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Arizona Corporation Commission
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August 7, 2013

Docket Control
Arizona Corporation Commission
1200 W. Washington
Phoenix, AZ 85007

RE: Arizona Public Service Company's Palo Verde to North Gila 500·kV Transmission Line Project,
Docket No. L-00000D-07-0566-00135

Pursuant to Decision No. 70127 dated January 23, 2008:

> Before construction on this Project may commence, the Applicant must file a Plan of Development approved by the Bureau of Land Management ("BLM") with Docket Control with copies to the affected areas of jurisdiction.

Attached please find Arizona Public Service Company's Plan of Development for the Hassayampa-North Gila 500kV-2 Transmission Line. Appendix A – Project Location and Construction Maps is included at the end of this document.

If you have any questions regarding this information, please contact me at (602)250-2661.

Sincerely,

Jeffrey W. Johnson

JJ/cd
Attachments

cc: Maricopa County
Yuma County

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AZ CORP COMMISSION
DOCKET CONTROL

HANG2

HASSAYAMPA–NORTH GILA 500kV-2 TRANSMISSION LINE
MARICOPA AND YUMA COUNTIES, ARIZONA

PLAN OF DEVELOPMENT

Prepared for

BUREAU OF LAND MANAGEMENT
BUREAU OF RECLAMATION
YUMA PROVING GROUND
ARIZONA STATE LAND DEPARTMENT

Prepared by

ARIZONA PUBLIC SERVICE COMPANY

aps

EnviroSystems Management

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PROJECT OVERVIEW

On January 23, 2008 the Arizona Corporation Commission granted Arizona Public Service Company (APS) a Certificate of Environmental Compatibility for the Palo Verde–North Gila 500kV Transmission Line (currently referred to as the Hassayampa–North Gila 500kV-2 line or HANG2, extending between the existing Hassayampa Switchyard (the actual power source) at the northeast end and the North Gila Substation at the southwest extent (*Figure 1*). The Bureau of Land Management (BLM), on behalf of all landowners along the project corridor, issued a Finding of No Significant Impact and Decision Record on November 6, 2007, which included Standard Construction Operating Procedures and Mitigation Measures to be followed and implemented. APS was granted Right-of-way (ROW) Case File/Serial No. AZA-33305. The proposed project is needed to support the continuing development and growth occurring and anticipated in the Yuma region. The projected in-service date for the proposed 500kV line has been updated to **July 1, 2015**, and construction preparation is anticipated to commence in March 2013.

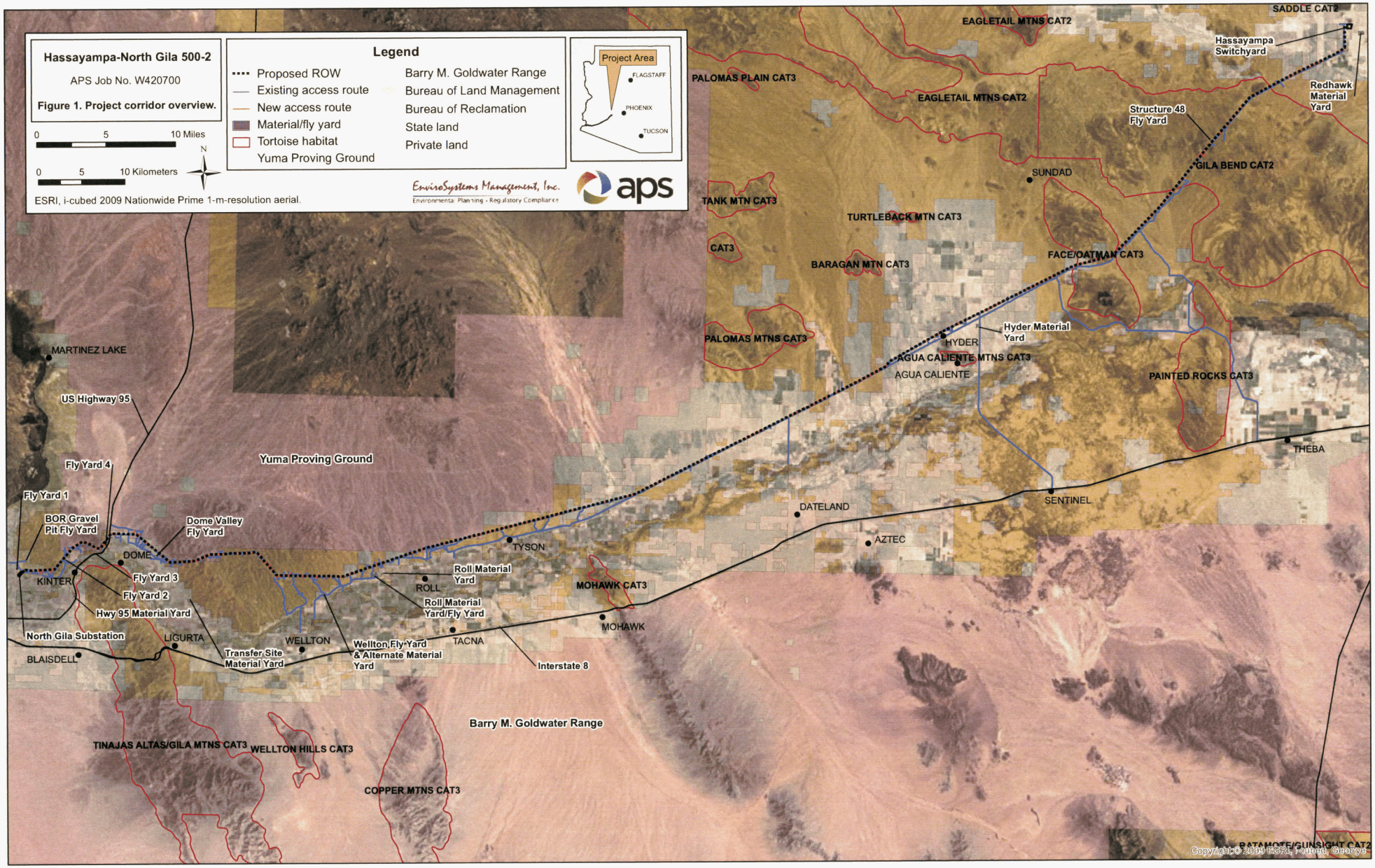
The estimated length of the proposed transmission line route is 111.36 miles. The line will cross a calculated 53.74 miles of BLM land, 1.63 miles of Bureau of Reclamation, 8.97 miles on the Department of Defense (DOD) Yuma Proving Ground, 25.94 miles of Arizona State Trust land, and 21.08 miles of private land. The required right-of-way width is 200 feet.

The Environmental Assessment (EA) completed for the project outlines line design and mitigation measures integral to the Proposed Action. Implementation of the measures as outlined and specified in this Plan of Development (POD) are intended to reduce to the fullest extent possible short-term and long-term environmental impacts. Issuance of ROW Grant AZA-33305 to APS for construction, operation, and maintenance of the HANG2 electric transmission line is consistent with the Lower Gila South Resource Management Plan (RMP) and Decision Record (BLM 1988), amended July 2005, which defines land uses along the 1-mile-wide San Diego Gas and Electric utility corridor, and the Yuma Field Office Record of Decision and Approved RMP (BLM January 2010), which defines uses along the 1-mile-wide Interconnection utility corridor. The project as proposed complies with the standards and guidelines specified in the RMPs, including the placement of new electrical transmission lines within BLM-designated utility corridors.

The BLM's current action will be approval of this Plan of Development to allow for guided construction, operation, maintenance, and termination of ancillary facilities for the HANG2 transmission line and associated fiber optics and access roads.

PURPOSE AND NEED FOR FACILITIES

The HANG2 project is included in the larger, regional transmission plans identified through the Southwest Area Transmission regional planning group. The project is noted as an important component in strengthening the entire Yuma area transmission system by providing an additional extra-high voltage electrical transmission source in the region. In addition to increasing import capability into the Yuma area load pocket, the line will increase the export transmission capability from the Hassayampa Switchyard, and provide additional transmission to reinforce the Wellton-


Hassayampa-North Gila 500-2
APS Job No. W420700
Figure 1. Project corridor overview.
0 5 10 Miles
0 5 10 Kilometers
N
ESRI, i-cubed 2009 Nationwide Prime 1-m-resolution aerial.
Legend
Proposed ROW
Existing access route
New access route
Material/fly yard
Tortoise habitat
Yuma Proving Ground
Barry M. Goldwater Range
Bureau of Land Management
Bureau of Reclamation
State land
Private land
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
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SADDLE CAT2
EAGLETAIL MTNS CAT2
Hassayampa Switchyard
Redhawk Material Yard
PALOMAS PLAIN CAT3
EAGLETAIL MTNS CAT2
Structure 48 Fly Yard
GILA BEND CAT2
SUNDAD
TANK MTN CAT3
TURTLEBACK MTN CAT3
CAT3
BARAGAN MTN CAT3
FACE/OATMAN CAT3
Hyder Material Yard
PALOMAS MTNS CAT3
HYDER
AGUA CALIENTE MTNS CAT3
AGUA CALIENTE
PAINTED ROCKS CAT3
MARTINEZ LAKE
US Highway 95
Yuma Proving Ground
THEBA
Fly Yard 4
Fly Yard 1
SENTINEL
DATELAND
BOR Gravel Pit Fly Yard
Dome Valley Fly Yard
AZTEC
TYSON
DOME
Fly Yard 3
Roll Material Yard
KINTER
ROLL
MOHAWK CAT3
Fly Yard 2
Roll Material Yard/Fly Yard
Hwy 95 Material Yard
MOHAWK
North Gila Substation
LIGURTA
WELLTON
TACNA
Wellton Fly Yard & Alternate Material Yard
BLAISDELL
Transfer Site Material Yard
Interstate 8
Barry M. Goldwater Range
TINAJAS ALTAS/GILA MTNS CAT3
WELLTON HILLS CAT3
COPPER MTNS CAT3
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Mohawk Irrigation and Drainage District service territory. The line will offer single-circuit 525kV alternating current (AC) and have capability up to 2,000 megawatts. The project will also provide access to renewable energy sources in Southern California such as the geothermal and under-construction solar generation in the Imperial Valley area.

The project is consistent with the latest APS 10-Year Plan, which was filed in January 2007 with the Arizona Corporation Commission (ACC). It was also identified as a critical component of the Fourth Biennial Transmission Assessment (2006-2016) issued by the ACC.

POD ORGANIZATION

The body of the POD is intended to provide the reader with a general overview (Executive Summary) of the project and key elements of the POD. Detailed information regarding the required mitigation measures, protocols, and procedures for the construction and operation and maintenance of the transmission line and ancillary facilities is primarily included in the Appendixes. While the POD sections provide general information, the Appendixes, including the mapping materials, are more detailed and have been designed to serve as stand-alone documents.

PROJECT MANAGEMENT

APS, as Project Proponent and Owner of the transmission line, has ultimate responsibility including the overall administration of the ROW and coordination among the regulatory agencies, Construction Contractor(s), Compliance Inspector (CI), and Resource-specific Contractor(s). The Proponent will be responsible for the construction, operation, and maintenance of the transmission line and ancillary facilities in a manner that complies with the conditions outlined in the ROW Grant, other required permits, and in the POD, and will ensure that activities are conducted in a manner that complies with all federal, state, and local regulations. The project is currently managed by Ms. Naomi Prieto (Project Manager) and Kevin Minnihan is the Supervisory Land Agent, both supported by other entities from within APS. These individuals should be contacted immediately if any problems arise concerning property owners, and the primary APS contacts will be updated as necessary upon and throughout construction. *(A Master Contact List will be prepared and distributed to the necessary supervisory personnel with the POD at the project onset and kept up to date by the APS Project Manager or Land Agent.)* The Project Proponent will work with the CI, government agencies, and Construction and Specialist Contractors to resolve any non-compliance issues that may occur.

AUTHORIZATIONS, PERMITS, REVIEWS, AND APPROVALS

The Project conforms to the current BLM Resource Management Plans for the area, as well as all other related federal, state, and local statutes, regulations, and plans. *Table 1* documents the primary federal, state, and local agencies' approvals, reviews, and permitting for the transmission line and substations.

TABLE 1
AUTHORIZATIONS, PERMITS, REVIEWS, AND APPROVALS

Action Requiring Permit, Approval, or Review	Permit/Approval	Accepting Authority/ Approving Agency	Statutory Reference
FEDERAL			
Right-of-way (ROW) over Land under Federal Management	ROW Grant	Bureau of Land Management (BLM)—AZA-33305 Yuma Proving Ground (YPG) Bureau of Reclamation (BOR)	FLPMA 1976 (PL94-579) USC 1761-1771 43 CFR 2800
National Environmental Policy Act (NEPA) Compliance to Grant ROW	Environmental Assessment (EA)	BLM, YPG, BOR	NEPA, CEO 40 CFR Part 1500-et.seq.
Grant of ROW by BLM	Section 7 of Endangered Species Act Compliance Biological Assessment Biological Opinion	BLM, US Fish & Wildlife Service (USFWS), Arizona Game & Fish Department (AGFD)	Endangered Species Act Arizona Native Plant Law
	National Historic Preservation Act Section 106 Compliance	BLM & State Historic Preservation Office	National Historic Preservation Act of 1966, 36 CFR Part 800, 16 USC 47
Preconstruction Notification	CWA Sec. 404 Nationwide Permit 12 (May 2013)	Army Corps of Engineers	Section 404 of Clean Water Act (33 U.S.C. 1344)
Raising of Power Structures	Notification	Federal Aviation Administration	
STATE OF ARIZONA			
Project Siting Approval	Certificate of Environmental Compatibility	Arizona Corporation Commission	Decision No. 70127
State Land ROW	ROW Permits	Arizona State Land Department	14-115754 (Yuma Co., Line) 14-116645 (Yuma Co., Access) 14-115755 (Maricopa Co., Line) 14-116644 (Maricopa Co., Access)
Surface Water Quality Certification	Clean Water Act Section 401 Compliance	Arizona Department of Environmental Quality (ADEQ)	CWA Section 401 Water Quality Certification Program
Stormwater Runoff (SWPPP)	Approval (4-1-13) & AZPDES Gen. Construction Permit per Individual NOI Submittals	ADEQ	AZ Pollutant Discharge Elimination System (AZPDES) Permit Program
Highway Crossing	Encroachment Permit	ADOT	ADOT Article 5. Highway Encroachments & Permits
MARICOPA & YUMA COUNTIES			
Construction	Dust Control Permit	Maricopa Co. Air Quality Dept.	Rule 310
County Road Crossings Utilities (Gas, others) Railroad Crossings Private Land Easements	Encroachment Permit Encroachment, Blue Stake Crossing Agreement Access & Work Yards	Maricopa & Yuma Counties Various (EPNG, others) Union Pacific Railroad (UPRR) Various	

FACILITY DESIGN AND CONSTRUCTION

Transmission Line Design

The electrical characteristics of the Proposed Action are shown in *Table 2*.

Self-Supporting Structure Types—Steel lattice towers and tubular steel monopoles are planned as the primary structure types for the HANG2 500kV transmission line (*Figures 2* and *3*). Lattice towers include tangent structures and varietal types such as angle, dead-end, and transposition (*Figure 4*). Monopoles consist of single-circuit tubular steel, tangent vertical configuration (*Figure 5*), and steel pole transposition (*Figure 6*). Other less frequently used types are the 3-pole dead-end (*Figure 7*), H-frame structure (*Figure 8*), and Y structure. The structures are planned to be between 72 and 170 feet tall depending on the span length required and topography, with quite a few being shorter than 130 and none exceeding 195 feet. The span length between structures will vary from 600 to 2,100 feet according to terrain conditions and to achieve site-specific mitigation objectives. Individual structure placement and selections have been specifically outlined for the entire line, as well as height and span. The steel lattice and tubular steel pole structures will have a dulled finish.

Foundations—The self-supporting steel lattice towers require four footings. The foundations for the 500kV self-supporting steel lattice towers will be cast-in-place concrete ranging from 30 to 48 inches in diameter. Each leg of the structure would be 16 to 24 feet deep. Steel poles will be installed on concrete foundations or directly imbedded. Foundations will typically be 5.5 to 8 feet in diameter.

Conductors—Single-circuit, double-bundled conductor will be used. Conductors will have a low reflective (non-specular), dulled finish to reduce visibility. The minimum height of the 500kV transmission line conductor above existing grade will be 31 feet, 6 inches based on National Electrical Safety Codes (NESC) and APS' own standards. The exact height of each tower is governed by topography and safety requirements for conductor clearance.

Insulators and Associated Hardware—The 500kV single-circuit lattice and tangent pole structures will have three vertical V-insulator/hardware assemblies per circuit suspended from the structure (See Figures 2 and 3). The 500kV single-circuit dead-end structures will have three horizontal strings per circuit installed in tension with the conductor on each side of the structure. Insulators will be composed of ceramic or polymer (Teflon-coated glass).

Optical Ground Wires—Ground wires will protect the single-circuit 500kV transmission line from direct lightning strikes, as well as serving a dual communications function. Two overhead ground wires, 0.656 inch in diameter, will be installed on the top of the structures. Current from lightning strikes would be transferred through the ground wires and structures into the ground.

TABLE 2
ELECTRICAL DESIGN CHARACTERISTICS OF HANG2 500kV TRANSMISSION LINE

Feature	Description
Line Length	111.36 miles
Type of Structure	Lattice tower, tubular steel pole, H-frame, and Y structure
Structure Height (range)	72-170 feet (maximum height of 195 feet for all structure types)
Span Length	600 (steel poles) to 2,100 feet (lattice towers)
Number of Structures per Mile	Typically 4 but ranges from 3 to 6
Right-of-Way Width	200 feet
Land Temporarily Disturbed	
Structure Work Areas/Pads	Typically 100 × 100 feet (99.64 acres)
Wire-Pulling & Tensioning & Assembly/Erection Sites	ROW width × 300 to 600 feet (total = 150.80 acres)
Additional Disturbances	20 × 20-foot RR crossings, turnaround areas (total = 14.03 acres)
Assembly/Fly Yards	Up to 8, average of 5 acres each (total = 40 acres)
Dry Wash Areas	18.58 acres (inside & outside ROW but will be restored w/exception of 0.021 acre)
TOTAL	*323.05 acres*
Land Permanently Required	
Structure Sites	Maximum of 18 acres (45 × 45-foot area); likely closer to 10 acres total
Access Roads (includes spur roads to structures)	90.83 acres (includes New both inside/outside the ROW)
Construction/Material Yards	Five previously disturbed areas on private land (total acreage = 90 acres)
TOTAL	*198.83 maximum / 190.83 minimum acres*
Access Roads	
New or Upgraded Roads Required	37.9 miles/91.87 acres (road width varies from 12-30 feet w/ 20-foot average)
Defined Existing Roads	Approximated at 399 miles
Electrical Properties	
Nominal Voltage	525,000 volts AC (500 kilovolts)
Capacity	Up to 2,000 megawatts per circuit
Circuit Configuration	Single circuit, double-bundled conductor
Conductor Size	1 to 1.83 inches
Ground Clearance of Conductor	31.5 feet minimum
Switchyard	500kV
Substation	230kV

Fiber Optics—A fiber optic component will be incorporated into the transmission system, which could be used for voice and data communication, protective relay telemetering, and supervisory control and data acquisition. While APS is not seeking to conduct or lease commercial telecommunication services at this time, the system is designed to accommodate such requests. Up to three optical ground wire amplification/repeater stations will be established along the transmission line route. Each station will require space for a 50 × 50-foot building to be fenced, needs to have 12kV power available (and as such will require distribution line construction), and enough room for a generator backup power source. One of the stations will be placed near the existing Agua Caliente Substation and extend north to Structure 102, another may extend south-southwest from Structure 260, and to boost power, the third would extend south-southeast from Structure 268.

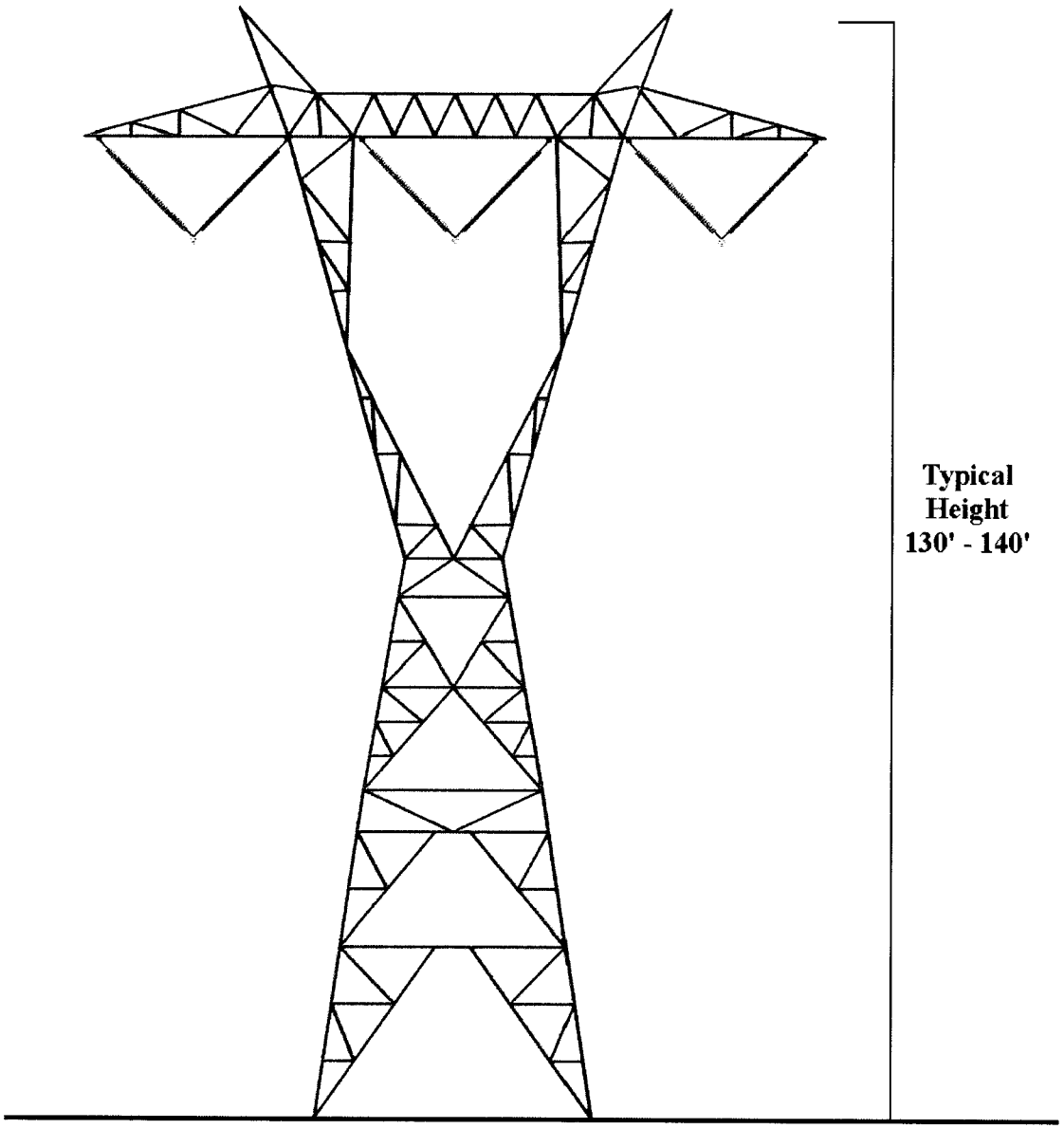


Figure 2. Typical 500kV Single-Circuit Steel Lattice Structure.

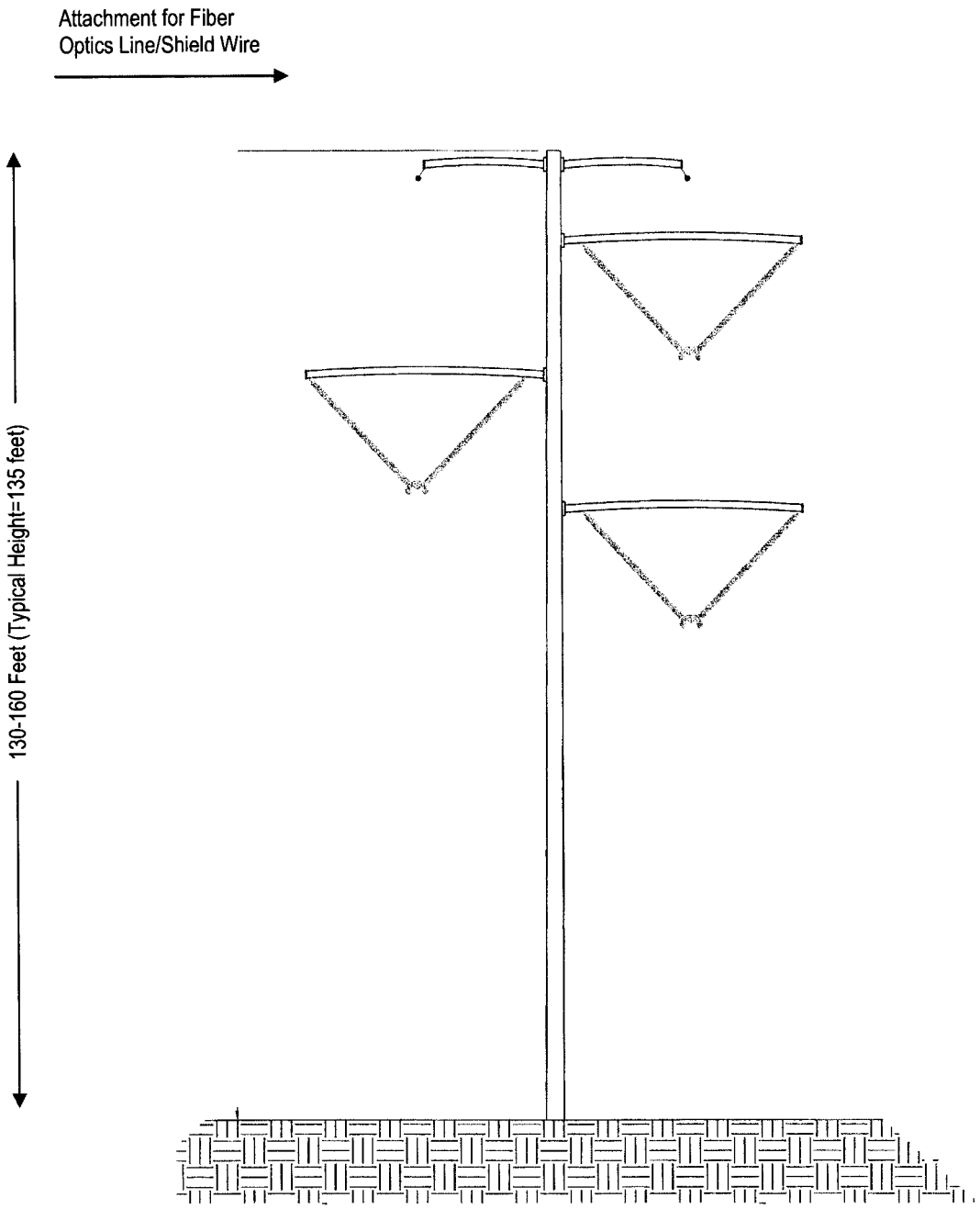


Figure 3. Typical 500kV Single-Circuit Tubular Steel Pole Structure.

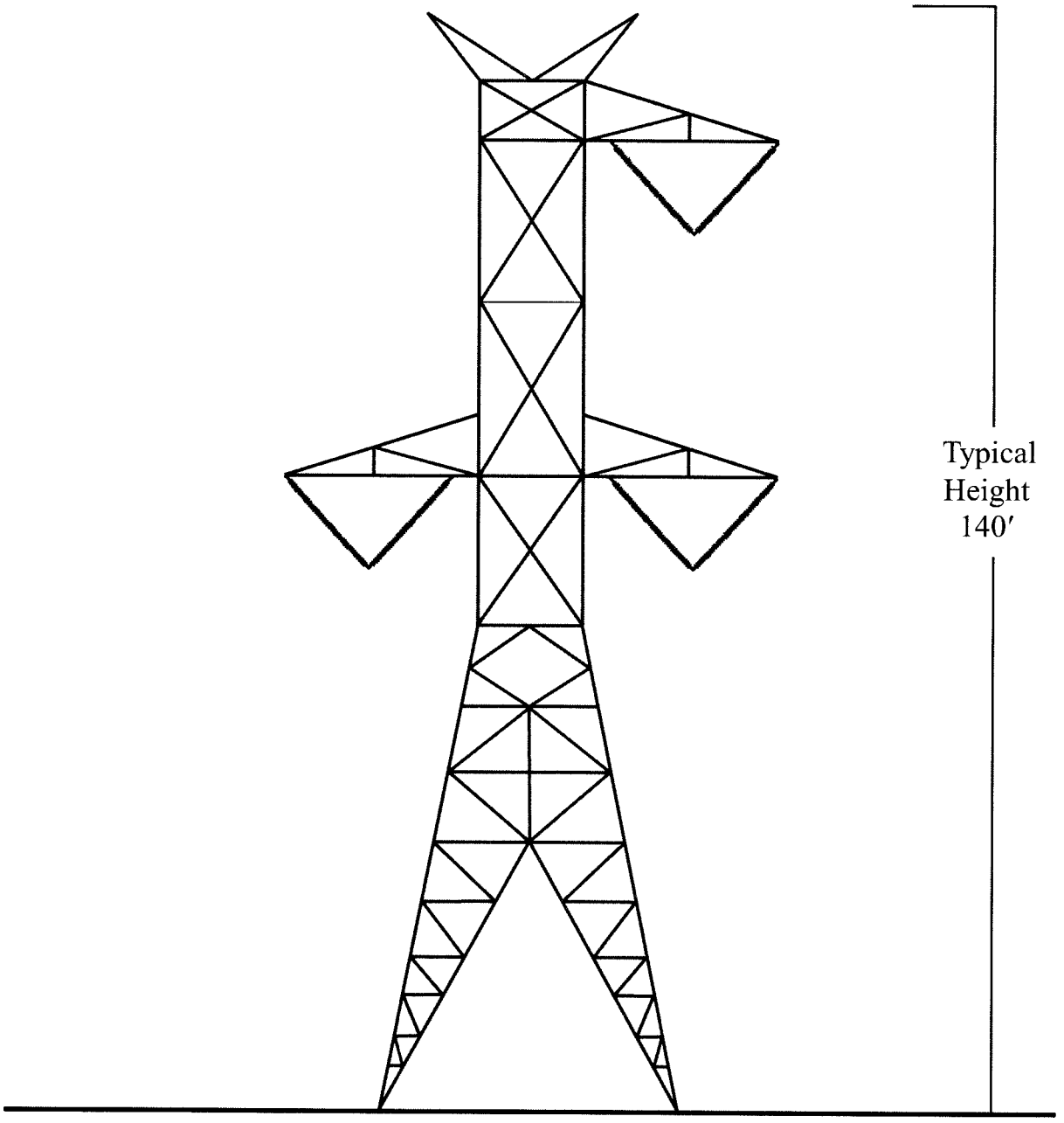


Figure 4. Typical 500kV Lattice Tower Transposition Structure.

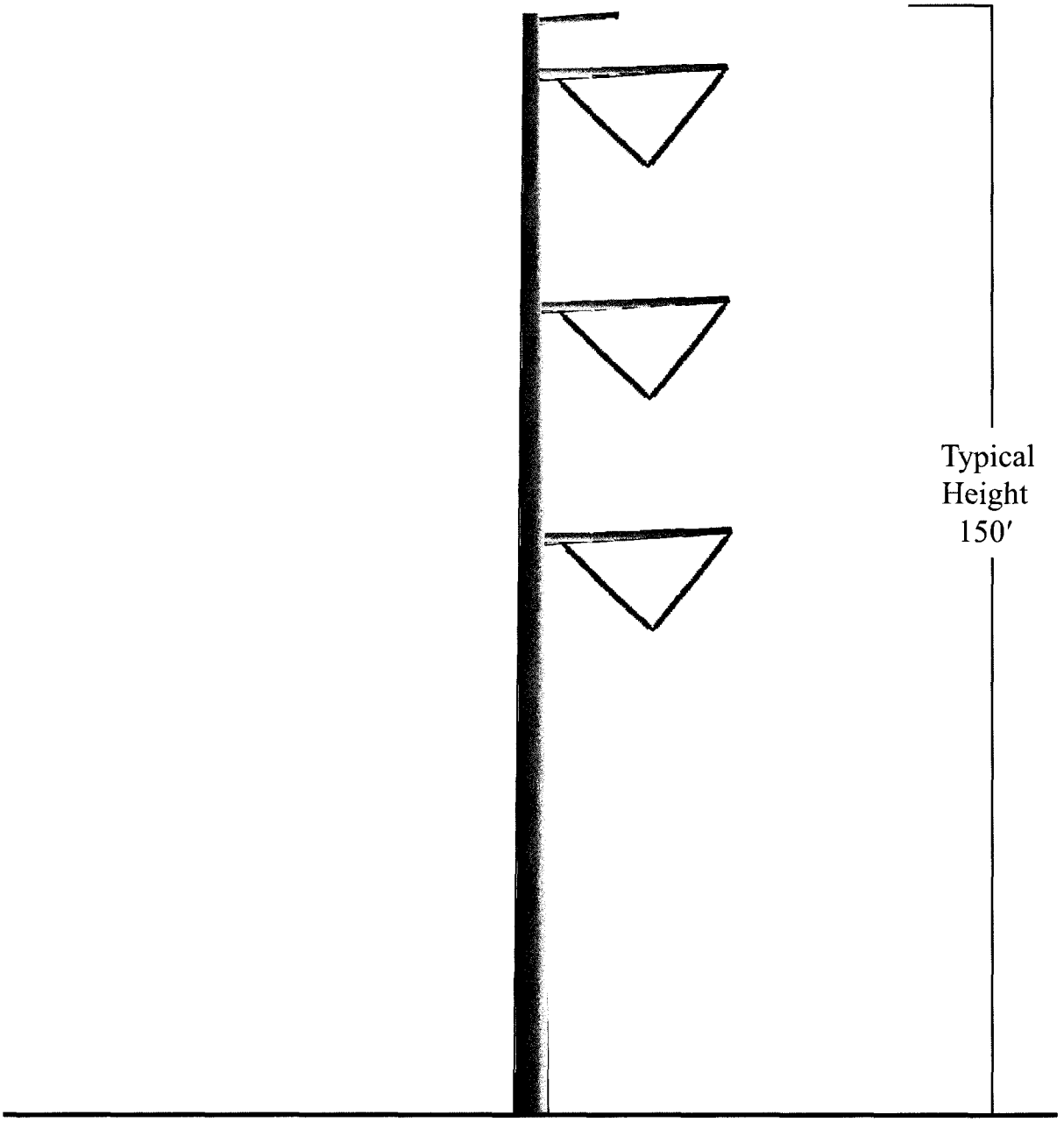


Figure 5. Typical 500kV Steel Pole Vertical Tangent Configuration.

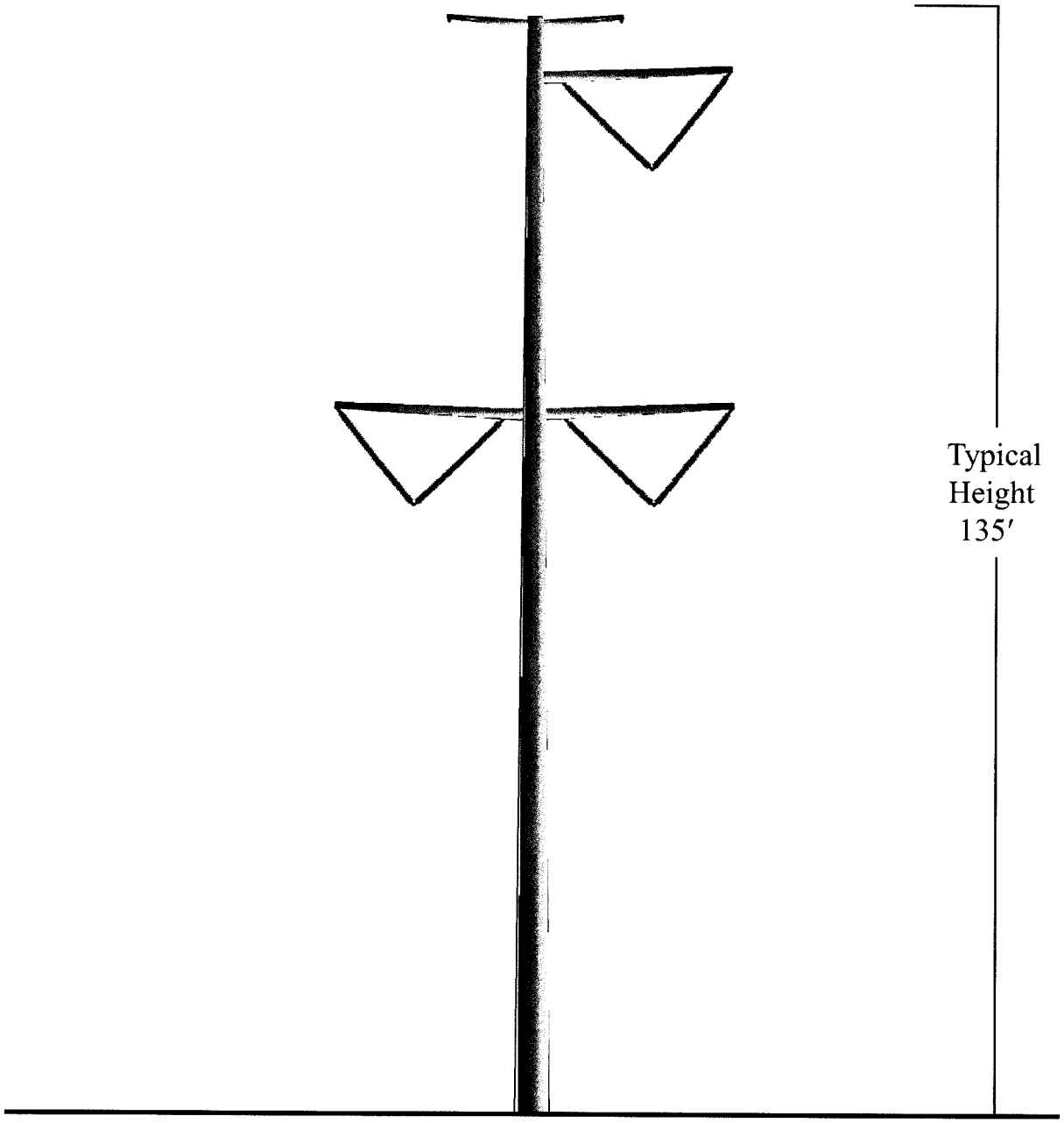


Figure 6. Typical 500kV Steel Pole Transposition Structure.

Figure 7. Typical 500kV Single-Circuit Dead-End Steel Three-Pole Structure.

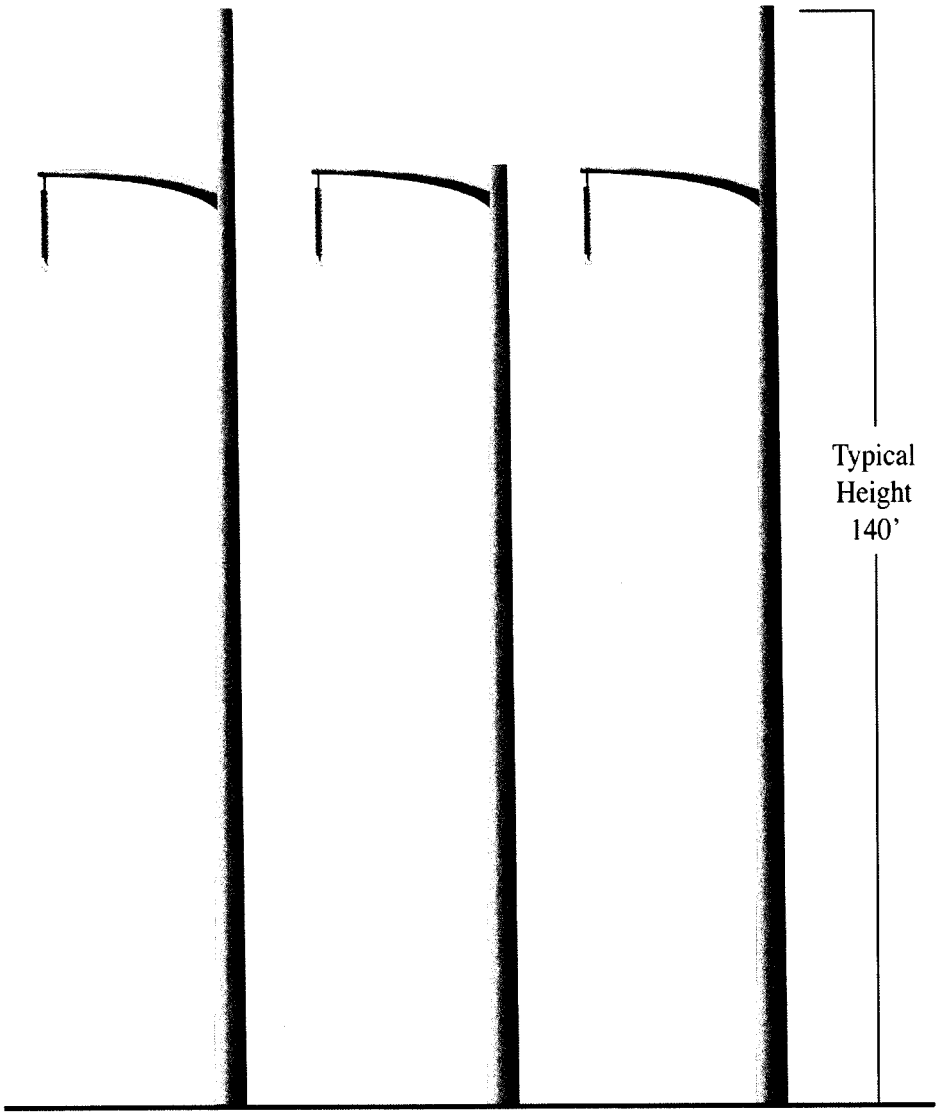
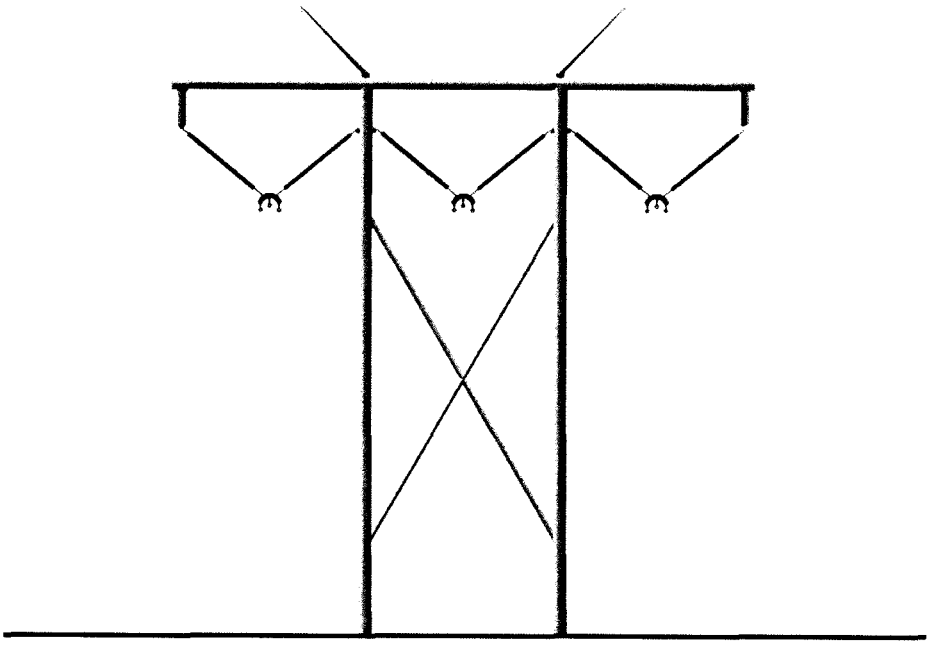


Figure 8. Modified 500kV Single-Circuit Steel H-Frame Structure.



Terminals

The transmission line would originate south of Interstate 10 and Wintersburg in Maricopa County at the Hassayampa Switchyard and would travel southwest to terminate at the North Gila Substation, 5 miles northeast of the community of Yuma in Yuma County. Both are existing facilities, and the Hassayampa Switchyard would serve as the actual power source for the line.

Right-of-Way Acquisition

New land rights, obtained in the name of APS, are required for the transmission line facilities such as the transmission line corridor, access roads, and construction yards (e.g., right-of-way grant, easements, and fee simple). APS has received Right-of-way Grant AZA-33305 from the BLM (as lead federal agency) and Right-of-way permits for both Maricopa and Yuma counties from the Arizona State Land Department (ASLD) for transmission line facilities located on public lands. APS is also seeking permitting specific to those portions of the line crossing YPG and BOR lands. Additional private rights-of-way have been sought and secured as necessary.

Transmission Line, Railroad, Utility, Road/Highway, and Canal Crossings

Whenever possible it is necessary during the design and permitting of the line to avoid crossings of the proposed 500kV transmission line with other transmission lines, particularly other 500kV transmission lines. While crossing any transmission line has the potential to reduce the reliability and stability of the transmission system (i.e., in the event of structure or conductor failure), the transmission system especially has the potential to be compromised if two high-capacity 500kV transmission lines were to be out of service from a single event. Therefore, avoiding crossings of other 500kV lines is of particular concern in the design, construction, and operation of this Proposed Action. As such, even though the HANG2 line closely parallels the HANG1 line for much of its length, there are only three crossings of the HANG1 line by HANG2. The first will be near the beginning of the line south of the Hassayampa Switchyard and north of the Union Pacific Railroad at Structure 7 (See Construction Map 2b in *Appendix A*). The second is at the Hoodoo Wash Switchyard where the HANG 1 line cuts northwest to the switchyard between proposed Structures 159 and 160 (See Construction Map 2j in Appendix A). The third is at the southwest end where the line ties into the North Gila Substation between Structures 384 and 385 (See Construction Map 2u). There are also two crossings of an existing 161kV transmission line owned by Western Area Power Administration, one at US Highway 95 at Structure 351 and again at the North Gila Substation between Structure 385 and the substation tie-in structure.

There are also a number of railroad crossings along the line since it parallels the Union Pacific Railroad for much of its length. A total of 18 crossings, depicted on the construction maps in Appendix A, have currently been identified and surveyed at ROW access points. Some or all of these crossings will be used through the course of the line's construction.

Utility crossings other than power transmission may include power distribution, gas, telephone, and water/sewer. Currently 19 such crossings are identified and depicted on the construction maps in relation to the various access roads.

There will also be a number of road crossings on federal, state, county, and private land jurisdictions, as well as one highway crossing of US Highway 95 at Structure 350 (See Construction Map 2u in Appendix A). Finally, various irrigation ditches and levees are located within and along the HANG2 corridor. In particular, the Gila Gravity Main Canal will be crossed by the line between Structure 350 and where it will enter the North Gila Substation.

Construction

Construction of a transmission line follows the sequence of surveying the centerline and specific structure locations, access road construction and improvement, clearing structure sites, digging holes, installing foundations, assembling and erecting the towers/structures, stringing ground wires and conductors, and cleanup and site reclamation. The estimated number of workers and types of equipment required to construct the HANG2 transmission line is shown in *Table 3*. Various phases of construction would occur at different locations throughout the construction process as well as at the same time at different locations. Typical transmission line construction activities are depicted in *Figure 9*.

Construction of the line is projected to take place over an estimated 24- to 26-month period, with the 500kV expected to be in service by approximately **July 1, 2015**.

This Plan of Development is the guiding document for Project Compliance with the Standard Construction and Operating Procedures and Mitigation Measures. The POD will apply through the life of the project in order to minimize potential environmental impacts. APS will not initiate any construction or other surface-disturbing activities on or off the ROW until acceptance of the POD by the BLM.

APS shall conduct all activities associated with the construction, operation, and termination of the ROW within the authorized limits of the ROW and ancillary work areas. APS shall construct, operate, and maintain the facilities, improvements, and structures within this ROW in strict conformity with the POD. Any relocation, additional construction, or use that is not in accord with the approved POD shall not be initiated without the prior written approval of the BLM. A copy of the complete ROW grant, including all stipulations and approved POD, shall be made available to inspecting personnel at construction yards and on the ROW during construction, operation, and termination. Noncompliance with the above could be grounds for an immediate temporary suspension of activities.

Construction Work Force and Schedule—The maximum total work force required to complete the phases of construction described above would be approximately 260 people. Table 3 lists the personnel and equipment that would be needed to support the construction activities.

Significant attempts will be made to hire locally for the construction work force and various contractors. Those who are not local people normally take up temporary housing in the nearby community and commute to and from the job site on a daily basis.

TABLE 3
ESTIMATED PERSONNEL AND EQUIPMENT REQUIRED FOR HANG2 500KV TRANSMISSION LINE CONSTRUCTION

Activity	Personnel	Equipment (& Minimum Quantity)	
Survey	3	2	Pickup Truck
Road Clearing/Construction/Upgrading (including maintenance)	14-28	2	Bulldozer (D-6 or D-8 Cat)
		1	Motor Grader
		2	Pickup Truck
		1	Water Truck (For construction & maintenance)
Hole Digging Footing/Foundation Installation & Excavation/Concrete	48	2	Hole Digger Rig
		1	Bulldozer (D-6)
		1	Backhoe
		1	Truck (2-ton)
		3	Concrete Truck
		2	Pickup Truck
		2	Dump Truck
		1	Carry All
		1	Hydro Crane
		2	Wagon Drill
		1	Water Truck
Structure/Pole Steel Haul	10	2	Steel/Pole Haul Truck
		2	Pickup Truck
		2	Heavy-duty Yard Crane
		1	Water Truck
Structure Assembly & Erection per crew (up to 5 crews)	12/crew (n=60)	3	Pickup Truck
		2	Carry All
		1	Crane (Rubber-tired)
		1	Crane (60-ton)
		2	Truck (2-ton)
		1	Water Truck
		2	Concrete Truck
Wire Installation/Conductoring per crew (up to 4 crews)	25/crew (n=100)	6	Wire Reel Trailer
		2	Diesel Tractors
		1	Crane (20-ton)
		1	Drag
		4	Trucks (5-ton)
		6	Pickup Truck
		2	Splicing Truck
		3	Drum Pullers (1 Light, 1 Medium, 1 Heavy)
		1	Helicopter & Fly Ropes
		2	Double-Wheeled Tensioner (1 Light, 1Heavy)
		1	Sagging Equipment
		5	2-person Lift
		1	Water Truck
Cleanup	4	2	Pickup Truck
Road Rehabilitation/ ROW Restoration	4	1	Bulldozer (D-8)
		1	Motor Grader
		1	Pickup Truck
		1	Hydro Seeder, Drill Seeder, & Grader/Tractor

Activity	Personnel	Equipment (& Minimum Quantity)	
Biological/Cultural Resources Monitoring	3-4	3-4	Pickup Truck

Estimated Total Personnel Required On-site Considering All Tasks = 260*
*(*Additional personnel and equipment may be utilized in order to meet schedule.)*

Surveying Activities – Construction survey work for the HANG2 500kV Transmission Line consists of determining centerline location and structure center hubs, structure work areas, ROW boundaries, structure access, and construction yards. The survey of the centerline, preliminary structure locations, and access routes has been completed, and maps showing these items and other associated disturbance areas have been included as *Appendix A*.

