NATIONAL MEMORIAL CEMETERY OF ARIZONA GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

CITY OF PHOENIX, MARICOPA COUNTY, ARIZONA

VA PROJECT NO. 914CM3009

Habitat Assessment

Prepared For:

U.S. Army Corps of Engineers
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September 2015

JN: 147391

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The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.

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Biologist
Natural Resources

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September 2015

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APPENDIX

Appendix A Site Photographs
Appendix B Potentially Occurring Sensitive Biological Resources
Appendix C Flora and Fauna Compendium

LIST OF ACRONYMS

ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
AZGFD	Arizona Game and Fish Department
BGEPA	Bald and Golden Eagle Protection Act
Corps	United States Army Corp of Engineers
CWA	Clean Water Act
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
GIS	Geographic Information System
HabiMap	HabiMap Arizona
MBTA	Migratory Bird Treaty Act
Michael Baker	Michael Baker International
NCA	National Cemetery Administration
NEPA	National Environmental Policy Act
NMCA	National Memorial Cemetery of Arizona
NRCS	Natural Resources Conservation Service
OERT	Online Environmental Review Tool
OHWM	Ordinary High Water Mark
SGCN	Species of Greatest Conservation Need
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VA	Veterans Affairs
WSC	Wildlife Species of Concern

Section 1 Introduction

This report contains the findings of Michael Baker International's (Michael Baker) Habitat Assessment for the National Memorial Cemetery of Arizona Gravesite Expansion and Cemetery Improvements Project located in the City of Phoenix, Maricopa County, Arizona (project site or site). A habitat assessment was conducted by Michael Baker biologists Travis J. McGill, Ryan S. Winkleman, and Thomas C. Millington on June 24 and June 25, 2015 to verify existing site conditions and assess the probability of occurrence for sensitive[1] plant and wildlife species, as well as sensitive habitats and jurisdictional waters that could pose a constraint to development of the proposed project site. Special attention was given to the suitability of the on-site habitat to support the Sonoran desert tortoise (*Gopherus morafkai = G. agassizii [Sonoran population]*), and other sensitive species identified by the Arizona Game and Fish Department's (AZGFD) Online Environmental Review Tool (OERT) and AZGFD's HabiMap Arizona online mapping tool (HabiMap) as potentially occurring on or within the general vicinity of the project site. The results of a delineation of jurisdictional waters reports, prepared under separated cover, and associated habitats is included in this report.

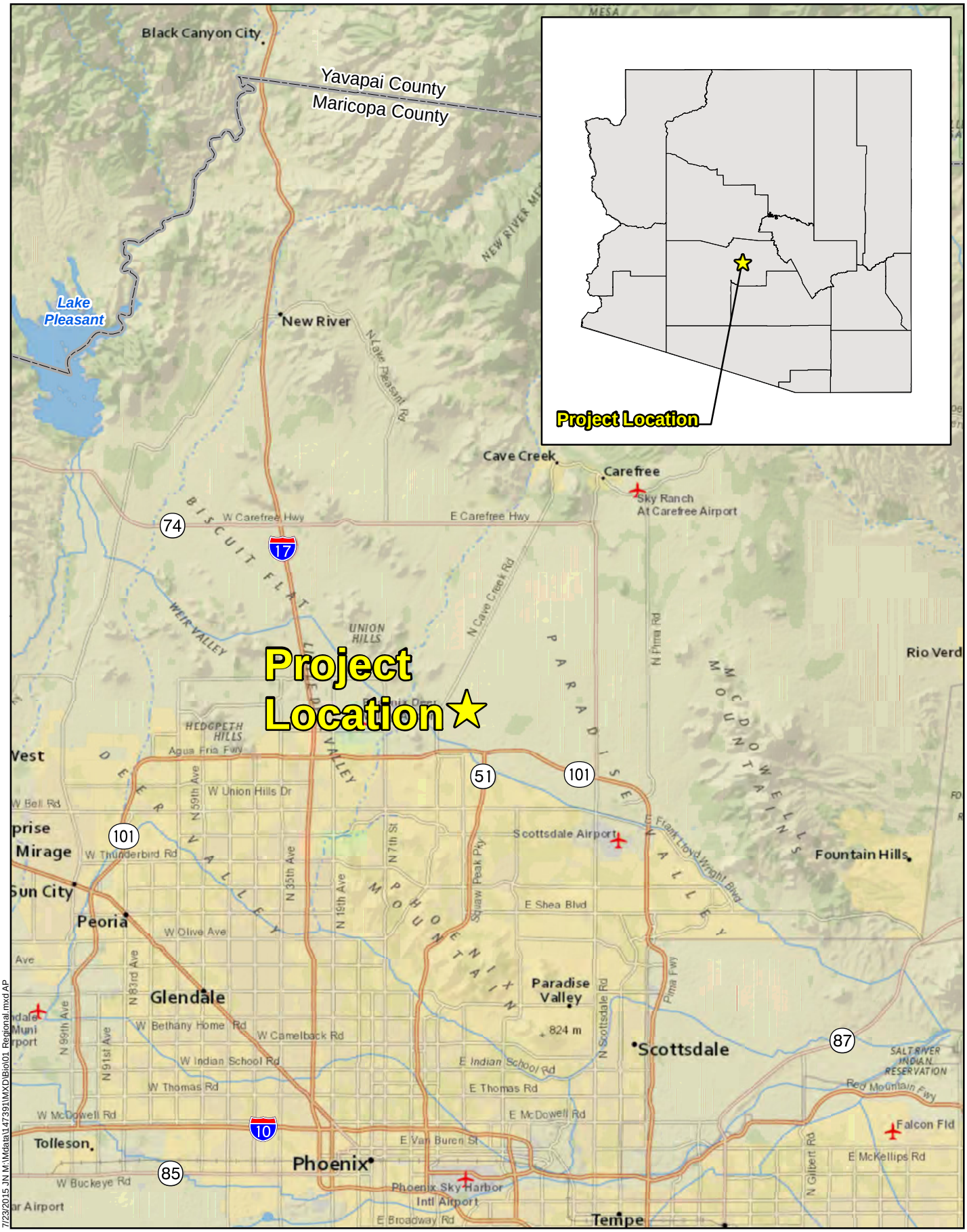
1.1 PROJECT LOCATION

The project site is generally located north of State Route 101 and east of Interstate 17 in the City of Phoenix, Maricopa County, Arizona (Exhibit 1, *Regional Vicinity*). The project site is depicted on the Union Hills quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series in Section 13 of Township 4 north, Range 3 east (Exhibit 2, *Site Vicinity*). Specifically, the project site is located south of Pinnacle Peak Road, west of North Black Mountain Parkway, north of East Deer Valley Road, and immediately east of the existing National Memorial Cemetery of Arizona (NMCA) (Exhibit 3, *Project Site*).

1.2 PROJECT DESCRIPTION

The United States Department of Veterans Affairs (VA) is proposing to implement the Master Plan, which includes improvements to the existing cemetery facilities, and to expand the existing NMCA by developing, operating, and maintaining the undeveloped 104 acres adjacent to and east of the existing cemetery site. Please refer to Exhibits 4A thru 4C for depictions of conceptual layout plans. As part of the master planning process the VA evaluated the physical, operational, and site-specific requirements of the proposed project, as well as cost, environmental issues, and other factors. The proposed project would provide approximately

[1] As used in this report, "sensitive species" refers to plant and animal species that are federally listed, proposed, candidates, or delisted; animals that have been designated by AZGFD as wildlife species of concern or as Tier 1a or Tier 1b species of greatest conservation need; and plant species that are protected under the Arizona Native Plant Law.



NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

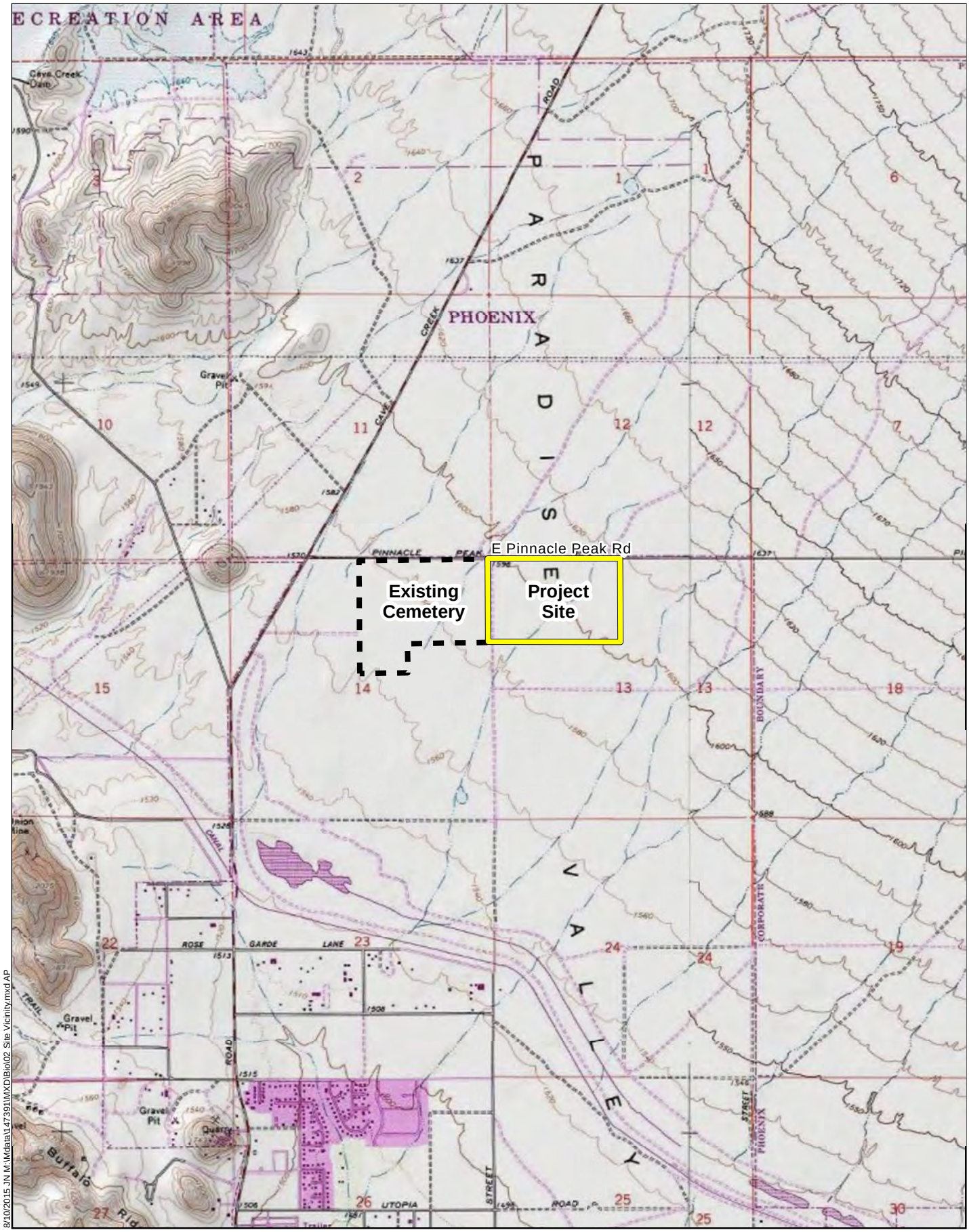
Michael Baker INTERNATIONAL

0 2.5 5 10 Miles

Source: ESRI National Geographic Basemap

Regional Vicinity

Exhibit 1



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NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

