife refuges, wildlife management areas, wildlife corridors, linkage corridors, important bird areas (IBAs), or conservation opportunity areas (COAs) (refer to Figure C-1). Centennial Wash is a Maricopa County Riparian Wildlife Movement Area that intersects the Study Area (AZGFD 2025a).

The closest COA (Lower Salt and Gila Rivers COA) contains the Lower Salt and Gila Rivers Ecosystem IBA and is approximately 4 miles east of the Project site (Audubon 2025; AZGFD 2025a). The Arlington Wildlife Area is within the Lower Salt and Gila Rivers Ecosystem IBA and comprises approximately 1,500 acres along the banks of the Gila River. It contains a large stand of salt cedar (*Tamarix* spp.) and about 4 miles of river channel, featuring flowing water, cattails (*Typha* spp.), and other emergent vegetation, sand and gravel bars, and riparian trees, such as cottonwood (*Populus* sp.), and willow (*Salix* spp.) (Arizona Birding Trail 2025). The Lower Salt and Gila Rivers COA also extends west and south along the Gila River, which has perennial flow, from treated effluent, excess agriculture water, and natural ground water. This COA includes areas managed by AZGFD for birds and other wildlife. The fish community in this COA is one of the most abundant in Arizona and attracts piscivorous birds in high numbers.

Federally Listed Threatened and Endangered Species

The USFWS official species list identifies eight federally listed and protected species and one experimental population with the potential to occur in the Project site (**Table C-1**). Two MBTA species and two BGEPA species also have the potential to occur in the Study Area.

Table C-1: ESA, MBTA, and BGEPA Species Potentially Occurring in the Study Area

Species	Status	Habitat Requirements	Habitat Suitability
Birds			
Bald eagle *(Haliaeetus leucocephalus)*	BGEPA MBTA	Found in aquatic habitats with open water or Southwest arid regions with available food and roost sites. The range for nonbreeding bald eagles extends throughout Arizona, except for the south-central portion of the state; breeding eagles occur in limited, fragmented locations of central, east-central, and west-central portions of the state (Katzner et al. 2020; Cornell Lab of Ornithology 2025a).	**Limited suitable habitat.** The Study Area does not contain preferred breeding or roosting habitats but is within nonbreeding range, with forage and transient potential occurring in areas of open desert in the Study Area.
California least tern *Sternula antillarum browni*	ESA-LE	Found on coastal edges and beaches, typically near river mouths, estuaries, and coastal embayments. Mostly utilize open, sandy beaches near the ocean with sparse vegetation (USFWS 2025c).	**No suitable habitat.** No coastal areas are present.
Cactus ferruginous pygmy owl *Glaucidium brasilianum cactorum*	ESA-LT	Found in mesquite thickets, desert riverine woods, and saguaros in desertscrub and semi-desert grasslands in southern Arizona; historic range continued into central Arizona. Found below 4000 feet in elevation (USFWS 2023).	**No suitable habitat.** Species heavily relies on saguaro; none were found on site during previous surveys. Believed to be absent from Maricopa County (USFWS 2023).
Golden eagle *Aquila chrysaetos*	BGEPA MBTA	Found in mountainous canyon land, rimrock terrain of open desert, grassland, and forested areas. Year-round range includes all of Arizona (USFWS 2022).	**Limited suitable habitat.** Although no suitable nesting habitat is present in the Project site or Study Area, eagles may forage or move through the area to nearby nesting locales.
Southwestern willow flycatcher *Empidonax traillii extimus*	ESA-LE	Dense riparian habitats with cottonwood/willow, saturated soils, standing water or streams. Typically found below 8500 feet of elevation (AZGFD 2025b).	**Limited suitable habitat.** Transient individuals may use vegetation in nearby Centennial Wash. No designated or proposed critical habitat is in the Project site (USFWS 2025b).
Yellow-billed cuckoo *Coccyzus americanus*	ESA-LT	This bird uses large contiguous patches of multi layered riparian habitat, such as cottonwood-willow gallery forests along rivers and streams below 6600 feet (AZGFD 2025c).	**Limited suitable habitat.** The Study Area lacks dense contiguous vegetation. No designated or proposed critical habitat is in the Project site (USFWS 2025b). A nearby observation was in the Arlington Wildlife Area, approximately 3 miles from the Study Area (eBird 2025).

Species	Status	Habitat Requirements	Habitat Suitability
Yuma Ridgway's rail *Rallus obsoletus yumanensis*	ESA-LE	Found along freshwater marshes, brackish marshes, and side waters. The species prefers tall, dense cattails and bulrushes along the edges of marshes. During the winter, it can be found in heavily overgrown sloughs and backwaters with a greater diversity of vegetation (AZGFD 2025d).	**Limited suitable habitat**. The Study Area crosses Centennial Wash but lacks necessary dense vegetation. This species was not observed during avian surveys (Heritage Environmental Consultants 2024). Numerous nearby observations have been made in the Arlington Wildlife Area, approximately 3 miles from the Study Area (eBird 2025).
Fish			
Gila topminnow *Poeciliopsis occidentalis*	ESA-LE	Small, perennial streams, springs, and cienegas in upland desertscrub, semi-desert grasslands, and interior chaparral communities below 5000 feet (AZGFD 2025e).	**No suitable habitat**. The Study Area lacks the right hydrology, springs, and cienegas.
Insects			
Monarch butterfly *Danaus plexippus*	ESA-C	Breeding and migratory monarch butterfly populations occur within different habitats in Arizona, including riparian areas, native desert, and urban habitats concentrated on parks. Abundance of milkweed is critical for this species. Additional plant species that monarch butterfly is known to use include dogbane, alfalfa, thistles, seep willow, sunflowers, groundsel, and clovers (Morris et al. 2015).	**Potential suitable habitat**. Candidate species with no current formal regulations. No critical habitat has been designated. Flowering plants are present in the Project site that can provide nectar resources for migrating monarch butterfly; however, these are concentrated along washes and are not the overall dominant vegetation type, and the Project has been designed to avoid large washes. Although the potential exists for monarch butterfly to reproduce in the Project site, the availability of suitable host plants is very low (SWCA 2025).
Mammals			
Sonoran pronghorn *Antilocapra americana sonoriensis*	ESA-XN	Found within alluvial valleys separated by block-fault mountain ranges. The valleys typically are level, with sandy soil and sparse vegetation at elevations of 400 to 1600 feet above mean sea level (AZGFD 2025f).	**Limited suitable habitat**. The desert surrounding the Project could provide habitat. There are AZGFD records of this species within three miles of the Study Area (AZGFD 2025a).

Notes:
amsl = above mean sea level; BGEPA = Bald and Golden Eagle Protection Act of 1940; C = Candidate; ESA = Endangered Species Act; LE = Listed Endangered; LT = Listed Threatened; MBTA = Migratory Bird Treaty Act of 1918; XN = experimental population, non-essential

The USFWS official species list did not list any critical habitat, National Wildlife Refuge Lands, or fish hatcheries in the Study Area, but did identify one freshwater pond (palustrine, unconsolidated bottom, semi-permanently flooded [PUBF]); two riverine systems (riverine, unknown perennial, unconsolidated bottom, semi permanently flooded, excavated [R5UBFx]) and riverine, intermittent, streambed, seasonally flooded [R4SBC]); and one freshwater forested shrub wetland (palustrine, scrub-shrub, seasonally flooded [PSSC]) in the Study Area. The wetland delineation report that was conducted by Dudek (2025c), in coordination with USACE, showed that the features in the Project site are ephemeral and intermittent channels that only exhibit flow in response to precipitation events; therefore, they are non-jurisdictional and do not meet the criteria for waters of the U.S. An Approved Jurisdictional Determination for the project was granted on July 14, 2025.

Bald and Golden Eagles

The bald eagle and golden eagle are protected under both the MBTA and BGEPA. The Project site and Study Area are within the nonbreeding range of both species (Cornell Lab of Ornithology 2025a).

Neither the Project site nor the Study Area contain characteristic nesting or roosting habitats for bald eagle, and no ERT records of bald eagle are within or near the Project site (AZGFD 2025a). No suitable aquatic foraging habitat (e.g., flowing rivers or lakes containing fish) is present in the Project site; however, small mammal prey is found across the Project site and Study Area, and bald eagle may forage in the Project site or travel through the area while foraging. The nearest and most recent sighting of an individual bald eagle was in March 2020, along Historic U.S. Highway 80 approximately 3.5 miles southeast of the Project site (eBird 2025).

Wintering or nonbreeding golden eagles as well as juveniles tend to remain associated with breeding habitats, although they can travel long distances while searching for food (Katzner et al. 2020). Neither the Project site nor the Study Area provides suitable nesting habitat, but both fall within the species predicted year-round range (AZGFD 2002). The ERT report did not show any golden eagle records within or immediately adjacent to the Study Area; however, numerous observations have been made in the surrounding region. The closest sighting of a golden eagle was in the Arlington Wildlife Area, approximately 4.5 miles east of the Project site (eBird 2025). Therefore, golden eagle occasionally may forage in or travel through both the Project site and the broader Study Area. The federal status and potential for occurrence in the Project vicinity for bald eagle and golden eagle are shown in **Table C-1**.

Other Special-Status Species

Other special-status species include BCC and SGCN, identified by USFWS and AZGFD respectively as species prioritized for proactive conservation efforts. The species in these categories that have occurrence records or predicted habitat modeled within 3 miles of the Study Area (and not designated as federally threatened or endangered or BGEPA species) are shown in **Table C-2** (AZGFD 2025a).

These species were evaluated for potential occurrence based on familiarity with the vicinity and freely available information sources including:

- All About Birds: Your Online Field Guide to Birds and Birdwatching (Cornell Lab of Ornithology 2025d)
- Arizona Breeding Bird Atlas (Corman and Wise-Gervais 2005)
- Cornell Lab eBird Website (eBird 2025)
- Heritage Data Management System Species Abstracts and Maps (AZGFD 2025g)
- iNaturalist Observations Database (iNaturalist (2025)
- Reptiles and Amphibians of Arizona online field guide (Brennan 2012)
- USFWS Environmental Conservation Online System (ECOS) website (USFWS 2025c)

Birds of Conservation Concern

Twenty BCC were identified as having the potential to occur in the Study Area vicinity (refer to **Table C-2**). BCC are protected under the MBTA; however, a BCC designation does not afford a taxa any additional protections but simply indicates that USFWS has prioritized it for conservation.

Species of Greatest Conservation Need

The AZGFD ERT identified 48 SGCN that are predicted to occur within the Study Area and five special-status species that may have the potential to occur within the Study Area (**Table C-2**). During the biological survey, site-specific information was gathered to assess special-status species potential to occur. Dudek determined that of the AZGFD ERT 48 SGCN species predicted to occur, 13 special-status species had the potential to occur (Dudek 2025a). Three special-status wildlife species were confirmed present in the adjacent BLM lands during the avian surveys, including Bendire's thrasher (*Toxostoma bendirei*), LeConte's thrasher (*Toxostoma lecontei*), and gilded flicker (*Colaptes chrysoides*). One incidental observation of burrowing owl occurred in the Project site during a 2024 habitat assessment (Dudek 2025a).

Table C-2. AZGFD ERT Species of Concern and Species of Greatest Conservation Need Potentially Occurring in the Study Area

Common Name (*Scientific Name*)	Habitat and Notes	Status		Occurrence Status	
		Federal	State (Tier)	Project	Study Area
Amphibians					
Lowland leopard frog (*Lithobates yavapaiensis*)	Found in rocky streams, canyon habitats surrounded by conifer forests, or ponds and stream pools. Usually found in areas with desertscrub biotic communities. Greatest threats to the species include habitat alteration, fragmentation, and introduction of nonnative predatory fish, crayfish, and frogs. Species dispersal has been shown to remain within a few kilometers of aquatic breeding sites.	N/A	SGCN (1)	**May occur.** Suitable habitat may be present within canals in agricultural areas.	**May occur.** Suitable habitat may be present within canals in agricultural areas.
Sonoran Desert toad (*Incilius alvarius*)	Found in Sonoran Desertscrub, semidesert grasslands, oak, and occasionally pine-oak woodland habitats up to about 5,600 feet amsl. Associated with major rivers, and edges of agriculture; although often tied to permanent water, can be found miles from water during summer monsoon season, in some areas.	N/A	SGCN (2)	**May occur.** Suitable habitat (i.e., agricultural edge habitat) for species occurrence and potential breeding occurs in the Project site. AZGFD records of this species are within 3 miles of the Study Area (AZGFD 2025a).	**May occur.** Suitable habitat (i.e., agricultural edge habitat) for species occurrence and potential breeding occurs in the Study Area. AZGFD records of this species are within 3 miles of the Study Area (AZGFD 2025a).
Birds					
American avocet (*Recurvirostra americana*)	Found in fresh and saltwater wetlands, impoundments, water generally less than eight inches deep (Cornell Lab of Ornithology 2025b). Breeds between April and August.	MBTA BCC	N/A	**Unlikely to occur.** Unlikely to breed in the Study Area; vegetation in nearby wetlands may be used by transient individuals.	**Unlikely to occur.** Unlikely to breed in the Study Area; vegetation in nearby wetlands may be used by transient individuals.
American bittern (*Botaurus lentiginosus*)	Requires marshlands and meadows with significant surface water.	MBTA	SGCN (2)	**Unlikely to occur.** The Project site lacks significant surface water.	**Unlikely to occur.** The Study Area lacks significant surface water.
American kestrel (*Falco sparverius*)	Found in open and semi-open habitats, frequently found in prairies, deserts, wooded streams, burned forest, and agricultural areas. Known to nest in natural holes in trees, abandoned woodpecker cavities, cavities in buildings or cliffs, and similar sites.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains suitable habitat for foraging, and multiple occurrence records exist east of the Project site (eBird 2025).	**May occur.** The Study Area contains suitable habitat for foraging, and multiple occurrence records exist east of the Study Area (eBird 2025).
American peregrine falcon (*Falco peregrinus anatum*)	Found in various habitats including tundra, moorlands, steppe, seacoasts, forests, and urban areas. Nests on ledges of rocky cliffs or crags. Can nest in tall urban structures.	MBTA	SGCN (1)	**May occur.** The Project site contains suitable habitat for foraging. The species has been observed east of the Project site in the Arlington Wildlife Area (eBird 2025).	**May occur.** The Study Area contains suitable habitat for foraging. One occurrence record is east of the Study Area in the Arlington Wildlife Area (eBird 2025).
Bendire's thrasher (*Toxostoma bendirei*)	Found in desert habitats with a mix of relatively large scrubs/cacti and open ground or open woodland with scattered shrubs and trees. Not typically found in riparian woodland areas; the species avoids continuous shrublands and grasslands (NatureServe 2025a). Commonly found in areas with desertscrub biotic communities. Nesting is known to occur in low trees, shrubs, and cacti including mesquite (*Prosopis* spp.), cholla (*Cylindropuntia* spp.), yucca (*Yucca* sp.), paloverde (*Parkinsonia* sp.), and saltbush (*Atriplex* sp.). Breeds between March and July.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains suitable habitat for species occurrence, foraging, and potential nesting sites. The species was observed in the Project vicinity during avian surveys (Heritage Environmental Consultants 2024).	**May occur.** The Study Area contains limited suitable habitat for species occurrence, foraging, and potential nesting. The species was observed in the Project vicinity during avian surveys (Heritage Environmental Consultants 2024).
Brewer's sparrow (*Spizella breweri*)	A shrub obligate species strongly associated with sagebrush (*Artemisia* sp.) over most of its range. Found in areas with scattered shrubs and short grasses. Known to nest in sagebrush or cacti. Frequently found in low desert, arid-adapted vegetation including desertscrub, sagebrush, and creosote bush (*Larrea tridentata*) during its nonbreeding season.	MBTA	SGCN (2)	**May occur.** The Project site contains suitable habitat for species occurrence, foraging, and potential nesting sites. Occurrence records are in the Project vicinity (eBird 2025).	**May occur.** The Study Area contains suitable habitat for species occurrence, foraging, and potential nesting sites. Occurrence records are in the Study Area vicinity (eBird 2025).
Bullock's oriole (*Icterus bullockii*)	Found in open woodland, deciduous forest edge, riparian woodland, brushy areas, and among scattered trees and orchards. Nests in trees an average of eight to nine meters above ground, usually at end of drooping branch.	MBTA	SGCN (2)	**May occur.** The Project site contains suitable habitat for species occurrence, foraging, and potential nesting sites. Occurrence records are in the Project vicinity (eBird 2025).	**May occur.** The Project site contains suitable habitat for species occurrence, foraging, and potential nesting sites. Occurrence records are in the Study Area vicinity (eBird 2025).
Cactus wren (*Campylorhynchus brunneicapillus*)	Nonmigratory species often found in arid desert habitat with biotic communities including cholla, mesquite, and sage scrub. Nesting is known to occur in thorny trees and shrubs, although they have been observed nesting in buildings in the past.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains suitable habitat for species occurrence, foraging, and nesting. Occurrence records are in the Project site (eBird 2025).	**May occur.** The Study Area contains suitable habitat for species occurrence, foraging, and potential nesting. Occurrence records are in the Study Area (eBird 2025).
Chestnut-collared longspur (*Calcarius ornatus*)	Found in dense short grass and long grass prairies. Have also been observed in riparian areas in more arid habitats. Although usually avoided, cultivated fields, fallow fields, stubble, and dense idle areas may support a small number of overwintering individuals in Arizona if vegetation is of suitable height and density.	MBTA BCC	SGCN (2)	**May occur.** The Project site is within potential overwintering habitat for the species, and occurrence records are nearby, outside the Project site (eBird 2025).	**May occur.** The Study Area is within potential overwintering habitat for the species, and occurrence records are nearby, outside the Project site (eBird 2025).
Costa's hummingbird (*Calypte costae*)	Occurs within Sonoran Desertscrub, in washes and arid brushy foothills and chaparral. Nests in trees, shrubs, or cacti, and are often far from water (NatureServe Explorer 2025b). Breeds between January and June.	MBTA BCC	SGCN (2)	**May occur.** Suitable habitat for foraging and nesting is in the Project site.	**May occur.** The Study Area contains suitable habitat for foraging and nesting.

Common Name (*Scientific Name*)	Habitat and Notes	Status		Occurrence Status	
		Federal	State (Tier)	Project	Study Area
Elf owl (*Micrathene whitneyi*)	Known to occupy diverse habitats. In the Sonoran Desert, it is known to use desert ironwood (*Olneya tesota*), ocotillo (*Fouquieria splendens*), paloverde, and saguaro. Nesting most often occurs in saguaro and other columnar cacti, Fremont cottonwood (*Populus fremontii*), honey mesquite (*Prosopis glandulosa*), and Goodding's willow (*Salix gooddingii*).	MBTA	SGCN (3)	**Unlikely to occur.** The Project site does not contain suitable habitat for species occurrence.	**Unlikely to occur.** The Study Area does not contain suitable habitat for species occurrence.
Ferruginous hawk (*Buteo regalis*)	Favors open scrublands, woodlands, and grasslands.	MBTA BCC	SGCN (2)	**May occur.** Winter foraging habitat is present in the Project site. Occurrence records are in the Project site (eBird 2025).	**May occur.** Winter foraging habitat is present in the Study Area. Occurrence records are in the Study Area (eBird 2025).
Gila woodpecker (*Melanerpes uropygialis*)	Uses uplands and needs saguaro. Sometimes found in riparian areas with cottonwood, willow, and mesquite, and below elevations of 3300 feet (Cornell Lab of Ornithology 2025c). Breeds between April and August.	MBTA BCC	SGCN (2)	**May occur.** Suitable habitat for species occurrence and foraging is in the Project site. Occurrence records are east of the Project site (eBird 2025).	**May occur.** Suitable habitat for species occurrence and foraging is in the Study Area. Occurrence records are east of the Study Area (eBird 2025).
Gilded flicker (*Colaptes chrysoides*)	Found in Sonoran Desertscrub with saguaros present, or in riparian woodlands with mature trees (e.g., cottonwood, willow, ironwood [*Olneya* sp.], saguaro) (NatureServe Explorer 2025c).	MBTA BCC	SGCN (2)	**May occur.** Suitable habitat for species occurrence and foraging is in the Project site. The species was documented in the Project vicinity during avian surveys (Heritage Environmental Consultants 2024).	**May occur.** Suitable habitat is in the Study Area. The species was documented in the Project vicinity during avian surveys (Heritage Environmental Consultants 2024).
Gray flycatcher (*Empidonax wrightii*)	Commonly found in pinyon-juniper woodlands, and less frequently observed in open ponderosa or pine-oak woodland.	MBTA	SGCN (2)	**May occur.** Although suitable habitat is not present, the species has been detected just east of the Project site (eBird 2025).	**May occur.** Although suitable habitat is not present, the species has been detected just east of the Study Area (eBird 2025).
Harris's hawk (*Parabuteo unicinctus*)	Found in savannas, open woodlands, and semi-desert habitats. Frequently observed near water sources, both natural and human-made. Often found near mesquite, saguaro, and desert lowlands.	MBTA BCC[1]	SGCN (2)	**May occur.** Suitable habitat for species occurrence and foraging is in the Project site. The species has been detected near the Arlington Wildlife Area (eBird 2025).	**May occur.** The Study Area contains suitable habitat for foraging. The species has been detected near the Arlington Wildlife Area (eBird 2025).
Inca dove (*Columbina inca*)	Found in open country with scattered trees or shrubs, most frequently in arid or semiarid conditions, and around cultivated areas including farmlands, parks, and gardens. Also can be found in urban areas near human-made structures.	MBTA	SGCN (2)	**May occur.** The Project site contains suitable habitat for foraging. Occurrence records are east of the Project site (eBird 2025).	**May occur.** The Study Area contains suitable habitat for foraging. Occurrence records are east of the Study Area (eBird 2025).
LeConte's thrasher *Toxostoma lecontei*	Found in open deserts with sparse vegetation.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains suitable habitat for nesting and foraging. The species was observed in the Project vicinity during avian surveys (Heritage Environmental Consultants 2024).	**May occur.** The Study Area contains suitable habitat for species occurrence, foraging, and potential nesting sites. The species was observed in the Project vicinity during avian surveys (Heritage Environmental Consultants 2024).
Lincoln's sparrow (*Melospiza lincolnii*)	Found near bogs, wet meadows, and riparian areas, predominantly in northern and montane habitats. Winters in central Arizona; breeds near streams with cottonwoods and willows.	MBTA	SGCN (2)	**May occur.** Although lacking the preferred habitat, the species has been detected near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).	**May occur.** Although lacking the preferred habitat, the species has been detected near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).
Loggerhead shrike (*Lanius ludovicianus*)	Found in open areas with scattered trees and shrubs. Frequently observed in savannas, desertscrub biotic communities, and occasionally agricultural lands.	MBTA BCC[1]	SGCN (2)	**May occur.** Suitable habitat for species occurrence, foraging, and potential nesting is in the Project site. The species has been detected and is common near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).	**May occur.** Suitable habitat for species occurrence, foraging, and potential nesting is in the Study Area. The species has been detected and is common near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).
Mountain plover (*Charadrius montanus*)	Inhabits agricultural fields, particularly in flat landscapes. Breeds elsewhere.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains agricultural areas suitable for species occurrence and winter foraging.	**May occur.** The Study Area contains agricultural areas suitable for species occurrence and winter foraging.
Prairie falcon (*Falco mexicanus*)	Found in open areas, predominantly in mountainous areas, steppes, plains, or prairies. Typically require cliff faces or tall urban structures for nesting. Nonbreeding wintering individuals have been known to forage in agricultural fields.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains habitat suitable for species occurrence and winter foraging. Numerous occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).	**May occur.** The Study Area contains habitat suitable for species occurrence and winter foraging. Numerous occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).
Sagebrush sparrow (*Artemisiospiza nevadensis*)	Found in shrubby, open flats and sagebrush plains.	MBTA	SGCN (3)	**May occur.** The Project site contains habitat suitable for species occurrence, foraging, and potential nesting. Occurrence records are in the Project vicinity (eBird 2025).	**May occur.** The Study Area contains habitat suitable for species occurrence, foraging, and potential nesting. Occurrence records are in the Study Area vicinity (eBird 2025).

Common Name (*Scientific Name*)	Habitat and Notes	Status		Occurrence Status	
		Federal	State (Tier)	Project	Study Area
Savannah sparrow (*Passerculus sandwichensis*)	Uses fields, pastures, and golf courses. Winter visitor to Arizona that breeds elsewhere.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains agricultural areas suitable for species occurrence and winter foraging. Numerous occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).	**May occur.** The Study Area contains agricultural areas suitable for species occurrence and winter foraging. Numerous occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).
Sprague's pipit (*Anthus spragueii*)	Prefers pastures, flat desert areas, weedy fields, and agricultural areas. Winter visitor to Arizona that breeds elsewhere.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains agricultural areas suitable for species occurrence and winter foraging. One occurrence record is in the Arlington Wildlife Area (eBird 2025).	**May occur.** The Study Area contains agricultural areas suitable for species occurrence and winter foraging. One occurrence record is in the Arlington Wildlife Area (eBird 2025).
Swainson's hawk (*Buteo swainsoni*)	Found in savanna, open pine-oak woodland, and cultivated lands with scattered trees. Typically nests in solitary trees, bushes, or small groves, but also is known to nest along agricultural fields.	MBTA	SGCN (2)	**May occur.** The Project site contains suitable habitat for species occurrence and foraging. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).	**May occur.** The Study Area contains suitable habitat for species occurrence and foraging. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).
Verdin (*Auriparus flaviceps*)	Found in arid, desert habitats, frequently observed in mesquite and creosote bush vegetation; is known to nest in shrubs, small trees, and cacti. Requires mesquite and creosote bushes with branches higher than 0.5 meter (NatureServe 2025d).	MBTA BCC	SGCN (2)	**May occur.** The Project site contains habitat suitable for species occurrence, foraging, and potential nesting. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).	**May occur.** The Study Area contains habitat suitable for species' occurrence, foraging, and potential nesting. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).
Vesper sparrow (*Pooecetes gramineus*)	Found in open areas with short, sparse grass and scattered shrubs. Uncommon wintering occurrence in central and southern Arizona.	MBTA BCC	SGCN (2)	**May occur.** The Project site contains suitable habitat for nonbreeding individual occurrence and foraging. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).	**May occur.** The Study Area contains suitable habitat for nonbreeding individual occurrence and foraging. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025).
Western burrowing owl (*Athene cunicularia hypugaea*)	Found in open areas with low brush cover, including grasslands, agricultural margins, and desertscrub. Year-round resident or migratory. Uses agricultural fields along irrigation canals and edges of urban development.	MBTA BCC	SGCN (2)	**May occur.** Agricultural margins provide suitable habitat for species occurrence, foraging, and potential for burrow nesting in the Project site. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025) and in the Project vicinity (AZGFD 2025a). The species was observed during a habitat assessment of the Project site (Dudek 2025a).	**May occur.** Agricultural margins provide suitable habitat for species occurrence, foraging, and potential for burrow nesting in the Study Area. Occurrence records are near the Arlington Wildlife Area and adjacent agricultural fields (eBird 2025), and in the Project vicinity (AZGFD 2025a). The species was observed during a habitat assessment of the Project site (Dudek 2025a).
Western grebe (*Aechmophorus occidentalis*)	Found in freshwater lakes and marshes with reeds and rushes (Cornell Lab of Ornithology 2025a).	MBTA BCC	SGCN (2)	**Unlikely to occur.** The Project site does not contain suitable habitat for species occurrence.	**Unlikely to occur.** The Study Area does not contain suitable habitat for species occurrence.
Western screech-owl (*Megascops kennicottii*)	Commonly found in broadleaf and riparian woodland, particularly in deciduous forests that border canyons and other drainages.	MBTA BCC	SGCN (2)	**Unlikely to occur.** The Project site does not contain suitable habitat for species occurrence.	**Unlikely to occur.** The Study Area does not contain suitable habitat for species occurrence.
Reptiles					
Banded (variable) sandsnake (*Chilomeniscus cinctus*)	In Arizona, fossorial in sandy and sandy-gravelly soils; prefers open and sandy creosote habitats, also in sandy soils of washes and arroyos in rocky upland (palo verde-saguaro) habitat. Also found in or near washes, mesquite bosques, and other areas with fine to coarse sand and leaf litter.	N/A	SGCN (2)	**May occur.** The Project site contains habitat suitable for species occurrence.	**May occur.** The Study Area contains habitat suitable for species occurrence.
Sonoran Desert tortoise (*Gopherus morafkai*)	Occurs primarily on rocky and often steep hillsides and bajadas of Mohave and Sonoran Desertscrub, typically at elevations less than 7800 feet above mean sea level (amsl). May occur, but is less likely to occur, in desert grassland, juniper woodland, and interior chaparral habitats, and even in pine communities.	CCA	SGCN (1)	**May occur.** Although the species was not observed during the habitat assessment, the southern portion of the Project site contains suitable habitat for species occurrence. AZGFD records of this species are within 3 miles of the Study Area (AZGFD 2025a).	**May occur.** Although the species was not observed during the habitat assessment, the southern portion of the Study Area contains suitable habitat for species occurrence. AZGFD records of this species are within 3 miles of the Study Area (AZGFD 2025a).