The specified ROW boundaries will be marked at 100- to 200-foot intervals with painted laths or flags using the flagging scheme identified in *Table 4*. Markings will be maintained until an activity is completed or final cleanup and/or reclamation is completed, after which all flagging will be removed. *Laminated copies of the flagging scheme will be provided to all on-site supervisors.*

TABLE 4
FLAGGING SCHEME

Ribbon or Paint Colors	Meaning	What To Do
Preferably **orange** flagging	Cadastral survey monuments or survey control points; offsets for tower legs	Protect in place
Red and white	Structure locations (capped rebar with tall lath/stake); also boring locations	Do Not Disturb survey markers
Blue	Rough centerline	Leave in place; replace if flagging missing/becoming obscured
Florescent green	Outside edge of permitted right-of-way	Do not drive vehicles or equipment outside designated corridor unless on approved access route
Green and white	200-foot square for each structure	Vehicles/equipment to remain in this marked area
White and **black** striped & signage as necessary	Access point identification, access road delineation, temporary work areas	Verify right of entry has been obtained before using these areas
Yellow with black stripes or **yellow** Caution tape	No Access	Protect in place; may need to be supplemented with signage
Yellow and **blue**	Tortoise burrows or other sensitive environmental areas	Avoid these items/areas – Do Not drive vehicles or equipment near flagged items or within flagged areas
Green or yellow **Blue**	Plants to leave in place Plant transplants/transplant locations	Contractor will dig up flagged plants and deliver them to nearest transplant locations as specified by APS Forestry
White and **pink**	Archaeological site boundary	Travel through these areas will be restricted to roped off access roads; impacts within site boundaries will be kept to the absolute minimum and monitored
Orange mesh fence	Safety or Specific Environmental Avoidance Area	

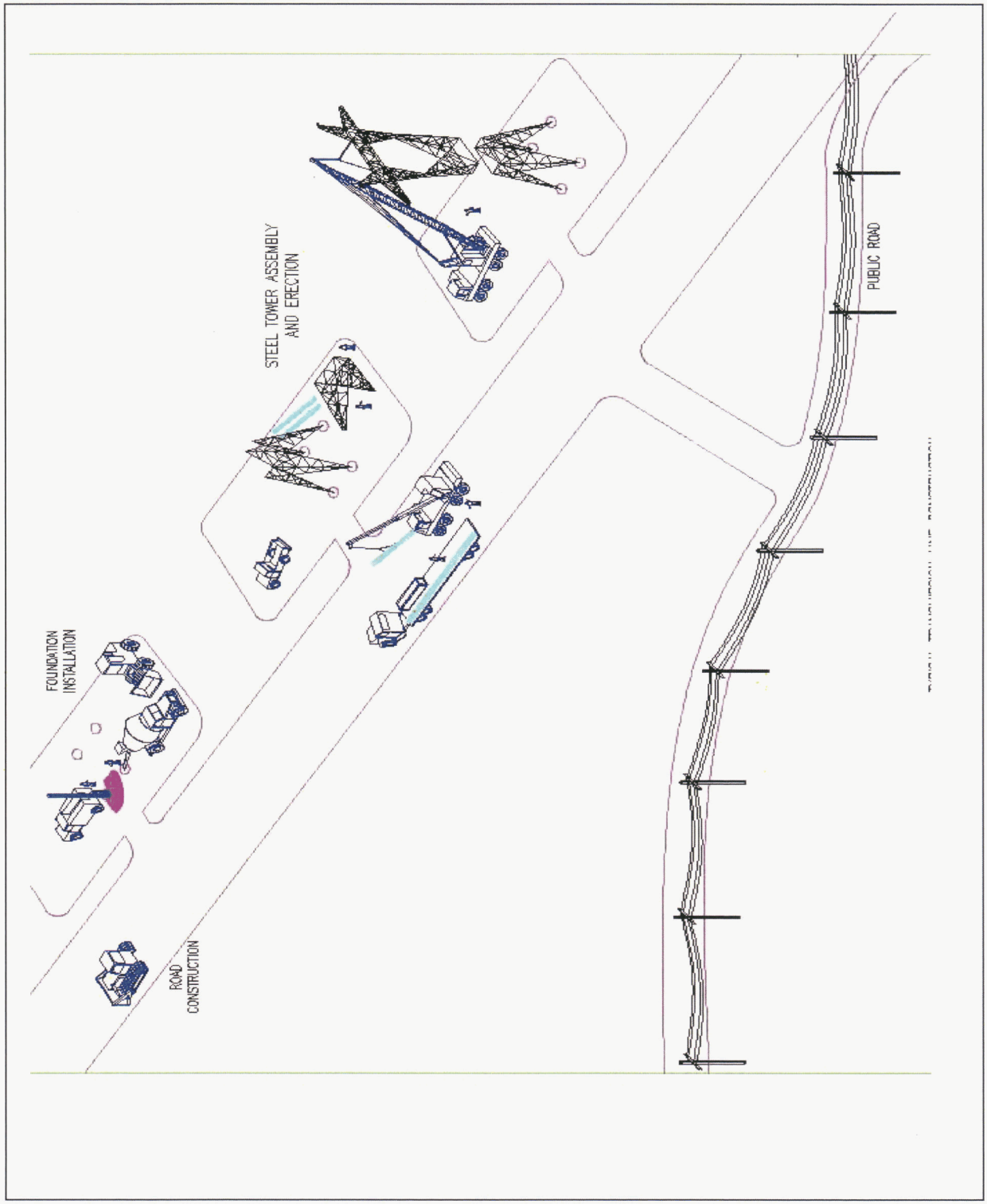


Figure 9. Typical Transmission Line Construction Activities.

Access Road Use/Upgrade/Construction—Facility construction requires the movement of large vehicles to and along the ROW. Unpaved access roads are required for the construction, operation, and maintenance of the transmission line. Existing roads to be used in association with the HANG2 line total an estimated 399 miles. Areas where there are not existing roads, including spur roads to the on-line structures, will require the development of new roads totaling about 90.83 acres or 37.9 miles. The average permanent disturbance calculator in the areas requiring new roads is estimated to be 0.5 acre per mile of transmission line. In areas of steep terrain (e.g., Muggins and Laguna Mountains), disturbance for spur roads will be minimized to the greatest extent possible to discourage a travel route through the mountains. All intended access roads, differentiated between existing or new, are illustrated on the construction maps in Appendix A.

The project's Transportation Management Plan is included as *Appendix B1* and addresses traffic management practices, levels of right-of-way access, and mitigation measures to help reduce impacts related to transportation and the construction of temporary and long-term access within the vicinity of the HANG2 Transmission Line.

All roads will be constructed in accordance with APS' Construction of Transmission Line Access Roads Specifications included as *Appendix B2*. These specifications include procedures for the proper set up of wash crossings (consisting primarily of Arizona crossings). Temporary road construction will include dust control measures (e.g., watering of roads) and compliance with the project's Stormwater Pollution Prevention Plan (SWPPP). Both the Dust Control Plan and summarized SWPPP requirements are included as *Appendixes B3* and *B4*. The alignment of any new access roads or overland routes will follow the designated area's landform contours where possible. This will minimize ground disturbance and reduce scarring. All existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line. All new roads and those that may undergo upgrades (identified as *new*), and auxiliary areas have been surveyed for cultural resources and routed in a way to avoid impacts to said resources.

Equipment and workers are those normally used for primitive road construction, ranging from hand tools to bulldozers, graders, and crew-haul vehicles. The road construction work force is anticipated to number eight individuals (See Table 3).

Fences and gates, if damaged or destroyed by construction activities, will be repaired or replaced to their original pre-disturbed condition as required by the landowner or land management agency. Temporary gates will be installed only with the permission of the landowner or land management agency and will be removed following construction. Any new access roads not needed for continued operation and maintenance of the line will be closed and reclaimed.

Right-of-Way Clearing—Selected clearing of some natural vegetation in the ROW will be required; clearing will be performed only when necessary to provide for surveying, electrical clearance, line reliability, construction, and maintenance operations. The topping or removal of mature vegetation under or near the conductors will be done to provide adequate electrical clearance, as required by NESC standards. Therefore, tall-growing vegetation consisting of

paloverde, mesquite, acacia, desert ironwood, saguaro, and tamarisk will be removed not more than 104 feet (max of 52 feet each side of the "wire zone") along the ROW centerline. **Pending BLM approval**, any maintenance chemical treatments of vegetation within the ROW would follow the Herbicide Treatment Methods outlined in the appended *Vegetation Management Plan.*

Of 9,627 trees inventoried along the ROW, 7,904 would be removed because they are situated in the wire zone 42 feet each side/84 feet along the ROW centerline or consist of trees greater than 20 feet tall within 42-52 feet each side/84-104 feet of centerline. There were only 93 identified as good transplant candidates with a suitable transplant site located in an adjacent span. Eight of these were determined to be within cultural sites, however, and cannot therefore be dug up for transplant. Six of the eight occur within the wire zone and will be cut down by hand crews. The remaining 85 trees are spread across 14 individual planting locations (See Appendix D2–Vegetation Management Plan for details, and plant and transplant locations on Construction Maps–Appendix A). Transplants are to be planted greater than 52 feet from the centerline and preferably as close as possible to the edge of ROW.

Structure Site Work Areas & Pull Sites Clearing—At each structure site, areas will be needed to facilitate the safe operation of equipment, such as construction cranes and line trucks. The area required for the location and safe operation of the necessary construction equipment will measure 100 × 100 feet, or no more than 100 × 200 feet (the width of the ROW). At each lattice tower site, a temporary work area of less than 1 acre (200 × 200 feet) will be needed for locating, assembling, and positioning/erecting each structure. A temporary work area of less than 0.5 acre (100 × 200 feet) will be required for those portions of the route where tubular steel poles will be used. The vegetation in each work area will by and large be avoided or trampled and left in place. There will be no vegetation mowing within tortoise category areas and archaeological sites, so any trees would be hand cut in these. After line construction, all areas not needed for normal transmission maintenance will be graded to blend, as nearly as possible, with the natural contours and revegetated.

Foundation Installation—Excavations for structures are conducted using power equipment. Where the soil conditions permit, a vehicle-mounted power auger or backhoe is used. In rocky areas, the foundation holes are to be excavated by micropile drilling and anchoring to avoid having to blast through rock. APS does not anticipate using blasting for foundation installation. If, however, blasting were to be necessary, a site-specific blasting plan would be followed. General provisions for blasting are included in *Appendix B5–Blasting Plan.*

After the hole is augered, tower footings or poles dug to a depth of 16 to 24 feet will be set and backfilled with concrete. Remaining minimal spoils material will be spread on the ground to best match the natural contour of the area adjacent to the structure excavations. The foundation excavation and installation requires access to the site by a power auger rig, crane, and hauling trucks, with the exception of those structures to be constructed with helicopter support. Foundation holes left open or unguarded will at a minimum be covered and sometimes fenced if necessary to protect the public and wildlife. Holes will remain open (and covered) on average 3 days/72 hours and typically not more than 1 week/7 days. Soil removed from foundation holes

will be temporarily stockpiled on the work area and typically spread across the same area soon after the holes are dug and concrete is poured. Concrete trucks will wash their chute debris into a depression in the stockpiled soil and that soil will be used first as backfill in the excavation holes. Self-contained washout systems will also be utilized by the concrete contractors, which results in removing the washed material from the area.

Material/Show-up Yards—Five to six temporary material staging and storage/show-up yards will be required during construction. The material yards will store all project-related materials and serve as construction operation centers. The yards will include space for contractor show-up, and the larger sites have the potential to include concrete batch plants. The material and pertinent equipment will include steel, insulators, insulator hardware, conductor reels, dumpsters, portable water closets, and a modular construction office. To the extent possible, the material yards are to be located on private land (unless otherwise noted) in close proximity to the line. In all cases these sites are located in previously disturbed areas and areas of minimal vegetative cover requiring little to no additional disturbance. The material yards average 25 acres in size. The list of currently identified yards are Redhawk, Hyder, Roll, the Transfer Site (BOR), Hwy 95, and Wellton as an alternate; the locations for each are plotted on Construction Maps 2a, 2h, 2q, 2s2, 2t, 2u, 2u2. Each locale has been assessed to ensure an absence of cultural and natural resources within the identified use areas. The procurement of temporary use leases will be obtained for these areas and permits will be acquired as needed per local jurisdictional requirements.

Concrete Batch Plants—The primary supply of concrete will be from installed retail batch plants. Ready-mixed concrete from installed retail batch plants will provide concrete to structure locations within 70 miles of existing batch plants. Fly yards will be used to transport concrete to those locations not serviceable by cement truck from retail batch plants. Mobile concrete batch plants may be established at the Hyder and Roll material yards in particular, and the need for additional mobile units will be more fully assessed at the time of construction. Concrete materials will be housed at the material yards and delivered to construction sites by concrete trucks. For tangent towers and as a third back-up supply, concrete will be mixed with volumetric concrete trucks. The volumetric mixer truck with compartments for sand, aggregate, cement, and water drives to a foundation site and proportionately combines the ingredients to make concrete, in accordance with American Concrete Institute standards and preapproved mix designs.

Fly Yards/Landing Zones—The fly yard/landing zones investigated to date total nine (Structure 48, Roll, Wellton, Dome Valley, Yards 1-4 ,and the BOR Gravel Pit or Gila Mine Dump Site). They are mostly distributed along the southwestern portion of the line (See Appendix A, Construction Maps 2d, 2q, 2t, 2u). Two of the fly yard/landing zones are intended within the Roll and Alternate Wellton material/show-up yards, though it is very likely that alternate locations will need to be established on the north side of the existing HANG1 transmission line to avoid flying over that line. Each yard will typically be about 5 acres in size and will result in temporary disturbance to the areas. Fly yards/landing zones will be used to assemble towers to transport them by helicopter to the delivery point for installation. The helicopter supplier will be responsible for providing their own fuel and refueling spill protection. As with material/show-up

yards, temporary use leases will be obtained and permits acquired as needed per local jurisdictional requirements.

Structure Assembly and Erection—Structure components (and associated hardware) or poles are transported to each structure truck or helicopter. Lattice steel members or pole sections will be assembled into subsections of convenient size and weight. Structure assembly and mounting of associated line hardware takes place at each site. The assembled structure components or structure is then hoisted into place by a large crane and mounted to the foundation.

Conductor Installation—After the structures are erected, insulators, hardware, and stringing sheaves are delivered to each structure site. The conductors are then rigged by helicopter with insulator strings and stringing sheaves at each ground wire and conductor position.

For public and property protection during wire installation, guard structures are erected over highways, railroads, powerlines, structures, and other obstacles. Guard structures normally consist of H-frame poles, but are not limited to these, placed on either side of an obstacle. These structures are designed to prevent ground wire, conductor, or equipment from contacting an obstacle. Equipment for erecting guard structures includes augers, line trucks, pole trailers, and cranes. Guard structures may not be required for small roads where other safety measures, such as barriers, flagmen, or other traffic control, are used.

Pilot lines are pulled (strung) from structure to structure by a helicopter, bulldozer, or all-terrain vehicle and threaded through the stringing sheaves at each structure. A large diameter, stronger pulling line is then attached to the pilot line and strung. The pulling line is attached to the conductor/ground wire and used to pull the conductor and ground wire through the sheave. This process is repeated until the ground wire or conductor is pulled through all sheaves.

Ground wire and conductor are installed under controlled tension using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. The tensioner, in concert with the puller, maintains tension on the ground wire or conductor. Maintaining tension achieves ground clearance and is necessary to avoid damage to ground wire, conductor, or any objects below them during the stringing operation. Tensioners, line trucks, wire trailers, and tractors are needed for stringing and anchoring the ground wire or conductor at the tensioning site (*Figure 10*). Sites for tensioning and pulling equipment typically cover a 200 × 300-foot area (1.38 acres), and at line turns as much as a 2.75-acre area (ROW width × up to 600 feet). In those instances where activities cannot be confined to the ROW (essentially at angle structures), the areas outside the ROW have been inspected for cultural and biological resources. Tensioning and pulling sites along the line currently total 76, approximately 10,000 feet apart, and will be restored after construction according to the standard construction and operating procedures and mitigation measures (See Construction Maps for locations).

An alternative method for conductor installation known as in-line implosive splicing or compression installation is likely to be employed by the selected construction contractor (See Appendix B5–Blasting Plan). It involves the use of an implosive compression joint attached to

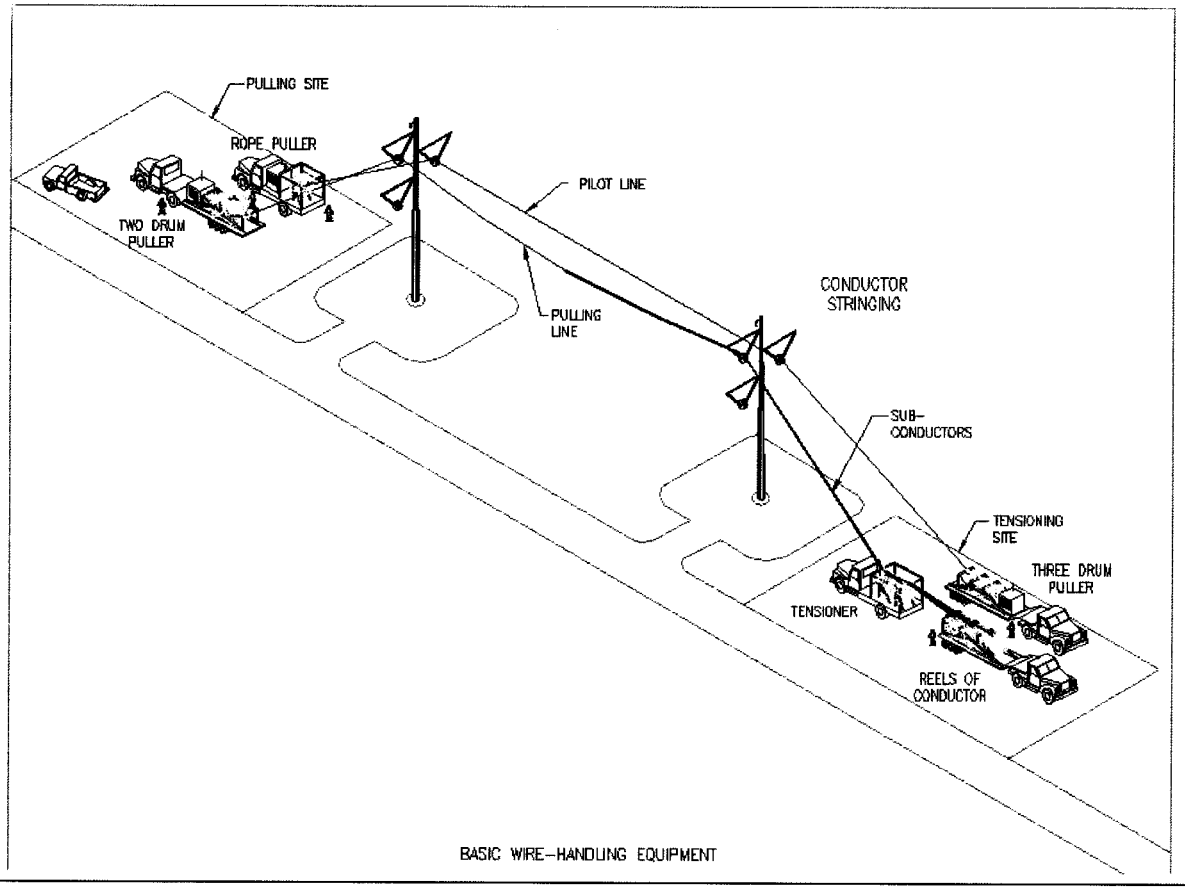


Figure 10. Basic Wire-Handling Equipment.

the conductor that results in splicing the conductor together at or near a structure location typically, including dead-ends. Implosive connectors consist of a small, engineered energy charge that is pre-wrapped around a specifically designed metallic sleeve. The charge creates an implosive compression, creating a permanent high-quality connection. The split-second detonation creates a flash and an air blast similar to a firework. Implosive connectors produce a smoother, stronger, and more electrically efficient connection. *The use of this method can also significantly reduce personnel hours and equipment use, as well as the pulling areas needed from 76 to about 46, thus resulting in fewer environmental impacts and lower project costs.*

Deviations during Construction

Changes or deviations are likely to be needed for the approved project in order to accommodate or mitigate on-site circumstances. In order to avoid delays in the construction schedule, the following process has been developed to allow for the proper review of proposed changes.

Deviation Review Process—When a desired deviation is identified by the Construction Contractor, a request will be submitted to the CI in writing. The Construction Contractor will provide a brief description of the deviation, the need for it, and a copy of the POD map sheet showing the location of the proposed change. In addition, the Construction Contractor will include a field review by the environmental monitors assessing the potential effects to cultural or biological resources, as appropriate. Once the CI has received the request, a determination will be made as to whether or not it constitutes a minor or major deviation (see below). If minor in nature, the CI will provide the Construction Contractor, within a 24-hour period, both a verbal and written decision either approving or rejecting the request. If major in nature, the CI will forward the request to the lead federal agency with a recommendation for approval or rejection. The lead federal agency will have 7 days to review the request and provide a decision.

It is important to note that some requests may require additional review and approval periods (over 30 calendar days) if they involve other regulatory agencies.

All variance approvals will be documented in the CI daily and weekly reports. Any special status species that could be impacted by modifications will be mitigated under the direction of the CI prior to implementation. All changes to the POD dictated by unique field conditions or construction changes will be submitted in an 'as built' format at the conclusion of construction. Minor and major deviations are defined below.

Minor Deviations—When the variance requested is for an action that has been assessed in the NEPA document for the project, and the resultant disturbance area is within the existing approved temporary and permanent rights-of-way, the CI will have the authority to approve or deny the requested variance. This empowerment of the CI to approve minor variances will expedite the project while protecting resource values. Minor deviations that occur will not require amending the right-of-way or cause any re-initiation triggers for the any environmental documents. Minor changes include movement within the existing approved temporary and

permanent rights-of-way. If the review by all the resource monitors identifies no resource constraints, then the request will be considered a minor deviation. If constraints are identified, then the deviation will have to be modified to avoid the constraint or it will be considered a major deviation.

Examples of minor deviations that could be approved by the CI are:

- Modification of disturbance areas within the authorized ROW and temporary use boundaries.
- Move location of erosion control devices, culverts, temporary fences, pulling or tensioning locations, temporary work sites, access point to poles/structures, and cable spool storage locations within authorized, cleared areas.
- Modifications of new access road alignments that fall within the extent of previous cultural resources surveys to avoid impacts to plants and wildlife or to utilize existing, previously disturbed roads that require no improvement.
- Additional pullout and/or parking areas where access road traffic or work areas are constrained that fall within the extent of previous cultural or biological resources surveys.
- Additional small, short-term, single occurrence, set up areas needed outside of the temporary or permanent rights-of-way.
- Change in helicopter landing zones due to terrain, safety concerns, or to avoid or reduce environmental impacts.
- Improvement to existing access roads that have been examined for cultural or biological resources and none were identified.

Major Deviations—Major deviations involve an action not previously assessed in environmental documents for the project (POD, EA, cultural and biological resources reports, etc.) that would require a more thorough review by the lead federal agency and resource specialists, or that would require consultation with other regulatory agencies.

Examples of major deviations that would need approval from the lead federal agency include:

- Relocation of a tower or structure outside the approved right-of-way.
- Use of an unapproved access road that would result in a potential impact to sensitive cultural or biological resources.
- Any discovery situation resulting in a temporary work stoppage as outlined in the Cultural Resources Monitoring and Discovery Plan (See Appendix E2).

Cleanup and Reclamation

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash, including stakes and flagging, would be removed from the sites and disposed of in an approved manner (See *Appendix B6* for the project's *Waste Management Plan*). No construction equipment's oils or fuels will be drained on the ground and will not be dumped in construction areas. Waste oils or chemicals will be hauled to an approved site for disposal. No open burning of construction trash will occur on federally

administered lands. See *Appendixes B7*, *B8*, and *B9* for the *Hazardous Materials Management Plan*, *Spill Prevention Control & Countermeasure Plan*, and *Spill Prevention & Response Plan.* Following construction and cleanup, reclamation will be completed. The disturbed surfaces will be restored to the original contours of the surrounding land surface. Water diversions will be construction along the right-of-way as needed to control surface water and soil erosion (See SWPPP Requirements in Appendix B4). Access roads not needed for operation and maintenance will be closed and reclaimed.

Appropriate site-specific seed mixes, tested to be free of noxious weeds and agency-scrutinized (see Vegetation Management Plan), will be used where conditions warrant. Salvaged native plants will not specifically be used for revegetation as they will have already been transplanted. Preferably, seed will be planted during late Fall-Winter (November–February) and/or the Summer monsoon season (July–September) following transmission line construction. The seed will be planted as directed by the BLM. APS will notify appropriate BLM personnel once reclamation is complete.

Fire Protection

All applicable fire laws, regulations, and standards will be observed during the construction period, and fire will be managed in accordance with the project's Fire Management Plan (*Appendix C*). All construction personnel will be advised of their responsibilities under the applicable fire laws and regulations.

MITIGATION OF ENVIRONMENTAL RESOURCE CONCERNS

This section focuses on the environmental resources potentially affected by the construction, operation, and maintenance of the transmission line and the protection of these resources. This discussion includes a description of potential impacts to resources and prescribed mitigation measures that will be adhered to. The key objective of the POD is to place an emphasis on the avoidance of sensitive resources and minimizing the impacts of the project development to the environment. In situations where sensitive resources are unavoidable, the use of mitigation measures will be implemented to offset potential impacts.

Safety and Environmental Training

Safety and Environmental Resource Protection will be significant themes communicated, reiterated, and compliance monitored frequently and at regular intervals throughout the construction period. Safety Training will cover all aspects of safe construction practices and conduct, as well as ensuring that all personnel are informed of the procedures to be followed in the case of an emergency.

The precautions that will be standard for Safety will also be applied to how environmental protections are achieved. Training will be provided specifically for protection of both natural and

cultural resources along the ROW as well as within access corridors and ancillary work areas (e.g., material yards, fly yards, pulling sites).

Natural Resources

The entire project corridor and all existing and proposed access routes have been assessed for suitable habitat and for the presence of special-status plant and wildlife species. Potential impacts were assessed for Federal species listed as endangered or threatened, proposed as endangered or threatened, or candidates for listing; State species of concern; and BLM sensitive species. Project-specific avoidance and mitigation measures were prepared using established agency standards. It is expected that implementing these measures will reduce short-term and long-term environmental impacts to a level of insignificance.

Consultation—In 2007 the project's Environmental Assessment analyzed potential impacts to 18 special-status wildlife species based on information obtained from the BLM, USFWS, and AGFD. Following the NEPA impact analysis and consultation process, the BLM issued a *Finding of No Significant Impact* (FONSI) and *Decision Record* on November 6, 2007. As part of the current review, in 2012 ESM obtained GIS shapefiles from AGFD and BLM to overlay species and habitat occurrences on the HANG2 project area. Current information was then obtained for special-status wildlife species analyzed in the EA. A wider group of species that are known to occur or could occur in the HANG2 project vicinity was also reviewed ensuring a complete list of species was considered. The current analysis builds upon impact analyses and mitigation measures conveyed in the EA (EPG 2007) and includes updated reviews of special-status species and habitat information.

Wildlife—Wildlife species that are anticipated to occur in the project area are those generally associated with arid desertscrub habitats of the Sonoran Desert. In conjunction with the current analysis, field visits were carried out on several occasions: May, July, August 2011; April 2012; and November 2012. ESM biologists surveyed numerous locations along the HANG2 ROW to identify potentially suitable habitat and individual occurrences of special-status species (none were encountered). Of the 18 species identified and analyzed in EA, upon further investigation 15 were dismissed from further analysis in *Appendix D1–Wildlife Management Plan.*

The three special status wildlife species that are most likely to be encountered and are further considered in the plan are the Sonoran pronghorn (*Antilocarpa americana sonoriensis*), an Endangered Species Act Section 10(j) Non-Essential Experimental population; the Sonoran desert tortoise (*Gopherus morafka*), a Federal candidate for listing; and the western burrowing owl (*Athene cunicularia hypugaea*), a USFWS Species of Concern and BLM Sensitive Species.

Wildlife could be temporarily affected by disruption of habitat, vegetation removal, disturbance from construction activities, or human presence, yet overall, impacts are expected to be minor. Only a small percentage of habitat will be affected as a result of the project. Longer-term impacts on local wildlife populations will be minimal given that the transmission line route parallels

existing transmission facilities. Specific protocols relating to the treatment and protection of wildlife resources are presented in Appendix D1–Wildlife Management Plan.

The entire project area is within the Sonoran pronghorn 10(j) area. The proposed transmission line would pass through approximately 11.25 miles of BLM-designated habitat for the Sonoran desert tortoise on lands administered by the BLM and Arizona State Land Department, including 8.5 miles in the Gila Bend Category II area and 2.75 miles in the Face/Oatman Category III area. The anticipated disturbance related to construction is unlikely to directly affect but may affect desert tortoises found to be present within the project area of potential effect (APE). To avoid impacts to tortoises and their designated habitat, qualified biologists will be on-site during ground-disturbing construction activities in the Category II area to monitor for tortoise presence, inspect underground burrows for tortoises and, during the breeding season, for their eggs using a specialized fiber optic scope. Habitat for western burrowing owl occurs in numerous locations along the project corridor. Occupancy can be determined utilizing a fiber optic scope to inspect burrows.

Compensation calculations covering loss of Category II and III desert tortoise habitat resulting from the project were determined utilizing BLM evaluation criteria, and this information is included within Appendix D1.

Plants—Vegetation in the project area is typically sparse and generally consistent with the Sonoran Desertscrub biotic community, including creosotebush (*Larrea tridentata*), ocotillo (*Fouquieria splendens*), foothill paloverde (*Parkinsonia microphylla),* ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), barrel cactus (*Ferocactus wislizenii*), and several cholla species (*Cylindropuntia* spp.), among others. Throughout the HANG2 corridor the vegetation type is more or less continuous, with the exception of areas where the transmission line will traverse upland bajadas with higher species diversity due to increased runoff from moisture. The plant species considered in the 2007 EA were reviewed and current legal status was confirmed for each.

After reviewing the 2007 EA and updated species and habitat information from AGFD, BLM, and USFWS to ensure all possible relevant species were considered, it was determined that only two special status species would likely occur in the project area: the straw-top cholla (*Cylindropuntia echinocarpa*), an Arizona Native Plant Law Salvage Restricted species; and the longleaf sandpaper plant (*Petalonyx linearis*), a BLM Yuma Field Office priority species. To date, no sensitive plants have been identified during biological field surveys along the proposed project corridor and access roads. If any are identified, they will be flagged for avoidance.

The majority of impacts to vegetation are expected to be minor as a result of damage to or loss of vegetation during construction and maintenance of the transmission line. Since the majority of the line will parallel existing linear facilities, right-of-way needed for additional access roads is minimal. Native plant surveys were completed in 2011 and 2012 along the proposed ROW corridor and all new access routes; a revised total of 85 trees have been rated as good candidates

for transplanting in an adjacent span within 14 planting locations. Wherever possible, vegetation along the ROW will remain undisturbed. Careful placement of towers and spanning of sensitive landscape features will minimize impacts to significant vegetation cover. Following construction, affected areas will be rehabilitated as appropriate using agency-approved, certified weed-free seed mixes. Protocols relating to the treatment and protection of native vegetation are presented in *Appendix D2–Vegetation Management Plan.*

Natural Resources Awareness Training and Monitoring—A worker education and awareness program was developed for this project and will be presented to all personnel who will be scheduled to be on site and working during construction. The program will include information on the legal status, identification, and preferred habitat of migratory birds, Sonoran pronghorn, western burrowing owl, Sonoran desert tortoise, straw-top cholla, and longleaf sandpaper plant, as well as reporting procedures to be followed if active bird nests are found or if the aforementioned special status plants, pronghorn, owls, or tortoises are detected in the project area. Specific protocols and procedures relating to the protection of natural resources are presented in *Appendix D3–Natural Resources Awareness Training and Monitoring Plan.*

Cultural Resources

Avoidance—The entire project corridor and all existing and proposed access routes have been assessed for the presence of cultural resource sites (EPG/Rowe 2007, LSD/Novotny & Stehman 2008, ESM/Poseyesva & Neal 2012). The sites of concern (those considered National Register eligible) on the ROW and within/adjacent to access roads total 33, all of which were specifically evaluated regarding impact avoidance along the HANG2 ROW and access routes. The 33 sites are shown on Figures 2a-u in Appendix A. The plan for how these sites will be avoided to the extent possible and monitored to minimize effects when complete avoidance cannot be achieved is discussed here and in *Appendix E*, with a summary table of the sites (including land ownership and National Register eligibility) and the recommended management actions included as *Appendix E1*. Of the 33 sites, 26 require some level of action, most often consisting of site boundary and/or access route marking followed by periodic monitoring to ensure that markings remain intact and enforced. Six sites contain structures and/or pull sites away from existing access routes and previous disturbance; the placement and construction of these facilities will therefore be actively monitored. The project has been determined to have potential to adversely affect historic properties AZ S:16:37(ASM), AZ X:4:399(ASM), and AZ X:7:10(ASM).

Mitigation—Sites AZ S:16:37(ASM) and AZ X:4:399(ASM) are on BLM land and AZ X:7:10(ASM) is on BOR land; all three sites are considered eligible to the National Register. Site AZ X:4:399(ASM) would be adversely affected by an access route to a new structure (No. 309) and as such requires mitigation. Sites AZ S:16:37(ASM) and AZ X:7:10(ASM) have the potential to be adversely affected should cultural materials be disturbed during the placement and excavation of structure pads, pull sites, construction of new spur access routes, and use of existing roads. Thus, a Historic Properties Treatment Plan has been prepared to address these affected sites and submitted to the BLM, BOR, Arizona State Historic Preservation Office, and

consulting tribes for review and approval. A Memorandum of Agreement to execute this plan has also been developed. Once approved, the plan would be implemented prior to (and in the case of sites AZ S:16:37 and AZ X:7:10 during) ground-disturbing construction activities at these sites.

Monitoring—Professionally qualified archaeologists will visit each of the listed sites prior to vegetation clearing and construction activities to conduct the recommended site, road, and ROW markings and to ensure that no significant resources will be impacted. Sites will be revisited periodically and as needed to ensure that all necessary markings remain intact and are being enforced. The structure locations themselves (and associated pull sites) have by and large already been adjusted to avoid adverse effects to cultural sites; thus, the focus will be on the access routes. Archaeological monitors are recommended to be present during the actual road development and construction activities within the listed resources to ensure that identified access routes across the archaeological sites are followed, and that construction zones occur in the lowest impact areas designated by the monitors. Construction personnel, and supervisors in particular, will be advised of the actual site locations and their identification on the ground, informed how best to avoid impacts to them, and trained on the methods and protocols established to achieve avoidance and minimal, non-adverse impacts. Sign-in sheets similar to those included for the Natural Resources Training will be kept, and certificates can be issued as well if thought beneficial to the training process.

A Fieldwork Authorization will be obtained from the BLM prior to conducting the monitoring activities, and the BLM RECO and Field Office archaeologists will be notified when the authorized activities are to commence. A Project-specific Permit for monitoring sites on State land will also be obtained from the Arizona State Museum (ASM), and Reclamation would require an Archaeological Resources Protection Act (ARPA) Permit for monitoring activities on their managed lands. Likewise, Yuma Proving Ground will be notified when carrying out monitoring activities on their land.

Discovery—During monitoring of actual construction excavations within site boundaries, limited exposure of cultural materials is anticipated. Nevertheless, if any volume or complexity of materials is exposed in an excavated area, the activity will be suspended at the discovery location long enough for the monitoring archaeologist to ascertain the nature of and to properly document the find. The appropriate BLM Field Office, land manager, and/or permitting entity will be promptly notified in order to inform and seek advice from the FO/land-managing cultural resources specialist as to whether further action needs to be taken (e.g., how best to proceed relative to recording the uncovered materials). For any discovery that may warrant more activity than basic field documentation, further disturbance will be avoided until the BLM or land manager is consulted or given the opportunity to inspect the find.

Documentation of specific cultural features would entail recording location, documenting feature information on standardized feature forms to guarantee thoroughness and consistency in the data being recorded, drawing stratigraphic profiles of the feature (if relevant), and photographing the feature. Any non-feature subsurface cultural deposits uncovered during construction will also be

mapped, described, and photographed. The intention is to conduct in-field analysis and reburial of any cultural deposits and artifacts encountered. Nonetheless, if exceptional materials are discovered, they may be collected for further study and either reburied at a later date or permanently curated at a chosen repository (likely Arizona State Museum [ASM]). Any associated archaeological documentation (e.g., field notes, photographs, feature forms, report copies) would be archived with the BLM and relevant land managers or permit administrators (ASM), while any collected artifacts and a copy of the final report would be curated with the selected repository.

The possibility of discovering human remains during monitoring at any of the listed sites or through the course of project construction is quite low. Nevertheless, if human remains or presumed funerary objects are encountered anywhere on the project, EnviroSystems will immediately suspend excavations, protect the discovery, and notify the BLM and relevant land managers/permit administrators within 24 hours of the discovery being made. In accordance with the Native American Graves Protection and Repatriation Act, affiliated tribes will be contacted, and the specific treatment and disposition of any human remains will be determined in consultation with those American Indian tribes having a legitimate claim to the remains. If human remains and/or funerary objects are encountered on State or private land during the course of any ground-disturbing activities relating to the development of the transmission line, work shall cease at the affected area and the BLM, ASLD (for State land per A.R.S. §41-844), and ASM Burial Coordinator would be contacted (the latter pursuant to §41-844 and §41-865–applicable to private land).

The unabridged Cultural Resources Monitoring and Discovery Plan to be followed for the project is included as *Appendix E2*. A report describing the procedures undertaken and the results of monitoring during the HANG2 Transmission Line Project will be prepared and submitted to the BLM and other relevant land managers/permit administrators.

REFERENCES

Novotny, Michael, and Kelly Stehman
2008 *Cultural Resources Survey of Arizona Public Service Company's 121-Mile-Long 500-4 Transmission Line, Maricopa and Yuma Counties, Arizona.* LSD Technical Report 075107 (500-4a). Logan Simpson Design, Inc., Tempe.

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2013 *Cultural Resources Assessment of Existing Access Routes and Archaeological Inventory of New Access Routes and Pulling Sites for the Proposed APS Hassayampa–North Gila 500kV-2 Transmission Line, Maricopa and Yuma Counties, Arizona.* EnviroSystems Management Report No. 1450-08/Arch1. Flagstaff.

Rowe, Robert A.
2007 *A Cultural Resource Survey for the Palo Verde Hub to North Gila 500kV Transmission Project, Maricopa and Yuma Counties, Arizona.* EPG Cultural Resource Research Report No. 2006-0017. Environmental Planning Group, Phoenix.

OPERATION, MAINTENANCE, & ABANDONMENT

Operational Characteristics—The nominal voltage for the transmission line will be 500kV AC. There may be minor variations of up to 5% above the nominal level depending upon load flow.

Permitted Uses—After the transmission line has been energized, land uses that are compatible with safety regulations would be permitted in and adjacent to the ROW. Existing land uses such as agriculture and grazing are generally permitted within the ROW. Incompatible land uses within the ROW include construction and maintenance of inhabited dwellings and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Land uses that comply with local regulations would be permitted adjacent to the ROW. Compatible uses of the ROW on public lands would have to be approved by the BLM and other land managers. Permission to use the ROW on private lands would have to be obtained from the private landowners.

Safety—Safety is a primary concern in the design of this 500kV transmission line. An AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead ground wires along the line. Electrical equipment and fencing at the substation and switchyard would be grounded. All fences, metal gates, etc. that cross or are within the transmission line ROW would be grounded to prevent electrical shock. If applicable, grounding outside the ROW may also occur.

Right-of-Way Maintenance—The ROW will be maintained in accordance with BLM stipulations. The transmission line will be inspected on a regular basis by both ground and air patrols. Maintenance will be performed as needed. When access is required for non-emergency maintenance and repairs, APS will adhere to the same precautions that were taken during the original construction.

Emergency maintenance will involve prompt movement of repair crews to repair or replace any damage. Crews will be instructed to protect plants, wildlife, and other environmental resources. Restoration procedures following completion of repair work will be similar to those prescribed for normal construction.

Vegetation Maintenance

APS maintains vegetation that could interfere with the powerlines and structures, that could become a fuel load issue under the lines, and to provide vehicle access to the structures for maintenance and repair. Vegetation maintenance work is done within the right-of-way. This work is typically done routinely about every 5 to 10 years, although there are situations where hazardous vegetation may need to be treated out of cycle. Protocols for vegetation maintenance are included within the Vegetation Management Plan–Appendix D2 and summarized here.

Routine Vegetation Maintenance: Routine vegetation maintenance involves the cyclical treatment of vegetation approximately every 5 to 10 years utilizing mechanical, manual, and herbicide treatments as discussed in the Vegetation Maintenance Methods section.

Hazard Vegetation Maintenance: Vegetation that presents a hazard to the powerline and structures requires treatment on an ongoing basis outside the routine maintenance cycle. The need to treat hazard vegetation is not common due to the ongoing routine maintenance, but is occasionally required. These hazards can be categorized into three levels and are treated slightly differently for each level.

Vegetation Maintenance Methods

Mechanical Treatment Methods: Mechanical treatment involves the use of a mower to remove and mulch vegetation on site. The mower consists of a rotary cutting device mounted on an arm on a rubber-tired or tracked vehicle that mulches trees and large shrubs from the top down. A mechanical mower may be used along the majority of the powerline right-of-way for routine vegetation maintenance. The mower would not operate in areas with steep slopes, poor access, water drainages, or within desert tortoise category habitat or cultural resource sites. Manual hand crews may be used to assist the mower operation in pruning or vegetation disposal.

Manual Treatment Methods: Hand crews are used for all hazard vegetation work and for some routine vegetation maintenance work. For routine vegetation maintenance, hand crews may be used to assist the mechanical mowers, to cut vegetation where mowers cannot be used, or as an alternative method to mechanical mowing. Hand crews consist of line clearance tree workers that use hand tools (e.g., chain saws, hand saws, rope) to cut down or prune vegetation. They typically only use pickup trucks as a means of travel to the work site but may also use a bucket truck and/or chipper.

Herbicide Treatment Methods: The purpose of herbicide treatment is to efficiently maintain clearances obtained following mechanical and/or manual treatments. Herbicide treatment is ideally conducted within 1-3 growing seasons following mechanical and/or manual treatments. *Herbicides treatments will be applied for vegetation maintenance following an Environmental Assessment specific to herbicide application and its approved decision record. A site-specific pesticide use proposal approved by the BLM will also be required prior to herbicide application.*

Vegetation targeted for herbicide treatment includes most vegetation that is targeted for manual and mechanical treatment, the exception being saguaros. Herbicide treatment involves vegetation that is less than 10 feet tall whose physiology is such that is could encroach within the associated FAC-003 clearance distance, impact the reliability of the transmission line or transmission facilities (e.g., structures, guy wires, etc.), or pose a fire fuel load concern. APS also proposes to treat any invasive species encountered during the course of an herbicide project within the permitted right-of-way where it is reasonable and prudent to do so and provided the herbicide being applied would be an effective treatment. All activities will be conducted within the existing APS powerline right-of-way.

All herbicide applications are spot treatments utilizing backpack, handheld, and quad/UTV-mounted sprayers with a support vehicle to control re-sprouting and/or emerging vegetation. The support vehicle will be available at intervals along the powerline to load the chemical sprayers.

All treatments are conducted over a 2-year interval. The initial treatment applications are scheduled between April 1 and November 30 with a follow-up application to be conducted 1 year later between April 1 and November 30. Following treatment, the powerline right-of-way is evaluated each year to determine when the next cycle of herbicide application is needed.

APS contractors employ a sealed, closed system that requires no waste disposal or on-site chemical mixing. In this system the herbicides are pre-mixed to the project specifications and shipped to the contractor. Each container of herbicide has a bar code attached to it that is tracked from the day it is shipped to the day it is returned empty. The herbicide containers are returned to the supplier after use. There is no waste disposal of chemical jugs or packaging required.

APS utilizes two product mixes, an Upland Mix and an Aquatic Mix, both utilizing Thinvert, a paraffinic oil emulsion, as the carrier. Any product listed on page 2-12 in Table 2-2 under the column for the State of Arizona in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (June 2007) and any product amended or added to this EIS and approved for use in the State of Arizona will be considered for use. In addition to these, APS would like to evaluate for use the following products:

Trade Name	Chemical Name	Manufacturer
Milestone VM	Triclopyr & Aminopyralid	Dow AgroSciences
Streamline	Aminocyclopyrachlor & Metsulfuron methyl	DuPont

All applicable labels, federal and state laws, and regulations with regard to the storage, handling, and application of herbicides will be strictly adhered to as appropriate to the project. Applicators will wear the maximum PPE required per the label for each herbicide being applied, including but not limited to long-sleeve shirts and pants, gloves, socks, and boots. Those operating the quad/UTV-mounted sprayers will also be required to wear goggles or safety glasses and helmets. Tailboard safety meetings will be conducted each morning or when the crew is moved to a new location. All herbicide applications will be conducted during daylight hours, typically from Monday to Friday, although weekend operations may take place as needed.

MSDS and labels will be on site at all times and all safety precautions listed on the product labels shall be adhered to strictly. Each crew will consist of licensed herbicide applicators, and at least one crew member will have a minimum of 3 years' experience applying herbicides. Crews working on the project will have telephones, chemical spill kits, shovels, first-aid kits, and fresh water available to them.

Hazard Vegetation Maintenance Protocol—Protocol for hazard vegetation work is simple and typically only requires 2-6 tree workers accessing the area of concern to prune or remove the offending hazard vegetation. This work is usually completed within 1-2 working days. The resulting slash is cut such that it lies within 18-24 inches of the ground surface and is lopped and scattered within the ROW in the immediate area.

Protocol for routine vegetation maintenance requires more specific steps, which are outlined in the Vegetation Management Plan–Appendix D2.

Abandonment

At the end of the useful life of the line, if the facility were no longer required the transmission line would be abandoned. Subsequently, conductors, insulators, and hardware would be dismantled and removed from the right-of-way. Tower and pole structures would be removed and foundations broken off below the ground surface. If the line and associated ROW were abandoned at some future date, the ROW would be available for the same uses that existed prior to construction of the line.

APPENDIX A

PROJECT LOCATION/CONSTRUCTION MAPS

APPENDIX B

CONSTRUCTION CONSIDERATIONS

APPENDIX B1

TRANSPORTATION MANAGEMENT PLAN

INTRODUCTION

This Transportation Management Plan addresses regulatory compliance, traffic management practices, levels of right-of-way access, and mitigation measures to help reduce impacts related to transportation and the construction of temporary and long-term access within the vicinity of the Hassayampa–North Gila 500kV-2 Transmission Line (HANG2).

PURPOSE

The purpose of this plan is to provide the land-managing agencies, the Compliance Inspection Contractor (CIC), and the Construction Contractor with a description of the type of access associated with the construction, operation, and maintenance of this project and make evident the potential impacts on transportation that HANG2 could create. The goal of this plan is to ensure that impacts from construction of the transmission line and any associated access are kept to a minimum through the use of management practices and mitigation measures described throughout this appendix. These practices and measures are intended to mitigate transportation activities' effects on environmental resources, roads, traffic, travel, and road safety.

REGULATORY

A number of agencies have jurisdiction over the transportation-related components of the project. These include the Bureau of Land Management, Arizona Department of Transportation (ADOT), county law enforcement and road departments of the two counties, and the Arizona State Highway Patrol. Encroachment permit applications will need to be filed with appropriate road agencies for those areas where the transmission line crosses public roads (e.g., Highway 95).

Other permits and approvals not directly related to transportation could affect the construction, use, and/or maintenance of roads in certain areas. Persons responsible for project transportation activities must be familiar with all relevant sections of this POD.

TRAFFIC MANAGEMENT PRACTICES

Ground travel will be the primary means of transporting construction and maintenance crews and equipment during project construction; helicopters will be used as well in mountainous, much less accessible areas. All vehicles will obey jurisdictional traffic speed regulations and the posted speed limit. Speeds along access roads and spur roads within the right-of-way may be limited to 15 mph in some areas to prevent excessive amounts of construction-related dust (see Appendix B3—Dust Control Plan).

Before construction, authorized access routes will be clearly marked in the field with signs and/or flagging (see Table 4 in the Plan of Development). The construction contractor will review the location of proposed access and will be responsible for ensuring that construction travel is limited to designated areas that clearly identify the limits of disturbance.

All field personnel will attend an environmental training program. Through this program, field personnel will be instructed to use only approved access roads, drive within the delineated road limits, and obey jurisdictional and posted speed limits to minimize potential impacts to biological and cultural resources.

Every effort will be made to minimize the effects of project construction activities on public transportation routes and to provide for public safety. The construction contractor, CIC, and all

environmental monitors will maintain a communications network that consists of one or both of the following devices: two-way radios and/or cellular phones. This will allow for coordination of equipment traffic along existing access roads, such that public safety and traffic impacts are minimized.

In general, the number of construction vehicles needed for the project is not expected to substantially increase traffic volume. Similarly, road and lane closures are anticipated to be minimal, and will most likely occur during conductor stringing activities or during blasting. If road and lane closures are needed (e.g., to pull line across Highway 95 or local roads), the appropriate regulatory agencies, affected parties, and emergency service providers will be notified in advance of the anticipated closure.

Although construction traffic is not expected to disrupt access to residences along the right-of-way, adjacent landowners will be notified of the construction schedule (where appropriate). Signs will be posted in the project area to notify landowners and others of the construction activity. Construction crews will park only in designated areas and will be shuttled to the appropriate work sites, if necessary.

In addition to minimizing the impacts associated with ground travel, the construction contractor will coordinate construction activities with jurisdictional utilities and the FAA, as needed.

LEVELS OF RIGHT-OF-WAY ACCESS

Access to the HANG2 right-of-way and other areas needed for construction (e.g., staging areas) will be needed for project construction, operation, and maintenance activities. Listed below are five types of access that will be used for this transmission line. The proposed access routes are illustrated as existing and new in Appendix A—POD Construction Maps.

Existing Paved Roads: These roads are typically highways and state routes (e.g., Highway 95, canal roads, many other county roads, etc.) that will be used for travel to existing and new dirt roads to access the right-of-way. No staking will be required for this type of access.

Existing Unpaved Roads Not Requiring Improvements: These are existing dirt or gravel roads that generally will not require any improvements to support construction vehicles to access the right-of-way. Regular maintenance for construction (regarding wash-out areas, graveling, and installation of gravel pads for controlling trackout) is allowed in these areas. The outer edge of existing dirt access roads that have been approved for the project will be staked to establish these designated travel routes. If it is determined that these roads need improvement, the CIC must be notified in writing and the necessary environmental inspections (biological, cultural) conducted before any improvements are initiated. Activities considered improvements include road widening, road straightening, and installation of culverts or temporary bridges. It is important to note that some requests may require additional review and approval periods (more than 30 days) if they involve additional regulatory agency consultation.

Dirt Roads that May Require Improvements: These are existing dirt roads that may require improvements to support construction vehicles to access the right-of-way and may be widened to a travel-surface width of 18-20 feet with 2-foot berms on either side (maximum 24 feet wide). Improvements to these existing dirt roads may include mowing, tree removal/trimming, blading, realignment, widening cut/fill, and bridge/culvert construction. Improvements to these roads may require restoration to pre-construction condition as determined by the authorized officer/land manager. Approved access roads that require improvement will be staked to a maximum width of 24 feet wide. In rough terrain conditions, improved roads may require increased grading for

access along steep slopes (side-hill roads) and could likely exceed a 24-foot width, varying from 24 to 60 feet wide, depending on the amount of displaced soil. Outside of the already investigated ROW, these roads have generally been assessed to a width of 66 feet for biological and cultural resources.

New Access Roads: These roads are generally a travel-surface width about 18-20 feet wide with 2-foot berms on either side but can be wider in steep or rugged terrain because of cut and fill, and will be constructed where existing access is non-existing or not sufficient to access the right-of-way. When spur roads are used the turn radius maximum will be no greater than 66 feet. Construction of these new access roads may include mowing, tree removal/trimming, blading, and bridge/culvert construction. These new roads will require restoration to pre-construction condition if they are not identified for future operation and maintenance of the transmission line. Methods of clearing for new roads are presented in the POD and Appendix D2—Vegetation Management Plan. Approved new access roads will be staked to a standard width of 24 feet wide, however, due to rough terrain conditions new roads that must be graded for access along steep slopes (side-hill roads) will most likely exceed a 24-foot width, varying from 24 to 60 feet wide, depending on the amount of displaced soil. Beyond the surveyed ROW, these roads have been inventoried to a width of 66 feet for biological and cultural resources.