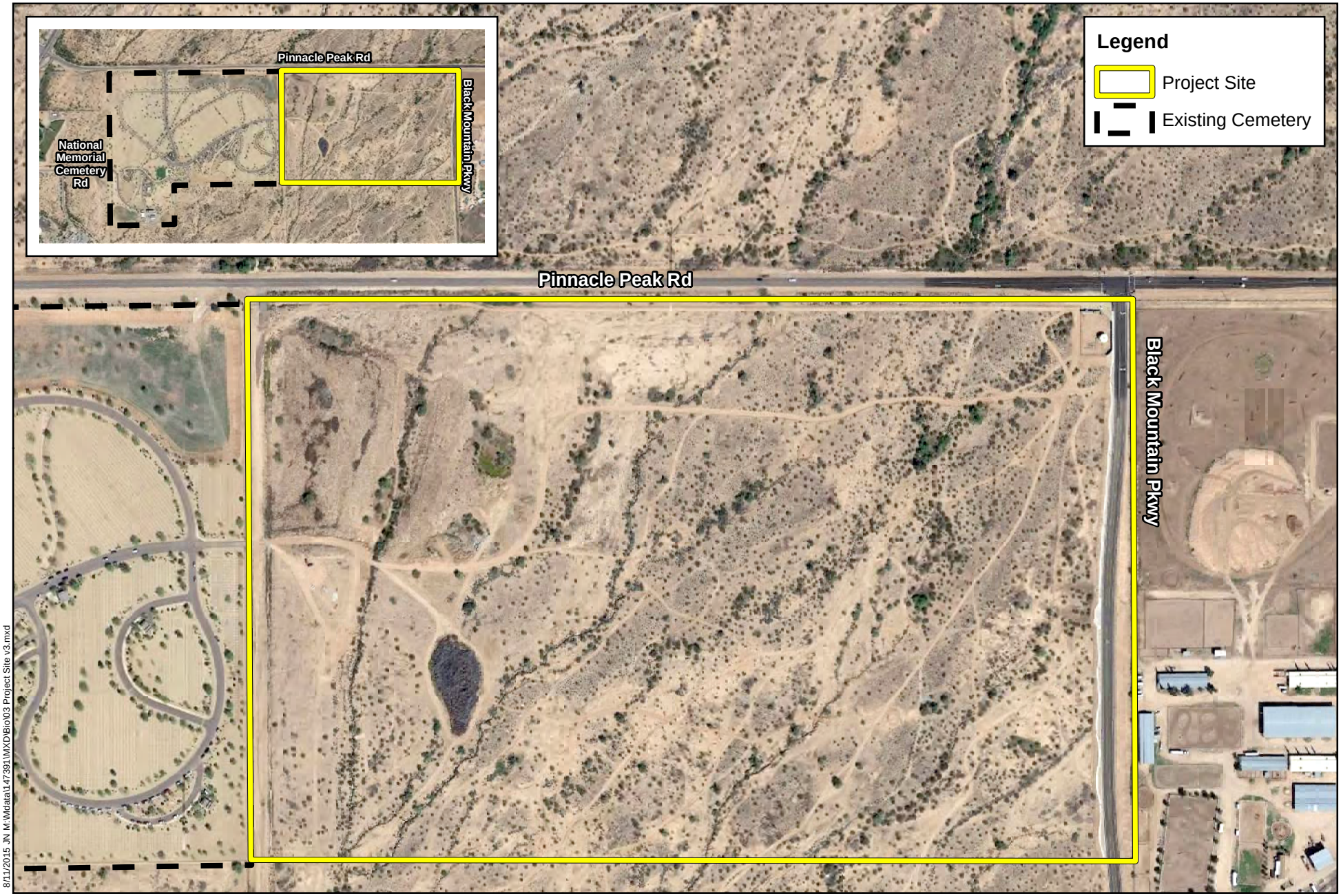
Michael Baker INTERNATIONAL

0 0.25 0.5 1 Miles

Source: ESRI World Topographic Basemap

Site Vicinity

Exhibit 2



8/11/2015 JN M:\Mdata\147391\MXD\Bio\03 Project Site v3.mxd

Michael Baker INTERNATIONAL

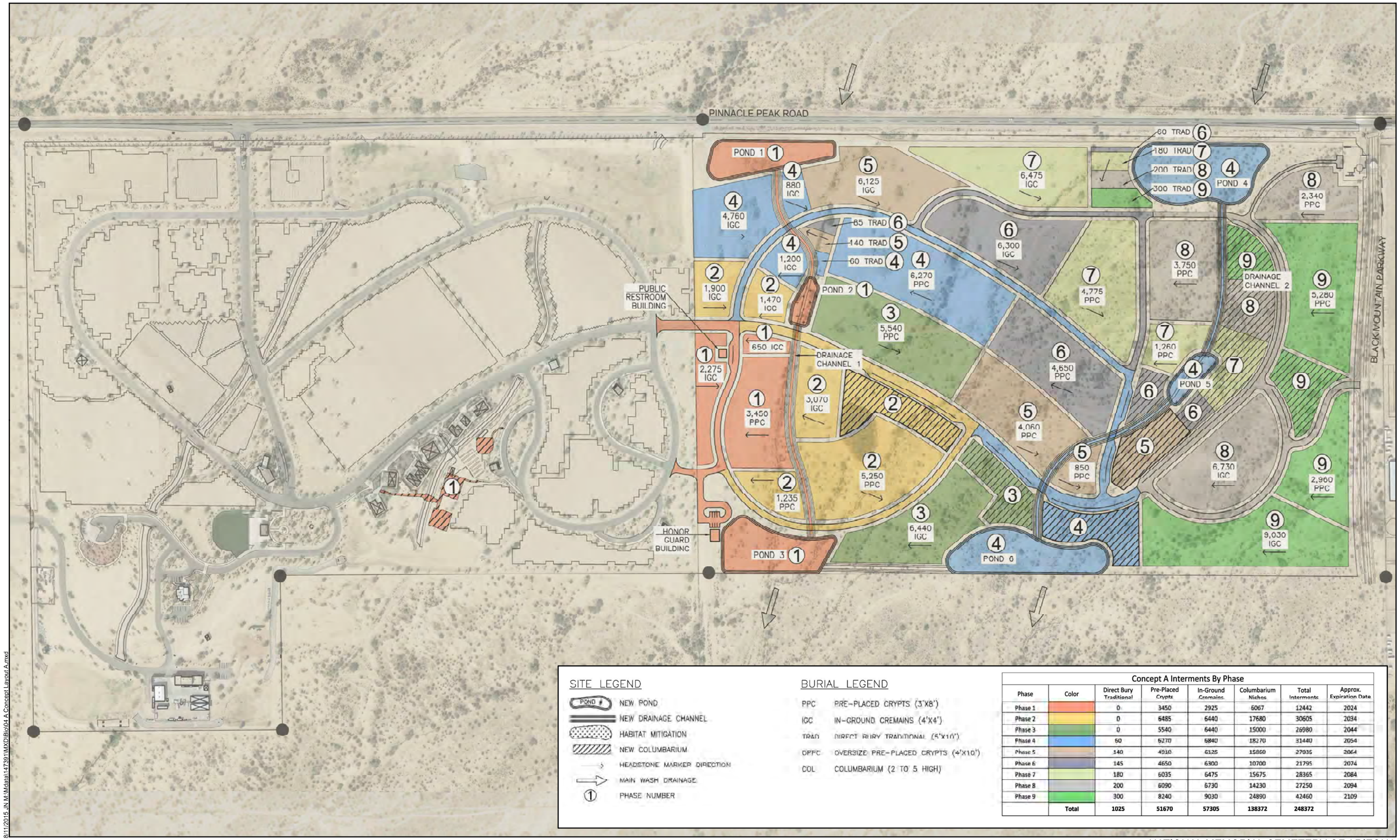
0 200 400 800 Feet

Source: Google Earth 2015

NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

Project Site

Exhibit 3



SITE LEGEND

- NEW POND
- NEW DRAINAGE CHANNEL
- HABITAT MITIGATION
- NEW COLUMBARIUM
- HEADSTONE MARKER DIRECTION
- MAIN WASH DRAINAGE
- PHASE NUMBER

BURIAL LEGEND

PPC	PRE-PLACED CRYPTS (3'X8')
IGC	IN-GROUND CREMAINS (4'X4')
TRAD	DIRECT BURY TRADITIONAL (5'X10')
OPPC	OVERSIZE PRE-PLACED CRYPTS (4'X10')
COL	COLUMBARIUM (2 TO 5 HIGH)

Concept A Interments By Phase

Phase	Color	Direct Bury Traditional	Pre-Placed Crypts	In-Ground Cremains	Columbarium Niches	Total Interments	Approx. Expiration Date
Phase 1		0	3450	2925	6067	12442	2024
Phase 2		0	6485	6440	17680	30605	2034
Phase 3		0	5540	6440	15000	26980	2044
Phase 4		60	6270	6840	18270	31440	2054
Phase 5		140	4010	6125	15860	27035	2064
Phase 6		145	4650	6300	10700	21795	2074
Phase 7		180	6035	6475	15675	28365	2084
Phase 8		200	6090	6730	14230	27250	2094
Phase 9		300	8240	9030	24890	42460	2109
	Total	1025	51670	57305	138372	248372	

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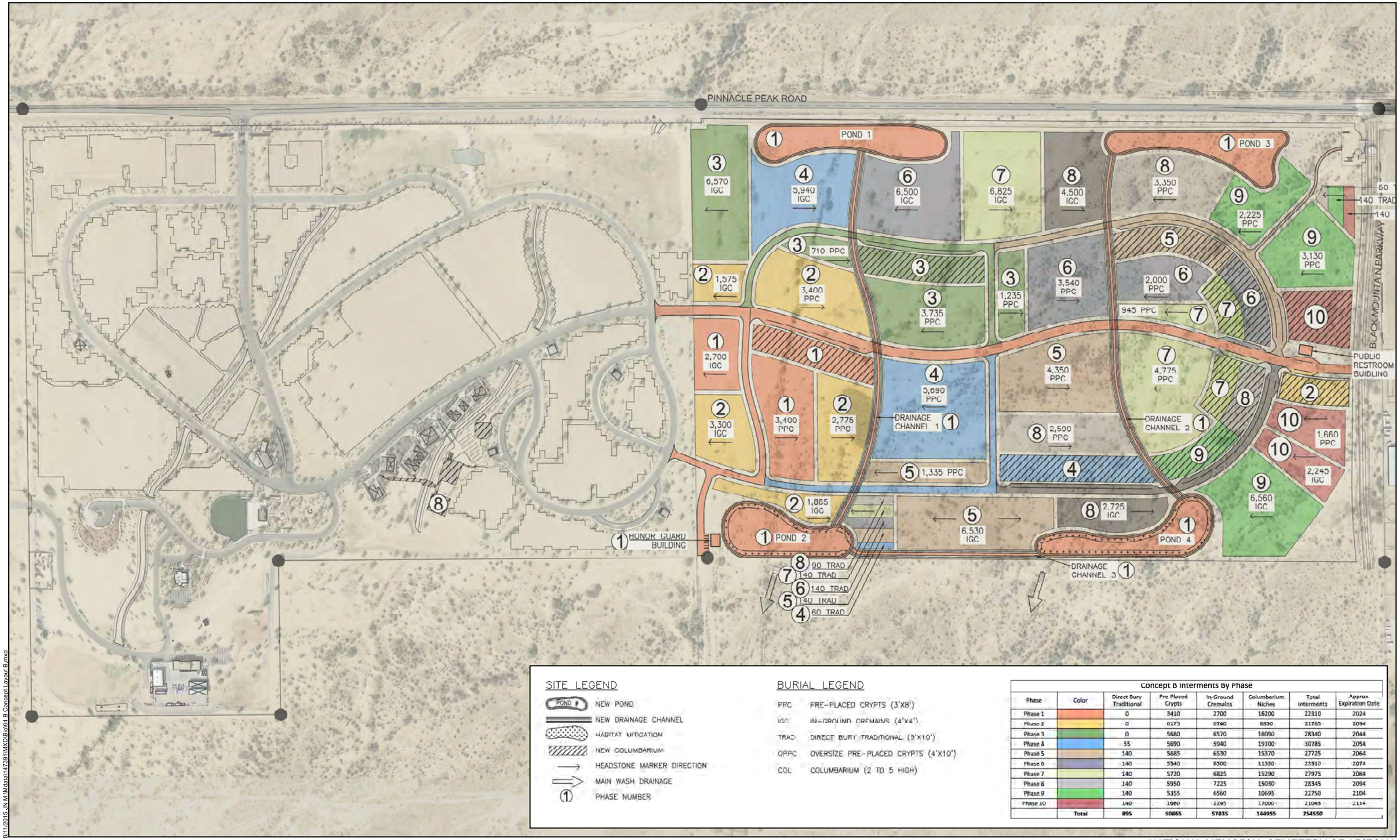
Michael Baker INTERNATIONAL

Source: Anderson Engineering

NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

Concept Layout A

Exhibit 4A



SITE LEGEND

- NEW POND
- NEW DRAINAGE CHANNEL
- HABITAT MITIGATION
- NEW COLUMBARIUM
- HEADSTONE MARKER DIRECTION
- MAIN WASH DRAINAGE
- PHASE NUMBER

BURIAL LEGEND

PPC	PRE-PLACED CRYPTS (3'X8')
IGC	IN-GROUND CREMAINS (4'X4')
TRAD	DIRECT BURY TRADITIONAL (3'X10')
OPPC	OVERSIZE PRE-PLACED CRYPTS (4'X10')
COL	COLUMBARIUM (2 TO 5 HIGH)

Concept B Interments By Phase

Phase	Color	Direct Bury Traditional	Pre Placed Crypts	In-Ground Cremains	Columbarium Niches	Total Interments	Approx. Expiration Date
Phase 1		0	3410	2700	16200	22310	2024
Phase 2		0	0173	0740	8830	21763	2034
Phase 3		0	5680	6570	16090	28340	2044
Phase 4		55	5690	5940	19100	30785	2054
Phase 5		140	5685	6530	15370	27725	2064
Phase 6		140	5340	6500	11330	23510	2074
Phase 7		140	5720	6825	15290	27975	2084
Phase 8		140	5950	7225	15030	28345	2094
Phase 9		140	5355	6560	10695	22750	2104
Phase 10		140	1660	2245	17000	21045	2114
	Total	895	50865	57835	144955	254550	