Common Name (*Scientific Name*)	Habitat and Notes	Status		Occurrence Status	
		Federal	State (Tier)	Project	Study Area
Mammals, Non-Bat Species					
Antelope jackrabbit (*Lepus alleni*)	Found in arid grassy areas with scattered large shrubs, foothills, mesas, and bajadas.	N/A	SGCN (2)	**May occur.** The Project site is within the range of this species and contains suitable habitat for occurrence.	**May occur.** Suitable habitat is present in the Study Area, and occurrence records are in the Project vicinity.
Arizona pocket mouse (*Perognathus amplus*)	Inhabits Sonoran Desertscrub communities.	N/A	SGCN (2)	**May occur.** The Project site contains suitable habitat.	**May occur.** The Study Area contains suitable habitat.
Bailey's pocket mouse *Chaetodipus baileyi*	Found in open desert, where it forages underneath shrubs.	N/A	SCGN (2)	**May occur.** The Project site contains suitable habitat.	**May occur.** The Study Area contains suitable habitat.
Gray-collared chipmunk (*Neotamias cinereicollis*)	Found in high mountains; clearings; and pine, spruce, and fir forest edges. Most common where pine and Douglas fir overlap.	N/A	SGCN (2)	**Unlikely to occur.** The Project site is not within the range of this species and does not contain suitable habitat for occurrence.	**Unlikely to occur.** The Study Area is not within the range of this species and does not contain suitable habitat for occurrence.
Harquahala southern pocket gopher (*Thomomys bottae subsimilis*)	Occupies dry desert habitats with loamy soils.	N/A	SGCN (2)	**Unlikely to occur.** The Project site contains limited loamy soils.	**May occur.** The Study Area contains suitable loamy soils.
Harris' antelope squirrel (*Ammospermophilus harrisii*)	Found in arid desertscrub habitats.	N/A	SCGN (2)	**May occur.** The Project site contains suitable habitat.	**May occur.** The Study Area contains suitable habitat.
Mammals, Bat Species					
Brazilian (Mexican) free-tailed bat (*Tadarida brasiliensis*)	Found in a variety of habitats with ranges across the U.S.. Often found roosting in caves, mines, cliff crevices, tunnels, bridges, and buildings. Known to forage in agricultural fields and desert edges.	N/A	SGCN (2)	**May occur.** The Project site contains suitable foraging habitat.	**May occur.** Foraging habitat is in the Study Area.
California leaf-nosed bat (*Macrotus californicus*)	Found in caves, mines, and rock shelters, mostly in Sonoran Desertscrub between elevations of 160 and 3980 feet amsl. Roost sites usually are near foraging areas. This species mostly forages on insects but also is known to forage on the fruits of cacti species, such as prickly pear. Its summer and winter range essentially are the same.	N/A	SGCN (2)	**May occur.** The Project site contains suitable foraging habitat.	**May occur.** Foraging habitat is in the Study Area.
Cave myotis (*Myotis velifer*)	Typically found in desertscrub with creosote bush, brittlebush (*Encelia* sp.), paloverde, and cacti, but sometimes found in pine-oak communities, between 300 and 5000 feet amsl. Roosts in caves, tunnels, mine shafts, and under bridges, and occasionally in buildings within a few miles of water.	N/A	SGCN (2)	**May occur.** The Project site contains suitable foraging habitat.	**May occur.** Foraging habitat is in the Study Area.
Desert (Western) red bat (*Lasiurus blossevillii*)	A summer resident, its preferred habitat includes riparian and wooded areas. Generally distributed in south-central to southern and southeastern Arizona, with a few observations along the Colorado River near Bill Williams, and occasionally in the Grand Canyon. Roosts in dense foliage of cottonwood trees, fruit orchards, leafy shrubs or herbs, saguaro boots, buildings, or cave-like structures. The species commonly is drawn to feed around city streetlights and floodlights on barns.	N/A	SGCN (2)	**May occur.** The Project site contains suitable foraging habitat.	**May occur.** Foraging habitat is in the Study Area.
Greater western bonneted bat (*Eumops perotis californicus*)	Typically requires nearby cliff edges for roosting. The species may use agricultural fields to forage.	N/A	SGCN (2)	**May occur.** The Project site contains suitable foraging habitat.	**May occur.** Foraging habitat is in the Study Area.
Hoary bat (*Lasiurus cinereus*)	Uses agricultural areas and human-made structures.	N/A	SCGN (2)	**May occur.** The Project site contains suitable foraging habitat.	**May occur.** Foraging habitat is in the Study Area.
Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)	Typically roosts in mines and caves above 9000 feet and can use agricultural areas for foraging.	N/A	SCGN (2)	**May occur.** Typically roosts in mines and caves above 9000 feet and can use agricultural areas.	**May occur.** Typically roosts in mines and caves above 9000 feet and can use agricultural areas.
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	Found in desertscrub. Roosts in cliff faces, rock crevices, caves, and occasionally buildings.	N/A	SGCN (2)	**May occur.** The species may use the Project site for foraging. No roosting habitat is present.	**May occur.** Foraging habitat is present in the Study Area.
Western yellow bat (*Lasiurus xanthinus*)	Found in arid habitats along riparian corridors; is known to roost in palm trees, cottonwood, and yucca. Forages over open water.	N/A	SGCN (2)	**Unlikely to occur.** The Project site does not contain suitable roosting or foraging habitat.	**Unlikely to occur.** The Study Area does not contain suitable roosting or foraging habitat.
Yuma myotis (*Myotis yumanensis*)	Found in a variety of habitats, including riparian, desertscrub, moist woodlands, and forests; prefers cliffs and rocky walls near water. Is known to roost in caves, mines, cliff crevices, and buildings. Foraging occurs along forested edges of streams, ponds, and lakes.	N/A	SGCN (2)	**May occur.** Will forage outside roosts in agricultural fields.	**May occur.** Will forage outside roosts in agricultural fields.

Common Name (*Scientific Name*)	Habitat and Notes	Status		Occurrence Status	
		Federal	State (Tier)	Project	Study Area

Notes:
ABSL = above mean sea level
BCC – Bird of Conservation Concern
CCA – Candidate Conservation Agreement
MBTA = Migratory Bird Treaty Act
N/A – not applicable
SGCN – Species of Greatest Conservation Need.
SGCN (1) = Tier 1 species identified by AZGFD (2022) as having conservation priority.
SGCN (2) = Tier 2 species are those categorized as "vulnerable" but do not fit the Tier 1 criteria for highest priority.
SGCN (3) = Tier 3 species are those for which existing data were insufficient to score one or more vulnerability criteria.
Sources:
AZGFD 2025a; Cornell Lab of Ornithology 2025a; eBird 2025; NatureServe 2025a-d; USFWS 2025b-c)

State-Protected Native Plants

The ANPL identifies a list of plant species—mainly cacti, agave, yucca, and desert trees—that are susceptible to removal for collection, landscaping, sale, or other commercial uses. The ANPL states that these plants are not to be taken, transported, or possessed from any nonfederal lands without permission and a permit from the AZDA. It also requires notification before land clearing, even if the plants will be destroyed.

Seven species that are covered under the ANPL were observed in the Project site during the 2025 Native Plant Inventory Survey (Dudek 2025b):

- Blue palo verde (*Parkinsonia florida*); salvage assessed
- Branched pencil cholla (*Cylindropuntia ramosissima*); salvage restricted
- Christmas cactus (*Cylindropuntia leptocaulis*); salvage restricted
- Crucifixion thorn (*Castela emoryi*); salvage restricted
- Jumping cholla (*Cylindropuntia fulgida*); salvage restricted
- Strawberry hedgehog cactus (*Echinocereus engelmannii*); salvage restricted
- Velvet mesquite (*Prosopis velutina*); salvage assessed and harvest restricted

Noxious Weeds

Arizona maintains a list of noxious weeds in three categories: Class A, Class B, and Class C (AZDA 2025). Class A species are those that are not known to occur in Arizona, of limited distribution, and of high priority for quarantine, control, or mitigation. Class B noxious weeds are species known to occur but with limited distribution in Arizona and may be high-priority pests for quarantine, control, or mitigation if a significant threat to crop, commodity, or habitat exists. Class C noxious weeds are plant species that are widespread but may be recommended for active control based on a risk assessment. Three of the nonnative plant species that were observed in the Project site during the 2025 Native Plant Inventory Survey are listed under AZDA's noxious weed regulations: red brome (*Bromus rubens), Class C;* stinknet (*Oncosiphon pilulifer), Class B;* and saltcedar (*Tamarix ramosissima) Class C* (Dudek 2025b).

Evaluation of Potential Impacts

Areas of Biological Wealth

The Project site and Study Area (including the proposed CEC Corridor) do not overlap any designated or proposed critical habitat, wildlife refuges, or COAs. Centennial Wash is a Maricopa County Riparian Wildlife Movement Area that intersects the Study Area (AZGFD 2025a).

Land cover in the Project site is comprised of agricultural fields, developed open space, North American Desert Pavement, North American Warm-Desert Xeric Riparian Scrub, and Sonora-Mojave Creosote Bush-White Bursage Desertscrub (Dudek 2025b). Because much of the landscape already has been converted to agricultural, industrial, and residential uses, the Project's small disturbance footprint and short construction period are expected to result in minimal effects on habitat connectivity.

Federally Listed Threatened and Endangered Species

Five ESA species may occur in the Project site and Study Area, including Sonoran pronghorn, monarch butterfly, southwestern willow flycatcher, yellow-billed cuckoo, and Yuma ridgeway rail. Suitable habitat for Sonoran pronghorn is in the solar array sub-areas, and telemetry data shows that pronghorn have been detected in the Study Area vicinity as recently as 2016 (Heritage Environmental Consultants 2024). AZGFD records of this species also are in the Study Area vicinity (AZGFD 2025a); however, no Sonoran pronghorn individuals were observed during field surveys (Heritage Environmental Consultants 2024).

On December 12, 2024, USFWS proposed listing monarch butterfly as a threatened species under the ESA, along with a 4(d) rule identifying exempted activities (USFWS 2024). The proposal also included critical habitat designation for western overwintering sites in coastal California, totaling about 4,395 acres across seven counties. No critical habitat was proposed in Arizona.

The Project site and Study Area fall within the known range for monarch butterfly. Although the species is not formally listed yet, it is addressed here in the event that Project activities occur after a final rule is issued. Habitats in the Project site and Study Area may support monarch butterfly use. Landscaped, roadside, and irrigated agricultural habitats can support higher plant densities, and thus monarch butterfly may pass through the area during migration or dispersal, but the Project site does not contain overwintering habitat, is not within proposed critical habitat, and the species has not been recorded in the Project site. Flowering plants are in the Project site and Study Area that can provide nectar resources for migrating monarch butterfly; however, these are concentrated along washes, which the Project has been designed to avoid, and those plants are not the overall dominant vegetation type. Although the potential exists for monarch butterfly to reproduce in the Project site, the availability of suitable host plants is very low (SWCA 2025).

The potential effects of the Project would be limited to temporary surface disturbance, such as vegetation removal, damage, and grading, which could reduce nectar availability and require monarch butterfly to expend additional energy when seeking resources elsewhere. These impacts are expected to be minimal because of the abundance of similar habitat nearby. Monarch butterfly would retain the ability to migrate, forage, and move through the area, and impacts likely would be minor behavioral responses to construction activity, including avoidance or occasional collision risk.

The Project may impact southwestern willow flycatcher, yellow-billed cuckoo, and Yuma ridgeway rail; however, the Project is not likely to jeopardize the continued existence of these species. Although limited suitable habitat is in the Centennial Wash and Project vicinity, the Project site and Study Area (including the proposed CEC Corridor) lack the dense, multi-layered riparian habitat that southwestern willow flycatcher and yellow-billed cuckoo require. The Project site and Study Area also lack suitable habitat with perennial waters and dense vegetation that Yuma ridgeway's rail requires. In addition, these species were not observed during the interconnection field surveys (Dudek 2025a; Heritage Environmental Consultants 2024). These species potentially may use the Project site as transient habitat but would not be likely to use it to forage or nest. Potential impacts on transient individuals would include disturbance from noise or human presence. Transmission line collision risk would be minimized through design measures, following Avian Power Line Interaction Committee (APLIC) guidelines (APLIC 2006, 2012). Electrocution

risk would be negligible for the proposed 500-kV line because the conductor spacing would exceed the wingspans of large birds.

Other Special-Status Species

Special-Status Mammals

Thirteen special-status mammals may occur in the Project site, including multiple species of bats. Bats may forage in the area, but because construction would occur during the day and the disturbance footprint would be small, impacts on foraging activity and habitat are expected to be minimal. Migrating bats could collide with structures, but transmission lines in this setting are not expected to pose a substantial risk. Terrestrial mammals could experience temporary disturbance, including noise- or vibration-related behavioral changes or risks to individuals in burrows. These impacts are expected to be minor because of the abundance of adjacent habitat. Dust that would be generated during construction temporarily may affect behavior but would diminish with distance from any work areas.

Special-Status Amphibians

Sonoran Desert toad and lowland leopard frog may occur in the Project site. The potential impacts (e.g., disturbance, noise, dust, temporary habitat loss) would be similar in type and scale to those described for mammals.

Special-Status Birds

Bald eagle and golden eagle may forage or pass through the Study Area, but no suitable nesting or perching habitat occurs in the Project site, and no eagle has been identified in the Project site (USFWS 2025b). Because only a small amount of foraging habitat would be affected and similar habitat is widely available nearby, no significant impact on either eagle species is anticipated.

Twenty-six special-status bird species that are protected under the MBTA may occur; Bendire's thrasher, Leconte's thrasher, and gilded flicker were observed during avian surveys in the Project vicinity (Heritage Environmental Consultants 2024). Potential impacts would include disturbance from noise or human presence and temporary loss of habitat. Nesting impacts protected under the MBTA would be avoided through seasonal restrictions or preconstruction nest surveys. Transmission line collision risk would be minimized through design measures, following APLIC guidelines (APLIC 2006, 2012). Electrocution risk would be negligible for the proposed 500-kV line because the conductor spacing would exceed the wingspans of large birds.

Special-Status Reptiles

Two special-status reptile species may occur: banded (variable) sandsnake and Sonoran Desert tortoise. Possible impacts would include disturbance, injury during ground-disturbance, habitat loss, and increased predation from new perching structures. Dust effects would be similar to those experienced by mammals.

Special-Status Fish

No special-status fish species are known or expected in the Study Area. No suitable aquatic habitat is present, and the Project would not affect perennial waters.

State-Protected Native Plants

Plant species protected under the ANPL could be removed during the Project's vegetation-clearing activities, in accordance with applicable laws. However, as the Project would occupy a relatively small area compared with that of nearby disturbances (e.g., agriculture and development), and the loss of vegetation in the Project site and Study Area would result in only minor impacts on protected native plants. If native plants must be removed, the applicant would comply with the ANPL and would submit a Notice of Intent to Clear Land to the AZDA.

Noxious Weeds

One Class B (stinknet) and two Class C species (red brome and saltcedar) were observed in the Project site. Measures would be taken to avoid introducing or spreading noxious weeds in the Project site, and best management practices (BMPs) would be implemented. Therefore, the Project would be unlikely to contribute to an increase of noxious weeds, in extent or abundance, in the Project vicinity.

Mitigation Measures

The following mitigation measures will reduce the potential for impacts on special-status species from the Project:

- If vegetation-disturbing activities are planned during the migratory bird nesting season (March through September or January through June for raptors), measures to avoid any impacts on active bird nests in the Project site, such as preconstruction surveys for migratory bird nests by a qualified biologist, will be taken to maintain compliance with the MBTA because suitable nesting habitat for migratory bird species is in the Project site.
- The transmission lines will pose a risk of collisions and electrocution for birds, particularly raptors. To minimize that risk, the Applicant will consider designing the Project's interconnection facilities, to incorporate reasonable measures to minimize electrocution of and impacts on avian species, following APLIC guidelines (APLIC 2006, 2012).
- If western burrowing owls are identified in the Project site, measures to avoid any active burrows will be considered. Because some burrowing owls are year-round residents, surveys for this species will be considered before the start of ground disturbance and vegetation removal activities. In addition, the guidance from *Burrowing Owl Project Clearance Guidance for Landowners* (AZGFD 2009) will be taken into consideration.
- To reduce the potential of negative effects on terrestrial species through collisions, worker awareness trainings and low-level speed limits will be taken into consideration.
- If Sonoran Desert tortoise is observed, adherence to the *Sonoran Desert Tortoise Conservation Guidelines* (AZGFD 2024) will be considered to minimize the potential for direct impacts on this species.
- The recommendations in the *Guidelines for Solar Development in Arizona* (AZGFD 2010) and the *Wildlife Compatible Fencing Guidelines* (AZGFD 2025h) will be considered for the Project, as applicable and feasible, to minimize impacts on wildlife and their habitats.
- If native plants listed under the ANPL are in the Project site, the AZDA Notice of Intent to Clear Land will be submitted before the start of ground clearing.

- To minimize the introduction and spread of invasive species and noxious weeds, standard BMPs will be implemented during construction.

Conclusions

Land cover in the Project site is comprised of agricultural fields, developed open space, North American Desert Pavement, North American Warm-Desert Xeric Riparian Scrub, Sonoran Paloverde–Mixed Cacti Desertscrub, and Sonora-Mojave Creosote Bush-White Bursage Desertscrub (Dudek 2025b; Heritage Environmental Services 2024). Special-status species that may occur include various species of amphibians, birds, reptiles, and mammals that may use the Study Area as nesting, foraging, or transient habitat. Impacts on federally listed species or special-status species would be negligible and are anticipated to be short-term and mostly limited to effects from construction activities, such as surface disturbance, noise, vibration, light, human presence, and dust.

Project construction and operation are not expected to negatively impact the continued existence of federally listed species, result in a measurable decline of other special-status species, or in a change to a species' management status. The proposed footprint of surface disturbance would not result in long-term detrimental impacts related to the loss or alteration of habitat in the Project site for federally listed and other special-status species. Although additional suitable and unaffected habitats are in the Project vicinity, Project construction is not anticipated to impact the surrounding areas and would not impact species using the surrounding habitat.

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Appendix C-1. USFWS Official Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arizona Ecological Services Field Office
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
Phone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer To: 11/18/2025 16:21:31 UTC
Project Code: 2026-0017029
Project Name: Vulcan Interconnection CEC

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The Fish and Wildlife Service (Service) is providing this list under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The list you have generated identifies threatened, endangered, proposed, and candidate species, and designated and proposed critical habitat, that *may* occur within the One-Range that has been delineated for the species (candidate, proposed, or listed) and it's critical habitat (designated or proposed) with which your project polygon intersects. These range delineations are based on biological metrics, and do not necessarily represent exactly where the species is located. Please refer to the species information found on ECOS to determine if suitable habitat for the species on your list occurs in your project area.

The purpose of the Act is to provide a means whereby threatened and endangered species and the habitats upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of Federal trust resources and to determine whether projects may affect federally listed species and/or designated critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.
If the Federal action agency determines that listed species or critical habitat *may be affected* by a federally funded, permitted or authorized activity, the agency must consult with us pursuant to 50 CFR 402. Note that a "may affect" determination includes effects that may not be adverse and that may be beneficial, insignificant, or discountable. An effect exists even if only one individual

or habitat segment may be affected. The effects analysis should include the entire action area, which often extends well outside the project boundary or "footprint." For example, projects that involve streams and river systems should consider downstream affects. If the Federal action agency determines that the action may jeopardize a *proposed* species or may adversely modify *proposed* critical habitat, the agency must enter into a section 7 conference. The agency may choose to confer with us on an action that may affect proposed species or critical habitat.

Candidate species are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event they become proposed or listed prior to project completion. More information on the regulations (50 CFR 402) and procedures for section 7 consultation, including the role of permit or license applicants, can be found in our Endangered Species Consultation Handbook at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf.

We also advise you to consider species protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) and the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668 *et seq.*). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the Service. The Eagle Act prohibits anyone, without a permit, from taking (including disturbing) eagles, and their parts, nests, or eggs. Currently 1,026 species of birds are protected by the MBTA, including the western burrowing owl (*Athene cunicularia hypugaea*). Protected western burrowing owls can be found in urban areas and may use their nest/burrows year-round; destruction of the burrow may result in the unpermitted take of the owl or their eggs.

If a bald eagle or golden eagle nest occurs in or near the proposed project area, our office should be contacted for Technical Assistance. An evaluation must be performed to determine whether the project is likely to disturb or harm eagles. The National Bald Eagle Management Guidelines provide recommendations to minimize potential project impacts to bald eagles (see https://www.fws.gov/law/bald-and-golden-eagle-protection-act and https://www.fws.gov/program/eagle-management).

The Division of Migratory Birds (505/248-7882) administers and issues permits under the MBTA and Eagle Act, while our office can provide guidance and Technical Assistance. For more information regarding the MBTA, BGEPA, and permitting processes, please visit the following web site: https://www.fws.gov/program/migratory-bird-permit. Guidance for minimizing impacts to migratory birds for communication tower projects (e.g. cellular, digital television, radio, and emergency broadcast) can be found at https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation.

The U.S. Army Corps of Engineers (Corps) may regulate activities that involve streams (including some intermittent streams) and/or wetlands. We recommend that you contact the Corps to determine their interest in proposed projects in these areas. For activities within a National Wildlife Refuge, we recommend that you contact refuge staff for specific information about refuge resources, please visit this link or visit https://www.fws.gov/program/national-

wildlife-refuge-system to locate the refuge you would be working in or around.

If your action is on tribal land or has implications for off-reservation tribal interests, we encourage you to contact the tribe(s) and the Bureau of Indian Affairs (BIA) to discuss potential tribal concerns, and to invite any affected tribe and the BIA to participate in the section 7 consultation. In keeping with our tribal trust responsibility, we will notify tribes that may be affected by proposed actions when section 7 consultation is initiated. For more information, please contact our Tribal Coordinator, John Nystedt, at 928/556-2160 or John_Nystedt@fws.gov.

We also recommend you seek additional information and coordinate your project with the Arizona Game and Fish Department. Information on known species detections, special status species, and Arizona species of greatest conservation need, such as the western burrowing owl and the Sonoran desert tortoise (*Gopherus morafkai*) can be found by using their Online Environmental Review Tool, administered through the Heritage Data Management System and Project Evaluation Program (https://www.azgfd.com/wildlife-conservation/planning-for-wildlife/project-evaluation-program/).

We appreciate your concern for threatened and endangered species. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office. If we may be of further assistance, please contact our Flagstaff office at 928/556-2118 for projects in northern Arizona, our general Phoenix number 602/242-0210 for central Arizona, or 520/670-6144 for projects in southern Arizona.

Sincerely,
/s/

Heather Whitlaw
Field Supervisor
Attachment

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arizona Ecological Services Field Office
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
(602) 242-0210

PROJECT SUMMARY

Project Code: 2026-0017029
Project Name: Vulcan Interconnection CEC
Project Type: Distribution Line - New Construction - Above Ground
Project Description: The Project will include a new, approximately 4.3-mile-long, 500-kilovolt, generation-tie transmission line (gen-tie) that will deliver power from a proposed 800 megawatts solar facility, 800 MW battery energy storage system facility, and a new on-site substation to the existing 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way corridor.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.3151748,-112.85327910000001,14z

Counties: Maricopa County, Arizona

ENDANGERED SPECIES ACT SPECIES

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Sonoran Pronghorn *Antilocapra americana sonoriensis* Population: U.S.A. (AZ), Mexico No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4750	Experimental Population, Non-Essential

BIRDS

NAME	STATUS
Cactus Ferruginous Pygmy-owl *Glaucidium brasilianum cactorum* There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1225	Threatened
California Least Tern *Sternula antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened
Yuma Ridgway's Rail *Rallus obsoletus yumanensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3505	Endangered

FISHES

NAME	STATUS
Gila Topminnow (incl. Yaqui) *Poeciliopsis occidentalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1116	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing

appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Avocet *Recurvirostra americana* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11927	Breeds Apr 21 to Aug 10
Bendire's Thrasher *Toxostoma bendirei* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9435	Breeds Mar 15 to Jul 31
Costa's Hummingbird *Calypte costae* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9470	Breeds Jan 15 to Jun 10
Gila Woodpecker *Melanerpes uropygialis* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5960	Breeds Apr 1 to Aug 31
Leconte"s Thrasher *Toxostoma lecontei* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8969	Breeds Feb 15 to Jun 20
Western Grebe *aechmophorus occidentalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

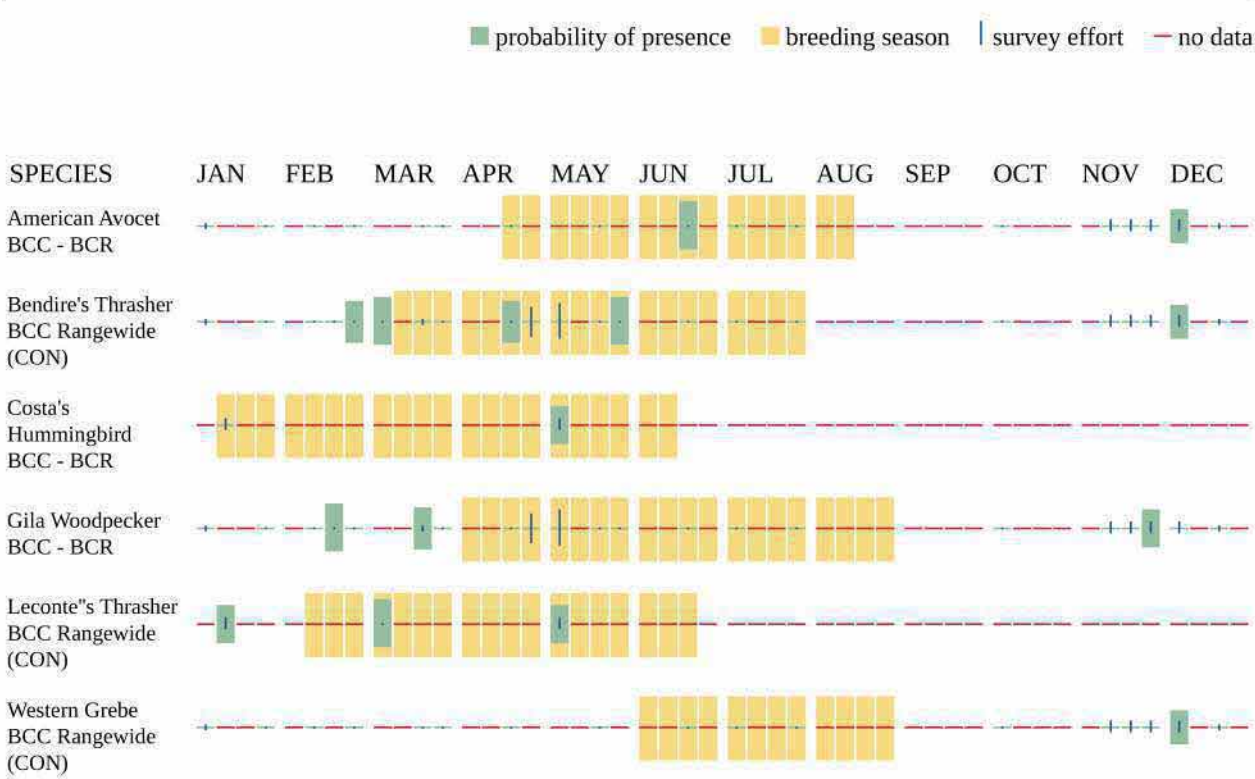
Probability of Presence (▪)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R5UBFx
- R4SBC

FRESHWATER POND

- PUBF

FRESHWATER FORESTED/SHRUB WETLAND

- PSSC

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Mark Turner
Address: 7720 N. 16th Street
City: Phoenix
State: AZ
Zip: 85020
Email mark.turner@aecom.com
Phone: 4806255533

Appendix C-2. AZGFD Online Environmental Review Tool

Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

The Department requests further coordination to provide project/species specific recommendations. Please use the Project Evaluation Form to submit your project to the Project Evaluation Program at PEP@azgfd.gov.

Project Name:
Vulcan Solar Project

Project Type:
Energy Production/Storage/Transfer, Energy Transfer, Power line/electric line (new)

Project ID:
HGIS-25864

Project Description:
Solar facility installation.

Contact Person:
Haily Martin

Organization:
AECOM

On Behalf Of:
OTHER

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. Arizona Wildlife Conservation Strategy (AWCS), specifically Species of Greatest Conservation Need (SGCN), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

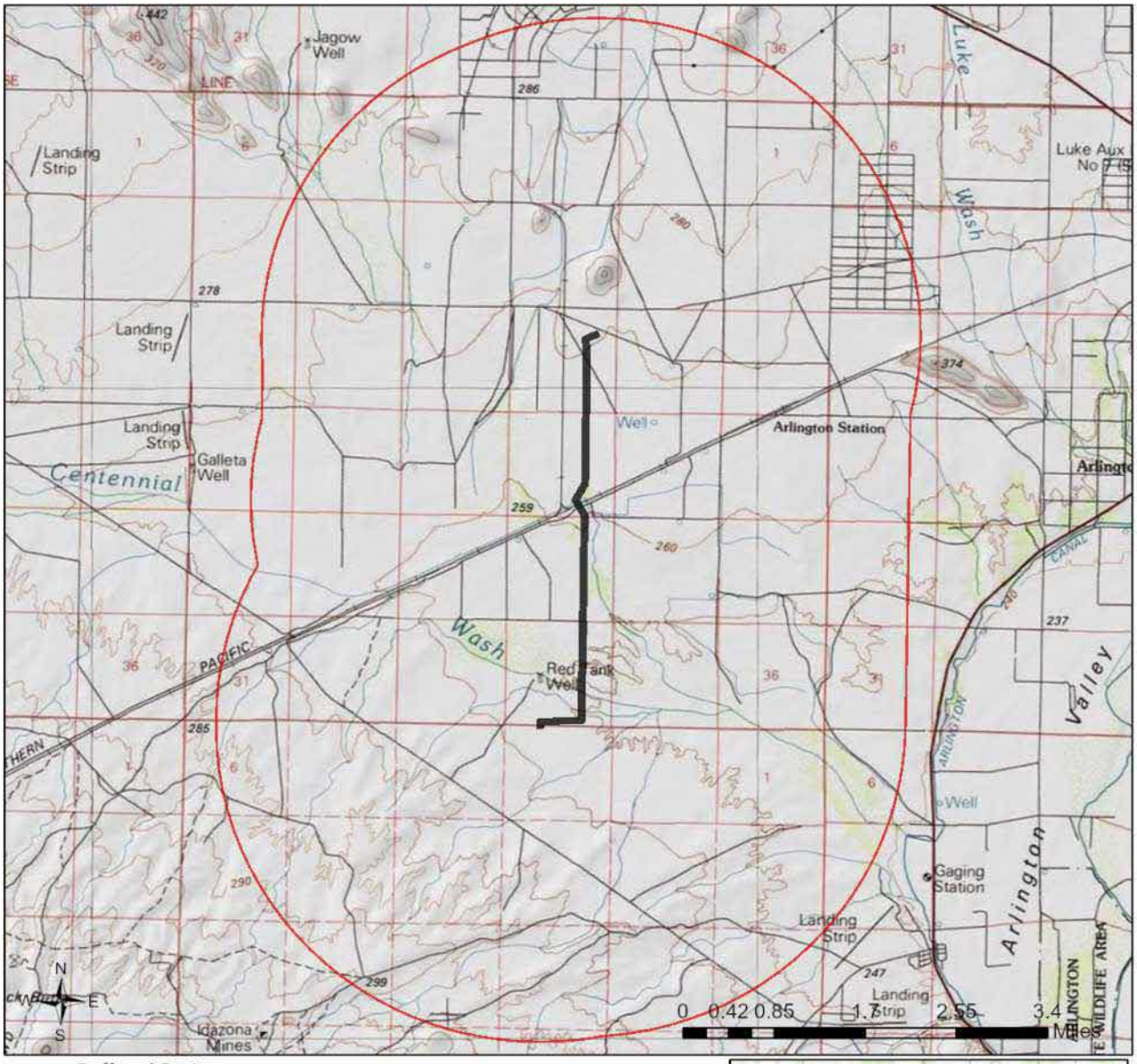
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.