Overland Access: In areas where no grading will be needed to access work areas, the Construction Contractor will use overland access to the greatest extent possible **within the transmission line ROW**. Overland access will consist of "drive and crush" and "clear and cut" travel. Drive and crush is vehicular travel to access a site without significantly modifying the landscape. Vegetation is crushed but not cropped. Soil is compacted but no surface soil is removed. Even though vegetation may be damaged or destroyed, this creates vertical mulch upon the surface soil and leaves the seed bank in place. Crushed vegetation will likely resprout after temporary use is stopped. Clear and cut is considered as brushing off all vegetation in order to improve or provide suitable access for other equipment. All vegetation is removed, soils are compacted, but no surface soil is removed. Prior to work beginning, overland access routes will be staked to a maximum width of 24 feet wide.

APS has identified all access that requires development or improvement inside and outside the 200-foot-wide ROW. If construction of additional access not identified on the maps included in the POD is needed, proper approvals will be acquired through the procedures outlined in the POD (see *Deviations during Construction* section).

TRANSPORTATION MITIGATION MEASURES

This section describes practices intended to mitigate potential environmental, traffic, and traffic safety-related impacts associated with access to and from the transmission line.

Generic and Selective Mitigation Measures: Following are standard and selective mitigation measures to reduce potential impacts resulting from ground disturbance and the increased levels of public access associated with the construction and operation of the transmission line.

Standard mitigation measures will be applied to all affected project areas to help reduce potential access-related impacts. Listed below are transportation-related standard measures that are to be implemented by the Contractor during construction of the project facilities:

Mitigation Measure 1 – All construction vehicle movement outside the right-of-way will be restricted to pre-designated access, contractor-acquired access, or public roads.

Mitigation Measure 2 – Limits of construction activities will typically be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate survey or construction activity limits. The ROW boundary will be flagged in environmentally sensitive areas described in the POD to alert construction personnel that those areas should be avoided and that any approved access through them is restricted to the roadway.

Mitigation Measure 3 – All construction and maintenance activities shall be conducted in a manner that will minimize disturbance to vegetation, drainage channels, and intermittent and perennial stream banks. In addition, all existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line.

Mitigation Measure 4 – All requirements of those entities having jurisdiction over air quality matters will be adhered to, and any necessary permits for construction activities will be obtained. Open burning of construction debris (cleared trees, etc.) will not be allowed on BLM-administered land.

Mitigation Measure 5 – The alignment of any new access roads or overland routes will follow the designated area's landform contours where possible, providing that such alignment does not additionally impact resource values. This would minimize ground disturbance and reduce scarring.

Vehicle Operation and Other Mitigation Measures: In addition to mitigation measures pertaining to traffic management and the construction of access roads, the following measures also will be implemented in association with the operation of vehicles during construction:

All vehicles will be equipped with approved spark arrestors and appropriate fire suppression equipment (see Appendix C—Fire Protection Plan).

All vehicle undercarriages will be washed to prevent the spread of noxious weeds prior to entering the project site.

All vehicles are to maintain current registration and will be maintained in good working condition, including emissions-control devices.

Vehicle refueling and servicing activities will be performed in designated construction zones located more than 100 feet from wetlands and streams (see Appendix B7—Hazardous Materials Management Plan).

The Construction Contractor must secure all construction-related equipment and storage yards to prevent unauthorized use of equipment that could result in avoidable environmental impacts.

The public and land-managing agencies will be informed regarding construction activity in the area as determined by the BLM Authorized Officer.

APPENDIX B2

CONSTRUCTION OF TRANSMISSION LINE ACCESS ROADS SPECIFICATIONS

ARIZONA PUBLIC SERVICE COMPANY

March 14, 2012
Revised November 18, 2012

Construction of Transmission Line Access Roads Specifications

POWER ENGINEERS

(Prepared by Power in consultation with APS and Kenny Construction)

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Attachment A—Access Road Drawings

C1-1 Typical Flat Section with Crown
C1-2 Typical Full Cut Section
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Attachment B—Stormwater Diversion Drawings

C1-8 Water Bar Detail
C1-9 Arizona Crossing Plan
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Attachment C—Other Drawing

C1-14 Cattle Guard Detail

1.1 Purpose of Specification

A. General

The intent of this specification is to provide technical guidance to the contractor for the design and construction of access roads associated with Arizona Public Service (APS) transmission line projects. The specification is not project specific and the actual design and construction may vary from the written guidance and details provided herein depending on soil type, terrain, local rainfall characteristics, environmental characteristics, cultural resources and vegetation.

This specification provides general guidelines that will lead to more consistent access roads and drainage in the APS access road system. The specification should be used by the contractor as a guideline to prepare detailed design drawings and specifications as needed for specific APS transmission line projects. Where this specification may seem inconsistent with practical construction knowledge, the contractor shall notify APS to discuss modified solutions.

B. Minimize Disturbance

The general goal of all access roadway design and construction is to provide safe travel to and from the APS transmission lines and tower sites for heavy construction traffic in all-weather conditions while minimizing disturbance, erosion and future maintenance of the access roads. The contractor is encouraged to discuss concepts and ideas that would minimize disturbance with APS even where the concepts are in conflict with this specification.

Methods of minimizing disturbance include those listed below.

1. Travel along Natural Contours vs. Blading New Access
   Wherever possible, steep roadway slopes, large cuts, and large fills should be avoided by choosing an alignment that follows the existing contours of the natural grade on the site when safely possible.
2. Skim Blade vs. Cutting into Grade
   Where the existing rolled soil can support anticipated traffic loads on gentle cross slopes, clearing and grubbing shall also be minimized by "skim blading" the alignment to smooth the surface and knock down the vegetation rather than cutting into the soil to match a specified cross slope shown on the specification drawings or the elevation shown on the project drawings.
3. Crush Vegetation vs. Bulldoze
   Where the existing vegetation is not preventative and the existing rolled soil can support anticipated traffic loads on gentle cross slopes, the contractor shall leave the existing root structure in place and crush the vegetation with rollers to achieve a smooth compacted surface without bulldozing the vegetation or disturbing the root structure.

1.2 Conformance with Codes and Regulatory Agencies

All construction shall be performed in accordance with any and all Federal, State, County, City and Public Utility regulations, ordinances, building codes, and permits that pertain to the work. It is the contractor's responsibility to be informed of the regulations, adhere to the regulations, and obtain the required permits or confirm they have been obtained. Applicable regulations, codes, ordinances, and permits may include the following:

- The Project Plans and Specifications
- These Specifications and Drawings
- Bureau of Land Management (BLM) Plan of Development
- Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) permit, Stormwater Pollution Prevention Plan (SWPPP) Requirements

- Corps of Engineers for a 404 Permit impacting "Waters of the United States" (WUS)
- OSHA Safety Regulations
- County and City Grading Permit Requirements
- Federal and State Cultural Resources Regulations
- Rules for Overland Power Line Construction

1.3 Contractor Scope of Work

The Contractor shall furnish all materials, equipment, labor, and supervision necessary to construct the access roadways as specified in the contract documents including the project plans and specifications.

Project-specific construction may include fences, gates and cattle guards, clearing and grubbing, disposal of unsuitable material and obstructions, site and roadway grading, retaining wall construction, drainage control features, soil stabilization, erosion and sedimentation control measures, reclamation of temporary roadways, and maintenance of the roadways and drainage features.

1.4 Document Priority

Where regulations and documents are in conflict, the following hierarchy shall govern as listed below in descending order:

1. Applicable Regulatory Requirements
2. Contract Terms and Conditions
3. Project Plans and Specifications
4. These Specifications and Drawings

1.5 Flagging Plan and Legend

The contractor is responsible for traffic safety both on the site and where construction traffic will interact with public or private traffic both off the site or coming through the project. The contractor shall provide a traffic plan to APS prior to the starting the work. All signing and traffic control measures shall conform to the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 2009 edition (published by U.S. Dept of Transportation Federal Highway Administration).

1.6 Roadway Alignment and Design (*Attachment A*)

A. General

The contractor shall establish a roadway alignment and construct all access roadways to provide safe, reliable, and sustainable access meeting the requirements of these specifications with minimum environmental disturbance.

B. Existing Roads

Specific projects may require use of existing public or private roadways for access to tower sites when informed by APS that they are available. The contractor may document the existing road conditions, and photograph or videotape existing roadway and drainage features prior to construction or use for hauling equipment and materials.

At intersections of existing roads and new roads, the new roads shall be constructed in accordance with the standard specifications of the owner of the existing roadways.

C. Access Roadway Geometric Standards

Access roadways shall meet geometric standards as listed below. Roadways requiring gradients exceeding standards 3 and 4 below will need prior approval from APS.

1. Straight Road Width. Roadway minimum driving surface width shall be 12 feet on all roads with a minimum centerline turning radius of 400 feet (straight road sections).
2. Curved Road Width. Roadway minimum driving surface width on curved road sections (centerline radius less than 400 feet) shall be 11 feet + 400/turning radius (19 feet minimum width for a centerline radius of 50 feet).
3. Straight Road Gradient. All roadways with a centerline radius greater than 400 feet (straight road sections) shall have a maximum approved gradient.
4. Curved Road Gradient. All roadways with a centerline radius less than 400 feet (curved road sections) shall have a maximum approved gradient.
5. Radius. Roadway minimum centerline radius shall be 50 feet.

D. Stub Roads and Turnarounds

Access roads to tower sites or other project structures that are not through roads may include a truck turnaround. Truck turnarounds shall meet the geometric access roadway geometric standards listed above in 1.6.C. Truck turnarounds shall consist of one of the constructed drivable surfaces listed below that provide minimal disturbance to the natural terrain.

1. A "Y" turnaround with two 60-foot-long branches, each at a 45-degree angle to the stub road. Minimum centerline radius shall be 50 feet, and minimum edge of road radius shall be 50 feet.
2. A "Circular" turnaround with a minimum centerline radius of 50 feet and a minimum driving surface width of 19 feet.

1.7 Clearing and Grubbing

A. General

The contractor shall only remove vegetation and obstructions that are deemed to hinder reasonable access, safety, and maintenance along the roadway alignment. The intent is to minimize removal of vegetation and to protect trees, brush, and grass whenever reasonable. If vegetation removal is in question, the contractor shall review with APS prior to removal.

B. Private Property

Clearing operations on private property may require prior notice to the APS Land Services Department prior to starting the work to allow APS to meet with the owner to review and discuss the clearing impacts. The contractor will be notified of any specific construction requirements within a 2-week time period.

C. Roads

All trees will be removed from the roadway corridor 5 feet beyond the edge of cut slopes and 4 feet beyond the edge of fill slopes unless trees are marked to remain. The contractor shall also remove unstable trees that are adjacent to the road and are in jeopardy of falling into the construction corridor.

Three-inch and larger diameter stumps and roots shall be removed to a minimum depth of 12 inches below the roadway surface in fill sections. Roots in roadway cut sections may be cut off flush with the road surface.

Where clearing grass and brush is deemed necessary, the contractor shall clear only to a point 2 feet inside the edge of fill slopes.

Cacti shall be removed or relocated in accordance with local regulations and the direction of the vegetation management plan for the project.

D. Disposal
The contractor shall not burn any clearing and grubbing debris on the site.

1. Haul and Dispose Off Site
The contractor may NOT haul any cleared and grubbed debris off the site.
2. Chipping
Branches and woody debris may be chipped and spread evenly over access roadway fill embankments or within the access road right-of-way that is outside the road surface and any potential drainage way. Chipped material shall be spread smoothly and shall not exceed 2 inches in depth.
3. Timber
May be cut on the job site and shall be disposed of in accordance with project requirements.

1.8 Grading

A. General
Grading shall be completed to elevations as shown on the project plans with no earth removed below the final road surface elevations, and cuts shall not be made below that necessary for clearing and grubbing and roadway construction. Care shall be taken to keep equipment and side castings inside the cleared and grubbed area to minimize further disturbance.

B. Cut Slopes
Cut slopes above the road surface shall be graded to a maximum slope of 1-1/2:1 horizontal to vertical and may be increased to a 1:1 slope in solid rock. No cuts above the road surface shall be steeper than 1-1/2:1 (or 1:1 in solid rock) unless reviewed and approved by an Arizona licensed civil or geotechnical engineer and APS prior to cutting.

Existing cross slopes of greater than 67% (1.5:1) may require benching and must be reviewed and approved.

Top of cut slopes must be a minimum of 10 feet from power poles and 35 feet from tower foundations.

C. Embankment Fills
Existing cross slopes of greater than 40% (2.5:1) may require benching and must be reviewed and approved.

Prior to placing embankment fills the top 6 inches of the existing surface shall be scarified and all objects larger than 8 inches in diameter removed.

Embankment fill slopes shall be graded to a maximum slope of 2:1 horizontal to vertical. Fill slopes may be steeper than 2:1 only where the soils at a specific location are reviewed and approved.

Soil used for fill shall be free of organics and consist of material free from any objects over 3 inches in diameter.

D. Soil Waste
Where fill material is in excess of available cut, the excess fill may be placed on embankment slopes to reduce the maximum slope and increase the width of the roadway fill. The contractor shall review proposed areas of increased fill width with APS prior to wasting excess material, to

ensure fill locations will not impair conductor to ground clearance or negatively affect drainage or erosion on the project.

Other designated areas on the site may be suitable for excess soil waste if reviewed and approved by APS prior to placing material.

E. Roadway Surfaces

Roadway surfaces shall be free of soft patches and visible rock surfaces over 6 inches in any dimension. The driving surface shall have a minimum width of 12 feet on straight roadway sections (see Section 1.6.C Access Roadway Geometric Standards) and a 3% cross slope including crowned roadway and super elevated roadway sections to prevent standing water from causing damage.

F. Road Passing Turnouts

The road passing turnouts shall be constructed to meet the same requirements of roadway surfaces (Section 1.8.E) with a minimum width of 10 feet and minimum lengths of 60 feet with 25 feet of tapered drive at each end, measured at the roadway edge. Passing turnouts shall be placed on straight roadway sections where possible at 1,500-foot-maximum intervals. (Any branching access roads or stub roads to tower sites will meet the intent of a passing turnout when determining 1,500-foot-maximum distance between turnouts.)

1.9 Drainage and Erosion Control (*Attachment B*)

A. General

The general intent of drainage measures is to maintain the existing flow patterns and flow quantities that were present on the site before the project began. The contractor shall not redirect stormwater runoff to different natural drainage channels as this may cause erosion and unraveling of the natural channels due to increased peak flows. Where it may be necessary to collect stormwater over some distance of the constructed roadway and discharge to one point, the contractor shall implement location-specific erosion control measures to prevent scouring or movement of the natural vegetation and soil.

B. Crossing Ravines and Natural Drainage Channels

1. General

Where a drainage structure will be installed in a ravine or natural drainage, an appropriate drainage structure shall be designed to pass water through the roadway corridor without harm to the road, embankment fills, cuts, or the natural drainage course. Drainage structures may include one of the structures listed below.

2. Arizona Crossing

When avoidance is not possible and existing roads do not exist an "Arizona Crossing" should be designed. The geography must be adaptable when using an Arizona crossing. It must not change the flow or direction of the WUS, should not allow for erosion, and allow for the toe of the wash and the wash bed to be intact. Any grading is to take place above the ordinary high water mark and only in the direction away from the wash. These crossings will be only temporary. Arizona crossings and mats or plates can be used in conjunction with each other to further protect the wash/river bottom. If there is a potential for sediment to collect in the wash bottom (rocky areas) a track out should be placed above the ordinary high water mark. Work in Arizona crossings must be done when there is no flow. Minimal work is needed for restoration if any. If all work can take place above the ordinary high water mark no permit is needed.

Wherever possible Arizona crossings shall not excavate or disturb native material within the bottom of channel. Excavation shall begin at the toe of bank and pull native material

away from the channel to create a roadway slope of no greater than 10% into and out of the channel bottom. Arizona Crossings shall smoothly transition stormwater runoff from the high to the low side of the access roadway without large angles or any change in direction of more than 2 feet in 10 feet. The Arizona Crossing shall be flush with the bottom of the natural channel on both the high and low side of the access road.
Rock for use in Arizona Crossings shall be smooth, rounded river cobble without sharp surfaces or flat faces that can shoot fast-moving water in erosive, angular directions. The rock shall be hard, durable, completely resistant to weathering, and have a minimum specific gravity of 2.5.

Arizona Crossing may include one or more of the following methods of construction:

a. Rock Rip Rap Arizona Crossings: Rock rip rap may be used to construct access roads crossings natural drainage channels where the channel soils are unsuitable. Rock used for rip rap crossings shall have a minimum diameter of 3 to 5 inches and a minimum layer depth of 18 inches across the road surface. Rock rip rap wet crossings in channels with unsuitable natural soil shall be designed with ~~e~~ a gravel base and geotextile fabric. The design may also include Arizona Crossing aprons, mud mats or hard armor to match the individual characteristics of each crossing.
b. Plates and Mats: Plates and mats can be deployed on sandy bottoms or other crossings. Deployment of plates and/or mats without any fill or dredging may limit permitting. When construction is completed these must be removed. When using plates/mats it is best practice to have a track out before entering the WUS. Mats and plates may collect material off of the vehicles. A strong filter fabric should be placed under the plates/mats to maintain the integrity of the wash. Small crossings can utilize traffic plates. Large crossings may need some sort of armored matting. Mats can sometimes be used for shoring or bank stabilization.

3. Roadway Culverts
Roadway culverts shall be avoided where possible as culverts are susceptible to clogging which may result in roadway washouts. Where deemed necessary to use a culvert, all culverts shall be sized and designed by a licensed professional engineer.
Roadway culverts shall have a minimum cover under the roadway surface of 1 foot and shall be in compliance with the gage requirements indicated in Section 1010 of the 2008 ADOT Standard Specifications.
Culvert ends shall be placed in the center of the existing channel and aligned with the direction of natural flow to the greatest extent possible. Culverts shall be placed in dry conditions. Temporary channels and cofferdams shall be constructed where necessary to keep the culvert trench dry during placement.

C. Water Bars
Water bars are the preferred method of moving rainfall across the roadway to the down side of an access road. Water bars best approximate the existing runoff characteristics by frequently moving small amounts of runoff across the road. Where the down side of an access road does not contain embankment fill, has not been disturbed, and natural brush provides adequate stabilization, the road surface shall be drained to the down side of the road with water bars. The water bars shall be constructed at a 60° angle to the road centerline and spaced as listed below:

Average Roadway Gradient	Maximum Water Bar Spacing
3% to 5%	500 feet
5% to 10%	300 feet
10% to 16%	150 feet

D. Energy Dissipaters

Energy dissipaters shall be used where water is collected along the roadway surface for a distance great enough to produce an erosive peak flow when discharged at one point. Drainage discharges from multiple water bars, half round corrugated pipe sections, culverts, and wet crossings may require energy dissipaters to prevent erosion at their point of discharge. Organic material and vegetation shall not be considered an energy dissipater as the material may biodegrade, burn, or be altered by peak stormwater flows. Energy dissipaters shall be designed to reduce peak flow velocities and concentrations to pre-development characteristics using one of the following methods. Rock used for energy dissipaters shall be shall be hard, durable, completely resistant to weathering, and have a minimum specific gravity of 2.5.

1. Rock Dissipater

   Rock rip rap may be used as an energy dissipater. Rip rap shall be 4-inch-minimum diameter, 12-inch-minimum thickness, 5-foot-minimum length, and 2-pipe-diameter minimum width. Rip rap shall also be constructed a minimum of 2 feet upstream behind ends of half round pipes or culverts.

2. Grouted Rock Dissipater

   Grouted rock may be used as an energy dissipater.

3. Temporary Energy Dissipaters

   On temporary roadways, hay or straw bales, filter socks, or other means may be utilized as a means of dissipating energy from runoff and controlling erosion.

E. Soil Stabilization

1. General

   Rainfall runoff from disturbed areas and stormwater runoff passing through disturbed areas shall maintain its natural drainage course and direction when leaving the site. Sediments from areas disturbed by construction shall be retained on site using an effective combination of erosion and sediment controls to the maximum extent possible. Stockpiles of soil shall be properly contained to minimize sediment transport from the site by runoff, vehicular tracking, or wind.

   The contractor shall, at a minimum, meet the requirements of this specification but shall also meet the more stringent of any alternate Federal, State, and local agency regulations including the EPA's SWPPP requirements.

   All removable erosion protective devices shall be in place, and all disturbed soil shall be contained at the end of each working day when the 5-day rain probability forecast exceeds 40%.

2. Vegetation

   If required by regulatory agencies or landowners, a suitable native, drought resistant seed mix shall be established and approved by APS to be used for revegetation. In the fall months the seed mix shall be applied to all disturbed soil outside the roadway surface after the soil has been properly prepared for vegetation.

1.10 Fences, Gates, and Cattle Guards

A. General

Prior to starting the work the contractor may videotape the access road right-of-way and existing fence lines and gates crossing the right-of-way. Videotape of the existing gates may be made while opening and closing the gate. The contractor shall restore all fences and gates to prior condition or better after the project is complete. The contractor shall install access gates and cattle guards to meet these specifications where access requires and where existing gates do not allow for adequate construction access. Gates and guards shall provide a clear travel surface width of 16 feet and be grounded to meet all applicable electrical power standards.

B. Fences and Gates

Gates shall be closed and locked by the contractor immediately after access unless specifically coordinated with the construction representative. The contractor may be responsible for settling any claims by property owners for lost livestock or damage resulting from fence construction or gates mismanaged by the contractor.

Tension in fences and wires shall be maintained during construction by properly bracing and fastening prior to cutting any existing wires.

C. Cattle Guards (*Attachment C*)

If necessary, Cattle Guards could be constructed prior to access road use or construction of the access roads. Cattle guards shall provide safe access for construction-loaded vehicles while preventing any livestock from navigating the guard. The cattle guard shall be installed with rigid steel framework that is welded, bolted, or riveted. The steel frame shall be securely anchored below grade with cast-in-place concrete. Cattle guard grate shall have a minimum 7 feet span along the travel way and a minimum width of 15 feet. The cattle guards shall support H-20 loading plus 20% impact and stress per AASHTO regulation. Reinforcing steel for the cattle guards shall be intermediate-grade deformed bars meeting ASTM A15 and A305 standards.

1.11 Project Completion: The following may apply based upon Landowner agreements.

A. Reclamation of Temporary Access Roads

Temporary access roads and temporary passing turnouts shall be decommissioned after project construction and equipment hauling are completed. Decommissioning shall include filling cut areas in 8-inch lifts and compaction up to natural grades and cutting embankment areas back to natural grades. The reclaimed roadway area shall then be stabilized to prevent erosion and closed to traffic in a manner that prevents any confusion resulting in an attempt to use the decommissioned roads.

B. Passing Turnouts

All permanent passing turnouts shall be brought back to these minimum standards after hauling and construction are completed and shall be inspected for compliance before the contractor removes finish grading equipment form the project site.

C. Permanent Access Roads

All permanent roads shall be brought back to these minimum standards after hauling and construction are completed and shall be inspected for compliance before the contractor removes finish grading equipment from the project site.

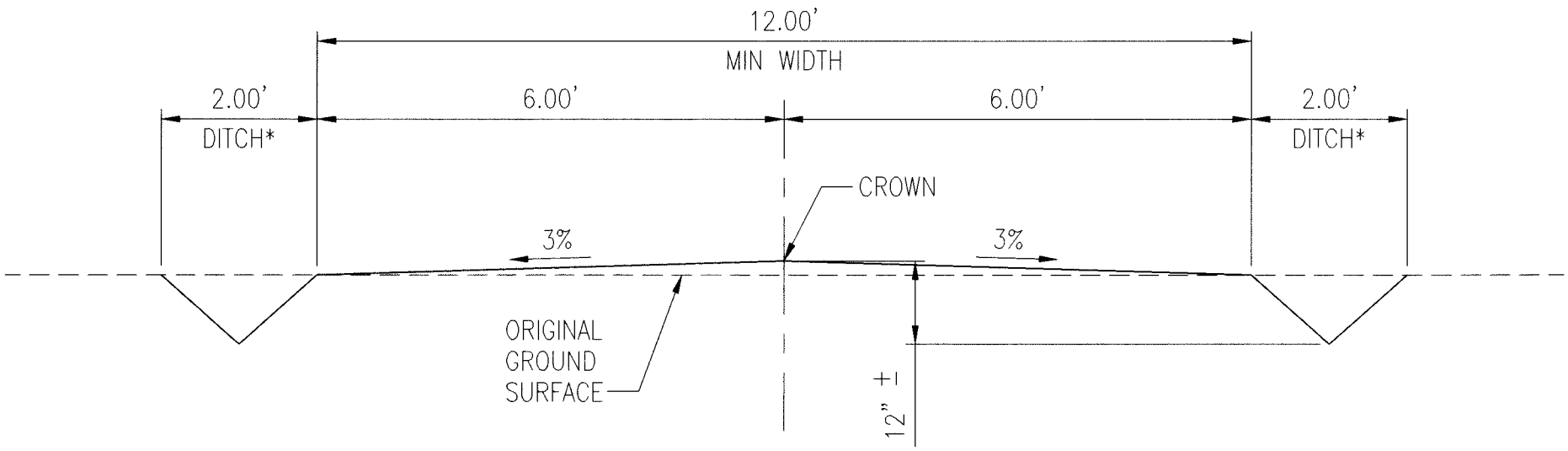
1.12 Maintenance

Roadway surfaces, embankments, cut slopes, drainage structures, and erosion control measures shall be regularly inspected and maintained by the contractor during all phases of the project.

Attachment A

Access Road Drawings

44KCC_C1-1.DWG



TYPICAL FLAT SECTION WITH CROWN

(20% OR 5:1 MAX GROUND CROSS SLOPE)

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

* AREA ADJACENT TO ROAD MAY INCLUDE DITCH, BERM, HAY OR STRAW BALES, FILTER SOCKS OR NO INSTALLATION DEPENDING ON LOCATION AND PROJECT REQUIREMENTS.

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	WMT	DLC	WKW	BB	

DSGN	DLC	01/17/12
DRN	WMT	01/17/12
CKD	WKW	01/24/12
SCALE:	NTS	

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

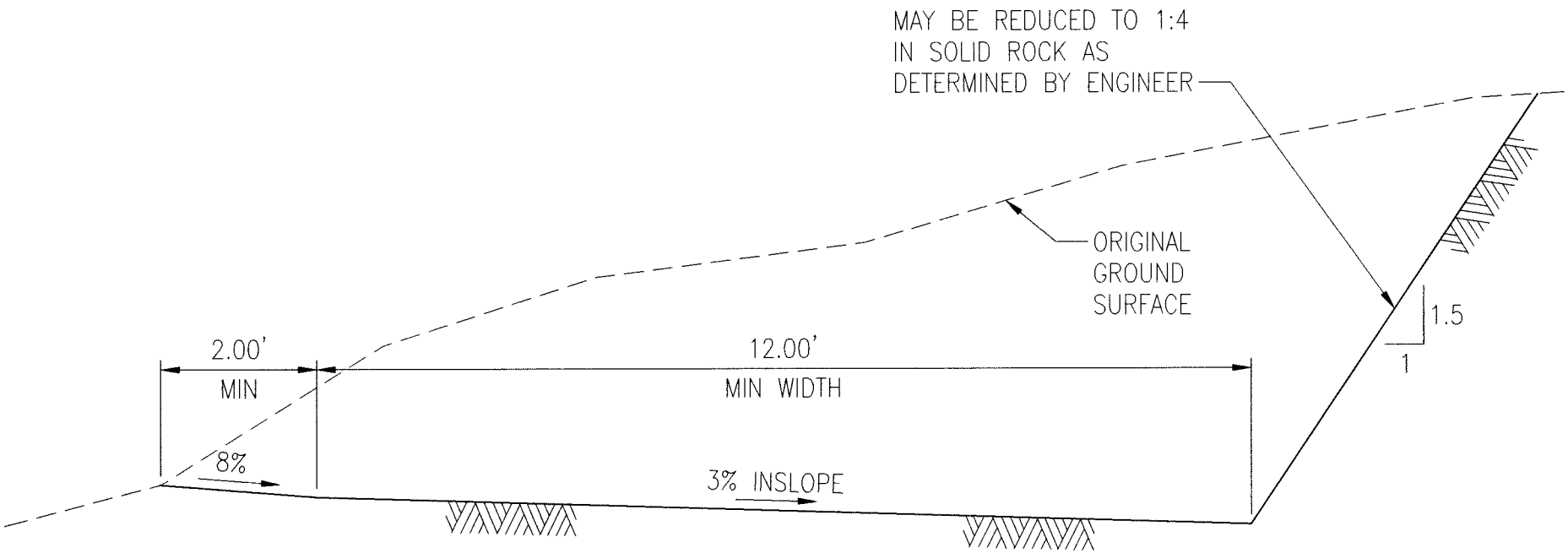
TYPICAL FLAT SECTION WITH CROWN

JOB NUMBER 125082

REV A

DRAWING NUMBER C1-1

44KCC_C1-2.DWG



TYPICAL FULL CUT SECTION

(80% OR 1.25:1 MAX GROUND CROSS SLOPE)

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	WMT	DLC	WKW	BB	

DSGN	DLC	01/17/12
DRN	WMT	01/17/12
CKD	WKW	01/24/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

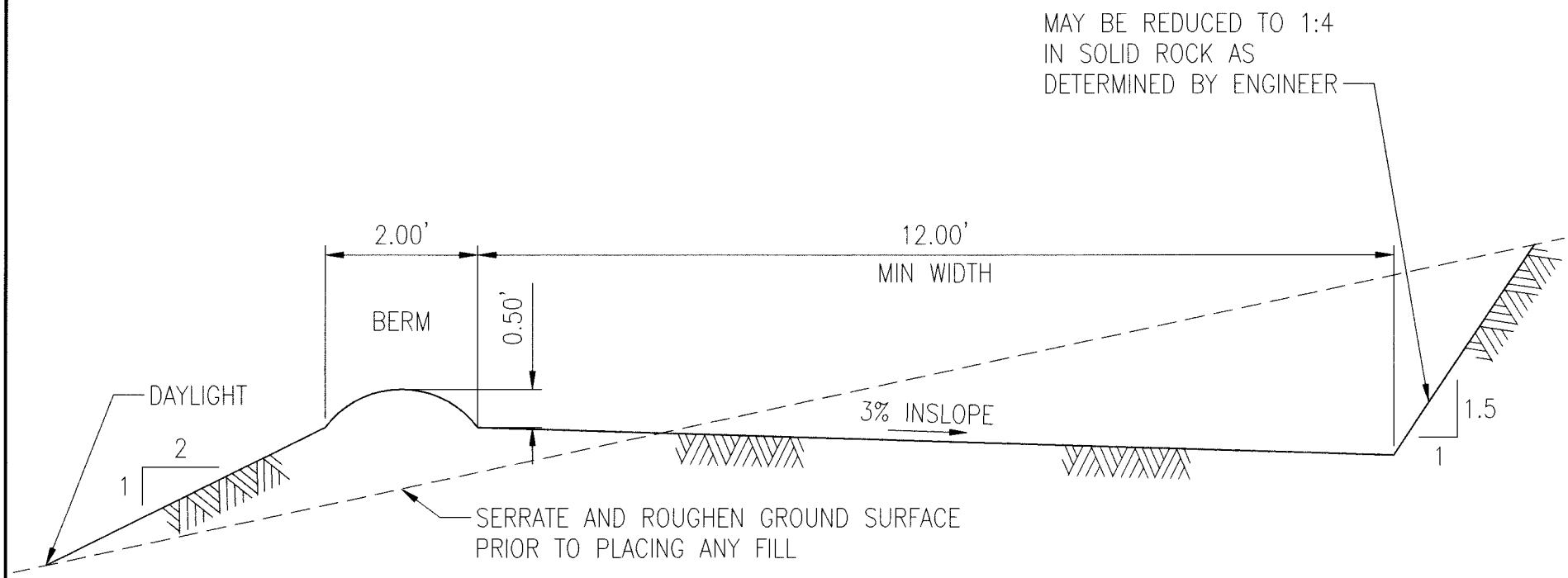
TYPICAL FULL CUT SECTION

JOB NUMBER 125082

REV A

DRAWING NUMBER C1-2

44KCC_C1-3.DWG



TYPICAL FILL – CUT SECTIONS

(50% OR 2:1 MAX GROUND CROSS SLOPE)

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
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DSGN	DLC	01/17/12
DRN	WMT	01/17/12
CKD	WKW	01/24/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

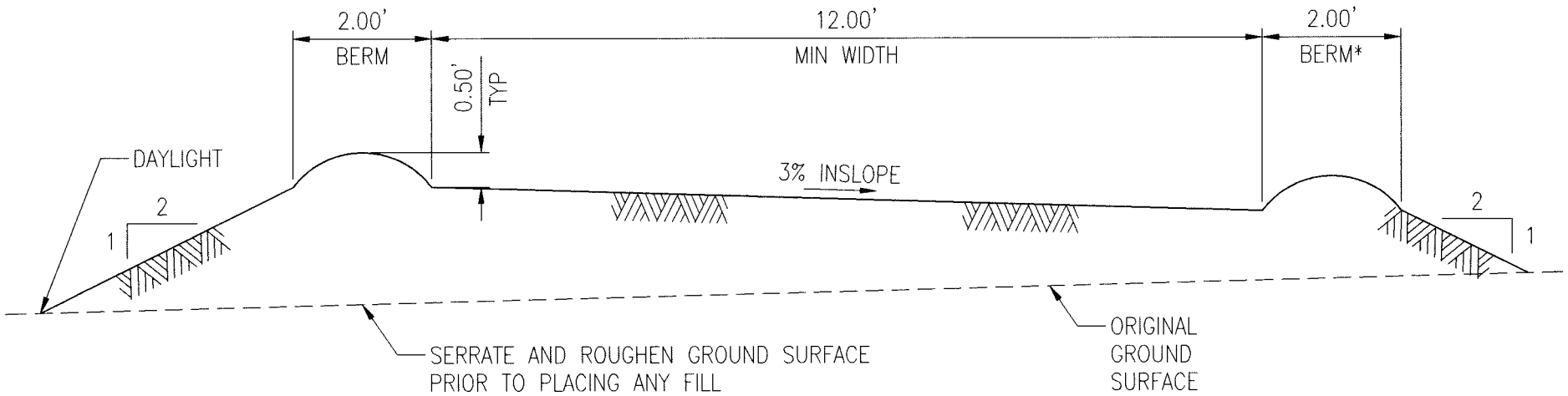
TYPICAL FILL – CUT SECTIONS

JOB NUMBER 125082

REV A

DRAWING NUMBER C1-3

44KCC_C1-4.DWG



TYPICAL FULL EMBANKMENT SECTION

(40% OR 2.5:1 MAX GROUND CROSS SLOPE)

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

* INSIDE BERM SHALL INCLUDE OUTLETS FOR SURFACE WATER FLOW AS NEEDED. SPACING OF OUTLETS TO BE DETERMINED BY ENGINEER.

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
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DSGN	DLC	01/17/12
DRN	WMT	01/17/12
CKD	WKW	01/24/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

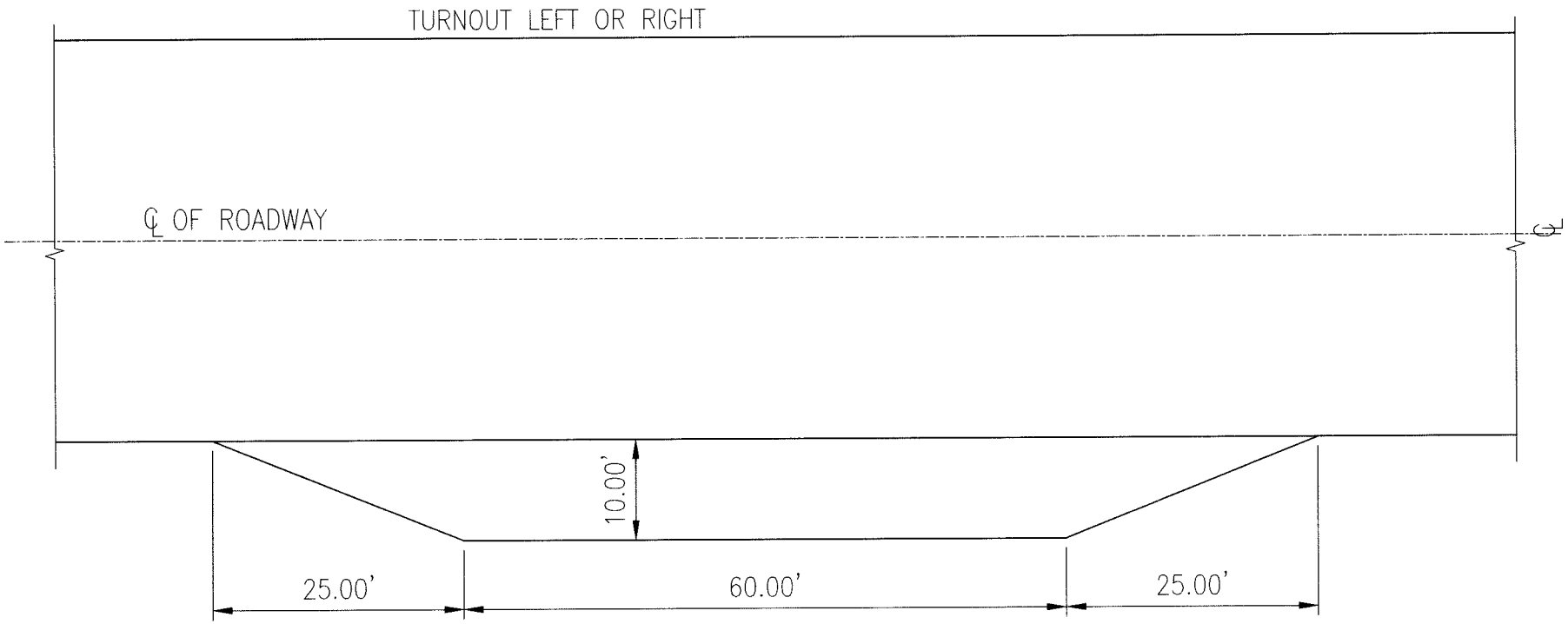
TYPICAL FULL EMBANKMENT SECTION

JOB NUMBER 125082

REV A

DRAWING NUMBER C1-4

44KCC_C1-5.DWG



TYPICAL ROADWAY TURNOUT

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	SAC	DLC	WKW	BB	

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

TYPICAL ROADWAY TURNOUT

JOB NUMBER 125082

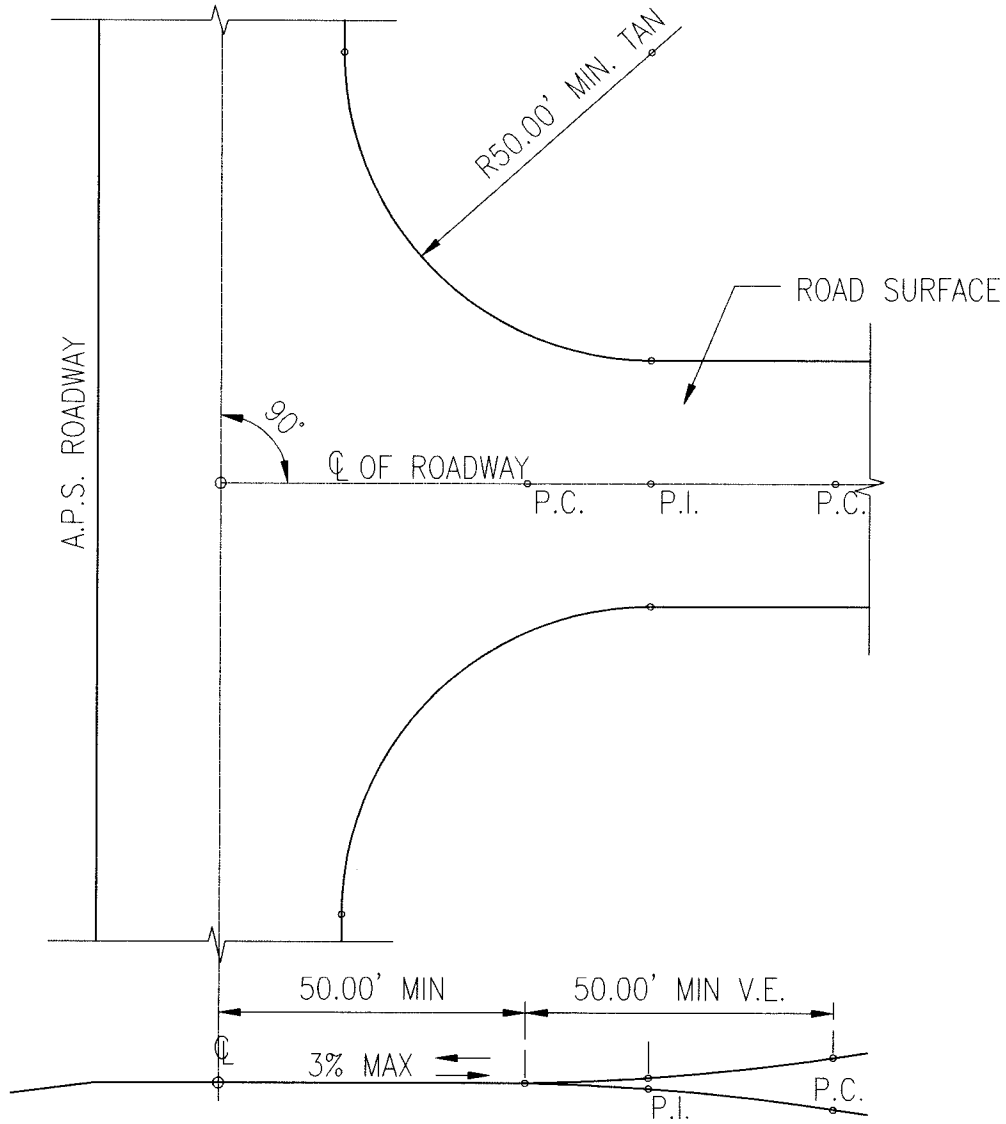
REV A

DRAWING NUMBER C1-5

44KCC_C1-6.DWG

AT INTERSECTIONS OF EXISTING ROADWAYS AND NEW ROADWAYS, NEW ROADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE OWNER OF THE EXISTING ROADWAY

LOCATION OF ROAD APPROACH CONNECTIONS AS SHOWN ON THE DRAWINGS ARE SUBJECT TO ADJUSTMENT.



DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

TYPICAL ROADWAY APPROACH

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	SAC	DLC	WKW	BB	

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

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POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

TYPICAL ROADWAY APPROACH

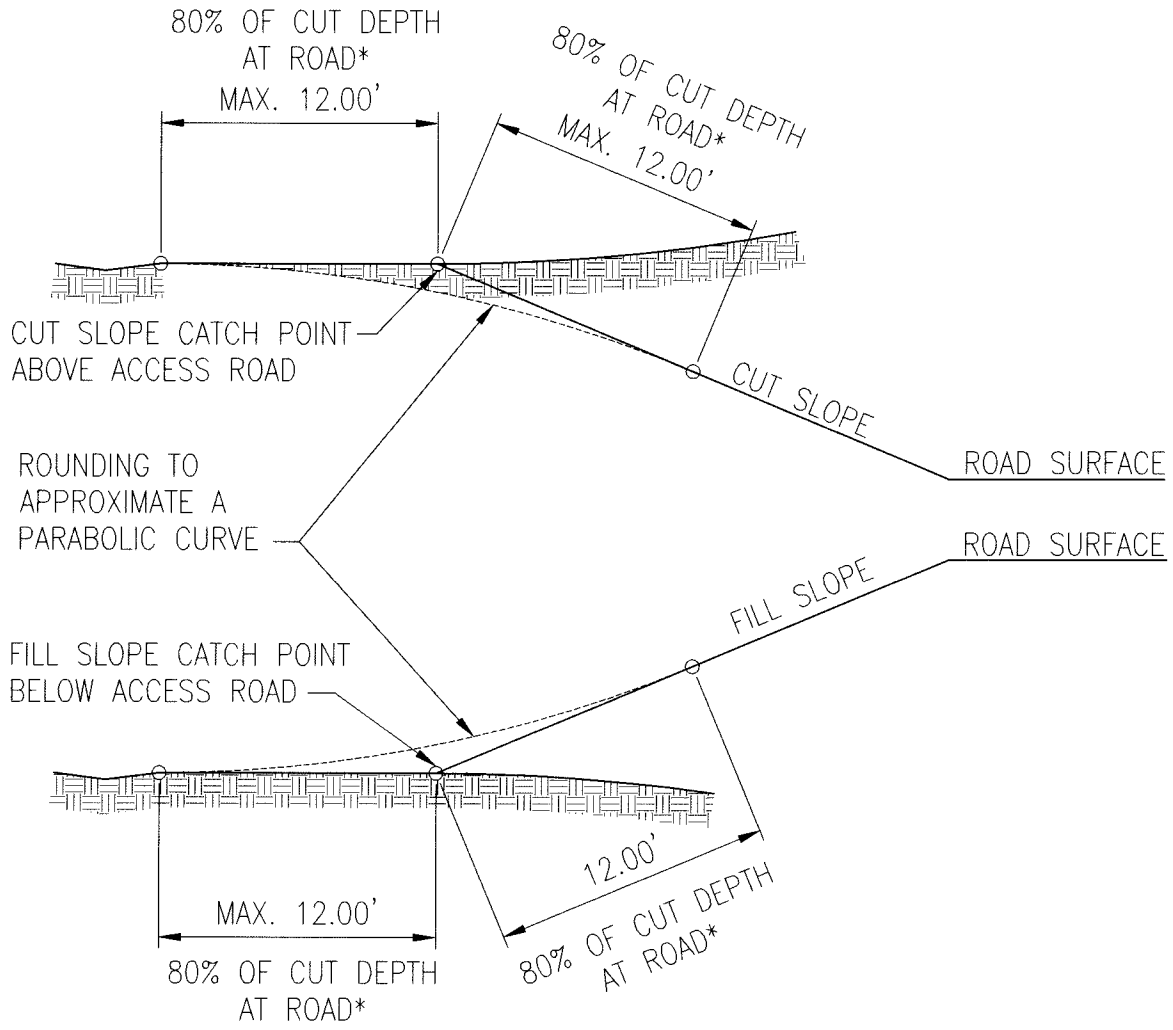
JOB NUMBER 125082

REV A

DRAWING NUMBER C1-6

44KCC_C1-7.DWG

* IN HEAVY BRUSH & FOR TIMBER AREAS, LENGTH SHALL BE SHORTENED TO APPROX. 5'-0"



DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

SIDE SLOPE ROUNDING

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	SAC	DLC	WKW	BB	

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12
SCALE:	NTS	

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

SIDE SLOPE ROUNDING

JOB NUMBER 125082

REV A

DRAWING NUMBER C1-7

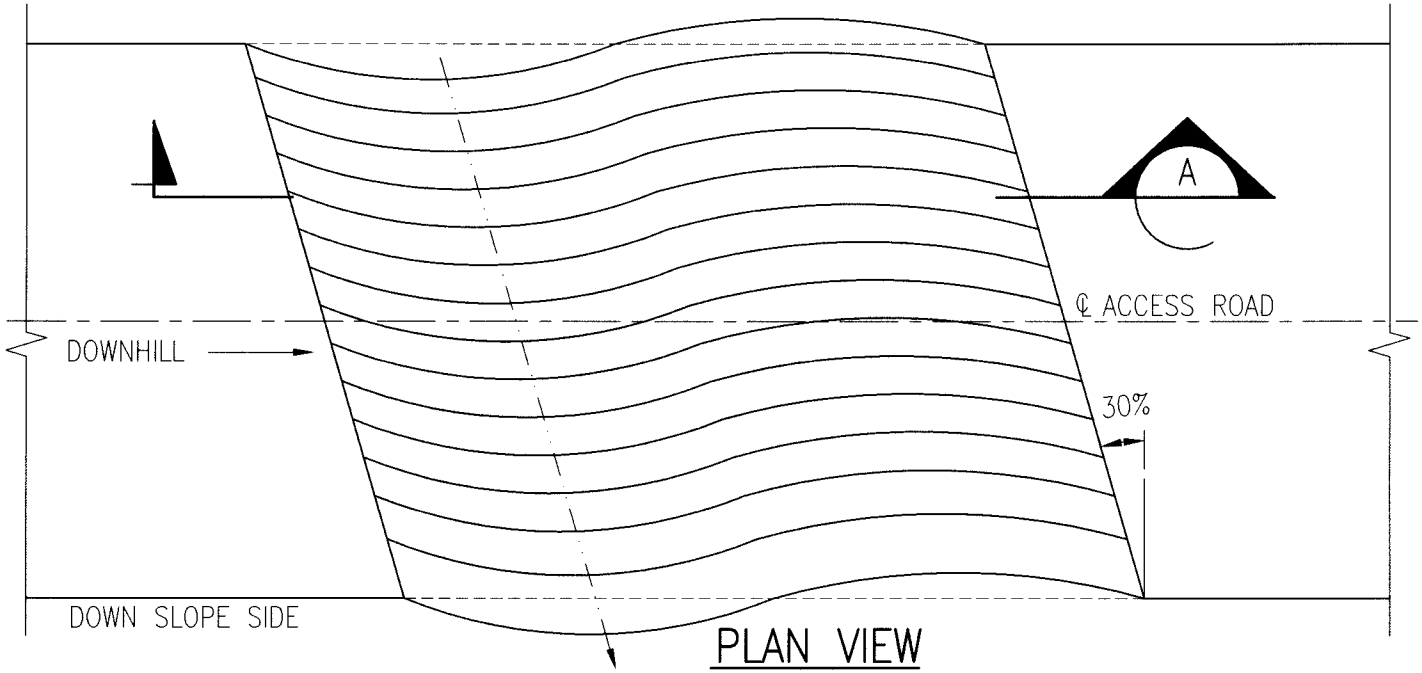
Attachment B

Stormwater Diversion Drawings

44KCC_C1-8.DWG

PAGE 1-16, AS SHOWN ON PLAN	
AVERAGE ROAD GRADE	MAXIMUM SPACING
1%-5%	600 FT
5%-10%	400 FT
10%-16%	200 FT

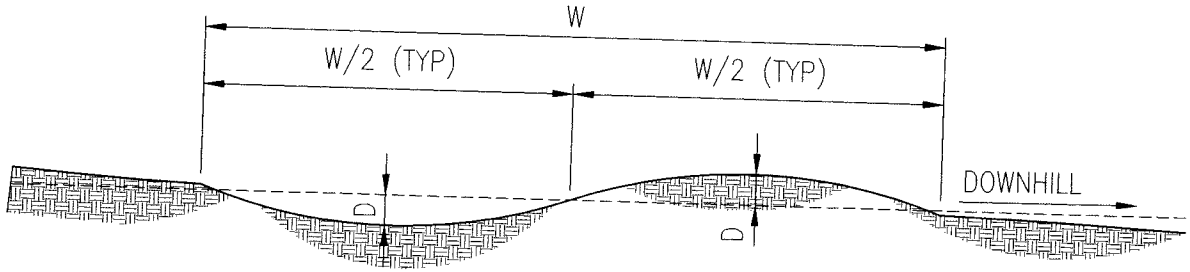
% GRADE OF ACCESS RD	W	W/2	D
0%-5%	6'	3'	3"
5%-10%	8'	4'	4"
10%-16%	16'	8'	8"



PLAN VIEW

WATER BARS

WATER BARS SHALL BE INSTALLED FOR EACH 30 FEET CHANGE IN ELEVATION OF THE ROAD SURFACE. THEY SHALL NOT BE INSTALLED APPROXIMATELY 30° TO THE TRANSVERSE SECTION OF THE ROAD IN ORDER TO TURN THE WATER OVER THE SIDE OF THE ROAD ON THE DOWN SLOPE SIDE.