8/11/2015 J:\N:\Mdata\147391\MXD\Bio\04 B Concept Layout B.mxd

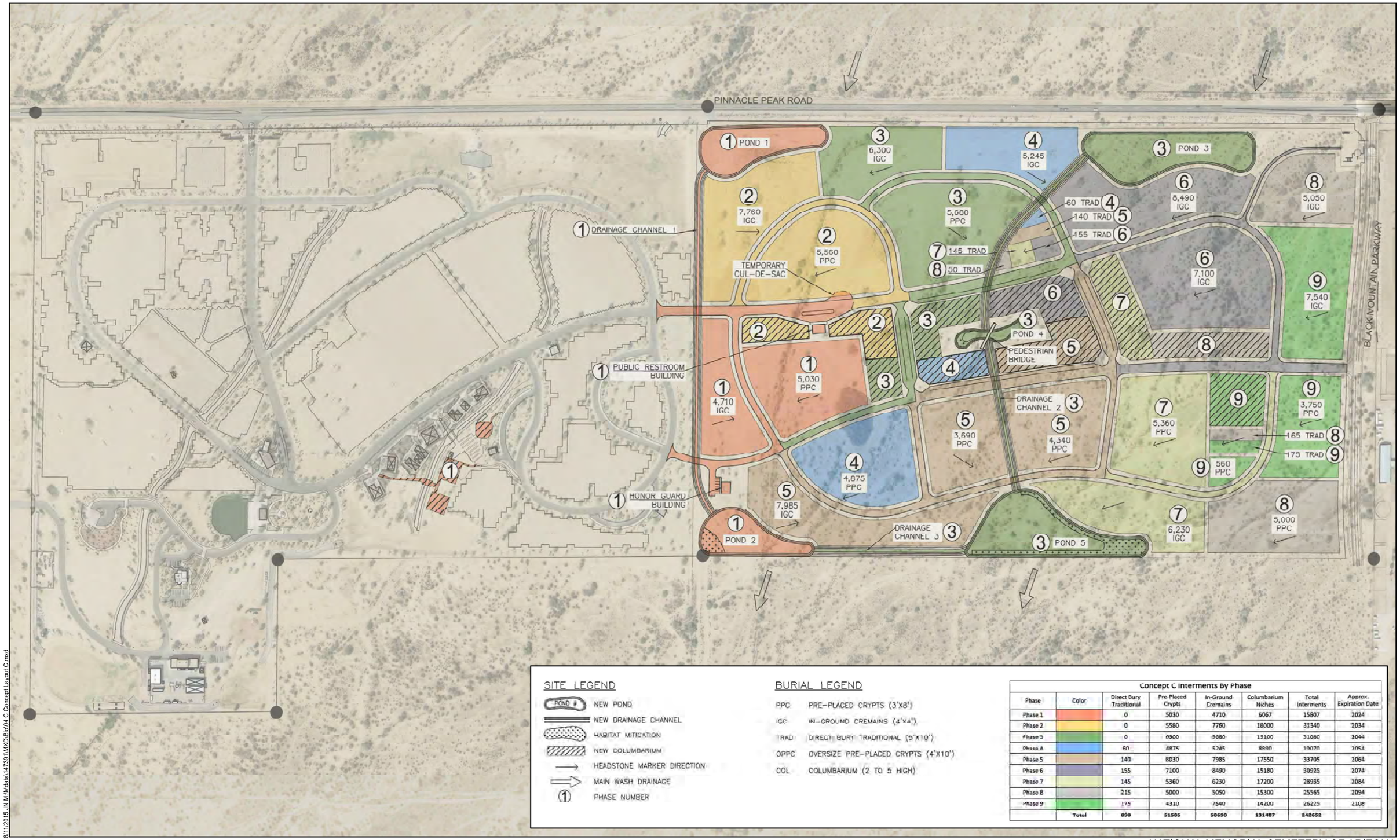
Michael Baker INTERNATIONAL

Source: Anderson Engineering

NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

Concept Layout B

Exhibit 4B



Concept C Interments By Phase

Phase	Color	Direct Bury Traditional	Pre Placed Crypts	In-Ground Cremains	Columbarium Niches	Total Interments	Approx. Expiration Date
Phase 1		0	5030	4710	6067	15807	2024
Phase 2		0	5580	7760	18000	31340	2034
Phase 3		0	6300	5680	19100	31080	2044
Phase 4		60	4875	5245	8890	19070	2054
Phase 5		140	8030	7985	17550	33705	2064
Phase 6		155	7100	8490	15180	30925	2074
Phase 7		145	5360	6230	17200	28935	2084
Phase 8		215	5000	5050	15300	25565	2094
Phase 9		175	4310	7540	14200	26225	2105
	Total	800	51585	58690	131487	242652	

8/11/2015 JN M:\Mdata\147391\MXD\Bio\04 C Concept Layout C.mxd

Michael Baker INTERNATIONAL

Source: Anderson Engineering

NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

Concept Layout C

Exhibit 4C

11,000 additional interment sites for the NMCA, consisting of approximately 3,400 preplaced gravesite casket crypts, 300 gravesites for casket interments, 4,600 columbarium niches, and 2,700 in-ground cremation gravesites. Services would continue to take place at five existing committal service shelters on the site. Up to 30 ceremonies would occur on Mondays and Fridays and about 5 to 10 services per day on Tuesdays, Wednesdays, and Thursdays between the hours of 8:00 am and 3:00 pm, with occasional services on the weekends. There are no new service shelters, where ceremonies will be conducted in the expansion area.

Operations and maintenance would be included as part of the proposed project and would consist of similar activities as currently conducted for the existing developed cemetery. Each national cemetery is managed by VA National Cemetery Administration (NCA) personnel in conformance with national and regional policies, priorities, goals, and objectives. Typical operation activities includes burial of veterans and eligible family members, the interment of cremated remains, and the placement and maintenance of a headstone or grave marker. Cemetery operations include conducting Memorial Day and other special ceremonies, as well as the care of the graves, structures, and grounds. Operating hours for the cemetery are Monday through Friday, 8:00 am – 4:30 pm. Maintenance activities include trimming and replanting of trees, shrubs, or cacti as needed, trash and debris removal, cleaning and repainting of buildings and structures/amenities as needed, irrigation repair, cleaning and repair of storm drain basins and channels and maintenance of roads, parking and fencing.

The proposed project would also include construction of access roads, signage, site furnishings, fencing, and irrigation consistent with the existing cemetery as well as an Honor Guard Lounge. The proposed project includes renovation and expansion of the administration building, improvements to the maintenance building, and improvements to the existing drainage channels and basins.

Access Roads

Existing roadways will be prioritized for repair and re-sealing, and will be extended into the 104 undeveloped acres to provide vehicular and pedestrian access to new interment sites. The accessible roads will be wide enough for parallel parking pull-offs at new buildings and columbaria. An additional entrance will be added off of Black Mountain Parkway. This additional entrance would be used for NMCA Operations and Maintenance access and may also be used for public access.

Utilities

Existing utilities will be extended for the development of the 104 acres. The existing administration building, maintenance complex, and public information center will have new connections to the municipal potable water source located in Pinnacle Peak Road.

Signage

Sign panels throughout the cemetery will be replaced as and where needed. With implementation of the Master Plan, some revisions to existing signs are necessary. New signage will be included throughout the proposed expansion area for directional support for visitors of the 104-acre development.

Site Furnishings

Support the development of the 104 acres by locating new furnishing sites, which would consist of benches, trash receptacles, flower vase receptacles, and water spigots.

Fencing

The existing steel fence with stone pilasters will be extended following the cemetery boundary along Pinnacle Peak Road. An automatic gate will be integrated on Pinnacle Peak Road to secure the main entrance to the cemetery when closed.

Irrigation

New irrigation circuits will be provided as necessary to new planting areas that must provide sufficient water to promote healthy plant life.

Renovation and Expansion of Administration Building

A renovation and expansion of the existing administration building will be completed to meet operational and space requirements. The building expansion will address the space deficiencies in the existing administration building with respect to having a cemetery with a full administrative staff of seven individuals to support an average of fourteen interments per day. The Master Plan identifies any roof leaks, interior finishes for floors, walls and ceilings, casework, and other finishes or improvements that are needed to bring the structure within current codes, NCA operational standards, and VA or Federal mandates for sustainability and energy and water consumption.

Maintenance Building Improvements

Improvements will be made to the Maintenance Complex to address square foot requirements and space deficiencies in the existing maintenance complex by functional area. The expansion and renovation may consist with the following: adding office space, cantilevered roof structure over the above-ground fuel storage tanks, replacing the pre-engineered metal buildings and bringing structure(s) to comply with current codes and VA or Federal mandates for sustainability, energy, and water consumption. The improvements also address environmental regulatory requirements by plugging a drain in the Maintenance Building to prevent discharge into drainage channels and provide an oil and water separator for the wash bay.

Honor Guard Lounge

An Honor Guard Lounge will be constructed, either as a free standing structure, integrated within the maintenance complex, or other location that is suitable with cemetery operations.

Section 2 Regulatory Background

The project will be implemented to satisfy the requirements of applicable federal and State regulations, local policies, ordinances, or adopted plans protecting biological resources. These regulations and/or environmental protection documents are outlined below.

2.1 FEDERAL REGULATIONS

National Environmental Policy Act

The National Environmental Policy Act (NEPA) directs a "systematic, interdisciplinary approach" to planning and decision making and requires environmental statements for "major federal actions significantly affecting the quality of the human environment." Implementing regulations by the Council of Environmental Quality (40 Code of Federal Regulations [CFR], Parts 1500–1508) require federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts.

Endangered Species Act of 1973

Federally listed threatened and endangered species and their habitats are protected under provisions of the Federal Endangered Species Act (ESA). Section 9 of the ESA prohibits "take" of threatened or endangered species. "Take" under the ESA is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct." The presence of any federally threatened or endangered species that are in a project area generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. Under the regulations of the ESA, the United States Fish and Wildlife Service (USFWS) may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act.

Critical Habitat is designated for the survival and recovery of species listed as threatened or endangered under the ESA. Critical Habitat includes those areas occupied by the species, in which are found physical and biological features that are essential to the conservation of an ESA listed species and which may require special management considerations or protection. Critical Habitat may also include unoccupied habitat if it is determined that the unoccupied habitat is essential for the conservation of the species.

Whenever federal agencies authorize, fund, or carry out actions that may adversely modify or destroy Critical Habitat, they must consult with USFWS under Section 7 of the ESA. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing uses federal funds, or requires federal authorization or permits (e.g., funding from

the Federal Highway Administration or a permit from the U.S. Army Corps of Engineers (Corps)).

If USFWS determines that Critical Habitat will be adversely modified or destroyed from a proposed action, the USFWS will develop reasonable and prudent alternatives in cooperation with the federal institution to ensure the purpose of the proposed action can be achieved without loss of Critical Habitat. If the action is not likely to adversely modify or destroy Critical Habitat, USFWS will include a statement in its biological opinion concerning any incidental take that may be authorized and specify terms and conditions to ensure the agency is in compliance with the opinion.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S. Government Code [USC] 703) makes it unlawful to pursue, capture, kill, possess, or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union, and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 USC 703; 50 CFR 10, 21).

The MBTA covers the taking of any nests or eggs of migratory birds, except as allowed by permit pursuant to 50 CFR, Part 21. Disturbances causing nest abandonment and/or loss of reproductive effort (i.e., killing or abandonment of eggs or young) may also be considered "take." This regulation seeks to protect migratory birds and active nests.

In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). Six families of raptors occurring in North America were included in the amendment: Accipitridae (kites, hawks, and eagles); Cathartidae (New World vultures); Falconidae (falcons and caracaras); Pandionidae (ospreys); Strigidae (typical owls); and Tytonidae (barn owls). The provisions of the 1972 amendment to the MBTA protects all species and subspecies of the families listed above. The MBTA protects over 800 species including geese, ducks, shorebirds, raptors, songbirds and many relatively common species.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds (16 U.S.C. § 668(a)). "Take" under BGEPA includes actions which significantly disturb eagles (50 C.F.R. § 22.3). Amendments enacted in 1972 increased penalties for violating provisions of the Act and strengthened other enforcement measures. A 1978 amendment authorized the

Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations, and recent amendments authorize FWS to issue permits for incidental and practically unavoidable take of eagles.

Section 404 of the Clean Water Act

Since 1972, the Corps and U.S. Environmental Protection Agency (EPA) have jointly regulated the filling of "waters of the U.S.," including wetlands, pursuant to Section 404 of the Clean Water Act (CWA). The Corps has regulatory authority over the discharge of dredged or fill material into the waters of the United States under Section 404 of the CWA. The Corps and EPA define "fill material" to include any "material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States." Examples include, but are not limited to, sand, rock, clay, construction debris, wood chips, and "materials used to create any structure or infrastructure in the waters of the United States." In order to further define the scope of waters protected under the CWA, the Corps and EPA published the Clean Water Rule on June 29, 2015. Pursuant to the Clean Water Rule, the term "*waters of the United States*" is defined as follows:

(i) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
(ii) All interstate waters, including interstate wetlands[2].
(iii) The territorial seas.
(iv) All impoundments of waters otherwise defined as waters of the United States under the definition.
(v) All tributaries[3] of waters identified in paragraphs (i) through (iii) mentioned above.
(vi) All waters adjacent[4] to a water identified in paragraphs (i) through (v) mentioned above, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.
(vii) All prairie potholes, Carolina bays and Delmarva bays, Pocosins, western vernal pools, Texas coastal prairie wetlands, where they are determined, on a case-specific

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2 The term *wetlands* means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

3 The terms *tributary* and *tributaries* each mean a water that contributes flow, either directly or through another water (including an impoundment identified in paragraph (iv) mentioned above), to a water identified in paragraphs (i) through (iii) mentioned above, that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark.

4 The term *adjacent* means bordering, contiguous, or neighboring a water identified in paragraphs (i) through (v) mentioned above, including waters separated by constructed dikes or barriers, natural river berms, beach dunes, and the like.

basis, to have a significant nexus to a water identified in paragraphs (i) through (iii) mentioned above.

(viii) All waters located within the 100-year floodplain of a water identified in paragraphs (i) through (iii) mentioned above and all waters located within 4,000 feet of the high tide line or ordinary high water mark of a water identified in paragraphs (i) through (v) mentioned above, where they are determined on a case-specific basis to have a significant nexus to a waters identified in paragraphs (i) through (iii) mentioned above.

The following features are not defined as "waters of the United States" even when they meet the terms of paragraphs (iv) through (viii) mentioned above:

(i) Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act.

(ii) Prior converted cropland.

(iii) The following ditches:

- (A) Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.
- (B) Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.
- (C) Ditches that do not flow, either directly or through another water, into a water of the United States as identified in paragraphs (i) through (iii) of the previous section.

(iv) The following features:

- (A) Artificially irrigated areas that would revert to dry land should application of water to that area cease;
- (B) Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds;
- (C) Artificial reflecting pools or swimming pools created in dry land;
- (D) Small ornamental waters created in dry land;
- (E) Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water;
- (F) Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of a tributary, non-wetland swales, and lawfully constructed grassed waterways; and
- (G) Puddles.

(v) Groundwater, including groundwater drained through subsurface drainage systems.

(vi) Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.
(vii) Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

Section 401 of the Clean Water Act

Section 401 of the Clean Water Act requires that "any applicant for a federal permit for activities that involve a discharge to waters of the State, shall provide the federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the federal Clean Water Act." Therefore, before the Corps will issue a Section 404 permit, applicants must apply for and receive a Section 401 water quality certification from the Arizona Department of Environmental Quality (ADEQ).