Vulcan Solar Project

USA Topo Basemap With Locator Map



Buffered Project Boundary

Project Boundary

Project Size (acres): 105.52

Lat/Long (DD): 33.3156 / -112.8554

County(s): Maricopa

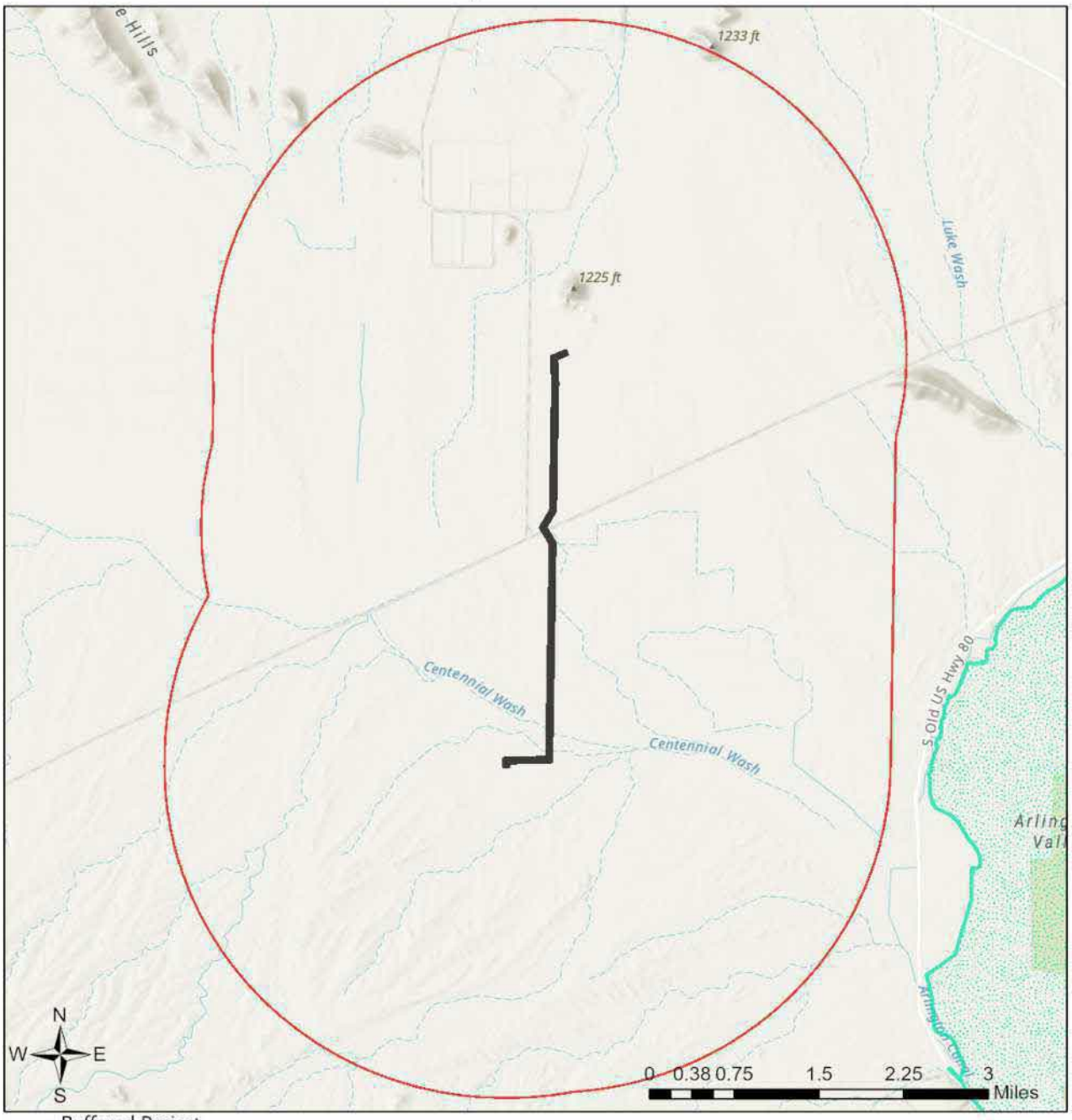
AGFD Region(s): Yuma

Township/Range(s): T1S, R6W; T2S, R6W

USGS Quad(s): ARLINGTON

Vulcan Solar Project

Important Areas



- Buffered Project Boundary
- Project Boundary
- Important Bird Areas
- Critical Habitat
- Pinal County Riparian
- Wildlife Connectivity

Project Size (acres): 105.52

Lat/Long (DD): 33.3156 / -112.8554

County(s): Maricopa

AGFD Region(s): Yuma

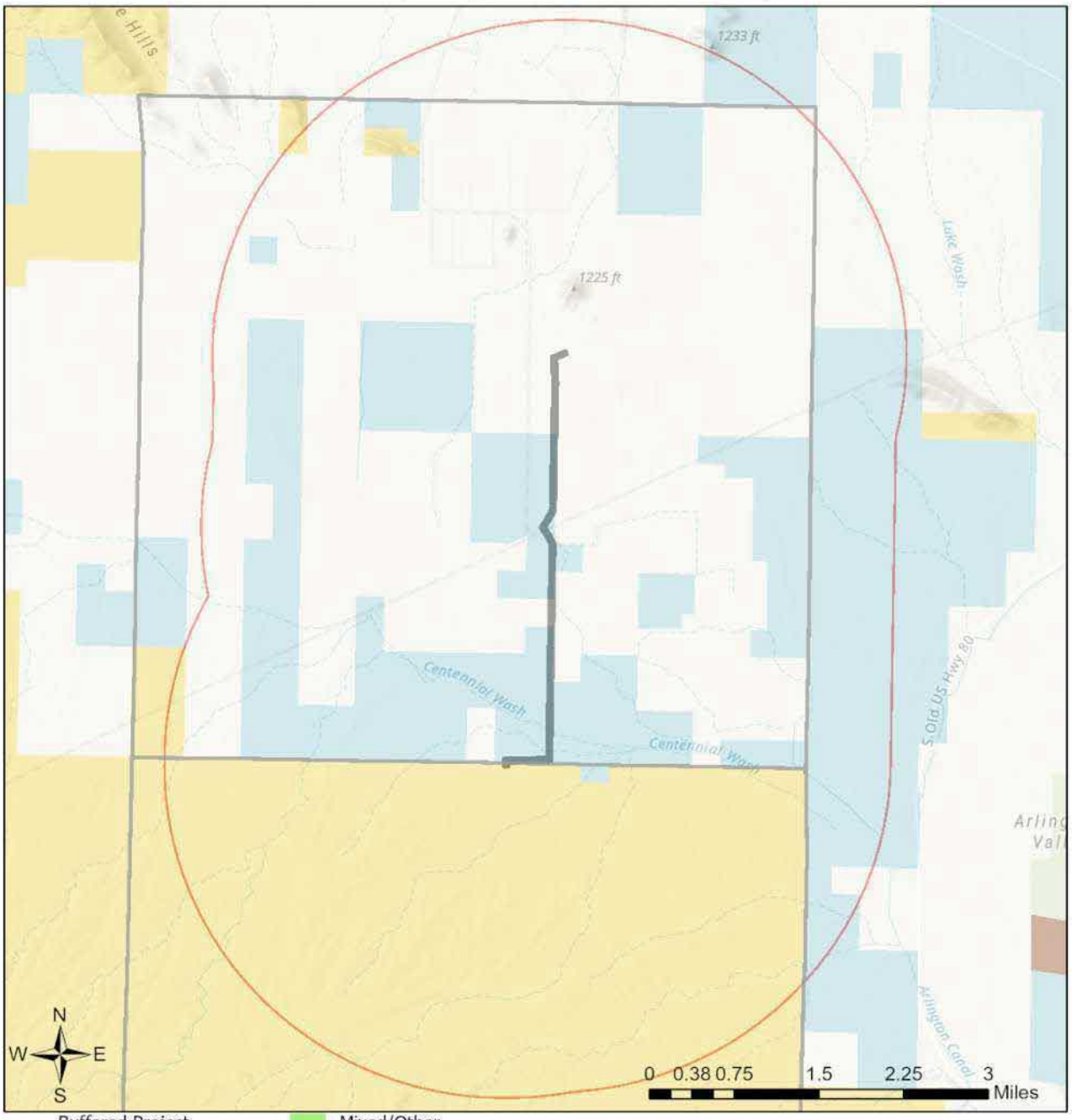
Township/Range(s): T1S, R6W; T2S, R6W

USGS Quad(s): ARLINGTON

Esri, NASA, NGA, USGS
City of Buckeye, Arizona, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS

Vulcan Solar Project

Township/Ranges and Land Ownership



- Buffered Project Boundary
- Project Boundary
- AZ Game & Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State & Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge
- Township/Ranges

Project Size (acres): 105.52

Lat/Long (DD): 33.3156 / -112.8554

County(s): Maricopa

AGFD Region(s): Yuma

Township/Range(s): T1S, R6W; T2S, R6W

USGS Quad(s): ARLINGTON

Esri, NASA, NGA, USGS
City of Buckeye, Arizona, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS

Special Status Species Documented within 3 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Antilocapra americana sonoriensis	Sonoran Pronghorn	LE,XN		S		1
Athene cunicularia hypugaea	Western Burrowing Owl		S	S		2
Cylindropuntia echinocarpa	Golden Cholla				SR	
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1
Incilius alvarius	Sonoran Desert Toad					2

Note: Status code definitions can be found at https://www.azgfd.com/wildlife-conservation/on-the-ground-conservation/state-wildlife-action-plan/state-wildlife-action-plan-status-definitions/.

Special Areas Documented that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Centennial Wash	Maricopa County Wildlife Movement Area - Riparian/Wash					

Note: Status code definitions can be found at https://www.azgfd.com/wildlife-conservation/on-the-ground-conservation/state-wildlife-action-plan/state-wildlife-action-plan-status-definitions/.

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Ammospermophilus harrisii	Harris' Antelope Squirrel					2
Anthus spragueii	Sprague's Pipit					2
Antilocapra americana sonoriensis	Sonoran Pronghorn	LE,XN		S		1
Artemisiospiza nevadensis	Sagebrush Sparrow					3
Athene cunicularia hypugaea	Western Burrowing Owl		S	S		2
Auriparus flaviceps	Verdin					2
Botaurus lentiginosus	American Bittern					2
Buteo regalis	Ferruginous Hawk			S		2
Buteo swainsoni	Swainson's Hawk					2
Calcarius ornatus	Chestnut-collared Longspur					2
Calypte costae	Costa's Hummingbird					2
Campylorhynchus brunneicapillus	Cactus Wren					2
Chaetodipus baileyi	Bailey's Pocket Mouse					2
Charadrius montanus	Mountain Plover					2
Chilomeniscus cinctus	Variable Sandsnake					2
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S	S		1
Colaptes chrysoides	Gilded Flicker			S		2
Columbina inca	Inca Dove					2
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat		S	S		1
Empidonax wrightii	Gray Flycatcher					2
Eumops perotis californicus	Greater Western Bonneted Bat			S		2

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Falco mexicanus	Prairie Falcon					2
Falco peregrinus anatum	American Peregrine Falcon		S	S		1
Falco sparverius	American Kestrel					2
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1
Icterus bullockii	Bullock's Oriole					2
Incilius alvarius	Sonoran Desert Toad					2
Lanius ludovicianus	Loggerhead Shrike					2
Lasiurus cinereus	Hoary Bat					2
Lasiurus frantzii	Desert Red Bat		S			2
Lasiurus xanthinus	Western Yellow Bat		S			2
Macrotus californicus	California Leaf-nosed Bat			S		2
Megascops kennicottii	Western Screech-owl					2
Melanerpes uropygialis	Gila Woodpecker					2
Melospiza lincolnii	Lincoln's Sparrow					2
Micrathene whitneyi	Elf Owl					3
Myotis velifer	Cave Myotis			S		2
Myotis yumanensis	Yuma Myotis					2
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					2
Parabuteo unicinctus	Harris's Hawk					2
Passerculus sandwichensis	Savannah Sparrow					2
Pooecetes gramineus	Vesper Sparrow					2
Rana yavapaiensis	Lowland Leopard Frog		S	S		1
Spizella breweri	Brewer's Sparrow					2
Tadarida brasiliensis	Brazilian Free-tailed Bat					2
Thomomys bottae subsimilis	Harquahala Southern Pocket Gopher					2
Toxostoma bendirei	Bendire's Thrasher					2
Toxostoma lecontei	LeConte's Thrasher			S		2

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Zenaida asiatica	White-winged Dove					
Zenaida macroura	Mourning Dove					

Project Type: Energy Production/Storage/Transfer, Energy Transfer, Power line/electric line (new)

Project Type Recommendations:
Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at https://www.invasivespeciesinfo.gov/ and the Arizona Native Plant Society https://aznps.com/invas for recommendations on how to control these species. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at https://imap.natureserve.org/imap/services/page/map.html.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select “See What’s Here” for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

The AZGFD recommends that wildlife surveys are conducted to determine if noise-sensitive species, such as birds or mammals, occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

The AZGFD recommends following the Avian Power Line Interaction Committee (APLIC) guidelines for new power lines, which can be found in the current version of *Suggested Practices for Avian Protection on Power Lines and Reducing Avian Collisions with Power Lines.* Large bodied birds, such as hawks, owls, vultures, and eagles, may be vulnerable to line strikes and electrocution during construction and operation of power lines and substations; power poles can also serve as perches for large-bodied birds. These potential impacts can be avoided or minimized by following the APLIC guidelines which include designing the power lines with enough space between energized components to reduce the likelihood of a bird electrocution or installing bird flight diverters in sections of line where elevated bird strikes are anticipated (e.g. lines over water bodies or in the path of colonial roosting locations). The AZGFD’s Raptor Coordinator, who can be contacted at raptors@azgfd.gov or 623-236-7575, can provide further information on specific design features and best management practices.

The AZGFD recommends that a qualified biologist conduct a survey for nesting birds within the project area prior to removal or trimming of trees/vegetation, if the removal or trimming occurs during the breeding season (the Project Evaluation Program can be contacted at PEP@azgfd.gov or 623-236-7600 to determine the appropriate breeding season within the project area). Trees and/or vegetation within the project area may provide nesting opportunities for avian species that are regulated under the Migratory Bird Treaty Act (MBTA) and protected under state law. If it is anticipated the project will not be in compliance with MBTA, the AZGFD recommends contacting the U.S. Fish and Wildlife Service (https://www.fws.gov/office/arizona-ecological-services) for technical assistance. The USFWS will provide options to comply with the MBTA.

The AZGFD recommends revegetating disturbed areas with native drought-tolerant species that represent the natural surrounding landscape. Landscaping with native plants can help support wildlife and pollinator species in the area while reducing dust and erosion. In addition, the applicable land management agencies should be consulted regarding guidelines for revegetation efforts. The AZGFD also recommends the development of a short and long-term monitoring plan, including adaptive management guidelines to address invasive species control and maintain native vegetation.

Project Location and/or Species Recommendations:

HDMS records indicate that one or more native plants listed on the **Arizona Native Plant Law and Antiquities Act** have been documented within the vicinity of your project area. Please contact:
Arizona Department of Agriculture
1688 W Adams St.
Phoenix, AZ 85007
Phone: 602.542.4373
https://agriculture.az.gov/sites/default/files/Native%20Plant%20Rules%20-%20AZ%20Dept%20of%20Ag.pdf starts on page 44

Analysis indicates that your project is located in the vicinity of an identified ***wildlife habitat connectivity feature***. The **County-level Stakeholder Assessments** contain five categories of data (Barrier/Development, Wildlife Crossing Area, Wildlife Movement Area- Diffuse, Wildlife movement Area- Landscape, Wildlife Movement Area- Riparian/Washes) that provide a context of select anthropogenic barriers, and potential connectivity. The reports provide recommendations for opportunities to preserve or enhance permeability. Project planning and implementation efforts should focus on maintaining and improving opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer to: https://www.azgfd.com/wildlife-conservation/planning-for-wildlife/planning-for-wildlife-identifying-corridors/.
Please contact the Project Evaluation Program (pep@azgfd.gov) for specific project recommendations.

Exhibit D

Biological Resources

Exhibit D
Biological Resources

In response to the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1:

> List the fish, wildlife, plant life, and associated forms of life in the vicinity of the proposed site or route and describe the effects, if any, other proposed facilities will have thereon…

the applicant is providing the following information.

Introduction

For the application for a Certificate of Environmental Compatibility (CEC), Exhibit D analyzes biological resources and impacts related to construction and operation of the Vulcan Interconnection Project (Project). The applicant would construct an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation tie transmission line (gen-tie line) that would deliver power from a proposed 800-megawatt (MW) solar and battery energy storage system (BESS) facility (collectively, the Energy Center) through a new on-site substation to the existing Salt River Project (SRP) 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within a 540 to 4,737-foot-wide siting corridor (CEC Corridor). The Project site is defined as the 200-foot-wide gen-tie ROW. The proposed CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south, with a width varying between 540 and 4,737 feet east to west.

The Project site is entirely within Maricopa County, Arizona, in Sections 15, 22, 27, and 34 of Township 1 South, Range 6 West, and Section 3 of Township 2 South, Range 6 West, Gila and Salt River Base and Meridian, as shown on the Arlington, Arizona, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. Biological resources were studied in the Project site, CEC Corridor, and the Study Area, which was defined as a 2-mile radius around the Project site (Error! Reference source not found.).

The average elevation at the Project site is approximately 850 feet above mean sea level, and the topography of the surrounding area is flat ground, with the prominent land cover classes being agricultural fields and open desert. The biotic environment is heavily disturbed throughout the site. Phoenix is approximately 47 miles northeast of the Project site, the city of Buckeye is approximately 16 miles to the east, Arlington Mountain is approximately 5 miles to the east, the Gila River flows approximately 6 miles to the southeast, and Centennial Wash flows adjacent to the site.

Biological Resources Information

The desktop-level review compiled information about the general wildlife, sensitive habitats, soils, streams, wetlands, and irrigation canals in the Study Area. The following online, publicly available data were reviewed:

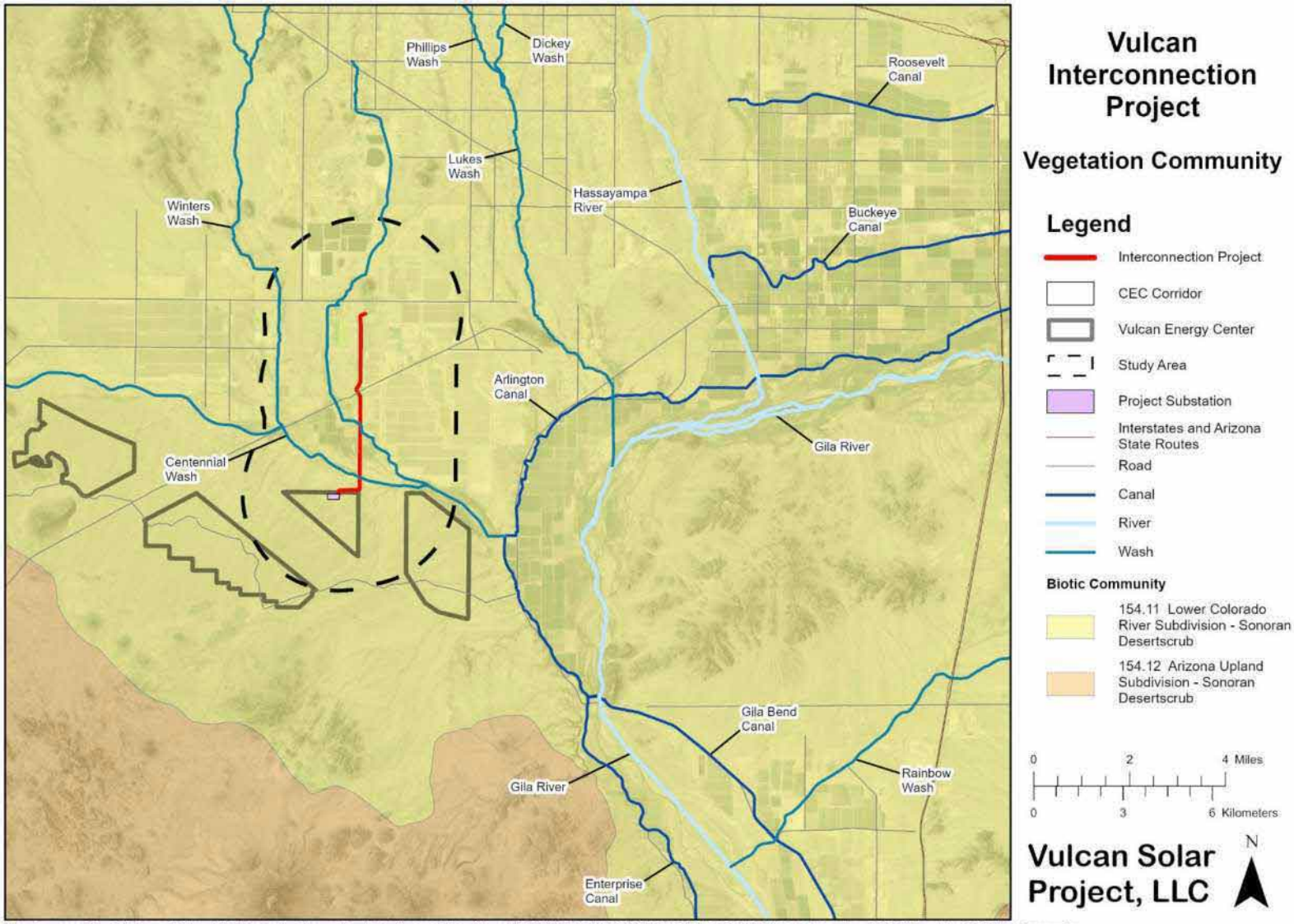
- Aerial photographs (Google Earth, Esri online imagery)
- Arizona Game and Fish Department (AZGFD) Online Environmental Review Tool (AZGFD 2025)
- Cornell Lab eBird Website (eBird 2025)
- Floodplain data from the Federal Emergency Management Agency (FEMA) Flood Map Service Center (FEMA 2025)
- Land cover data from the U.S. Geological Survey (USGS) Southwest Regional Gap Analysis Project (USGS 2005)
- Soil data from the U.S. Department of Agriculture National Resources Conservation Service Web Soil Survey (USDA NRCS 2025)
- Sonoran Desert Birds (iNaturalist (2025)
- Surface water features data from the U.S. Environmental Protection Agency (EPA) Waters Mapper (EPA 2025)
- USGS 7.5-minute topographic maps
- Wetlands data from the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) (USFWS 2025)

In addition, a biological survey of the Project site and accessible portions of the broader Study Area and adjacent Bureau of Land Management (BLM) lands was performed (Dudek 2025a-b; Heritage Environmental Consultants 2024). The biological survey field efforts were to verify previously mapped vegetation communities and land covers, identify commonly occurring plant or wildlife species, identify plant or wildlife species protected under the federal Endangered Species Act, and determine the likelihood of occurrence of any special-status plant or wildlife species. In addition, vegetation surveys consisted of quantitative botanical BLM surveys and a Native Plant Inventory, following the Arizona State Land Native Plant Survey Protocol for Large Scale Projects.

The data was used to develop a characterization of the biological resources in the Study Area. The impact analysis focused on vegetation communities, existing human disturbance, the presence of riparian or wetland habitats, and other habitats general vegetation, wildlife, and fish species. Species overlapping the special-status taxa (addressed in **Exhibit C**) were excluded from further consideration in **Exhibit D**.

Ecological Setting

The Study Area is in the Lower Colorado River Valley Subdivision of the Sonoran Desertscrub biome, which is characterized by high temperatures and low precipitation and is the most arid subdivision of the Sonoran Desert (Brown 1994). The three vegetation communities in the Study Area include Sonora-Mojave creosote bush-white bursage desertscrub, Sonoran Paloverde mixed-cacti desertscrub, and North American warm desert xeric-riparian scrub (Heritage Environmental Consultants 2024). Sonora–Mojave creosotebush–white bursage desertscrub composes most of the proposed CEC Corridor.



Map Sources: City of Maricopa Parks, MAG Recreation Viewer, Earthstar Geographics, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community

Figure D-1. Vegetation Community

One freshwater pond that is classified as palustrine, unconsolidated bottom, semi-permanently flooded (PUBF) wetland; two riverine features classified as riverine, intermittent, streambed, seasonally flooded (R4SB) and riverine, unknown perennial, unconsolidated bottom, semi-permanently flooded, excavated (R5UBFx); and one freshwater forested, shrub wetland (palustrine, shrub, seasonally flooded) are in the Study Area, based on NWI data (USFWS 2025).

Most of the aquatic resources that transect the Project site have connectivity to Centennial Wash. Water from Centennial Wash likely reaches the Arlington Canal during large flow events; however, those events are not frequent enough to meet the relatively permanent standard. Furthermore, Centennial Wash historically may have flowed directly to the portion of the Gila River that is considered a traditional navigable water. However, development of the agricultural lands between the wash and the Gila River, including the Arlington Canal, blocks and reroutes flow to Gillespie Dam. An aquatic resources survey and delineation concluded that all aquatic resources in the Project site would not be considered relatively permanent waters, with some isolated and/or determined to be anthropogenically created drainages, meaning that they do not meet the current waters of the United States definition; therefore, all aquatic features in the Project site are non-jurisdictional (Dudek 2025c).

Most of the Study Area is classified by FEMA as areas with a 0.2 percent annual chance of flood hazard (*Zone X*), with a small percentage of the eastern edges of the Study Area classified as a Special Flood Hazard Area (*Zone A*) (FEMA 2025).

Vegetation

The Study Area lies within the most arid portion of the Sonoran Desert, which is characterized by high temperatures and limited precipitation (Brown 1994). Native vegetation in this subdivision typically consists of low, open stands of creosote bush (*Larrea tridentata*), velvet mesquite (*Prosopis velutina*), and white bursage (*Ambrosia dumosa*). Cacti, such as saguaro (*Carnegiea gigantea*) and fishhook barrel cactus (*Ferocactus wislizenii*), occur at lower densities than in upland desertscrub. Local areas with undrained or salt-affected soils often are dominated by four-wing saltbush (*Atriplex canescens*) and velvet mesquite. Other characteristic species include desertbroom (*Baccharis sarothroides*), chuparosa (*Justicia californica*), jumping cholla (*Cylindropuntia fulgida*), ironwood (*Olneya tesota*), and blue paloverde (*Parkinsonia florida*) (Brown 1994; USGS 2005). Associated species in the Project site include fourwing saltbush (*Atriplex canescens*) and brittlebush (*Encelia farinosa*). Cacti include desert Christmas cholla (*Cylindropuntia leptocaulis*) and branched pencil cholla (*Cylindropuntia ramosissima*), with desert Christmas cholla being the most dominant. Common herbaceous species include desert trumpet (*Eriogonum inflatum*) and popcornflower (*Cryptantha* sp.).

A Native Plant Inventory Survey was conducted for the Project and documented native vegetation in the Study Area that is dominated by velvet mesquite (*Prosopis velutina*) and desert Christmas cholla (Dudek 2025b). Blue palo verde (*Parkinsonia florida*) is present but not abundant. Cacti, including jumping cholla (*Cylindropuntia fulgida*), hedgehog (*Echinocereus engelmannii*), and branched pencil cholla (*Cylindropuntia ramosissima*), also are present. In undisturbed areas in the southern portion of the Study Area, trees and taller vegetation generally are confined to washes and other drainages.

The Arizona Native Plant Law (ANPL) under Arizona Corporation Commission Rules of Practice and Procedure, Sections 3-901 to 3-916) is administered by the Arizona Department of Agriculture (AZDA), which manages native plant resources and impacts on protected native plant species. ANPL-listed plants include four protection categories: (1) Highly Safeguarded, (2) Salvage Restricted, (3) Salvage Assessed, and (4) Harvest Restricted. Landowners have the right to destroy or remove native plants growing on their land but are required to notify the AZDA at least 60 days before the destruction of any protected native plants. At the time of the notification, the landowner can state whether they will allow salvage companies an opportunity to recover the plants or if they intend to destroy them. Landowners are also allowed to transplant healthy native trees within the site without a permit or notification.

Seven species that are listed under the ANPL were recorded during a Native Plant Inventory (Dudek 2025b):

- Blue palo verde (*Parkinsonia florida*); salvage assessed.
- Branched pencil cholla (*Cylindropuntia ramosissima*); salvage restricted.
- Crucifixion thorn (*Castela emoryi*); salvage restricted.
- Desert Christmas cholla (*Cylindropuntia leptocaulis*); salvage restricted.
- Jumping cholla (*Cylindropuntia fulgida*); salvage restricted.
- Strawberry hedgehog cactus (*Echinocereus engelmannii*); salvage restricted.
- Velvet mesquite (*Prosopis velutina*); salvage assessed and harvest restricted.

Although not anticipated, any removal of protected native plants from the Project site with the intention to sell will require tags/permits from the AZDA.

Wildlife Species

A summary of wildlife species and their habitats that may occur or are known to occur within the Study Area is shown in **Table D-1**. The representative wildlife species could potentially use resources in the Project vicinity.