WATER BAR

SECTION A

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	SAC	DLC	WKW	BB	

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

WATER BAR DETAIL

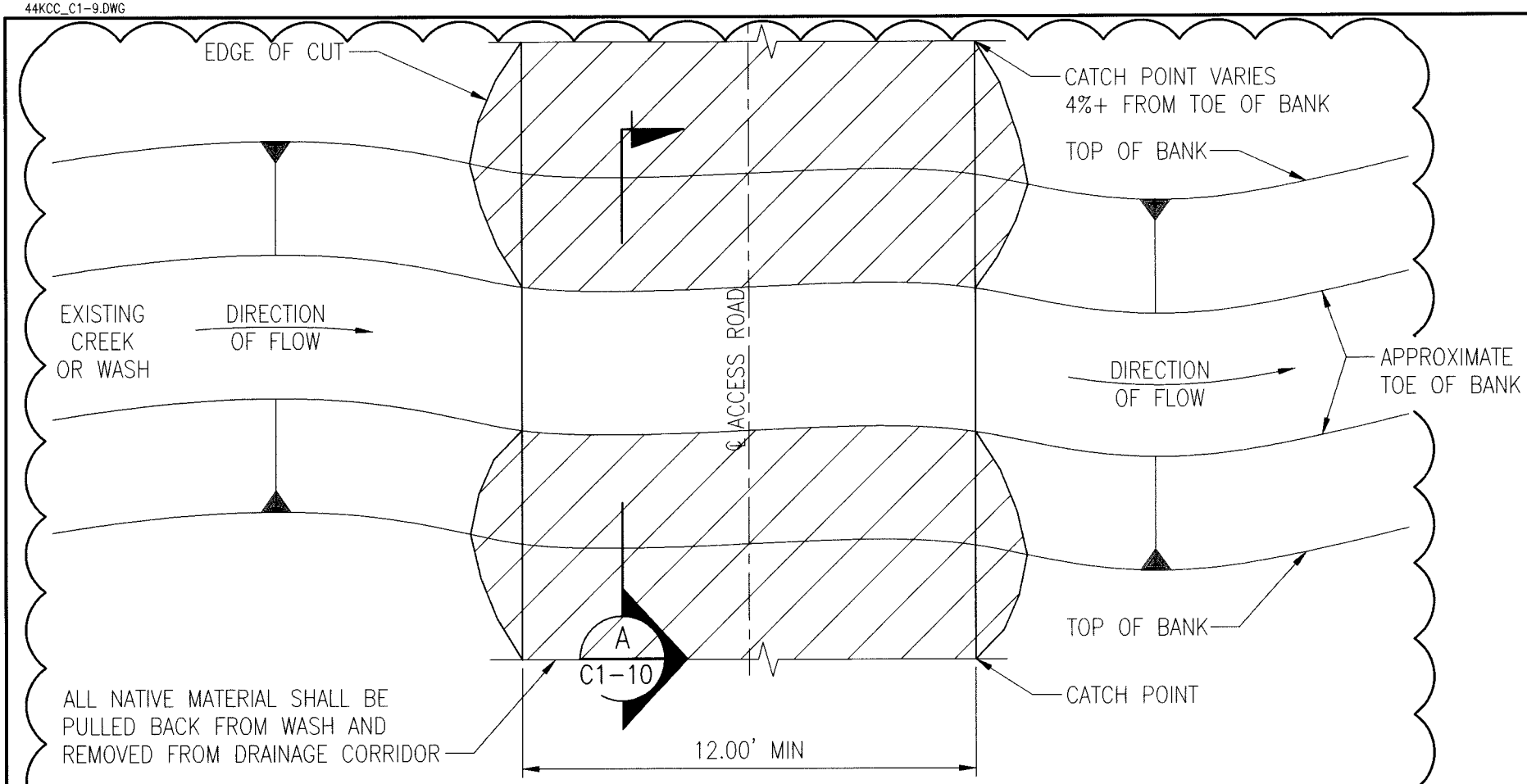
JOB NUMBER 125082

REV A

DRAWING NUMBER C1-8

aps

44KCC_C1-9.DWG



ARIZONA (WET) CROSSING PLAN VIEW

B

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

NOTE

CROSS SLOPE OF APRON TO MATCH SLOPE OF EXISTING CHANNEL

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
B	NO CONCRETE	02/22/12	WMT	DLC	WKW	BB	
A	ISSUED FOR REVIEW	01/27/12	SAC	DLC	WKW	BB	

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

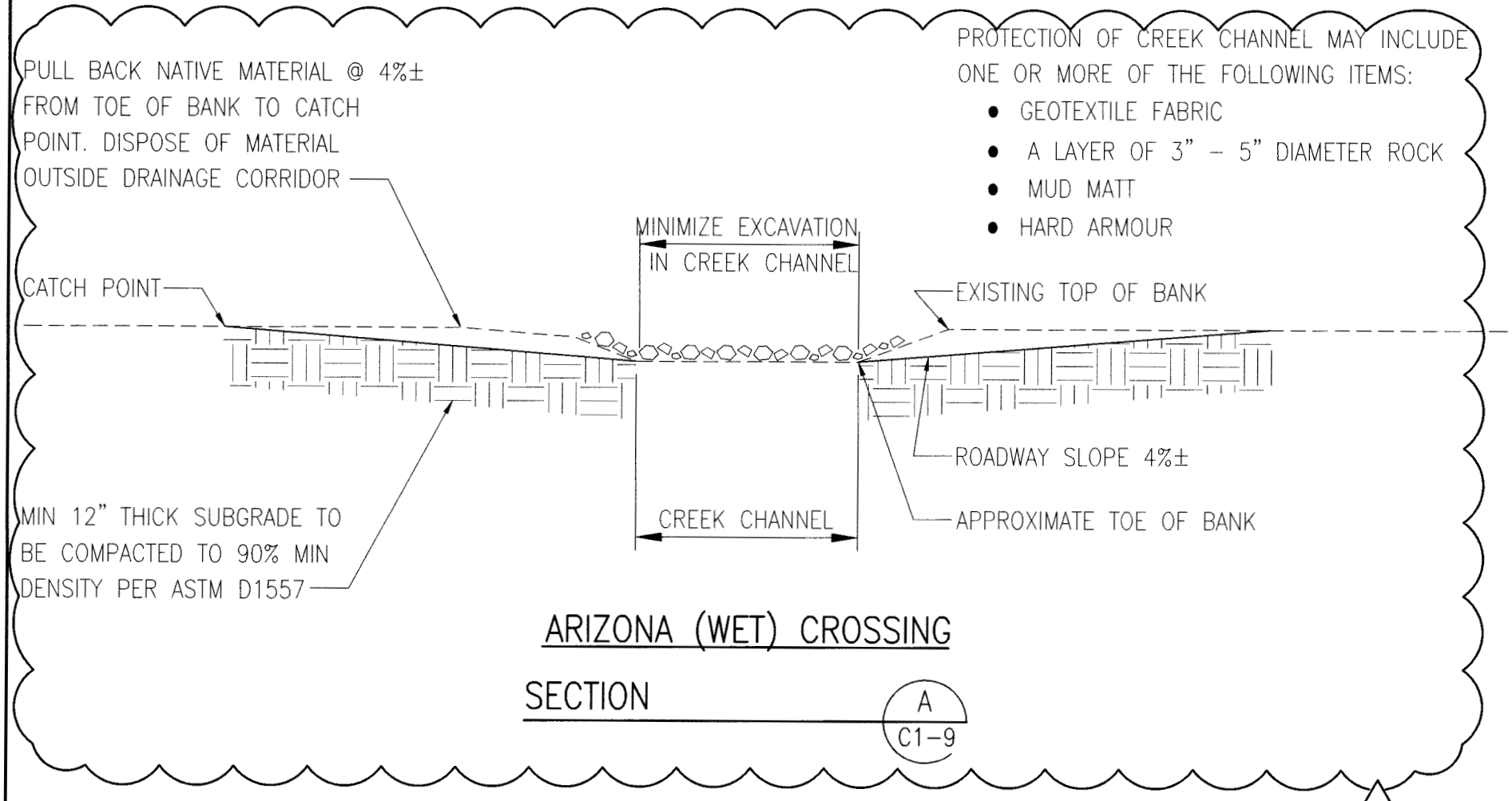
ARIZONA (WET) CROSSING PLAN

JOB NUMBER 125082

REV B

DRAWING NUMBER C1-9

44KCC_C1-10.DWG



ARIZONA (WET) CROSSING

SECTION A / C1-9

B

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
B	NO CONCRETE	02/22/12	WMT	DLC	WKW	BB
A	ISSUED FOR REVIEW	01/27/12	SAC	DLC	WKW	BB

REFERENCE DRAWINGS

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

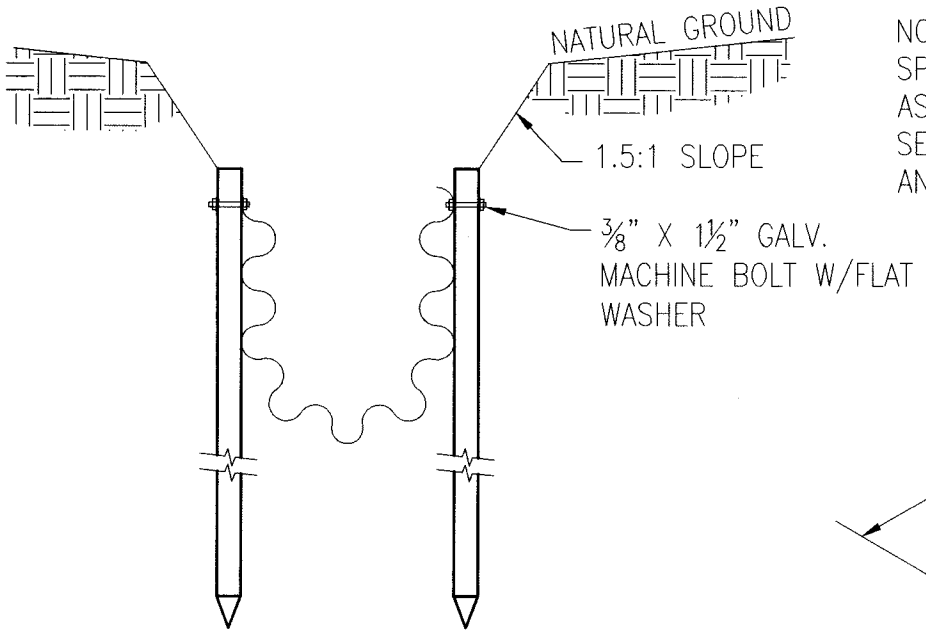
ARIZONA (WET) CROSSING SECTION

JOB NUMBER 125082

REV B

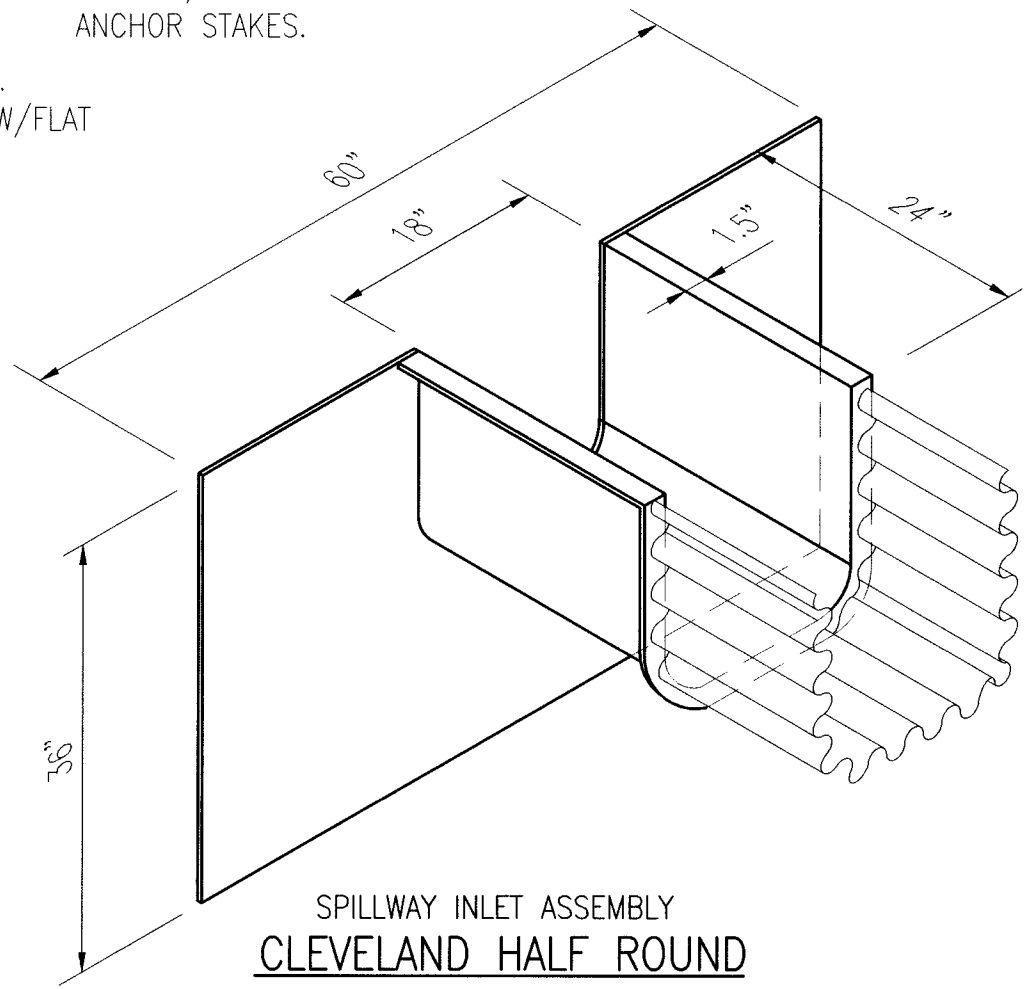
DRAWING NUMBER C1-10

44KCC_C1-11.DWG



SECTION A

NOTE: FOR EACH SPILLWAY INLET ASSEMBLY AND FLUME SECTION, SUPPLY TWO ANCHOR STAKES.



SPILLWAY INLET ASSEMBLY

CLEVELAND HALF ROUND

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	SAC	DLC	WKW	BB	

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

CORRUGATED HALF CIRCLE DRAIN

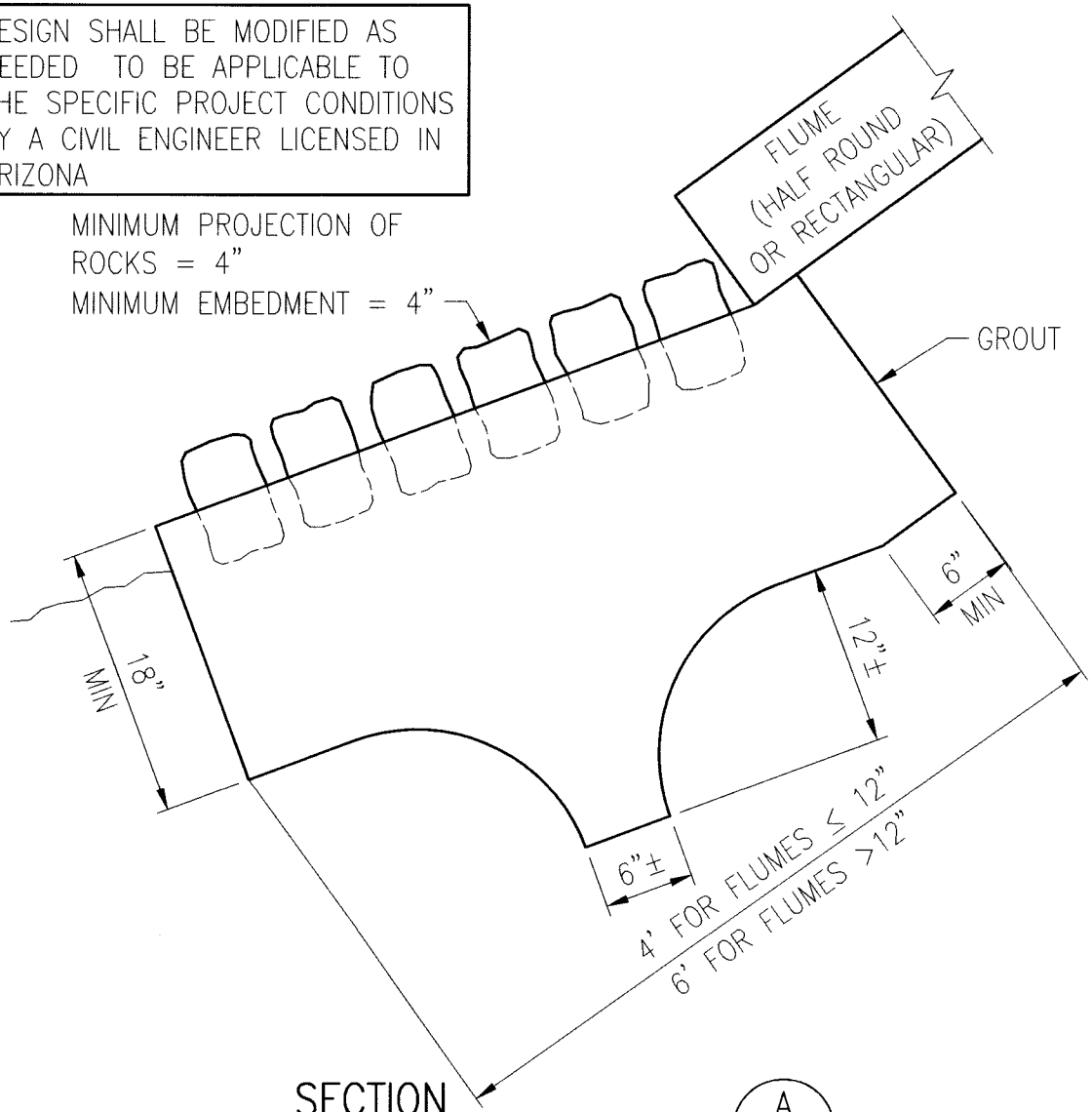
JOB NUMBER 125082

REV A

DRAWING NUMBER C1-11

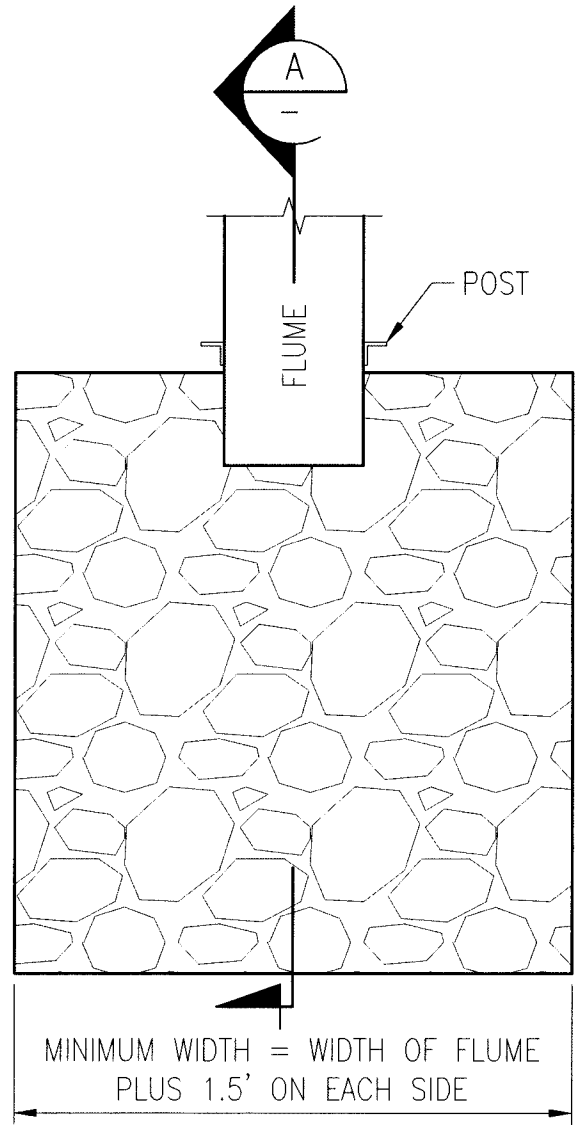
44kcc_C1-12.dwg

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA



SECTION A

NTS



PLAN

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
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DSGN	DLC	02/02/12
DRN	DP	02/02/12
CKD	WKW	02/02/12
SCALE:	NTS	

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

GROUTED ROCK ENERGY DISSIPATOR

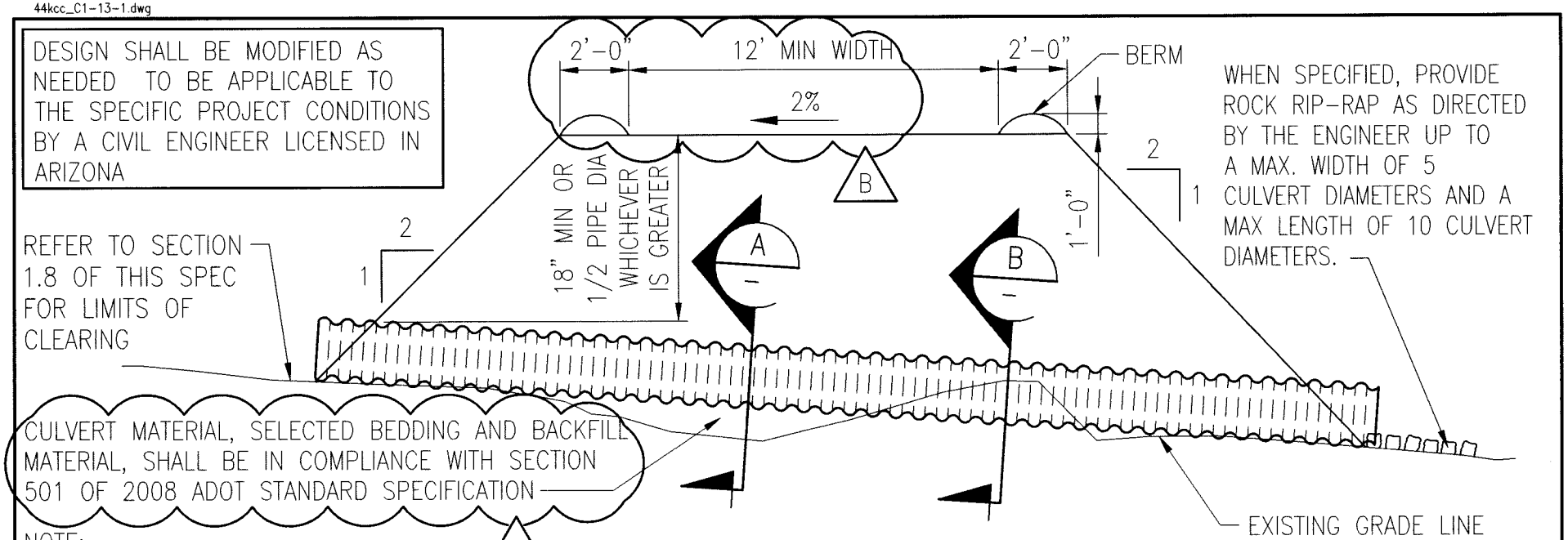
JOB NUMBER 125082

REV A

DRAWING NUMBER C1-12

44kcc_C1-13-1.dwg

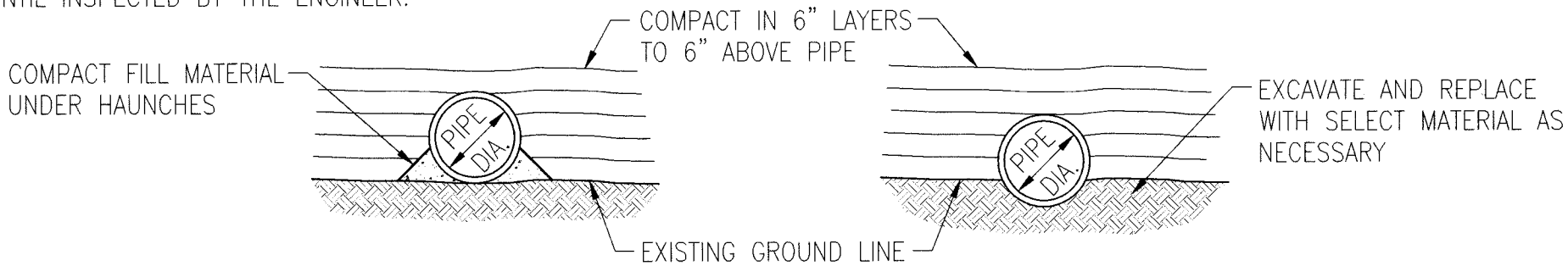
DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA



NOTE:
NO BACKFILLING SHALL BE PERFORMED UNTIL INSPECTED BY THE ENGINEER.

B

TYPICAL CULVERT SECTION



SECTION A

SECTION B

TYPICAL BACKFILLING PRACTICE

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
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A	ISSUED FOR REVIEW	02/02/12	BEB	DLC	WKW	BB

REFERENCE DRAWINGS

DSGN	DLC	02/02/12
DRN	BEB	02/02/12
CKD	WKW	02/02/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

CULVERT INSTALATION

JOB NUMBER 125082

REV B

DRAWING NUMBER C1-13-1

44KCC_C1-13-2.DWG

CULVERT NOTES WHEN CROSSING WATERS OF THE UNITED STATES

CULVERT CROSSINGS

WORK PERFORMED WITHIN WATERS OF THE US (WUS) MUST MEET THE CLEAN WATER ACT CONDITIONS UNDER SECTIONS 404 AND 401. APS ENVIRONMENTAL FIELD OFFICE (EFO) WILL IDENTIFY WUS LOCATED IN THE PROJECT AREA AND OBTAIN PERMITS AS REQUIRED. CONTRACTOR WILL BE PROVIDED A COPY OF PERMITS AND TRAINED ON CONDITIONS OF THE PERMIT.

WHEN DESIGNING TEMPORARY CULVERT CROSSINGS THE CULVERTS NEED TO BE DESIGNED TO HANDLE THE FLOW. A TARP OR FABRIC NEEDS TO BE LAID DOWN FIRST TO MAINTAIN THE INTEGRITY OF THE WASH BOTTOM AND ONLY CLEAN FILL MATERIAL MAY BE USED TO CONSTRUCT THE CROSSING. WHEN CONSTRUCTION IS COMPLETED THE CULVERTS NEED TO BE REMOVED AND THE WASH RESTORED. SEEDING MAYBE NECESSARY TO STABILIZE THE BANK FROM FURTHER EROSION.

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING CONSTRUCTION MATERIAL AND/OR FILL INCLUDING, BUT NOT LIMITED TO: ROCK, GABION FILL OR OTHER UN-CEMENTED CHANNEL-LINING MATERIALS, PLACED WITHIN THE ORDINARY HIGH WATER MARK (OHWM) OF ANY WUS, SHALL NOT INCLUDE MATERIALS THAT CAN CAUSE OR CONTRIBUTE TO AN EXCEEDENCE OF ARIZONA WATER QUALITY STANDARDS FOR SURFACE WATERS (18, A.A.C., 11, ARTICLE 1). WASHING OF FILL MATERIAL MUST OCCUR OUTSIDE OF THE FLOODPLAIN OF ANY WUS PRIOR TO PLACEMENT AND THE EFFLUENT FROM SUCH WASHING SHALL BE CONTAINED AND SETTLED OR OTHERWISE PREVENTED FROM CONTRIBUTING SEDIMENT OR CAUSING EROSION TO ANY WUS. FILL PLACED IN LOCATIONS SUBJECT TO SCOUR SHALL CONTAIN NOT MORE THAN TEN PERCENT (10%) ON A DRY WEIGHT BASIS OF PARTICLES FINER THAN 0.25 MM DIAMETER (PASSING A NO. 60 SIEVE).

PERMANENT CULVERT CROSSINGS NEED TO BE ENGINEERED AND DESIGNED FOR ALL WEATHER. THEY SHOULD NEED VERY LITTLE MAINTENANCE.

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
A	ISSUED FOR *	01/27/12	SAC	DLC	WKW	BB	

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

CULVERT NOTES WHEN CROSSING WATERS OF THE UNITED STATES

JOB NUMBER 125082

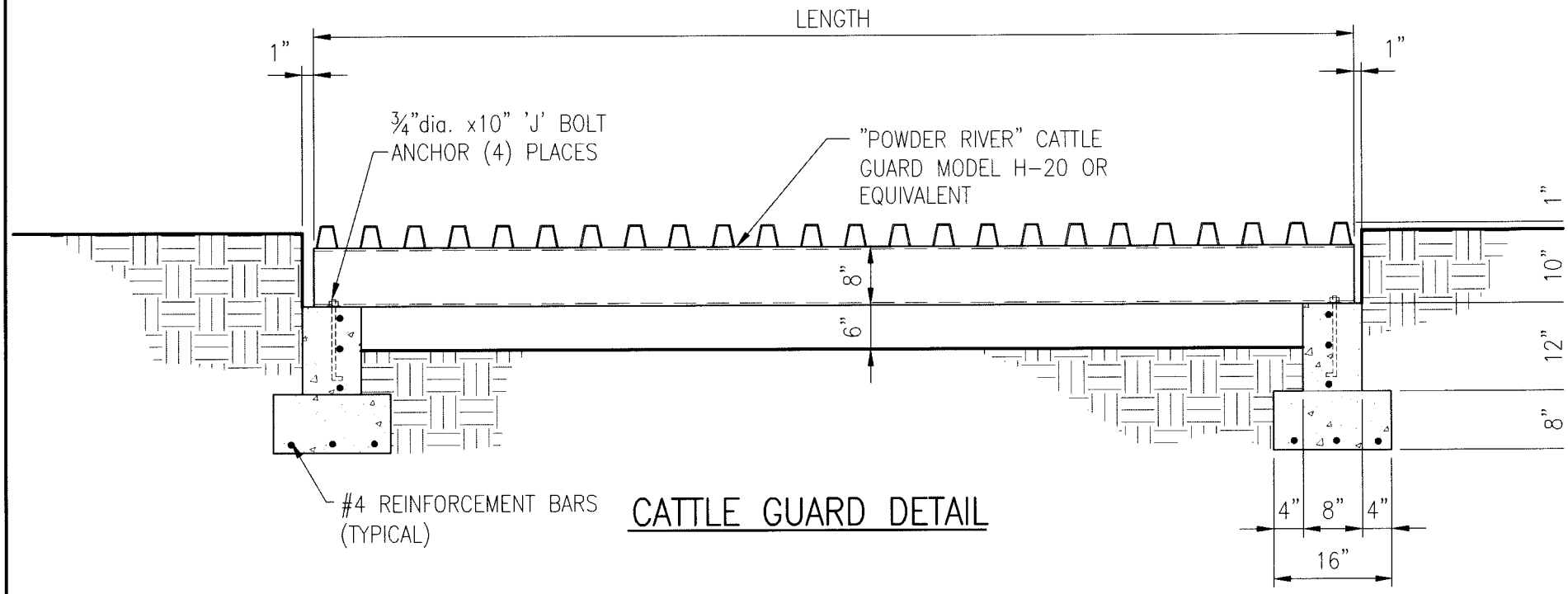
REV A

DRAWING NUMBER C1-13-2

Attachment C

Other Drawing

44KCC_C1-14.DWG



CATTLE GUARD DETAIL

NOTE

1. CATTLEGUARD DECKING AND FRAMING SHALL BE DESIGNED FOR H20 LOADING.
2. REINFORCING STEEL SHALL BE INTERMEDIATE GRADE DEFORMED BARS CONFORMING TO ASTM A15 AND A305.
3. CONCRETE SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 2,500 PSI WITHIN 28 DAYS.

DESIGN SHALL BE MODIFIED AS NEEDED TO BE APPLICABLE TO THE SPECIFIC PROJECT CONDITIONS BY A CIVIL ENGINEER LICENSED IN ARIZONA

aps

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
A	ISSUED FOR *	01/27/12	SAC	DLC	WKW	BB

REFERENCE DRAWINGS

DSGN	DLC	01/27/12
DRN	SAC	01/27/12
CKD	WKW	01/27/12

SCALE: NTS

FOR 8.5x11 DWG ONLY

POWER ENGINEERS

ARIZONA PUBLIC SERVICE COMPANY

CATTLE GUARD DETAIL

JOB NUMBER 125082

REV A

DRAWING NUMBER C1-14

APPENDIX B3

DUST CONTROL PLAN

DUST CONTROL PLAN

Prepared for

Arizona Public Service Company
2124 West Cheryl Drive
Building B2, MS 3371
Phoenix, Arizona 85201

May 2013

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1.0 OVERVIEW

This dust control plan (plan) for the Hassayampa–North Gila #2 (HANG2) 500kV Transmission Line Project (the project) presents the activities to be conducted to support compliance with the applicant-committed proposed mitigation measures that were derived from the Plan of Development (POD) and National Environmental Policy Act (NEPA) documentation. In addition to the applicant-committed proposed mitigation measures, control measures (primary control and contingency measures) have been identified as required by the applicable state and local fugitive dust rules listed below in Table 1. Compliance with these rules and the proposed mitigation measure listed in Section 4 will reduce potential fugitive dust impacts that would result from construction of the project. Moreover, this plan has been developed to conform to Maricopa County Air Pollution Control Regulations (MCAPCR) Rule 310, Section 402. This plan is required by the Maricopa County Air Quality department and is to be submitted as part of the dust permit application, as well as with the POD.

This plan should be submitted as part of the Maricopa County Dust Control Permit application to:

One Stop Shop
501 North 44th Street, Suite 200
Phoenix, Arizona 85008
(602) 372-1071

2.0 INTRODUCTION

Arizona Public Service (APS) is proposing the construction, operation, and maintenance of a 111.36-mile-long, 500kV transmission line designated as the Hassayampa–North Gila #2/HANG2. The new transmission line will originate at the existing Hassayampa Switchyard, located at the Palo Verde Hub south of the Palo Verde Nuclear Generating Station, and terminate at the existing North Gila Transmission Substation northeast of Yuma, Arizona (refer to POD project overview and Appendix A, Construction Maps).

The transmission line will be located within an existing right-of-way (ROW), which traverses multiple jurisdictions, including private, Arizona State Trust Land, and federal lands. The federal lands are administered by the BLM, Department of Defense-Yuma Proving Grounds, and Bureau of Reclamation.

Construction of the project will result in the generation of fugitive dust. Fugitive dust is particulate matter suspended in the air by wind or human activities and is not emitted from a single point source. Air quality regulations require the use of control measures to minimize fugitive dust emissions. The goal of this plan is to minimize visible airborne fugitive dust to the extent possible, given the construction requirements and techniques. This plan provides fugitive dust control measures for construction activities and sources that emit fugitive dust. These construction activities and sources that emit fugitive dust include unpaved and paved roads, disturbed surface areas, earthmoving activities, earthmoving, trenching, and the management of large material stock piles.

There are several reasons to control fugitive dust. First, portions of Maricopa and Yuma counties are not currently in compliance with the U.S. Environmental Protection Agency (EPA) National Ambient Air Quality Standards with respect to particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}); EPA refers to these areas as being in nonattainment. The project area occurs within the Yuma PM_{10} nonattainment area but is outside the boundaries of the Maricopa County PM_{10} nonattainment area. While the project is outside the Maricopa County nonattainment area for PM_{10}, projects of this nature are still subject to Maricopa County air quality regulations, including dust control. Second, fugitive dust can cause respiratory distress, not only in the construction workers and nearby residents, but also in nearby wildlife. Fugitive dust can obscure visibility to the point of creating a safety hazard. Finally, fugitive dust can be evidence of soil loss through wind erosion.

3.0 PROJECT CONTACT

The contact information for the individuals responsible for the submittal and implementation of this plan is provided below.

3.1 Person Responsible for Submitting the Dust Control Plan

Contractor: TBD

(Per oversight from Michelle Turgeon and Ben Dowler of APS)

Michelle Turgeon
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
602.371.7715
Michelle.Turgeon@aps.com

Ben Dowler
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
602.328.1925
Benjamin.Dowler@aps.com

24-hour emergency phone: 602-371-6900

3.2 Person Responsible for Implementing the Dust Control Plan

MCAPCR Rule 310 (described below in the Applicable Dust Control Requirements section), Section 310, specifies that if a site has more than 1 acre of disturbed surface area, the site superintendent (or other designated on-site representative) of the Dust Control Permit holder must possess the **Basic** Dust Control Training certification. If a site has 5 or more acres of disturbed surface area, a Dust Control Coordinator in possession of the **Comprehensive** Dust Control Training certification must be available during all primary dust-generating operations.

The Dust Control Coordinator for this project is: Certified on-site employee(s) of the Contractor
(with oversight from APS Environmental Section—see above)

In accordance with MCAPCR Rule 310, Section 310.2, "The Dust Control Coordinator shall have the full authority to ensure that dust control measures are implemented on-site, including conducting inspections, deployment of dust suppression resources, and modifications or shutdown of activities as needed to control dust."

4.0 FUGITIVE DUST SOURCES

Fugitive dust, as defined by the Arizona Revised Statutes 49-457.05, Part 6, is "particulate matter that could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening, that can be entrained in the ambient air and that is caused by human or natural activities, including the movement of soil, vehicles, equipment, blasting and wind. Fugitive dust does not include particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines, from portable brazing, soldering or welding equipment or from pile drivers."

Fugitive dust can be created directly from such activities as, but not limited to, vegetation removal, grading, trenching, backfilling, or topsoil replacement. Vehicles and equipment moving on unpaved roads and work areas and/or causing track-out, carry-out, or spillage can also create dust. Significant wind action on unprotected spoil piles or topsoil storage areas is another source of fugitive dust. These activities consist of a series of different operations, each with its own duration and potential for dust generation.

This plan applies only to fugitive dust generated by construction activities involved in the HANG2 project construction and vehicle trips by support equipment, which include the following categories of dust- generating operations or areas:

- Grading/excavating/trenching/backfilling
- Unpaved haul roads or equipment paths
- Access point/planned exit locations onto areas accessible to the public
- Material handling
- Hauling
- Disturbed surface areas
- Inactive areas

Energy use, architectural coatings, and point source impacts were not quantified because their impacts are not pertinent to, or subject to, dust control measures. No demolition is required as part of this project.

5.0 APPLICABLE DUST CONTROL REQUIREMENTS

The construction activities associated with the project will occur in Maricopa and Yuma counties, Arizona. These activities are governed by the applicable rules and regulations promulgated by the Arizona Department of Environmental Quality (ADEQ) (which includes Yuma County), Maricopa County Air Quality Department (MCAQD), and by several proposed mitigation measures identified in the POD and in the NEPA documentation.

Table 1 provides the applicable ADEQ, MCAQD, and Yuma County fugitive dust rules, regulations, or ordinances with which the project must comply.

Table 1. Applicable Fugitive Dust Rules

Agency	Rule Number	Rule Description
ADEQ	R18-2-604	Construction on "open areas'" fugitive dust limitations
ADEQ	R18-2-605	Road construction fugitive dust limitations
ADEQ	R18-2-606	Material handling fugitive dust limitations
ADEQ	R18-2-607	Storage pile fugitive dust limitations
ADEQ	R18-2-614	Opacity limitation for non-point sources
ADEQ	R18-2-702	Visible emission limitations
ADEQ	R18-2-802	Off-road machinery opacity limitations
ADEQ	R18-2-805	Roadway and site-clearing opacity limitations
MCAQD	Rule 310	Establishes limits for the emissions of particulate matter into the ambient air from any property, operations, or activity that may serve as a fugitive dust source
Yuma County	Ordinance 05-01	Requires a project information signage for construction activities within the Yuma PM_{10} nonattainment area

The following subsections provide a brief overview of the applicable fugitive dust rules, regulations, and ordinances applicable to the project.

5.1 Arizona Department of Environmental Quality Rules

The Arizona Administrative Code Title 18, Environmental Quality, Chapter 2, Department of Environmental Quality, Air Pollution Control, Section R18-2-614, effective July 18, 2005, prohibits visible dust emissions with opacity greater than 40% from any non-point source measured in accordance with the Arizona Testing Manual, Reference Method 9.

EPA Reference Method 9 involves the determination of plume opacity by qualified observers. The method includes procedures for the training and certification of observers, as well as procedures to be used in the field for determination of plume opacity.

These rules also require control of visible dust from open areas, road construction, material handling, storage piles, roadway, and site clearing. ADEQ rules apply to areas of the project that occur outside Maricopa County, which would generally refer to the central and western portions of the HANG2 project.

5.2 Maricopa County Air Quality Department

The MCAQD regulations are responsible for protecting the public from airborne particulate matter within Maricopa County. MCAPCR Rule 310, Fugitive Dust from Dust-Generating Operations (revised in January 2010), establishes visible emission limits for the emissions of particulate matter into the ambient air from any property, operations, or activity that may serve as a fugitive dust source. MCAPCR Rule 310 applies to any construction activity within Maricopa County, regardless of whether the project is located in the PM_{10} nonattainment area or not. The project will require a Maricopa County Dust Control Permit since the disturbed area would exceed the threshold of 0.1 acre.

Under this rule, the owner and/or operator of a dust-generating operation or activity shall

- not allow visible fugitive dust emissions to exceed 20% opacity anywhere on-site (measured in accordance with MCAPCR Appendix C, Fugitive Dust Test Methods); and
- prohibit visible dust emissions beyond property lines for periods aggregating more than 30 seconds in any 6-minute period by using EPA Reference Method 22.

EPA Reference Method 22 does not require that the opacity of emissions be determined. Since this procedure requires only the determination of whether visible emissions occur and does not require the determination of opacity levels, observer certification according to the procedures of Method 9 is not required. However, it is necessary that the observer is knowledgeable with respect to the general procedures for determining the presence of visible emissions.

Under MCAPCR Rule 310, the owner and/or operator of any dust-generating operation is required to conduct the following:

- Obtain a MCAQD Dust Control Permit for all projects that will disturb more than 0.1 acre (4,356 square feet) of soil prior to commencement of construction (Rule 310, Section 401).
- Submit to the Control Officer a dust control plan for approval, with any application for a Dust Control Permit. Applicants shall describe, in a dust control plan, all control measures to be implemented before, after, and while conducting any dust-generating operation, including on weekends, after work hours, and on holidays (Rule 310, Section 402).
- For all areas with a Dust Control Permit that are larger than 5 acres, the owner and/or operator shall erect and maintain a project information sign (Rule 310, Section 308).
- Comply with the Dust Control Training Requirements (Rule 310, Section 309).

- For any site of 5 acres or more of disturbed surface area, at least one Dust Control Coordinator must be present at all times during primary dust-generating operations (Rule 310, Section 310).
- Implementation of contingency dust control measures when primary control measures are ineffective (Rule 310, Section 305).
- Maintain a daily written log recording the actual application or implementation of the control measures described in the approved dust control plan (Rule 310, Section 502).

5.3 Yuma County Board of Supervisors

Yuma County Ordinance 05-01 applies to areas of the project that occur within the designated PM_{10} nonattainment area within Yuma County (*Attachment A*, Figure 1). Ordinance 05-01 differs from Maricopa County's Rule 310, which is county-wide, since 05-01 applies only to the PM_{10} nonattainment area within Yuma County. Ordinance 05-01 requires that project construction signage be posted prior to beginning actual construction activities.

5.4 NEPA Mitigation Requirements

Not only does the project require compliance with the state and local requirements, the federal government can impose conditions as part of the federal NEPA process. These conditions can go above and beyond those imposed at the state or local level. For this project, the BLM is the federal lead agency responsible for compliance with the NEPA.

Two mitigation measures related to the control of fugitive dust were described in Appendix A, Standard Construction and Operating Procedures and Mitigation Measures, contained within the NEPA Finding of No Significant Impact documentation and repeated in the project's POD. These two mitigation measures must be followed throughout the construction project. They are as follows:

- All requirements of those entities having jurisdiction over air quality matters will be adhered to and any necessary permits for construction activities will be obtained. Open burning of construction debris (cleared trees, etc.) will not be allowed on BLM-administered lands.
- During construction, the holder shall apply water for the purpose of dust control.

6.0 DUST CONTROL MEASURES

The factors that affect dust control include ambient conditions (temperature, wind, and humidity), size and weight of vehicles, vehicle speed, frequency and number of active vehicles, soil characteristics (chemical composition, particle size distribution, organic components), and day-to-day aggressiveness of mitigation efforts (e.g., application of water or dust suppressants—see *Attachment B* for types). All reasonable measures will be taken to limit opacity of emissions to 20% or less in Maricopa County and 40% or less in all other areas.

Impacts from fugitive dust would be controlled by applying the appropriate control measures (e.g., watering unpaved roads, covering piles, etc.) as identified by mitigation measures identified in the POD/environmental assessment and each air quality control agency having jurisdiction over the construction areas.

The measures listed herein include primary control measures and contingency measures. Primary control measures are the first approach the project would implement to control dust emissions; contingency measures are a backup strategy to be used when the primary control measure is not effectively controlling dust emissions.

Additionally, APS's standard practices designed to address temporary and permanent impacts have been included in this plan. The project mitigation measures were developed for

- suppressing dust at all work and staging areas,
- reducing dust on access roads and unpaved surfaces,
- preventing transport of mud and dust onto paved roadway surfaces and onto public roads and ensuring adequate public liaison and a complaint response mechanism.

Table 2 describes dust control measures proposed by APS based on the best management practices identified by permitting and rule-enforcing agencies.

Table 2. APS-Proposed Dust Control Measures

Activity	Primary Control Measure	Contingency Control Measure	Agency
Prior to commencement of construction activities in Maricopa County	Obtain a MCAQD Dust Permit; submit a dust control plan for approval; post-project information signage in accordance w/ Rule 310 Section 308; comply w/ Dust Control Training requirements in accordance w/ Rule 309, Section 308	N/A	BLM, MCAQD
Prior to commencement of construction activities within the Yuma County PM_{10} nonattainment area	Post-project information signage in accordance with Yuma County Ordinance 05-01	N/A	BLM, Yuma County Board of Supervisors
Grading/excavating/ trenching/backfilling	Watering	Cease work temporarily during high-wind events	BLM, ADEQ, MCAQD
Unpaved haul roads or equipment paths	Watering &/or APS-approved dust suppressants (see Attachment B for MSDS for selected types, *Tall Oil Pitch* manufactured by Ensolutions Environmental Stabilization, *Lignobond 50* by Shilon Corporation, and *SoilTac* by SoilWorks LLC)	Apply & maintain gravel, recycled asphalt, or other suitable material (where feasible); limit vehicle trips to no more than 20 per day per road & limit vehicle speed to no more than 15 miles/hour; prohibit activities during high-wind events	BLM, ADEQ, MCAQD
Access points	Gravel pads	Use grizzly, wheel washer, or pressure sprayers	BLM, ADEQ, MCAQD
Material handling	Water spraying	Cover storage piles with tarps &/or canvas	BLM, ADEQ, MCAQD
Hauling	Freeboard of not less than 3 inches on haul trucks, & the highest point of bulk material must not be higher than the sides, front, & back of cargo container area Maintain haul equipment to prevent spillage Clean empty cargo areas &/or cover haul trucks w/ tarp &/or other enclosure Gravel pad, grizzly, or other track-out control device at all project site access points which may result in track-out upon public paved roads (as applicable/required on private paved roads)	Limit vehicle speeds to 15 mph or less; apply water or other dust suppressant to top of the load; cease work temporarily during high-wind events	BLM, ADEQ, MCAQD

Table 2. APS-Proposed Dust Control Measures, continued

Activity	Primary Control Measure	Contingency Control Measure	Agency
Disturbed surface areas	Reduce amount of disturbed surface area, when possible	Water &/or use an APS-approved dust suppressant such as Durasoil; use wind erosion control techniques such as windbreaks; and cease work temporarily during high-wind events	BLM, ADEQ, MCAQD
Inactive areas	Water spraying	Use wind erosion control techniques such as windbreaks and revegetation following construction	BLM, ADEQ, MCAQD

* These measures apply to the dust control requirements of the APS Construction Commitments made to the BLM in 2008, as well as the dust control requirements of ADEQ, MCAQD, and the Yuma County Board of Supervisors.

6.1 Grading/Excavating/Trenching/Backfilling

The primary control measure for earthmoving activities would include water application by means such as trucks, water tanks, water wagons, water trailer hoses, or sprinklers at sufficient frequency and quantity to control fugitive dust prior to, during, and after earthmoving operations. The construction sites for all earthmoving activities will be pre-watered in advance of vegetation clearing, if topographic and/or conditions enable water truck access. In addition, earth-loading activities will be executed carefully by maintaining the bucket close to the truck while dumping (i.e., minimizing material drop height).

Contingency measures for earthmoving activities include but are not limited to prohibiting grading during high-wind events. The definition of "wind event" was removed from Maricopa County Air Quality Department Rule 310 in January 2010. The following language replaced the definition:

If wind conditions cause fugitive dust emissions to exceed the visible emissions requirement in Section 303.1(a) of this rule, despite implementation of the Dust Control Plan, an owner and/or operator shall:

- Ensure that all control measures and requirements of the Dust Control Plan are implemented and the subject violations cannot be prevented by better application, operation or maintenance of these measures and requirements.
- Cease dust-generating operations and stabilize any disturbed surface area consistent with Section 304.3 of this rule.
- Compile records consistent with Sections 502 and 503 of this rule and document control measure and other Dust Control Plan requirement implementation.

6.2 Unpaved Roads or Equipment Paths

The primary control measure to be used on unpaved roads and equipment paths include the application of water or an APS-approved dust suppressants to the unpaved surface. These APS-approved dust suppressants include Lignobond 50 Corporation, Tall Oil Pitch, and Soiltac. The frequency of watering and/or dust suppressant application may be reduced or eliminated during periods of precipitation.

The entrances to all access roads (all are unpaved) will be posted with visible speed limit signs of 15 miles per hour (mph). The application instructions and Material Safety Data Sheets (MSDS) for the approved dust suppressants are provided in Attachment B.

The contingency measure for unpaved roads includes applying and maintaining gravel, recycled asphalt, or other suitable material; limiting vehicle trips to no more than 20 per day per road and limiting vehicle speed to no more than 15 mph; and prohibiting activities during high-wind events.

6.3 Access Points

Access points consist of planned exit locations onto areas accessible to the public. Track-out is one of the most frequently cited violations. Track-out is defined by the MCAQD as any and all bulk materials that adhere to and agglomerate on the surfaces of motor vehicles, haul trucks, and trailers and/or equipment (including tires) and that have fallen or been deposited onto a paved area accessible to the public.

Track-out/carry-out must be cleaned up immediately if it extends a cumulative distance of 25 linear feet or more along an area accessible to the public, including curbs, gutters, and sidewalks. All other track-out/carry-out must be cleaned up no later than the end of the work day or no later than 8:00 p.m.

The primary control measures for track-out will be the use of gravel pads. Gravel pads will be installed at all exits to paved areas. Gravel pads consist of 1- to 3-inch washed river rock, 30 feet wide (where practicable), 50 feet long (or as long as the longest haul truck), and 3-6 inches deep.

A contingency measure for track-out may include the use of a grizzly. A grizzly is a device (i.e., rails, pipes, or grates) used to dislodge mud, dirt, and/or debris from the tires and undercarriage of motor vehicles and/or haul trucks prior to leaving the work site. In addition, contingency measures for track-out may also include a paved area, wheel washer, or pressure sprayers.

6.4 Spoil Material Handling

The primary control measure for exposed storage piles of soil and other excavated materials will be water spraying daily as needed.

The contingency measure for the prevention of fugitive dust from excavated material storage piles that may occur within the ROW would be to cover the storage pile with tarps and/or canvas.

6.5 Hauling

If entering paved areas accessible to the public the following control measures must be used as primary control measures:

- When a cargo compartment is loaded:
  - Load all haul trucks such that the freeboard is not less than 3 inches;
  - Load all haul trucks such that at no time shall the highest point of the bulk material be higher than the sides, front, and back of the cargo container area;
  - Prevent spillage or loss of bulk material from holes or other openings in the cargo compartment's floor, sides and/or tailgate(s); and
  - Cover the cargo compartment with a tarp or other suitable closure.
- When a cargo compartment is empty:
  - Clean the interior of the cargo compartment; or
  - Cover the cargo compartment with a tarp or other suitable closure.

- Haul equipment must be maintained to prevent spillage
- Empty cargo areas must be cleaned and/or haul trucks must be covered with tarp and/or other enclosure
- Gravel pad, grizzly, or other track-out control device must be present at all project site access points

Contingency measures for hauling activities may include limiting the vehicle speeds to 15 mph or less, applying water or dust suppressant to the top of the load, and temporarily ceasing work during high-wind events.

6.6 Disturbed Surface Areas

The primary control measure for disturbed surface areas would be to reduce the amount of disturbed area wherever possible. Contingency measures for all disturbed areas within the project may include watering and/or an APS-approved dust suppressants, wind erosion control techniques such as windbreaks, and temporarily ceasing work during high-wind events.

6.7 Inactive Areas/Reclamation

Inactive areas must be stabilized for any inactive period, of any length, 24 hours per day, 7 days per week, including weekends, after work hours, and holidays. Moreover, permanent stabilization of disturbed surface areas is required within 10 days following the completion of the dust-generating activity if finished for a period of 30 days or longer. For sequenced construction that may include inactive periods that last longer than 30 days, temporary stabilization would be achieved utilizing the primary control measure of water spraying.