Applicants for a federal license or permit for activities which may discharge to waters of the U.S. must seek Water Quality Certification from the state or Indian tribe with jurisdiction.[5] Such Certification is based on a finding that the discharge will meet water quality standards and other applicable requirements. In Arizona, the ADEQ can issue or deny Certification for discharges to waters of the U.S. Under Section 401 of the CWA, a federal agency cannot issue a permit or license until the state has certified, conditionally certified, or waived the 401 Certification. A federal agency also cannot issue a permit or license if the state denies the 401 certification. By issuing a 401 Certification, ADEQ ensures that the project will not violate surface water quality standards, adversely impact impaired waters (waters that do not meet water quality standards) and that the project complies with applicable water quality improvement plans (total maximum daily loads).

2.2 STATE REGULATIONS

Arizona Game and Fish Law

Pursuant to Arizona Game and Fish Law Section 17-236, “it is unlawful to take or injure any bird or harass any bird upon its nest, or remove the nests or eggs of any bird, except as may occur in normal horticultural and agricultural practices and except as authorized by commission order.” Under this law, the removal or destruction of active bird nests would be considered a violation.

[5] Title 33, United States Code, Section 1341; Clean Water Act Section.

Arizona Native Plant Law

The Arizona Native Plant Law (Arizona Revised Statute [ARS] § 3-901-907) is administered by the Arizona Department of Agriculture (ADA). The ADA defines four categories of protected native plants over which it exercises jurisdiction within the State. These categories are: Highly Safeguarded, Salvage Restricted, Salvage Assessed, and Harvest Restricted. The Highly Safeguarded category is the highest category of protection provided for native plants in Arizona, and includes all ESA candidate species. "Permits applicable to highly safeguarded native plants may be issued only for collection for scientific purposes or for the noncommercial salvage of highly safeguarded native plants whose existence is threatened by intended destruction, or by their location or by a change in land usage, and if the permit may enhance the survival of the affected species" (ARS 3-906 C).

The three additional categories allow plants to be moved or harvested, provided ADA regulations are complied with. All categories of ADA-listed plants require a permit from the agency, and all but Harvest Restricted plants also require tags and seals prior to moving any protected plants.

ADA jurisdiction includes all lands within the State, but since native plants occurring on private lands are the property of the landowner, their removal requires only that the ADA be notified prior to their removal. Laws regulating native plants in Arizona that fall under the auspices of the ADA are found in the State of Arizona Administrative Code – Article 11, consisting of Sections R3-3-1101 through R3-3-1111 and Appendix A, changed from 3 AAC 4, Article 6 at 10 AAR 726, and in the Arizona Revised Statutes – Title 3, Chapter 7, Articles 1 and 2 (subsections 3-901 through 3-916). Highly Safeguarded plant species are included in this review of sensitive resources within the study area. The remaining three categories of protected native plants are not included since they are not considered to be in jeopardy and regulatory permitting and compensation measures are in place for these categories.

Section 3 Methodology

Michael Baker conducted a thorough literature review and records search to determine which sensitive biological resources have the potential to occur on or within the general vicinity of the project site. In addition, a general habitat assessment and field investigation of the project site was conducted and provided information about the existing conditions on the project site in order to determine the potential for sensitive biological resources to occur.

3.1 LITERATURE REVIEW

Prior to conducting the field visit, a literature review and records search was conducted for sensitive biological resources potentially occurring on or within the vicinity of the project site. Previously recorded occurrences of sensitive plant and wildlife species and their proximity to the project site were determined through a query of the AZGFD's OERT and HabiMap, compendia of sensitive species published by AZGFD, and the USFWS species listings.

Literature detailing biological resources previously observed in the vicinity of the project site were reviewed to understand the extent of disturbances to the habitats on-site. Standard field guides and texts on sensitive and non-sensitive biological resources were reviewed for habitat requirements, as well as the following resources:

- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey;
- Google Earth Pro Version 7.1.2.2041 Aerials (1997 – 2014);
- USGS Union Hills Topographic Quadrangle Map;
- USFWS Critical Habitat designations for threatened and endangered Species; and
- Habitat requirements for Sonoran desert tortoise.

The literature review provided a baseline from which to inventory the biological resources potentially occurring on the project site. Additional recorded occurrences of those species found on or near the project site were derived from database queries.

3.2 HABITAT ASSESSMENT AND FIELD INVESTIGATION

Michael Baker biologists Travis J. McGill, Ryan S. Winkleman, and Thomas C. Millington inventoried and evaluated the extent and conditions of the plant communities found within the boundaries of the project site on June 24 and June 25, 2015. Plant communities identified on aerial photographs during the literature review were verified on-site by walking meandering transects through the plant communities and along boundaries between plant communities. The plant communities were evaluated for their potential to support sensitive plant and wildlife

species. In addition, field staff identified any features or natural corridors/linkages that may support the movement of wildlife through the area.

Special attention was given to any sensitive habitats and/or undeveloped areas, which have higher potentials to support sensitive flora and fauna species. Areas providing suitable habitat for Sonoran desert tortoise were closely surveyed for signs of presence during the habitat assessment. Methods to detect the presence of desert tortoise included direct observation and signs of presence including scat, carapaces and scutes, and burrows.

All plant and wildlife species observed, as well as dominant plant species within each plant community, were recorded. Wildlife detections were made through observation of scat, trails, tracks, burrows, nests, and/or visual and aural detection. In addition, site characteristics including soil condition, topography, hydrology, anthropogenic disturbances, indicator species, condition of on-site plant communities, and presence of potential jurisdictional drainage and/or wetland features were noted.

3.3 SOIL SERIES ASSESSMENT

On-site and adjoining soils were researched prior to the field visit using the USDA NRCS Soil Survey for Maricopa County, California. In addition, a review of the local geological conditions and historical aerial photographs was conducted to assess the ecological changes the project site has undergone.

3.4 PLANT COMMUNITIES

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities were classified in accordance with Biotic Communities of the American Southwest-United States and Mexico (Brown 1982), delineated on an aerial photograph, and then digitized into GIS Arcview. The Arcview application was used to compute the area of each plant community in acres.

3.5 PLANTS

Common plant species observed during the field survey were identified by visual characteristics and morphology in the field, and recorded in a field notebook. Unusual and less familiar plants were photographed on-site and identified in the laboratory using taxonomical guides, specifically online databases created by the Arizona State University Vascular Plant Herbarium (SEINet 2015). The locations of all saguaro cacti (*Carnegiea gigantea*) were mapped using a Garmin Map62 Global Positioning System and recorded on an aerial photograph. In this report, scientific names are provided immediately following common names of plant species (first reference only).

3.6 WILDLIFE

Wildlife species detected during field surveys by sight, calls, tracks, scat, or other sign were recorded during surveys in a field notebook. Field guides used to assist with identification of species during surveys included The Sibley Field Guide to the Birds of Western North America (Sibley 2003) for birds, A Field Guide to Western Reptiles and Amphibians (Stebbins 2003) for herpetofauna, and A Field Guide to Mammals of North America (Reid 2006) for mammals. Although common names of wildlife species are fairly well standardized, scientific names are provided immediately following common names in this report (first reference only).

3.7 JURISDICTIONAL AREAS

A jurisdictional delineation was prepared under separate cover. The jurisdictional delineation was conducted to determine jurisdictional limits of "waters of the United States," including potential wetlands, located within the boundaries of the project site. The literature review and site visit are utilized to define:

- the Corps' ordinary high water mark (OHWM) and any three (3) parameter wetlands on-site. The actual presence or absence of wetlands on-site was verified through the determination of the presence of hydrologic conditions, hydrophytic vegetation, and hydric soils pursuant to the September 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*;

The analysis presented in this report is supported by field surveys and verification of site conditions conducted on June 24 and 25, 2015. Michael Baker conducted a site investigation to determine the jurisdictional limits of "waters of the United States," including potential wetlands and vernal pools, located within the boundaries of the project site. While in the field, jurisdictional features were recorded on an aerial base map at a scale of 1" = 50' using topographic contours and visible landmarks as guidelines. Data points were obtained with a Garmin Map62 Global Positioning System to record and identify specific widths for OHWM indicators and the locations of photographs, soil pits, and other pertinent jurisdictional features, if present. This data was then transferred as a .shp file and added to the project's jurisdictional exhibit. The jurisdictional exhibit was prepared using ESRI ArcInfo Version 10 software.

Section 4 Existing Conditions

4.1 LOCAL CLIMATE

Maricopa County, like the Sonoran Desert in general, features a monsoon-based climate with dry springs and comparatively rainy summers, falls, and winters. Climatological data obtained for the City of Phoenix indicates the annual precipitation averages 8.29 inches per year. Because the Sonoran Desert experiences summer rains, most months of the year (i.e. those within summer, fall, and winter) receive high precipitation relative to the dry spring season. Almost all of the precipitation occurs in the months between July and March, with hardly any occurring between the months of April and June. The wettest month is March, with a monthly average total precipitation of 1.07 inches, while the driest is June, with a monthly average of 0.09 inch. The average maximum and minimum temperatures for the City of Phoenix are 107 and 44 degrees Fahrenheit respectively with July being the hottest month and December being the coldest. Temperatures during the site visit were in the mid-100s (degrees Fahrenheit) with little cloud cover and no precipitation.

4.2 TOPOGRAPHY AND SOILS

The project site is relatively flat with no areas of significant topographic relief. On-site surface elevation ranges from approximately 1,584 to 1,621 feet above mean sea level and generally slopes to the southwest. Based on the USDA Soil Survey, the project site is underlain by the following soil units: Gilman loams, Momoli gravelly sandy loam (1 to 5 percent), and the Tremant-Rillito complex (Exhibit 5, *Soils*). All on-site soil series are well drained and derived from mixed alluvium.

4.3 SURROUNDING LAND USES

The project site is located on the northeast fringe of the City of Phoenix, approximately 10 miles southeast of the Cave Buttes Recreation Area and approximately 7 miles southeast of the Phoenix Sonoran Desert Preserve. The proposed project site is bordered by the existing National Memorial Cemetery of Arizona to the west and North Black Mountain Parkway and an equestrian center and residential developments to the east. The land immediately to the north and south of the project site are undeveloped and generally undisturbed. The project site is bordered by Pinnacle Peak Road along its northern boundary.

The area south of the project site is generally developed and connects with the urban sprawl of the City of Phoenix, while the area north of the project site is composed of a mix of developed and undeveloped areas that connects into undeveloped mountain ranges and desert scrub plant communities.

8/11/2015 JN M:\Mdata\147391\MXD\Bio\05 Soils.mxd

Michael Baker INTERNATIONAL

0 200 400 800 Feet

Source: NRCS Web Soil Survey, Google Earth 2015

NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

Soils

Exhibit 5

Section 5 Discussion

5.1 SITE CONDITIONS

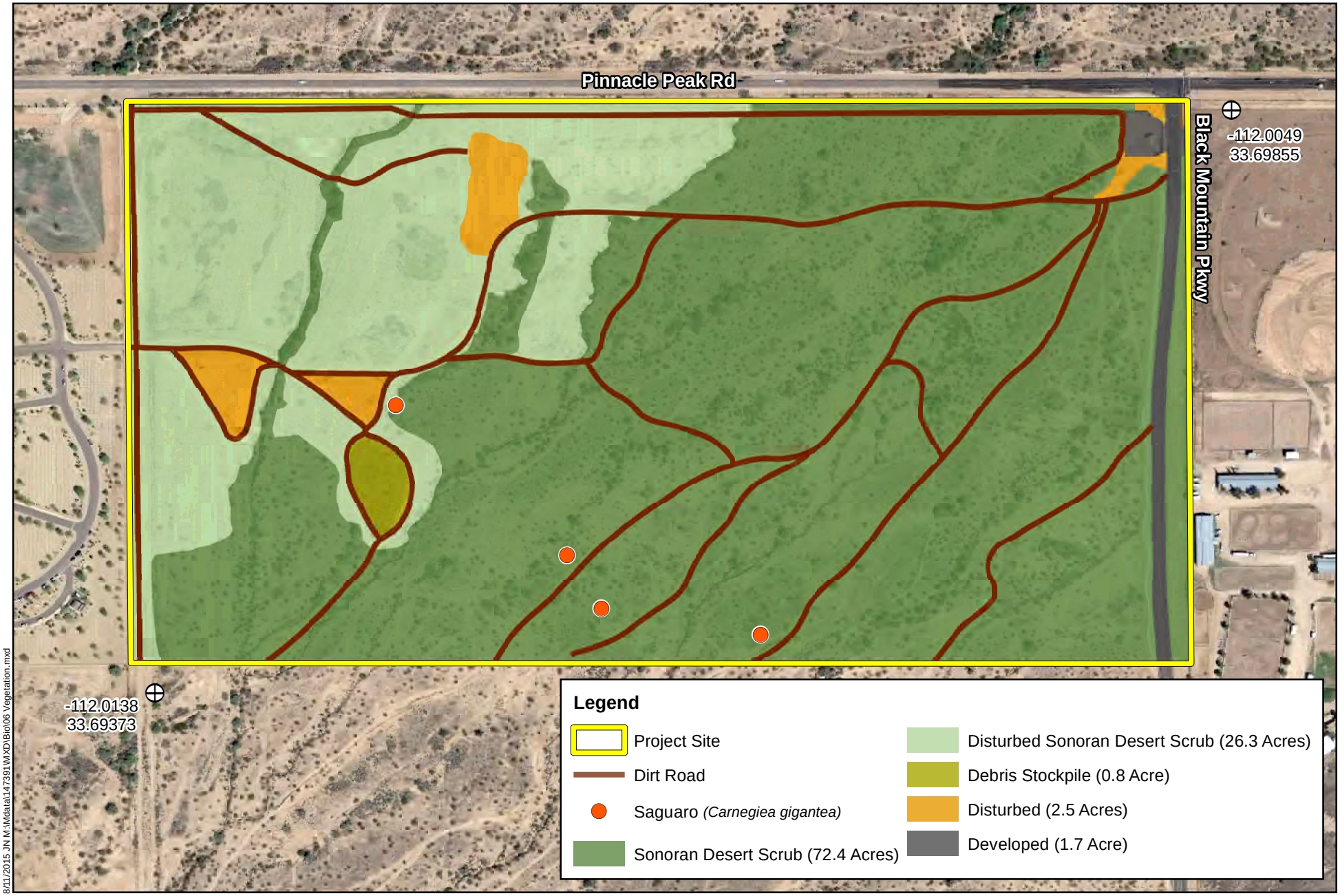
The project site is undeveloped and is primarily undisturbed, with disturbance restricted to the western side of the site where there is a large organic debris pile and other areas that have been historically cleared of vegetation. Although historic aerials (4/29/1997) show the northwestern section of the site to be nearly devoid of vegetation, subsequent aerials show that the site was able to reestablish itself until 2007 and 2009, before the northwestern portion of the site was again cleared of vegetation. This area is dominated by non-native grasses. The debris pile was initially observed on the historic aerials in the 10/28/2003 aerial and has subsequently grown in the ensuing years. The project site has been subject to material stockpiling and illegal off-road vehicle use. Unimproved dirt roads are present throughout much of the site, but with the exception of the northwestern portion of the site, the majority of the plant communities on-site are undisturbed. There are several drainage features found on-site that generally follow on-site topography and flow in a northeast to southwest direction.