Table D-1. Wildlife Species that May Occur or Are Known to Occur in the Study Area

Common Name (*Scientific Name*)	Habitat
Amphibians	
American bullfrog (*Lithobates catesbeianus*)	Introduced in Arizona. Occurs in a wide variety of aquatic habitats, from cattle tanks and canals to ponds, reservoirs, and marshes.
Couch's spadefoot (*Scaphiopus couchii*)	Found primarily in Sonoran and Chihuahuan deserts and associated grasslands. It can be encountered in any arid western desert valley capable of supporting rain pools that last at least 7 to 8 days.
Great Plains toad (*Anaxyrus cognatus*)	Inhabits deserts, grasslands, semi-desert shrublands, open floodplains, and agricultural areas. When not active on the surface, it usually occupies underground burrows.
Woodhouse's toad (*Anaxyrus woodhousii*)	Found in areas near ponded permanent water, such as backwaters and slack water of lakes and irrigation ditches and canals, but it also can be found at cattle tanks and other seasonal wetlands, foraging in rural or urban areas near these habitats.
Birds	

Common Name (*Scientific Name*)	Habitat
Anna's hummingbird (*Calypte anna*)	Occurs in chaparral, coastal scrub, oak savannas, and open woodland. Also common in urban and suburban settings.
Ash-throated flycatcher (*Myiarchus cinerascens*)	Occurs in dry scrub, open woodlands, and deserts. Cavity nester that breeds in south central Arizona.
Black phoebe (*Sayornis nigricans*)	Usually found near water, including marshy ponds, streams, near farm ponds, and along irrigation ditches.
Black-throated sparrow (*Amphispiza bilineata*)	Found in sparsely vegetated desertscrub; most often found in desert uplands, alluvial fans, and hillsides.
Black vulture (*Coragyps atratus*)	Occurs in a wide variety of habitats. Typically occurs in riparian woodlands and desertscrub, where saguaros (*Carnegiea gigantea*) and tall trees occur. Also occurs in rural and agricultural fields and prefers elevated perches, including trees, saguaros, telephone poles, and transmission towers.
Brewer's blackbird (*Euphagus cyanocephalus*)	Often occurs near human habitation. Occurs in shrubby and bushy areas near water, riparian woodland, cultivated lands, and marshes. Winters south of the Mogollon Rim.
Brown-headed cowbird (*Molothrus ater*)	Often associated with human-modified, fragmented landscapes and are attracted to feedlots, pastures, and fields. Occurs in a variety of habitats, including desertscrub, agricultural lands, and residential areas. Migratory; present in Arizona in spring through fall.
Cliff swallow (*Petrochelidon pyrrhonota*)	Feeds over pastures, fields, towns, and open areas. Nests in colonies that can be on cliffsides, caves, building eaves, bridges, culverts, dams, or large trees. Nests are created with mud and dried grass at the juncture of a vertical wall and horizontal overhang.
Common raven (*Corvus corax*)	Found in most habitat types in select open areas. Regularly encountered in rural, agricultural, and urbans settings; year-round resident.
Cooper's hawk (*Accipiter cooperii*)	Occurs in woodlands, parks, neighborhoods, and fields associated with trees.
Curve-billed thrasher (*Toxostoma curvirostre*)	Found in creosote bush desertscrub, grasslands, and residential areas.
Eurasian collared dove (*Streptopelia decaocto*)	Found in a variety of habitats, from open woodland to desertscrub. Nonnative species; not protected under the MBTA.
European starling (*Sturnus vulgaris*)	Occurs predominantly near human settlements, in rural and urban areas, and in agricultural fields; year -round resident. Nonnative species; not protected under the MBTA.
Gambel's quail (*Callipepla gambelii*)	Typically associated with brushy Sonoran Desert uplands and desert washes. Also can occur in residential areas and along the margins of cultivated lands. Year-round resident. Native species; not protected under the MBTA.
Great horned owl (*Bubo virginianus*)	Occurs in a wide variety of habitats, including agricultural and residential areas, as well as in woodlands and orchards.
Greater roadrunner (*Geococcyx californianus*)	Occurs in open, arid countryside with scattered shrubs, trees, or cacti. Also common in agricultural areas and urban and suburban settings; year-round resident.
Great-tailed grackle (*Quiscalus mexicanus*)	Occurs in partly open situations with scattered trees, around human habitations; year-round resident.
House finch (*Carpodacus mexicanus*)	Occurs in arid scrub and brush, open woodland, oak-juniper, and pine-oak habitats, and towns and cultivated lands; year-round resident.
House sparrow (*Passer domesticus*)	Nonnative introduced species that occurs abundantly in cities and towns. Occurs in feedlots, agricultural areas, and urban and rural communities; year-round resident. Not protected under the MBTA.
Lark sparrow (*Chondestes grammacus*)	Found in agricultural areas, suburban gardens, oak woodlands, chaparral, and mesquite/acacia grassland.
Lesser goldfinch (*Spinus psaltria*)	Occurs in patch open habitats, including thickets, weedy fields, woodland, scrubland, and farmlands.

Common Name (*Scientific Name*)	Habitat
Lesser nighthawk (*Chordeiles acutipennis*)	Found in arid lowlands, deserts, and agricultural areas. Nests on the ground, usually beneath a shrub but sometimes out in the open. Migratory; present in Arizona in spring through fall.
Mourning dove (*Zenaida macroura*)	Occurs in a wide variety of habitats, most regularly in desertscrub, shrubby grasslands, and open woodlands. Also found in rural and urban habitats.
Northern cardinal (*Cardinalis cardinalis*)	Occurs in dense shrubby areas, including overgrown fields, backyards, mesquite (*Prosopis* spp.), thickets, and ornamental landscaping.
Northern mockingbird (*Mimus polyglottos*)	Prefers open and partly open situations. Occurs in areas of scattered brush or trees to semi-desert, and around towns and cultivated areas.
Orange-crowned warbler (*Leiothlypis celata*)	Breeding habitat includes various open, shrubby deciduous and mixed woodlands and chaparral. During migration and winter, habitats include low dense undergrowth in scrub or in gardens and parks.
Phainopepla (*Phainopepla nitens*)	Occurs in Arizona during the breeding season. Found in desert washes, where it feeds heavily on desert mistletoe berries.
Red-tailed hawk (*Buteo jamaicensis*)	Occurs in a wide variety of open habitats. Elevated perches are important. Year-round resident.
Rock dove (*Columba livia*)	Introduced. Closely associated with human settlement, such as towns, parks, and agricultural areas. Year-round resident. Not protected under the MBTA.
Turkey vulture (*Cathartes aura*)	Widespread; uses a variety of habitats. Commonly perches on rocky outcrops, cliffs, canyon walls, transmission towers, telephone poles, and tall trees. Migratory.
Western kingbird (*Tyrannus verticalis*)	Prefers open areas in many habitat types, including desert, rural, and agricultural areas. Migratory.
White-crowned sparrow (*Zonotrichia leucophrys*)	Occurs in woodlands, shrubland, croplands, suburbs, old fields, and conifer woodlands.
White-winged dove (*Zenaida asiatica*)	Habitat generalist, including desertscrub, riparian, urban, and agricultural areas. Year-round resident.
Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)	Breeds near freshwater marshes. During migration or winter, occurs in open cultivated lands, pastures, and fields. Wintering and migratory only in the Project site.
Yellow warbler (*Setophaga petechia*)	Habitat includes open scrub, second-growth woodland, thickets, farmlands, and gardens, especially near water.
Reptiles	
Coachwhip (*Coluber flagellum*)	Typically occurs in desertscrub and semi-desert grasslands. Uses a wide range of habitats, including desert, prairie, scrubland, woodland, farmland, and creek valleys, generally in dry, open terrain.
Common side-blotched lizard (*Uta stansburiana*)	Typically occurs in desertscrub, semi-desert grasslands, Great Basin grasslands, and interior chaparral.
Desert iguana (*Dipsosaurus dorsalis*)	Primarily found in Mohave Desertscrub and the Lower Colorado River Subdivision of Sonoran Desertscrub, and occasionally in the Arizona Upland Subdivision of Sonoran Desertscrub. Occurs on flatlands and gently sloping bajadas.
Desert horned lizard (*Phrynosoma platyrhinos*)	Inhabits arid desert environments that are characterized by sandy or loose soils in desertscrub and dune systems. It is closely associated with sparsely vegetated areas that support harvester ant populations, its primary prey. The species relies on open ground for camouflage and burrowing, with limited use of rocky cover.
Desert night snake (*Hypsiglena chlorophaea*)	Ranges from flat, open, sandy deserts to steep, rocky, and wooded slopes.
Desert spiny lizard (*Sceloporus magister*)	Found in Sonoran Desertscrub, Great Basin Desertscrub, semi-desert grassland, interior chaparral, and woodlands.
Gopher snake (*Pituophis catenifer*)	Found in biotic communities up to Alpine tundra. Occurs in deserts, forests, and coastal grasslands.
Long-nosed leopard lizard (*Gambelia wislizeni*)	Found in desertscrub and semi-desert grasslands.

Common Name (*Scientific Name*)	Habitat
Long-nosed snake (*Rhinocheilus lecontei*)	Occurs in deserts, dry prairies, arid river valleys, thorn brush, and shrubland.
Long-tailed brush lizard (*Urosaurus graciosus*)	Primarily an inhabitant of Lower Colorado River Sonoran and Mohave Desertscrub, commonly found in creosote bush-lined desert flats with sandy soils and along drainages.
Mohave rattlesnake (*Crotalus scutulatus*)	Found in desertscrub and semi-desert grassland, usually in relatively level terrain.
Ornate tree lizard (*Urosaurus ornatus*)	Occurs in most biotic communities, from desertscrub to subalpine.
Sidewinder (*Crotalus cerastes*)	Typically occurs in flat, open desert with sandy or loamy soils.
Spotted leaf-nosed snake (*Phyllorhynchus decurtatus*)	Found in creosote bush flats and washes in Sonoran Desertscrub.
Tiger whiptail (*Aspidoscelis tigris*)	Occurs in a wide variety of habitats, including creosote bush flats, sandy washes, canyons, and hillsides. Found in desertscrub, semi-desert grasslands, and lower reaches of chaparral.
Western banded gecko (*Coleonyx variegatus*)	Ranges from dry creosote bush flats to rugged, rocky slopes to barren high desert plateaus.
Western diamondback rattlesnake (*Crotalus atrox*)	Typically occurs in arid and semi-arid habitats, including desertscrub, grasslands, and open woodlands. It favors areas with rocky outcrops, washes, and dense shrub cover that provide shelter and thermoregulatory sites. The species commonly occurs from low desert valleys to foothills, often near rodent burrows, used for refuge.
Western patch-nosed snake (*Salvadora hexalepsis*)	Found in flatlands and low valleys, from desertscrub to woodlands.
Western shovel-nosed snake (*Chionactis occipitalis klauberi*)	Found in or near sandy washes or dunes, in desert flats or on gently sloping bajadas.
Zebra-tailed lizard (*Callisaurus draconoides*)	Found primarily in desertscrub. Occurs in flatlands and broad, sandy washes.
Mammals (Non-Bat Species)	
Arizona pocket mouse (*Perognathus amplus*)	Occurs in desertscrub habitats.
Badger (*Taxidea taxus*)	Occurs in grassland and desertscrub.
Black-tailed jackrabbit (*Lepus californicus*)	Occurs in open habitats with scattered patches of shrubs, including plains, fields, and deserts.
Bobcat (Lynx rufus)	Occurs in various habitats, including woodlands, river bottomlands, deserts, and mountains.
Botta's pocket gopher (*Thomomys bottae*)	Found in a wide variety of habitats, from valleys to high mountain meadows, below 11,000 feet above mean sea level, with variable soils and ground cover ranging from open to grasslands. Occurs in roadsides, valleys, and mountain meadows.
Cactus mouse (*Peromyscus eremicus*)	Found in both deserts and pinyon-juniper (*Pinus* spp.–*Juniperus* spp.) woodland. Occurs in rocky, sandy, or loamy soils. Found in rock heaps, stone walls, burrows, woodrat houses, and brush fences.
Coyote (*Canis latrans*)	Occurs in all habitat types, including agricultural, urban, and suburban areas.
Deer mouse (*Peromyscus maniculatus*)	Occupies upland and riparian habitats, including open areas, brushlands, and coniferous and deciduous forests.
Desert cottontail (*Sylvilagus audubonii*)	Found in grasslands, brushlands, edges of foothill woodlands, willow thickets, and occasionally in cultivated fields or under buildings.

Common Name (*Scientific Name*)	Habitat
Desert kangaroo rat (*Dipodomys deserti*)	Occurs in low deserts, often sandy soil with sparse vegetation, including alkali sinks, shadscale scrub, and areas dominated by creosote bush (*Larrea tridentata*).
Desert pocket mouse (*Chaetodipus penicillatus*)	Occurs in sparsely vegetated sandy desert floors.
Gray fox (*Urocyon cinereoargenteus*)	Typically occurs in woodland or shrubland but can occupy deserts and grasslands. Dens in caves, hollow logs, or debris piles.
Javelina (collared peccary) (*Pecari tajacu*)	Found in deserts, shrublands, cities, and agricultural areas.
Merriam's kangaroo rat (*Dipodomys merriami*)	Occurs in low deserts in sparsely vegetated areas.
Mule deer (*Odocoileus hemionus*)	Occurs in mountains and lowlands, often associated with successional vegetation.
Raccoon (*Procyon lotor*)	Occurs in varying habitats, often along streams and shorelines and in human-altered environments.
Rock pocket mouse (*Chaetodipus intermedius*)	Occurs in lower grasslands and deserts. Commonly found in creosote bush, mesquite, saltbush, and creosote bush-lechuguilla areas.
Round-tailed ground squirrel (*Xerospermophilus tereticaudus*)	Found in Sonoran Desertscrub, alkali sink, and creosote bush communities in low, flat areas; avoids rocky hills.
Western harvest mouse (*Reithrodontomys megalotis*)	Occurs in a wide variety of habitats in places with adequate cover. Often lives in areas with adequate grass cover, along streams, bottomlands, along fences, or around irrigated areas.
White-throated woodrat (*Neotoma albigula*)	Found in brushlands, rocky cliffs, creosote bush scrub, mesquite (*Prosopis* spp.)–yucca (*Yucca* spp.), and pinyon–juniper woodland.
Mammals (Bat Species)	
Big brown bat (*Eptesicus fuscus*)	Occurs in variable habitat, from ponderosa pine (*Pinus ponderosa*) forests, pinyon-juniper woodlands, the lower edge of spruce (*Picea* spp.)–fir (*Abies* spp.) forests, and Lower Sonoran zones. Migratory; found throughout the state in summer and in southern Arizona in winter. Roosts in buildings, bridge joints, mines, hollow trees, and caves.
California myotis (*Myotis californicus*)	Desert ranges and flatlands; desertscrub–oak (*Quercus* spp.) to ponderosa pine zones. Migratory; winter distribution in southern Arizona, south of the Gila River. Roosts in crevices and cracks in canyon walls, caves, and mine shafts, and under bark in trees or snags.
Canyon bat (*Parastrellus hesperus*)	Occurs in deserts, woodlands, and shrublands. Roosts in boulders, cracks, and crevices.
Pallid bat (*Antrozous pallidus*)	Found in many habitat types, including forests, canyons, open farmland, and deserts. Migratory; occurs throughout Arizona and in the southern part of the state in winter. Roosts in rock crevices, buildings, caves, and mines.

Note:
MBTA = Migratory Bird Treaty Act of 1918
Sources: AZGFD 2025; Brennan 2012; Corman and Wise-Gervais 2005, eBird 2025, Hoffmeister 1986; NatureServe Explorer 2025

Summary of Potential Effects on Biological Resources

Vegetation

The Project would occur within previously developed and disturbed areas, including existing roadways, agricultural fields, and electrical infrastructure, as well as within North American desert pavement, Sonora–Mojave creosote bush–white bursage desertscrub, and North American warm-desert xeric-riparian scrub (Dudek 2025a). Vegetation removal would be limited to locations required for pole installation and access road construction. Because of the small disturbance

footprint relative to the surrounding landscape and the widespread availability of Sonoran Desertscrub in the Project vicinity, the Project is not expected to result in landscape-level effects on native vegetation within the Lower Colorado River Valley subdivision of the Sonoran Desert.

Wildlife Species

Land cover in most of the Study Area contains limited suitable habitat and would provide limited support for general wildlife species with the potential to occur. Four non-special-status amphibian species may occur in the Project site. Potential effects would be limited to temporary disturbance or injury during ground-disturbing activities, including the possibility of individuals being crushed or buried during construction.

A total of 45 non-special-status bird species were documented during surveys. Potential Project effects could include short-term behavioral disturbance, minor habitat loss, and effects on nesting birds, which would be avoided or minimized through nest surveys. Collision and electrocution risks associated with the proposed 500-kV line are expected to be low because the applicant would implement best management practices (BMPs) per the Avian Power Line Interaction Committee (APLIC) guidelines when applicable and feasible (APLIC 2006, 2012), and some species may benefit from increased perching and hunting opportunities. Birds using canal corridors may experience only local disturbance near Project construction.

Eighteen non-special-status reptile species may occur, and eight were observed during surveys Potential effects on these species could include temporary disturbance, potential crushing during ground disturbance, and increased predation near new perches. Smaller, fossorial, or inactive individuals may be more vulnerable.

Approximately 24 non-special-status mammal species, including four bats, may occur in the Project site, and four of these species were observed during the surveys. Project construction may cause temporary behavioral shifts, minor habitat loss, or injury risk for small or fossorial species, although the effects are expected to remain limited because of the small disturbance footprint. Project effects on bats would be minimal because construction would be limited to daytime only, roosts generally are outside the Project site, and foraging habitat is abundant; bats typically detect and avoid transmission lines.

Fish present in concrete-lined canals are likely transient, introduced, or stocked species. Construction activities may cause minor, temporary risk of injury, but no population-level effects are anticipated because these species do not persist long term in canal habitats. Fugitive dust could enter canal waters; however, BMPs would be implemented to prevent stormwater contamination.

Mitigation Measures

Implementation of the following mitigation measures will reduce the potential for wildlife injury and the spread of invasive species (for measures specific to special-status species, refer to **Exhibit C**):

- Transmission lines can increase the risk of bird collisions and electrocutions, particularly for raptors. To reduce these risks, the applicant will design the Project's facilities to

incorporate reasonable avian protection measures, consistent with the APLIC guidelines as applicable and feasible.

- To limit the introduction and spread of invasive species and noxious weeds, standard BMPs will be implemented during construction. Such BMPs may include cleaning equipment before and after mobilization to the Project site.

- To reduce potential collisions affecting terrestrial species, worker awareness training and low-speed travel requirements will be implemented.

- If vegetation-disturbing activities are planned during the migratory bird nesting season (March–September or January–June for raptors), measures to avoid any active bird nests in the Project site, such as preconstruction surveys for migratory bird nests by a qualified biologist, will be performed to maintain compliance with the MBTA.

- If trenching is included as part of Project construction, the following will be implemented to minimize injury to wildlife: when trenches cannot be backfilled immediately, escape ramps, which can be short lateral trenches or wooden planks sloping to the surface, will be constructed at least every 295 feet; trench slopes will be less than 45 degrees (1:1); and any trenches left open overnight will be inspected to remove wildlife before backfilling.

Conclusions

Project construction and operation will occur on disturbed and developed areas with electrical energy transmission and distribution infrastructure and unpaved roadways. Although towers and other support structures may pose a risk of collision for birds and other flying species, wildlife species are not expected to experience long-term detrimental impacts from the loss or alteration of vegetative cover in the Study Area, based on the previously disturbed nature of most of the landscape proposed for use by the Project and the availability of other suitable and unaffected habitats in the vicinity. At a landscape level, the Project will not significantly reduce the amount of vegetation available for wildlife use, increase habitat fragmentation, or impact any likely wildlife dispersal or migration corridors. Therefore, the Project may impact individuals (both wildlife and plants) but is unlikely to result in impacts at the population level for any species.

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Exhibit E

Scenic Areas, Historic Sites and Structures, and Archaeological Sites

Exhibit E
Scenic Areas, Historic Sites and Structures, and Archaeological Sites

As stated in Arizona Corporation Commission Rules of Practice and Procedure (R-14-3-219), Exhibit 1:

Describe any existing scenic areas, historic sites and structures, or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon.

Overview

For the application for a Certificate of Environmental Compatibility (CEC), this exhibit analyzes potential effects on scenic or visual resources and existing historic sites and structures or archaeological sites that would have the potential to be affected by construction and operation of the Vulcan Interconnection Project (Project). The applicant would construct an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation tie transmission line (gen-tie line) that would deliver power from a proposed 800-megawatt solar and battery energy storage system facility (collectively, the Energy Center) through a new on-site substation to the existing Salt River Project 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within a 540 to 4,737-foot-wide siting corridor (CEC Corridor). The Project site is defined as the 200-foot-wide gen-tie ROW (**Figure E-1**). The proposed CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south, with a width varying between 540 and 4,737 feet east to west.

The Project site, CEC Corridor, and the Study Area are in Sections 15, 22, 27, and 34 of Township 1 South, Range 6 West, and Section 3 of Township 2 South, Range 6 West, Gila and Salt River Base and Meridian, as shown on the Arlington, Arizona, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. Approximately 1.09 miles (25.25 percent) of the land in the Study Area is privately owned. Approximately 3.17 miles (73.31 percent) is Arizona State Trust land, managed by the Arizona State Land Department (ASLD), and federal land administered by the Bureau of Land Management (BLM) in the southern portion of the Study Area. The gen-tie line would cross overhead about 0.06 mile (1.43 percent) from ASLD land into the proposed new substation that is on the federal land. No gen-tie structures are anticipated to be sited on BLM land outside the substation.

The elevation of the Project site is approximately 850 feet above mean sea level, and the landscape character of the surrounding area is flat ground, with the prominent land cover classes being agricultural fields and open desert. The City of Buckeye is approximately 16 miles east of the site, Arlington Mountain is approximately 5 miles east, and the Gila River flows approximately 6 miles to the southeast.

The BLM manages its land in accordance with the Visual Resource Management (VRM) Class III and IV objectives, defined in BLM *Handbook 8400* (BLM 1984) as follows:

- **VRM Class III**: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **VRM Class IV**: The objective of this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and may be the major focus of view attention. However, the impact of these activities should be minimized through careful siting, minimal disturbance, and repeating the basic elements of form, line, color, and texture in the existing setting.

To support the BLM's National Environmental Policy Act analysis, a Visual Resources Report was completed to document existing visual resources and views in and around the Project, perform an assessment of potential effects to existing visual quality and character associated with Project development, and detail anticipated visual change and contrast in accordance with the BLM VRM system (refer to Exhibit B, Appendix B-3).

The following section presents the methodology for this assessment and separate discussions for the scenery and sensitive viewers. This assessment is followed by the results of the inventory and impact assessment, both of which also include separate discussions about the scenery (e.g., scenic quality) and sensitive viewers. A discussion of the existing historic sites and structures and archaeological sites and associated impacts follows the discussion on scenic areas.

Methodology

The purpose of the visual resource impact assessment is to identify and characterize the level of visual modification to the landscape that would result from Project construction and operation. Modification of the scenic landscape is described in levels of visual contrast, which potentially could affect both the scenic quality and sensitive viewers. Generally, the Study Area consists of power plants, transmission lines, solar generating facilities, agricultural land, and scattered low-density, single-family residential properties.

This visual resource impact assessment used the following steps to assess the potential impacts to the visual environment from Project construction and operation:

- Define the visual Study Area.
- Perform a desktop analysis to review and inventory existing landscape characteristics and designated scenic areas and assess aerial imagery.
- Evaluate the existing landscape character to identify potential impacts from establishment of Project components.

- Identify key observation points (KOPs) from locations with high viewer sensitivity (e.g., residences, parks, trails).
- Perform a field survey by visiting each KOP, collecting site photographs, and documenting existing conditions.
- Prepare visual simulations of the Project using KOP photographs by integrating the proposed Project infrastructure into the exiting landscape imagery from each KOP location.
- Assess the potential visual impacts of the Project by comparing the existing conditions of the Study Area with the corresponding visual simulations to evaluate how the Project would alter the character and visibility of the landscape.
- Develop two distance zones to separate the analysis area into distinct classifications based on the various levels of landscape detail available to the viewer, type of Project components, and ability to discern details over distance.

Inventory

Landscape Character

Landscape character refers to the overall visual and cultural impression of an area based on its distinct landscape attributes. Landscape character is a product of both natural and human influences on the landscape, including unique landforms, vegetation, and built infrastructure. The scenic quality of an area is determined by assessing the diversity and visual contrast of the surrounding landscape. Areas with high scenic quality are more aesthetically pleasing, and therefore, they increase the perceived value of the landscape.

The landscape surrounding the Project site can be characterized as flat with expansive views. Generally, the Study Area includes power generation facilities—Palo Verde Generating Station, Redhawk Power Plant, and Mesquite Power Plant—as well as several solar generation facilities, agricultural lands along Centennial Wash, a rural residential neighborhood mainly east of South 355th Avenue, and Arlington Elementary School, with sports fields on the west side of South 355th Avenue and south of Dobbins Road.

Sensitive Viewers

Sensitive viewers are individuals who could observe the Project and may be affected by changes or alterations of the landscape. The degree of visual contrast experienced by sensitive viewers is influenced by the viewing distance, duration of observation, viewing conditions, and the Project's visibility. Collectively, these factors determine the Project's overall visual impact on the landscape.

Sensitive viewing locations within and surrounding the Study Area include residential areas, travel routes, and recreation or scenic areas. These locations are represented both by static viewpoints (e.g., residences, scenic overlooks) and linear viewpoints (e.g., highways, various roads, trails).

The sensitive viewers or viewing locations that potentially would be affected by the Project include:

- **Recreational areas**: Arlington Wildlife Area, Agua Caliente Trail Staging Area, Buckeye Hills Regional Park, Powers Butte Wildlife Area, Sonoran Desert National Monument, Signal Mountain Wilderness, and Woolsey Peak Wilderness
- **Vehicular travelers**: Primary travel routes including Southern Pacific Trail, Elliot Road, Agua Caliente Extension Road, Narramore Road, 355th Avenue, and Old Highway 80
- **Residences**: Low-density residential use in the Study Area near Arlington Elementary School approximately 3 miles northeast of the Project site

The two developed distance zones are the **foreground-middle ground zone**, which includes the Study Area, and the **background zone**, which is beyond the Study Area and extends up to 15 miles. The foreground-middle ground zone includes areas that can be seen from travel routes where Project components may be viewed in detail. The outer limit of the zone is defined as the location where the texture and form of individual Project components are no longer apparent in the landscape. Atmospheric conditions may reduce visibility and shorten the distance normally covered by this zone. The background zone extends beyond the foreground-middle ground zone and includes areas that can be seen from travel routes up to approximately 15 miles. It does not include areas that are so far distant that the only thing discernible is the form or outline.

The Study Area contains flat ground, with the prominent land cover classes being agricultural fields and open desert. Inventory data for visual resources in the Study Area were collected from aerial photographs and field review. The inventory focused on landscape character, determination of scenic quality, identification of sensitive viewers, and viewing conditions (e.g., distance zones, viewer orientation, and screening).

Salome Highway, a two-lane, east-west county roadway connecting local communities in western Maricopa County, and Interstate 10 are approximately 5.5 and 9 miles north of the Project site, respectively. U.S. Highway 85 is approximately 13 miles southeast. Elliot Road provides east-west access, and West Dobbins Road provides north-south access to the northern section of the Project site. The southern section can be accessed from Narramore Road and the unpaved West Southern Pacific Trail.

Analysis

Impacts on sensitive viewing locations were assessed by evaluating the visual contrast, viewer sensitivity, and viewshed analysis in relation to the Project. The four impact levels are:

- **Negligible**: The landscape would appear unaltered, and the Project elements would not be evident visually.
- **Low***:* The landscape would be slightly altered.
- **Moderate**: The landscape would appear to be altered moderately, and the Project would attract the attention of sensitive viewers.
- **High***:* The landscape would appear to be heavily altered, and the Project would dominate the visual setting.

Scenic and Recreational Areas

Foreground-Middle Ground Zone

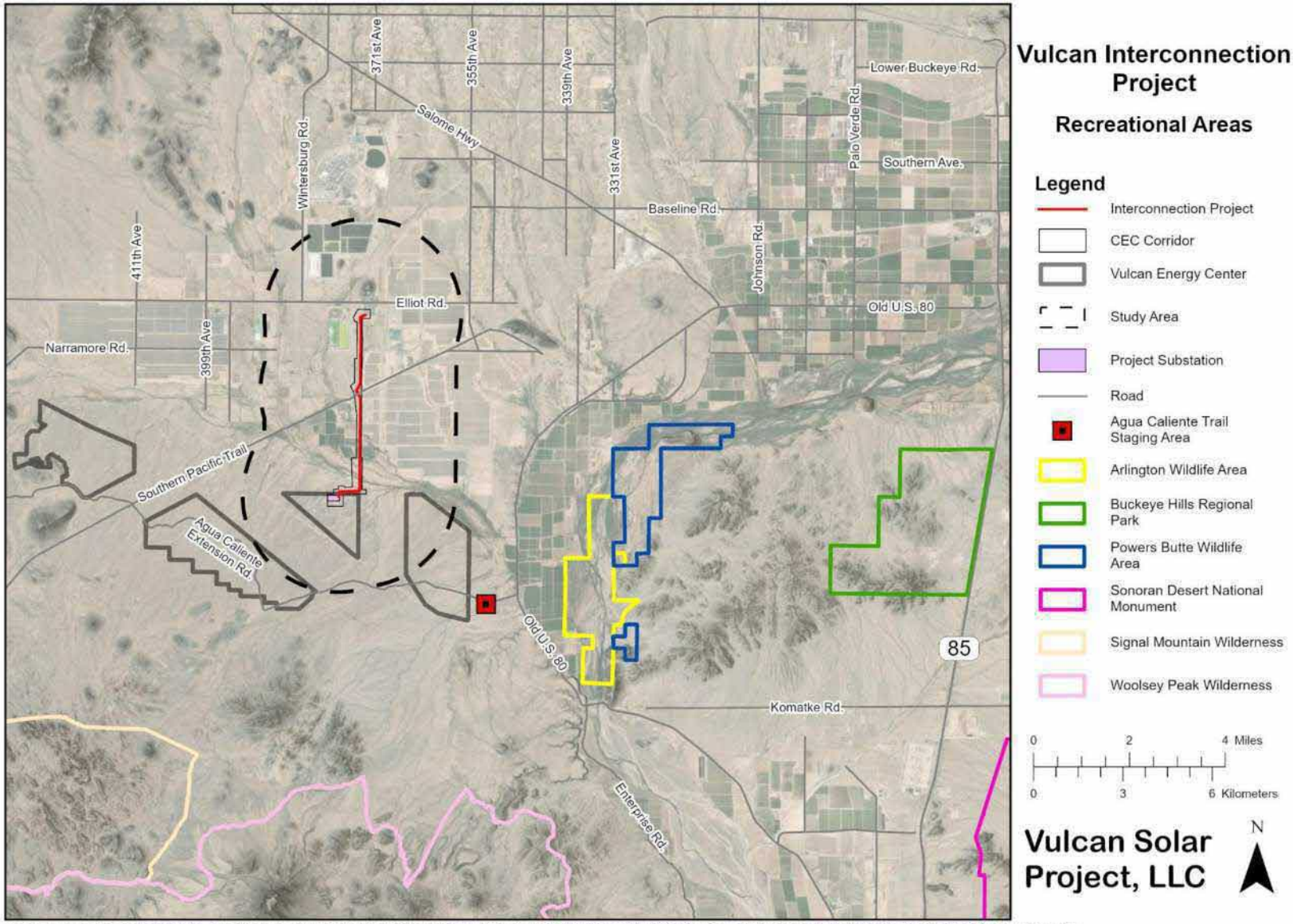
Four KOPs were developed in the Study Area from the nearest residences and the closest travel routes near the Project site (**Figures E-2 through E-9**). KOP 1, KOP 2, and KOP 3 are along local travel routes in the Study Area, and KOP 4 is near the closest residence, which is approximately 2.3 miles from the Project site. The existing visual conditions of KOP 1, KOP 2, KOP 3, and KOP 4 (refer to **Figures E-2, E-4, E-6, and E-8**) show the expansive views and the existing transmission line infrastructure not associated with the Project. The simulated visual conditions of KOP 1, KOP 2, KOP 3, and KOP 4 (refer to **Figures E-3, E-5, E-7, and E-9**) show the proposed Project's structures in relation to the existing infrastructure. The simulated visual conditions indicate that Project construction and operation would not hinder existing views of the landscape and would not significantly interfere with the existing views of the landscape by sensitive viewers traveling near the Project, and the impact level would be negligible.