The primary control measure for inactive areas (areas that are unused for 4 consecutive days) will be water spraying. A contingency measure for inactive areas may include use of wind erosion control techniques such as windbreaks, temporarily ceasing work during high-wind events, and revegetation following construction, where feasible.

7.0 MONITORING, RECORDKEEPING AND SIGNAGE REQUIREMENTS

This section summarizes the monitoring, recordkeeping, and signage requirements established in the regulations and/or NEPA documentation that are applicable to the project.

7.1 Monitoring

Fugitive dust monitoring is not required outside Maricopa County. However, within Maricopa County the Dust Control Coordinator will be primarily responsible for monitoring and enforcing the need for dust control, as specified in Table 2, and will be responsible for making sure that dust control is effective and recorded.

7.2 Recordkeeping

Fugitive dust recordkeeping is not required outside Maricopa County. However, within Maricopa County a written record or dust control log must be completed on a daily basis. An example Daily Dust Control Log is provided in *Attachment C*. Each day a self-inspection by the Dust Control Coordinator or designee must be

conducted, with notes taken to document the observations. Critical information that is required by Rule 310 includes the following:

- Observations of damp and crusted soils
- Track-out conditions and actions taken to clean up track-out
- Daily water usage (note how water is applied, how often, and an estimation of the amount)
- Dust suppressant application (note how suppressant is applied, how often, and an estimation of the amount)
- When street sweeping occurred
- Maintenance of track-out controls (what kind and when installed)
- What kind and when contingency measures in the dust control plan were used
- Which subcontractors were on-site, including the MCDEQ registration numbers
- A list of employees who have completed dust control training, the date of the class, and the name of the company or person who did the training
- All supporting documentation
- Types and results of all test methods conducted

Copies of the implementation records and all supporting documentation should be retained for at least 6 months following the termination of the dust-generating activities and for at least 2 years from the date the records were initiated.

7.3 Signage

Fugitive dust signage is not required outside Maricopa County or the Yuma County PM_{10} nonattainment area. Pursuant to the Maricopa County requirements listed in Table 1, project information must be posted for activities within Maricopa County. The sign must contain the following information (using text of at least 4 inches):

- Project name
- Permit holder's name
- Current Dust Control Permit number
- Name and local phone number of person(s) responsible for dust control

In addition, the project information sign must include the following text (for all activities within Maricopa County):

Dust Complaints?
Call Maricopa County Air Quality Department
(602) 372-2703

Pursuant to the Yuma County Ordinance 05-01, project construction signage must be posted prior to beginning actual construction activities within the Yuma County PM_{10} nonattainment area. The ordinance requires one sign be posted prior to the beginning of actual construction activities at the relevant (within the Yuma County PM_{10}

nonattainment area) main construction entrance to the ROW. Refer to Figure 2 in Appendix A for an illustration of the Yuma PM_{10} nonattainment area.

The sign must contain the following information, depending on the size of the project (*Table 3*):

Table 3. Sign Requirements

Project Size	1.01 to 9.99 Acres	More than 10 Acres
Sign Size	36" H × 48" W	48" H × 96" W
Developer's name	3"	4"
Project name	3"	4"
Company phone number ###-####	3"	4"
IF YOU HAVE DUST COMPLAINTS Please call Yuma County Dust Control Hotline 928-217-DUST (3878)	2.25"	3"

The project information sign text height shall be at a minimum as shown on the template above and must contrast with lettering, typically black text with white background. The lower edge of the sign board must be a minimum of 3 feet and a maximum of 5 feet above grade.

8.0 REFERENCES

Arizona Administrative Code. 1993. Title 18. Environmental Quality, Article 6. Emissions from Existing and New Non-Point Sources. Available at: http://www.azsos.gov/public_services/Title_18/18-02.htm#Article_6. Accessed January 9, 2011.

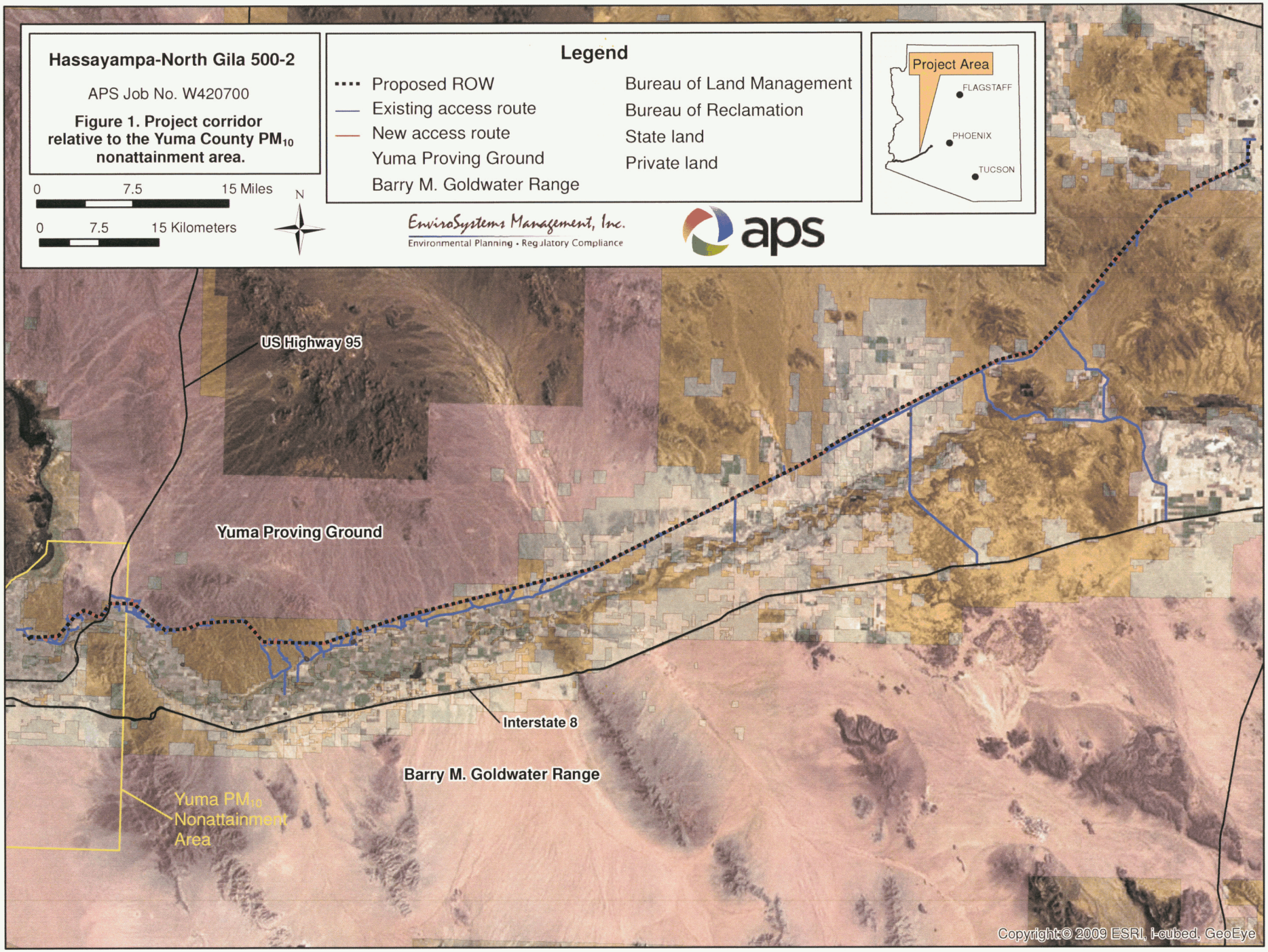
Bureau of Land Management. February 2008. Palo Verde to North Gila Substation 500kV Transmission Line Project Construction Commitments (Hand-off Letter).

Maricopa County. 2010. *Dust Abatement Handbook.* Air Quality Department. Available at: http://www.maricopa.gov/aq/divisions/compliance/dust/docs/pdf/Dust%20Handbook.pdf. Accessed January 5, 2011.

Yuma County Board of Supervisors. 2005. Ordinance Number 05-01. Available at: http://www.co.yuma.az.us/Modules/ShowDocument.aspx?documentid=3400. Accessed January 9, 2011.

Attachment A

FIGURE 1


Hassayampa-North Gila 500-2
APS Job No. W420700
Figure 1. Project corridor relative to the Yuma County PM10 nonattainment area.
0 7.5 15 Miles
0 7.5 15 Kilometers
N
Legend
Proposed ROW
Existing access route
New access route
Yuma Proving Ground
Barry M. Goldwater Range
Bureau of Land Management
Bureau of Reclamation
State land
Private land
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
US Highway 95
Yuma Proving Ground
Interstate 8
Barry M. Goldwater Range
Yuma PM10 Nonattainment Area
Copyright© 2009 ESRI, i-cubed, GeoEye

Attachment B

MATERIAL SAFETY DATA SHEETS FOR SELECT DUST SUPPRESSANTS

CHEMICAL ASSOCIATES
1270 South Cleveland-Massillon Road
Building B
Copley, OH 44321-1683

CHEMICAL ASSOCIATES
Prime Access to Worldwide Resources.

MATERIAL SAFETY DATA SHEET

EMERGENCY PHONE: 800-347-2891 **CHEMTREC: 800-424-9300**
MSDS REFERENCE: CA0375

SECTION I - IDENTIFICATION

PRODUCT: CA0375 TALL OIL PITCH
SYNONYMS: TALL OIL PITCH
CHEMICAL: STEROL ESTERS OF C_{18} STRAIGHT CHAIN AND C_{20} CYCLIC ORGANIC
CAS NO: 8016-81-7
SARA HAZARD: NONE NOTED (SECTION 302/304)
NONE NOTED (SECTION 311/312)
TITLE III SECTION 313 NOT LISTED

SECTION II - INGREDIENTS AND HAZARD CLASSIFICATION

TYPICAL COMPOSITION	TYPICAL %	PEL/TLV	HAZARD
TALL OIL PITCH (8016-81-7)	89	NONE/NONE	NONE NOTED
ROSIN ACIDS (8050-09-7)	11	NONE/NONE	NONE NOTED

SECTION III - HEALTH INFORMATION

INHALATION: PROLONGED EXPOSURE TO VAPORS FROM HEATED MATERIAL MAY CAUSE IRRITATION IN MOUTH AND/OR THROAT.

INGESTION: NO TOXICITY DATA FOUND.

EYE CONTACT: PROLONGED EXPOSURE TO VAPORS FROM HEATED MATERIAL MAY CAUSE TRANSIENT IRRITATION TO EYES. CONTACT WITH MOLTEN MATERIAL WILL CAUSE THERMAL BURNS.

SKIN CONTACT: PROLONGED CONTACT MAY CAUSE MILD TRANSIENT SKIN IRRITATION. REPEATED CONTACT MAY CAUSE SKIN SENSITIZATION IN SUSCEPTIBLE INDIVIDUALS. CONTACT WITH MOLTEN MATERIAL WILL CAUSE THERMAL BURNS.

SECTION IV - OCCUPATIONAL EXPOSURE LIMITS

PEL: NONE ESTABLISHED
TLV: NONE ESTABLISHED

SECTION V - EMERGENCY FIRST AID PROCEDURE

INGESTION: NOT EXPECTED TO BE A ROUTE OF ENTRY. RINSE MOUTH. IMMEDIATELY DILUTE BY DRINKING LARGE QUANTITIES OF WATER. DO NOT INDUCE VOMITING UNLESS OTHERWISE INSTRUCTED TO DO SO BY A DOCTOR OR POISON CONTROL CENTER. SEEK MEDICAL ATTENTION IF NECESSARY.

INHALATION: IMMEDIATELY REMOVE VICTIM TO FRESH AIR. IF VICTIM HAS STOPPED BREATHING GIVE ARTIFICAL RESPERATION, PREFERABLY BY MOUTH TO MOUTH. SEEK MEDICAL ASSISTANCE.

EYE CONTACT: IMMEDIATELY FLUSH EYES WITH PLENTY OF COOL WATER FOR AT LEAST 15 MINUTES. REMOVE CONTACT LENSES TO ENSURE THOROUGH FLUSHING. CONSULT A PHYSICIAN IF IRRITATION PERSISTS.

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING. WASH WITH PLENTY OF SOAP AND WATER. CONSULT A PHYSICIAN IF IRRITATION PERSISTS BEYOND SEVERAL HOURS. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

SECTION VI - PHYSICAL DATA

BOILING POINT:	>350 DEG C (650 DEG F)
SOFTENING POINT:	130°F (TYPICAL)
VAPOR PRESSURE:	N / A
SPECIFIC GRAVITY:	0.995
SOLUBILITY IN WATER:	INSOLUBLE
APPEARANCE AND COLOR:	DARK LIQUID (MOLTEN) WITH A TAR-LIKE ODOR.

SECTION VII - FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD USED:	>300°F C.O.C.
AUTO IGNITION TEMPERATURE:	NONE KNOWN
EXTINGUISHING MEDIA:	DRY CHEMICAL, FOAM OR CARBON DIOXIDE.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	MATERIAL EMITS ACID SMOKE.
FLAMMABLE LIMITS:	NONE KNOWN

HMIS RATING: HEALTH: (2) FIRE: (1) REACTIVITY: (0)

SECTION VIII - REACTIVITY

STABILITY:	STABLE.
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR.
CONDITIONS AND MATERIALS TO AVOID:	STABLE UNDER NORMAL STORAGE CONDITIONS. SPONTANEOUS HEATING MAY OCCUR IN ITEMS SUCH AS TRASH, INSULATION, AND RAGS SOAKED WITH MATERIAL AND LEFT EXPOSED TO AIR.
HAZARDOUS DECOMPOSITION PRODUCTS:	CARBON MONOXIDE AND CARBON DIOXIDE.

SECTION IX - EMPLOYEE PROTECTION

CONTROL MEASURES:

AVOID CONTACT WITH EYES, SKIN, AND CLOTHING. WASH THOROUGHLY AFTER HANDLING, AND BEFORE EATING, DRINKING, OR SMOKING. REMOVE CONTAMINATED CLOTHING PROMPTLY AND CLEAN BEFORE REUSE.

RESPIRATORY PROTECTION:

NONE REQUIRED UNDER NORMAL CONDITIONS OF USE. IF EXPOSED TO VAPORS FROM HEATED MATERIAL, A RESPIRATOR, FULL FACE, POSITIVE PRESSURE, AIR-SUPPLIED, HEPA.

PROTECTIVE CLOTHING:

IMPERVIOUS CLOTHING AND RUBBER GLOVES. IF HOT MATERIAL IS HANDLED, PROTECTIVE CLOTHING TO PREVENT BURNS.

EYE PROTECTION:

FACE SHIELD WHEN WORKING WITH MOLTEN MATERIAL.

SECTION X - ENVIRONMENTAL PROTECTION

ENVIRONMENTAL PRECAUTIONS:

AVOID UNCONTROLLED RELEASE OF THIS MATERIAL. WHERE SPILLS ARE POSSIBLE. A COMPREHENSIVE RESPONSE PLAN SHOULD BE DEVELOPED AND IMPLEMENTED.

SPILL OR LEAK PRECAUTIONS:

CONFINE MATERIAL. SHOVEL INTO METAL CONTAINERS IF POSSIBLE. ABSORB ON SAND, SAWDUST, OR OTHER SOLIDS. UNCONTAMINATED SPILLED MATERIAL MAY BE REUSED. SPILLS OF THIS MATERIAL DO NOT CURRENTLY MEET THE EMERGENCY RELEASE REPORTING REQUIREMENTS UNDER THE FEDERAL SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA). STATE AND LOCAL LAWS MAY DIFFER FROM FEDERAL.

WASTE DISPOSAL:

INCINERATION IS RECOMMENDED. DISPOSAL MAY BE SUBJECT TO LOCAL, STATE OR NATIONAL REGULATIONS.

SECTION XI - REGULATORY CONTROLS

DEPARTMENT OF TRANSPORTATION:

DOT CLASSIFICATION:	NOT REGULATED IN NON-BULK CONTAINERS. REGULATED IN BULK WHEN SHIPPED AT TEMPERATURES EXCEEDING 100 DEG C.
FOR BULK SHIPMENTS:	
PROPER SHIPPING NAME:	HOT: ELEVATED TEMPERATURE LIQUID, N.O.S.
HAZARD CLASS:	9
IDENTIFICATION NO.:	UN 3257
PACKAGING GROUP:	III.
LABEL REQUIRED:	HOT (IF APPLICABLE)

OTHER REGULATORY REQUIREMENTS:

LISTED IN TSCA INVENTORY
LISTED IN CANADIAN DSL
WHIMS (CANADA) CONTROLLED. CLASSIFICATION D/2/A

SECTION XII - PRECAUTIONS: HANDLING, STORAGE AND USAGE

AVOID SKIN AND EYE CONTACT WITH HOT MATERIAL.

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Chemical Associates bears responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

CHEMICAL ASSOCIATES
1270B SOUTH CLEVELAND-MASSILLON ROAD
COPLEY, OHIO 44321-1683

DATE: 09/16/08
SUPERSEDES: 04/15/08

ENVIROTECH SERVICES, INC.

MATERIAL SAFETY DATA SHEET

SECTION I: PRODUCT, COMPANY AND SHIPPER IDENTIFICATION

Product Name: **Ammonium Lignin Sulfonate (Lignosulfonate) RTU**
Chemical Name: *Ligninsulfonate*
Manufacturer: *EnviroTech Services, Inc.* *(970) 346-3900*
910 54th Avenue, Suite 230
Greeley, CO 80634

Shipper/Distributor:
(if different than Manufacturer)

Chemtrec: *(800) 424-9300*

SECTION II: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Percent
Water	*7732-18-5*	*40 - 60*
Ligninsulfonate	*8062-15-5*	*20 - 30*

SECTION III: HAZARDS INDENTIFICATION

Emergency Overview: *This MSDS has been compiled as a response to customer requests to address the safe handling of the product.*
THIS PRODUCT IS NOT REGULATED UNDER OSHA.
It does not contain any hazardous components.
CAUTION – MAY CAUSE EYE IRRITATION

Potential Health Effects

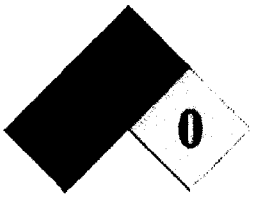
Route(s) Of Entry: *Eye, Inhalation, Ingestion, Skin Contact*
Eyes: *May cause mild irritation.*
Inhalation: *May cause respiratory tract irritation.*
Ingestion: *May cause GI irritation.*
Skin: *May cause mild irritation.*

Chronic Effects *None known.*

SECTION IV: FIRST AID MEASURES

Ingestion: *Non toxic, do not induce vomiting, rinse mouth with water, do not give an unconscious person something to ingest.*
Skin: *Flush with water, wash with mild soap and water, and practice reasonable and ordinary hygiene.*
Eyes: *Look for and remove contact lenses. Irrigate with water.*
Inhalation: *Normally not applicable. If inhaled, remove to fresh air, if not breathing, give artificial respiration. Obtain medical attention if irritation occurs.*

SECTION V: FIRE AND EXPLOSION HAZARD DATA



Flammable Limits: *N/A Not Flammable*
LEL: *N/A*
UEL: *N/A*
Extinguishing Media: *None, non-flammable*
Flash Point: *None*
Special Fire Fighting Procedures: *None*
Unusual Fire and Explosion Hazards: *None*

NFPA Classification: *Health = 0* *Flammability = 0* *Reactivity = 0*

SECTION VI: ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedure:

Contain spills to prevent access to waterways, sewers and basements.
Flush with water.

SECTION VII: HANDLING AND STORAGE

Precautions to be taken in Handling and Storage:

KEEP OUT OF THE REACH OF CHILDREN
Material can be corrosive to some metals; care should be taken when stored for long periods in metal containers.
Avoid contact with eye, skin or clothing.
Wash thoroughly after handling.
Practice reasonable care and precautions.
Wear safety glasses and rubber or other impervious gloves.

Other Precautions:

Not for food or drug use. Do not take internally. May cause leather to shrink.

SECTION VIII: EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory Protection: *None*
Ventilation: *Local Exhaust: Not required*
Mechanical (General): Not required
Protective Gloves: *Rubber or other impervious gloves recommended.*
Eye Protection: *Safety glasses or goggles with splash shields recommended.*
Other: *None*

SECTION IX: PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	*212°F*	Specific Gravity:	*1.10 – 1.25*
Vapor Pressure:	*N/A*	Melting Point:	*N/A*
Vapor Density:	*N/A*	Evaporation Rate:	*Not Determined*
Solubility in Water:	*100%*	pH:	*3 – 8 as shipped*

Appearance and Odor: *Dark brown liquid with woody odor*

SECTION X: STABILITY AND REACTIVITY

Stability: *Stable*
Incompatibilities: *Strong oxidizers, concentrated acids (i.e. nitric acid)*
Hazardous Decomposition: *Hydrogen chloride, halogenated compounds. Thermal decomposition above temperatures of 570° F may release chlorine gas.*
Hazardous Polymerization: *Will not occur*
Conditions to Avoid: *Avoid contact and storage with above listed compounds or materials.*

SECTION XI: TOXICOLOGICAL INFORMATION

Description: *Not Listed*

SECTION XII: ECOLOGICAL INFORMATION

Environmental Effects: *Not Available*
Ecotoxicity: *Not Available*

SECTION XIII: DISPOSAL CONSIDERATIONS

Disposal Method:

If a waste is identified it must be disposed of in accordance with federal, state and local regulations.

SECTION XIV: TRANSPORTATION INFORMATION

U.S. Department of Transportation:

Not regulated as dangerous goods. Not regulated as hazardous.

Transportation of Dangerous Goods (TDG – Canada):

Not regulated as dangerous goods. Not regulated as hazardous.

SECTION XV: REGULATORY INFORMATION

OSHA Status:	*Not Listed*
TSCA Status:	*Not Listed*
CERCLA reportable quantity:	*None*
SARA Section 302 Extremely Hazardous Substances:	*Not Listed*
SARA Section 311/312 Hazard Category:	*Not an OSHA hazardous material.*
SARA Section 313 Toxic Chemical:	*Not an OSHA hazardous material.*
RCRA Status:	*Not Listed*

SECTION XVI: OTHER INFORMATION

Disclaimer: *This Material Data Safety Sheet (MSDS) is provided in response to customer requests to address the safe handling of the product. All statements, technical information and recommendations contained herein are the best of our knowledge, reliable and accurate. This MSDS is not intended to make any representation as to how the product will perform when used for its intended purpose by a user. In that regards the product is sold "AS IS" and nothing in this MSDS should be deemed to be a representation or warranty of any injury, loss, or damage, of any kind or nature, which are sustained by or arise from the use of the product. Nothing in this MSDS is intended to be a representation or warranty by the manufacturer of the accuracy, safety, or usefulness for any purpose of any technical information, materials, techniques, or practices.*

Issue Date: September 1st, 2011
Supersedes Date: All Previous Versions

The information contained in this Material Safety Data Sheet is, to the best of our knowledge, accurate and reliable. This information should be provided to all individuals handling this product. Federal, state, and local regulations should be followed when handling this product.

SECTION 1 - MATERIAL IDENTIFICATION

PRODUCT NAME	Soiltac SOILTAC is a registered trademark of Soilworks, LLC.
MANUFACTURER	Soilworks, LLC. 1750 E. Northrop Blvd., Suite 250, Chandler, AZ 85286-1747 USA www.soilworks.com
TELEPHONE NUMBER	800-545-5420
ONLINE INFORMATION	www.Soiltac.com
EMERGENCY TELEPHONE NUMBERS	800-545-5420 (National & International)
REVISION DATE	November 2009
EMERGENCY OVERVIEW	
PHYSICAL FORM	Mobile liquid
COLOR	Milky White (transparent once cured)
ODOR	Mild / Slight (no odor once cured)
HAZARDS	There are no known health hazards.
EXTINGUISHING MEDIA	The product will only burn after the water it contains is driven off.
C.A.S. CHEMICAL NAME	Mixture
SYNONYMS	Soil stabilizer, soil stabilization agent, soil solidifier, soil amendment, soil additive, soil crusting agent, dust control agent, dust inhibitor, dust palliative, dust suppressant, dust retardant
CHEMICAL FAMILY	Vinyl Copolymer Emulsion
EMPIRICAL FORMULA	Mixture
INTENDED USE	Soil stabilization, soil solidification, fugitive dust control, dust suppression, dust abatement, tackifier, dust abatement, PM10 and PM2.5 air quality control and erosion control

SECTION 2 - INGREDIENTS

	%	CAS Number	Chemical Name
1.	50-60	Proprietary	Vinyl Copolymer
2.	40-60	7732-18-5	Water

SECTION 3 - HEALTH HAZARDS

ROUTES OF ENTRY
Eye Contact, Skin Contact, Ingestion and Inhalation
SIGNS AND SYMPTOMS OF ACUTE EXPOSURE
Eyes: Direct contact with this material may cause eye irritation including lachrymation (tearing).
Inhalation: Inhalation of vapor or aerosol may cause irritation to the respiratory tract (nose, throat, and lungs). Skin: Contact may cause skin irritation. Ingestion: No hazard in normal industrial use. Skin: Contact may cause skin irritation. Ingestion: No hazard in normal industrial use.
SIGNS AND SYMPTOMS OF CHRONIC EXPOSURE
Prolonged or repeated contact with skin may cause irritation and dermatitis (inflammation).
CARCINOGENICITY
This material **does not** contain 0.1% or more of any chemical listed by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or regulated by the Occupational Safety and Health Administration (OSHA) as a carcinogen.

SECTION 4 - FIRST AID

EYE CONTACT
Rinse immediately with plenty of water. Get immediate medical attention.
SKIN CONTACT
Remove contaminated clothing and shoes. Wash affected area with soap and water. Get medical attention if irritation develops or persists.
INHALATION
Move patient to fresh air. If breathing has stopped or is labored give assisted respiration (e.g. mouth-to-mouth). Supplemental oxygen may be indicated. Seek medical advice.
INGESTION
Give the victim one or two glasses of water or milk to drink. Get immediate medical attention . Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE AND EXPLOSION DATA

FLASH POINT (closed cup)	Not applicable
UPPER EXPLOSION LIMIT (UEL)	Not applicable
LOWER EXPLOSION LIMIT (LEL)	Not applicable
AUTOIGNITION TEMPERATURE	Not applicable
FIRE HAZARD CLASSIFICATION (OSHA/NFPA)	Non-Combustible

EXTINGUISHING MEDIA
Product does not burn. The product will only burn after the water it contains is driven off. For dry polymer use carbon dioxide, foam, dry chemical or water fog to extinguish fire. Aqueous solution **is not flammable**.
FIRE FIGHTING EQUIPMENT
Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective clothing. Thoroughly decontaminate all protective equipment after use.
FIRE AND EXPLOSION HAZARDS
This material **will not burn** unless it is evaporated to dryness. Closed containers may rupture when exposed to extreme heat.
HAZARDOUS COMBUSTION PRODUCTS
When dried polymer burns, water (H2O), carbon dioxide (CO2), carbon monoxide (CO) and smoke are produced.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

CONTAINMENT TECHNIQUES (Removal of ignition sources, diking etc)
Stop the leak, if possible. Ventilate the space involved.
CLEAN-UP PROCEDURES
Wear suitable protective equipment. If recovery is not feasible, admix with dry soil, sand or non-reactive absorbent and place in an appropriate chemical waste container. Prevent spilled material from entering sanitary sewers, storm sewers, drainage systems and from entering bodies of water or ditches that lead to waterways. Transfer to containers by suction, preparatory for later disposal. Place in metal containers for recovery or disposal. Flush area with water spray. Wash contaminated property (e.g., automobiles) quickly before the material dries. For large spills, recover spilled material with a vacuum truck.
OTHER EMERGENCY ADVICE
Spilled polymer emulsion is very slippery. Use care to avoid falls. A film will form on drying. Remove saturated clothing and wash contacted skin area with soap and water. Product imparts a milky white color to contaminated waters. Foaming may result. Sewage treatment plants may not be able to remove the white color imparted to the water.

SECTION 7 - HANDLING AND STORAGE

STORAGE
Keep from freezing. Store in a dry area. Keep containers closed when not in use to
minimize contact with atmospheric air and prevent inoculation with microorganisms.
HANDLING
Use only in well-ventilated areas. Avoid contact with eyes. Avoid breathing

vapors. Avoid prolonged or repeated contact with skin. Wash hands thoroughly after handling and before eating or drinking.

SECTION 8 - PERSONAL PROTECTION / EXPOSURE CONTROLS

EXPOSURE GUIDELINES
There are no Occupational Safety and Health (OSHA) Permissible Exposure Limits (PEL) or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) or Short Term Exposure Limits (STEL) established for the component(s) of this product.
EYE PROTECTION
Chemical safety glasses.
HAND PROTECTION
Rubber Gloves. The breakthrough time of the selected glove(s) must be greater than the intended use period.
RESPIRATORY PROTECTION
Not required under normal use.
PROTECTIVE CLOTHING
No specific recommendation.
ENGINEERING CONTROLS
Good general ventilation should be sufficient to control airborne levels of irritating vapors.

SECTION 9 - TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM	liquid
COLOR	Milky White (transparent once cured)
ODOR	Mild / Slight (no odor once cured)
pH	4. 5-6.0
EVAPORATION RATE	< 1 (BuAc=1)
VAPOR DENSITY	> 1 (Air = 1)
BOILING POINT	> 100.00°C (>212.00°F)
FREEZING POINT	<0°C (<32°F)
SOLUBILITY IN WATER	Completely (100%) (until cured)
SPECIFIC GRAVITY (Water = 1)	1.0 5-1.10

SECTION 10 - STABILITY AND REACTIVITY

STABILITY
Stable at ambient temperatures. Coagulation may occur following freezing,

thawing or boiling.

INCOMPATIBILITY (Materials to Avoid)

No incompatibilities have been identified.

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition may form: Acetic acid and Acrolein. Thermal decomposition may produce various hydrocarbons and irritating, acrid vapors.

HAZARDOUS POLYMERIZATION

Will not occur

CONDITIONS TO AVOID

Freezing temperatures (until cured).

SECTION 11 - TOXICOLOGICAL PROPERTIES

ACUTE EYE TOXICITY

No Information is available.

ACUTE ORAL TOXICITY

No Information is available.

ACUTE SKIN TOXICITY

No Information is available.

ACUTE INHALATION TOXICITY

No Information is available.

CHRONIC/CARCINOGENICY

This material does not contain 0.1% or more of any chemical listed by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or regulated by the Occupational Safety and Health Administration (OSHA) as a carcinogen.

SECTION 12 - ECOLOGICAL INFORMATION

ECOTOXICITY

Common Name	Species	Test	Result	Concentration
Green Algae	Raphidocelus Subcapitata	96-hr chronic LC50	>1,000	Undiluted
Fathead Minnow	Pimephales Promelas	96-hr acute LC50	>1,208	Undiluted
Rainbow Trout	Oncorhynchus Mykiss	96-hr acute LC50	>1,000	Undiluted

ENVIRONMENTAL FATE

No data is available.

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD
This material **is not** a RCRA hazardous waste. Disposal of this material is not regulated under RCRA. Consult federal, state and local regulations to ensure that this material and its containers, if discarded, is disposed of in compliance with all regulatory requirements . NOTE: As supplied or diluted, product material (foam included), when splashed on automobiles or other personal property, is difficult to remove if allowed to dry.
RCRA HAZARD CLASS
This material **is not** a RCRA hazardous waste. When discarded in its purchased form, this material would not be regulated as a RCRA Hazardous waste under 40 CFR 261.

SECTION 14 - TRANSPORT INFORMATION

DOT NON-BULK SHIPPING NAME	Refer to Bill of Lading - Not DOT Regulated // Keep From Freezing // Not dangerous goods
DOT BULK SHIPPING NAME	Refer to Bill of Lading.
IMO SHIPPING DATA	Refer to Bill of Lading.
ICAO/IATA SHIPPING DATA	Refer to Bill of Lading - Not IATA Regulated // Keep From Freezing // Not dangerous goods
CFR	Not Regulated // Keep From Freezing // Not dangerous goods
IMDG	Not Regulated // Keep From Freezing // Not dangerous goods
CTC	Not Regulated // Keep From Freezing // Not dangerous goods

SECTION 15 - REGULATORY INFORMATION

TSCA SECTION 8(b) INVENTORY STATUS
All components are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
TSCA SECTION 12(b) EXPORT NOTIFICATION
This material **does not** contain any components that are subject to the U.S. Toxic Substances Control Act (TSCA) Section 12 (b) Export Notification requirements.
OSHA Hazard Communication Standard (29CFR1910.1200) hazard class(es)
This material **is not** classified as hazardous under the criteria of the U.S. Occupational Safety and Health Administration (OSHA) Hazard

Communication Standard, 29 CFR 1910.1200

EPA SARA Title III Section 304 CERCLA

Reportable quantities have not been established for any of this material's components.

EPA SARA Title III Section 311/312 HAZARD COMMUNICATION STANDARD (HCS)

This material **is not** a hazardous chemical.

EPA SARA Title III Section 313 TOXIC CHEMICAL LIST (TCL)

This product **does not** contain Section 313 Reportable Ingredients.

CANADIAN INVENTORY STATUS

All components of this material are listed on the Canadian Domestic Substances List (DSL)

CANADIAN WHMIS

This material **is not** classified as a controlled product under the Canadian Workplace Hazardous Material Information System.

ADDITIONAL CANADIAN REGULATORY INFORMATION

This product **does not** contain a substance present on the WHMIS Ingredient Disclosure List (IDL) which is at or above the specified concentration limit.

EUROPEAN INVENTORY STATUS (EINECS)

The polymer portion of this product is manufactured from reactants which are listed on EINECS and meets the EINECS definition of an exempt polymer.

AICS (Australia)

Included on inventory

ENCS (Japan)

Included on inventory

ECL (South Korea)

Included on inventory

SEPA (China)

Included on inventory

SECTION 16 – OTHER INFORMATION

HMIS and NFPA Classification

Health	: 1
Flammability	: 0
Reactivity	: 0
Special Hazard	: 0

Attachment C

DAILY DUST CONTROL LOG

RULE 310 SECTION 502 DUST CONTROL RECORD KEEPING FORM

SELF INSPECTION AND CONTROL MEASURE APPLICATION MCAQD PERMIT #:

DATE		Trackout Control Device	Trackout	STABILIZATION				Water Application	Water Supply
				Parking/staging	Unpaved Roads	Open Areas	Storage Piles		
	Self Inspection								
	Control Measure Application - Method, Frequency, Intensity	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐
		Maintenance	Cleaning	Moisture / Crust	Moisture / Crust	Moisture / Crust	Moisture / Crust	App. Equipment	Source

DATE		Trackout Control Device	Trackout	STABILIZATION				Water Application	Water Supply
				Parking/staging	Unpaved Roads	Open Areas	Storage Piles		
	Self Inspection								
	Control Measure Application - Method, Frequency, Intensity	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐
		Maintenance	Cleaning	Moisture / Crust	Moisture / Crust	Moisture / Crust	Moisture / Crust	App. Equipment	Source

DATE		Trackout Control Device	Trackout	STABILIZATION				Water Application	Water Supply
				Parking/staging	Unpaved Roads	Open Areas	Storage Piles		
	Self Inspection								
	Control Measure Application - Method, Frequency, Intensity	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐	☐ P / C ☐
		Maintenance	Cleaning	Moisture / Crust	Moisture / Crust	Moisture / Crust	Moisture / Crust	App. Equipment	Source

*Maricopa CountyRule 310 S502: A list of subcontractor names & registration numbers, as well as employee names who have successfully completed dust control training classes must be kept up to date.

APPENDIX B4

STORM WATER POLLUTION & PREVENTION PLAN REQUIREMENTS

INTRODUCTION

The Environmental Protection Agency (EPA) currently allows discharges of Stormwater associated with construction activities for projects such as the Hassayampa–North Gila 500kV-2 Transmission Line (HANG2) if the activity is compliant with the National Pollutant Discharge Elimination System (NPDES) General Permit. Under the Arizona Pollutant Discharge Elimination System (AZPDES) Permit Program, all facilities that discharge pollutants from any point source into waters of the United States (navigable waters) are required to get an AZPDES permit. Operator(s) of construction sites that involve 1 or more acres of disturbance must submit a Notice of Intent (NOI) to obtain coverage under the General Permit, which requires that a Stormwater Pollution Prevention Plan (SWPPP) be prepared for the project in accordance with the AZPDES. The SWPPP has been drafted in its entirety and submitted to the Arizona Department of Environmental Quality (ADEQ) for review and acceptance.

PURPOSE AND NEED

The purpose of the SWPPP for HANG2 is to identify and implement stormwater pollution prevention measures to reduce the quantity of impacted runoff and to deal with runoff in a manner that minimizes environmental impacts during construction, operation, and maintenance of the line.

The need for a SWPPP is to minimize the volume of contaminated runoff, including sediment runoff, and to implement mitigation measures in a manner that minimizes environmental impacts. Temporary stabilization methods (e.g., silt fences, straw bales, etc.) are not guaranteed or fail-safe measures without regular maintenance and field inspection throughout the winter and runoff season. In addition to conventional methods of erosion control there are numerous new and improved products, and the Construction Contractor is encouraged to review these progressive or improved materials in the implementation of the project SWPPP.

The proper implementation of mitigation measures associated with the SWPPP is imperative during all construction activities, and these activities will be conducted in an environmentally sensitive and responsible manner in order that no discharge of sediment or contaminants may be conveyed as either direct or indirect discharge to wetlands, Waters of the United States (WUS), or Waters of the State of Arizona (WSA).

NOTIFICATION REQUIREMENTS AND IMPLEMENTATION

Before construction begins, APS will provide the Construction Contractor with the approved SWPPP, and APS will ensure that coverage is obtained under the AZPDES General Permit by filing a Notice of Intent and appropriate fees with the ADEQ Water Quality Division in accordance with NOI instructions. The Construction Contractor will be responsible for implementing the site-specific SWPPP and is required to perform routine inspections over the duration of construction activities.

The primary intent of the mitigation measures (often referred to as Best Management Practices) is to control and minimize erosion at the source. For HANG2, the main source of potential stormwater pollutants from the construction site will be soils eroding into drainages. It will be the responsibility of the Construction Contractor to implement erosion control measures where necessary, to protect drainages, and to keep the project in compliance with ADEQ regulations.

A copy of the SWPPP shall remain with the Construction Contractor's Manager on the construction site or at a staging area, and be readily available while the transmission line and

substations are under construction, from the start of construction activities until completion of restoration for the project.

As a part of the SWPPP, the Construction Contractor will be required to conduct inspections of the construction site prior to anticipated storm events and after actual storm events to identify areas contributing to a stormwater discharge, and to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly implemented in accordance with the terms of the General Permit and whether additional control practices are needed. For storms with extended durations, observations must be performed every 24 hours.

The Construction Contractor (and APS) must retain a set of construction site maps for the duration of the project and for 3 years after the Notice of Termination, that delineate the following items:

- Areas of soil disturbance that have been stabilized;
- Areas to be graded along with a time schedule;
- Areas of potential soil erosion where control practices will be implemented;
- Indicate the type of control practices and time schedule for implementation;
- Locations of any post-construction projects; and
- Copies of all inspections performed over the duration of the project.

PROJECT MODIFICATIONS

The Construction Contractor, in consultation with APS, shall amend the SWPPP whenever there is a change in construction or operations that may affect the discharge of pollutants to surface waters or groundwater. The SWPPP shall also be amended if it is in violation of the General Permit or has not achieved the general objective of eliminating pollutants in stormwater discharges. The SWPPP shall be amended and implemented in a timely manner, but in no case more than 14 days after it has been determined that the SWPPP is inadequate. All amendments should be dated and directly attached to the SWPPP. The ADEQ may require the discharger to amend the SWPPP.

MITIGATION MAINTENANCE, INSPECTION, REPAIR, AND MONITORING

The Construction Contractor shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances). Proper operation and maintenance also include appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems if construction takes place in an above average precipitation year.

The Construction Contractor will be required to conduct routine maintenance and emergency repair on any structural controls, including the maintenance of erosion control mitigation measures and any required subsequent reporting. All monitoring and inspection records which have been produced in association with this SWPPP will be retained for a period of at least 3 years.

To monitor the mitigation's effectiveness and to evaluate whether additional mitigation measures are required, a monitoring program and reporting system will be followed. As part of erosion control of the site, weather monitoring should be conducted to prepare for precipitation events. It is recommended that weather forecasts be checked at least every week.

TRAINING

The Construction Contractor will be responsible for the SWPPP implementation, amendments, and revisions. On-site construction personnel will be responsible for installation and maintenance of on-site mitigation measures.

The Construction Contractor will be responsible for familiarizing their personnel with the information contained within the SWPPP. Training meetings will need to be held for new personnel who join the project after the initial training has been provided. The purpose of these meetings will be to review the proper installation methods and maintenance of all erosion control measures to be used for the project. The monitoring/inspection program and all required maintenance and repair will be conducted by trained personnel.

POST-CONSTRUCTION STORM WATER MANAGEMENT

Mitigation measures used to reduce pollutants in stormwater discharges after all construction phases have been completed at the site should take into account local post-construction stormwater management requirements, policies, and guidelines, as well as site-specific and seasonal conditions. Post-construction mitigation measures will be assessed during future line maintenance. During line maintenance, any areas disturbed by the line installation that are observed to be eroding sediment into drainages will be assessed for the appropriate permanent mitigation measure to control sediment movement off the disturbed area. Disturbed areas will also be restored per the Cleanup and Reclamation standards and the project's Vegetation Management Plan.

APPENDIX B5

BLASTING PLAN

INTRODUCTION

This Blasting Plan outlines methods to mitigate risks and potential impacts associated with blasting procedures that may be required for construction of HANG2.

PURPOSE

The Blasting Plan will provide construction crews, the Compliance Inspector (CI), and environmental monitors with project-specific information concerning blasting procedures, including the safe use and storage of explosives. The objective of the Blasting Plan is to prevent adverse impacts to human health and safety, property, and the environment that could potentially result from the use of explosives during project construction. Blasting may be needed but is thought to be unlikely in certain areas with rocky terrain to excavate tower footings. Blasting will be used only in areas where traditional excavation and earth-moving equipment and practices are unable to accomplish the excavation. Most likely, however, the blasting action to be undertaken by the Construction Contractor will be the utilization of **implosive sleeves** during line stringing activities to fuse conductor wire together. The "blasting" in wire splicing is not an underground disturbance situation, and there is no flying debris or shrapnel during installation. Such devices also decrease the number of pulling sites needed and therefore reduce environmental impact.

REGULATORY COMPLIANCE AND PROCEDURES

The Blasting Contractor will be responsible for preparing and implementing any site-specific Blasting Plan to comply with the most stringent provisions of all federal, state, and local laws that pertain to explosives. No blasting operations will be undertaken until any appropriate permits have been obtained from applicable agencies.

The Construction Contractor will contract a qualified, experienced, and licensed Blasting Contractor that will perform blasting using current and professionally accepted methods, products, and procedures to maximize safety during blasting operations. Blasting procedures will be carried out according to, and in compliance with, applicable laws and will be closely monitored by the CI.

BLASTING PLAN GUIDANCE

Prior to blasting the Blasting Contractor shall prepare a specific Blasting Plan for review by APS, the CI, and other applicable parties. The plan will address safety as well as design for production and controlled blasting. The Blasting Plan will contain the full details of the blasting patterns as well as controls the Blasting Contractor proposes to use for both controlled and production blasting. Review of the plan by the parties shall not relieve the Blasting Contractor of the responsibility for the accuracy and adequacy of the Blasting Plan when implemented in the field. A minimum of 2 weeks should be allowed for review and approval of the Blasting Plan by the appropriate parties. If at any time changes are proposed to the Blasting Plan, the Blasting Contractor will need to submit them for approval.

OVERVIEW OF BLASTING PRINCIPLES

Locations. The Construction Contractor's Blasting Contractor will avoid blasting in potential rockslide/landslide areas to the maximum extent possible and will consult with a geologist before blasting in such areas. Geologists will be a part of the construction team. A common practice for fusing conductor wire together is the use of 'implosive sleeves', which utilizes a controlled implosive device. The Blasting Contractor will be knowledgeable about this practice and will coordinate with the CI, particularly in regards to the locations of these practices.

Materials. The Blasting Contractor will determine the specific materials needed for blasting operations. These materials will be included on the hazardous materials list for the project and their use and storage will comply with applicable federal, state, and local laws.

BLASTING PLAN CONTENTS

The Blasting Plan for *ground-disturbing uses* would be prepared by the Blasting Contractor and shall contain the following minimum information:

1. Purpose
2. Scope of the Blasting
3. Definitions
4. Responsibilities
    a. Management Organization
    b. Authority Responsibility
    c. Blaster in Charge (licensed Arizona)
5. Location of Blasting Area
    a. Description of Blasting Area
    b. Description of Bedrock and Geological Challenges
    c. Description of Adjacent Utility Facilities
6. Environmental Considerations
7. Safety Considerations
    a. General
    b. Warning Signs and Signals
    c. Procedures around Adjacent Utility Facilities
    d. Traffic Control
    e. Emergency Blast Initiation
    f. Safety Publications
    g. Fire Prevention
    h. Safety Hazards, Emergency Services, and Communication
    j. Minor or Non-Emergency Medical Care; First Aid
8. Risk Management
    a. Protection of Adjacent Utility Facilities
    b. Lightning
    c. Flyrock (Note: flyrock will be controlled with blasting mats)
    d. Carbon Monoxide
    e. Ground Vibrations
    g. Preblast Survey and Inspection
    h. Blast Damage Complaints
    i. Airblast
9. Blast Design Concept
    a. Station limits of proposed shot
    b. Plan and section views of proposed drill pattern including free face, burden (assume 2.45 specific gravity for limestone), blasthole spacing, blasthole diameter, blasthole angles, lift height, and subdrill depth
    c. Loading diagram showing type and amount of explosives, primers, initiators, and location and depth of stemming
    d. Initiation sequence of blastholes including delay times and delay system
    e. Manufacture's data sheets for all explosives, primers, and initiators to be employed
10. Procedures
    a. Delivery of Explosives
    b. Storage of Explosives and Blasting Agents
    c. Blast Hole Drilling
    d. General Handling of Explosives

e. Blast Hole Loading
f. Notification
g. Initiation of Blast
h. Misfire Management

11. Records
12. Attachments

SAFETY PROCEDURES

Safe storage and use of explosive materials will be a top priority during construction. The safety measures discussed in this section are intended to prevent theft and/or vandalism of the explosive materials, protect them against fire, and to prevent personal injury and property damage. These measures are intended as general guidelines.

STORAGE

Explosives must be stored in an approved structure (magazine) and kept cool, dry, and well ventilated. APS' Construction Contractor will provide the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) Regulatory Enforcement Office in Arizona with a list of dates and locations for the explosives and blasting agent storage facilities to be used on the project at least 14 days before the establishment of such storage facilities.

At a minimum, the following storage requirements will be implemented:

Explosives must be stored in an approved structure (magazine), and storage facilities will be bullet-resistant, weather-resistant, theft-resistant, and fire-resistant;

Magazine sites will be located in remote (out of sight) areas with restricted access, kept cool, dry, and well ventilated, and will be properly labeled and signed;

Detonators will be stored separately from other explosive materials;

The most stringent spacing between individual magazines will be determined according to the guidelines contained in the BATF publication or state or local explosive storage regulations;

Both the quantity and duration of temporary on-site explosives storage will be minimized; and

The Blasting Contractor will handle and dispose of dynamite storage boxes in accordance with relevant federal, state, and local laws.

GROUND BLASTING NOTIFICATION AND SAFETY PROCEDURES

The Construction Contractor will obtain a permit from the various counties associated with the HANG2 alignment (as needed) for the period when blasting may occur and will comply with the following requirements.

The holder shall publish a proposed blasting schedule in the local newspaper 1 week prior to any blasting taking place. The schedule shall identify the location and dates and times that blasting will occur. No blasting shall occur outside the published schedule except in emergency situations.

The holder shall post warning signs at all entry points for the project. Warning signs shall include information on blasting, including the general hours blasting might take place and audible signals to be used as warning of impending blasting, and to indicate that the site is all clear.

Access points to areas where ground blasting will take place will be blocked to prevent access by the public at least 30 minutes prior to blasting. The site shall be swept 5 minutes prior to any shot being put off to ensure that no unauthorized personnel have wandered onto the site. An audible

warning signal, capable of carrying for ½ mile, shall be used at least 2 minutes prior to the shot being put off. An "all-clear signal" will be given once it has been determined that all danger in the area has passed.

A determination of all-clear danger will be derived once the blasting area has been inspected for undetonated or misfired explosives. The blasting area will also be inspected for hazards such as falling rock and rockslides. Once the area has been inspected and these issues have been addressed, the all-clear signal as described above will sound, and persons will be able to safely re-enter the blast zone. Additional safety precautions will be developed to address site-specific conditions at the time of the blast. Special attention will be given to preventing potential hazards in the blasting area resulting from flying rock, destabilized walls, structures, presences of low flying aircraft, dispersion of smoke and gases.

FIRE SAFETY

The presence of explosive materials on the project site could potentially increase the risk of fire during construction. Special precautions will be taken to minimize this risk, including but not limited to:

- Prohibiting ignition devices within 50 feet of explosives storage area
- Properly maintaining magazine sites so that they are clear of fuels and combustible materials, are well ventilated, and are fire-resistant
- Protecting magazines from wildfires that could occur in the immediate area
- Posting fire suppression personnel at the blast site during high fire danger periods
- Prohibiting blasting during extreme fire danger periods.

TRANSPORTATION OF EXPLOSIVES

Transportation of explosives will comply with all applicable federal, state, and local laws including Title 49 of the Code of Federal Regulations (CFR), Chapter III. These regulations are administered by the U.S. Department of Transportation and govern the packaging, labeling, materials compatibility, driver qualifications, and safety of transported explosives. In general, these regulations require that vehicles carrying explosive materials must be well maintained, properly marked with placards, and have a non-sparking floor. Materials in contact with the explosives will be non-sparking, and the load will be covered with a fire- and water-resistant tarpaulin. Vehicles also must be equipped with fire extinguishers and a copy of the Emergency Response Guidebook (US DOT 1993). Every effort will be made to minimize transportation of explosives through congested or heavily populated areas.

Prior to loading a vehicle which is appropriate for carrying explosives, the vehicle must be fully fueled and inspected to ensure its safe operation. Refueling of vehicles carrying explosives will be avoided. Smoking will be prohibited during the loading, transporting, or unloading of explosives.

In addition, the following specific restrictions apply to re-transport of other items in vehicles carrying explosives:

- Tools may be carried in the vehicle but not in the cargo compartment
- Detonation devices can, in some cases, be carried in the same vehicle as the explosives, but they must be stored in a specially constructed compartment
- Batteries and firearms must never be carried in a vehicle with explosives

- Vehicle drivers must comply with the specific laws related to the materials being transported.

Vehicles carrying explosives will not be parked or left unattended except in designated parking areas with approval of the State Fire Marshall. When traveling, vehicles carrying explosives will avoid congested areas to the maximum extent possible.

ENVIRONMENTAL PROTECTION MEASURES

Ground-disturbing blasting has the potential to cause environmental impacts. Implementing the practices/procedures listed below will mitigate these impacts.

- Avoid potential rockslide/landslide areas to the maximum extent possible and consult the blasting geologist before blasting in such areas
- Design blasts to minimize ground vibrations that can cause slope instability and impact wells and springs
- Limit hours of blasting to Monday through Saturday from 7:00 am to 7:00 pm when blasting within 3,000 feet of sensitive receptors
- Avoid blasting within 500 feet of wells/springs to the maximum extent possible
- Adhere to desert tortoise stipulations (see below).

Stipulations developed by USFWS and described below will be followed for protection of Desert Tortoise and other sensitive species, as well as the required notification discussed above. The Construction Contractor will notify the CI and environmental monitors 24-48 hours prior to scheduled blasting and comply with the permit requirements for notification by the various counties associated with the HANG2 line, including any requirements for dust abatement. Regular field meetings will be held with the CI and environmental monitors to review the process and its implementation. If changes are needed to the notification process, changes will be made to facilitate protection of environmental resources.