5.2 VEGETATION

One (1) naturally occurring vegetation community, Sonoran desert scrub, was observed on-site in varying degrees of disturbance (Exhibit 6, *Vegetation*). This overall plant community can be separated into three sub-communities: Sonoran desert scrub, disturbed Sonoran desert scrub, and ephemeral drainage features. In addition there are two (2) areas that were classified as disturbed and developed. These areas are not vegetation classifications, but rather are considered to be land cover types. A vegetation debris stockpile is present in the southwest quadrant of the site.

5.2.1 Sonoran Desert Scrub

The project site primarily supports a Sonoran desert scrub plant community. This plant community is dominated by creosote bush *(Larrea tridentata*) and triangleleaf bursage (*Ambrosia deltoidea*). Other plant species observed with this plant community include broom baccharis (*Baccharis sarothroides*) and apricot mallow (*Sphaeralcea ambigua*). Various species of cacti, including saguaro, barrel cactus (*Ferocactus* spp.), and buckhorn cholla (*Cylindropuntia acanthocarpa*) are present on-site. Based on historical aerial imagery, portions of this plant community, specifically in the northwestern section of the project site, have been subject to occasional clearing and heavy disturbance resulting in very patchy native vegetation separated by swaths of non-native vegetation, particularly Arabian grass (*Schismus arabicus*) and Russian thistle (*Salsola tragus*).



8/11/2015 JN M:\Mdata\147391\MXD\Biol\06 Vegetation.mxd

Michael Baker INTERNATIONAL

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Source: Google Earth 2015

NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

Vegetation

Exhibit 6

The ephemeral drainage features generally flow from northeast to southwest across the project site terminate south of the project site, outside of the site boundaries. These drainage features and associated vegetation make up a portion of the Sonoran desert scrub plant community on-site. Plant species observed within the ephemeral drainage features include desert ironwood (*Olneya tesota*), blue palo verde (*Parkinsonia florida*), and honey mesquite (*Prosopis glandulosa*) within the Sonoran desert scrub plant community.

5.2.2 Disturbed

Disturbed areas generally encompass areas where vegetation has usually been cleared, such as for dirt roads. Within the project site, disturbed areas consist of unimproved dirt paths and areas that show evidence of extensive and potentially frequent mechanical disturbance and, as a result, only now contain low-growing exotic vegetation such as Arabian grass and Russian thistle.

5.2.3 Developed

Developed areas generally encompass all buildings, as well as all paved, impervious surfaces. The developed portion of the project site consists of a fenced, paved area containing a storage tank and pipelines.

5.3 WILDLIFE

Plant communities provide foraging habitat, nesting and denning sites, and shelter from adverse weather or predation. This section provides a discussion of those wildlife species observed, expected, or not expected to occur on-site. The discussion is to be used as a general reference and is limited by the season, time of day, and weather condition in which the survey was conducted. Wildlife observations were based on calls, songs, scat, tracks, burrows, and actual sightings of animals.

5.3.1 Fish

No fish or hydrogeomorphic features (e.g., creeks, ponds, lakes, reservoirs) that would provide suitable habitat for fish were observed on or within the vicinity of the project site. The drainage features on the project site are ephemeral and do not support standing water that would be sufficient to support a fish population. Therefore, no fish are expected to occur on-site and they are presumed absent.

5.3.2 Amphibians

No amphibians or hydrogeomorphic features that would provide suitable habitat for amphibian species were observed on or within the vicinity of the project site. The drainage features on the project site are ephemeral and do not support standing water that would normally be sufficient

to support an amphibian population. However, it is possible that minimal amphibian life may occur on-site during the rainy seasons when water is present. For example, the Sonoran desert toad (*Incilius alvarius*) can live miles away from permanent water, and move into an otherwise dry area during the summer monsoon season if that area receives water.

5.3.3 Reptiles

Two (2) reptilian species were detected during the habitat assessment, western side-blotched lizard (*Uta stansburiana elegans*) and Sonoran tiger whiptail (*Aspidoscelis tigris punctilineatus*). The project site has the potential to support various species of reptiles, but due to the high temperatures during the site visit, only two species were observed during the survey. Due to the open and mostly undisturbed desert scrub habitat, the site has the potential to support common species such as long-nosed leopard lizard (*Gambelia wislizenii*), desert iguana (*Dipsosaurus dorsalis*), desert spiny lizard (*Sceloporus magister*), Arizona glossy snake (*Arizona elegans noctivaga*), red racer (*Coluber flagellum piceus*), desert nightsnake (*Hypsiglena chlorophaea*), western diamond back (*Crotalus atrox*), and Sonoran gophersnake (*Pituophis catenifer affinis*).

5.3.4 Avian

The project site provides suitable foraging habitat for a limited variety of avian species. A total of nineteen (19) avian species were identified during the habitat assessment. The species identified included Gambel's quail (*Callipepla gambelii*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), Eurasian collared-dove (*Streptopelia decaocto*), white-winged dove (*Zenaida asiatica*), mourning dove (*Zenaida macroura*), lesser nighthawk (*Chordeiles acutipennis*), Gila woodpecker (*Melanerpes uropygialis*), gilded flicker (*Colaptes chrysoides*), American kestrel (*Falco sparverius*), Say's phoebe (*Sayornis saya*), ash-throated flycatcher (*Myiarchus cinerascens*), horned lark (*Eremophila alpestris*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), black-tailed gnatcatcher (*Polioptila melanura*), Abert's towhee (*Melozone aberti*), brown-headed cowbird (*Molothrus ater*), and house finch (*Haemorhous mexicanus*). On-site avian activity was heavily dominated by Gambel's quail, white-winged dove, mourning dove, lesser nighthawk, and cactus wren.

5.3.5 Mammals

The project site provides habitat for a variety of mammalian species. However, most mammal species are nocturnal and are difficult to observe during a diurnal field visit. Only two (2) mammals were detected during the habitat assessment: cottontail (*Sylvilagus audubonii*) and round-tailed ground squirrel (*Xerospermophilus tereticaudus*). Other common mammal species that have the potential to occur on the project site include Botta's pocket gopher (*Thomomys bottae*), American deer mouse (*Peromyscus* maniculatus), and coyote (*Canis latrans*).

5.4 NESTING BIRDS

The plant communities found on the project site provide suitable nesting opportunities for avian species. More than 30 avian nests were identified during the survey. These avian nests ranged from inactive and deteriorated to presumably active or recently active based on surrounding activity (e.g., lesser nighthawk pairs flushing upon approach, juvenile horned larks, and egg fragments observed on-site). Most nests were either cup-shaped or enclosed, with some ground nests as well. On-site nesting activity, measured by observation of physical nests, appeared to be dominated by cactus wren. However, in only one instance was a bird actually observed entering an apparent nest, where a Gila woodpecker was observed repeatedly entering and exiting a cavity in a saguaro. One large stick nest in the cradle of a separate saguaro fit the profile of a raptor nest based on nest size and nesting habits, but no activity was observed at this nest during Michael Baker's survey efforts.

5.5 MIGRATORY CORRIDORS AND LINKAGES

Habitat linkages provide connections between larger habitat areas that are separated by development. Wildlife corridors are similar to linkages, but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet still inadequate for others. Wildlife corridors are features that allow for the dispersal, seasonal migration, breeding, and foraging of a variety of wildlife species. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

The project site is bordered by existing development (i.e., recreational, funerary, and residential land uses) to the east and west, and undeveloped areas to the north and south. The area south of the project site is generally developed and connects with the urban sprawl of the City of Phoenix, while the area north of the project site is composed of a mix of developed and undeveloped areas that connects into undeveloped mountain ranges and desert plant communities. Since the general area south of the project site has been developed, wildlife movement opportunities have been severely reduced if not eliminated. However, the open space north of the project site has the potential to provide wildlife movement opportunities to the mountain ranges north of the project site, away from the development associated with the City of Phoenix.

As a result, the project site has the potential to provide minimal wildlife movement opportunities, but development of Pinnacle Peak Road has limited the site's connection to undeveloped areas north of the project site.

5.6 JURISDICTIONAL AREAS

This section summarizes the results of the field investigation completed to identify washes and other watercourses or drainage features that may be considered jurisdictional by the Corps under Section 404 of the CWA on the proposed project site. The waters of the U.S. observed on-site consist entirely of ephemeral drainage features (desert washes); there are no perennial or intermittent streams, wetlands, or other special aquatic resources on the project site.

Drainage of the project site is accomplished via overland sheet flow and follows on-site topography to the southwest. There are four (4) unnamed ephemeral drainage features (Drainages 1, 2, 3, and 4) that generally run from northeast to southwest across the project site (Exhibit 7, *Corps Jurisdiction*). These unnamed ephemeral drainage features exhibited an earthen streambed consisting of fine sediment and gravel. Evidence of a Corps OHWM and surface hydrology was observed via the following indicators: scour, drift/debris, sediment deposition, changes in terrestrial vegetation, and drainage patterns. These drainage features and associated vegetation make up a portion of the Sonoran desert scrub plant community on-site. Plant species observed within the ephemeral drainage features include desert ironwood, palo verde, and honey mesquite.

All four on-site drainage features possess a hydrologic connection to the Hayden-Rhodes Aqueduct and ultimately tributary to the Salt and Gila Rivers. As such, Drainages 1, 2, 3, and 4 qualify as waters of the United States and fall under the regulatory authority of the Corps. Approximately 0.27 acres (5,531 linear feet) of Corps non-wetland waters were identified on the project site. It should also be noted that Drainages 1, 2, 3, and 4 are not tributary to any surface water identified as a 303[d]-listed Impaired Water, Outstanding Arizona Water, or lake.

Based on current project design plants all 0.27 acres (5,531 linear feet) of Corps non-wetland waters will be impacted from development of the proposed project.

5.7 SENSITIVE BIOLOGICAL RESOURCES

The AZGFD's OERT and HabiMap were queried for sensitive plant and wildlife species that could occur in the Union Hills and Currys Corner USGS 7.5-minute quadrangles. These tools were used to supply information regarding the distribution of and habitats occupied by sensitive species known to occur in the vicinity of the project site. Although the project is located entirely within the Union Hills quadrangle, the Currys Corner quadrangle was also reviewed since its western edge is only 0.30 mile from the site and the two quadrangles contain contiguous natural habitat along this border. The habitat assessment was used to assess the ability of the plant communities found on-site to provide suitable habitat for relevant sensitive plant and wildlife species.

8/11/2015 JN M:\Mdata\147391\MXD\Bio\07 Jurisdictional Map.mxd

Michael Baker INTERNATIONAL

0 200 400 800 Feet

Source: Google Earth 2015

NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY IMPROVEMENTS

Corps Jurisdiction

Exhibit 7

The literature search identified seventeen (17) sensitive plant species and forty-nine (49) sensitive wildlife species as having potential to occur within the Union Hills and Currys Corner quadrangles. No sensitive plant communities have been recorded within these two quadrangles. Sensitive plant and wildlife species were evaluated for their potential to occur within the project boundaries based on habitat requirements, availability and quality of suitable habitat, and known distributions. Species determined to have the potential to occur within the general vicinity are presented in Appendix B, *Potentially Occurring Sensitive Biological Resources*, and discussed below.

5.7.1 Sensitive Plants

According to the literature search, seventeen (17) sensitive plant species have been reported in the Union Hills and Currys Corner quadrangles (refer to Appendix B). Based on the results of the habitat assessment, habitat requirements for specific species, and the availability and quality of habitats needed by each sensitive plant species, it was determined that all sensitive plant species that have been reported in these two quadrangles have a low potential to occur or are presumed absent from the project site. No sensitive plant species were observed on-site during the June 2015 site investigation. Several species protected under the Arizona Native Plant Law were positively identified on-site, including saguaro, honey mesquite, both blue palo verde and foothill palo verde (*Parkinsonia microphylla*), crucifixion thorn (*Castela emoryi*), desert ironwood, and honey mesquite. No Highly Safeguarded species were found on-site.