Expansive views in the Study Area allow the surrounding mountain ranges to be seen during normal conditions. The northern section of the Project site is approximately 6 miles from Arlington Wildlife Area, approximately 7 miles from Powers Butte Wildlife Area, and approximately 6 miles from Agua Caliente Trail Staging Area. The southern section of the Project is approximately 12.5 miles from Buckeye Hills Regional Recreation Park, approximately 5 miles from Arlington Wildlife Area, approximately 7 miles from Powers Butte Wildlife Area, and approximately 3.5 miles from the Agua Caliente Trail Staging Area.

Sensitive viewers are found in the residential community east of South 355th Avenue and at Arlington Elementary School, which contains community sports fields. Approximately 120 single-family homes are about 3 miles from the Project site. These homes are primarily northeast of the northern section of the site, mainly concentrated east of South 355th Avenue, south of Dobbins Road, and north of Elliot Road. Although the Project would be visible from this residential neighborhood, it would blend in with existing electrical infrastructure that is not associated with the Project and would not significantly hinder the expansive views of the surrounding mountains. Therefore, the visual impacts would be negligible to low.

Background Zone

The northern section of the Project site is approximately 23 miles from Buckeye Hills Regional Recreation Park, and all other recreation areas are in the foreground-middle ground zone. Visual impacts from beyond these recreation areas would be negligible to low because of distance and because the Project would blend into the surrounding landscape and the existing electrical infrastructure components in the Study Area.



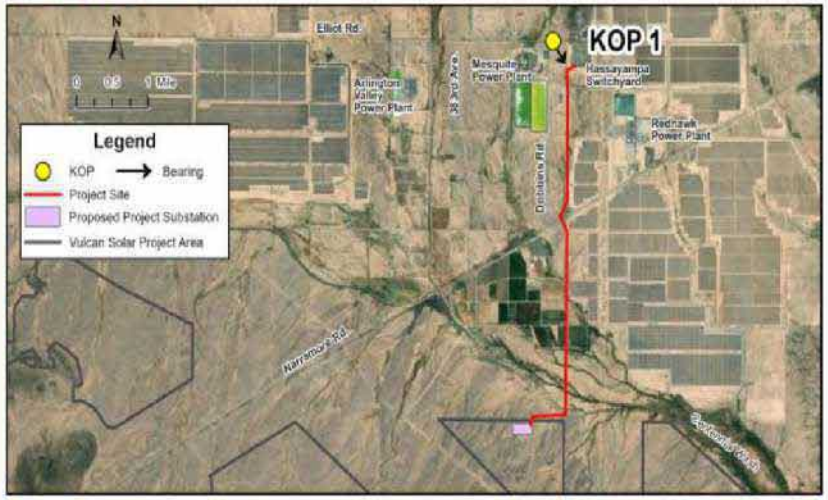
Map Sources: City of Maricopa Parks, MAG Recreation Viewer, Earthstar Geographics, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community

Exhibit E-1. Recreational Areas

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 1

PROJECT LOCATION MAP



PHOTOGRAPH INFORMATION

Time of photograph:	10:13 a.m.
Date of photograph:	July 25, 2025
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	Southeast
Bearing:	147°
Elevation:	897.9 ft.
Latitude:	33°20'53.97" N
Longitude:	112°51'31.668" W
Distance to project:	1,780 ft. / 0.34 mi.

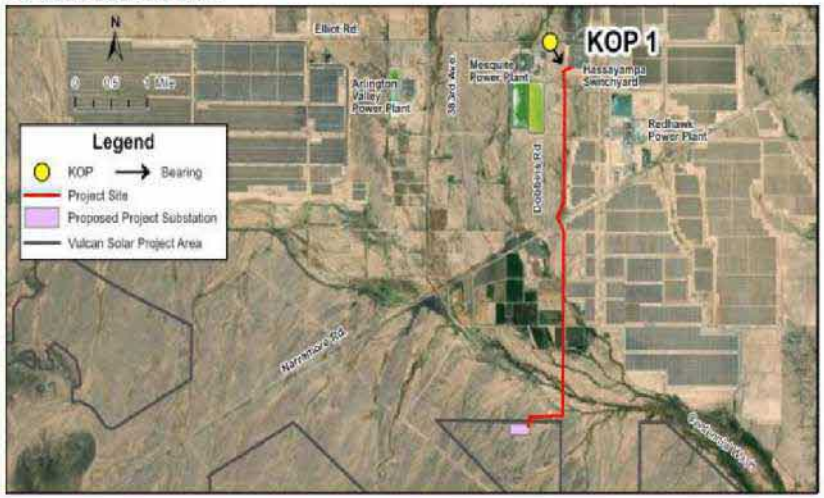
DECEMBER 2025

Figure E-2. KOP 1 Existing Conditions: Looking southeast from Elliot Road

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 1

PROJECT LOCATION MAP



PHOTOGRAPH INFORMATION

Time of photograph:	10:13 a.m.
Date of photograph:	July 25, 2025
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	Southeast
Bearing:	147°
Elevation:	897.9 ft.
Latitude:	33°20'53.97" N
Longitude:	112°51'31.668" W
Distance to project:	1,780 ft. / 0.34 mi.

DECEMBER 2025

Figure E-3. KOP 1 Simulated Conditions: Looking southeast from Elliot Road

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 2

PROJECT LOCATION MAP

PHOTOGRAPH INFORMATION

Time of photograph:	9:45 a.m.
Date of photograph:	July 25, 2025
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	West
Bearing:	243°
Elevation:	879.46 ft.
Latitude:	33°19'36.006" N
Longitude:	112°50'29.928" W
Distance to project:	4,848 ft. / 0.92 mi.

DECEMBER 2025

Figure E-4. KOP 2 Existing Conditions: Looking west along Narramore Road

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 2

PROJECT LOCATION MAP

PHOTOGRAPH INFORMATION

Time of photograph:	9:45 a.m.
Date of photograph:	July 25, 2025
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	West
Bearing:	243°
Elevation:	879.46 ft.
Latitude:	33°19'36.006" N
Longitude:	112°50'29.928" W
Distance to project:	4,848 ft. / 0.92 mi.

DECEMBER 2025

Figure E-5. KOP 2 Simulated Conditions: Looking west along Narramore Road

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 3

PROJECT LOCATION MAP

PHOTOGRAPH INFORMATION

Time of photograph:	9:23 a.m.
Date of photograph:	July 25, 2025
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	East
Bearing:	115°
Elevation:	848.43 ft.
Latitude:	33°20'53.97" N
Longitude:	112°51'31.668" W
Distance to project:	1,055 ft. / 0.2 mi.

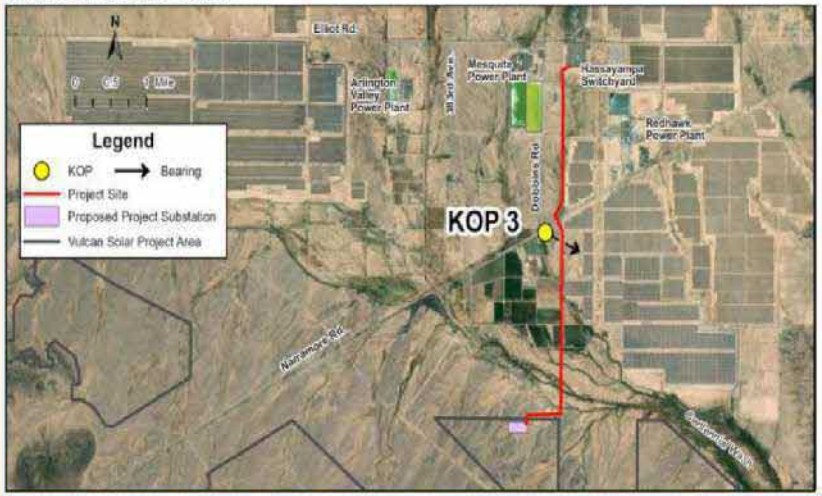
DECEMBER 2025

Figure E-6. KOP 3 Existing Conditions: Looking southeast from Narramore Road

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 3

PROJECT LOCATION MAP



PHOTOGRAPH INFORMATION

Time of photograph:	9:23 a.m.
Date of photograph:	July 25, 2025
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	East
Bearing:	115°
Elevation:	848.43 ft.
Latitude:	33°20'53.97" N
Longitude:	112°51'31.668" W
Distance to project:	1,055 ft. / 0.2 mi.

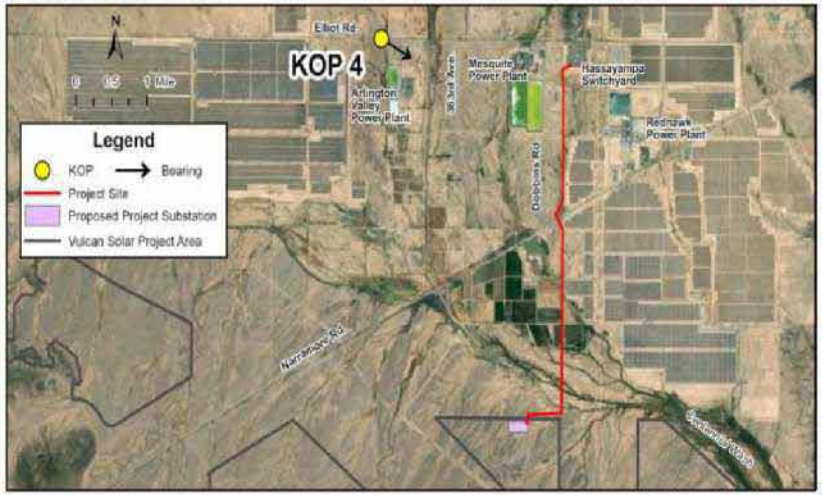
DECEMBER 2025

Figure E-7. KOP 3 Simulated Conditions: Looking southeast from Narramore Road

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 4

PROJECT LOCATION MAP



PHOTOGRAPH INFORMATION

Time of photograph:	10:13 a.m.
Date of photograph:	July 25, 2025
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	Southeast
Bearing:	118°
Elevation:	896.56 ft.
Latitude:	33° 20' 54.2074" N
Longitude:	-112.895120938" W
Distance to project:	12,307 ft. / 2.33 mi.

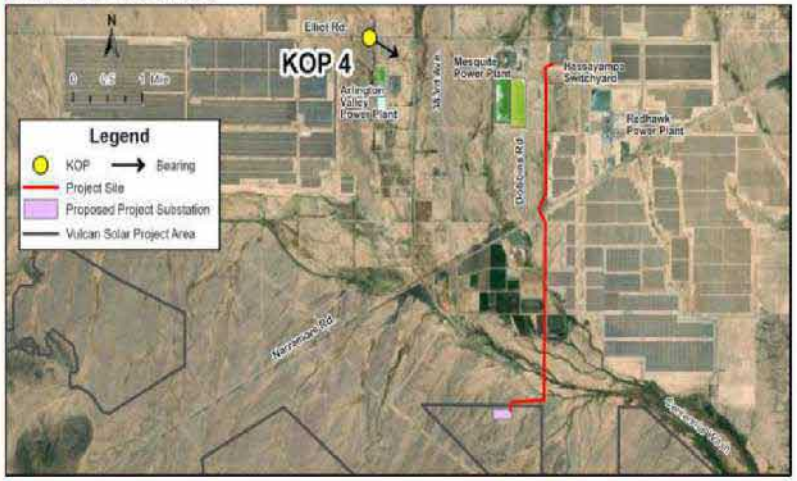
DECEMBER 2025

Figure E-8. KOP 4 Existing Conditions: Looking southeast from Elliot Road (nearest residence)

Vulcan Interconnection CEC 4.3-Mile Long 500kV Transmission Line

KOP 4

PROJECT LOCATION MAP



PHOTOGRAPH INFORMATION

Time of photograph:	10:13 a.m.
Date of photograph:	July 30, 2025 |
Camera:	Canon R5
Focal length:	35mm
Weather condition:	Clear
Viewing direction:	Southeast
Bearing:	118°
Elevation:	896.56 ft.
Latitude:	33° 20' 54.2074" N
Longitude:	-112.895120938" W
Distance to project:	12,307 ft. / 2.33 mi.

DECEMBER 2025

Figure E-9. KOP 4 Simulated Conditions: Looking southeast from Elliot Road (nearest residence)

Scenic Area Conclusions

Although the Study Area landscape includes natural vegetation and contains adjacent features (i.e., hills and mountains) considered to be scenic, it also includes visual remnants of previous agricultural operations or lands and existing high-voltage transmission lines supported by tall (i.e., 100 feet or taller) steel towers. In addition, existing solar and industrial facilities are present in the broader Arlington Valley landscape. The existing landscape character in the Study Area generally includes expansive views of flat native desert with dispersed residences, power generating facilities, and existing transmission lines, with distant mountains visible in the background (refer to **Figures E-2** through **E-9**). Project construction and operation is not anticipated to impact general views in the area or high-sensitivity viewers from Arlington Elementary School or residential neighborhoods that are both approximately 3 miles away (refer to **Figure E-9**).

Historic Sites and Structures and Archaeological Sites

The assessment of potential effects on historic sites and structures and archaeological sites relied on existing information about prior cultural resource studies in an area that included the CEC Corridor (which encompasses the Project site) and a surrounding buffer 0.5 mile wide (Review Area), which is consistent with State Historic Preservation Office (SHPO) guidelines for linear projects. Reviewed sources of information included:

- Arizona Register of Historic Places (ARHP)
- National Register of Historic Places (NRHP)
- AZSITE Cultural Resources Inventory, a geospatial database that includes records of the AZSITE Consortium members (Arizona State Museum [ASM], Arizona State University, Museum of Northern Arizona, and SHPO) (AZSITE Consortium 2025)
- Records on file at the ASM Archaeological Records Office for information not incorporated in the AZSITE database
- Historic maps and aerial photos
- Selected reports of prior cultural resource studies

The review identified 41 prior cultural resource studies conducted within or overlapping the Review Area between 1955 and 2025, which covered 72.9 percent of the Review Area (2,993 of 4,107 acres). Twenty-two of the 41 prior surveys overlapped the CEC Corridor, most of which in the northernmost mile where the CEC Corridor crosses the railroad ROW, and an area about 1 mile south of the railroad that was subjected to two surveys for power generation and transmission projects.

The most recent prior cultural resource surveys were completed in 2024 and 2025 to support the Vulcan Energy Center project and covered about 87.4 percent (406.8 acres) of the 465.69-acre CEC Corridor (Hale et al. 2025). Fourteen prior surveys conducted between 1999 and 2011 encompassed another 39.3 acres of the CEC Corridor, bringing the total survey coverage to 95.8 percent (446.1 acres) of the 465.69-acre CEC Corridor. The 19.6 acres that have not been surveyed in the CEC Corridor are private lands where access was not granted for the 2024 and 2025 surveys conducted to support the Vulcan Energy Center project.

The prior studies have recorded 13 cultural resources intersecting the CEC Corridor:

- Two road trails (AZ T:9:63[ASM] and AZ T:9:159[ASM])
- A historical earthen canal feature (AZ T:9:192[ASM])
- Southern Pacific Railroad Phoenix Main Line
- A historical, in-use railroad spur
- Four thermal feature sites with artifact scatters [AZ T:9:213(ASM), AZ T:9:214(ASM), AZ T:9:216(ASM), and AZ T:9:219(ASM)] and
- Four artifact scatters [AZ T:9:215(ASM), AZ T:9:217(ASM), AZ T:9:218(ASM), and Vulcan-C-ACA-02] (**Table E-1**)

The SHPO determined archaeological sites AZ T:9:63(ASM), AZ T:9:159(ASM), and AZ T:9:192(ASM) as well as the in-use railroad spur are not eligible for listing in the ARHP or NRHP.[1] The Southern Pacific Railroad Phoenix Main Line, which was constructed between 1923 and 1926, is eligible for the ARHP and NRHP under Criterion A for its association with the development of railroad transportation in Arizona. The Union Pacific Railroad continues to use the upgraded and regularly maintained rail line, now designated as the Roll Industrial Lead, for hauling freight. Archaeological site AZ T:9:219(ASM), previously recorded as a moderately dense artifact scatter with a thermal feature, has been recommended eligible for the ARHP and NRHP under Criterion D for the site's potential to yield important information about the prehistory of the region. Archaeological site Vulcan-C-ACA-02 is recorded as a scatter of flaked stone artifacts on desert pavement that was recommended ineligible for the ARHP and NRHP. The ARHP and NRHP eligibilities of archaeological sites AZ T:9:213, 214, 215, 216, 217, and 218(ASM) have not been evaluated.

The records review identified 26 historical or archaeological sites or structures previously recorded in the Review Area outside the boundary of the CEC Corridor. These sites include seven newly discovered archaeological sites for which the available information is limited to their spatial location and their ARHP and NRHP eligibilities were not determined and one site for which no information has been found beyond its spatial location. Nine cultural resources have been determined not eligible for the ARHP and NRHP, one archaeological site was recommended not eligible for the ARHP and NRHP, and two sites were recommended eligible by the recorders, and four cultural resources have not been evaluated for eligibility. Two archaeological sites, AZ T:9:5(ASM) and AZ T:9:126(ASM), have been determined eligible for listing in the ARHP and NRHP under Criterion D for their potential to provide valuable information on the prehistory of Arizona.

Historic Site and Structures and Archaeological Sites Analysis and Conclusions

The cultural resource assessment identified 13 known historical or archaeological sites or structures in the CEC Corridor and another 26 recorded within the 0.5-mile Review Area

[1] The criteria of eligibility for the ARHP are the same as the criteria of eligibility for the NRHP.

(**Table E-2**). Eighteen of these cultural resources, including six in the CEC Corridor, have not been evaluated for ARHP or NRHP eligibility, or their eligibility status was not determined. Four resources in the CEC Corridor have been determined not eligible for listing in the ARHP and NRHP, along with another nine in the Review Area buffer. Archaeological sites AZ T:9:163(ASM), consisting of a historical trash deposit east of the Hassayampa Switchyard in the Review Area, and Vulcan-C-ACA-02, a scatter of flaked stone artifacts on desert pavement in the CEC Corridor, were recommended by the recorders to be considered not eligible for the ARHP and NRHP, but no official determination has been made.

Three cultural resources have been determined eligible for listing in the ARHP and NRHP. Archaeological sites AZ T:9:5(ASM) and AZ T:9:126(ASM), which are within the 0.5-mile Review Area, have been determined eligible for listing in the ARHP and NRHP under Criterion D for their potential to provide valuable information on the prehistory of Arizona. The Southern Pacific Railroad Phoenix Main Line, which crosses the CEC Corridor, is eligible for the ARHP and NRHP under Criterion A, for its association with development of railroad transportation in Arizona.

Archaeological sites AZ T:9:42(BLM) and AZ T:9:110(ASM), which are in the Review Area, and archaeological site AZ T:9:219(ASM), which is in the CEC Corridor, were recommended by the recorders to be eligible for the ARHP and NRHP, but no official determinations have been made. Archaeological site AZ T:9:42(BLM) was recorded as a Hohokam/Patayan habitation site with an artifact scatter approximately a half mile east of the CEC Corridor. Archaeological site AZ T:9:110(ASM) is a series of rock rings on the side of a butte, and archaeological site AZ T:9:219(ASM) includes a thermal feature with a scatter of artifacts consisting of calcined faunal bone, flaked stone, and ceramics associated with the Patayan during the Patayan II/Patayan III Period (ca. AD 950 to 1900).

The setting of the Southern Pacific Railroad Phoenix Main Line has been altered substantially by previous construction of electrical generating and transmission infrastructure. Therefore, the Project would not substantially diminish the historical integrity of the in-use railroad. The two archaeological sites determined eligible for listing in the ARHP and NRHP under Criterion D, AZ T:9:5(ASM) and AZ T:9:126(ASM), are more than 0.25 mile from the CEC Corridor, and the Project would be unlikely to diminish their potential to yield important information about the prehistory of Arizona.

If archaeological sites AZ T:9:42(BLM) or AZ T:9:110(ASM), which were recommended eligible; any of the 12 archaeological sites in the Review Area whose eligibility status is either unevaluated or undetermined; or the archaeological site that was recommended not eligible, AZ T:9:163(ASM), by the recorder are found to be eligible for the ARHP and/or NRHP, they most likely would be significant for their potential to yield important information about the history or prehistory of the region and would not be degraded by any proximity impacts.

In summary, the Project would be constructed in an area that was intensively surveyed for cultural resources in 2024 and 2025 to support the Vulcan Energy Center EIS. The review found that 95.8 percent of the CEC Corridor was surveyed for cultural resources between 1999 and 2025, and 13 cultural resources have been identified in the CEC Corridor. Four of those cultural

resources—archaeological sites AZ T:9:63(ASM), AZ T:9:159(ASM), and AZ T:9:192(ASM) and the in-use railroad spur—have been determined to be not eligible for listing in the ARHP or NRHP. The CEC Corridor intersects the Southern Pacific Railroad Phoenix Main Line, which the SHPO determined eligible for the ARHP and NRHP under Criterion A for its association with the development of railroad transportation in Arizona. The setting of the railroad has been substantially altered by prior construction of electrical generating and transmission infrastructure, and the proposed Project will not substantially diminish its historical integrity. Archaeological site AZ T:9:219(ASM), which is in the CEC Corridor, has been recommended eligible for the ARHP and NRHP under Criterion D for the site's potential to yield important information about the prehistory of the region, and archaeological site Vulcan-C-ACA-02 was recommended to be considered not eligible for the ARHP and NRHP. The initial reporting for sites AZ T:9:213, 214, 215, 216, 217, and 218(ASM) recommends that the sites be considered unevaluated, and additional research is needed for evaluating their eligibility.

Table E-1. Cultural Resources in the CEC Corridor and the 0.5-mile Study Area

Resource Number/Name[1]		Affiliation	Resource Type	Eligibility Status	Comment
Overlapping the CEC Corridor					
1	unnamed road; AZ T:9:63(ASM)	Euro-American	road (in use)	not eligible (SHPO 2012-0136)	N/A
2	unnamed rail spur; AZ T:9:107(ASM)	Euro-American	rail spur (in use)	not eligible (SHPO 2012-0136)	N/A
3	AZ T:9:159(ASM)	Euro-American	road	not eligible (SHPO-2012-0136)	N/A
4	AZ T:9:192(ASM)	Euro-American	canal feature	not eligible	N/A
5	AZ T:9:213(ASM)	Native Archaeological Culture	artifact scatter and feature	unevaluated	N/A
6	AZ T:9:214(ASM)	Hohokam/Patayan	artifact scatter and feature	unevaluated	N/A
7	AZ T:9:215(ASM)	Hohokam	artifact scatter and features	unevaluated	N/A
8	AZ T:9:216(ASM)	Native Archaeological Culture	artifact scatter and feature	unevaluated	N/A
9	AZ T:9:217(ASM)	Hohokam/Patayan	artifact scatter and features	unevaluated	N/A
10	AZ T:9:218(ASM)	Native Archaeological Culture	artifact scatter	unevaluated	N/A
11	AZ T:9:219(ASM)	Patayan	artifact scatter and feature	recommended eligible, Criterion D	N/A
12	Southern Pacific Railroad Phoenix Main Line; AZ T:10:84(ASM)	Euro-American	railroad (in use)	eligible, Criterion A (SHPO-2011-1058)	N/A
13	Vulcan-C-ACA-02	Native Archaeological Culture	artifact scatter	recommended not eligible	N/A
In or Overlapping the Study Area within 0.5 Mile of the CEC Corridor					
14	AZ T:9:5(ASM); AR-03-07-01-00943	Hohokam/Patayan	artifact scatter	eligible; Criterion D (SHPO-2023-184)	N/A
15	AZ T:9:5(BLM)	unknown	unknown	unknown	information limited to the site boundary mapped on USGS quadrangle
16	AZ T:9:24(ASM)	Euro-American	homestead	unevaluated	N/A
17	AZ T:9:42(BLM)	Hohokam/Patayan	habitation site with artifact scatter	recommended eligible	N/A

Resource Number/Name[1]		Affiliation	Resource Type	Eligibility Status	Comment
18	AZ T:9:56(ASM)	Euro-American	ramada shelter	not eligible (SHPO 2000-76)	N/A
19	AZ T:9:58(ASM)	Euro-American	artifact scatter	not eligible (SHPO 2012-0136)	N/A
20	AZ T:9:59(ASM)	Euro-American	artifact scatter	not eligible (SHPO 2012-0136)	N/A
21	AZ T:9:60(ASM)	Euro-American	artifact scatter	not eligible (SHPO 2012-0136)	N/A
22	AZ T:9:61(ASM)	Euro-American/Native Archaeological Culture	artifact scatter and feature	not eligible (SHPO 2012-0136)	N/A
23	AZ T:9:62(ASM)	Euro-American	homestead	not eligible (SHPO 2012-0136)	N/A
24	AZ T:9:66(MNA); NA15678	Hohokam	artifact scatter	unevaluated	N/A
25	AZ T:9:73(ASM)	Euro-American	artifact scatter	not eligible (SHPO 2012-0136)	N/A
26	AZ T:9:93(ASM)	unknown	unknown	unknown	newly discovered archaeological site; information limited to sketches on USGS quadrangle
27	AZ T:9:94(ASM)	unknown	unknown	unknown	newly discovered archaeological site; information limited to sketches on USGS quadrangle
28	AZ T:9:95(ASM)	unknown	unknown	unknown	newly discovered archaeological site; information limited to sketches on USGS quadrangle
29	AZ T:9:96(ASM)	unknown	unknown	unknown	newly discovered archaeological site; information limited to sketches on USGS quadrangle
30	AZ T:9:98(ASM)	unknown	unknown	unknown	newly discovered archaeological site; information limited to sketches on USGS quadrangle
31	AZ T:9:99(ASM)	unknown	unknown	unknown	newly discovered archaeological site; information limited to sketches on USGS quadrangle

Resource Number/Name[1]		Affiliation	Resource Type	Eligibility Status	Comment
32	AZ T:9:100(ASM)	unknown	unknown	unknown	newly discovered archaeological site; information limited to sketches on USGS quadrangle
33	AZ T:9:110(ASM); NA12496	unknown	rock rings	recommended eligible	N/A
34	AZ T:9:125(ASM)	unknown	rock path and enclosure	not eligible	N/A
35	AZ T:9:126(ASM); NA12508	unknown	clearings, intaglio, rock alignment, and structure	eligible; Criterion D	N/A
36	AZ T:9:163(ASM)	Euro-American	artifact scatter	recommended not eligible	N/A
37	AZ T:9:191(ASM)	Euro-American	irrigation system	not eligible	N/A
3538	AZ T:9:211(ASM)	Hohokam/Patayan and Euro-American	artifact scatter and features	unevaluated	N/A
39	AZ T:9:212(ASM)	Hohokam/Patayan	artifact scatter and feature	unevaluated	N/A

Notes:

ASM = Arizona State Museum

CEC = Certificate of Environmental Compatibility

MNA = Museum of Northern Arizona

N/A = not applicable

SHPO = State Historic Preservation Office

1. ASM site numbers assigned to in-use structures would remain valid only for any abandoned components.

Table E-2. Summary of Cultural Resources within the CEC Corridor and the 0.5-mile Study Area

Resource Number/Name		Resource Type	Overlaps the CEC Corridor
ARHP/NRHP Eligible			
Not Eligible			
1	AZ T:9:56(ASM)	ramada shelter	no
2	AZ T:9:58(ASM)	artifact scatter	no
3	AZ T:9:59(ASM)	artifact scatter	no
4	AZ T:9:60(ASM)	artifact scatter	no
5	AZ T:9:61(ASM)	artifact scatter and feature	no
6	AZ T:9:62(ASM)	homestead	no
7	unnamed road; AZ T:9:63(ASM)	road (in use)	yes
8	AZ T:9:73(ASM)	artifact scatter	no
9	unnamed rail spur; AZ T:9:107(ASM)	rail spur (in use)	yes
10	AZ T:9:125(ASM)	rock path and enclosure	no
11	AZ T:9:159(ASM)	road	yes
12	AZ T:9:191(ASM)	irrigation system	no
13	AZ T:9:192(ASM)	canal feature	yes
Recommended Not ARHP/NRHP Eligible			
14	AZ T:9:163(ASM)	artifact scatter	no
15	Vulcan-C-ACA-02	artifact scatter	yes
ARHP/NRHP Eligible			
16	AZ T:9:5(ASM); AR-03-07-01-00943, Criterion D	artifact scatter	no
17	AZ T:9:126(ASM); NA12508, Criterion D	clearings, intaglio, rock alignment, and structure	no
18	Southern Pacific Railroad Phoenix Main Line; AZ T:10:84(ASM), Criterion A	railroad (in use)	yes
Recommended ARHP/NRHP Eligible			
19	AZ T:9:42(BLM)	habitation with artifact scatter	no
20	AZ T:9:110(ASM); NA12496	rock rings	no
21	AZ T:9:219(ASM)	artifact scatter and feature	yes
Eligibility Unevaluated			
22	AZ T:9:24(ASM)	homestead	no
23	AZ T:9:66(MNA); NA15678	artifact scatter	no
24	AZ T:9:211(ASM)	artifact scatter and features	no
25	AZ T:9:212(ASM)	artifact scatter and feature	no
26	AZ T:9:213(ASM)	artifact scatter and feature	yes
27	AZ T:9:214(ASM)	artifact scatter and feature	yes
28	AZ T:9:215(ASM)	artifact scatter and features	yes
29	AZ T:9:216(ASM)	artifact scatter and feature	yes

Resource Number/Name		Resource Type	Overlaps the CEC Corridor
30	AZ T:9:217(ASM)	artifact scatter and features	yes
31	AZ T:9:218(ASM)	artifact scatter	yes
Eligibility Unknown (newly recorded sites as defined by ASM)			
32	AZ 9:5(BLM)	unknown	no
33	AZ T:9:93(ASM)	unknown	no
34	AZ T:9:94(ASM)	unknown	no
35	AZ T:9:95(ASM)	unknown	no
36	AZ T:9:96(ASM)	unknown	no
37	AZ T:9:98(ASM)	unknown	no
38	AZ T:9:99(ASM)	unknown	no
39	AZ T:9:100(ASM)	unknown	no

Notes:
ARHP = Arizona Register of Historic Places
ASM = Arizona State Museum
CEC = Certificate of Environmental Compatibility
MNA = Museum of Northern Arizona
NRHP = National Register of Historic Places

References

AZSITE Consortium. 2025. *AZSITE Cultural Resources Inventory*. Arizona State Museum, Arizona State University, Museum of Northern Arizona, State Historic Preservation Office. Available: https://azsiteapp.rc.asu.edu/azsite/search.html. Accessed October 2025.