DESERT TORTOISE

If ground-disturbing blasting is necessary the following mitigation measures will be performed by a Biological Monitor.

Prior to blasting a 200-foot area around the blasting site will be surveyed for desert tortoise using 100% coverage survey techniques.

All tortoises located within 100 feet of the blast site will be removed and temporarily relocated in accordance with Desert Tortoise handling protocol, prior to blasting.

Prior to any blasting all tortoise burrows or cover areas within a 200-foot radius of the blast site will be located and the entrances carefully stuffed with crumpled newspaper or other approved material. After blasting is completed, all burrows and cover sites will be inspected for damage, and stuffing material will be removed. If a burrow or coversine has collapsed and there is a possibility that it could be occupied, it will be probed to ensure that no tortoises have been buried and are in danger of suffocation.

Tortoises in burrows at a distance of 100 to 200 feet from the blasting site will be left in their burrows. Burrow locations will be flagged and recorded using a GPS unit and burrows will be stuffed with newspaper. Immediately after blasting, newspaper and flagging will be removed. In addition all applicable biological stipulations in the Wildlife Management Plan will be adhered to as described in Appendix B2.

APPENDIX B6

WASTE MANAGEMENT PLAN

WASTE MANAGEMENT PLAN

Prepared for

Arizona Public Service Company
2124 West Cheryl Drive
Building B2, MS 3371
Phoenix, Arizona 85201

February 2012

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Attachment

A. List Of Arizona Solid Waste And Used Oil Recycler Facilities

1.0 INTRODUCTION

This waste management plan (WMP) will be implemented for the construction of the transmission line known as the Hassayampa–North Gila #2 (HANG2) Transmission Line. The purpose of the WMP is to outline non-hazardous waste handling procedures to be used during the construction phase of the project and to identify expectations for minimizing waste and recycling processes. Waste addressed in this WMP includes all non-hazardous waste resulting from construction and land clearing, as well as material that is recycled, reused, salvaged, or disposed of as garbage.

2.0 RESPONSIBILITIES

All non-hazardous construction waste associated with the HANG2 construction project will be collected, stored, and disposed of in accordance with all federal, state, and local rules, regulations, and ordinances. The following overall waste management mitigation measures will be implemented at the HANG2 project construction site:

- Totally enclosed, predator proof, sealed containment will be provided for all construction waste
- All construction waste will be removed to a disposal facility authorized to accept such material

It is the responsibility of the Arizona Public Service (APS) construction contractor and subcontractors to maintain good housekeeping practices at the HANG2 construction site and to contract with an approved waste management company to conduct the following activities: 1) provide covered waste containers, 2) pick up on-site waste at regularly scheduled intervals, and 3) haul the waste to a disposal facility authorized to accept such materials.

The construction contractor will provide employee training on this WMP, and it is the responsibility of the construction employees to follow WMP procedures.

3.0 WASTE PREVENTION, PACKAGING, AND RECYCLING

Preventing or minimizing waste can be accomplished by reusing or recycling waste at the project construction site. Examples of materials that can be reused at a construction site include land-clearing debris (for use as mulch) and soil (stockpiled for later use). Examples of materials that can be recycled include concrete, metals, wood, glass, aluminum cans, field office paper, and cardboard. Recycling requires recyclable materials to be sorted into separate containers as they are generated on the job site. The separated materials are then hauled directly to a recycling facility or transfer station. Recycling is encouraged as a way to minimize waste at the construction site and can occur if the contracted waste management company has the capacity to haul recycled material to an approved recycling or materials recovery facility.

To the extent practicable, material purchasing agreements should include a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, and that packaging be taken back for reuse or recycling.

4.0 Communication and Education

Waste management, prevention, and recycling activities will be discussed regularly at ongoing safety meetings. A copy of this WMP will be provided to each new subcontractor that comes on-site; the subcontractor will be expected to make sure its crews comply with the WMP.

5.0 EXPECTED PROJECT WASTE, DISPOSAL, AND HANDLING

Expected project waste at the HANG2 construction site includes items such as:

- soil
- rock
- plastic
- concrete waste
- trash or garbage
- litter
- human waste

All litter, solid and liquid construction debris, and trash will be cleaned up on a daily basis. On-site construction waste will be collected in covered waste disposal containers such as trash containers, recycling bins, and/or roll-off dumpsters. Waste containers will be located at the project material storage/ show-up yards and will be inspected daily by material yard managers. If recycling will be made available, recycling bins will be clearly designated with a posted list of what is recyclable and what is not.

Waste will be hauled off-site, at a minimum, on a weekly basis or as needed if determined by the material yard manager. A yet-to-be-determined waste management company will be contracted to haul the waste to an approved waste disposal facility. No open burning of construction trash will occur.

Self-contained chemical toilets equipped with hand-cleaning stations will be located at the material storage/show-up yards and show-up yards. Trailer-mounted self-contained or stationary self-contained toilets will be used in the right-of-way at active tower construction sites as needed. A licensed sanitary waste company/hauler specializing in such products will be contracted to provide and maintain the portable toilets. The contracted company will be responsible for scheduled maintenance/inspection, waste disposal, and removal of the portable toilets from the project site once construction is complete. All wastewater associated with these portable toilets will be hauled off by the licensed contractor, and no wastewater will be discharged or buried on-site.

Hazardous waste is explicitly not covered by this WMP. Refer to the hazardous materials management plan for requirements for hazardous waste handling and disposal.

6.0 MATERIAL DISPOSITION/WASTE DISPOSAL COMPANIES

The contracted waste disposal company must dispose of waste in an authorized, permitted facility. Municipal and non-municipal landfills as well as recycling facilities are located in both Maricopa and Yuma counties.

Solid waste facilities in Maricopa County that accept construction debris are located 15+ miles from the northeastern end of the project site and include:

- Allied Waste - Southwest Regional Landfill 24427 South Highway 85 Buckeye, AZ 85326 (623) 393-0085
- City of Glendale Landfill 11480 West Glendale Avenue Glendale, AZ 85307 (623) 930-2660

- Salt River Pima-Maricopa Indian Community - Salt River Landfill 13602 East Beeline Highway Scottsdale, AZ 85256 (480) 941-3427
- Waste Management - Butterfield Station Landfill 40404 South 99th Avenue Mobile, AZ 85239 (602) 437-3165
- Waste Management - Northwest Regional Landfill 19401 West Deer Valley Road Surprise, AZ 85387 (623) 584-6065
- Vulcan (Calmat) Litchfield Landfill 11923 West Indian School Road Avondale, AZ 85392 (623) 935-2323
- El Mirage Inert Landfill 4545 North El Mirage Road Litchfield Park, AZ 85340 (623) 935-2021
- M. R. Tanner Landfill 6515 North El Mirage Road Glendale, AZ 85307 (623) 536-5395
- Waste Management - 7th Avenue Landfill 3000 South 7th Avenue Phoenix, AZ 85013 (602) 437-3165
- Waste Management - Deer Valley Landfill 1441 East Alameda Road Phoenix, AZ 85024 (602) 437-3165
- Waste Management - Lone Cactus Landfill 21402 North 7th Street Phoenix, AZ 85024 (602) 437-3165
- Weinberger Landfill - 43rd Avenue 3425 South 43rd Avenue Phoenix, AZ 85009 (602) 278-9155
- Weinberger Landfill - Rainbow Valley 39500 South 99th Avenue Phoenix, AZ 85239 (602) 278-9155
- Source: http://www.maricopa.gov/EnvSvc/WaterWaste/SolidWaste/Landfill.aspx

Solid waste facilities in Yuma County that accept large loads of commercial waste are located 20-30 miles from the southwestern end of the project site and include:

- South Yuma County Landfill - 19536 S. Avenue 1E Yuma, AZ (928) 341-9300
- Copper Mountain Landfill - 34853 CO 12th Street Wellton, AZ (928) 785-3797
- Allied Waste Transfer Station - 3040 S. Avenue 3½ E Yuma, AZ (928) 726- 5210

Source: http://www.co.yuma.az.us/index.aspx?page=449

The Arizona Department of Environmental Quality (ADEQ) list of statewide solid waste facilities and used oil transporters is provided in *Attachment A*; additional information is available at the ADEQ interactive geographic information system website on landfills at http://gisweb.azdeq.gov/arcgis/emaps/?topic=landfills and on material recovery facilities at http://www.azdeq.gov/environ/waste/solid/recycle.html.

7.0 HOUSEKEEPING

A stormwater pollution prevention plan (SWPPP) has been prepared for the HANG2 project and is incorporated into this WMP by reference. The SWPPP presents good-housekeeping best management practices and the inspection schedule to be observed during construction of the project. The construction site, material yards, and access roads will be kept in an orderly condition throughout the construction period. Once the project is complete, all refuse and trash (including stakes and flags) will be removed from the site and disposed of properly, all trash receptacles will be removed, all material yards will be decommissioned, and the project area will be left debris free. Where required, restoration of disturbed

construction areas that are not needed for normal transmission line maintenance will be returned to their natural contour to the extent practical and reseeded or revegetated with native plants.

8.0 DOCUMENTATION

All waste removal and disposal performed by the contracted waste contractor will be documented with a manifest or bill of lading and will become part of the permanent construction record.

Attachment A

LIST OF ARIZONA SOLID WASTE AND USED OIL RECYCLER FACILITIES

Arizona Solid Waste Landfill

Facility Type	County	Landfill	Owner	Operator	Operator Name	Company Phone	Physical Address	Driving Directions	Status	Landfill Phone
MSWLF	Apache	Apache County Regional Landfill - Blue Hills	Apache County	Blue Hills Environmental	Ray Davis	928-337-2357		3 miles north of St. Johns HWY US 191	Open	928-337-4019
	Cochise	Cochise County Western Regional Landfill	Cochise County	Cochise County	Marty Haverty	520-803-3778	2595 N Sagebrush Rd	1/2 mile north of SR 82 and 4 miles east of SR 90	Open	520-803-3770
		Huachuca City	Huachuca City	Huachuca City	Roger Pluta	520-456-1354	600 Skyline Ave	1 miles east of AZ 90 on Skyline Ave. north .3 miles to site	Open	520-456-1354
	Coconino	Cinder Lake	City of Flagstaff	City of Flagstaff	Matt Morales	928-527-1927	6770 Landfill Rd	North highway 89 on Landfill Rd.	Open	928-527-1927
		Grand Canyon South Rim	United States Park Service	United States Park Service	Peter Steinkopf	928-638-7637		Just N of South entrance on HWY 181, go 1 mile	Open - closed to public	928-638-7637
	Gila	Buckhead Mesa	Gila County	Gila County	Sharon Winters	928-425-3231		10 miles northwest of Payson at Mile Post 263 on HWY 87	Open	928-476-3350
		Russell Gulch	Gila County	Gila County	Sharon Winters	928-425-3231	5891 E Landfill Lane	*5891 E. Landfill Lane*	Open	928-425-3231
	Graham	Graham County Regional Landfill (Safford)	City of Safford	City of Safford	Jay Howe	928-348-3143	3600 N Safford Landfill Rd	3600 N. Safford Landfill Rd.	Open	928-428-0410
	Greenlee	Loma Linda	Greenlee County	Greenlee County	Philip Ronnerud	928-865-4762	2930 Skyline View Rd	2930 Skyline View Rd, 3 miles southeast of Clifton 2 miles east of US 191 at milepost 157.5	Open	928-865-4762
	La Paz	La Paz County Regional Landfill	La Paz County	Allied Waste	Brian Conway	928-669-8886	26999 Hwy 95, Milepost 128	3.5 miles south of Hwy 72 on Hwy 95	Open	928-855-9441
	Maricopa	Southwest Regional	Buckeye Pollution Control Assoc.	Allied Waste	Wayne Hedman	602-237-2078	24427 S Hwy 85	24427 S HWY 85, Buckeye, AZ 85326	Open	623-393-0085
		Butterfield Station	Waste Management	Waste Management	Jack Kolopanis	602-256-0630	40404 S 99th Ave	1 mile north of 238 on 99th Ave.	Open	602-256-0630
		City of Glendale	City of Glendale	City of Glendale	Christine Betz	623-236-4816	11480 W Glendale	North side of Glendale Ave. east of the Agua Fria River	Open	623-930-4722
		City of Phoenix State Route 85	City of Phoenix	City of Phoenix	Joe Gudice	602-534-3333	28361 W Patterson Rd	28361 W Patterson Rd, Buckeye AZ 85326	Open	
		Northwest Regional	Waste Management	Waste Management	Jim Denson	602-757-3352	19401 W Deer Valley Rd	South of 195th Ave and Deer Valley	Open	623-584-6065
	Mohave	Arizona Strip Landfill	Colorado City	Arizona Strip Landfill Corp	Preston Barlow	928-875-2646		Highway 389 8 miles south of Colorado City within 1 mile	Open	602-875-2722
		Cerbat	Mohave County	Gambi	Nicolas Hont	928-757-0910	7300 Mineral Park	*Mineral Park Rd off of US HWY 93, 7300 Mineral Park Road, Kingman AZ 86401*	Open	928-565-2777
		Lake Havasu City	Lake Havasu City	Allied Waste	Brian Conway	928-855-9441	3251 E Chenowith Rd	3 miles of AZ 95 1.5 miles north milepost 186	Open	928-764-3428
		Mohave Valley Sanitary Landfill	Mohave County	Allied Waste	Nicholas Hont	928-757-0912	3999 El Rodeo Rd	4 1/2 miles east of highway 95 of Highway 95 along El Redeo Rd.	Open	928-758-0000
	Navajo	Painted Desert Regional Landfill	Waste Management	Waste Management	Shote Forester	928-587-1448	9001 N Portr Ave	3 miles north of Joseph City	Open	928-288-3605
	Pima	Ajo	Pima County	Pima County	Colby Fayer	520-744-7649	2000 N Ajo Well Rd	2000 N. Ajo Well Rd.	Open	520-744-7649
		Los Reales	City of Tucson	City of Tucson	Nancy Petersen	520-791-5414	53000 E Los Reales Rd	E on I-10 to Craycroft Rd. exit, at stop sign, take right, follow around to Los Reales rd. At Swan Rd. turn left.	Open	520-791-5414
		Sahuarita	Pima County	Pima County	Colby Fayer	520-744-7649	16605 S LaCanada Dr	16605 S. LaCanada Dr.	Open	520-791-4183
		Tangerine	Pima County	Pima County	Colby Fayer	520-744-7649	10220 W Tangerine Rd	10220 W. Tangerine Rd.	Open	520-791-3125
	Pinal	Apache Junction	Allied Waste	Allied Waste	Brad Dugas	480-982-7003	4050 Tomahawk Rd	2.6 miles south of AZ 60/80/89 on Tomahawk Dr	Open	480-982-7003
		City of Casa Grande	City of Casa Grande	City of Casa Grande	Norm Gumenik	520-421-8600	5200 S Chui Chu Rd	3.2 miles south of Casa Grande at 5200 S. Chui Chu Rd.	Open	520-421-8628
		City of Coolidge	*City of Coolidge*	*City of Coolidge*	*Donald G. Peters P.E.*	*520-723-4882*		South of the intersection of Bartlett Rd. and South Arizona Blvd.	Not accepting waste	520-723-4882
		City of Eloy	City of Eloy	City of Eloy	John Mitchell	520-466-3082	3555 S Toltec Rd	Northeast corner of Toltec Rd and Alsdorf Rd. 2 miles south of I-10 on Toltec Rd.	Open	520-466-3366
		Dudleyville	Pinal County	Waste Management	Greg Johnson	520-744-2600	8195 N Highway 77	3 Miles south of Winkelman on eastside of hwy 77	Open	520-358-6180
		Ironwood (Adamsville)	Pinal County	Waste Management	Greg Johnson	520-744-2600	12720 E Highway 287	2 Miles west of Florence on hwy 287	Open	520-868-8778
		Cactus	Allied Waste	Allied Waste	Doug Sawyer	602-442-5985	22481 E Deep Well Ranch Rd	22481 E Deep Well Ranch Rd, Eloy, AZ 85231	Open	
		Sierra Estrella	Waste Management	Waste Management	Jack Kolopanis	602-256-0636	22087 N Ralston Rd	3 Miles NW of Town of Maricopa on State route 238	Open	602-256-0636
		Silver Bar Mine Regional Landfill	AK Mineral Mountain, LLC	Cowley Management, LLC	J. Charles Coughlin	602-528-3684	830 N 4th Ave, Phoenix, AZ 85003	Cottonwood Canyon Road, Florence, AZ 85232		
	Santa Cruz	Rio Rico	Santa Cruz County & AVATAR	Santa Cruz	Karl Moyers	520-841-1104	1500 W Frontage Rd	West on frontage road 1 mile north Peck Canyon Rd. exit on highway	Open	520-761-7892
		Sonoita/Elgin	BLM	Santa Cruz	Karl Moyers	520-841-1104	2857 Hwy 83	3.1 miles southeast of AZ 82 on Az 83 dirt road .2 miles	Open	520-455-0409
		Town of Patagonia	Town of Patagonia	Town of Patagonia	Randy Heiss	520-841-1104		2.1 miles north of Az 82 on First Ave.	Open	520-841-1104
	Yavapal	Gray Wolf	*Waste Management*	*Waste Management*	*Vincent Murphy*	*928-925-6249*	*23355 Hwy 169, Dewey, AZ 86327*	11 mi e of 69 on hwy 169 or conveniently located only 3 mi w on hwy 169 form interstate 17 and hwy 169 exit	Open	928-632-0224
	Yuma	Copper Mountain	Allied Waste	Allied Waste	Matt Jueber	928-785-3797	34853 East County 12 St, Wellton, AZ 85356	7 miles east of Welton 2 miles south of Antelope, 34853 E. County 12th St.	Open	928-785-3797
		South Yuma Landfill	South Yuma County LLC	South Yuma County LLC	Rebbeca Zeller	928-341-8454	19536 S Ave 1E	county 19 Rd.	Open	928-341-9300
		Yuma Proving Grounds	U.S. Army		Vivian Bleving	928-328-2015		U.S. Army Proving Grounds	Open	928-328-2015
NAR	La Paz	Colorado River Indian Tribes	Colorado River Indian Tribe	Colorado River Indian Tribe	James Alcaida	928-669-2121		1 mile N of Parker Airport on AZ 95, .5 mile E, Native American Reservation	Open	928-669-2121
	Maricopa	Salt River-Pima IndianTribe Tri City	Salt River-Pima Indian Tribe	Salt River-Pima Indian Tribe	Randy Watkins	480-941-3427	13602 E Baseline Hwy	13602 E Baseline Hwy, Native American Reservation	Open	480-941-3427
NMSWLF	Greenlee	Loma Linda II	Greenlee County	Greenlee County	Philip Ronnerud	928-865-4762	1271 SkyLine View Road	3 mile southeast of Clifton 2 m E of US 191	Open	928-865-4762
	Maricopa	Vulcan Materials (CalMat/Avondale Landfill)	Vulcan	Vulcan	Dan Zeller	602-258-8818	11923 W Indian School Rd	11923 W. Indian School Rd.	*Open*	*623-247-0730*
		Deer Valley	State Of Arizona	Waste Management	Jim Denson	602-584-8406	24802 N 14th St., Phoenix	SW corner of 12st St and Alameda	Open	602-584-8406
		Glenn Weinberger Rainbow Valley	Weinberger	Weinberger	Glenn Weinberger	602-278-9155	39500 S 99th Ave		Open	602-278-9155
		Glenn Weinberger Landfill	Weinberger	Weinberger	Glenn Weinberger	602-278-9155	3425 S 43rd Ave.	3425 S 43rd Ave.	Open	602-278-9155
		Lone Cactus	Waste Management	Waste Management	Will Adams	623-516-0244	21402 N 7th St	NW corner of 7th St. and Beardsley Rd.	Open	623-516-0244
	Pima	Ina Road Construction Debris	Pima County	Pima County	Chris Cawein	520-744-7649	5301 W Ina Rd	5301 W. Ina Rd	Open	520-744-7649
		Speedway Landfill	Fairfax Management Co LLC	Fairfax Management Co LLC	Jason Tankersley		7301 E Speedway	Speedway and Prudence Rd	Open	520-290-9313
	Pinal	Ironwood C/D	Waste Management	Waste Management	James Denson	602-757-3352	12720 Easte Highway 287, Florence, AZ 85034	12720 E HWY 287, Florence, AZ 85034		
	Yavapal	Iron King	Khules Brother/KSERV LLC	KSERV LLC	Clayton Kuhles	928-445-8446	11910 E Iron King Rd	End of Iron King Rd in Humboldt (behind Ironite)	Open	928-445-8446
		Prescott Valley II	Prescott Vallley C&D Landfill, Inc	Prescott Valley C&D Landfill	Kurt Wahl	480-201-4588	2640 South Lake Valley, Prescott Valley, AZ 8631	8 miles from the Town of Prescott along state road 69	Open	928-778-1450
SGSWLF	Apache	*SRP/Coronado Generating Station*	Salt River Project	Salt River Project	Jim Wood	928-337-4131		7miles N of St. John off Hwy 66	Open	928-337-4131
	Coconino	Black Mesa Pipeline - Williams	Black Mesa Pipeline Inc	Black Mesa Pipeline Inc	Fred Rimington	402-492-7557	PO Box 542500, Omaha, NE 68154	20 Miles N of Williams at MP 204 off HWY 64	Open	
	Cochise	Apache Generating Station	AZ Electric Power Coop Inc	Az Electric Power Coop Inc	James A. Andrew	520-384-6517	3525 N US Hwy 191	9 miles S of I-10 on US 191	Open	520-384-4256
	Gila	BHP/Miami	BHP Copper	BHP Copper	Evelyn Bingham	928-473-6410		HWY 60 Town of Miami	Open	928-473-6410
		BHP/Pinto Valley Unit	BHP Copper	BHP Copper	Evelyn Bingham	928-473-6410		Hwy 60 8 Miles West of Miami	Open	928-473-6410
		Phelps Dodge Miami	Phelps Dodge	Phelps Dodge	Daniel Johnson	928-473-7154		US Hwy 60 at New St.	Open	928-473-7100
		ASARCO Hayden Concentrator Landfill	Phelps Dodge	Phelps Dodge	Neil A. Gambell	520-356-3284		Hayden & Kennecott	Open	520-356-3284
		ASARCO Hayden Smelter	Phelps Dodge	Phelps Dodge	Neil A. Gambell	520-356-3284	640 Asarco Ave	640 Asarco Ave.	Open	520-356-3284
	Greenlee	Phelps Dodge Morenci	Phelps Dodge	Phelps Dodge	Brian Musser	928-865-6484	4521 US Hwy 91		Open - asbestos	928-865-6484
	Maricopa	APS/Palo Verde Rubbish	Arizona Public Service	Arizona Public Service	Thomas *Hillmier*	623-393-6567	5801 *S Winterburg Rd*	*6 miles south of I-10 on Wintersberg Rd.west of Phoenix*	Open	623-393-6567
	Navajo	Catalyst Paper (Snowflake) Inc- Mill Pond	Catalyst Paper (Snowflake) Inc	Catalyst Paper (Snowflake) Ir	Fred Mollenhauer	928-536-9462		Spur Route 277 15 miles west of Snowflake	Open	520-536-9462
		Catalyst Paper (Snowflake) Inc- Monofill	Catalyst Paper (Snowflake) Inc	Catalyst Paper (Snowflake) Ir	Fred Mollenhauer	928-536-9462		Spur Route 277 15 miles west of Snowflake	Open	520-536-9462

Pima	ASARCO Mission Landfill	Phelps Dodge	Phelps Dodge	Al Cooper	520-648-2500	4201 W Pima Mine Rd	4201 W. Pima Rd. within Mission Mine Property	Open	520-648-2500
	Phelps Dodge Sierrita	Phelps Dodge	Phelps Dodge	Jay Fumusa	520-648-8605		6200 W Duvall Mine Rd	Open	520-648-8605
	Silver Bell Mine	ASARCO	ASARCO	Katherine Arnold	520-682-2420	25000 W Avra Valley Rd	25000 W. Avra Valley Rd	Open	520-682-2420
Pinal	ASARCO Ray Complex - Ray Mine	ASARCO	ASARCO	Neil A. Gambell	520-356-3284		East of State Highway 177 10 miles north of Kearny	Open	520-356-3284
	BHP San Manuel Plantsite Asbestos Landfill	BHP Copper	BHP Copper	James Glasston	520-385-3552	200 S Reddington Rd	Highway 76 1 mile west of highway 77	Open	520-385-3552
	BHP San Manuel Plant Wood Dump	BHP Copper	BHP Copper	James Glasston	520-385-3552		Highway 76 east of San Manuel	Open	520-385-3552
	BHP San Manuel Plantsite SW Landfill	BHP Copper	BHP Copper	James Glasston	520-385-3552	200 S Reddington Rd	Highway 76 1 mile west of highway 77	Open	520-385-3552
	BHP San Manuel Mine Site Wood Dump	BHP Copper	BHP Copper	James Glasston	520-385-3552		Highway 76 east of San Manuel Townsite	Open	520-385-3552
	BHP San Manuel Mine Site SW Dump	BHP Copper	BHP Copper	James Glasston	520-385-3552		Highway 76 east of the Town of San Manuel	Open	520-689-2444
	Superior Magma	BHP Billiton	BHP Billiton	Bill Gray	520-229-4306			Open	928-633-3390
Yavapai	Phelps Dodge Bagdad Copper Corp.	Phelps Dodge	Phelps Dodge	Brent Fletcher	928-633-3390		Approx. 0.5 miles along mine access rd. due west of security gate	Open	
	Black Mesa Pipeline - Seligman	Black Mesa Pipeline Inc	Black Mesa Pipeline Inc	Fred Rimington	402-492-7557	PO Box 542500, Omaha, NE 68154	10 miles SW of Seligman on Fort Rock Rd off AZ HWY 66	Open	

ADEQ Registered Used Oil Transporter Contacts 3rd Quarter 2011
Compiled November 2011

AAA Waste Oil Company

Mailing Address:	Facility Address:
6260 N Calle De Ona	3219 East 48th Street
Tucson, AZ 85741	Tucson, AZ 85713

Arizona Waste Oil Service (AWOS)

Mailing Address:	Facility Address:
PO Box 19149	7030 East Old Vail Road #5
Tucson, AZ 85731-9149	Tucson, Arizona 85706

Arizona Waste Oil Transfer Site (AWOS)

Mailing Address:	Facility Address:
PO Box 19149	6964 East Century Park Drive
Tucson, AZ 85731-9149	Tucson, Arizona 85706

Booth Machinery, Inc.

Mailing Address:	Facility Address:
P.O. Box # 2768	6565 East 30th Street
Yuma, AZ 85366	Yuma, AZ 85365

Bulk Carrier Services
3451 Losee Rd, Ste A
North Las Vegas, NV 89030

Chemical Transportation, Inc.

Facility Address #1	Facility Address #2::
11105 N Casa Grande Highway	1945 East Jackson
Tucson, AZ	Phoenix, AZ

Mailing Address #1:	Mailing Address #2:
P.O. Box # 397	1945 East Jackson Street
Rillito, AZ 85654	Phoenix, Arizona 85034

Crane's Waste Oil, Inc.

Mailing Address:	Facility Address:
15412 Hwy 178	16095 Hwy 178
Weldon, CA 93283-9702	Weldon, CA 93283-9702

Copper State Petroleum, Inc.

Mailing Address:	Facility Address:
3370 N Hayden Rd, #123 M/S 584 Scottsdale, AZ 85251	2132 South 5th Avenue Phoenix, AZ 85003

Duncan Environmental

Mailing Address:	Facility Address:
P.O. Box #: 25674 Prescott Valley, AZ 86312	8461 East Dalas Road Prescott Valley, AZ 86314

Environmental Response, Inc.
2202 W Medtronics Way, Ste 108
Tempe, AZ 85281

Stericycle Specialty Waste Solutions, Inc.

Mailing Address:	Facility Address:
2120 Southwest Blvd. Tulsa, OK 74107	2844 West Broadway Road Phoenix, AZ 85041

Filter Recycling Services, Inc.

Mailing Address:	Facility Address:
PO Box 449 Colton, CA 92404	180 W Monte Ave Colton, CA 92316

Heritage Environmental Services, LLC
284 E Storey Rd
Coolidge, AZ 85228

Industrial Recycling Solutions, Inc.

Mailing Address:	Facility Address:
PO Box 878 Peoria, AZ 85380-0878	2610 West Holly Street #C Phoenix, AZ 85009

January Transport, Inc.

Mailing Address:	Facility Address:
2701 S Prospect Oklahoma City, OK 73129	4300 SW 36th Street Oklahoma City, OK 73129

Mesa Oil, Inc.
Mailing Address:
7239 Bradburn Blvd
Westminster, CO 80030

Facility	Location
Mesa Oil Inc. AZR000033381	209 South 57th Ave, PHX
Mesa Oil Inc. NM0000096024	20 Lucero Rd, Belen NM

M.L. Sheets Transport, LLC
6104 West Acoma Drive
Glendale, AZ 85306-3828

MP Environmental Services, Inc.
3045 S 51st Ave
Phoenix, AZ 85043

NAFTA Environmental, Inc.
PO Box 545
Somerton, AZ 85350-0545

Overley's Vacuum Service
18616 S Lindsay Rd
Gilbert, AZ 85296

Pacific Oil Company
19528 Ventura Blvd
Tarzana, CA 91356

Parker Oil Products

Mailing Address:	Facility Address:
P.O. Box #: 775	508 California Ave
Parker, AZ 85344	Parker, AZ 85344

PSC Industrial Outsourcing LP / Rhochem, LLC
Mailing Address:
5150 North Tom Murray Avenue
Glendale, AZ 85301

Facility	Location
PSC Industrial Outsourcing LP	5150 North Tom Murray Avenue, Glendale, AZ 85301
Rhochem, LLC	5150 North Tom Murray Avenue, Glendale, AZ 85301

RCM Transportation, LLC
2041 South Sunburst Drive
Tucson, AZ 85748

Red J Environmental

Mailing Address:	Facility Address:
1465 N Fiesta Blvd. Gilbert, AZ 85233	3215 South 7th Street Phoenix, AZ 85040

Romulan Transportation
P.O. Box # 26983
El Paso, Texas 79926

Safety-Kleen Corporation
Mailing Address:
1502 East Villa Street, 2nd Floor
Elgin, Illinois 60120

Facility	Location	EPA ID #:
Farmington	4200 N Hawkins Road Farmington, NM 87410	NMD980698849
Tucson	4161 E Tennessee Tucson, AZ 85719	AZD980892897
Chandler	6625 W. Frye Road Chandler, AZ 85226	AZD981969504

SLT Express Way, Inc
7138 North 110th Avenue
Glendale, AZ 85307

Solvent RecyClean, Inc.
1850 W Broadway Rd, Suite 110
Phoenix, AZ 85041-2255

Statewide Environmental Services

Mailing Address:	Facility Address:
PO Box 2077 Gilbert, AZ 85299	2475 West Dallas, #4 Apache Junction, AZ 85220

Thermo Fluids, Inc.
Mailing Address:
Pima Center Parkway, Suite #105
Scottsdale, AZ 85258

#	*Facility*	*Address:*
1.	Thermo Fluids Inc, Phoenix	4301 W. Jefferson St Phoenix, AZ 85043
2.	Thermo Fluids Inc, Tucson	3401 E Pennsylvania Tucson, AZ 85713
3.	Thermo Fluids Inc, Albuquerque	9010 Bates Rd SW Albuquerque, NM 87105
4.	Thermo Fluids Inc, LV Antifreeze	4000 Arcata Way Las Vegas, NV 89030
5.	Thermo Fluids Inc, LV	9 West Delhi Las Vegas, NV 89030
6.	Thermo Fluids Inc, El Paso	8528 Alameda Ave El Paso, TX 79907
7.	Thermo Fluids Inc, Brownfield	2302 Lubbock Rd Lubbock, TX 79316
8.	Thermo Fluids Inc, Denver	4845 Forest Commerce City, CO 80022

Trans Titan, LLC

Mailing Address:	Facility Address:
3613 Crossings Drive, Suite A Prescott, AZ 86305	31645 Industrial Lane – Trans. Building Parker, AZ 85344

Trimac Transportation
13301 Bay Park Rd
Pasadena, TX 77507

Univar - USA, Inc.
50 S 45th Avenue
Phoenix, AZ 85043

(Worley's) Trinity Transport, LLC
3820 West Hermans Road
Tucson, AZ 85746-9385

Botavia Energy, LLC
Mailing Address:
4535 Sahara Avenue, Suite #200
Las Vegas, Nevada 89102-3625

Facility	Location
#1	49945 Ehrenberg Parker Highway, Ehrenberg, AZ 85334
#2	3174 East Highway 90, Yuma, AZ 85365

Road Machinery, LLC

Facility:	Facility Address / Mailing Address:
Road Machinery, LLC	3285 East 44th Street, Tucson, AZ 85713
Road Machinery, LLC	1339 West San Pedro, Gilbert, AZ 85233

Ancon Service Company
1777 North 23rd Avenue
Phoenix, Arizona 85009

Kleilock Environmental, LLC

Mailing Address	Facility Address:
5978 East Cactus Lane Cottonwood, AZ 86326-6045	1625 Sullivan Avenue Camp Verde, Arizona 86322

Bennett Oil Company
810 E. Sheldon Street
Prescott, AZ 86301

Environmental Logistics, Inc.
140 West Monte Avenue
Bloomington, CA 92316

Los Angeles Pumping Co, LLC

Mailing Address:	Facility Address:
P.O. Box 921393	13377 Herrick Avenue
Sylmar, CA 91392	Sylmar, CA 91342

Kern Oil Filter Recycling
2355 Road 192
Delano, Ca 93215

All Valley Environmental
P.O. Box #: 7003
Big Bear Lake, California 92315

Blue Hills Environmental
P.O. Box #: 175
St. Johns, Arizona 85936

Alexis Environmental, Inc.
219 Glider Circle
Corona, CA 92880

American Technical Services, LLC
1936 North Tortoise Trail
Dragoon, Arizona 85609

Triad Transport, Inc.
P.O. Box #: 818
McAlester, Oklahoma 74502

Graham's Mobile Solutions
10027 E Isleta Ave
Mesa, Arizona 85209

Fuels, LLC

Facility Address:
308 South Lebaron
Mesa, AZ 85210

Facility Address:
203 South 23rd Street
Phoenix, AZ

Facility Address:
400 Valley Chile Road
Anthony, TX 79821

San Fernando Oil
10341 Rincon Avenue
Pacoima, California 91331

Wild West Express Oil Recovery
404 North Main Street
Cottonwood, Arizona 86326

Mashburn Transportation Services, Inc.

Mailing Address:	Facility Address:
PO Box 66	1423 Kern Street
Taft, California 93628	Taft, California 93628

Belsito Plumbing LLC

Mailing Address:	Facility Address:
10645 North Tatum Blvd	7740 East Redfield Road
Suite 200-651	Scottsdale, AZ 85260-6903

Force 1 One Transport, Inc.
1364 East 142nd Street
Compton, California 90222

JB Transportation Services, Inc.
DBA All Phase Environmental

Mailing Address:	Facility Address:
P.O. Box # 265	910 East 4th Street
Tustin, California 92781	Santa Ana, California 92701

Englund Equipment Co.

Mailing Address:	Facility Address:
PO Box 250 Cashion, AZ 85329	11498 West Buckeye Road Cashion, AZ 85329

Neier, Inc.

Mailing Address:	Facility Address:
P.O. Box # 151 Coatesville, IN 46121-9703	8069 West Main Street Coatesville, IN 46121

Heritage Crystal Clean, LLC

Mailing Address:	Facility Address:
2175 Point Blvd, Suite 375 Elgin, Il 60115	3220 West Sherman Street Phoenix, AZ 85009

DNG Trucking, Inc.
9065 West Palm Lane
Phoenix, AZ 85037

Action Lube, LLC

Mailing Address:	Facility Address:
4225 Roosevelt Street Kingman, AZ 86409	1714 Los Angeles Street Kingman, AZ 86401

MMX – Used Oil Transporter

Mailing Address:	Facility Address:
3022 East Garfield Phoenix, AZ 85008	3022 East Garfield Street Phoenix, AZ 85008

Used Oil Transporter, LLC
5907 West Desert Cove
Glendale, AZ 85304

EFR Environmental Services

Mailing Address:	Facility Address:
PO Box 2669 Alpine, CA 91903-2669	14232 Old Highway 80 El Cajon, California 92020

Southwest Oil Recovery

Mailing Address:	Facility Address:
PO Box 18251 Phoenix, AZ 85808	4215 W Whitton Ave Phoenix, AZ 850149

Rapid Environmental Services
3305 Lee Blvd., Building A
El Paso, Texas 79936

US Fuel Oil, LLC

Mailing Address:	Facility Address:
8967 West Olive Avenue, Suite # 117-27 Peoria, AZ 85345	3125 W. Dome Rock Road Quartzsite, AZ 85346

Black Oil Transporters, LLC

Mailing Address:	Facility Address:
1041 North 27th Place Phoenix, AZ 85008	1045 N. 21st Place Phoenix, AZ 85008

APPENDIX B7

HAZARDOUS MATERIALS MANAGEMENT PLAN

HAZARDOUS MATERIALS MANAGEMENT PLAN

Prepared for

Arizona Public Service Company
2124 West Cheryl Drive
Building B2, MS 3371
Phoenix, Arizona 85201

February 2012

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Attachments

A. Typical Fuel, Lubricants, And Hazardous Materials
B. Example Hazardous Waste Labels

PLAN AMENDMENTS

This hazardous materials management plan will be amended when:

- There are revisions to applicable laws or regulations
- A significant increase in the quantity of or change in a disclosed material occurs
- New hazardous materials are brought onto the project site
- There is a change in business name or address
- There is a change in coordinators or contacts

Amendment Log

Amendment Number	Date	Description Of Amendment	Page Number	Amended By (Print And Initial)

1.0 INTRODUCTION

Arizona Public Service (APS) has applied for a right-of-way (ROW) grant from the Bureau of Land Management (BLM) to construct, operate, and maintain a 111-mile-long, 500-kilovolt transmission line known as the Hassayampa–North Gila #2 (HANG2) Transmission Line (the project). This hazardous materials management plan (HMMP) for the HANG2 project is designed to meet the requirements of the BLM ROW grant. The purpose of the HMMP is to reduce the risks associated with the storage, use, transportation, and disposal of hazardous materials anticipated to be used during the construction phase of the project.

1.1 Project Overview

The HANG2 transmission line will originate in Maricopa County at the existing Hassayampa Switchyard at the Palo Verde Hub, south of the Palo Verde Nuclear Generating Station, and terminate in Yuma County at the existing North Gila Transmission Substation site, northeast of Yuma, Arizona (see POD project overview). A 200-foot-wide ROW will be utilized for the transmission line and structures; additional areas will be needed for access roads, material storage/show-up yards, and line pulling sites. Steel lattice towers are the primary structures to be used on HANG2. The span length between structures will vary between 600 and 2,100 feet, and up to 390 structures will be constructed for the project outside the substations at each end.

Construction activities performed in conjunction with the HANG2 project will be in conformance with all federal, state, and local rules, regulations, and ordinances applicable to the use, storage, transportation, production, and disposal of hazardous materials. A hazardous material is a substance that, because of the quantity, concentration, or physical or chemical characteristics, may pose an unreasonable risk to health, safety, and property (49 Code of Federal Regulations [CFR] 171.8). Hazardous materials include flammable or combustible material, toxic material, poisonous and infectious material, corrosive material, oxidizers, aerosols, biohazards, and compressed gases. The following regulatory codes may be applicable:

- Occupational Safety and Health Administration (OSHA) 1910.1200, Hazardous Communications Standards
- Solid and Hazardous Wastes (40 CFR 239–299)
- Clean Water Act (40 CFR 100–149)
- Clean Air Act (40 CFR 15–99)
- Toxic Substance Control Act (40 CFR 700–799)
- Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300–372)
- Hazardous Materials Transportation Act (49 CFR 100–199)
- Arizona Administrative Code R18-8-260 to 280
- Arizona Revised Statutes 49-901 through 49-944

1.2 Operator Information

The HANG2 transmission line will be owned and operated by APS, although it will be constructed on federal and non-federal lands. Owner/operator information for the project is:

Arizona Public Service
2124 West Cheryl Drive
Building B2, M.S. 3371
Phoenix, Arizona 85201

The designated representative(s) having operational control over construction is:

Naomi Prieto
APS Project Manager
2124 West Cheryl Drive
Building B2, M.S. 3371
Phoenix, Arizona 85021
602.371.7075
Naomi.Prieto@aps.com

The designated Emergency Coordinator contact information for this HMMP for the project is:

Michelle Turgeon
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
602.371.7715
24-hour emergency phone 602-371-6900
Michelle.Turgeon@aps.com

The Alternate Emergency Coordinator contact information for this HMMP for the project is:

Ben Dowler
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
602.328.1925
Benjamin.Dowler@aps.com

2.0 SITE INFORMATION

2.1 Site Map

Because of the linear nature of the HANG2 project, all potentially hazardous materials that will be stored during the construction of the transmission line will be stored in designated material storage/show-up yards. No storage will occur outside the designated areas. The locations of the proposed material storage/show-up yards are shown on Figure 1 in the POD. A site layout map will be developed for each of the material yards to identify material storage areas where hazardous materials will be stored and safety precautions that will be implemented.

2.2 Other Environmental Documents

Other environmental documents associated with this HMMP that are being developed for the construction phase of the HANG2 project include:

- Stormwater pollution prevention plan to address erosion and stormwater control and prevent migration of contaminated stormwater off the construction site
- Spill prevention control and countermeasure (SPCC) plan to address prevention and remediation of oil, hydraulic fluid, and petroleum fuel spills
- Spill prevention and response plan (SPRP) to identify where hazardous materials and wastes are to be stored on-site, spill prevention measures, training, and procedures for spill response and notification procedures
- Waste management plan to address solid and liquid wastes generated at the site.

2.3 Hazardous Materials Inventory

Following is a description of the types of hazardous materials that are expected to be used on the HANG2 project site and a description of the amounts, transportation, and storage methods.

2.3.1 Types and Amounts of Hazardous Materials

The contractor will maintain an inventory of all hazardous materials stored or used on the construction project site. This will include potentially hazardous materials such as fuels, oils, hydraulic fluid, lubricating oils and solvents, cleansers, explosives, and herbicides.

A list of the typical fuel, lubricants, and hazardous materials used on transmission line projects of this type is provided in *Attachment A*. The contractor will provide, maintain, and make available the appropriate Material Safety Data Sheet (MSDS) documents for all hazardous materials used or stored in the material storage/show-up yards or used on the ROW. Because of the remote nature of this project, diesel fuel will need to be stored in relatively large quantities (up to 500 gallons) at material storage/show-up yards or used on the ROW to operate and maintain equipment during construction. Smaller quantities of other hazardous materials, such as paints, and other chemicals, may also be used on-site and stored in the material yards.

To the extent possible, storage and use of hazardous materials in the material storage/show-up yards and in the ROW will be minimized to the amount necessary to perform the work.

2.3.2 Transportation and Storage of Hazardous Materials

Procedures for loading and transporting fuels and other hazardous materials will meet the minimum requirements established by the U.S. Department of Transportation (USDOT) and by the Arizona Department of Transportation. Transportation of hazardous materials will be performed by a hazardous material transport company, and appropriate shipping papers shall be completed by properly trained personnel in accordance with federal and state regulations and guidance. During transportation, all hazardous materials used for the HANG2 project will be properly labeled and stored in USDOT-approved containers. If it is determined that blasting rock will be necessary to install transmission towers, a blasting plan will be developed and will contain special provisions specific to the transportation and storage of explosives.

Refueling of equipment in the ROW will be necessary throughout the construction phase. As needed, fuel will be transferred from bulk storage tanks in the materials yard to refueling tankers or transported from non-project related facilities. Fuel will then be transported to a specific location within the ROW. All refueling activities will be monitored by the contractor's site coordinator or their designee. Transfer of materials from large bulk tanks to small refueling tankers will be performed using the appropriate equipment, including pumps, hoses, and safety equipment. All fuel nozzles will be equipped with functional automatic shut-off valves. Devices such as drip trays and sorbent pads will be used during on-site refueling to minimize spills. Prior to departure of any refueling tanker, all outlets on the vehicle will be examined by the driver for leakage and tightened, adjusted, or replaced as necessary to prevent leaking while in transit. Details on spill prevention measures and procedures that will be used at the project site are addressed in the project SPCC plan and SPRP.

Storage methods and quantities will vary with the length of project construction phases, the time of year, and the type of terrain. MSDSs for all hazardous materials used or stored in the ROW or in material yards will be made accessible to all contractor, subcontractor, and APS employees. The MSDSs will provide basic emergency response information for small and large releases of hazardous materials. In addition, the contractor will make copies of the USDOT-produced Emergency Response Guidebook available for employee reference.

All hazardous materials stored on the project site will be located in secured fenced materials storage/ show-up yards at least 100 feet away from washes, ditches, or other waterways and away from environmentally sensitive areas or areas subject to periodic flooding. All storage containers will remain sealed when not in use, and storage areas shall be gated, locked, and/or guarded at night or during non-construction periods.

Totally enclosed containment will be provided for all hazardous materials. Containers holding hazardous materials or waste will be compatible with the specific materials stored. At a minimum, containers shall be inspected weekly to verify the integrity of the containers and containment system. If the container is damaged or shows signs of leaking, the material will be transferred to a container in good condition. Hazardous materials or waste will not be placed in containers that previously held an incompatible waste or material. Containers holding hazardous materials or waste that are reactive or that may ignite must be located in a suitable location in the materials storage/show-up yard and "NO SMOKING" signs shall be posted.

Containers that once held hazardous substances such as products or waste will be considered potentially hazardous waste due to residual materials.

2.3.3 Secondary Containment

Liquid hazardous materials will be placed within secondary containment and inspected daily for spills or leaks. Diesel fuel is the only hazardous material that is expected to be stored on the project site in large bulk quantities. Secondary containment for large volumes of diesel include devices such as dual-walled aboveground tanks or bermed areas lined with impervious material designed to provide a minimum containment volume equal to 150% of the volume of the largest storage vessel contained within the bermed area. Small volumes of materials such as paints or solvents will be stored in properly labeled containers in fireproof boxes inside contractor vehicles or on-site structures.

3.0 HAZARDOUS WASTE MANAGEMENT

Containers holding hazardous wastes will be kept closed at all times, except when it is necessary to add or remove contents. Before the handling or transportation of containers carrying hazardous waste, the containers will be inspected to ensure that they are sealed so no spilling of the material can occur.

3.1 Responsibilities

It is the construction contractor's responsibility to properly collect, store, and contain hazardous construction waste in accordance with all federal, state, and local rules, regulations, and ordinances until such time as it can be removed from the site to a disposal facility authorized to accept such materials. It is the construction contractor's and subcontractor's responsibility to ensure that their employees are familiar with this HMMP and take appropriate actions if they become aware of an issue. It is the employees' responsibility to follow the directions outlined in this HMMP and report any variances to their supervisor.

Hazardous waste will be removed from the HANG2 project site and disposed of by a contracted, permitted transporter facility. U.S. Environmental Protection Agency (EPA)-approved waste manifest forms will be used when hazardous waste is transported. Copies of all waste manifests will be maintained by APS for a minimum of 3 years.

All project documents relating to hazardous waste and materials management will be maintained on-site until project completion. Upon project completion, project documents will become part of the permanent project construction record maintained by the contractor and APS and available to regulatory personnel at any time. This includes:

- MSDSs
- Training records
- Spill reports
- Laboratory reports
- Chain-of-custody forms
- Waste manifests
- Transportation documents
- Compliance reports and audits
- Site inspection reports
- Vehicle inspection reports
- Other related environmental documents

3.2 Training

All APS construction personnel, as well as contractor employees and subcontractors, will be required to complete training before they commence work on the project. Hazardous waste and materials management and spill response will be addressed during project orientation. Additional training/ certifications will be provided to employees who are responsible for handling or transporting hazardous materials for the project. This will include training on the proper use and management of the materials. Refresher training will be performed at least annually or may be conducted as part of mandatory weekly safety and environmental meetings. Training records will be maintained by the contractor as part of the permanent construction record.

Training topics will include items such as:

- Information about the Hazardous Communication Program (HCP), including the location of the HCP binder, organization of the MSDSs within the HCP, availability of the MSDSs for their use and what information they contain, the manner in which hazardous substances are labeled, and the list of hazardous substances that may be encountered at the job site

- Information on the handling and storage of hazardous materials
- An explanation of any operations that will take place in the work area where hazardous substances are present, the physical and health hazards of the substance, and protection measure to be used to prevent exposure (such as appropriate work practices, emergency procedures, and proper use of personal protective equipment)
- The importance of immediately reporting to a project supervisor the visual appearance of a release of a substance or detected odors

3.3 Labeling and Hazard Communication

The construction contractor will label all hazardous waste storage containers, as required by 40 CFR 262. Hazardous waste labels will include the following:

- The accumulation start date and/or the date of the 90-day storage period The words "Hazardous wastes"
- A warning indicating the hazards of the particular waste (such as flammable, corrosive, or reactive)
- The name and address of the facility that generated the waste

Example hazardous waste labels are provided in *Attachment B*.

A hazardous waste permit is not required for generators who store hazardous waste for less than 90 days for large-quantity generators. Conditionally exempt hazardous waste includes waste produced that does not exceed the generation of 220 pounds per month of all hazardous waste combined or the aggregate accumulation of 2,200 pounds of hazardous waste on site.

Each contractor and subcontractor is required under OSHA to have its own HCP that identifies methods for informing and training employees on hazardous substances that may be encountered on the job site, MSDSs, and labeling procedures.

Master MSDSs will be maintained in the HCP, and sheets shall be updated if and when they are updated by the supplier. All MSDSs must be readily accessible to employees and must contain the following information:

- Identity of the substance as used on the label
    - The chemical name and common name if a single substance, or
    - The chemical and common name(s) of the ingredients if a mixture, or
    - To the extent required by OSHA, the chemical and common name(s) of the ingredients if a mixture has not been tested as a whole
- Chemical and physical characteristics
- Physical hazards of the substance
- Medical conditions and health hazards generally recognized as being aggravated by exposure to the substance
- Primary route of entry
- Exposure limit recommended by the manufacture
- Whether the substance is a carcinogen
- Precautions for safe handling and use

- Control measures
- First-aid and emergency procedures
- Most current date of issue
- Name, address, and telephone number of the manufacturer, who can provide additional information on the substance and appropriate emergency procedures

Each container of hazardous substance entering the job site must be labeled, tagged, or marked. Labels should never be removed from a container and should contain the following:

- Identity of the hazardous chemical
- Appropriate hazard warnings
- Name and address of the supplier

3.4 Expected Hazardous Waste, Disposal, and Handling

Common construction-generated hazardous waste includes items such as used aerosol cans, used oil or oil products, empty hazardous material containers with hazardous substance residue, or material associated with a leak or spill. The construction contractor will properly collect, store, and contain hazardous construction waste on the project site until such time as it can be removed to a disposal facility authorized to accept such materials. All hazardous materials will be stored in closed containers that are labeled as specified in Section 3.3.

Hazardous materials will be removed from the project site and disposed of by a contracted, permitted transporter facility. EPA-approved waste manifest forms will be used when hazardous waste is transported, and such manifests will become part of the project's permanent construction record.

Copies of manifests of all hazardous materials disposed of must be provided to APS Environmental Field Operations.

4.0 OPERATING PROCEDURES

The following hazardous materials mitigation measures will be implemented by all APS construction contractors:

- Totally enclosed containment will be provided for all hazardous waste
- All potentially hazardous construction waste will be removed to a disposal facility authorized to accept such material
- A spill contingency plan and an SPCC plan will be prepared to address prevention and remediation of oil, hydraulic fluid, and petroleum fuel spill, including spills that could enter navigable waters of the United States
- Oils or chemicals will be hauled to an approved site for disposal
- If a spill occurs on federal or state land, the appropriate agency office will be notified, and a copy of the manifest for disposal of the affected materials will be provided to the appropriate agency if required.

5.0 SPILL CONTINGENCY PLAN

An SPCC plan has been prepared for the HANG2 project and is incorporated into this HMMP as a matter of reference. The SPCC plan details the spill response procedures, employee training, and spill response equipment.