5.7.2 Sensitive Wildlife

According to the literature search, forty-nine (49) sensitive wildlife species have been reported in the Union Hills and Currys Corner quadrangles (refer to Appendix B). Based on the results of the habitat assessment, habitat requirements for specific species, and the availability and quality of habitats needed by each sensitive wildlife species, it was determined that the project site has a moderate potential to provide suitable foraging habitat for golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*), American peregrine falcon (*Falco peregrinus anatum*), Sonoran desert toad, and regal horned lizard (*Phrynosoma solare*). Gila woodpecker, gilded flicker, and Abert's towhee were all documented on-site during Michael Baker's June 2015 survey. All other sensitive wildlife species are expected to have a low potential to occur or are presumed absent from the project site.

Golden Eagle

Golden eagle is listed by the AZGFD as a Species of Greatest Conservation Need (SGCN)[6] Tier 1b[7] species. They are usually found in open country, in prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. They nest on rock ledges, cliffs, or in large trees. In Arizona, they are found in mountainous areas and are virtually vacant after breeding in some desert areas. Based on the results of the habitat assessment, it was determined that the project site supports suitable foraging habitat for golden eagle, but does not provide suitable nesting opportunities.

Ferruginous Hawk

Ferruginous hawk is listed by the AZGFD as a Wildlife Species of Concern (WSC) and as a SGCN Tier 1b species. In Arizona, open scrublands and woodlands, grasslands, and semidesert grassland in the northern and southeastern parts of the state support potential breeding grounds for ferruginous hawks. This species avoids high elevation, forest interior, and narrow canyons. Based on the results of the habitat assessment, it was determined that the project site supports suitable foraging habitat for ferruginous hawk, but does not provide suitable nesting opportunities.

Tucson Shovel-Nosed Snake

Tucson shovel-nosed snake is listed by the AZGFD as a SGCN Tier 1a[8] species. This species is found on more productive creosote-mesquite floodplain habitats, with soils described as soft, sandy loams with sparse gravel. Based on the results of the habitat assessment, it was determined that the Sonoran creosote scrub plant community has the potential to provide suitable habitat for Tucson shovel-nosed snake.

American Peregrine Falcon

American peregrine falcon is listed by the AZGFD as a WSC and as a SGCN Tier 1a species. This species is found in Arizona near cliffs that support sufficient abundance of prey. Optimum habitat is generally considered to be steep, sheer cliffs overlooking woodlands, riparian areas or other habitats supporting avian prey species in abundance. Based on the results of the habitat

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[6] These species are ranked as "vulnerable" under one or more of the following categories: Extirpated from Arizona, Federal or State status, Declining status, Disjunct status, Demographic status, Concentration status, Fragmentation status, Distribution status

[7] Ranked "vulnerable" in at least one of the SGCN categories but does not meet any of the subsequent criteria

[8] Ranked "vulnerable" in at least one of the SGCN categories and in addition matches at least one of the following subsequent criteria: Federally listed as endangered or threatened under the Endangered Species Act (ESA); Candidate species under ESA; Is specifically covered under a signed conservation agreement or a signed conservation agreement with assurances; Recently removed from ESA and currently requires post-delisting monitoring; Closed season species (i.e., no take permitted) as identified in Arizona Game and Fish Commission Orders 40, 41, 42 or 43.

assessment, it was determined that the project site supports suitable foraging habitat for American peregrine falcon, but does not provide suitable nesting opportunities.

Sonoran Desert Toad

Sonoran desert toad is listed by the AZGFD as a SGCN Tier 1b species. This species is common in the Sonoran Desert. It occurs in a variety of habitats including creosote bush desert scrub, grasslands up into oak-pine woodlands, and thornscrub and tropical deciduous forest in Mexico. The habitat assessment determined that the project site has the potential to provide suitable habitat for this species. Rodent burrows found on-site provide suitable aestivation opportunities, and during monsoon season the on-site drainages have the potential to provide suitable aquatic habitat.

Regal Horned Lizard

Regal horned lizard is listed by the AZGFD as a SGCN Tier 1b species. This species is found within Arizona upland Sonoran desert scrub, Chihuahuan desert scrub, and semidesert grassland communities. It inhabits valleys, rocky bajadas, and low foothills and it is usually encountered in relatively level areas with low shrubs and open, sunny patches. The habitat assessment determined that the project site has the potential to provide suitable habitat for this species.

The following species were observed on-site during the June 2015 site investigation.

Gila Woodpecker

Gila woodpecker is listed by the AZGFD as a SGCN Tier 1b species. This species requires cacti or trees with large trunks that are used for nesting sites. This species is typically associated with riparian woodlands, uplands with concentrations of large columnar cacti, old-growth xeric-riparian was woodlands, and urban or suburban residential areas. This species was observed nesting on-site during the June 2015 site investigation.

Gilded Flicker

Gilded flicker is listed by the AZGFD as a SGCN Tier 1b species. This species is strongly associated with, but not completely restricted to, giant cactus forests of southwestern deserts. This species was observed foraging on-site during the June 2015 site investigation.

Abert's Towhee

Abert's towhee is listed by the AZGFD as a SGCN Tier 1b species. This species typically frequents dense riparian vegetation; thickets of willow (*Salix* spp.), cottonwood (*Populus* spp.),

mesquite, and saltcedar (*Tamarisk* spp.). This species was observed foraging on-site during the June 2015 site investigation.

Sonoran Desert Tortoise

In 2010 the USFWS determined that the Sonoran population of the desert tortoise (i.e., what is now known as *Gopherus morafkai*) qualified for candidacy under the ESA (75 Federal Register [FR] 78093 78146). The following year, the Sonoran desert tortoise was classified as a distinct species from the Mojave desert tortoise based on molecular, phenotypic, and morphological differences (Murphy et al. 2011). This distinction was formally recognized and validated by both the Committee on Standard English and Scientific Names (Crother 2012) and by the USFWS (77 FR 69993 70060) in 2012. As a new distinct species, the Sonoran desert tortoise continues to be a candidate for listing. However, according to the USFWS's most recent annual review of candidate species, the Sonoran desert tortoise is expected to be proposed for listing prior to December 2015 (79 FR 72449 72497).

The project site is vegetated with Sonoran desert scrub and generally provides suitable habitat for the Sonoran desert tortoise. However, whereas the Mojave desert tortoise (*Gopherus agassizii*) is known for inhabiting lowlands and valleys, the Sonoran desert tortoise is instead typically known for inhabiting slopes, rocky hillsides, and bajadas, although they may occur in low density populations in washes or valley bottoms (Murphy et al. 2011, 77 FR 69993 70060). The project site is far removed from any slopes, rocky hillsides, or bajadas and is in a lowland environment surrounded by development, with only a relatively narrow passageway (the site itself) connecting scarce open lands to the north and south. Two burrows that were sufficient size for desert tortoise were found on-site. An inspection of these burrows found no tortoises or sign of tortoise use. While the survey was conducted at a time when desert tortoises are generally dormant, based on this species' habitat preferences and the general lack of any positive indication of current or recent tortoise activity, this species is presumed to have a low potential to occur on the project site.

5.8 CRITICAL HABITAT

Under the ESA, "Critical Habitat" for a species is designated at the time of listing or within one year of listing. "Critical Habitat" refers to habitat or a specific geographic area that contains the elements and features that are essential for the survival and recovery of the species. In the event that a project may result in take or in adverse effects to a species' designated Critical Habitat, the project proponent may be required to engage in suitable mitigation. However, consultation for impacts to Critical Habitat is only required when a project possesses a federal nexus (i.e. occurs on federal land, requires federal permits [e.g. Corps Section 404 Clean Water Act permit], or receives any other federal oversight or funding). If a project does not possess a federal nexus, consultation for impacts to Critical Habitat is not required.

The project site is not located within designated Critical Habitat. The nearest Critical Habitat unit is the proposed yellow-billed cuckoo (*Coccyzus americanus*) Unit 42: AZ-34 Lower Verde River, located approximately 19 miles east of the site on the Verde River downstream of Bartlett Dam (79 FR 48547 48652). The designation of Critical Habitat for yellow-billed cuckoo has been highly controversial and has not been finalized as of writing. It should also be noted that designated Critical Habitat for the southwestern willow flycatcher (*Empidonax traillii extimus*), specifically the Verde Management Unit, is located approximately 25 miles northeast of the project site (78 FR 343 534).

Section 6 Conclusion and Recommendations

The project site is undeveloped and supports a Sonoran desert scrub plant community. It is mostly undisturbed except for its northwestern quadrant, where repeated vegetation clearing and disturbance have created an area dominated primarily by non-native plant species. Numerous unimproved dirt paths also traverse the site. Additionally, there are several drainage features found on-site that generally follow on-site topography and flow in a northeast to southwest direction.

The project site is located on the northeast fringe of the City of Phoenix and is bordered by the existing National Memorial Cemetery of Arizona to the west and North Black Mountain Parkway and an equestrian center and residential developments to the east. The land immediately to the north and south of the project site are undeveloped and generally undisturbed. The project site is bordered by Pinnacle Peak Road along its northern boundary.

One (1) naturally occurring vegetation community, Sonoran desert scrub, was observed on-site in varying degrees of disturbance. This overall plant community can be separated into three sub-communities: Sonoran desert scrub, disturbed Sonoran desert scrub, and ephemeral drainage features.

Jurisdictional Features

There are four (4) unnamed ephemeral drainage features that generally run from northeast to southwest across the project site and are tributary to the Hayden-Rhodes Aqueduct and ultimately the Salt and Gila Rivers. Therefore, these on-site drainage features possess a surface hydrologic connection to downstream traditional navigable waters and qualify as waters of the U.S. Based on a comprehensive field survey, approximately 0.27 acres (5,531 linear feet) of Corps non-wetland waters were identified on the project site.

The Corps regulates discharges of dredged or fill materials into waters of the United States, including wetlands, pursuant to Section 404 of the CWA. Based on a review of preliminary design plans, the proposed project will result in the permanent loss of approximately 0.27 acres of non-wetland waters of the U.S. Therefore, the VA will be required to mitigate jurisdictional impacts at no less than a 1:1 ratio through a Corps approved in-lieu fee program. As a result it will be necessary for the VA to acquire a CWA Section 404 Permit prior to impacts occurring within Corps jurisdictional areas. Prior to issuance of a CWA Section 404 Permit, the VA will also be required to obtain a CWA Section 401 Water Quality Certification from the ADEQ to ensure that the project will not violate surface water quality standards or adversely impact impaired waters (waters that do not meet water quality standards), and that the project complies with applicable water quality improvement plans (total maximum daily loads).

Sensitive Plants

Based on habitat requirements for specific sensitive plant species along with the availability and quality of habitats needed by each sensitive species, it was determined that the project site does not contain suitable habitat to support sensitive plant species that have been recorded in the Union Hills and Currys Corner quadrangles. The site is located at too low of an elevation for most of the plant species and does not provide suitable habitat for the remaining species based on the habitat requirements for the other plant species. As a result, focused sensitive plant surveys are not recommended.

Arizona Native Plant Law

All categories of ADA-listed plants require a permit from the agency, and all but Harvest Restricted plants also require tags and seals prior to moving any protected plants. This includes all of the cacti, most of the trees (ironwood, palo verde, mesquite), and many of the smaller plants. Saguaro, ironwood, palo verde, and mesquite trees were observed on-site. Refer to Exhibit 7 for the locations of Saguaros documented on the project site.

Impacts to ADA-listed plants will avoided to the greatest extent possible during project design. Project planning and design measures to avoid impacts to native plants may include arrangement of facilities on-site to avoid the plants, in particular saguaro. Prior to development of the project site, the VA may need obtain a permit for the removal and transportation of protected native plants from the ADA. Compensation for impacts to native plants shall be negotiated with the ADA based on their May 3, 2008 fee schedule. In addition, native plants will be incorporated into the landscaping plan to offset impacts to native plant species.

In accordance with the 2012 Evaluation of Salvage and Replanted Native Plants on Arizona Department of Transportation's Projects report, saguaros salvaged for re-vegetation should be 12 feet or less in height and transplanted to their final destination using a "move-once" technique.

Sensitive Wildlife

Based on habitat requirements for specific sensitive wildlife species along with the availability and quality of habitats needed by each sensitive species, it was determined that the project site has a moderate potential to support golden eagle, ferruginous hawk, Tucson shovel-nosed snake, American peregrine falcon, Sonoran desert toad, and regal horned lizard. Gila woodpecker, gilded flicker, and Abert's towhee were all documented on-site during Michael Baker's June 2015 survey. All other known sensitive plants and wildlife species are expected to have a low potential to occur or are presumed absent.

Although determined to have a moderate potential to occur or observed occur on-site, the aforementioned wildlife species are not federally or State listed as threatened or endangered, but rather are AZGFD sensitive species that will not require an incidental take permit for direct or indirect impacts to these species. These species, if found, will remain on-site during the early development phases but would be expected to disperse to undeveloped areas to the north and south as the project site is developed.

Sonoran Desert Tortoise

Based on Michael Baker's habitat assessment, the federal candidate species Sonoran desert tortoise has a low potential to occur and focused surveys are not recommended. This species is typically associated with slopes, rocky hillsides, and bajadas, landscape features which are not present on the project site (Murphy et al. 2011). However, low density populations may sometimes be found in washes and valley bottoms (Murphy et al. 2011, 77 FR 69993 70060). While two burrows capable of supporting tortoises were observed on-site, no tortoises or tortoise sign were observed in the burrows, in the area surrounding the burrows, or on the project site. Out of an abundance of caution, a 30-day pre-construction desert tortoise clearance survey shall be conducted prior to implementation of the proposed project to ensure Sonoran desert tortoise do not occur on-site.

Nesting Birds

Pursuant to the MBTA and Arizona Game and Fish Law, removal of any trees, shrubs, or any other potential nesting habitat should be conducted outside the avian nesting season to avoid impacts to nesting birds. The nesting season generally extends from early February through August, but can vary slightly from year to year based upon seasonal weather conditions and individual species, which may nest earlier or later depending largely on food availability. Some birds may nest later than this due to renewed vegetation and prey during the summer monsoon season.