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Exhibit F

Recreational Resources

Exhibit F
Recreational Resources

As stated in the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1:

> State the extent, if any, the proposed site or route will be available to the public for recreational purposes, consistent with safety considerations and regulations, and attach any plans the applicant may have concerning the development of the recreational aspects of the proposed site or route.

Recreational Purposes and Aspects

The purpose of this assessment of recreational resources is to compile baseline data and determine potential recreational impacts that may result from construction, operation, and maintenance of the Vulcan Interconnection Project (Project). The applicant would construct an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation tie transmission line (gen-tie line) that would deliver power from a proposed 800-megawatt (MW) solar and battery energy storage system (BESS) facility (collectively, the Energy Center) through a new on-site substation to the existing Salt River Project (SRP) 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within a 540 to 4,737-foot-wide siting corridor (CEC Corridor) (**Figure F-1**). The Project site is defined as the 200-foot-wide gen-tie ROW. The proposed CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south, with a width varying between 540 and 4,737 feet east to west.

The Project, which would be entirely within unincorporated Maricopa County, Arizona, is in Sections 15, 22, 27, and 34 of Township 1 South, Range 6 West, and Section 3 of Township 2 South, Range 6 West, Gila and Salt River Base and Meridian, as shown on the Arlington, Arizona, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The Project site and the lands in the Study Area are privately owned, Arizona State Trust land managed by the Arizona State Land Department (ASLD), and federal land administered by the Bureau of Land Management (BLM). Approximately 3.17 miles (73.31 percent) of the Project would be on Arizona State Trust land managed by the ASLD, and approximately 1.09 miles (25.25 percent) of the Project would be on private property. From ASLD land, the gen-tie line would cross overhead about 0.06 miles (1.43 percent) into the proposed new substation that would be on federal land administered by the BLM. No gen-tie structures are anticipated to be sited on BLM land.

Recreational information for the Study Area was obtained from the ASLD parcel viewer (ASLD 2025), the Maricopa County parks and trails geographic information system (GIS) mapper (Maricopa County 2025), the Old Highway 80 Area Plan (Maricopa County 2007), and the BLM national data mapper website (BLM 2025). Maricopa County's Comprehensive Plan and the county parks and trails GIS mapper do not identify any proposed dedicated recreation or open

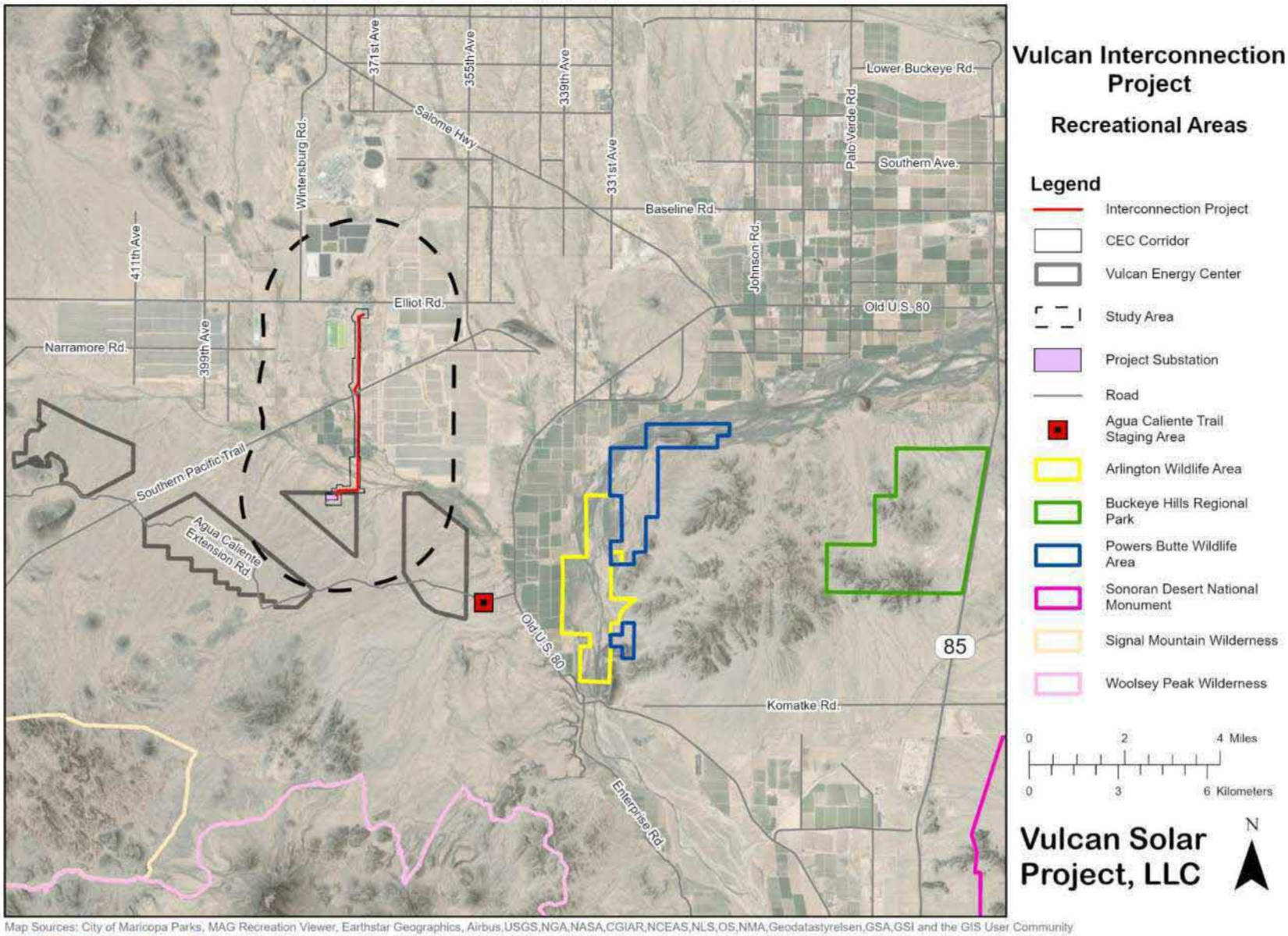
space areas within the Study Area (Maricopa County 2016). The BLM also does not have any plans to designate additional recreation facilities in the Study Area, and the ASLD has no existing or planned recreational ROWs in the Project site or Study Area (BLM 2012; ASLD 2025).

The Project site is in rural Maricopa County and is bordered by several mountain ranges, including Saddle Mountain approximately 12 miles to the west, the Palo Verde Hills 7.5 miles to the northwest, the Buckeye Hills 10 miles to the southeast, and the Belmont Mountains 23 miles to the north. The northern section of the Project site is approximately 6 miles from the Arlington Wildlife Area, approximately 7 miles from the Powers Butte Wildlife Area, and approximately 6 miles from the Agua Caliente Trail Staging Area. The southern section of the Project site is approximately 12.5 miles from Buckeye Hills Regional Recreation Park, approximately 5 miles from the Arlington Wildlife Area, approximately 7 miles from the Powers Butte Wildlife Area, and approximately 3.5 miles from the Agua Caliente Trail Staging Area (refer to **Figure F-1**). No recreational areas are within the proposed CEC Corridor.

Conclusions

The Project would not involve the conversion or preservation of any publicly owned parks, recreation areas, or designated wildlife and waterfowl refuges. Project activities would not extend into any recreation lands or encroach within 5 miles of any of the above-mentioned recreation areas, and Project development would not affect access to these areas or interfere with current recreational activities. The Project site would not be fenced or open to the general public.

Project implementation would have minimal impact on existing recreational use because currently only limited use of the area (primarily travel along public roadways) is possible, and such access would continue to be available following Project construction. Similarly, implementation would have minimal to no impact on recreation in the Study Area or surrounding region because access to the recreation areas would not be blocked.



Map Sources: City of Maricopa Parks, MAG Recreation Viewer, Earthstar Geographics, Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community

Figure F-1. Recreation Areas

References

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Exhibit G

Conceptual Drawings of Transmission Facilities

Exhibit G
Conceptual Drawings of Transmission Facilities

As stated in the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1:

> Attach any artist's or architect's conception of the proposed plant or transmission line structures and switchyards, which applicant believes may be informative to the Committee.

Vulcan Solar Project, LLC will construct the Vulcan Interconnection Project (Project), an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation-tie transmission line that will deliver power from a proposed 800 megawatt solar and battery storage system through a new collector substation to the existing Salt River Project 500-kV Hassayampa Switchyard. **Figures 1 through 6,** provided in Exhibit G, show conceptual designs of the transmission line structures for the Project. The final structures may look different and be configured differently, including height, than those shown herein, depending on the final engineering design and location.

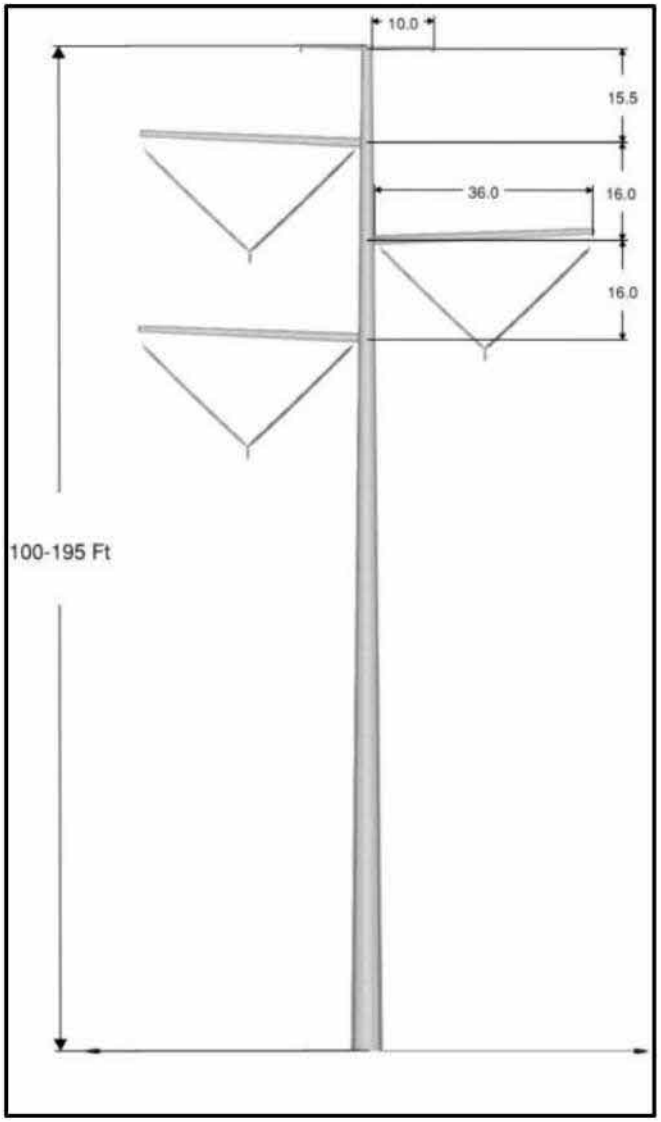

Figure 1. Single-Circuit 500-kV Monopole Tangent Structure (front)

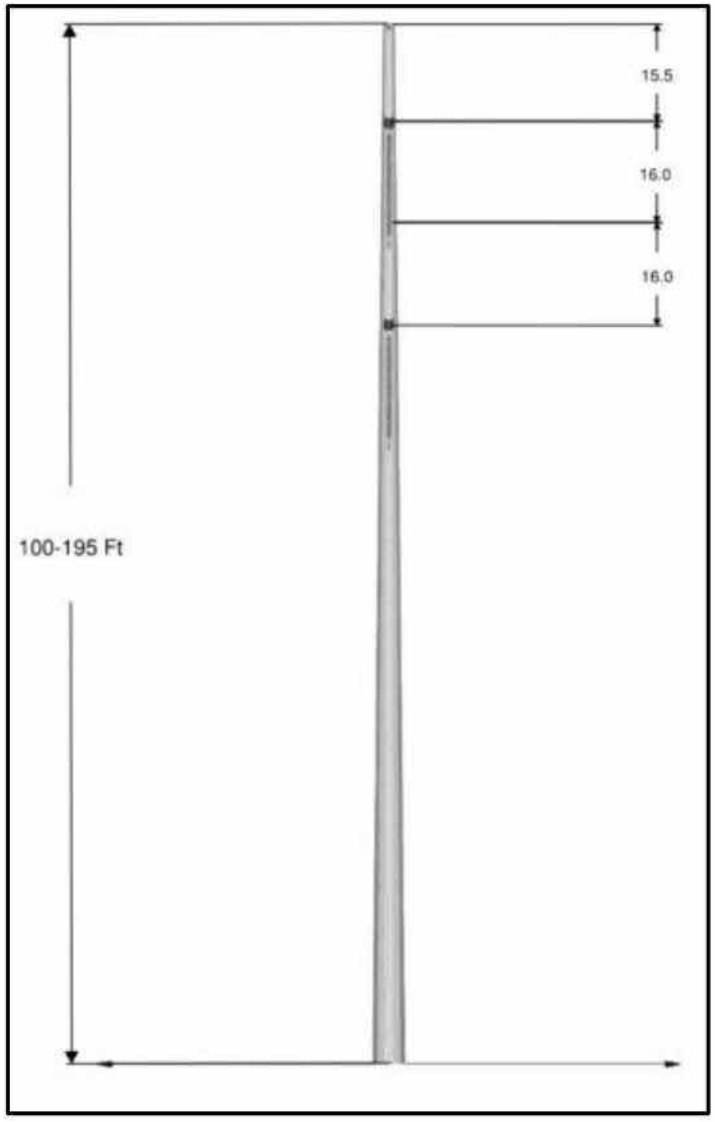

Figure 2. Single-Circuit 500-kV Monopole Tangent Structure (side)

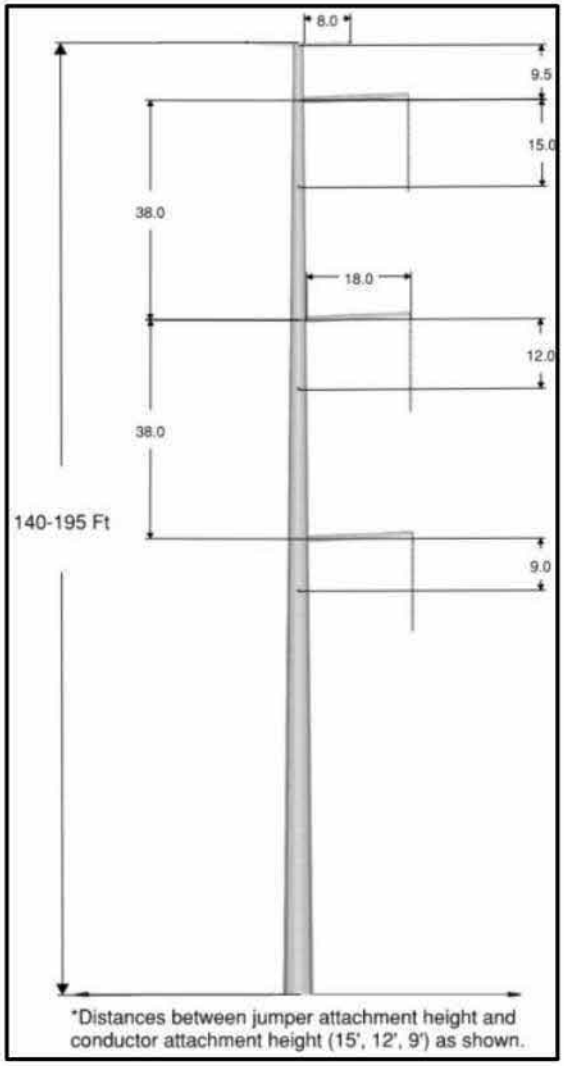

Figure 3. Single-Circuit 500-kV Monopole Dead-End Structure (front)

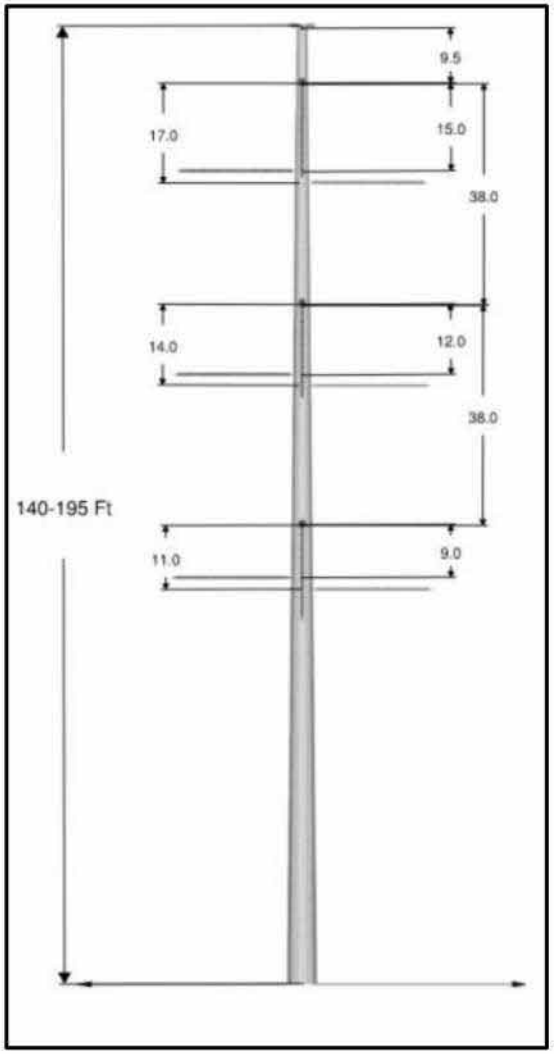

Figure 4. Single-Circuit 500-kV Monopole Dead-End Structure (side)

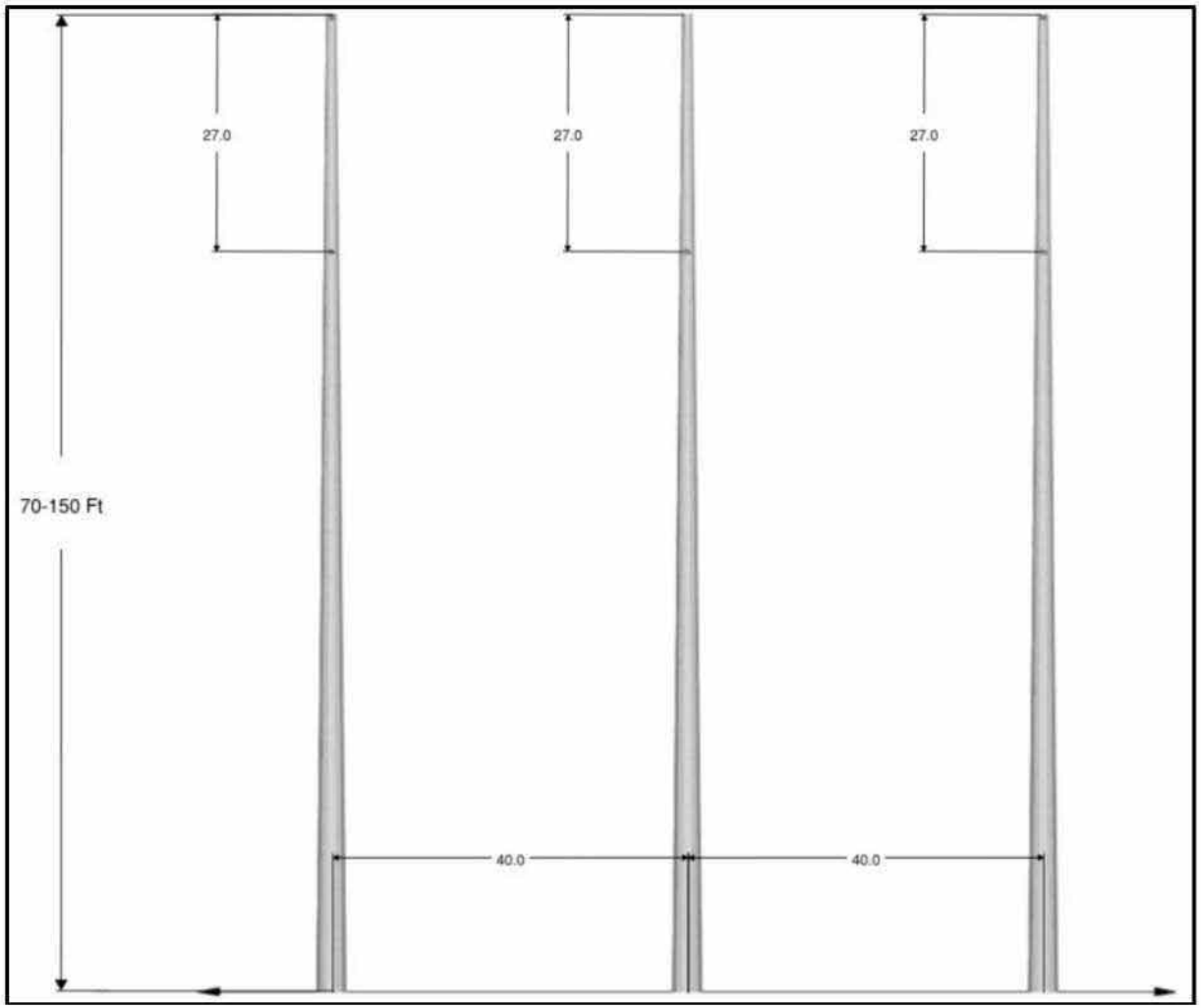

Figure 5. Single-Circuit 500-kV Three-Pole Dead-End Structure (front)

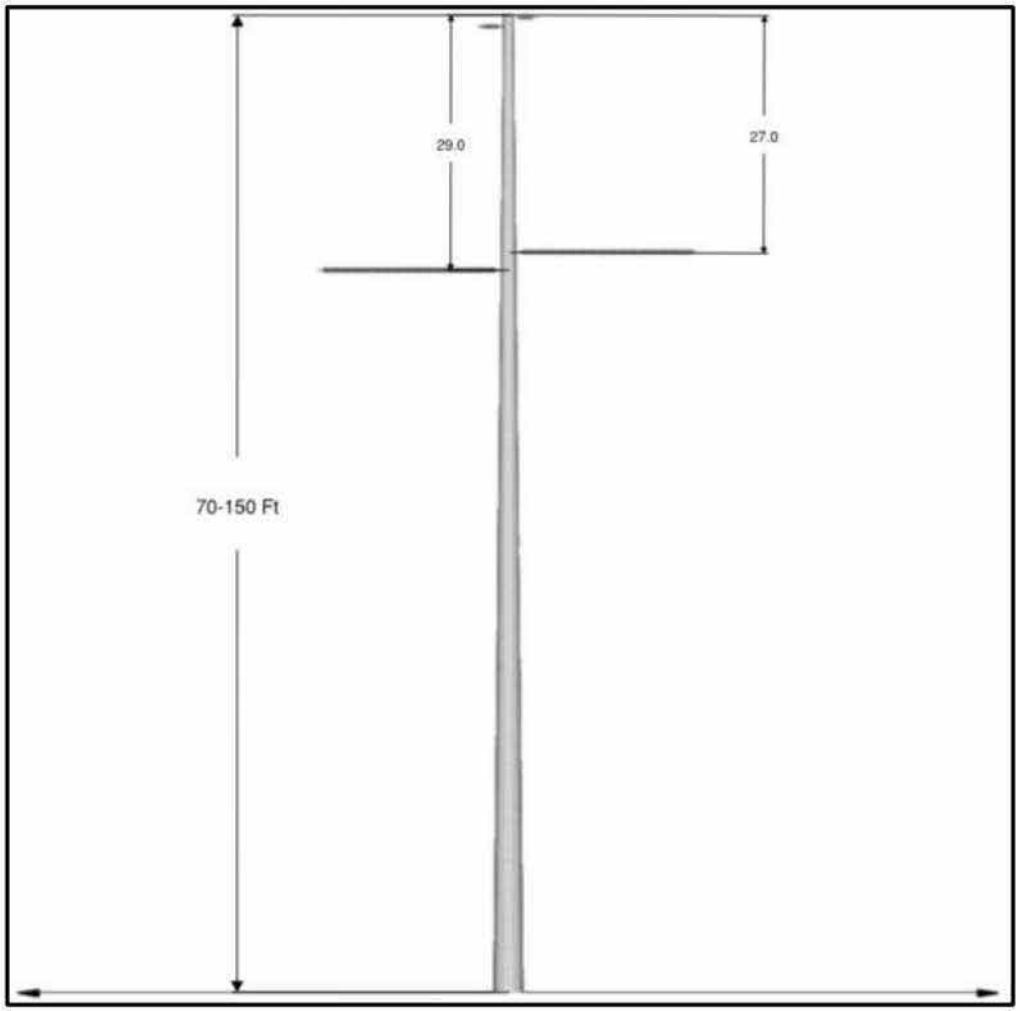

Figure 6. Single-Circuit 500-kV Three-Pole Dead-End Structure (side)

Exhibit H

Existing Plans

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Exhibit H
Existing Plans

As stated in the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1:

> To the extent applicant is able to determine, state the existing plans of the state, local governments and private entities for other developments at or in the vicinity of the proposed site or route.

Overview

As part of the land use study (detailed discussion provided in **Exhibit A, Location and Land Use Information**), general and site-specific plans were obtained from the respective jurisdictions, landowners, and developers. Furthermore, Vulcan Solar Project, LLC (Vulcan Energy Center) invited representatives from jurisdictional planning departments, local agencies, and developers to provide relevant planning information throughout the siting study process.

Jurisdictional and Agency General Plans

Existing and future land use information was reviewed for the 2-mile Study Area. The analysis is based on the most recently available data from various local and regional general or comprehensive plans, relevant to the Study Area and Geographic Information System (GIS) databases, including the following:

- Arizona State Land Department Resources Information System (ASLD 2025a)
- Arizona State Land Department Parcel Viewer (ASLD 2025b)
- Bureau of Land Management National Environmental Policy Act (NEPA) Register (BLM 2025)
- Maricopa County GIS Maps (Maricopa County 2025)
- Maricopa County Old U.S. Highway 80 Area Plan (Maricopa County 2007)
- Maricopa County Vision 2030 Comprehensive Plan (Maricopa County 2016)
- Maricopa County Zoning Ordinance (Maricopa County 2023)
- U.S. Geological Survey National Land Cover Database (USGS 2019)
- U.S. Geological Survey TopoView Interactive Topographic Map Viewer (USGS 2025)

On September 26, 2025, letters were sent to personnel at various federal, State, and local agencies, municipalities, and other stakeholders as appropriate to provide Project information and request new or additional information, plans, or planning development (**Table H-1;** refer to example letter in **Appendix H-1**). Reponses were requested by November 8, 2025. The only response that was received on December 3, 2025, from the Arizona Game and Fish Department (**Appendix H-2**). If additional responses are received after the filing date, they will be provided as supplemental exhibits.

Table H-1. Jurisdictions/Agencies/Entities Contacted

Contact Name	Title	Jurisdiction/Agency
Ginger Ritter	Project Evaluation Program Supervisor	Arizona Game and Fish Department
Amber Troidl	Rights-of-Way Section Manager	Arizona State Land Department
Robyn Sahid	Commissioner	Arizona State Land Department
Ruben Ojeda	Assistant Director, Real Estate Division	Arizona State Land Department
Jim Perry	Director, Real Estate Division and Deputy Commissioner	Arizona State Land Department
Taylor Suiter	Project Leader, Rights-of-Way	Arizona State Land Department
Tom Buschatzke	Director	Arizona Department of Water Services
Jason Spitzkoff	Manager, Transportation Engineering	Arizona Public Service
Timothy Dunn	Member of the Senate, District 25	Arizona State Legislature
Nick Kupper	Member of the House, District 25	Arizona State Legislature
Chad Turner	Superintendent	Arlington Elementary School Administration
Adrienne Mason	Director, Landowner Assistance and Information Rights-of-Way	El Paso Natural Gas Company, LLC, Western Pipelines
Dylan Sproul	Vice President, Land Services and Investment Sales	Transwestern Pipeline Company
Daren Sweet	Community Liaison for Maricopa County	Arizona Department of Environmental Quality
Jen Pokorski	County Manager	Maricopa County
Joe Hester	Assistant Chief, Operations Section	Arizona Fire and Medical Authority
Adam Heflin	Executive Vice President and Chief Nuclear Officer	Palo Verde Generating Station
Carl Hamblin	Plant Manager	Mesquite Power Plant
Terry Nealy	Plant Manager	Capital Power, Arlington Valley Power Plant
*	*	Mesquite Solar – RWE
Natalie Currie	Solar Operations Manager	Sun Streams Solar Park
Chelsea McKinney	Project Manager	Bureau of Land Management, Lower Sonoran Field Office
Dayna Brown	Realty Specialist	Bureau of Land Management, Lower Sonoran Field Office
Derek Eysenbach	Project Manager	Bureau of Land Management, Lower Sonoran Field Office

Note:
* No contact was identified at Mesquite Solar – RWE.

References

Arizona State Land Department (ASLD). 2025a. *ASLD Resources Information System*. Available: https://land.az.gov/. Accessed July 21, 2025.

———. 2025b. *ASLD Parcel Viewer*. Available: http://gis.azland.gov/webapps/parcel/?loc=-112.8749,33.3185,13&layers=4,1,0. Accessed August 4, 2025.

Bureau of Land Management (BLM). 2025. *BLM NEPA Register: Vulcan Solar Project*. NEPA No. DOI-BLM-AZ-P020-2023-006-EIS. Available: https://eplanning.blm.gov/eplanning-ui/project/2024466/510. Accessed November 2025.

Maricopa County. 2007. *Old U.S. Highway 80 Area Plan*. Available: https://www.maricopa.gov/DocumentCenter/View/6618/Old US Highway 80 Area Plan PDF. Accessed August 4, 2025.

———. 2016. *Vision 2030 Maricopa County Comprehensive Plan* (MCCP). Planning and Development Department. Available: https://www.maricopa.gov/DocumentCenter/View/3786/Vision-2030-Maricopa-County-Comprehensive-Plan-PDF. Accessed July 15, 2025.

———. 2023. *Zoning Ordinance.* Planning and Development Department. Available: https://www.maricopa.gov/DocumentCenter/View/4785/Maricopa-County-Zoning-Ordinance-PDF. Accessed July 8, 2025.