5.1 Emergency Contacts

The APS Spill Coordinator for the project is:

Michelle Turgeon
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
602.371.7715
Michelle.Turgeon@aps.com

Ben Dowler
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
602.328.1925
benjamin.dowler@aps.com

APS 24-hour Spill Line: (602) 371-6900

The Contractor Spill Coordinator for the project is yet to be determined.

The Emergency Response Contractor for the project is yet to be determined.

5.2 Spill Response Procedures

In the instance of a spill of hazardous materials, immediate response activities will be initiated by field personnel. Only persons having received proper training and with the appropriate protective clothing and clean-up materials should attempt to clean up or control a spill. Untrained individuals should notify the appropriate response personnel.

All spills must be reported to the APS Spill Coordinator and/or the APS Site Representative. If a spill occurs on federal or state land, the appropriate agency office will be notified, and a copy of the manifest for disposal of the affected materials will be provided to the appropriate agency if required.

5.3 Employee Training

The SPCC plan details employee training regarding spill prevention and emergency response procedures for the HANG2 project. Employee training also includes:

- Use of spill clean-up materials and equipment
- Procedures for coordinating emergency response teams

- Procedures for notifying agencies
- Procedures for documenting spills
- Identification of sites/areas requiring special treatment

5.4 Spill Contingency Response Equipment

The contractor shall supply spill prevention kits, which shall be stored at all material yards and readily accessible during construction. The Spill Coordinator will make known to all personnel involved with construction the contractor's location of the spill prevention kits. The contractor shall also provide a smaller portable spill kit for each truck. An SPRP detailing the spill response equipment has been prepared for the HANG2 project and is incorporated into this HMMP as a matter of reference.

Attachment A

TYPICAL FUEL, LUBRICANTS, AND HAZARDOUS MATERIALS

Generic List of Chemicals Used during the Construction of an Overhead Transmission Line

2-cycle oil (contains distillates and hydrotreated heavy paraffinic)

ABC fire extinguisher

Acetylene gas

Air tool oil

Ammonium hydroxide

Automatic transmission fluid

Battery acid (in vehicles and in the meter house of the substations)

Bee Bop Insect Killer

Canned spray paint

Chain lubricant (contains methylene chloride)

Connector grease (penotox)

Contact cleaner 2000

Diesel de-icer

Diesel fuel

Diesel fuel additive

Explosives (detonators, detonator assemblies – non-electric, tubular primers, cap-type primers, ammonium nitrate fertilizers)

Eye glass cleaner (contains methylene chloride)

Gasoline

Gasoline treatment

Herbicides (used for vegetation control)

Hot Stick cleaner (cloth treated with polydimethylsiloxane)

Insulating oil (inhibited, non-PCB)

Lubricating grease

Mastic coating

Methyl alcohol

North wasp and hornet spray (1,1,1-trichloroethene)

Oxygen

Paint thinner

Petroleum products (gasoline, diesel fuel, jet fuel A, lubricants, brake fluid, hydraulic fluid)

Prestone 11 antifreeze

Propane.

Puncture seal tire inflator

Safety fuses

Starter fluid

Wagner brake fluid

WD-40

ZEP (safety solvent)

ZIP (1,1,1-tricholorethane)

Attachment B

EXAMPLE HAZARDOUS WASTE LABELS

Hazardous Waste Label

To be affixed on containers holding Hazardous Waste generated at a Hazardous Waste Small Quantity Generator (e.g. Deer Valley Service Center). Some examples include:

- Ignitable paint related waste
- Ignitable solvent waste
- Hazardous waste from paint chip or blast media (contains lead)
- Corrosive waste.
- Broken Lamps or Mercury switches (contains mercury)

HAZARDOUS WASTE

ACCUMULATION
START DATE_____
CONTENTS_____

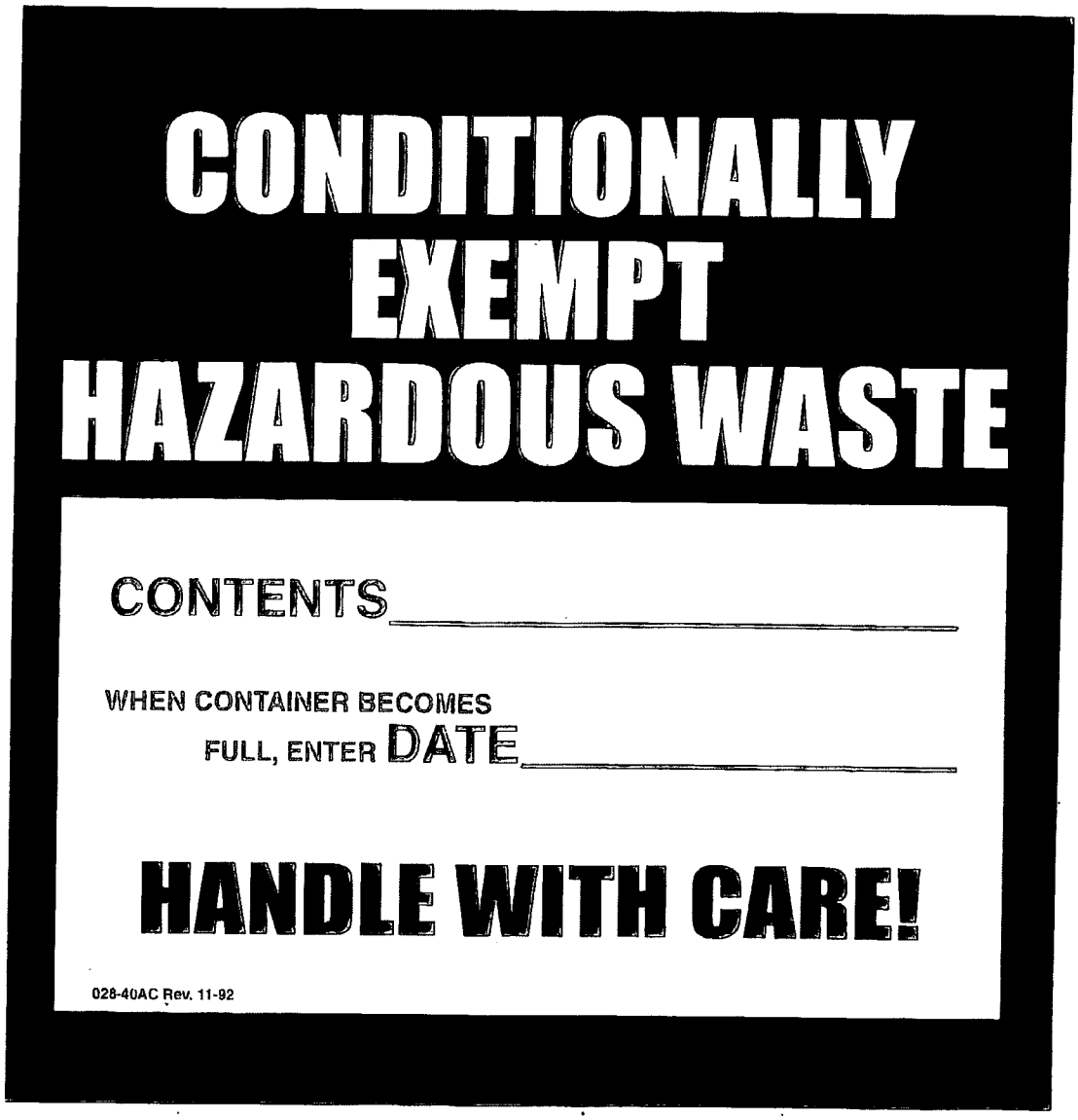
HANDLE WITH CARE!

CONTAINS HAZARDOUS OR TOXIC WASTES

Conditionally Exempt Hazardous Waste Label

To be affixed on containers holding Conditionally Exempt amounts of Hazardous Waste generated from field related activities and CESQG facilities. Some common examples include:

- Spent Sand Fuses contaminated with lead
- Street Light contaminated with mercury and lead
- Pressurized spent aerosol cans
- Fluorescent Lamps removed contaminated with mercury



APPENDIX B8

SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN

SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN

Prepared for

Arizona Public Service Company
2124 West Cheryl Drive
Building B2, MS 3371
Phoenix, Arizona 85201

February 2012

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2.0 INTRODUCTON **2**

3.0 TRAINING REQUIREMENTS **3**

4.0 TIER I QUALIFIED FACILITY SPCC PLAN **5**

Attachment

A. Response Procedures

1.0 OVERVIEW

This Spill Prevention Control and Countermeasure (SPCC) Plan for the Hassayampa–North Gila #2 (HANG2) 500kV Transmission Line Project (the project) has been prepared in accordance with 40 Code of Federal Regulations (CFR) 112 of the SPCC Rule as part of Arizona Public Service's (APS's) construction commitments made in 2008 to the Bureau of Land Management (BLM). The SPCC Rule, administered by the U.S. Environmental Protection Agency (EPA), is a rule that includes requirements for oil spill prevention, preparedness, and response to prevent oil discharge to navigable waters and adjoining shorelines. Specifically, the rule requires facilities to prepare, amend, and implement SPCC plans.

Under Section 112.6 of the SPCC Rule, two types of qualified facilities can self-certify the facility's SPCC Plan. This SPCC Plan has been prepared as a Tier I Qualified Facility, as the project meets the applicability criteria of Section 112.3(g)(1):

- The facility total aboveground oil storage capacity is 10,000 gallons or less;
- No individual aboveground oil containers greater than 5,000 gallons are located at the facility; and
- In the 3 years prior to the date the SPCC Plan will be certified, there was no single discharge of oil to navigable waters or adjoining shorelines exceeding 1,000 U.S. gallons, or there were no two discharges of oil to navigable waters or adjoining shorelines each exceeding 42 U.S. gallons within any 12-month period.

An owner/operator that self-certifies a facility's SPCC Plan attests that he/she is familiar with the SPCC Rule requirements and has visited and examined the facility. In addition, the owner/operator attests to the following:

- The SPCC Plan has been prepared in accordance with accepted and sound industry practices and standards and is within the rule requirements;
- Procedures for required inspections and testing have been established;
- The SPCC Plan is being fully implemented;
- The facility meets the qualifying criteria;
- The SPCC Plan does not deviate from rule requirements except as allowed and as certified by a P.E.; and
- Management approves the SPCC Plan and has committed resources to implement it.

The SPCC Plan herein addresses prevention and remediation of oil, hydraulic fluid, and petroleum fuel spills, including spills that could enter navigable waters of the United States. Spilled materials will be cleaned up immediately and hauled to a designated and approved site for disposal. If a spill occurs on federal or state land, the appropriate agency office or landowner will be notified, and a copy of the manifest for disposal of the affected materials will be provided to the appropriate agency if required.

Any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Section 102b. A copy of any report required or requested by any federal agency or state government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved federal agency or state government.

The Plan of Development (POD) will also include a spill prevention and response plan (SPRP) identifying where hazardous materials and wastes are stored on-site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on-site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.

In accordance with 40 CFR 112.3(e), a complete copy of this SPCC Plan is maintained both at APS and on-site and would be available for review by the EPA if requested.

If the project discharges more than 1,000 gallons in a single event or if it discharges more than 42 U.S. gallons of oil in each of two discharges occurring within any 12-month period, the SPCC Plan, with the site-specific information listed in 40 CFR 112.4(a), will be submitted within 60 days to the EPA Regional Administrator.

2.0 INTRODUCTON

Kenny Construction, on behalf of APS, has prepared this SPCC Plan, to be implemented during the construction phase of the HANG2 500kV Transmission Line. APS will be constructing, operating, and maintaining the 111-mile-long, 500kV transmission line for HANG2.

The new transmission line will originate in the existing Hassayampa Switchyard at the Palo Verde Hub, south of the Palo Verde Nuclear Generating Station, and will terminate at the existing North Gila Transmission Substation site, northeast of Yuma, Arizona (Refer to the POD project overview and Appendix A, Construction Maps).

This SPCC plan is required by EPA regulations contained in 40 CFR 112, Oil Pollution Prevention. These regulations are applicable to an owner or operator of a non-transportation-related onshore or offshore facility engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and oil products that, due to its location, could reasonably be expected to discharge oil in quantities that may be harmful into or upon the waters of the United States.

A project is subject to SPCC regulations if the total aboveground storage capacity of oil and oil products exceeds 1,320 gallons; or if the underground storage capacity exceeds 42,000 gallons; and if, because of its location, the facility could reasonably be expected to discharge oil into navigable waters of the United States. Containers with a capacity of less than 55 gallons of oil or oil products are exempted from the requirements under 40 CFR 112.

Oil is defined in 40 CFR 112.2 as "oil of any kind or in any form, including, but not limited to: fats, oils, or greases from animals, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredge spoil."

This SPCC Plan addresses two basic issues: 1) design, operation, and maintenance procedures to prevent and control oil spills; and 2) oil discharge response procedures for project personnel. More specifically, the first basic issue encompasses the following:

- measures designed for the prevention of operational error and equipment failure involving oil, which are the causes of most spills; and
- the control and recovery of oil spills by containment structures to prevent a spill from entering navigable waters.

The second basic issue specifically encompasses countermeasures (a contingency plan) to contain, clean up, and mitigate the effects of an oil spill at or from the project.

The EPA Tier I Qualified Facility SPCC Plan Template was used to develop this self-certified SPCC Plan, as the project meets all of the applicability criteria of a Tier I qualified facility under Section 112.3(g)(1) of the SPCC Rule. The completed template is provided in Section 3.

Weekly inspections will be performed by the SPCC Coordinator or a designee using the forms provided in Attachment 3 of the EPA's Tier I Qualified Facility SPCC Plan Template. The completed inspection forms will be kept with the master copy of the SPCC Plan. Inspection forms must be kept on-site.

Oil spill response procedures are provided in *Attachment B* of this SPCC Plan. A copy of the Discharge Notification Form is included in Attachment 4 of the EPA's Tier I Qualified Facility SPCC Plan Template. Any completed Discharge Notification forms will also be kept both with the master copy of the SPCC and with the SPCC on-site.

3.0 TRAINING REQUIREMENTS

All APS construction personnel as well as contractor employees and subcontractors involved with transporting or handling fueling equipment or maintaining construction equipment will be required to complete spill training before they commence work on the project. APS will audit contractor compliance with respect to this requirement and will instruct the contractor to replace any employees (or subcontractors' employees) found to be working on the project prior to having spill training. Spill training will also be required for contractor and subcontractor supervisory personnel before beginning work on the project.

Spill training programs will be conducted by the construction contractor and the APS Spill Coordinator and will do the following:

- Provide information concerning pollution control laws,
- Inform personnel concerning the proper operation and maintenance of fueling equipment,
- Inform personnel of spill prevention and response requirements,
- Describe the measures and provisions of the SPCC, and
- Assign roles and responsibilities for implementing the SPCC.

Measures, responsibilities, and provisions of this SPCC and spill training for other workers will be provided through ongoing safety briefings, which will discuss safety and spill prevention and response, including personal responsibility to initiate appropriate procedures. These safety briefing sessions will be held by the contractor as crew "tailgate" meetings. Contractor compliance with this requirement will be audited. Contractor will follow their disciplinary program, up to and including discharge for failure to hold such meetings. Attendance of training sessions will be documented using sign-in sheets that will become part of the permanent construction records.

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4.0 TIER I QUALIFIED FACILITY SPCC PLAN

U.S. ENVIRONMENTAL PROTECTION AGENCY
TIER I QUALIFIED FACILITY SPCC PLAN TEMPLATE

Instructions to Complete this Template

This template is intended to help the owner or operator of a Tier I qualified facility develop a self-certified Spill Prevention, Control, and Countermeasure (SPCC) Plan. To use this template, your facility must meet all of the applicability criteria of a Tier I qualified facility listed under §112.3(g)(1) of the SPCC rule. This template provides every SPCC rule requirement necessary for a Tier I qualified facility, which you must address and implement.

You may use this template to comply with the SPCC regulation or use it as a model and modify it as necessary to meet your facility-specific needs. If you modify the template, your Plan must include a section cross-referencing the location of each applicable requirement of the SPCC rule and you must ensure that your Plan is an equivalent Plan that meets all applicable rule requirements of 40 CFR 112.6(a)(3).

You may complete this template either electronically or by hand on a printed copy. This document is a reformatted version of the template found in Appendix G of 40 CFR part 112.[a] No substantive changes have been made. Please note that a "Not Applicable" ("N/A") column has been added to both Table G-10 (General Rule Requirements for Onshore Facilities) and Table G-11 (General Rule Requirements for Onshore Oil Production Facilities). The "N/A" column should help you complete your self-certification when a required rule element does not apply to your facility. Use of the "N/A" column is optional and is not required by rule.

All Tier I qualified facility self-certifiers must complete Sections I, II, and III. Additionally, the owner or operator of an:

- Onshore facility (excluding production) must complete Section A.
- Onshore oil production facility (excluding drilling and workover facilities) must complete Section B.
- Onshore oil drilling and workover facility must complete Section C.

Complete and include with your Plan the appropriate attachments. You should consider printing copies of the attachments for use in implementing the SPCC Plan (e.g. Attachment 3.1 - Inspection Log & Schedule; Attachment 4 - Discharge Notification Form).

To complete the template, check the box next to the requirement to indicate that it has been adequately addressed. Either write "N/A" in the column or check the box under the "N/A" column to indicate those requirements that are not applicable to the facility. Where a section requires a description or listing, write in the spaces provided (or attach additional descriptions if more space is needed).

Below is a key for the colors used in the section headers:

Sections I, II, and III: Required for all Tier I qualified facilities
Section A: Onshore facilities (excluding production)
Section B: Onshore oil production facilities (excluding drilling and workover facilities)
Section C: Onshore oil drilling and workover facilities
Attachments: 1 - Five Year Review and Technical Amendment Logs 2 - Oil Spill Contingency Plan and Checklist 3 - Inspections, Dike Drainage and Personnel Training Logs 4 - Discharge Notification Form

After you have completed all appropriate sections, certify and date your Plan, and then implement it by the compliance date. If your facility was in operation before August 16, 2002, and you do not already have a Plan, then implement this template immediately. Conduct inspections and tests in accordance with the written procedures that you have developed for your facility. You must keep with the SPCC Plan a record of these inspections and tests, signed by the appropriate supervisor or inspector, for a period of three years.

Do not forget to periodically review your Plan (at least once every five years) or to update it when you make changes to your facility. You must prepare amendments within six months of the facility change, and implement them as soon as possible, but not later than six months following preparation of any amendment.

In the event that your facility releases oil to navigable waters or adjoining shorelines, immediately call the National Response

[a] Please note that the use of this template is not mandatory for a Tier I qualified facility. You may also meet the SPCC Plan requirement by preparing a satisfactory Tier II qualified facility Plan, preparing a satisfactory Plan that is certified by a Professional Engineer, or by developing an equivalent Plan for a Tier I qualified facility. Further information on the requirements of these methods can be found in 40 CFR part 112.6(a)(1). If you use any of these alternative methods you must include a cross reference in your Plan that shows how the equivalent Plan meets all applicable 40 CFR part 112 requirements.

Center (NRC) at 1-800-424-8802. The NRC is the federal government's centralized reporting center, which is staffed 24 hours

Tier I Qualified Facility SPCC Plan

per day by U.S. Coast Guard personnel.

This template constitutes the SPCC Plan for the facility, when completed and signed by the owner or operator of a facility that meets the applicability criteria in §112.3(g)(1). This template addresses the requirements of 40 CFR part 112. Maintain a complete copy of the Plan at the facility if the facility is normally attended at least four hours per day, or for a facility attended fewer than four hours per day, at the nearest field office. When making operational changes at a facility that are necessary to comply with the rule requirements, the owner/operator should follow state and local requirements (such as for permitting, design and construction) and obtain professional assistance, as appropriate.

Facility Description

Facility Name: 500-kV transmission line for Hassayampa–North Gila #2

Facility Address: _____

City: Arlington to Yuma State: AZ ZIP: _____

County: Yuma and Maricopa Tel. Number: ( ) -

Owner or Operator Name: Arizona Public Service (APS)

Owner or Operator Address: APS Environmental Group 2124 W. Cheryl Drive Building B2, M.S. 3371

City: Phoenix State: AZ ZIP: 85021

County: Maricopa Tel. Number: ( ) -

I. Self-Certification Statement (§112.6(a)(1))

The owner or operator of a facility certifies that each of the following is true in order to utilize this template to comply with the SPCC requirements:

I Chris Walker certify that the following is accurate:

1. I am familiar with the applicable requirements of 40 CFR part 112;
2. I have visited and examined the facility;
3. This Plan was prepared in accordance with accepted and sound industry practices and standards;
4. Procedures for required inspections and testing have been established in accordance with industry inspection and testing standards or recommended practices;
5. I will fully implement the Plan;
6. This facility meets the following qualification criteria (under §112.3(g)(1)):
   a. The aggregate aboveground oil storage capacity of the facility is 10,000 U.S. gallons or less; and
   b. The facility has had no single discharge as described in §112.1(b) exceeding 1,000 U.S. gallons and no two discharges as described in §112.1(b) each exceeding 42 U.S. gallons within any twelve month period in the three years prior to the SPCC Plan self-certification date, or since becoming subject to 40 CFR part 112 if the facility has been in operation for less than three years (not including oil discharges as described in §112.1(b) that are the result of natural disasters, acts of war, or terrorism); and
   c. There is no individual oil storage container at the facility with an aboveground capacity greater than 5,000 U.S. gallons.
7. This Plan does not deviate from any requirement of 40 CFR part 112 as allowed by §112.7(a)(2) (environmental equivalence) and §112.7(d) (impracticability of secondary containment) or include any measures pursuant to §112.9(c)(6) for produced water containers and any associated piping;
8. This Plan and individual(s) responsible for implementing this Plan have the full approval of management and I have committed the necessary resources to fully implement this Plan.

I also understand my other obligations relating to the storage of oil at this facility, including, among others:

1. To report any oil discharge to navigable waters or adjoining shorelines to the appropriate authorities. Notification information is included in this Plan.
2. To review and amend this Plan whenever there is a material change at the facility that affects the potential for an oil discharge, and at least once every five years. Reviews and amendments are recorded in an attached log [See Five Year Review Log and Technical Amendment Log in Attachments 1.1 and 1.2.]
3. Optional use of a contingency plan. A contingency plan:
   a. May be used in lieu of secondary containment for qualified oil-filled operational equipment, in accordance with the requirements under §112.7(k), and;
   b. Must be prepared for flowlines and/or intra-facility gathering lines which do not have secondary containment at an oil production facility, and;
   c. Must include an established and documented inspection or monitoring program; must follow the provisions of 40 CFR part 109; and must include a written commitment of manpower, equipment and materials to expeditiously remove any quantity of oil discharged that may be harmful. If applicable, a copy of the contingency plan and any additional documentation will be attached to this Plan as Attachment 2.

I certify that I have satisfied the requirement to prepare and implement a Plan under §112.3 and all of the requirements under §112.6(a). I certify that the information contained in this Plan is true.

Signature _____ Title: Spill Coordinator

Name Chris Walker Date: / / 2012

II. Record of Plan Review and Amendments

Five Year Review (§112.5(b)):

Complete a review and evaluation of this SPCC Plan at least once every five years. As a result of the review, amend this Plan within six months to include more effective prevention and control measures for the facility, if applicable. Implement any SPCC Plan amendment as soon as possible, but no later than six months following Plan amendment. Document completion of the review and evaluation, and complete the Five Year Review Log in Attachment 1.1. If the facility no longer meets Tier I qualified facility eligibility, the owner or operator must revise the Plan to meet Tier II qualified facility requirements, or complete a full PE certified Plan.

Table G-1 Technical Amendments (§§112.5(a), (c) and 112.6(a)(2))	
This SPCC Plan will be amended when there is a change in the facility design, construction, operation, or maintenance that materially affects the potential for a discharge to navigable waters or adjoining shorelines. Examples include adding or removing containers, reconstruction, replacement, or installation of piping systems, changes to secondary containment systems, changes in product stored at this facility, or revisions to standard operating procedures.	☒
Any technical amendments to this Plan will be re-certified in accordance with Section I of this Plan template. *[§112.6(a)(2)]* **[See Technical Amendment Log in Attachment 1.2]**	☒

III. Plan Requirements

1. Oil Storage Containers (§112.7(a)(3)(i)):

Table G-2 Oil Storage Containers and Capacities		
This table includes a complete list of all oil storage containers (aboveground containers[a] and completely buried tanks[b]) with capacity of 55 U.S. gallons or more, unless otherwise exempt from the rule. For mobile/portable containers, an estimated number of containers, types of oil, and anticipated capacities are provided.		☒
Oil Storage Container *(indicate whether aboveground (A) or completely buried (B))*	**Type of Oil**	**Shell Capacity (gallons)**
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Diesel Fuel	>1,075
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Diesel Fuel	>1,075
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Diesel Fuel	>1,075
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Diesel Fuel	>1,075
	I	

Total Aboveground Storage Capacity[c] 4,300 gallons
Total Completely Buried Storage Capacity n/a gallons
Facility Total Oil Storage Capacity 4,300 gallons

[a] Aboveground storage containers that must be included when calculating total facility oil storage capacity include: tanks and mobile or portable containers; oil-filled operational equipment (e.g. transformers); other oil-filled equipment, such as flow-through process equipment. Exempt containers that are not included in the capacity calculation include: any container with a storage capacity of less than 55 gallons of oil; containers used exclusively for wastewater treatment; permanently closed containers; motive power containers; hot-mix asphalt containers; heating oil containers used solely at a single-family residence; and pesticide application equipment or related mix containers.

[b] Although the criteria to determine eligibility for qualified facilities focuses on the aboveground oil storage containers at the facility, the completely buried tanks at a qualified facility are still subject to the rule requirements and must be addressed in the template; however, they are not counted toward the qualified facility applicability threshold.

[c] Counts toward qualified facility applicability threshold.

2. Secondary Containment and Oil Spill Control (§§112.6(a)(3)(i) and (ii), 112.7(c) and 112.9(c)(2)):

Table G-3 Secondary Containment and Oil Spill Control	
Appropriate secondary containment and/or diversionary structures or equipment[a] is provided for all oil handling containers, equipment, and transfer areas to prevent a discharge to navigable waters or adjoining shorelines. The entire secondary containment system, including walls and floor, is capable of containing oil and is constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs.	☒

[a] Use one of the following methods of secondary containment or its equivalent: (1) Dikes, berms, or retaining walls sufficiently impervious to contain oil; (2) Curbing; (3) Culverting, gutters, or other drainage systems; (4) Weirs, booms, or other barriers; (5) Spill diversion ponds; (6) Retention ponds; or (7) Sorbent materials.

Table G-4 below identifies the tanks and containers at the facility with the potential for an oil discharge; the mode of failure; the flow direction and potential quantity of the discharge; and the secondary containment method and containment capacity that is provided.

Table G-4 Containers with Potential for an Oil Discharge

Area	Type of failure (discharge scenario)	Potential discharge volume (gallons)	Direction of flow for uncontained discharge	Secondary containment method[a]	Secondary containment capacity (gallons)
Bulk Storage Containers and Mobile/Portable Containers[b]					
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Tank overfill, fitting leak, seam failure	10 - 1,075	Radial	Plastic liner and earthen berm	7,500
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Tank overfill, fitting leak, seam failure	10 - 1,075	Radial	Plastic liner and earthen berm	7,500
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Tank overfill, fitting leak, seam failure	10 - 1,075	Radial	Plastic liner and earthen berm	7,500
Horizontal, double wall, cylindrical steel tank on concrete saddles and gravel pad; aboveground	Tank overfill, fitting leak, seam failure	10 - 1,075	Radial	Plastic liner and earthen berm	7,500
Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[c]					
None					
Piping, Valves, etc.					
Aboveground piping between diesel and gasoline tank dispensers	Fitting leak or failure	1	Radial	Plastic liner and earthen berm	7,500
Steel tank mounted on trailer for transport on ROW	Tank overfill, fitting leak, seam failure		Radial	Spill kit	Absorbs up to 25
Motor, hydraulic, lubrication, and adjacent oil dispensing hoses	Fitting leak or failure, hose failure	>1	Radial	Spill kit	Absorbs up to 25
Product Transfer Areas (location where oil is loaded to or from a container, pipe or other piece of equipment.)					
Diesel and gasoline fuel transfer within laydown area	Receiving tank overfill, fitting leak or failure, fuel transfer hose failure	1-15		Spill kit	Absorbs up to 25
Refueling areas along the ROW in the field	Receiving container overfill, fitting leak or failure, fuel transfer hose failure	1-15	Radial	Spill kit	Absorbs up to 25
Other Oil-Handling Areas or Oil-Filled Equipment (e.g. flow-through process vessels at an oil production facility)					

None					

[a] Use one of the following methods of secondary containment or its equivalent: (1) Dikes, berms, or retaining walls sufficiently impervious to contain oil; (2) Curbing; (3) Culverting, gutters, or other drainage systems; (4) Weirs, booms, or other barriers; (5) Spill diversion ponds; (6) Retention ponds; or (7) Sorbent materials.
[b] For storage tanks and bulk storage containers, the secondary containment capacity must be at least the capacity of the largest container plus additional capacity to contain rainfall or other precipitation.
[c] For oil-filled operational equipment: Document in the table above if alternative measures to secondary containment (as described in §112.7(k)) are implemented at the facility.

3. Inspections, Testing, Recordkeeping and Personnel Training (§§112.7(e) and (f), 112.8(c)(6) and (d)(4), 112.9(c)(3), 112.12(c)(6) and (d)(4)):

Table G-5 Inspections, Testing, Recordkeeping and Personnel Training	
An inspection and/or testing program is implemented for all aboveground bulk storage containers and piping at this facility. *[§§112.8(c)(6) and (d)(4), 112.9(c)(3), 112.12(c)(6) and (d)(4)]*	☐
The following is a description of the inspection and/or testing program (e.g. reference to industry standard utilized, scope, frequency, method of inspection or test, and person conducting the inspection) for all aboveground bulk storage containers and piping at this facility: The 1,075-gallon diesel tank propsoed for each material storage/Show-up area is a well-designed, shop-built tank. All sides, including the bottom, of the tanks are elevated so they can be visually assessed by the assigned Spill Coordinator and are staged in the laydown area in lined-bermed areas. The sides, bottom, and top of these tanks can be observed. The SPCC Spill Coordinator or designee will inspect for malfunctions, deterioration, operator errors, leaks, damage, discharge, or corrosion of SPCC-regulated valves, pumps, tanks, piping, and spill prevention equipment. These items will be checked to minimize the possibility of spills of oil and hazardous substances. Inspections will be documented, and a written record of inspection, signed by an appropriate supervisor or the SPCC Coordinator, will be made a part of this SPCC Plan. Inspections will be recorded on forms located in Appendix B of the SPCC Plan and will be maintained with this SPCC Plan for a minimum of 3 years.	
Inspections, tests, and records are conducted in accordance with written procedures developed for the facility. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph. *[§112.7(e)]*	☒
A record of the inspections and tests are kept at the facility or with the SPCC Plan for a period of three years. *[§112.7(e)]* **[See Inspection Log and Schedule in Attachment 3.1]**	☒
Inspections and tests are signed by the appropriate supervisor or inspector. *[§112.7(e)]*	☒
Personnel, training, and discharge prevention procedures [§112.7(f)]	
Oil-handling personnel are trained in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and, the contents of the facility SPCC Plan. *[§112.7(f)]*	☒
A person who reports to facility management is designated and accountable for discharge prevention. *[§112.7(f)]* Name/Title: TBD by the Contractor	☒
Discharge prevention briefings are conducted for oil-handling personnel annually to assure adequate understanding of the SPCC Plan for that facility. Such briefings highlight and describe past reportable discharges or failures, malfunctioning components, and any recently developed precautionary measures. *[§112.7(f)]* **[See Oil-handling Personnel Training and Briefing Log in Attachment 3.4]**	☒

4. Security (excluding oil production facilities) §112.7(g):

Table G-6 Implementation and Description of Security Measures	
Security measures are implemented at this facility to prevent unauthorized access to oil handling, processing, and storage area.	☒

The following is a description of how you secure and control access to the oil handling, processing and storage areas; secure master flow and drain valves; prevent unauthorized access to starter controls on oil pumps; secure out-of-service and loading/unloading connections of oil pipelines; address the appropriateness of security lighting to both prevent acts of vandalism and assist in the discovery of oil discharges:

There are four proposed material storage/Show-up areas proposed in the HANG2 project. Each material storage/Show-up area is surrounded by an 8-foot fence and is kept locked during all non-working hours. Contractors or subcontractors may not enter the laydown areas unless authorized by the Construction Contractor Superintendent. During non-working hours, the laydown area is locked to prevent unauthorized entry. The fenced area is normally locked by the Construction Contractor Superintendent designee.

Access to the handling and storage areas is restricted to employees and authorized contractors accompanied by employees.

Tank fill pipes are capped and locked when not in use.

Fuel dispensing hoses are properly stowed when not in use.

Refer to Appendix A for the location of the four proposed material storage/Show up yards.

5. Emergency Procedures and Notifications (§112.7(a)(3)(iv) and 112.7(a)(5)):

Table G-7 Description of Emergency Procedures and Notifications

The following is a description of the immediate actions to be taken by facility personnel in the event of a discharge to navigable waters or adjoining shorelines *[§112.7(a)(3)(iv) and 112.7(a)(5)]*:

As the situation warrants, the response procedures (relating to spill discovery, containment, cleanup, and notification) described in Appendix B of the SPCC Plan will be followed.

6. Contact List (§112.7(a)(3)(vi)):

Table G-8 Contact List	
Contact Organization / Person	**Telephone Number**
National Response Center (NRC)	1-800-424-8802
Cleanup Contractor(s)	
Key Facility Personnel	
Designated Person Accountable for Discharge Prevention: On-site employee TBD by the Contractor Michelle Turgeon, Spill Coordinator	Office: 602-371-7715
	Emergency:
	Office:
	Emergency:
	Office:
	Emergency:
	Office:
	Emergency:
State Oil Pollution Control Agencies Arizona Division of Emergency Management (ADEM) Arizona Department of Environmental Quality (ADEQ)	1-800-234-5677
Other State, Federal, and Local Agencies Maricopa County Department of Emergency Management APS Emergency Response	1-602-273-1411 1-602-371-6900
Local Fire Department Buckeye Fire Department	911; 1-623-349-6700
Local Police Department Maricopa County Sheriff's Office	911; 1-602-876-1801
Hospital West Valley Hospital	1-623-882-1500
Other Contact References (e.g., downstream water intakes or neighboring facilities)	

7. NRC Notification Procedure (§112.7(a)(4) and (a)(5)):

Table G-9 NRC Notification Procedure	
In the event of a discharge of oil to navigable waters or adjoining shorelines, the following information identified in Attachment 4 will be provided to the National Response Center immediately following identification of a discharge to navigable waters or adjoining shorelines **[See Discharge Notification Form in Attachment 4]**: *[§112.7(a)(4)]*	☒
• The exact address or location and phone number of the facility; • Date and time of the discharge; • Type of material discharged; • Estimate of the total quantity discharged; • Estimate of the quantity discharged to navigable waters; • Source of the discharge; • Description of all affected media; • Cause of the discharge; • Any damages or injuries caused by the discharge; • Actions being used to stop, remove, and mitigate the effects of the discharge; • Whether an evacuation may be needed; and • Names of individuals and/or organizations who have also been contacted.	

8. SPCC Spill Reporting Requirements (Report within 60 days) (§112.4):

Submit information to the EPA Regional Administrator (RA) and the appropriate agency or agencies in charge of oil pollution control activities in the State in which the facility is located within 60 days from one of the following discharge events:

A single discharge of more than 1,000 U.S. gallons of oil to navigable waters or adjoining shorelines or
Two discharges to navigable waters or adjoining shorelines each more than 42 U.S. gallons of oil occurring within any twelve month period

You must submit the following information to the RA:

(1) Name of the facility;
(2) Your name;
(3) Location of the facility;
(4) Maximum storage or handling capacity of the facility and normal daily throughput;
(5) Corrective action and countermeasures you have taken, including a description of equipment repairs and replacements;
(6) An adequate description of the facility, including maps, flow diagrams, and topographical maps, as necessary;
(7) The cause of the reportable discharge, including a failure analysis of the system or subsystem in which the failure occurred; and
(8) Additional preventive measures you have taken or contemplated to minimize the possibility of recurrence
(9) Such other information as the Regional Administrator may reasonably require pertinent to the Plan or discharge

* * * * *

NOTE: Complete one of the following sections (A, B or C) as appropriate for the facility type.

A. Onshore Facilities (excluding production) (§§112.8(b) through (d), 112.12(b) through (d)):

The owner or operator must meet the general rule requirements as well as requirements under this section. Note that not all provisions may be applicable to all owners/operators. For example, a facility may not maintain completely buried metallic storage tanks installed after January 10, 1974, and thus would not have to abide by requirements in §§112.8(c)(4) and 112.12(c)(4), listed below. **In cases where a provision is not applicable, write "N/A".**

Table G-10 General Rule Requirements for Onshore Facilities		N/A
Drainage from diked storage areas is restrained by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. Diked areas may be emptied by pumps or ejectors that must be manually activated after inspecting the condition of the accumulation to ensure no oil will be discharged. *[§§112.8(b)(1) and 112.12(b)(1)]*	☒	☐
Valves of manual, open-and-closed design are used for the drainage of diked areas. *[§§112.8(b)(2) and 112.12(b)(2)]*	☐	☒
The containers at the facility are compatible with materials stored and conditions of storage such as pressure and temperature. *[§§112.8(c)(1) and 112.12(c)(1)]*	☒	☐
Secondary containment for the bulk storage containers (including mobile/portable oil storage containers) holds the capacity of the largest container plus additional capacity to contain precipitation. Mobile or portable oil storage containers are positioned to prevent a discharge as described in §112.1(b). *[§112.6(a)(3)(ii)]*	☒	☐
If uncontaminated rainwater from diked areas drains into a storm drain or open watercourse the following procedures will be implemented at the facility: *[§§112.8(c)(3) and 112.12(c)(3)]*		
• Bypass valve is normally sealed closed	☐	☒
• Retained rainwater is inspected to ensure that its presence will not cause a discharge to navigable waters or adjoining shorelines	☒	☐
• Bypass valve is opened and resealed under responsible supervision	☐	☒
• Adequate records of drainage are kept **[See Dike Drainage Log in Attachment 3.3]**	☒	☐
For completely buried metallic tanks installed on or after January 10, 1974 at this facility *[§§112.8(c)(4) and 112.12(c)(4)]*:		
• Tanks have corrosion protection with coatings or cathodic protection compatible with local soil conditions.	☒	☐
• Regular leak testing is conducted.	☒	☐
For partially buried or bunkered metallic tanks *[§112.8(c)(5) and §112.12(c)(5)]*:		
• Tanks have corrosion protection with coatings or cathodic protection compatible with local soil conditions.	☐	☒
Each aboveground bulk container is tested or inspected for integrity on a regular schedule and whenever material repairs are made. Scope and frequency of the inspections and inspector qualifications are in accordance with industry standards. Container supports and foundations are regularly inspected. **[See Inspection Log and Schedule and Bulk Storage Container Inspection Schedule in Attachments 3.1 and 3.2]** *[§112.8(c)(6) and §112.12(c)(6)(i)]*	☒	☐
Outsides of bulk storage containers are frequently inspected for signs of deterioration, discharges, or accumulation of oil inside diked areas. **[See Inspection Log and Schedule in Attachment 3.1]** *[§§112.8(c)(6) and 112.12(c)(6)]*	☒	☐
For bulk storage containers that are subject to 21 CFR part 110 which are shop-fabricated, constructed of austenitic stainless steel, elevated and have no external insulation, formal visual inspection is conducted on a regular schedule. Appropriate qualifications for personnel performing tests and inspections are documented. **[See Inspection Log and Schedule and Bulk Storage Container Inspection Schedule in Attachments 3.1 and 3.2]** *[§112.12(c)(6)(ii)]*	☐	☒

Table G-10 General Rule Requirements for Onshore Facilities		N/A
Each container is provided with a system or documented procedure to prevent overfills for the container. Describe: Fuel delivery to laydown area aboveground storage tank: 1. Gauge storage tank and check the level gauge to prevent tank overfill; 2. Set parking brake and use chock blocks to prevent fueling vehicle movement; inspect fittings and fueling hose for damage; 3. Place drip pans under valve-hose fitting connections; 4. Monitor the liquid level in the receiving tank during transfer to prevent overfill; 5. If an oil spill occurs, the spill kit will be used to contain the spill. Each vehicle is equipped with a spill kit, and there is a spill kit at the fuel storage tank area within the construction laydown area. Dispenser and mobile refueler fueling procedures: 1. Before filling motorized equipment, shut off all engines and set parking brakes; 2. Do not leave filling operation unattended; 3. Do not top off tank after automatic shut-off; 4. If an oil spill occurs, the spill kit will be used to contain the spill.	☒	☐
Liquid level sensing devices are regularly tested to ensure proper operation **[See Inspection Log and Schedule in Attachment 3.1]**. *[§112.6(a)(3)(iii)]*	☒	☐
Visible discharges which result in a loss of oil from the container, including but not limited to seams, gaskets, piping, pumps, valves, rivets, and bolts are promptly corrected and oil in diked areas is promptly removed. *[§§112.8(c)(10) and 112.12(c)(10)]*	☒	☐
Aboveground valves, piping, and appurtenances such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces are inspected regularly. **[See Inspection Log and Schedule in Attachment 3.1]** *[§§112.8(d)(4) and 112.12(d)(4)]*	☒	☐
Integrity and leak testing are conducted on buried piping at the time of installation, modification, construction, relocation, or replacement. **[See Inspection Log and Schedule in Attachment 3.1]** *[§§112.8(d)(4) and 112.12(d)(4)]*	☒	☐

B. Onshore Oil Production Facilities (excluding drilling and workover facilities) (§112.9(b), (c), and (d)):

The owner or operator must meet the general rule requirements as well as the requirements under this section. Note that not all provisions may be applicable to all owners/operators. **In cases where a provision is not applicable, write "N/A".**

Table G-11 General Rule Requirements for Onshore Oil Production Facilities		N/A
At tank batteries, separation and treating areas, drainage is closed and sealed except when draining uncontaminated rainwater. Accumulated oil on the rainwater is returned to storage or disposed of in accordance with legally approved methods. *[§112.9(b)(1)]*	☐	☐
Prior to drainage, diked areas are inspected and *[§112.9(b)(1)]*:		
• Retained rainwater is inspected to ensure that its presence will not cause a discharge to navigable waters	☐	☐
• Bypass valve is opened and resealed under responsible supervision	☐	☐
• Adequate records of drainage are kept **[See Dike Drainage Log in Attachment 3.3]**	☐	☐
Field drainage systems and oil traps, sumps, or skimmers are inspected at regularly scheduled intervals for oil, and accumulations of oil are promptly removed **[See Inspection Log and Schedule in Attachment 3.1]** *[§112.9(b)(2)]*	☐	☐
The containers used at this facility are compatible with materials stored and conditions of storage. *[§112.9(c)(1)]*	☐	☐
All tank battery, separation, and treating facility installations (except for flow-through process vessels) are constructed with a capacity to hold the largest single container plus additional capacity to contain rainfall. Drainage from undiked areas is safely confined in a catchment basin or holding pond. *[§112.9(c)(2)]*	☐	☐
Except for flow-through process vessels, containers that are on or above the surface of the ground, including foundations and supports, are visually inspected for deterioration and maintenance needs on a regular schedule. **[See Inspection Log and Schedule in Attachment 3.1]** *[§112.9(c)(3)]*	☐	☐
New and old tank batteries at this facility are engineered/updated in accordance with good engineering practices to prevent discharges including at least one of the following: i. adequate container capacity to prevent overfill if regular pumping/gauging is delayed; ii. overflow equalizing lines between containers so that a full container can overflow to an adjacent container; iii. vacuum protection to prevent container collapse; or iv. high level sensors to generate and transmit an alarm to the computer where the facility is subject to a computer production control system. *[§112.9(c)(4)]*	☐	☐
Flow-through process vessels and associated components are:		
• Are constructed with a capacity to hold the largest single container plus additional capacity to contain rainfall. Drainage from undiked areas is safely confined in a catchment basin or holding pond; *[§112.9(c)(2)]* and	☐	☐
• That are on or above the surface of the ground, including foundations and supports, are visually inspected for deterioration and maintenance needs on a regular schedule. **[See Inspection Log and Schedule in Attachment 3.1]** *[§112.9(c)(3)]*	☐	☐
Or		
• Visually inspected and/or tested periodically and on a regular schedule for leaks, corrosion, or other conditions that could lead to a discharge to navigable waters; and	☐	☐
• Corrective action or repairs are applied to flow-through process vessels and any associated components as indicated by regularly scheduled visual inspections, tests, or evidence of an oil discharge; and	☐	☐
• Any accumulations of oil discharges associated with flow-through process vessels are promptly removed; and	☐	☐
• Flow-through process vessels are provided with a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation within six months of a discharge from flow-through process vessels of more than 1,000 U.S. gallons of oil in a single discharge as described in §112.1(b), or a discharge more than 42 U.S. gallons of oil in each of two discharges as described in §112.1(b) within any twelve month period. *[§112.9(c)(5)]* *(Leave blank until such time that this provision is applicable.)*	☐	☐

Table G-11 General Rule Requirements for Onshore Oil Production Facilities		N/A
All aboveground valves and piping associated with transfer operations are inspected periodically and upon a regular schedule. The general condition of flange joints, valve glands and bodies, drip pans, pipe supports, pumping well polish rod stuffing boxes, bleeder and gauge valves, and other such items are included in the inspection. **[See Inspection Log and Schedule in Attachment 3.1]** *[§112.9(d)(1)]*	☐	☐
An oil spill contingency plan and written commitment of resources are provided for flowlines and intra-facility gathering lines **[See Oil Spill Contingency Plan and Checklist in Attachment 2 and Inspection Log and Schedule in Attachment 3.1]** *[§112.9(d)(3)]*	☐	☐
or Appropriate secondary containment and/or diversionary structures or equipment is provided for flowlines and intra-facility gathering lines to prevent a discharge to navigable waters or adjoining shorelines. The entire secondary containment system, including walls and floor, is capable of containing oil and is constructed so that any discharge from the pipe, will not escape the containment system before cleanup occurs.	☐	☐
A flowline/intra-facility gathering line maintenance program to prevent discharges from each flowline has been established at this facility. The maintenance program addresses each of the following:	☐	☐
• Flowlines and intra-facility gathering lines and associated valves and equipment are compatible with the type of production fluids, their potential corrosivity, volume, and pressure, and other conditions expected in the operational environment;	☐	☐
• Flowlines, intra-facility gathering lines and associated appurtenances are visually inspected and/or tested on a periodic and regular schedule for leaks, oil discharges, corrosion, or other conditions that could lead to a discharge as described in §112.1(b). The frequency and type of testing allows for the implementation of a contingency plan as described under part 109 of this chapter.	☐	☐
• Corrective action and repairs to any flowlines and intra-facility gathering lines and associated appurtenances as indicated by regularly scheduled visual inspections, tests, or evidence of a discharge.	☐	☐
• Accumulations of oil discharges associated with flowlines, intra-facility gathering lines, and associated appurtenances are promptly removed. *[§112.9(d)(4)]*	☐	☐
The following is a description of the flowline/intra-facility gathering line maintenance program implemented at this facility:		

C. Onshore Oil Drilling and Workover Facilities (§112.10(b), (c) and (d)):

The owner or operator must meet the general rule requirements as well as the requirements under this section.

Table G-12 General Rule Requirements for Onshore Oil Drilling and Workover Facilities	
Mobile drilling or worker equipment is positioned or located to prevent discharge as described in §112.1(b). *[§112.10(b)]*	☐
Catchment basins or diversion structures are provided to intercept and contain discharges of fuel, crude oil, or oily drilling fluids. *[§112.10(c)]*	☐
A blowout prevention (BOP) assembly and well control system was installed before drilling below any casing string or during workover operations. *[§112.10(d)]*	☐
The BOP assembly and well control system is capable of controlling any well-head pressure that may be encountered while the BOP assembly and well control system are on the well. *[§112.10(d)]*	☐

ATTACHMENT 1 – Five Year Review and Technical Amendment Logs

ATTACHMENT 1.1 – Five Year Review Log

I have completed a review and evaluation of the SPCC Plan for this facility, and will/will not amend this Plan as a result.

Table G-13 Review and Evaluation of SPCC Plan for Facility			
Review Date	Plan Amendment		Name and signature of person authorized to review this Plan
	Will Amend	Will Not Amend	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	

ATTACHMENT 1.2 – Technical Amendment Log

Any technical amendments to this Plan will be re-certified in accordance with Section I of this Plan template.

Table G-15 Description and Certification of Technical Amendments		
Review Date	Description of Technical Amendment	Name and signature of person certifying this technical amendment

ATTACHMENT 2 – Oil Spill Contingency Plan and Checklist

An oil spill contingency plan and written commitment of resources is required for:

- Flowlines and intra-facility gathering lines at oil production facilities and
- Qualified oil-filled operational equipment which has no secondary containment.

An oil spill contingency plan meeting the provisions of 40 CFR part 109, as described below, and a written commitment of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful is attached to this Plan.	☐

Complete the checklist below to verify that the necessary operations outlined in 40 CFR part 109 - Criteria for State, Local and Regional Oil Removal Contingency Plans - have been included.

Table G-15 Checklist of Development and Implementation Criteria for State, Local and Regional Oil Removal Contingency Plans (§109.5)[a]	
(a) Definition of the authorities, responsibilities and duties of all persons, organizations or agencies which are to be involved in planning or directing oil removal operations.	☐
(b) Establishment of notification procedures for the purpose of early detection and timely notification of an oil discharge including:	
(1) The identification of critical water use areas to facilitate the reporting of and response to oil discharges.	☐
(2) A current list of names, telephone numbers and addresses of the responsible persons (with alternates) and organizations to be notified when an oil discharge is discovered.	☐
(3) Provisions for access to a reliable communications system for timely notification of an oil discharge, and the capability of interconnection with the communications systems established under related oil removal contingency plans, particularly State and National plans (e.g., NCP).	☐
(4) An established, prearranged procedure for requesting assistance during a major disaster or when the situation exceeds the response capability of the State, local or regional authority.	☐
(c) Provisions to assure that full resource capability is known and can be committed during an oil discharge situation including:	
(1) The identification and inventory of applicable equipment, materials and supplies which are available locally and regionally.	☐
(2) An estimate of the equipment, materials and supplies which would be required to remove the maximum oil discharge to be anticipated.	☐
(3) Development of agreements and arrangements in advance of an oil discharge for the acquisition of equipment, materials and supplies to be used in responding to such a discharge.	☐
(d) Provisions for well defined and specific actions to be taken after discovery and notification of an oil discharge including:	
(1) Specification of an oil discharge response operating team consisting of trained, prepared and available operating personnel.	☐
(2) Predesignation of a properly qualified oil discharge response coordinator who is charged with the responsibility and delegated commensurate authority for directing and coordinating response operations and who knows how to request assistance from Federal authorities operating under existing national and regional contingency plans.	☐
(3) A preplanned location for an oil discharge response operations center and a reliable communications system for directing the coordinated overall response operations.	☐
(4) Provisions for varying degrees of response effort depending on the severity of the oil discharge.	☐
(5) Specification of the order of priority in which the various water uses are to be protected where more than one water use may be adversely affected as a result of an oil discharge and where response operations may not be adequate to protect all uses.	☐
(6) Specific and well defined procedures to facilitate recovery of damages and enforcement measures as provided for by State and local statutes and ordinances.	☐

[a] The contingency plan must be consistent with all applicable state and local plans, Area Contingency Plans, and the National Contingency Plan (NCP)

ATTACHMENT 3 – Inspections, Dike Drainage and Personnel Training Logs

ATTACHMENT 3.1 – Inspection Log and Schedule

Table G-16 Inspection Log and Schedule

This log is intended to document compliance with §§112.6(a)(3)(iii), 112.8(c)(6), 112.8(d)(4), 112.9(b)(2), 112.9(c)(3), 112.9(d)(1), 112.9(d)(4), 112.12.(c)(6), and 112.12(d)(4), as applicable.

Date of Inspection	Container / Piping / Equipment	Describe Scope (or cite Industry Standard)	Observations	Name/ Signature of Inspector	Records maintained separately [a]
					☐
					☐
					☐
					☐
					☐

[a] Indicate in the table above if records of facility inspections are maintained separately at this facility.