A large number of bird nests, both from the current nesting season and from prior seasons, were found on the project site during Michael Baker's June 2015 survey of the project site. If ground disturbance and vegetation removal cannot occur outside of the nesting season, a pre-construction clearance survey for nesting birds should be conducted within three days of the start of any ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur. If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a 300-foot buffer around the active nest. For raptor species, this buffer is expanded to 500 feet. It is recommended that a biological monitor be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged

and left the nest, or the nest otherwise becomes inactive under natural conditions, normal construction activities can occur.

Section 7 References

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Appendix A Site Photographs

Photograph 1: Facing south. The project site is almost entirely covered with Sonoran desert scrub vegetation.

Photograph 2: Facing northwest. The project site is almost entirely covered with Sonoran desert scrub vegetation.

Photograph 3: Several saguaro (*Carnegiea gigantea*) cacti are present on-site. This one contained a large nest. Another saguaro was observed to have a Gila woodpecker (*Melanerpes uropygialis*) nesting in it.

Photograph 4: Arboreal species such as honey mesquite (*Prosopis glandulosa*), and blue palo verde (*Parkinsonia florida*) were observed in association with the ephemeral drainages.

Photograph 5: A large vegetative debris pile is present on the western edge of the project site. This pile has grown over time and consists of discarded vegetation from the adjacent, existing cemetery.

Photograph 6: Facing southwest. Several areas along the western portion of the project site have been repeatedly disturbed and now consist almost entirely of exotic weeds.

Photograph 7: Looking upstream (north) at one of the ephemeral drainage features.

Photograph 8: Looking downstream (south) along one of the ephemeral drainage features.

Appendix B Potentially Occurring Sensitive Biological Resources

Table B-1: Potentially Occurring Sensitive Biological Resources

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
WILDLIFE SPECIES				
Aix sponsa wood duck	Fed: None AZ: SGCN 1b	Prefers wooded, freshwater habitats with an abundance of cover. Common of riparian habitats, wooded swamps and freshwater marshes, where its slim body allows of use of woodpecker cavities. In Arizona, wood ducks are attracted to permanent ponds, marshes, and lakes as well as slower sections of streams and rivers lined by large trees for nesting.	No	**Presumed absent.** No suitable habitat is present on-site.
Ammospermophilus harrisii Harris' antelope squirrel	Fed: None AZ: SGCN 1b	Can be found in western, central, and southern Arizona. Also found in extreme southwest New Mexico and northwestern Sonora, Mexico. Prefers rocky desert habitats that contain cactus and shrubs.	No	**Low**. There is marginal habitat on-site.
Anaxyrus microscaphus Arizona toad	Fed: None AZ: SGCN 1b	Rocky streams and canyons in the pine-oak belt. Also occurs in lower deserts e.g. Agua Fria River area.	No	**Presumed absent**. No suitable habitat is present. There is no permanent water on-site.
Aquila chrysaetos golden eagle	Fed: None AZ: SGCN 1b	Usually found in open country, in prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. They nest on rock ledges, cliffs, or in large trees. In Arizona, they are found in mountainous areas and are virtually vacant after breeding in some desert areas.	No	**Moderate**. There is suitable foraging habitat throughout the project site. No nesting habitat is present.
Athene cunicularia hypugaea western burrowing owl	Fed: None AZ: SGCN 1b	Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**Low**. There is marginal habitat on-site. Despite a systematic search, no burrowing owl burrows or sign were found on-site.
Botaurus lentiginosus American bittern	Fed: None AZ: WSC; SGCN 1b	Marshlands and very wet meadows. Rarely seen away from dense reeds, rushes, cordgrass, cattails, and other emergent vegetation. Occurs along rivers, lakes, and ponds where marshy habitat is well developed. Nest sometimes in upland cover surrounding a wetland basin.	No	**Presumed absent.** No suitable habitat is present on-site.
Buteo regalis ferruginous hawk	Fed: None AZ: WSC; SGCN 1b	In Arizona, the open scrublands and woodlands, grasslands, and semidesert grassland in the northern and southeastern parts of the state are the potential areas of breeding ferruginous hawks. Avoids high elevation, forest interior, and narrow canyons.	No	**Moderate**. There is suitable foraging and nesting habitat throughout the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Castor canadensis American beaver	Fed: None AZ: SGCN 1b	Commonly inhabit riparian areas of mixed coniferous-deciduous forests and deciduous forests containing abundant food and lodge building material such as quaking aspen (*Populus tremuloides*), willows (*Salix* sp.), alders (*Alnus* sp.), red-osier dogwood (*Cornus sericea*), and cottonwoods (*Populus* sp.).	No	**Presumed absent**. No suitable habitat is present.
Chilomeniscus stramineus variable sandsnake	Fed: None AZ: SGCN 1b	Found primarily in the Arizona upland subdivision of the Sonoran desertscub community. It is usually encountered above the flats in or near drainages and canyons with loose gravel or sand substrates.	No	**Low**. There is marginal habitat on-site.
Chionactis occipitalis klauberi Tucson shovel-nosed snake	Fed: None AZ: SGCN 1a	Found on more productive creosote-mesquite floodplain habitats, with soils described as soft, sandy loams with sparse gravel.	No	**Moderate**. There is suitable habitat throughout the project site.
Coccyzus americanus occidentalis western yellow-billed cuckoo	Fed: **THR** AZ: WSC; SGCN 1a	Limited to marrow and often widely separated, riparian cottonwood-willow galleries; salt cedar is also used by cuckoos. Dense understory foliage appears to be an important factor in nest site selection. Can be found in larger mesquite bosques in Arizona.	No	**Presumed absent.** No suitable habitat is present on site.
Colaptes chrysoides gilded flicker	Fed: None AZ: SGCN 1b	Strongly associated with, but not completely restricted to, giant cactus forests of southwestern deserts.	Yes	**Present**. This species was observed on-site.
Coluber bilineatus Sonoran whipsnake	Fed: None AZ: SGCN 1b	Commonly found in rocky canyons, riparian areas, foothills and mountains with dense vegetation at elevations up to 6,100 feet. Also found in open creosote bush flats.	No	**Low**. May forage on-site but no roosting habitat is present on-site.
Corynorhinus townsendii pallescens pale Townsend's big-eared bat	Fed: None AZ: SGCN 1b	In Arizona, summer day roosts are found in caves and mines from desertscrub up to woodlands and coniferous forests. Night roosts may often be in abandoned buildings. In the winter, they hibernate in cold caves, lava tubes, and mines mostly in uplands and mountains from the vicinity of the Grand Canyon to the southeastern part of the state.	No	**Low**. May forage on-site but no roosting habitat is present on-site.
Crotalus tigris tiger rattlesnake	Fed: None AZ: SGCN 1b	Found in Arizona upland Sonoran desertscrub, Chihuahuan desertscrub, interior chaparral, and madrean evergreen woodland communities, usually on rocky slopes or in washes within rocky mountains and foothills. It is occasionally found in the desert flatlands, but rarely strays more than a mile from foothills, mountains, or rocky habitat.	No	**Low**. There is marginal habitat on-site. This species tends to avoid flatlands.
Dendroica petechial yellow warbler	Fed: None AZ: SGCN 1b	Occurs in riparian woodland or forest dominated by cottonwoods and willows.	No	**Presumed absent.** No suitable habitat is present on-site.