———. 2025. GIS Maps. Planning and Development Department. Available: https://maricopa.maps.arcgis.com/apps/webappviewer. Accessed June 30, 2025.

U.S. Geological Survey (USGS). 2019. *National Land Cover Database*. Available: https://www.usgs.gov/centers/eros/science/national-land-cover-database. July 7, 2025.

———. 2025. *TopoView Interactive Topographic Map Viewer*. National Geologic Map Database, U.S. Department of the Interior. Available: https://ngmdb.usgs.gov/topoview/viewer/#11/33.3830/-112.8361. Accessed July 31, 2025).

Appendix H-1. Example Stakeholder Letter

AECOM

AECOM
7720 North 16th Street
Phoenix, AZ 85020
aecom.com

September 26, 2025

Amber Troidl, Rights-of-Way Section Manager
Arizona State Land Department
1110 W. Washington St.
Phoenix, AZ 85007

Re: Vulcan Interconnection CEC Project Notification

Vulcan Solar Project, LLC (Vulcan Solar), a wholly owned indirect subsidiary of NextEra Energy Resources, LLC, plans to construct the Vulcan Interconnection CEC Project (Project) near the community of Arlington in unincorporated Maricopa County, Arizona (**Figure 1**). The Project will include a new, approximately 4.3-mile-long, 500-kilovolt (kV), generation-tie transmission line (gen-tie) that will deliver power from a proposed 800 megawatts (MW) solar facility, 800 MW battery energy storage system (BESS) facility, and a new on-site substation to the existing 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) corridor. The existing Hassayampa Switchyard is co-owned by several Arizona and California utility companies. The ROW would occur on both State Trust land under Arizona State Land Department jurisdiction and Maricopa County jurisdiction. Further information about the Project is available at: https://www.nexteraenergyresources.com/vulcan-solar.html.

The Project requires an Arizona Corporation Commission (ACC) Certificate of Environmental Compatibility (CEC), which will be reviewed by the Arizona Power Plant and Transmission Line Siting Committee (Siting Committee). The CEC application will evaluate pertinent resources within a two-mile radius (study area) of the Vulcan Interconnection Project, and the Siting Committee may approve of the extent to which the Interconnection Project can be sited (CEC Corridor). Vulcan Solar retained AECOM Technical Services Inc. (AECOM) to prepare various environmental studies to support the Project's CEC application.

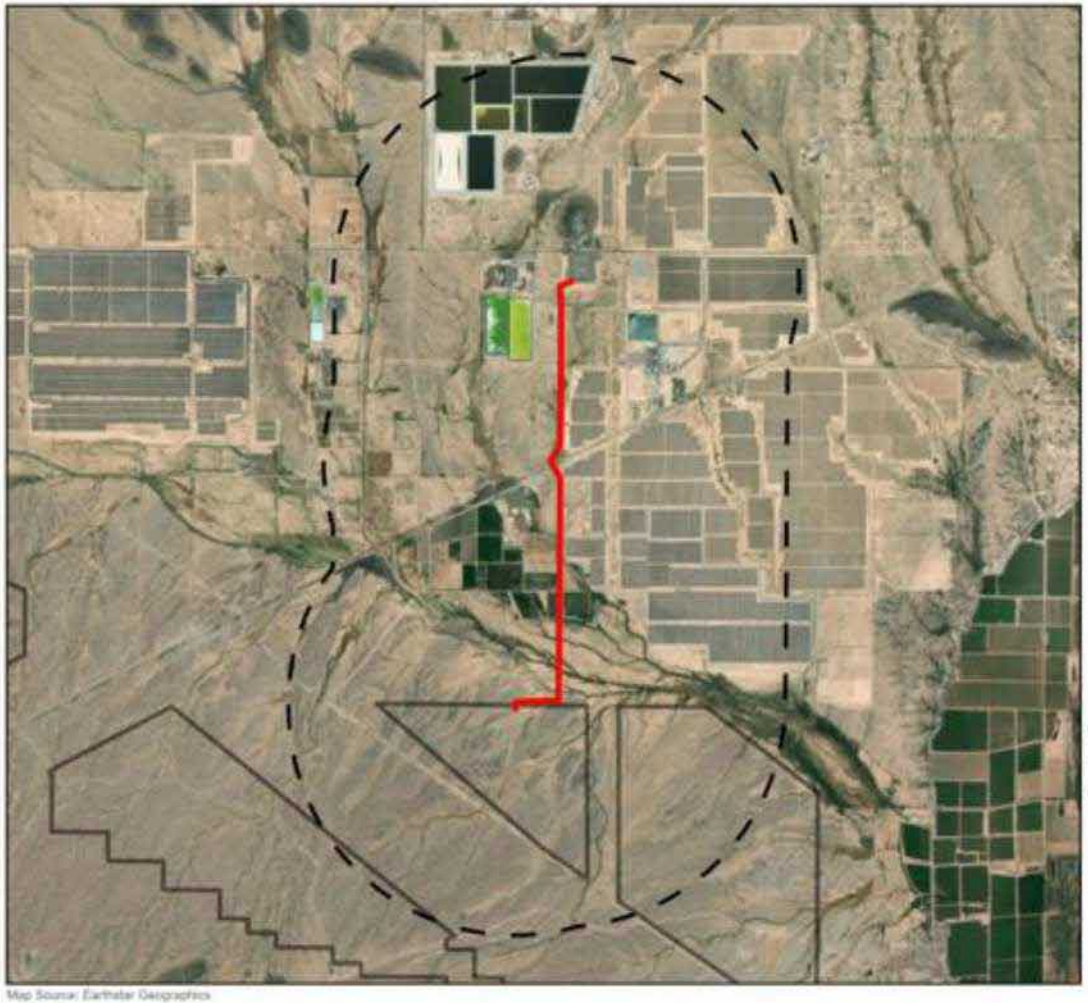
Arizona Administrative Code Rule R14-3-219 requires CEC applications to include an exhibit that identifies "the existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route." We welcome feedback from your organization to provide any information or comments regarding existing or future development plans near the Project Area for inclusion in the CEC application.

The Siting Committee will evaluate the CEC application at a public hearing in February 2026, and we respectfully request your response in writing (via email or letter), but you may also leave a voicemail, if preferred. To respond to this letter and/or submit any development plans to be included in the CEC application, please provide your comments by November 8, 2025, via phone at (800).487.3477, via email to vulcanenergycenter@nexteraenergy.com, or by physical mail: Attn: Mark Turner, AECOM 7720 North 16th Street, Suite 100, Phoenix, Arizona 85020. We look forward to receiving your input.

Respectfully,

Mark Turner
Senior Project Manager
AECOM Technical Services Inc.

Enclosure: Figure 1. Project Vicinity map



Map Source: Earthstar Geographics

Figure 1. Project Vicinity Map

Appendix H-2. Arizona Game and Fish Department Letter

December 3, 2025

Mr. Mark Turner
Senior Project Manager
AECOM Technical Services Inc.
7720 North 16th Street Suite 100
Phoenix, AZ 85020

Electronically submitted to vulcanenergycenter@nexteraenergy.com

RE: Vulcan Interconnection Project

Dear Mr. Turner:

The Arizona Game and Fish Department (Department) appreciates the opportunity to review the Vulcan Interconnection CEC Project (Project). The Department understands that Vulcan Solar Project, LLC, a wholly owned subsidiary of NextEra Energy Resources, LLC (NextEra) proposes to construct a 4.3-mile 500kV transmission line and associated infrastructure to deliver power from a proposed 800MW solar facility, 800MW battery energy storage system (BESS) facility, and a new on-site substation to the existing 500-kV Hassayampa Switchyard via a 200-foot wide right-of-way (ROW) corridor. The ROW would be located on Arizona State Land Department (ASLD) lands near the community of Arlington in unincorporated Maricopa County, Arizona, crossing undisturbed and partially disturbed Sonoran desert scrub habitat, as well as a segment of agricultural land.

Under Title 17 of the Arizona Revised Statutes, the Department, by and through the Arizona Game and Fish Commission, has jurisdictional authority and public trust responsibilities to conserve and protect the state fish and wildlife resources. In addition, the Department manages threatened and endangered species through authorities of Section 6 of the Endangered Species Act and the Department's Section 10(a)(1)(A) permit. It is the mission of the Department to conserve and protect Arizona's diverse fish and wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

The Department recognizes the importance of planning efforts to develop energy infrastructure that contributes to regional and state economic growth needs and would like to work closely with NextEra and AECOM Technical Services Inc. during the planning and development of this Project. The Department recognizes that appropriate coordination, proper planning, and voluntary implementation of best management practices allow projects to be developed that avoid, minimize, or offset potential impacts to wildlife and wildlife related recreation during development and operation of the facilities. For your consideration, the Department provides the

following comments based on the agency's statutory authorities, public trust responsibilities, and special expertise related to wildlife resources and recreation:

- Maintaining habitat connectivity is a priority for the Department, and wildlife movement corridors are important for wildlife to respond to changing environmental conditions. As noted in the Environmental Review Tool report (HGIS-25864) generated for this Project, a portion of the proposed transmission line crosses Centennial Wash. The Department recommends minimizing ground disturbance within the wash to maintain connectivity and minimize potential impacts to wildlife movement within these areas.
- The western burrowing owl, a special status species that is regulated under the Migratory Bird Treaty Act (MBTA), has been documented within three miles of the Project area. If suitable habitat is present, the Department recommends conducting occupancy surveys for this species to determine appropriate conservation measures. Guidelines for conducting this survey are found in *Burrowing Owl Project Clearance Guidance for Landowners*[1]. Please note that the survey should be conducted by a surveyor who is certified by the Department or has similar training and qualifications. If an active burrow is detected, please contact the Department for direction.
- The Sonoran desert tortoise, which is a federal and state species of special concern, has been documented within three miles of the Project area. If tortoises are detected during Project activities, please refer to the Department's *Sonoran Desert Tortoise Conservation Guidelines*[2] for guidance on handling tortoises and recommended measures to avoid, minimize, or offset impacts resulting from development activities.
- The Project site falls within the 10(j) designated, experimental nonessential recovery area for the endangered Sonoran pronghorn, and pronghorn have been documented within three miles of the Project area. If pronghorn are detected during Project activities, please notify the USFWS and the Department's Sonoran Pronghorn Program Lead (rgardner@azgfd.gov) as soon as possible.
- The Department recommends following the Avian Power Line Interaction Committee (APLIC) guidelines for new power lines, which can be found in the current versions of *Suggested Practices for Avian Protection on Power Lines* and *Reducing Avian Collisions with Power Lines*. Large bodied birds, such as hawks, owls, vultures, and eagles, may be vulnerable to line strikes and electrocution during construction and operation of power lines and substations; power poles can also serve as perches for large-bodied birds. These potential impacts can be avoided or minimized by following the APLIC guidelines which include designing the power lines with enough space between energized components to reduce the likelihood of a bird electrocution or installing bird flight diverters in sections of line where elevated bird strikes are anticipated (e.g. lines over water bodies or in the path of colonial roosting locations). The Department's Raptor Coordinator, who can be contacted at raptors@azgfd.gov or 623-236-7575, can provide further information on specific design features and best management practices.
- The Department recommends conducting surveys for nesting birds prior to vegetation removal and/or construction activities that occur during the breeding season, which is

[1] https://s3.amazonaws.com/azgfd-portal-wordpress/PortalImages/files/wildlife/nongame/eagles/BurrowingOwlClearanceProtocol_2009.pdf
[2] https://azgfd-portal-wordpress-pantheon.s3.us-west-2.amazonaws.com/wp-content/uploads/2025/01/16114611/Rubke-2024.-Sonoran-Desert-Tortoise-Conservation-Guidelines.pdf

generally January through June in this area. The vegetation within the Project area may provide nesting opportunities for avian species that are regulated under the MBTA, such as the Bendire's and LeConte's thrashers.

- If other wildlife are encountered during construction activities, the Department recommends moving them out of harm's way, no more than 0.25 mile outside the project boundary within similar habitat.
- If trenching or digging of large holes is necessary, the Department recommends trenching/digging and backfilling crews work closely together to minimize the amount of open trenches/holes at any given time. Where trenches or holes cannot be back-filled immediately, the Department recommends escape ramps be constructed in each hole and at least every 300 feet in trenches. Escape ramps can be short lateral trenches or wooden planks sloping to the surface, and ramp slopes should be less than 45 degrees (1:1). Trenches and holes that have been left open should be inspected and animals removed prior to backfilling.
- For any areas that would be fenced as part of this Project, please refer to the Department's *Wildlife Compatible Fencing Guidelines*[3] for information on how fencing impacts wildlife, ways to design fencing to prevent wildlife entanglement and impalement, and to ensure wildlife movement is not restricted. Department personnel are available to assist in determining appropriate fencing design and layout that will achieve its objective while reducing impact to wildlife.
- Artificial lighting could impair the ability of nocturnal animals to navigate (e.g., owls, migratory birds, bats, and other nocturnal mammals) and may affect wildlife behavior and populations (Davies et. al. 2013[4]). The Department recommends using only the minimum amount of light needed for safety. If feasible, "warmer" narrow spectrum lighting (amber, orange, red) is wildlife-friendly and should be used as often as possible to minimize the number of species affected by lighting. It is also beneficial that all lighting is shielded, canted, or cut to minimize the amount of upward shining light.
- To minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects, and pathogens, the Department encourages taking precautions to wash and/or decontaminate equipment before entering and leaving the site. See the Arizona Department of Agriculture's website[5] for a list of prohibited and restricted noxious weeds and the Arizona Native Plant Society[6] for recommendations on how to control them. To view a list of documented invasive species or to report invasive species in or near your project area, visit iMapInvasives[7], which is a national cloud-based application for tracking and managing invasive species.
    - Stinknet is a highly invasive winter weed native to South Africa, and is extremely flammable when dry. Stinknet (also known as globe chamomile) has heavily infested Maricopa, Pinal, and Pima counties and is expanding into Yuma, Yavapai, and Gila counties. Infestations spread rapidly along highways and open

[3] https://s3.amazonaws.com/azgfd-portal-wordpress/PortalImages/files/wildlife/planningFor/wildlifeFriendlyGuidelines/110125_AGFD_fencing_guidelines.pdf
[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3657119
[5] https://agriculture.az.gov/pestspest-control/agriculture-pests/noxious-weeds
[6] https://aznps.com/invas
[7] https://imap.natureserve.org/imap/services/page/map.html

fields in residential areas, with emergence starting in late November and plants continuing to germinate and emerge through May in wet years. In order to minimize the spread of this plant it is critical that any new infestations are identified and quickly managed. Additional information is available through the Southwest Vegetation Management Association[8] and the Sonoran Desert Cooperative Weed Management Area[9].

- The Department recommends revegetating disturbed areas with native drought-tolerant species that represent the natural surrounding landscape. Landscaping with native plants can help support wildlife and pollinator species in the area while reducing dust and erosion. In addition, the applicable land management agencies should be consulted regarding guidelines for revegetation efforts.

Thank you for the opportunity to provide input on the Vulcan Interconnection Project. For further coordination, please contact Teigan Williams at tstruck@azgfd.gov or 928-341-4069.

Sincerely,

Danielle Klaas

Danielle Klaas
Regional Supervisor, Region IV

cc: Callie Cavalcant – Habitat, Evaluation, and Lands Branch Chief

AZGFD #M25-11204430

[8] https://www.swvma.org/
[9] https://www.sdcwma.org/species/stinknet.php

Exhibit I

Anticipated Noise Emission Levels and Potential Interference with Communication Signals

Exhibit I

Anticipated Noise Emission Levels and Potential Interference with Communication Signals

As stated in the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1:

> Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities.

Exhibit I outlines common electrical and noise emissions associated with high-voltage transmission lines, encompassing phenomena such as audible sounds, corona discharges, and electromagnetic fields (EMFs). The following analysis describes typical audible noise emissions and radio noise levels that are anticipated during construction and operation of the Vulcan Interconnection Project (Project) in contrast with generally acceptable thresholds for emissions and radio noise levels. Typical television broadcast level (in megahertz [MHz]) compatibility also is evaluated.

The Project is an approximately 4.3-mile-long, single-circuit, alternating current, 500-kilovolt (kV) generation tie transmission line (gen-tie) that will deliver power from a proposed 800 megawatt (MW) solar and battery energy storage system (BESS) facility, and a new collector substation to the existing 500kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) within an approximately 540 to 4,737-foot-wide siting corridor. The Project Area is defined as the 200-foot-wide gen-tie ROW, and the Study Area for the environmental review is defined as a 2-mile radius around the Project Area. The requested CEC Corridor encompasses approximately 465.69 acres and measures approximately 21,736 feet long (4.12 miles) north to south, with a width varying between 540 and 4,737 feet east to west.

Audible Noise

Noise is any unwanted or intrusive sound that disrupts a preferred auditory environment. Sound travels in waves from a specific source and exerts a sound pressure level (referred to as sound level), which is measured in decibels (dB). A-weighted decibels (dBA) adjust for the human ear's sensitivity to different frequencies, ensuring that sound measurements reflect what people hear. Zero dBA corresponds roughly to the threshold of average human hearing, and 120 to 140 dBA corresponds to the threshold of pain. Human response to noise is subjective and can vary from person to person. Factors that can influence individual response include intensity, frequency, and time pattern of the noise; the amount of background noise before the intruding noise; and the nature of work or human activity that is exposed to the noise. **Table I-1** shows the average decibel levels for familiar noise sources and their corresponding sound levels in dBA.

Table I-1. Summary of Common Environments and Noise Sources in Terms of Decibel Sound Level

Common Outdoor Activities	Noise Level (dBA)	Common Outdoor Activities
	110	rock band
jet flyover at 1,000 feet		
	100	
gas lawnmower at 3 feet		
	90	
diesel truck at 50 feet at 50 miles per hour		food blender at 3 feet
	80	garbage disposal at 3 feet
noisy urban area, daytime		
gas lawnmower at 100 feet	**70**	vacuum cleaner at 10 feet
commercial area		normal speech at 3 feet
heavy traffic at 300 feet	**60**	
		large business office
	50	dishwasher in next room
quiet urban nighttime	**40**	theater, large conference room (background)
	30	library
quiet rural nighttime		bedroom at night, concert hall (background)
	20	broadcast/recording studio
	10	
	0	lowest threshold of human hearing

Note:
dBA = A-weighted decibels
Source: Caltrans 2013

Existing Sound Levels

Guidance was developed by the American National Standards Institute (ANSI) on typical background noise levels associated with various land use types (ANSI 2013). This guidance was used to assess acoustic conditions in the Study Area. These standardized estimates are widely used in environmental noise assessments, especially in areas where long-term sound level monitoring may be limited, or where baseline conditions need to be approximated. For locations categorized as “very quiet suburban and rural residential,” ANSI identifies average daytime background noise levels of approximately 40 dBA and nighttime levels of about 34 dBA. These values reflect the low ambient sound conditions typical of rural settings with limited traffic, sparse development, and minimal commercial or industrial activity.

No ambient noise monitoring was conducted to provide precise sound levels near the Study Area. However, because the surrounding land primarily consists of low-density residential development, agricultural land, open desert, and energy production, the ANSI classification serves as a reasonable and conservative representation of existing baseline sound levels. These values were used as reference points in evaluating potential noise impacts associated with Project construction and operation.

Ambient noise in the Study Area is typical of rural areas where agricultural activities, energy production, and transportation are the primary contributors to the acoustic environment. The area is comprised of agricultural lands and open desert, which is privately owned, Arizona State Trust land managed by the Arizona State Land Department, or federal land administered by the Bureau of Land Management. The Study Area is a semi-developed rural area with existing utility infrastructure along with scattered agriculture. The nearest homes, which are considered noise-sensitive receptors because of their residential character and the rural ambient soundscape, are 2.3 miles west and east of the Study Area.

Anticipated Noise during Project Construction

Construction noise that would be generated by the Project would be intermittent and temporary. The heavy equipment that would be used for clearing and grading (access roads and structure sites), assembly and erection of structures, and conduit pulling and splicing would generate noise. This equipment would include cranes, trucks, and tractor graders. **Table I-2** shows typical construction equipment noise levels at a distance of 50 feet. These values assume that the equipment is operating at full power.

Table I-2. Typical Construction Equipment Noise Levels

Equipment Type	Noise Level (L_{max}, dBA) at 50 Feet
backhoe, generators	80–82
crane, scrapers	83–85
backhoe, front-end loader, concrete truck/mixer	80–85

Notes:
dBA = A-weighted decibels; L_{max} = maximum noise level
Source: Federal Transit Administration 2018

The typical noise 50 feet from a construction site would be 85 dBA. The propagation of noise depends on many factors, including atmospheric conditions, ground cover, and the presence of any natural or manufactured barriers. As a general rule, noise decreases by approximately 6 dBA with every doubling of the distance from the source. The maximum noise levels at various distances from the construction site and at the closest noise-sensitive receptors are shown in **Table I-3**.

Table I-3. Predicted Noise near Construction Activities

Distance from Construction Site	Predicted Maximum Noise Level (L_{max}, dBA)
50 feet	85
100 feet	79
200 feet	73
400 feet	67
800 feet	61
11,800 feet *(closest residence to construction work area)*	37
12,300 feet *(closest residence to gen-tie line)*	37

Notes:
dBA = A-weighted decibels; L_{max} = maximum noise level

Construction of the gen-tie is expected to take 5 to 6 months. Noise from construction activities occasionally may be audible, particularly to the closest residents (12,300 feet) from the gen-tie. However, the noise would not be considered a major impact because nearly all construction activities would occur during daylight hours, when tolerance to noise is higher.

Noise during Operation

Corona

Corona is a discharge resulting from ionization of the air surrounding a conductor and caused by a voltage gradient, which exceeds the breakdown strength of air. Corona is a function of the voltage gradient at the conductor surface. This voltage gradient is controlled by engineering design and a function of voltage, phase spacing, the height of conductors above the ground, phase geometry, and meteorological conditions. In particular, irregularities on the surface of the conductor (e.g., nicks, scratches, contamination, insects, water droplets) increase the amount of corona discharge. Consequently, during periods of rain and foul weather, corona discharges increase. Corona represents power loss on the transmission line and creates transmission line noise.

Certain corona-related effects are associated inherently with overhead transmission facilities. Potential corona effects include audible noise, radio interference (RI), and television interference (TVI). These particular effects are minimized by construction practices and line location and design.

Transmission Line Audible Noise

The Project would involve a 500-kV transmission line established within a 200-foot ROW. Although corona noise modeling has not been conducted for the Project, the results of the noise modeling that were completed for the 500-kV Boardman to Hemingway Transmission Line Project in eastern Oregon and western Idaho can be used as proxy[1] (Idaho Power 2013).

The primary consideration in using modeling results from the 500-kV Boardman to Hemingway Transmission Line Project as a representative dataset for the Project was the similarities in infrastructure. Both projects involve 500kV transmission lines, suggesting comparable technical designs and functional parameters. Based on the noise modeling results from the 500-kV Boardman to Hemingway Transmission Line Project, we concluded that the noise levels from operation of the transmission line outside the ROW would be lower than the assumed daytime background noise levels (40 dBA) for the Project.

Another significant factor supporting this justification would be the elevation of the two projects. The Boardman to Hemingway transmission line was modeled at an elevation of 5000 feet, significantly higher than the 850-foot average elevation of the Project. Elevation would play a crucial role in corona noise generation, with higher elevations typically experiencing increased corona effects because of the reduced density of the atmosphere compared to sea level. Using the relationship A/300, where A represents the elevation in meters above sea level, we determined that the corona noise at 600 meters (1,969 feet) elevation would be double that at 300 meters

[1] The corona noise modeling for the 500-kV Boardman to Hemingway Transmission Line Project was conducted using the EMF Workstation: ENVIRO (version 3.52).

(985 feet) (EPRI 2005). Therefore, the corona noise produced from the Boardman to Hemingway transmission line would be higher than that of the Project because of the difference in elevation.

The results from the 500-kV Boardman to Hemingway Transmission Line Project showed various noise levels under different weather conditions, as shown in **Figure I-1**. Under fair weather conditions, the noise at the ROW edges was approximately 23 dBA, while in wet conditions, it increased to 48 dBA. The maximum noise observed within the ROW was 22 dBA in fair weather and surged to 53 dBA during wet conditions. For the closest residential receptors, approximately 2.3 miles east and west of the Study Area, and not accounting for the differences in elevation, corona noise during normal operations either would be indistinguishable from ambient sounds or inaudible, depending on the final siting of the gen-tie line.

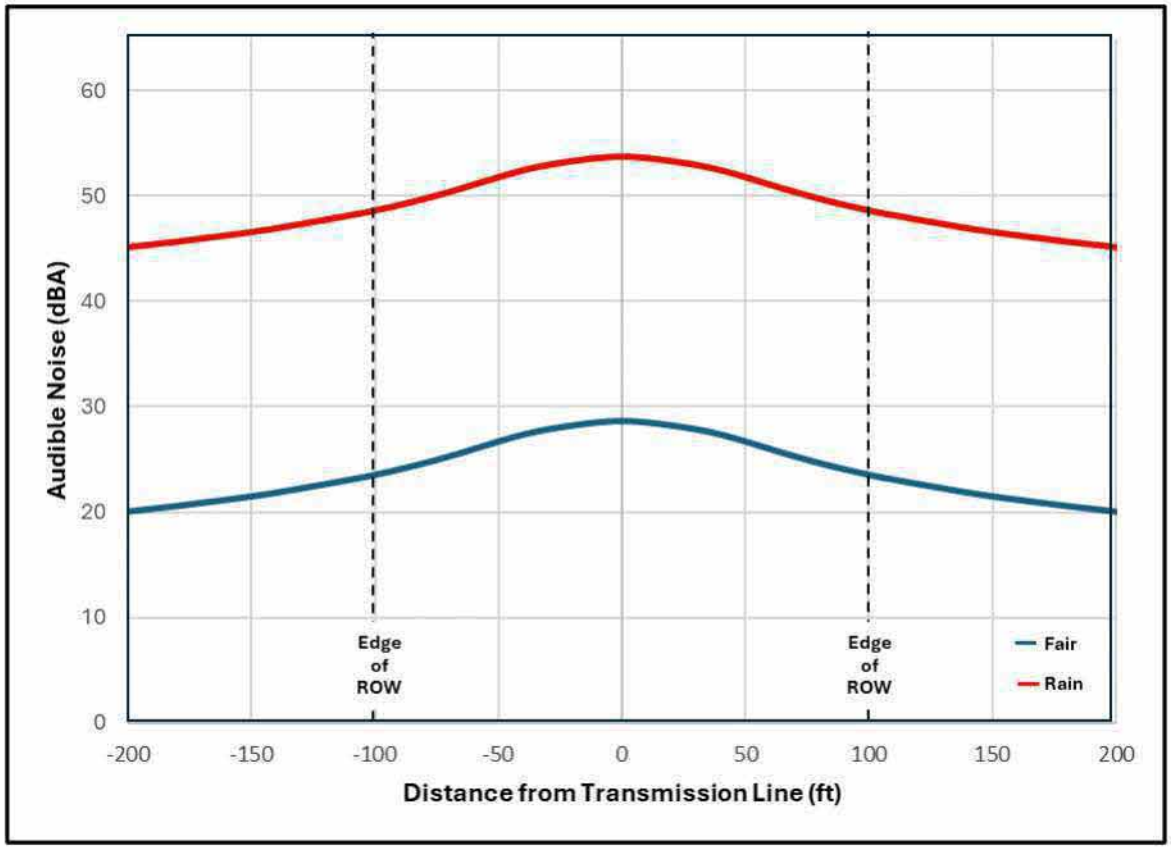


Figure I-1. Corona Audible Noise for a 500 kV Transmission Line

Radio Interference

RI is the reception of spurious energy not generated by the transmitting station. This energy affects the amplitude-modulated (AM) radio band but not the frequency-modulated (FM) radio band. Transmission line RI is caused by the corona noise and gap discharges. Gap discharges are electrical discharges across a small gap, with the most common cause being loose hardware, and they comprise a large percentage of all interference problems and are remedied easily. Experience shows that gap discharges are not a problem with steel structures but are more prevalent with wood structures because of the expansion and contraction of the wood, which causes the hardware to loosen.

The impact of corona-produced RI depends on various factors, including the distance from the line to the receiver, radio signal strength, ambient radio noise level, receiving antenna orientation, and weather conditions. A common practice of determining the expected level of RI is to calculate the transmission line RI at a frequency of 1 MHz.

Two active radio towers are within 10 miles of the Study Area. The closest is approximately 5 miles to the northwest, and the second tower is approximately 10 miles to the north along the Interstate 10 corridor (Tower Maps 2025). Generally, no problems occur with RI when calculated noise interference levels are below 40 dB at 100 feet from the outside phase (IEEE 1980). However, because interference is a function of radio signal strength and other factors, this is not a precise value, and unacceptable interference would not necessarily occur if levels for this line are above 40 dB at the prescribed distance. During inclement weather, transmission line noise levels would increase to levels in the range of 65 to 69 dB at 100 feet from the outside phase (average stable foul weather values). Although radio reception quality would be reduced near transmission lines during precipitation events, the impact is expected to be de minimis, based on the low frequency of inclement weather in the area and the existence of numerous high voltage lines, and substation equipment already in immediate vicinity.

Television Interference

TVI effects are similar to radio interference. Traditional analog television broadcasts occur in three ranges:

- 54–88 MHz (Channels 2–6)
- 174–216 MHz (Channels 7–13)
- 470–890 MHz (Channels 14–83)

Transmission line interference reduces with increasing frequency above 100 MHz. Consequently, TVI would affect only the lower Very High Frequency (VHF) band (Channels 2 through 6), and no interference would be experienced in the upper VHF (Channels 7 through 13) and Ultra High Frequency (UHF) bands (Channels 14 through 83), even during foul weather. Because expected TVI levels at the edge of the Project ROW are expected to be the same as the existing 500-kV/230-kV lines in the area, no transmission line-generated TVI is expected from the Project, even during periods of inclement weather.

In cases where transmission line-generated **TVI** has been found to be a problem, it generally is **from** induced voltage on fences, conductors, and hardware, adjacent to the **ROW**. In these situations, the interference can be corrected easily by grounding the objects, or by realigning, relocating, or providing higher gain television antennas.

Electric and Magnetic Fields

Electric fields occur throughout the world from a variety of sources and typically range from 12 to 150 kilovolts per meter (kV/m). For example, electric fields created by televisions and other video display units typically occur in the range of 20 kV/m. **Figure I-2** shows typical EMF levels and dissipation of this energy further removed from a transmission facility. For a standard 500-kV transmission line, the electric field directly beneath it is around 7.0 kV/meter.

Magnetic fields occur naturally. The magnitude of Earth's magnetic field ranges from 250 to 650 milligauss (mG) at its surface. Magnetic fields that occur under a transmission line typically occur in the range of 30 to 90 mG (refer to **Figure I-2**). EMFs dissipate rapidly with distance from the line, thus reducing the potential for signal interference.

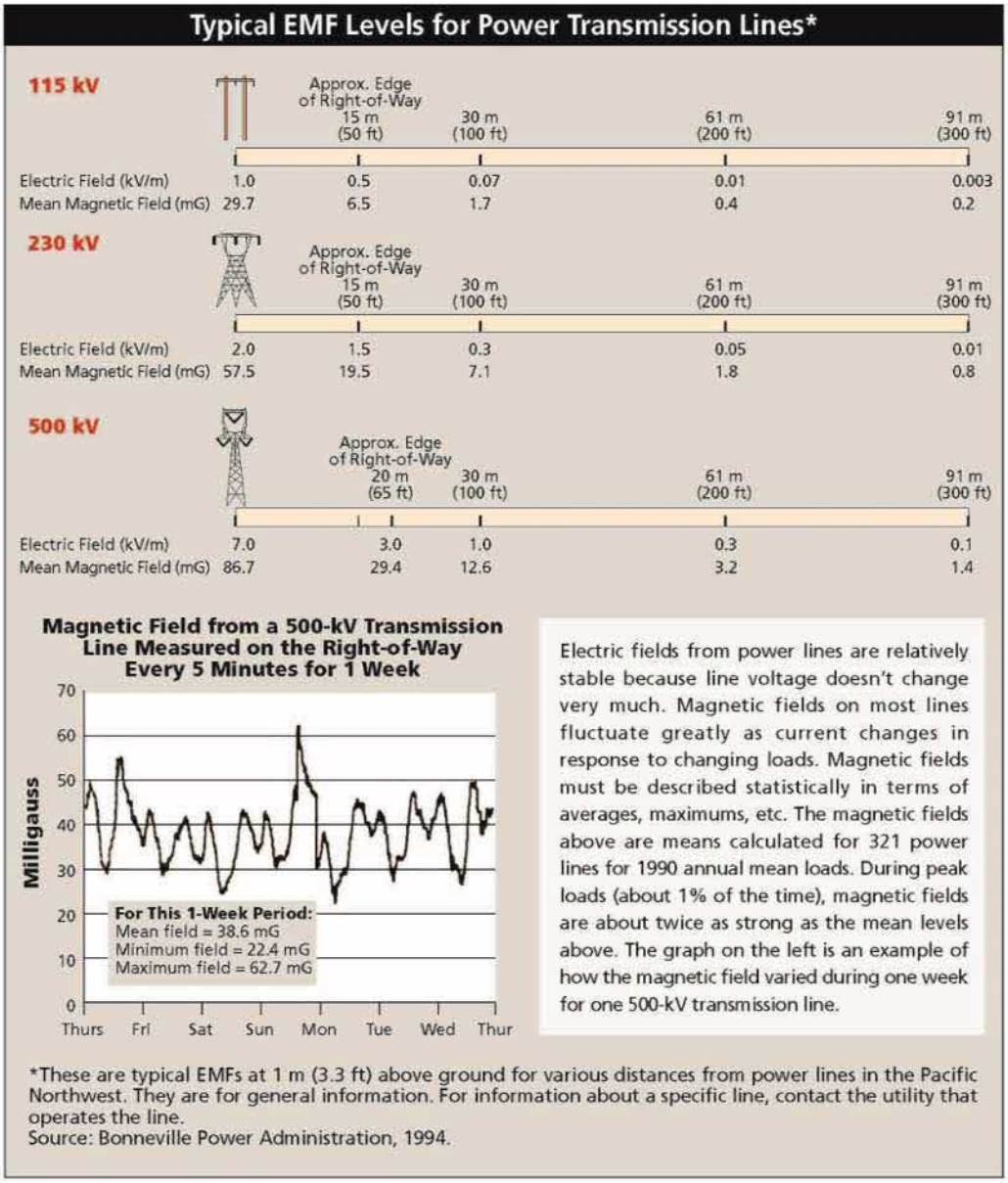


Figure I-2. Typical EMF Levels for Power Transmission Lines

Conclusions

Construction

Noise from Project construction occasionally may be audible, particularly to the closest residents (12,300 feet). However, the noise would not be considered a major impact because nearly all construction activities would occur during daylight hours when tolerance to noise is higher.

Operation

The Project's operational noise would be consistent with the existing noise-generating sources in the Study Area, including the Hassayampa Switchyard and 500-kV and 230-kV transmission lines. During operation, Project noise generally would be inaudible during typical (dry) meteorological conditions. Project noise that could be generated during precipitation events or major windstorms would be described best as a crackling or hissing sound that would cease after the conductors are dry. During maintenance or repair activities, momentary noise could be generated from vehicles driving along the access roads. No significant noise impacts are expected from Project operations.

Radio and Television Interference

Transmission lines do not materially impact radio communications. FM radio is rarely affected by transmission lines. Radio interference potentially may impact the AM broadcast band, but only receivers immediately adjacent to the gen-tie would have the potential to be affected by the Project during rainy weather, which is uncommon in this region. Overall, no material radio interference is expected to be caused by the Project because of the electrical characteristics of the gen-tie, the remote nature of the Project location, and the existing electrical infrastructure in the area.

No significant impacts on radio or television reception are anticipated from Project construction and operation. Cellular phone antennae and microwave receivers commonly are mounted on transmission structures, to take advantage of the added height afforded by the structures, which demonstrates that transmission lines do not interfere with cellular phone tower operations or microwave communication paths.

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Exhibit J

Special Factors

Exhibit J
Special Factors

As stated in the Arizona Corporation Commission Rules of Practice and Procedure (R14-3-219), Exhibit 1:

> Describe any special factors not previously covered herein, which applicant believes to be relevant to an informed decision on its application.

Introduction

This exhibit includes information regarding the public and agency involvement program that was conducted in support of the application of Vulcan Solar Project, LLC (hereinafter, Vulcan Energy Center) for a Certificate of Environmental Compatibility (CEC) for the Vulcan Interconnection Project (Project). The outreach efforts provided information to agencies and individuals, solicited feedback on the Project and information on the Study Area[1], helping to identify potential issues related to the Project.

The public involvement program was initiated to provide affected jurisdictions, relevant agencies, and community residents with the opportunity to relay information or potential concerns relevant to the Project. To reach the affected residents and agencies, Vulcan Energy Center and AECOM (as a consultant to Vulcan Energy Center) instituted multiple public engagement initiatives including:

- a newsletter
- a website (http://vulcanenergycenter.com)
- an in-person open house
- a virtual open house (https://vulcaninterconnectioncec.com)
- social media advertisement
- a telephone hotline (1-800-484-3477) with voicemail
- a dedicated Project email to facilitate feedback from interested parties (vulcanenergycenter@nexteraenergy.com)

Various outreach materials were available in English and Spanish to promote inclusivity and make all Project-related information available and comprehensible to a wide range of residents.

Project Newsletter

Vulcan Energy Center prepared one bilingual newsletter to provide technical information to the public, which included the Project webpage address, the Project objective, information about the various methods to comment on the Project (e.g., via email or telephone), the date and location of the in-person open house, and otherwise how to become involved in the CEC process (**Appendix J-1**). The newsletter was mailed on September 26, 2025, and was circulated to residences and businesses within approximately 3 miles of the Project Area. Approximately

[1] The Study Area is defined as a 2-mile radius around the 200-foot-wide Project right-of-way.

460 copies of the newsletter were mailed. As of December 4, 2025, only one comment had been received via email in response to the newsletter (**Table J-1**).

Table J-1. Public Comment

No.	Date	Commenter	Notification Type	Issues / Comments	Concern / Topics	Response
1	10/01/2025	Janet Olsen	email	"I received information about your planned construction in Arlington, but the brochure failed to state where the construction will actually take place. Could you please provide more information about the location?"	Project Location	Mark Turner responded to Ms. Olsen on 10/06/2025. He provided a map of the Project location and information on the in-person open house that was occurring that week. No additional communication was received from Ms. Olsen.

Customer Email

A Project-specific email address (vulcanenergycenter@nexteraenergy.com) was established to collect comments from the public and allow the Project team to respond to all feedback received. As of December 4, 2025, only one e-mail had been received (refer to Table J-1). In addition, the Project received five advertisement e-mails. No response was provided to ads.

Project Website and Virtual Open House

A Project webpage and a virtual open house website specific to the CEC process were created and maintained to provide the public with a convenient way to access Project information. The websites are presented in both English and Spanish, to accommodate a broad audience and reflect the linguistic diversity of the neighboring community. Through the websites, viewers can access Project information, review environmental study results, view maps, and provide feedback through an email hyperlink. The virtual open house is compliant with Section 508 of the Rehabilitation Act of 1973, which requires electronic content, such as websites, to be accessible to all users regardless of disability. Examples of accessibility include keyboard navigation in addition to mouse options, optimization for screen readers, and high-level color contrast ratio to allow visual content to be interpreted easily.

The virtual open house and the Project webpage URLs were included in the newsletter and the social media post. The Project website went live on September 23, 2025; it was viewed by 530 unique users and had a total of 575 visits from its launch through December 2, 2025. Users viewed the content for an average of about 2 minutes. The main "Project Page" was the most visited page and served as the main entry point for all other content with 377 visits. The "Get Involved" and the "Get Informed" pages were the second and third most visited pages and had the strongest engagement rate, with 67 visits and 48 visits, respectively. Most visits to the Project webpage occurred through paid search (223 visits), other marketing channels from unspecified or miscellaneous sources (126 visits), and direct traffic (122 visits). Paid search refers to webpage visits that come from search engine advertisements, and direct traffic occurs when a user types in the Project webpage address manually. Overall, the user activity on the Project webpage was concentrated on a few key pages, with a mixed engagement across the rest of the Project webpage content. User traffic was driven heavily by paid search, unspecified sources, and direct access.

The virtual open house that was created for the Project was launched on September 26, 2025. According to Google analytics, the virtual open house had been viewed by approximately 194 visitors since its launch through December 18, 2025.

Screenshots of the Project webpage and virtual open house website are provided in **Appendices J-2** and **J-3**. Project virtual open house visitor analytics and city demographics analytics from September 26 to October 20, 2025, are included in **Appendix J-4**, and Project webpage analytics from September 23 through December 2, 2025, are included in **Appendix J-5**.

In-Person Open House

Vulcan Energy Center hosted an in-person open house at the Arlington Elementary School at 9410 South 355th Avenue in Arlington, Arizona, on October 8, 2025, from 4 to 8 p.m. The public was notified of the date and time of this open house through the Project newsletter and the social media post. During the open house, Vulcan Energy Center provided display boards with Project maps and details, and Vulcan Energy Center staff attended the event to allow the public to interact with the Project team one-on-one and to solicit feedback. A Spanish translator was present to provide clear communication of Project information, address any concerns or questions, and ensure that all comments were accurately understood and considered. Two members of the public who attended the open house were interested in the Vulcan Energy Center location. The open house visitors viewed the poster boards detailing the Project-specific details and the results of the environmental reports, but they did not leave any written comments. Comment sheets were provided for visitors, but no written comments were received. Photos of the in-person open house are provided in **Appendix J-6.**

Social Media

Vulcan Energy Center created a Project-specific Facebook post to reach a broad audience, engage with the community directly, and centralize Project updates. The Facebook post targeted users within ZIP codes 85322 and 85354, which encompass the Study Area and adjacent neighborhoods, and included a brief Project description and the date, location, and time of the in-person open house. The Facebook post also provided the Project's email address, telephone hotline number, the webpage, and listed the AECOM Phoenix office address as the location for submitting hard copies of questions, comments, or concerns about the Project.

Social media metrics are key measurements that evaluate the performance of online content. The most common metrics used to measure social media engagement are reach and impressions. Reach refers to the total number of unique people who saw the advertisement and impressions measure the total number of times the advertisement is shown, including multiple views by the same person. The Facebook post was uploaded on September 24, 2025, and still is displayed. The Facebook post reached 72,236 people and 152,737 in September and October 2025, respectively, and made 192,664 and 382,751 impressions in September and October 2025, respectively. The Facebook post received 16 likes, 0 comments, and 0 shares. A screenshot of the social media post is provided in **Appendix J-7**.

Newspaper Advertisement and Legal Notice

Vulcan Energy Center will place a legal notification in the *Arizona Republic* and *West Valley View* newspapers, announcing the Arizona Power Plant and Transmission Line Siting Committee CEC hearing, to be held from February 23 through February 27, 2026. Affidavits of publication and copies of the legal notifications will be provided after publication.

Public Outreach Comments

As of December 4, 2025, Vulcan Energy Center had received one comment from the public. All comments sent to Vulcan Energy Center are provided in Table J-1.

Appendix J-1. Project Newsletter


Return Address
Mailing Info
stamp
NEXTera ENERGY RESOURCES
Vulcan Interconnection CEC Project
Contact Us | Contáctenos
http://vulcanenergycenter.com/
vulcanenergycenter@nexteraenergy.com
800.484.3477

Vulcan Solar Project, LLC a wholly-owned indirect subsidiary of NextEra Energy Resources, LLC plans to construct a new generation-tie transmission line (gen-tie) located in Arlington, Arizona.

El Proyecto de Vulcan Solar, LLC una filial indirecta de propiedad exclusiva de NextEra Energy Resources, LLC, tiene previsto construir una nueva línea de transmisión conectada a la generación (gen-tie) en Arlington, Arizona.

Where can I learn more? | ¿Dónde puedo aprender más?

The Project includes:
A new, approximately 4.3-mile-long, 500 kilovolt (kV) generation-tie transmission line (gen-tie) that will deliver power from a proposed 800 megawatts (MW) solar facility, 800 MW battery energy storage system (BESS) facility and a new on-site substation to the existing 500-kV Hassayampa Switchyard via a 200-foot-wide right-of-way (ROW) corridor.

El proyecto incluye:
Una nueva línea de transmisión de 500 kilovoltios (kV) y aproximadamente 4,3 millas de longitud que transportará la energía generada por una planta solar de 800 megavatios (MW) , instalación de un sistema de almacenamiento de energía en baterías (BESS) de 800 MW y una nueva subestación in situ hasta la subestación existente de 500 kV de Hassayampa a través de un corredor de 200 pies de derecho de vía.

About this Project | Sobre este proyecto

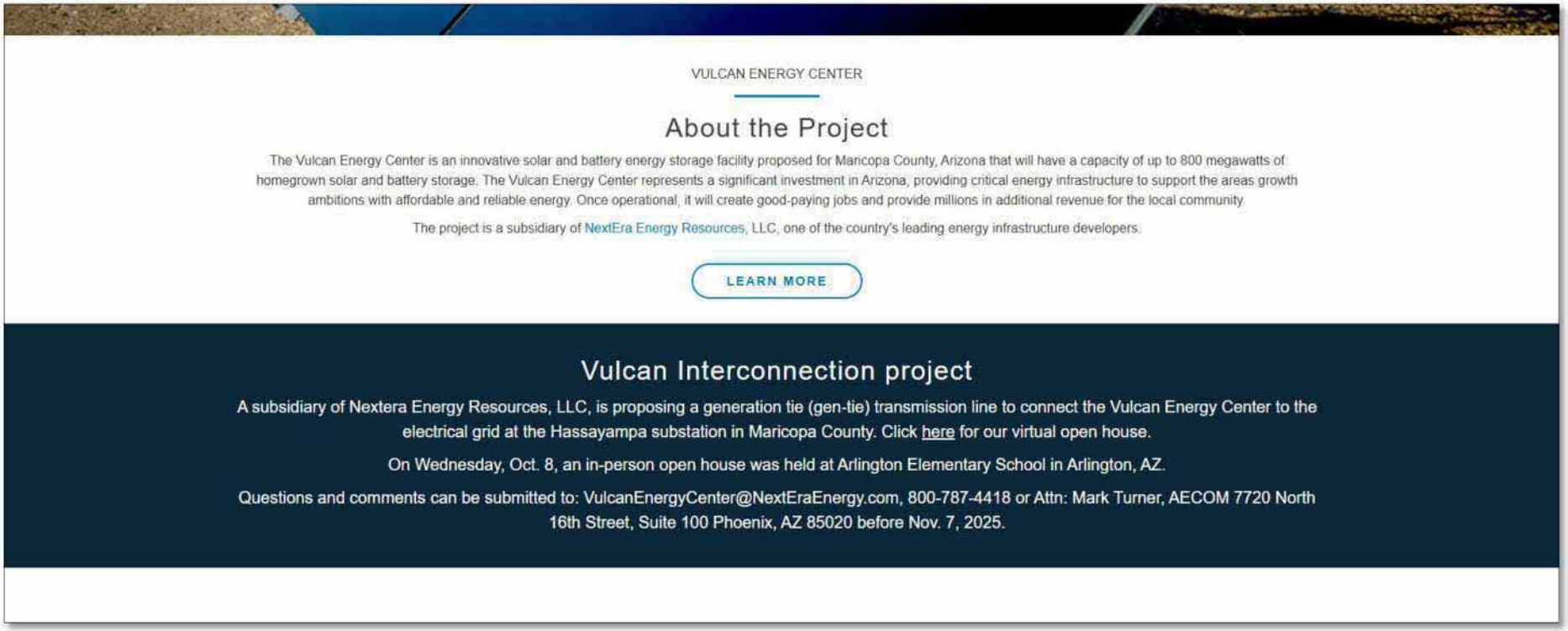
The gen-tie would connect the generation facility to the electrical grid via the existing Hassayampa Switchyard, which is co-owned by several Arizona and California utility companies The ROW would occur on both State Trust land under Arizona State Land Department jurisdiction and Maricopa County jurisdiction. The proposed Project requires a Certificate of Environmental Compatibility (CEC) to be approved by the Power Plant and Transmission Line Siting Committee of the Arizona Corporation Commission (ACC), as set forth in Arizona Revised Statutes (ARS) 40-360.

El gen-tie conectaria la instalación de generación a la red eléctrica a través del actual Hassayampa Switchyard, del que son copropietarias varias empresas de servicios públicos de Arizona y California. El derecho de vía se extenderia tanto por terrenos estatales bajo la jurisdicción del Departamento de Tierras del Estado de Arizona como por terrenos bajo la jurisdicción del condado de Maricopa.El proyecto propuesto requerirá un Certificado de Compatibilidad Ambiental (CEC, por sus siglas en inglés), que deberá ser aprobado por el Power Plant and Transmission Line Siting Committee de la Arizona Corporation Commission (ACC), tal y como se establece en los Estatutos Revisados de Arizona (ARS, por sus siglas en inglés) 40-360.

The Schedule | El calendario

Spring/Summer 2025	October 2025	January 2026	February 2026	March/April 2026
Environmental analysis	Community Open House and comment period begins	CEC application filed with the Arizona Corporation Commission	ACC Power Plant and Line Siting Committee CEC Hearing to review the gen-tie project	ACC ruling to authorize the construction and operation of the gen-tie project
Primavera/Verano 2025	**Octubre de 2025**	**Enero de 2026**	**Febrero de 2026**	**Marzo/abril de 2026**
Análisis medioambiental	Comienza el período de comentarios y la sesión informativa para la comunidad	Solicitud de la CEC presentada ante la Arizona Corporation Commission	Audiencia del CEC del Power Plant and Transmission Line Siting Committee de la ACC para revisar el proyecto de la gen-tie	Resolución de la ACC para autorizar la construcción y operación del proyecto de la gen-tie

Appendix J-2. Project Webpage


VULCAN ENERGY CENTER
About the Project
The Vulcan Energy Center is an innovative solar and battery energy storage facility proposed for Maricopa County, Arizona that will have a capacity of up to 800 megawatts of homegrown solar and battery storage. The Vulcan Energy Center represents a significant investment in Arizona, providing critical energy infrastructure to support the areas growth ambitions with affordable and reliable energy. Once operational, it will create good-paying jobs and provide millions in additional revenue for the local community.
The project is a subsidiary of NextEra Energy Resources, LLC, one of the country's leading energy infrastructure developers.
LEARN MORE
Vulcan Interconnection project
A subsidiary of Nextera Energy Resources, LLC, is proposing a generation tie (gen-tie) transmission line to connect the Vulcan Energy Center to the electrical grid at the Hassayampa substation in Maricopa County. Click here for our virtual open house.
On Wednesday, Oct. 8, an in-person open house was held at Arlington Elementary School in Arlington, AZ.
Questions and comments can be submitted to: VulcanEnergyCenter@NextEraEnergy.com, 800-787-4418 or Attn: Mark Turner, AECOM 7720 North 16th Street, Suite 100 Phoenix, AZ 85020 before Nov. 7, 2025.

Project Overview

The Vulcan Energy Center project creates jobs, economic growth and clean energy.

Map is representative of project location but is not to scale and the icon does not indicate actual project boundaries.

VULCAN ENERGY CENTER

800 Megawatts of Solar Energy and Battery Storage in Maricopa County, Arizona

For decades, NextEra Energy Resources' subsidiaries have been helping fuel America's economic growth and quality of life and moving our nation toward energy independence. To date, we operate solar projects in more than 30 states, including six other solar projects in Arizona. The energy storage component of this project uses batteries to store renewable energy and make it available even when the sun isn't shining, improving the reliability and efficiency of the electric grid and making more renewable energy available more hours of the day.

Features of the Vulcan Energy Center project:

- A next-generation renewable energy facility capable of delivering up to 800 megawatts (MW) of clean power through an integrated photovoltaic (PV) solar and battery energy storage system.
- The first phase of the Vulcan Energy Center project is scheduled to begin operations in late 2029.

COMMUNITY BENEFITS

Bringing Economic Opportunities

Solar projects generate home-grown, renewable energy, while preserving clean air and water. They can also generate significant economic benefits for the communities that host them.

County Tax Revenue

The Project provides millions* in additional revenue for Maricopa County, money that can enhance local roads, schools and services.

Want to Participate?

See how you can be a part of the Vulcan Energy Center project.

GET INVOLVED >

*Estimated over first 20 years of the project. All figures are estimated and subject to change.

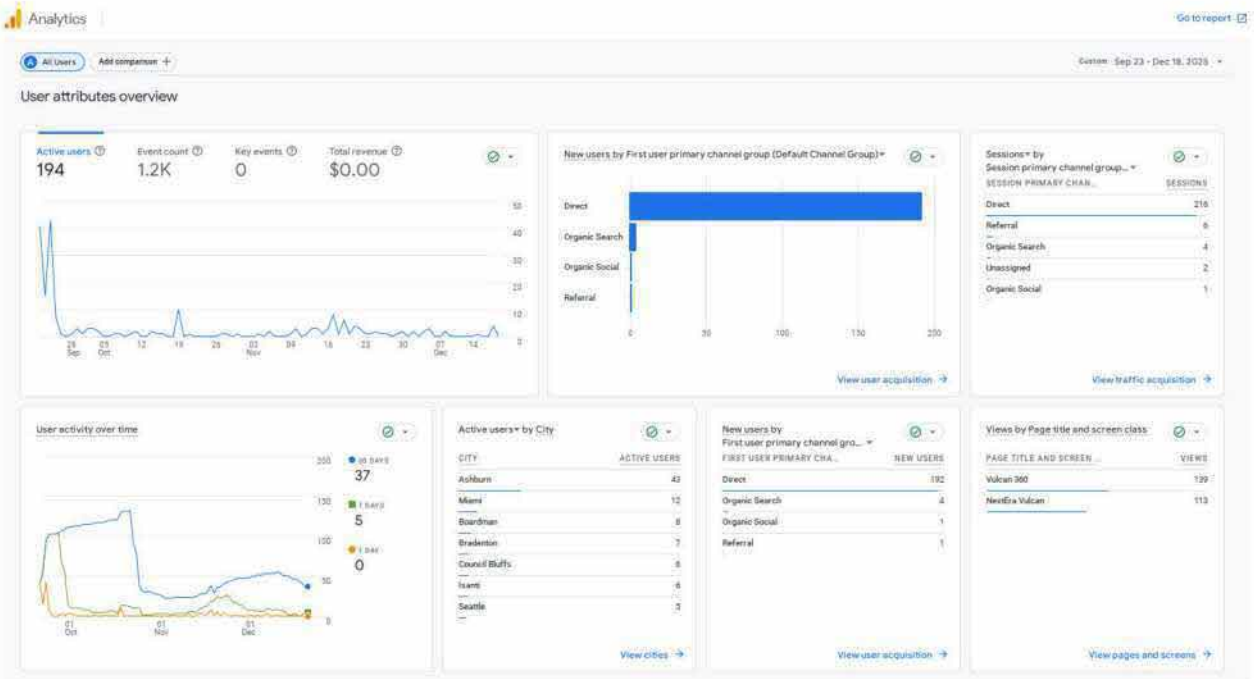
Appendix J-3. Virtual Open House


SOURCES
Public Outreach
Participación del público
Project Schedule
Cronograma Del Proyecto
WELCOME!
¡BIENVENIDO!

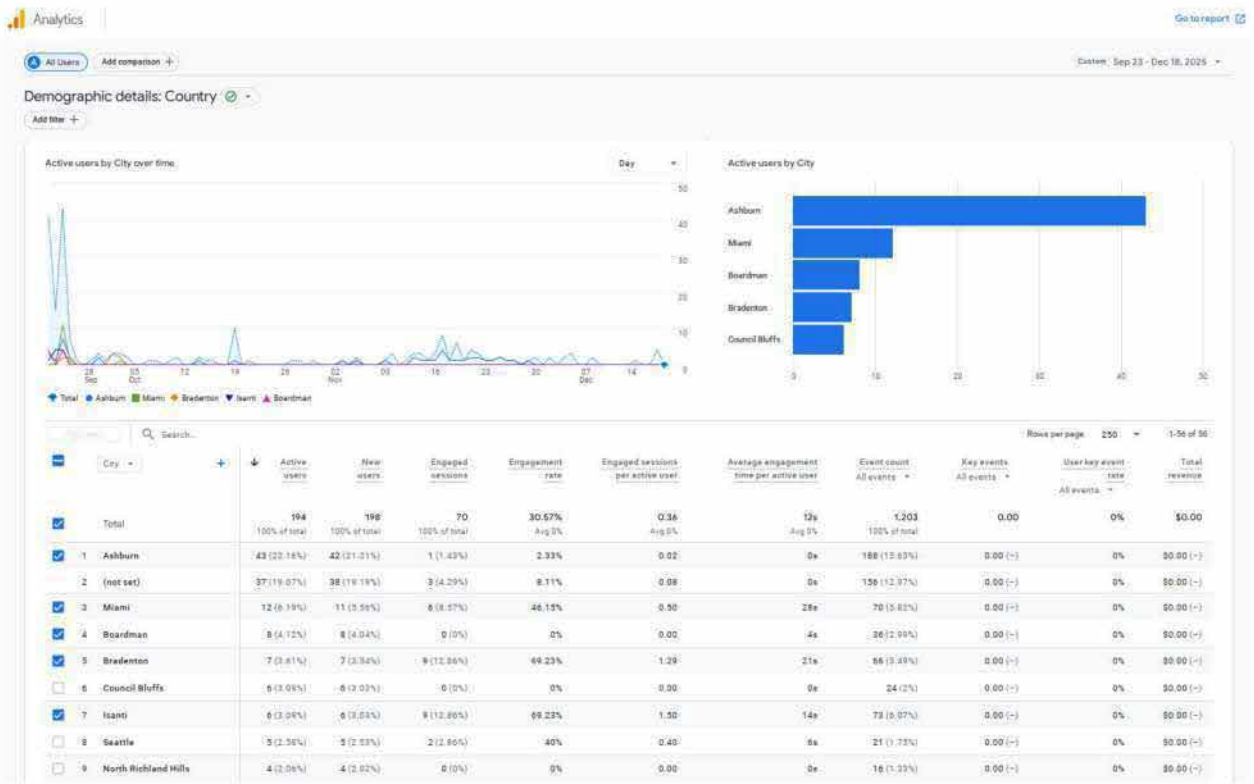

Visual Evaluation
Evaluación Visual
Day Time Visual Simulations
Simulaciones Visuales Diurnas
Biological Resources
Recursos Biológicos
Cultural Resources
Recursos Culturales

Appendix J-4. Virtual Open House Analytics

Virtual Open House Visitor Analytics (September 23 – December 18, 2025)



Virtual Open House City Demographic Analytics (September 23 – December 18, 2025)



Appendix J-5. Project Webpage Analytics

Pages / Content

Page	Page Views	Visits	Unique Visitors	Entries	Bounce Rate	% New Visits	% Return Visits	Average Time on Site
Vulcan Solar	377	327	299	308	63%	84%	16%	81
Vulcan Solar | Project	114	91	78	23	74%	64%	36%	139
Vulcan Solar | Get Involved	67	56	54	9	78%	84%	16%	62
Vulcan Solar | Get Informed	48	35	33	4	25%	74%	26%	23
Vulcan Solar | Contact	41	31	31	11	55%	87%	13%	47
Vulcan Solar | FAQ	28	25	25	7	71%	80%	20%	228
Vulcan Energy Center	5	5	5	5	60%	80%	20%	299
Vulcan Energy Center | Get Informed	4	3	3	2	0%	67%	33%	190
Vulcan Energy Center | Project	2	2	2	0		50%	50%	0
Total	686	575	530	369	53%	74%	26%	119

Visits by Marketing Channel

Marketing Channel	Visits
Paid Search	223
Direct	122
Natural Search	75
Internal	16
Facebook Organic	5
Social Networks - Organic	5
3rd Party Sites	3
Other	126
Total	575

Appendix J-6. In-Person Open House Photos


ARLINGTON
WILDCATS
HOME
VISITOR

Appendix J-7. Social Media Post

Vulcan Solar
September 24 ·

Save the date 14 Learn more about the Vulcan Interconnection project at Arlington Elementary School on Wednesday, Oct. 8 from 4 to 8 p.m. Residents are invited to stop b... **See more**

Learn more about the **Vulcan Interconnection Project**

A subsidiary of NextEra Energy Resources, LLC, is proposing a generation tie (gen-tie) transmission line to connect the Vulcan Energy Center to the electrical grid at the Hassayampa substation in Maricopa County.

Residents are invited to stop in and meet our team to learn more about the proposed project at the upcoming neighborhood meeting.

Wednesday, Oct. 8 from 4 to 8 p.m.
Arlington Elementary School
9410 South 355th Avenue, Arlington, AZ 85131

Questions and comments can be submitted to:
VulcanEnergyCenter@NextEraEnergy.com,
800-787-4418 or
Attn: Mark Turner, AECOM 7720 North 16th Street, Suite 100, Phoenix, Arizona 85020 before Nov. 7, 2025.

Learn more at: www.VulcanEnergyCenter.com

16