Scientific Name Common Name	**Status**		**Habitat**	**Observed Onsite**	**Potential to Occur**
Euderma maculatum spotted bat	Fed: AZ:	None WSC; SGCN 1b	Most are captured in dry, rough desertscrub with a few captured or heard in ponderosa pine forest. Also has been found from low desert in southwestern Arizona to high desert and riparian habitats in northwestern Arizona and Utah and conifer forests in northern Arizona.	No	**Low**. There is marginal habitat on-site. This species may forage on-site but there is no roosting habitat.
Eumops perotis californicus greater mastiff bat	Fed: AZ:	None SGCN 1b	Lower and upper Sonoran desertscrub near cliffs, preferring the rugged rocky canyons with abundant crevices. They prefer crowding into tight crevices a foot or more deep and two inches or more wide. Colonies prefer crevices even deeper, to ten or more feet.	No	**Presumed absent.** No suitable habitat is present on-site.
Falco peregrinus anatum American peregrine falcon	Fed: AZ:	None WSC; SGCN 1a	Found in Arizona near cliffs that support sufficient abundance of prey. Optimum peregrine habitat is generally considered to be steep, sheer cliffs overlooking woodlands, riparian areas or other habitats supporting avian prey species in abundance.	No	**Moderate**. There is suitable foraging habitat throughout the site but no nesting habitat.
***Gopherus morafkai* (= *G. agassizii* [Sonoran Population])** Sonoran desert tortoise	Fed: AZ:	**Candidate** WSC; SGCN 1a	The Sonoran population of the desert tortoise occurs primarily on rocky slopes and bajadas of Mojave and Sonoran desertscrub.	No	**Low**. There is marginal habitat throughout the project site. The site is located in the lowlands, where this species is generally scarce. Some burrows of suitable tortoise size were identified on-site, but no tortoises or tortoise sign were observed inside or in the vicinity of them.
Haliaeetus leucocephalus bald eagle	Fed: AZ:	Delisted WSC; SGCN 1a	Inhabit coastal areas, estuaries, unfrozen inland waters, and some arid areas of the western interior and southwestern portion of the U.S. Prefers areas with high water-to-land edge and areas with unimpeded views including both horizontal and vertical aspects.	No	**Presumed absent**. No suitable habitat is present on-site.
Heloderma suspectum gila monster	Fed: AZ:	None SGCN 1a	Primarily in Sonoran Desert and extreme western edge of Mohave Desert, less frequent in desert-grassland and rare in oak woodland. Most common in undulating rocky foothills, bajadas and canyons.	No	**Presumed absent.** No suitable habitat is present on site.
Incilius alvarius Sonoran desert toad	Fed: AZ:	None SGCN 1b	Common in the Sonoran Desert. Occurs in a variety of habitats including creosote bush desertscrub, grasslands up into oak-pine woodlands, and thornscrub and tropical deciduous forest in Mexico.	No	**Moderate**. There is suitable habitat throughout the project site. Rodent burrows suitable for aestivation are scattered throughout the entire site, and during monsoon season the on-site drainages may provide suitable aquatic habitat.
Kinosternon sonoriense Sonora mud turtle	Fed: AZ:	None SGCN 1b	Occurs in pond and stream habitats. Known from a pond and limited stream habitat at	No	**Presumed absent.** No suitable habitat is present on site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Lasiurus blossevillii western red bat	Fed: None AZ: WSC; SGCN 1b	Preferred habitat includes riparian and wooded areas. They roost during the day in trees. Summer roosts occur in tree foliage, sometimes in leafy shrubs or herbs. Often found in fruit orchards.	No	**Presumed absent.** No suitable habitat is present on-site.
Lasiurus xanthinus western yellow bat	Fed: None AZ: WSC; SGCN 1b	May be associated with Washington fan palm trees, or other palms or other leafy vegetation such as sycamores, hackberries and cottonwoods, which provide roost sites.	No	**Presumed absent.** No suitable habitat is present on-site.
Leopardus (Felis) pardalis ocelot	Fed: **END** AZ: WSC; SGCN 1a	Lives in areas of dense cover or vegetation, and high prey populations. Avoids open country.	No	**Presumed absent.** No suitable habitat is present on-site.
Leptonycteris curasoae yerbabuenae lesser long-nosed bat	Fed: **END** AZ: WSC; SGCN 1a	Desert grassland and shrubland up to the oak transition. Roosts in caves, mine tunnels, and occasionally in old buildings. Forages in areas of saguaro, ocotillo, paloverde, prickly pear, and organ pipe cactus and later in the summer among agaves.	No	**Low**. May forage on-site but no roosting habitat is present on-site.
Lithobates yavapaiensis lowland leopard frog	Fed: None AZ: WSC; SGCN 1a	Inhabit aquatic systems in desert grasslands to pinyon-juniper. This species is considered to be a habitat generalist and breed in a variety of natural and man-made aquatic systems. In semi-permanent aquatic systems, may survive the loss of water by retreating into deep mud cracks, mammal burrows, or rock fissures.	No	**Presumed absent**. No suitable habitat is present. There is no permanent water on-site.
Macrotus californicus California leaf-nosed bat	Fed: None AZ: WSC; SGCN 1b	Mostly found in the Sonoran desertscub roosting in caves, mines, and rock shelters. Prefer roost sites with large areas of ceiling and flying space.	No	**Low**. May forage on-site but no roosting habitat is present on-site.
Melanerpes uropygialis Gila woodpecker	Fed: None AZ: SGCN 1b	Require cacti or trees with large trunks that are used for nesting sites. Suitable habitats include riparian woodlands, uplands with concentrations of large columnar cacti, old-growth xeric-riparian was woodlands, and urban or suburban residential areas.	Yes	**Present**. This species was observed nesting on-site.
Melospiza lincolnii Lincoln's sparrow	Fed: None AZ: SGCN 1b	Riparian-willow habitat surrounded by large, contiguous tracts of upland forest. Forest types include lodgepile pine (*Pinus contorta*), spruce (*Picea* sp.), fir (*Abies* sp.), aspen, and cottonwoods (*Populus* sp.).	No	**Presumed absent.** No suitable habitat is present on-site.
Melozone aberti Abert's towhee	Fed: None AZ: SGCN 1b	Frequents dense riparian vegetation; thickets of willow, cottonwood, mesquite, saltcedar.	Yes	**Present**. This species was observed on-site.
Micruroides euryxanthus Sonoran coralsnake	Fed: None AZ: SGCN 1b	Found in communities ranging from Sonoran, Mohave, and Chihuahuan desertscrubs, through semidesert grassland, and into the lower reaches of the woodlands. It is usually encountered about the flats in or near rocky or gravelly drainages, mesquite lined washes, and canyons.	No	**Low**. There is marginal habitat on-site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Myotis lucifugus occultus Arizona myotis	Fed: None AZ: SGCN 1b	During the summer, it is usually found in ponderosa pine and oak-pine woodland near water. Also found along permanent water or in riparian forests in some desert areas such as along the lower Colorado and Verde rivers.	No	**Presumed absent.** No suitable habitat is present on-site.
Myotis velifer cave myotis	Fed: None AZ: SGCN 1b	Desertscrub of creosote, brittlebush, palo verde, and cacti. Roosts in caves, tunnels, mineshafts, under bridges, and sometimes buildings within a few miles of water.	No	**Low**. There is marginal habitat on-site. This species may forage on-site but there is no roosting habitat.
Myotis yumanensis Yuma myotis	Fed: None AZ: SGCN 1b	Roosts in buildings, mines, caves, or crevices and also has been observed roosting in abandoned swallow nests and under bridges. Distribution is closely tied to bodies of water, which it uses as foraging sites and sources of drinking water. Open forest and woodlands are optimal habitat.	No	**Presumed absent.** No suitable habitat is present on-site.
Nyctinomops femorosaccus pocketed free-tailed bat	Fed: None AZ: SGCN 1b	Reaches the northern limits of its distribution in desert scrub and arid lowland habitats in southern Arizona and southern California. Roosts in crevices high on cliff faces in rugged canyons. Roosts in rock crevices and caves during the day and may roost in buildings or under roof tiles.	No	**Low**. There is marginal habitat on-site. This species may forage on-site but there is no roosting habitat.
Panthera onca jaguar	Fed: **END** AZ: WSC; SGCN 1a	Known for a variety of habitats, showing a high affinity to lowland wet habitats, typically swampy savannas or tropical rain forests. In the northern and southern periphery, they may occur in warmer, more arid habitat types, including oak-pine woodland.	No	**Presumed absent.** No suitable habitat is present on site.
Passerculus sandwichensis savannah sparrow	Fed: None AZ: SGCN 1b	Habitat consists of open country, grassy meadows, agricultural fields, sedge bogs, edges of salt marshes, and tundra. Typically avoid areas with extensive tree cover.	No	**Presumed absent.** No suitable habitat is present on-site.
Perognathus amplus Arizona pocket mouse	Fed: None AZ: SGCN 1b	Range includes southwestern half of AZ and extreme northwestern Mexico. Occupies great basin desertscrub habitat usually with sparse ground cover of greasewood, snakeweed, rabbitbrush, ephedra, shortgrass, and short junipers.	No	**Low**. There is marginal habitat on-site.
Perognathus longimembris little pocket mouse	Fed: None AZ: SGCN 1b	Inhabits arid plains and desert-like country. This species is nocturnal, spending daylight hours in burrows and emerging at night to feed on a variety of vegetation and insect species.	No	**Low**. There is marginal habitat on-site.
Phrynosoma solare regal horned lizard	Fed: None AZ: SGCN 1b	Found within Arizona upland Sonoran desertscrub, Chihuahuan desertscrub, and semidesert grassland communities. It inhabits valleys, rocky bajadas, and low foothills. It is usually encountered in relatively level areas with low shrubs and open, sunny patches.	No	**Moderate**. There is suitable habitat throughout the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Phyllorhynchus browni saddled leaf-nosed snake	Fed: None AZ: SGCN 1b	Primarily an inhabitatnt of the Arizona upland subdivision of the Sonoran desertscrub community, but it extends into the lower Colorado River subdivision near Gila Bend and Florence. It is usually found above the flats in foothills and on moderate bajadas.	No	**Presumed absent.** No suitable habitat is present on site.
Sonorella allynsmithi Phoenix talussnail	Fed: None AZ: SGCN 1b	Reside in deep talus slopes, boulder outcrops and rocky wash embankments above the flood zone. The snails often use vegetated areas along the edge of talus because the vegetation provides food, reduces soil temperature and helps stabilize the talus slope.	No	**Presumed absent.** No suitable habitat is present on site.
Tadarida brasiliensis Mexican free-tailed bat	Fed: None AZ: SGCN 1b	In the spring, these migratory bats move northward from southern Arizona and Mexico, to the lower Sonoran and upper Sonoran life zones. Considered primarily a lowland species, they do sometimes range into the highlands.	No	**Presumed absent.** No suitable habitat is present on-site.
Troglodytes pacificus pacific wren	Fed: None AZ: SGCN 1b	Highest breeding densities are found in conifer forests. Frequently associated with water.	No	**Presumed absent.** No suitable habitat is present on site.
Vireo bellii arizonae Arizona Bell's vireo	Fed: None AZ: SGCN 1b	Relies heavily on cotton-willow forests at low elevations, possibly due to high midsummer temperatures that exist outside of the forests. At higher elevations (above 1,400 feet), this species uses tamarisk (*Tamarix* sp.) and honey mesquite (*Prosopis glandulosa*), as well as cottonwood-willow forest.	No	**Presumed absent.** No suitable habitat is present on-site.
Vulpes macrotis kit fox	Fed: None AZ: SGCN 1b	Primarily associated with desert shrub or shrub-grass habitats. They appear not to need free-standing water, meeting their needs through metabolic processes instead. Dens are important to kit foxes, providing more moderate habitat temperatures in both the summer and winter.	No	**Presumed absent**. While the site contains suitable habitat to support this species, kit fox dens are conspicuous and distinctive and none were found on-site. May pass through the site but based on the lack of observed dens is not believed to currently inhabit it as a resident.
PLANT SPECIES				
Abutilon parishii Parish's indian mallow	Fed: None NPL: SR	Found on rocky slopes and canyon bottoms in desertscrub, and up into semidesert grassland. Found at elevations ranging from 2,500 to 4,900 feet. Flowers in the spring followed by a longer, late summer to fall bloom.	No	**Presumed absent**. The project site is well outside of the known elevation range for this species.
Agave arizonica Arizona century plant	Fed: None NPL: HS	Sonoran desertscrub, chaparral, or juniper grassland; known only from the New River Mountains of central Arizona. Found at elevations ranging from 3,600 to 5,800 feet. Blooming period is from May to July.	No	**Presumed absent**. The project site is well outside of the known elevation range for this species.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Agave delamateri Tonto Basin century plant	Fed: None NPL: HS	Grows in open, hilly slopes of the Sonoran Desert adjacent to major drainages. Populations are associated with prehistoric agave cultivation in central Arizona. Found at elevations ranging from 2,190 to 5,100 feet. Blooming period is from May to July.	No	**Presumed absent**. The project site is well outside of the known elevation range for this species.
Agave murpheyi Murphey's century plant	Fed: None NPL: HS	In central Arizona, it is usually found on benches or alluvial terraces on gentle bajada slopes above major drainages in desert scrub. Can also be found near rock piles. Found at elevations ranging from 1,300 to 3,200 feet. Blooming period is from March to July.	No	**Presumed absent.** No suitable habitat is present on site.
Argemone pleiacantha southwestern pricklypoppy	Fed: **END** NPL: None	Occurs on gravelly soils of open or disturbed ground. Also found on slopes or canyon bottoms. Found at elevations ranging from 4,200 to 7,100 feet.	No	**Presumed absent**. The project site is well outside of the known elevation range for this species.
Astragalus corbrensis var. ***maguirei*** coppermine milkvetch	Fed: None NPL: SR	Grows in Pinon-juniper or pine-oak woodlands in the Chiricahua and Peloncillo mountains. Found at elevations ranging from 5,500 to 7,000 feet. Blooming period is from March to April.	No	**Presumed absent**. The project site is well outside of the known elevation range for this species.
Carnegiea gigantea Saguaro (crested form)	Fed: None NPL: HS	Occurs throughout the Sonoran Desert; generally in rocky soils and low mountains. Crested plants are a very small proportion of the population. Found at elevations ranging from 590 to 6,496 feet. Blooming period is from May to June.	No	**Absent**. Saguaro are present on-site, but are not of the crested form.
Echinomastus erectocentrus var. ***acuñensis*** Acuña cactus	Fed: **Proposed** NPL: HS	Grows in low hills and gravel ridges in Sonoran desertscrub habitat. Found at elevations ranging from 1,300 to 2,000 feet. Blooming period is from March to April.	No	**Presumed absent.** No suitable habitat is present on site. Few cacti were found on-site, and this species was not observed.
Erigeron lemmonii Lemmon's fleabane	Fed: **Candidate** NPL: HS	Known only from the Huachuca Mountains at 6,300 to 7,300 feet in elevation. Blooming period is from August to October.	No	**Presumed absent**. The project site is well outside of the known elevation range for this species.
Erigeron piscaticus Fish Creek fleabane	Fed: None NPL: SR	Grows in alluvial soils in shady canyon bottoms between 2,250 and 3,500 feet in elevation. Found in moist, sandy canyon bottoms associated with perennial streams. Blooming period is from May to August, probably continuing until October.	No	**Presumed absent**. The project site is well outside of the known elevation range for this species.
Fremontodendron californicum Flannel bush	Fed: None NPL: SR	Found in well-drained rocky slopes in chaparral or oak-pine woodland habitats. Blooming period is from May to June.	No	**Presumed absent.** No suitable habitat is present on site.
Purshia (Cowania) subintegra Arizona cliffrose	Fed: **END** NPL: HS	Occurs on Tertiary limestone lake bed deposits of the Verde Valley Formation in Sonoran desertscrub habitat to 4,000 feet.	No	**Presumed absent.** No suitable habitat is present on site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed Onsite**	**Potential to Occur**
Tumamoca macdougalii Tumamoc globeberry	Fed: None NPL: SR	Found on undisturbed soils along washes below 3,000 feet. Blooming period is August to September.	No	**Low**. There is marginal habitat on-site.

U.S. Fish and Wildlife Service (Fed)
END- Federal Endangered
THR- Federal Threatened
Proposed- Proposed for listing
Candidate- Candidate for listing
Delisted- Species delisted and being monitored

Arizona Game and Fish Department (AZ)
WSC- Wildlife Species of Concern
SGCN- Species of Greatest Conservation Need. These species are ranked as "vulnerable" under one or more of the following categories: Extirpated from Arizona, Federal or State status, Declining status, Disjunct status, Demographic status, Concentration status, Fragmentation status, Distribution status

SGCN Tiers
1a- Ranked "vulnerable" in at least one of the SGCN categories and in addition matches at least one of the following subsequent criteria: Federally listed as endangered or threatened under the Endangered Species Act (ESA); Candidate species under ESA; Is specifically covered under a signed conservation agreement or a signed conservation agreement with assurances; Recently removed from ESA and currently requires post-delisting monitoring; Closed season species (i.e., no take permitted) as identified in Arizona Game and Fish Commission Orders 40, 41, 42 or 43.
1b- Ranked "vulnerable" in at least one of the SGCN categories but does not meet any of the subsequent criteria

Arizona Native Plant Law (NPL)
HS- Highly Safeguarded
SR- Salvage Restricted

Appendix C Flora and Fauna Compendium

Table C-1: Plant Species

PLANT SPECIES	
Scientific Name	**Common Name**
Ambrosia ambrosioides	canyon ragweed
Ambrosia deltoidea	triangleleaf bursage
Baccharis sarothroides	broom baccharis
Carnegiea gigantea	saguaro
Castela emoryi	crucifixion thorn
Cylindropuntia acanthocarpa	buckhorn cholla
Dasyochloa pulchella	low woollygrass
Datura wrightii	jimsonweed
Encelia farinosa	brittlebush
Eriogonum deflexum	flatcrown buckwheat
Ferocactus sp.	barrel cactus
Ferocactus cylindraceus	California barrel cactus
Ferocactus fordii	ford barrel cactus
Isocoma pluriflora	southern goldenbush
Larrea tridentata	creosote bush
Lycium fremontii	Fremont's desert-thorn
Malva parviflora	cheeseweed
Olneya tesota	desert ironwood
Oncosiphon piluliferum	stinknet
Parkinsonia florida	blue palo verde
Parkinsonia microphylla	foothill palo verde
Pennisetum ciliare	buffelgrass
Prosopis glandulosa	honey mesquite
Salsola tragus	Russian thistle
Schismus arabicus	Arabian grass
Senna covesii	rattlebox senna
Sphaeralcea ambigua	apricot mallow
Ziziphus obtusiflora	lotebush

Table C-2: Wildlife Species

WILDLIFE SPECIES	
Scientific Name	**Common Name**
AVES	**BIRDS**
Auriparus flaviceps	verdin
Buteo lineatus	red-shouldered hawk
Callipepla gambelii	Gambel's quail
Campylorhynchus brunneicapillus	cactus wren
Cathartes aura	turkey vulture
Chordeiles acutipennis	lesser nighthawk
Colaptes chrysoides	gilded flicker
Eremophila alpestris	horned lark
Falco sparverius	American kestrel
Haemorhous mexicanus	house finch
Melanerpes uropygialis	Gila woodpecker
Melozone aberti	Abert's towhee
Molothrus ater	brown-headed cowbird
Myiarchus cinerascens	ash-throated flycatcher
Polioptila melanura	black-tailed gnatcatcher
Sayornis saya	Say's phoebe
Streptopelia decaocto	Eurasian collared-dove
Zenaida asiatica	white-winged dove
Zenaida macroura	mourning dove
MAMMALIA	**MAMMALS**
Sylvilagus audubonii	desert cottontail
Xerospermophilus tereticaudus	round-tailed ground squirrel
REPTILIA	**REPTILES**
Aspidoscelis tigris punctilinealis	Sonoran tiger whiptail
Uta stansburiana elegans	western side-blotched lizard