ATTACHMENT 3.2 – Bulk Storage Container Inspection Schedule – onshore facilities (excluding production):

To comply with integrity inspection requirement for bulk storage containers, inspect/test each shop-built aboveground bulk storage container on a regular schedule in accordance with a recognized container inspection standard based on the minimum requirements in the following table.

Table G-17 Bulk Storage Container Inspection Schedule

Container Size and Design Specification	Inspection requirement
Portable containers (including drums, totes, and intermodal bulk containers (IBC))	Visually inspect monthly for signs of deterioration, discharges or accumulation of oil inside diked areas
55 to 1,100 gallons with sized secondary containment	Visually inspect monthly for signs of deterioration, discharges or accumulation of oil inside diked areas plus any annual inspection elements per industry inspection standards
1,101 to 5,000 gallons with sized secondary containment and a means of leak detection[a]	
1,101 to 5,000 gallons with sized secondary containment and no method of leak detection[a]	Visually inspect monthly for signs of deterioration, discharges or accumulation of oil inside diked areas, plus any annual inspection elements and other specific integrity tests that may be required per industry inspection standards

[a] Examples of leak detection include, but are not limited to, double-walled tanks and elevated containers where a leak can be visually identified.

ATTACHMENT 3.3 – Dike Drainage Log

Table G-18 Dike Drainage Log

Date	Bypass valve sealed closed	Rainwater inspected to be sure no oil (or sheen) is visible	Open bypass valve and reseal it following drainage	Drainage activity supervised	Observations	Signature of Inspector
	☐	☐	☐	☐		
	☐	☐	☐	☐		
	☐	☐	☐	☐		
	☐	☐	☐	☐		
	☐	☐	☐	☐		
	☐	☐	☐	☐		
	☐	☐	☐	☐		
	☐	☐	☐	☐		

ATTACHMENT 3.4 – Oil-handling Personnel Training and Briefing Log

Table G-19 Oil-Handling Personnel Training and Briefing Log		
Date	**Description / Scope**	**Attendees**

ATTACHMENT 4 – Discharge Notification Form

In the event of a discharge of oil to navigable waters or adjoining shorelines, the following information will be provided to the National Response Center **[also see the notification information provided in Section 7 of the Plan]**:

Table G-20 Information provided to the National Response Center in the Event of a Discharge			
Discharge/Discovery Date		Time	
Facility Name			
Facility Location (Address/Lat-Long/Section Township Range)			
Name of reporting individual		Telephone #	
Type of material discharged		Estimated total quantity discharged	Gallons/Barrels
Source of the discharge		Media affected	☐ Soil ☐ Water (specify) ☐ Other (specify)
Actions taken			
Damage or injuries	☐ No ☐ Yes (specify)	Evacuation needed?	☐ No ☐ Yes (specify)
Organizations and individuals contacted	☐ National Response Center 800-424-8802 Time		
	☐ Cleanup contractor (Specify) Time		
	☐ Facility personnel (Specify) Time		
	☐ State Agency (Specify) Time		
	☐ Other (Specify) Time		

Attachment A

RESPONSE PROCEDURES

As the situation warrants, the response procedures (relating to spill discovery, containment, cleanup, and notification) described below will be followed.

DISCOVERY OF A RELEASE

The person discovering a release of oil or oil product from a container, tank, or operating equipment should notify the Spill Coordinator or designee immediately.

1. **Ensure no danger to human health exists first.**

   If there is an immediate threat to human life (e.g., a fire in progress or fumes overcoming workers), initiate alarm signal and report the incident immediately to the Construction Manager and the Spill Coordinator. The Spill Coordinator or the Construction Manager should be involved with requests for outside assistance.

2. **Extinguish sources of ignition, if possible.**

   Until the material is identified as nonflammable and noncombustible, potential sources of ignition in the area should be removed without endangering your safety and the safety of others. If the ignition source is stationary (immobile), attempt to move spilled material away from ignition source if this can be accomplished safely.

3. **Attempt to stop the release at its source.**

   Simple procedures (turning valves, plugging leaks, etc.) may be attempted by the discoverer if there is no health hazard and there is a reasonable certainty of the origin of the leak. If the source of the release has not been found, if special protective equipment is necessary to approach the release area, or if assistance is required to stop the release, a team should be assembled and equipped to halt the discharge at its source or to guide and/or assist with the fire department's efforts. If a hazardous substance is known to have leaked, make appropriate notifications (see Step 4), and make sure to wear appropriate personal protective equipment (PPE) before approaching the spill area.

4. **Initiate spill notification and reporting procedures.**

   Report the incident as soon as possible to the Construction Manager and the Spill Coordinator. The Spill Coordinator or the Construction Manager is responsible for notifications to outside agencies.

RELEASE CONTAINMENT PROCEDURES

Releases of oil and oil-containing materials at the site should be safely contained within secondary containment structures or otherwise diverted to prevent a discharge from the site. However, if material is released outside the containment areas, it is critical that the material be accurately identified and that appropriate control measures be taken in the safest possible manner.

1. **Attempt to stop the release at the source.**

   A team should be assembled and equipped to halt the discharge at its source.

2. **Contain the material released into the environment.**

   Following proper safety procedures (consult applicable material safety data sheets [MSDSs] for material compatibility, safety, and environmental precautions), use spill kits to contain the spill.

3. **Continue the notification procedure.**

   The Spill Coordinator will perform notifications as appropriate. The Spill Coordinator will obtain assistance from outside contractors to clean up oil residues, if necessary. Requests for outside assistance will be made by either the Spill Coordinator or the Construction Manager.

SPILL CLEANUP PROCEDURES

Appropriate PPE and cleanup procedures can be found on the MSDSs. Care must be taken when cleaning up spills of oil and oil-containing materials. Spill cleanup activities will be conducted under the general supervision of the Spill Coordinator, or a designee, who will designate personnel and equipment and authorize assistance as needed. Spill residues and other contaminated materials will be characterized (i.e., as hazardous or nonhazardous waste) using MSDSs and will be disposed of in accordance with applicable regulations. Spill response supplies or equipment depleted, consumed, damaged, or destroyed as a result of the spill or subsequent response activities will be replaced as soon as possible.

1. **Recover or clean up the material spilled.**

   Wherever possible, and appropriate, spilled material should be recovered and reused. Materials that cannot be reused must be declared waste. Liquids absorbed by solid materials will be shoveled into open-top drums. When drums are filled after a cleanup, the drum lids will be secured and the drums will be appropriately labeled (or relabeled) identifying the substance(s) within. Cleanup personnel should try to avoid commingling wastes. Combining non-compatible materials can cause potentially dangerous chemical and/or physical reactions or may limit disposal options. Compatibility information can be found on the MSDSs.

2. **Clean up the spill area.**

   Surfaces contaminated by the release will be cleaned by the use of an appropriate cleaning material or water. Occasionally, porous materials (such as wood) may be contaminated with hazardous materials. These porous materials may require special handling and disposal.

3. **Decontaminate tools and equipment used in the cleanup.**

   Even if dedicated to cleanup efforts, tools and equipment that have been used must be decontaminated before replacing them in the spill control kit.

NOTIFICATION AND REPORTING PROCEDURES

In the event of an accident or chemical spill, the Spill Coordinator or the designee will be contacted as soon as practicable after the incident has occurred. If a spill discharge to surface waters or off the site (including storm or sanitary sewers) is imminent, the appropriate agencies should be notified immediately of the potential threat.

The Spill Coordinator is responsible for reporting and documenting procedures regarding spills. Spills ultimately reaching navigable waters in harmful quantities, as defined in 40 CFR §112.2, will be reported under the provisions of 40 §CFR 112.4. A discharge that creates a sheen, emulsion, or sludge that effects or threatens to affect navigable waters of the United States must be reported by the Spill Coordinator to the National Response Center (NRC) at (800) 424-8802.

EXTERNAL REPORTING

If the spill is reportable, the Spill Coordinator or another responsible individual will notify the proper authorities. This notification will be documented by the Spill Coordinator. Information in the notification should follow the requirements described in the beginning of this subsection. **Notification to the NRC must be verbally made immediately (within 15 minutes of discovery) by the owner of the release/spill.**

A follow-up written report will be submitted to the U.S. Environmental Protection Agency (EPA) Regional Office within 60 days if the spill exceeds 1,000 gallons or occurs within 12 consecutive months of a previous reportable oil spill. The written report will contain, at a minimum, the following information:

- Name, telephone number, and address of site where spill occurred
- Name of owner/operator
- Date and year of initial site operation
- Maximum storage or handling capacity of oil on the site and normal daily throughput
- Facility description with maps, flow diagrams, and topographic information
    - Name, title, telephone number, and address of reporter
    - Date and time of the spill or release
    - Estimated quantity of material released or spilled and the time/duration
    - Extent of injuries/illness, if known
    - Possible hazards to human health and environment
    - Exact spill location, including the name of the waters threatened or other affected media
    - Source of the release or spill
    - Cause of accident/spill
    - Name and telephone number of the person responsible for facility operations at the spill site
    - Steps being taken or proposed to contain/clean up the spill, and precautions taken to minimize impacts
- SPCC Plan and failure analysis
- Cause of spill, with failure analysis
- Corrective action taken, with description of equipment repairs and replacements
- Additional preventive measures taken or contemplated to minimize recurrence
- Other information pertinent to the SPCC Plan or spill event

Once the reportable spill has been communicated to the outside agencies, a Discharge Reporting Form will be completed and submitted within 60 days. A copy of the Discharge Reporting Form is included in Attachment 4 of the EPA's Tier I Qualified Facility SPCC Plan Template. The completed form and verification of submittal must be maintained in the site files with the SPCC Plan.

The Spill Coordinator will keep a log of activities during the spill event, including the quantity of oil spilled, recovered, and disposed, as well as other notable events that may occur during the spill and subsequent response activities. The Spill Coordinator will prepare a chronological summary of the incident for the SPCC files.

INTERNAL REPORTING

If no report needs to be filed with an external agency, the Spill Coordinator will complete a Discharge Reporting Form and evaluate the procedures included in the SPCC Plan to ensure that a similar event does not happen again.

SPILL CONTROL EQUIPMENT

The contractor will supply spill prevention kits that can be used in the event of a spill, leak, or other release. The spill prevention kits will be stored at all contractor laydown areas. Each spill prevention kit will consist of the following:

- One 55-gallon drum
- Two bags of absorbent material
- One bag of absorbent pads
- One 400-square-foot sheet of plastic sheeting
- Two short-handled shovels
- One Tyvek suit and booties
- Two pair of nitrile gloves
- Two pair of safety goggles

The contractor's Spill Coordinator (to be determined) will make known to all personnel involved with the construction (foremen, laborers, and inspectors) the contractor's warehouse/trailer locations for the spill prevention kits. These spill prevention kits will be readily accessible during construction.

In addition, the contractor shall provide a more portable 20-gallon spill prevention kit for each truck. These kits shall contain: twenty-five 17" × 19" white oil-only Sonic Bonded pads, four 3" × 48" white oil-only socks, two 18" × 18" white oil-only pillows, one pair nitrile gloves, one pair goggles, two clear disposal bags, three bag ties, and one 20-gallon over pack. Oil-only products will soak up oil and repel water. Spill residues and other contaminated materials will be characterized (i.e., as hazardous or nonhazardous waste) using MSDSs and will be disposed of in accordance with applicable regulations.

CONFORMANCE WITH REQUIREMENTS

This SPCC Plan has been prepared in accordance with good engineering practices and has the full approval and support of management (see Certification in the preface). This SPCC Plan is designed to comply with the EPA SPCC regulations. Currently, the State of Arizona does not have additional SPCC regulatory requirements for Arizona facilities. Some features at the project that allow the site to comply with EPA SPCC regulations include the retention basins, which have the capacity to contain the contents of the oil-filled equipment at the site, and a 25-year, 24-hour storm event. In addition, the fuel tank is elevated so all sides of each tank can be inspected.

APPENDIX B9

SPILL PREVENTION & RESPONSE PLAN

SPILL PREVENTION AND RESPONSE PLAN

Prepared for

Arizona Public Service Company
2124 West Cheryl Drive
Building B2, MS 3371
Phoenix, Arizona 85201

February 2012

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A. Typical Fuel, Lubricants, and Hazardous Materials
B. Response Team Contacts
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1.0 INTRODUCTION

This Spill Prevention and Response Plan (SPRP) will be implemented during the construction phase of the Hassayampa–North Gila #2 500kV Transmission Line. Arizona Public Service (APS) will be constructing, operating, and maintaining the111-mile-long, 500kV transmission line for Hassayampa–North Gila #2, known as HANG2 (the project). The new transmission line will originate in the existing Hassayampa Switchyard at the Palo Verde Hub, south of the Palo Verde Nuclear Generating Station, and will terminate at the existing North Gila Transmission Substation site, northeast of Yuma, Arizona (see POD project overview and Appendix A, Construction Maps). This SPRP outlines specific preventive measures and practices to reduce the likelihood of an accidental release of hazardous or regulated liquid and to expedite response and cleanup of any release that may occur during construction activities.

1.1 Purpose

This SPRP provides restrictions and procedures for fuel storage location, fueling activities, and construction equipment maintenance along the construction right-of-way (ROW) and in material storage/show-up yards associated with the project. Training and lines of communication to facilitate the prevention, response, containment, and cleanup of spills during construction activities are also outlined. The goals of this plan are to minimize the potential for a spill, to contain any spillage to the smallest physical area possible, and to protect areas that are considered environmentally sensitive (e.g., streams, ephemeral washes, groundwater wells, wetlands, wildlife habitats, cultural resources, etc.).

All contractor and subcontractor personnel working within the HANG2 transmission line ROW are responsible for implementation of the measures and procedures defined herein. The SPRP will be included, as written herein, in both the bid and the contract documents as contractual requirements and instructions to the contractor(s).

2.0 PREVENTIVE MEASURES

APS will require the contractor to do everything reasonable to minimize the potential for a spill during construction of the project. APS will require the contractor to comply with applicable environmental and safety laws and regulations, including compliance by its subcontractors. The contractor will be required to ensure that a copy of this SPRP is available on-site to all contractor and subcontractor personnel.

2.1 Hazards Assessment

The hazardous materials that may be on-site during construction of the project include those usually associated with operation and maintenance of vehicles and machinery, such as diesel fuel, gasoline, hydraulic fluid, brake fluid, antifreeze, and lubricants. Other materials considered hazardous are chemicals used in portable toilets and the associated human waste, as well as herbicides that are used in the weed control plan. There is also the possibility of encountering buried hazardous or toxic materials during the construction process. Each of these hazards is discussed in the Regulated Materials Storage and Handling section.

2.1.1 Vehicle and Machinery Fluids

The materials associated with vehicle operation and maintenance are hazardous to humans, wildlife, and sensitive environments. Spills of diesel fuel, gasoline, and hydraulic fluid are considered hazardous, and spill prevention and control measures must be initiated. These materials can be toxic to the skin, eyes, respiratory system, and internal organs. Toxicity can be transmitted in liquid or vapor form. These

materials may also be flammable and combustible, and proper precautions must be used in handling spills. Antifreeze, Freon, and other non-petroleum products are also hazardous toxic substances. The same spill prevention and response actions are to be employed with spills of these materials.

Potential sources of spills of vehicle fluids include mobile refueling trucks and construction vehicles and equipment. Potential causes of vehicle fluid spills include emergency ruptures in fuel tanks or construction equipment; overflow of fuel from the tank during the refueling of equipment; seepage of fuel or lubricants during normal operation or storage; spills of oil or hydraulic fluid, etc. during on-site vehicle and equipment servicing; vehicle accidents; and natural disasters.

2.1.2 Chemical Toilets and Human Waste

Proper disposal and disinfection of human waste at the construction site is required. Human waste may contain infectious bacteria, pathogens, and other health hazards. Waste must be contained in portable toilets that receive specified periodic cleaning and disposal of waste. Chemicals used in toilets are also hazardous to wildlife and sensitive environments. Portable chemical toilets could overflow if not pumped regularly, or they could spill if dropped or overturned during moving. All portable chemical toilets will be anchored securely to the ground to prevent tipping over.

2.1.3 Unknown Hazardous Materials

Given the rough terrain and remoteness of the ROW, it is unlikely that unknown hazardous materials will be encountered during construction activities. However, if any unknown waste is discovered, the potential exists for encountering unknown hazardous materials within the project area. These materials would most likely take the form of buried containers containing used lubricants, batteries, etc. If any unknown waste is discovered, construction within 100 feet (or a safe distance determined by the APS Spill Coordinator) of that particular area shall stop until the material encountered is properly identified by the APS Spill Coordinator and removed.

2.2 Contractor Responsibilities

APS will require its contractors and any subcontractors to do everything practicable to minimize the potential for a spill during construction of the project. This will include compliance with applicable environmental and safety laws and regulations. Each contractor will be required to ensure that a copy of this plan is available on-site to all contractor and subcontractor personnel.

3.0 TRAINING

All APS construction personnel as well as contractor employees and subcontractors involved with transporting or handling fueling equipment or maintaining construction equipment will be required to complete spill training before they commence work on the project. APS will audit contractor compliance with respect to this requirement and will instruct the contractor to replace any employees (or subcontractors' employees) found to be working on the project prior to having spill training. Spill training will also be required for contractor and subcontractor supervisory personnel before beginning work on the project.

Spill training programs will be conducted by the construction contractor and the APS Spill Coordinator and will do the following:

- Provide information concerning pollution control laws,
- Inform personnel concerning the proper operation and maintenance of fueling equipment,

- Inform personnel of spill prevention and response requirements,
- Describe the measures and provisions of the SPRP, and
- Assign roles and responsibilities for implementing the SPRP.

Measures, responsibilities, and provisions of this SPRP and spill training for other workers will be provided through ongoing safety briefings, which will discuss safety and spill prevention and response, including personal responsibility to initiate appropriate procedures. These safety briefing sessions will be held by the contractor as crew "tailgate" meetings. Contractor compliance with this requirement will be audited. Contractor will follow their disciplinary program, up to and including discharge for failure to hold such meetings. Attendance of training sessions will be documented using sign-in sheets that will become part of the permanent construction records.

3.1 Release Response Equipment

The contractor will supply spill prevention kits that can be used in the event of a spill, leak, or other release. The spill prevention kits will be stored at all contractor show-up yards. Each spill prevention kit will consist of the following:

- One 55-gallon drum
- Two bags of absorbent material
- One bag of absorbent pads
- One 400-square-foot sheet of plastic sheeting
- Two short-handled shovels
- One Tyvek suit and booties
- Two pair of nitrile gloves
- Two pair of safety goggles

The contractor's APS Spill Coordinator(s) will make known to all personnel involved with the construction (foremen, laborers, and inspectors) the contractor's warehouse/trailer locations for the spill prevention kits. These spill prevention kits will be readily accessible during construction.

In addition, the contractor shall provide a more portable 20-gallon spill prevention kit for each truck. These kits shall contain: twenty-five 17" × 19" white oil-only Sonic Bonded pads, four 3" × 48" white oil-only socks, two 18" × 18" white oil-only pillows, one pair nitrile gloves, one pair goggles, two clear disposal bags, three bag ties, and one 20-gallon over pack. Oil-only products will soak up oil and repel water.

3.2 Equipment Inspection

Before moving any equipment onto the construction site, the contractor will visually inspect each piece of equipment for cracks, excessive corrosion, or other flaws that may compromise the integrity of its fuel, hydraulic, or cooling systems. The contractor will repair or replace leaking equipment immediately after a leak is detected and will be responsible for prompt reporting and mitigation of any fuel or lubricant spills from the contractor's equipment.

4.0 REGULATED MATERIALS STORAGE AND HANDLING

A list of the typical fuel, lubricants, and hazardous materials used in this type of project is provided in *Attachment A*. Storage methods and quantities vary with the length of the project construction segments, the time of year, and the type of terrain. The contractor will provide, maintain, and make available the appropriate Material Safety Data Sheet (MSDS) documents for all hazardous or controlled materials used on the ROW or in the contractor material storage/show-up yards at an on-site location accessible to all contractor, subcontractor, and APS employees.

4.1 Contractor Show-up Yards

Any fuels, petroleum products, herbicides, or hazardous materials at the contractor's material storage/show-up yards will be stored in safe locations within secondary containment containers/ structures. Secondary containment tanks include dual-walled high-density polyethylene (HDPE) containers. Other secondary containment systems normally consist of a bermed area lined with an impervious material to provide a minimum containment volume equal to 150% of the volume of the largest storage vessel contained within the bermed area. Spill kits will be stored in readily accessible areas for quick use in the event that they are needed by the construction personnel. The contractor will construct these containment structures to contain spilled or leaked liquids within the structures. If earthen containment dikes are used, they will be constructed with slopes no steeper than 3:1 (horizontal to vertical) to limit erosion and provide structural stability. Containment areas will not have drains.

Hazardous liquids will not be stored in areas subject to periodic flooding or within 100 feet of jurisdictional water boundaries. All hazardous materials stored at either the construction material storage/show-up yards will be stored in secure (fenced) areas. Accumulated rainwater may be removed if authorized by an Environmental Inspector under specific situations, such as if visual inspection indicates that no spillage has occurred in the containment structure and if no sheen is present on the accumulated rainwater. If spillage has occurred in the structure, accumulated wastewater will be drawn off and pumped into a storage vessel for proper disposal. The contractor will visually inspect aboveground bulk tanks frequently and whenever the tank is refilled. Drain valves on temporary storage tanks will be locked to prevent accidental or unauthorized discharges from the tank. The contractor will correct visible leaks in tanks as soon as possible.

Refueling activities will be monitored by contractor's site coordinator or their designee. All fuel nozzles will be equipped with functional automatic shut-off valves. Drip trays and sorbent pads should be used during on-site refueling to minimize spills. Prior to departure of any fuel tank truck, all outlets on the vehicle will be examined by the driver for leakage and tightened, adjusted, or replaced to prevent leaking while in transit.

Routine equipment maintenance of wheel-mounted vehicles will be accomplished at the material storage/show-up yards to the greatest extent practical. Routine maintenance of track-mounted equipment will be conducted in a manner that gathers all oil and other discharges and removes them from the project site to a suitable recycling or disposal site.

Storage containers will display labels that identify the contents of the container and whether the contents are hazardous. The contractor will provide and maintain copies on-site of MSDS for all materials accessible to all contractor personnel, including subcontractors.

The contractor will provide, maintain, and make available the appropriate MSDS documents for all hazardous or controlled materials used on the project site or in the contractor's material storage/show-up yards at an on-site location accessible to all contractor, subcontractor, and APS employees.

Any change to the layout of the material storage/show-up yards would be reviewed, recorded, and approved by the APS Environmental Coordinator.

4.2 On the Right-of-Way

Contractors and operations personnel will not store fuel within the ROW unless the site has been designated a contractor material storage/show-up yard. The contractor will undertake preventive measures to avoid environmental impacts from refueling and lubrication activities on the construction ROW.

Refueling and lubricating construction equipment will be restricted to upland areas at least 100 feet away from the edge of any streams, wetlands, ditches, and other waterbodies and 150 feet from water supply wells wherever possible. Wheeled and tracked construction equipment will be moved to an upland area more than 100 feet away from streams, wetlands, ditches, and other waterbodies for refueling. However, this is not anticipated as the material storage/show-up yards will be sited on upland areas located at least 100 feet from waterbodies, if feasible. Fuel and service truck drivers will be responsible for spill prevention during fueling and service activities, and drivers will be held responsible for observing and controlling fueling operations at all times to prevent overfilling.

Fuels and lubricants will be stored in designated areas and in appropriate service vehicles. Storage sites for fuels, other petroleum products, chemicals, and hazardous materials, including wastes, will be located in uplands. To prevent these materials and other contaminants from reaching waterways, no hazardous substances will be stored within 100 feet of streams and/or within 200 feet of groundwater wells (400 feet for public wells). The contractor will confirm with the APS Spill Coordinator or the Construction Manager the locations of areas where these activities are prohibited prior to construction crews' entering the area with equipment.

The contractor will maintain the specified release response equipment described above at each show-up yard and on fuel and service trucks to allow for rapid containment and recovery of a spill. In addition, fuel trucks will be equipped with shovels and an assortment of hand tools to aid in the containment of a spill.

Equipment will not be washed in streams, wetlands, ditches, or other waterbodies. Equipment operators will be held responsible for prompt reporting and mitigation of any fuel or lubricant spills from their equipment.

4.3 Restricted Refueling Areas

Restricted refueling areas include areas where the buffer zone for refueling activities (100 feet from a wetland or waterbody, 200 and 400 feet from private and public water wells, respectively) cannot be maintained. Potential situations where plans may be approved by the APS Spill Coordinator and/or the Construction Manager to allow refueling in restricted areas include extensive wetland crossings with limited cross-ROW access, continuous construction at stream/river crossings, and the required placement and operation of stationary equipment such as dewatering pumps, generators, and other equipment. The requirement for any refueling and equipment service within restricted areas will be verified and approved by the APS Spill Coordinator and/or the Construction Manager before any activity is carried out. In addition, areas deemed environmentally sensitive will be avoided as a refueling area.

4.4 Vehicle and Equipment Maintenance

All vehicle and equipment maintenance on the project site involving fluid replacement will be conducted at least 100 feet away from the boundary restrictions for jurisdictional waters. Before lubricants are drained from the construction equipment, a suitable containment vessel and plastic sheeting will be placed

under the equipment to collect any spilled material. The contractor will take the necessary precautions to ensure that material that might accumulate on the liner does not spill on the ground surface. Vehicle maintenance wastes, including used oils and other fluids, will be handled and managed by personnel trained in the procedures outlined in this plan. Vehicle maintenance wastes will be stored and disposed of in accordance with applicable environmental regulations.

5.0 SPILL RESPONSE

In the event of a spill, the release will be contained and cleaned up as soon as possible. The order of priorities after discovering a spill are to protect the safety of personnel and the public, minimize damage to the environment, and control costs associated with cleanup and remediation. The initial response to an emergency will be to protect human health and safety, and then the environment. If a spill is not contained within a dike, an area of isolation will be established around the spill. The size of this area will depend on the size of the spill and the materials involved. The contractor will take precautions in the area of the spill to eliminate possible sources of ignition.

5.1 APS Spill Coordinator

The APS Spill Coordinator will be responsible for the reporting of spills, coordinating contractor personnel for spill cleanup, subsequent site investigations, and associated incident reports. The APS Spill Coordinator will report to the Construction Manager or other designated APS on-site representative. In the event of a spill, the APS Spill Coordinator will be responsible for determining the extent of the isolation area and ensuring that proper cleanup and disposal measures are initiated.

The APS Spill Coordinator for the project is

Michelle Turgeon
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
(602) 371-7715
APS 24-hour Spill Line: (602) 371-6900
Michelle.Turgeon@aps.com

Ben Dowler
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
(602) 328-1925
24-Hour Spill Line: (602) 371-6900
Benjamin.dowler@aps.com

Additional Spill Response Team contacts are provided in *Attachment B*.

5.2 Immediate Response

All spills, regardless of size, must be reported to the APS Spill Coordinator and/or the APS Site Representative. The person observing the incident must take the following actions:

- Assess the situation
- If safe to do so, make every effort to stop the source of the spill and remove any potential ignition sources, protect any waterways
- Promptly notify the contractor's APS Spill Coordinator and/or the Construction Manager
- Report your name, the spill location, and the extent of the incident to the contractor's APS Spill Coordinator and/or the Construction Manager.

Upon learning of the spill, the Contractor's Supervisor and/or the Contractor's Spill Coordinator will implement the following measures:

- Sorbent materials will be applied to the spill area
- Contaminated soils and vegetation will be excavated, temporarily placed on plastic, and covered by plastic until proper disposal is arranged
- If a spill is beyond the scope of on-site equipment and personnel, an Emergency Response Contractor will be secured to further contain and cleanup the spill.

The Emergency Response Contractor for the project is

- (see Attachment B)

5.3 Specific Response Procedures

Specific response procedures have been developed for various spills, including vehicle fluid spills, chemical toilet and human waste spills, herbicide spills, and discovery of an unknown hazardous material.

Some response procedures common to all spills are to keep people away from the spilled material, secure the source of the spill, if this can be done safely, and determine the type of spilled material, the volume, extent, and potential for danger of the spill. Securing the source of the spill is an extremely important step in the response activities. However, a source should be secured only if it can be performed safely, without risk to human life and health. Steps to be taken to secure the source include turning off machinery, clamping or disabling hoses, etc.

Another key element in the early response to all spills is determining the type of material spilled and the volume and extent of the spill. This should be determined as soon as possible to facilitate the proper response operations. The volume will be needed in order to evaluate equipment and personnel needs, as well as requirements for containment and disposal of the recovered waste and incident reporting. EPA Reporting thresholds, as specified at 40 CFR 112, state a discharge must be reported to the EPA Regional Administrator when there is a discharge of:

- More than 1,000 U.S. gallons of oil in a single discharge to navigable waters or adjoining shorelines.
- More than 42 U.S. gallons of oil in each of two discharges to navigable waters or adjoining shorelines occurring within any 12-month period.

All spills must be reported to the APS Spill Coordinator and/or the APS Site Representative. If a spill occurs on federal or state land, the appropriate agency office will be notified, and a copy of the manifest for disposal of the affected materials will be provided to the appropriate agency if required.

A rough estimate of the spill volume can be generated from visual observation and identification of the source. Refer to the Spill Prevention, Control & Countermeasure Plan for incident reporting procedures.

5.3.1 Vehicle and Machinery Spills

Incidents involving loss of a petroleum product from equipment or vehicles shall be considered a spill. After the spill has been flagged, the volume and extent of the spill estimated, and initial notification procedures implemented, the spill must be confined. Do not handle materials without wearing protective clothing (i.e., gloves, etc.).

- Determine whether a Spill Response Team is needed to complete the cleanup. If the answer is no, prepare a spill report and submit it to the on-site APS Spill Coordinator. If yes, activate the local Spill Response Team.
- Determine whether additional cleanup contractor staff would be required for a major incident. If the answer is no and the incident has been determined to be a minor spill, conduct the cleanup, inspect the site, and complete and file a spill report form. If the incident has been determined to be a major spill, a cleanup contractor with enough resources will be hired to complete the cleanup, inspect the site, dispose of the waste material, and complete and file a spill report.
- Arrange for proper testing (if the substance is unknown, send a sample to specified qualified testing laboratory).
- Closely monitor all cleanup activities.
- Ensure proper disposal of absorbent materials, containers, and soils as required.
- Complete cleanup and restore damaged areas.
- Submit the spill report to the APS Spill Coordinator and the Construction Manager.

5.3.2 Chemical Toilet Spill

Chemical toilets are self-contained and pose little threat to the construction site. Chemicals used in the portable toilets are biodegradable and generally non-toxic to humans. However, they can pose a danger to wildlife and sensitive habitats by virtue of heavy concentration of chemicals and human waste. They shall be pumped out at regular intervals. All portable chemical toilets will be anchored securely to the ground to prevent tipping over. Toilets shall never be placed in or near environmentally sensitive areas or in areas with the potential for flooding.

In the unlikely event that a portable toilet spills during transport or relocation, the same procedures shall be used as for other hazardous material spills. Disposal of absorbent materials shall be handled the same way as other spills, with proper disposal by the toilet supply company.

5.3.3 Unknown Hazardous Materials

There is always the possibility that personnel may unexpectedly encounter a hazardous situation when working on the site. The most likely materials to be encountered during grading activities are materials that are left over from past mining or dumping activities. If there is any doubt regarding the degree of hazard of the particular circumstance, and personnel are unsure as to what measures to take, the following steps shall be taken immediately to ensure the health and safety of the personnel involved.

- Stop work in the immediate area (100-foot radius, or as determined by the APS Spill Coordinator) of the discovery as soon as safely possible.
- Determine what has been encountered, i.e., tank or other container.
- Cordon off the area.
- Request that the APS Spill Coordinator further investigate and remove the object(s).

6.0 CLOSING OF A SPILL INCIDENT

6.1 Disposal of Waste

Following the cleanup of a spill, the waste, absorbent materials, protective clothing, and any soil that has been contaminated must be removed to a designated hazardous waste disposal area. All contaminated materials shall be sealed in 55-gallon drums and labeled with the contents. If the contaminant is unknown, a sample of the material must be collected and analyzed at a qualified testing laboratory before disposal of the drum. Sampling of any unknown contaminants will be done prior to cleanup to ensure the proper personal protective equipment (PPE) is used to protect worker health. Approval from APS Environmental Field Operations must be obtained prior to disposal of the drum. A copy of any laboratory results or MSDS must accompany the material, and copies must be attached to the spill report form submitted to the APS Spill Coordinator and Construction Manager. The contactor is responsible for the proper disposal of all waste and for understanding the responsibilities under federal and state statutes.

6.2 Final Reporting

All spill incidents that require cleanup must be reported. Notification must begin as soon as the incident occurs. The APS Spill Coordinator is responsible for the completion of the spill report form (*Attachment C*). Completion of this form will assist in the assessment of the spill and will ensure that the cleanup has been properly implemented. The spill report form must be submitted no later than 5 days after the incident has been closed. A copy of MSDS or laboratory results must be attached to the spill report. All disposal manifests will be approved through APS Environmental Field Operations.

6.3 Follow-up Investigation

The APS Spill Coordinator shall critique any spill response efforts and make recommendations or suggested modifications to the contractor's operating procedures that could prevent future spills or improve response efforts. This critique shall consider the following:

- Detection
- Assessment/Evaluation
- Response
- Command Structure

7.0 NOTIFICATIONS

Once the spill has been assessed, the APS Spill Coordinator will be responsible for notifying the appropriate federal, state, and local agencies.

The U.S. Environmental Protection Agency Region 9 is responsible for the administration and enforcement of the federal requirements of a Spill Prevention, Control, and Countermeasure Plan requirements in Arizona.

7.1 Federal and State Agencies

National Response Center (Washington, D.C.)
(800) 424-8802

Arizona Department of Environmental Quality
(800) 234-5677
(602) 771-2330 – Spill Reporting

Attachment A

TYPICAL FUEL, LUBRICANTS, AND HAZARDOUS MATERIALS

Generic List of Chemicals Used during the Construction of an Overhead Transmission Line

2-cycle oil (contains distillates and hydrotreated heavy paraffinic)

ABC fire extinguisher

Acetylene gas

Air tool oil

Ammonium hydroxide

Automatic transmission fluid

Battery acid (in vehicles and in the meter house of the substations)

Bee Bop Insect Killer

Canned spray paint

Chain lubricant (contains methylene chloride)

Connector grease (penotox)

Contact cleaner 2000

Diesel de-icer

Diesel fuel

Diesel fuel additive

Explosives (detonators, detonator assemblies – non-electric, tubular primers, cap-type primers, ammonium nitrate fertilizers)

Eye glass cleaner (contains methylene chloride)

Gasoline

Gasoline treatment

Herbicides (used for vegetation control)

Hot Stick cleaner (cloth treated with polydimethylsiloxane)

Insulating oil (inhibited, non-PCB)

Lubricating grease

Mastic coating

Methyl alcohol

North wasp and hornet spray (1,1,1-trichloroethene)

Oxygen

Paint thinner

Petroleum products (gasoline, diesel fuel, jet fuel A, lubricants, brake fluid, hydraulic fluid)

Prestone 11 antifreeze

Propane

Puncture seal tire inflator

Safety fuses

Starter fluid

Wagner brake fluid

WD-40

ZEP (safety solvent)

ZIP (1,1,1-tricholorethane)

Attachment B

RESPONSE TEAM CONTACTS

The APS Spill Coordinator for the project is:

Michelle Turgeon
APS Environmental Field Operations
2133 West Peoria Avenue
M.S. 3871
Phoenix, Arizona 85029
(602) 371-7715
APS 24-hour Spill Line: (602) 371-6900
Michelle.Turgeon@aps.com

The APS Project Manager for the project are, respectively:

Naomi Prieto
APS Project Manager
2043 West Cheryl Drive
Phoenix, Arizona 85021
(602) 371-7075
Naomi.Prieto@aps.com

The Dust Control Coordinator for this project is:

TBD by the Contractor

Additional Response Team Contacts will be provided prior to the start of construction; these new Team Contacts' information will be added to this SPRP before construction begins.

Attachment C

SPILL REPORT FORM

HANG2 Transmission Line Project

SPILL REPORT FORM

Date/time of spill: _____

Date/time of spill discovery: _____

Name and title of discoverer: _____ Phone: _____

Name of Spill Coordinator: _____ Phone: _____

Name of Construction Contractor Superintendent: _____

Name of APS Construction Manager: _____

Milepost/Legal Description: _____

Material Spilled/Estimated Volume: _____

Unique qualifier, if relevant, such as manufacturer of spilled material: _____

Media in which the release exists (circle one):

SAND SILT CLAY UPLAND WETLAND SURFACE WATER OTHER

Topography and surface conditions of the spill site: _____

Proximity to wetlands and surface waters (including ditches): _____

Proximity to private or public water supply wells: _____

Weather conditions at time of release: _____

Describe the cause and circumstances resulting in the spill: _____

_____

_____

Describe the extent of observed contamination, both horizontal and vertical (i.e., spill-stained soil in a 5-foot radius to a depth of 1 inch): _____

_____

Describe immediate spill control and/or cleanup methods used and implementation schedule:

_____

_____

Location of any excavated/stockpiled contaminated soil: _____

HANG2 Transmission Line Project

SPILL REPORT FORM

Describe the extent of spill-related injuries and remaining risk to human health and environment:

_____

Name, Company, and telephone number of party causing spill: _____

_____

Current status of cleanup actions: _____

_____

Name and company for the following:

Construction Contractor Superintendent: _____

Spill Coordinator: _____

Environmental Inspector: _____

Other Comments: _____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX C

FIRE MANAGEMENT PLAN

INTRODUCTION

This plan details measures that should be implemented to: (1) reduce the risk of starting a fire, and (2) to suppress a fire in the event one does occur within the construction area during project construction, operation, and maintenance.

PURPOSE

The risk of fire danger during construction of a transmission line is related largely to the use of vehicles and other motorized equipment operating off roadways, the handling and use of explosive materials and flammable liquids, and welding.

The purpose of this plan is to outline responsibilities, notification procedures, fire prevention measures, fire suppression equipment, and post-fire rehabilitation strategies related to the needs of this project. The goal is to minimize risk of project-related fires and, in case of fire, provide for immediate suppression within the construction area. Other plans containing information related to fire protection include Appendix B5–Blasting Plan and Appendix B7–Hazardous Materials Management Plan.

REGULATORY COMPLIANCE

This project will be subject to state, county, and federally enforced laws, ordinances, rules, and regulations that pertain to fire prevention and suppression activities. Key local regulatory agencies include the BLM Hassayampa and Yuma Field Offices and local fire protection agencies.

RESPONSIBILITIES

REGULATORY AGENCY

Fire management personnel (FMP) from the appropriate regulatory agency will oversee all fire control activities in his/her administrative unit. The FMP will discuss fire protection stipulations at the Notice to Proceed meeting, which will be attended by the appropriate agency, the CI, and the Construction Contractor(s) and their environmental monitors.

CONSTRUCTION CONTRACTOR

The Construction Contractor will implement the following action plan to the extent needed.

- The Construction Contractor is required to comply with state, county, and federal laws, ordinances, rules, and regulations which pertain to prevention and suppression of fire activities. When project construction occurs on BLM land, fire suppression is the responsibility of the BLM, and current BLM standard fire fighting rates for labor will be used. Equipment will be paid for at negotiated rates established in BLM rental agreement contracts for the particular working season. The BLM may call on the Contractor's workers and equipment in emergencies for fires outside the project area. Payment will be made in a similar manner to that above.

- The project will comply with all fire suppression requirements for all jurisdictions traversed by the project. The CI will contact the appropriate land-managing agency for the latest fire suppression requirements prior to construction activities.

Costs involved with Contractor-caused fires will be charged to the Contractor. There will be no extension of time for line construction for delays caused by Contractor-related fires. Specific construction-related activities and safety measures will be implemented during construction of

the transmission line in order to prevent fires and to ensure quick response and suppression in the event a fire occurs. These activities and requirements include:

Construction Crew

- If a fire starts in the project area, initiate fire suppression activities on the project until relieved by appropriate fire authorities and notify the Construction Contractor's Fire Marshal (see below) when a construction fire occurs in the area.
- Immediately alert the available project crews when a Contractor-caused fire occurs in the project area. Project tools, equipment, and trained workers will be sent immediately to control the fire.

Construction Contractor(s), Designated Fire Marshall

The Construction Contractor will designate a Fire Marshall that will be responsible for the following:

- Conduct regular inspections of tools, equipment and first-aid kits for completeness.
- Conduct regular inspections of storage areas and practices for handling flammable fuels to confirm compliance with applicable laws and regulations.
- Post smoking and fire rules at centrally visible locations.
- Coordinate initial response to Contractor-caused fires within the project area.
- Accompany the CI on fire inspections of the project area.
- Ensure that all construction workers and subcontractors are aware of the contents of this Fire Prevention Plan.
- Remain on duty when construction activity is in progress and any additional periods where fire safety is an issue.
- Report all wildfires in accordance with the notification procedures described in the Notification section below.
- If a fire starts in the project area, initiate and implement fire suppression activities until relieved by the appropriate fire agencies. Fire suppression personnel and equipment, including water trucks, will be dispatched within 15 minutes from the time a fire is reported. Issue current fire potential and fire safety warnings.

Compliance Inspector

The CI and the Fire Marshal will accompany the BLM FMO on fire inspections and take corrective action when notified that fire protection requirements are not in compliance. The CI will notify contractor to stop or reduce construction activities that pose a significant fire hazard until appropriate safeguards are taken.

NOTIFICATION

The Construction Contractor's Fire Marshal will notify the CI who will be responsible for notifying the appropriate agency's Project Manager and the appropriate agency's FMPs of a fire started in the project area during construction. During operation and maintenance activities, APS' maintenance crews or contract crews will be responsible for the immediate notification of a fire started in the project area. The Construction Contractor(s) and the Project Proponent will update the following emergency contact numbers for any changes prior to construction or maintenance.

EMERGENCY FIRE CONTACTS
Call 911 First

Arizona State Land Department
Dispatch: 602-255-4059
Bureau of Land Management
Fire Calls: 911
National Interagency Dispatch Center for Wildfire Reporting: 800-535-6076
or within
Hassayampa Field Office
Phoenix Interagency Dispatch Center (Mesa): 866-746-6516 or 480-457-1551
Yuma Field Office
Prescott Interagency Dispatch Center (Prescott): 928-537-5305
Also applicable to both offices—Arizona Interagency Dispatch Center (ADC): 800-309-7081

FIRE PREVENTION MEASURES

The following fire prevention measures will be implemented at all times by the Construction Contractor(s) during construction, operation, and maintenance of the project.

- No smoking will be allowed while operating equipment or while walking or working in areas with vegetation.
- Smoke only in cleared areas.
- In areas where smoking is allowed, completely extinguish all burning tobacco and matches and discard them in ash trays, **not on the ground**.
- Do not allow any fires or barbecues on the transmission line right-of-way, at material yards, substations, access roads, or other construction areas unless permitted by the lead federal agency.
- Instruct all field personnel about emergency response for fire events.
- Clear away all flammable material for a minimum of 10 feet, including snags (fallen or standing dead trees) from areas of operation where a spark, fire, or flame could be generated.
- If a fire does start by accident, take immediate steps to extinguish (if it is safe to do so) using available fire suppression equipment and techniques taught at field crew emergency response training that will be provided by the Construction Contractor(s) during construction or the Project Proponent during operation and maintenance.

ACTIVITY-RELATED PRECAUTIONS

BURNING (NOT ALLOWED)
No burning activities, campfires, or barbecues will be allowed on the transmission line right-of-way, at material yards, substations, on access roads, or in any other project construction areas.

BLASTING
No blasting will be performed without the notification of the CI and the Fire Marshal. Blasting operations will follow the guidelines described in the Blasting Plan (refer to Appendix B5). The Blasting Contractor's vehicle will be equipped with fire suppression equipment (see below).

WELDING
The Construction Contractor's Construction Manager must approve any welding or cutting of powerline structures or their component parts. Approved welding or cutting activities will only be performed in areas cleared of vegetation a minimum of 10 feet around the area. Welding or cutting activities will stop 1 hour before all fire-response personnel leave a construction area to reduce the possibility of welding activities smoldering and starting a fire. Welder vehicles will be equipped with fire suppression equipment (see below).

SPARK ARRESTERS
All equipment assigned to the project will be inspected and approved. Internal combustion engines (stationary or mobile) will be equipped with spark arresters that meet agency standards, and for which the following guidelines will apply:

- Spark arresters will be in good working order.
- Light trucks and cards with factory installed (type) mufflers (in good condition) may be used on roads where the roadway is cleared of all vegetation.
- On roads where vegetation exists, spark arresters will be used.
- Vehicles equipped with catalytic converters may represent potential fire hazards and will be parked on areas cleared of vegetation.
- If required, flues used in extra work areas will be equipped with spark arresters in good working order and meeting agency standards.

SMOKING
Smoking signs and fire rules will be posted for the project on the project bulletin board at the Contractor's field office, at all show-up locations, and on all portable toilet doors during the fire season (to be determined by the authorized officer). The Contractor is responsible for and will require supervisory personnel to enforce all posted rules, will prohibit smoking except in designated areas approved by the authorized federal officer, and will prohibit smoking during any season while operating equipment, walking, or working in areas of vegetation.

WARNING DEVICES
The use of torches, fuses, highway flares, or other warning devices with open flames will be prohibited. The Construction Contractor will use only electric or battery-operated warning devices within the project area.

PARKING AND VEHICLE STORAGE AREAS
Equipment parking areas and small stationary engine sites will be cleared of all flammable materials as determined necessary by the authorizing officer. Gas and oil storage areas will be cleared of all flammable material for a distance of 100 feet with "NO SMOKING" signs posted throughout the area. All used and discarded oil filters and oily rags or other waste will be disposed of in an approved landfill. Glass jugs or bottles will not be used as containers for gasoline or other flammable materials.

SIGNAGE
"NO SMOKING" signs and fire rules will be posted at material yards and key construction sites during the fire season.

POWER SAWS
All gasoline-powered saws will be provided with approved spark arresters/mufflers. Gasoline-powered chainsaws will be maintained in good condition throughout their assignment to the project. In addition, chainsaws will comply with the following requirements:

- Arresters/mufflers will contain a 0.23-inch mesh, stainless steel screen.
- During the period of use, the operator will have one long-handled, round point, size 0 shovel that will be maintained in good working order; the operator will also carry an approved belt carrying-type fire extinguisher.
- Refueling will be done in an area that has been cleared of flammable materials; power saws will be moved at least 10 feet from the place of refueling before starting (all gas will be carried in approved metal safety containers only).

EQUIPMENT REFUELING
Fuel trucks will have at a minimum a 35-pound fire extinguisher charged with necessary chemicals to control electrical and gas fires. If required, helicopter fuel trucks will be grounded to the helicopter during refueling.

ACCESS
The Construction Contractor will provide continuous access to roads for emergency vehicles during construction. The access roads could have the potential to be used as fire breaks to help in fire suppression.

MINIMUM FIRE PREVENTION AND SUPPRESSION EQUIPMENT REQUIRED

The following fire prevention and suppression equipment will be available and maintained in good working order at all times during project construction.

In all motorized vehicles and equipment in each active construction area:

- One long-handled, round point shovel
- One ax or Pulaski fire tool
- One 5-pound ABC Dry Chemical Fire Extinguisher
- One 5-gallon water backpack (or other approved container) full of water or other extinguishing solution
- Hardhat, work gloves, and eye protection.

In addition to the fire suppression equipment required in motorized vehicles and equipment above, construction work sites shall include:

- Power saws, if required for construction, equipped with an approved spark arrester and accompanied by one 5-pound ABC dry chemical fire extinguisher and a long-handled, round point shovel when used away from a vehicle.
- Fuel service trucks shall contain one 35-pound capacity fire extinguisher charged with the necessary chemicals to control electrical and fuel fires.

- Wood cutting, welding, or other construction work sites that have a higher risk of starting fires shall have at least two long-handled, round point shovels and two 5-pound ABC dry chemical fire extinguishers available on site.
- Every construction work site shall have at least one radio and/or cellular/satellite telephone to contact fire suppression agencies or the project management.
- Backpumps filled with water (two at each wood-cutting site, one at each welding site, and two at each tower installation or construction, or any activity site at risk).

During periods of heightened fire danger, the following equipment shall be available in the construction area to aid in response to a fire situation, or stationed near high-risk construction work sites:

- One fire suppression vehicle equipped with a water tank of minimum 500 gallons capacity, 250 feet of ¾-inch heavy-duty rubber hose, and a pump with a discharge capacity of at least 20 gallons per minute. The pump shall have fuel capacity to operate for at least 2 hours.
- The fire suppression vehicle shall be outfitted with one tool cache for fire use only containing at a minimum: two long-handled round point shovels, two axes or Pulaski fire tools, and one chainsaw of 3.5 or more horsepower with a cutting bar of at least 20 inches in length.

IN CASE OF FIRE-INITIAL RESPONSE AND EMERGENCY CONTACTS

If a fire does start in the project area during construction, operation, or maintenance activities and if the fire is manageable, safely attempt to control it with a fire extinguisher or other available equipment (e.g., using shovel to throw dirt on the fire or remove small patches of vegetation). As part of the environmental compliance training program, the Construction Contractor(s) will receive training on initial fire suppression techniques, reporting requirements how to determine if a fire is manageable and what control measures should be implemented by on-site field crews, and at what point field crews should evacuate. The training also will address how to respond to wildfires in the area and maintain knowledge of and plans for evacuation.

If the fire is unmanageable, field crews will evacuate and call 911 or the district dispatch for the area (see emergency contacts listed above). All fires must be reported to the jurisdictional fire agency regardless of size and actions taken.

POST-FIRE REHABILITATION STRATEGIES

If the cause of a fire is determined to be the result of the project, the Construction Contractor will implement rehabilitation measures (refer to Cleanup and Reclamation in the POD and Appendix D2—Vegetation Management Plan) to support the following goals:

- Restoration of high quality wildlife habitat and various vegetation types
- Restoration of range value
- Suppression of invasive weeds
- Prevention of increased fire hazard
- Prevention of increased erosion

The following post-fire rehabilitation measures will be implemented by the Construction Contractor:

- After a fire has been extinguished, the burn areas will be reclaimed in accordance with lead agency requirements. Small fires will be revegetated to the native vegetation using appropriate seed mixtures. Larger fires may require restoration plans. Coordination with the lead agency is necessary to determine requirements for each particular area, depending upon the size and location of a fire and the location of sensitive resources.
- To prevent the spread of noxious weeds and invasive species during post-fire rehabilitation, the following measures will be implemented by the Construction Contractor:
    - Off-road vehicles and ATVs will be inspected and will receive high pressure air or water cleaning on the undercarriage if necessary, with special emphasis on axles, frame, cross members, motor mounts, underneath the steps, running boards, and front bumper/brush guard assemblies.
    - Clean off-road equipment (power or high-pressure cleaning) of all mud, dirt, and plant parts before moving into weed-free areas.
    - The Construction Contractor and the contractor employees working in the field will receive basic weed identification training.
    - The project proponent will implement the Noxious Weed Plan (refer to Appendix D2–Vegetation Management Plan).
    - Reclamation activities will use certified invasive weed-free seed.

APPENDIX D

BIOLOGICAL CONSIDERATIONS

APPENDIX D1

WILDLIFE MANAGEMENT PLAN

Wildlife Management Plan

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INTRODUCTION

The Wildlife Management Plan will serve as a site-specific plan for avoiding and/or mitigating impacts to special status wildlife that may occur in the vicinity of the APS Hassayampa-North Gila 500kV-2 (HANG2) Transmission Line project. For this purpose, the project area includes the 200-foot right-of-way (ROW) corridor, existing access roads, and new spur routes to the proposed powerline structure locations. Project-specific avoidance and mitigation measures were prepared using established agency standards. It is expected that implementing these measures would reduce short-term and long-term environmental impacts to a level of insignificance. The Wildlife Plan was prepared as a supplement to the Plan of Development (POD) for this project. It builds upon the analysis of impacts and mitigation measures contained in the *Environmental Assessment* (EA) prepared under BLM direction in 2007 (EPG 2007). The Wildlife Plan also includes an updated review of species and habitat information, including the upgraded legal status and mitigation for Sonoran desert tortoise (*Gopherus morafkai*).

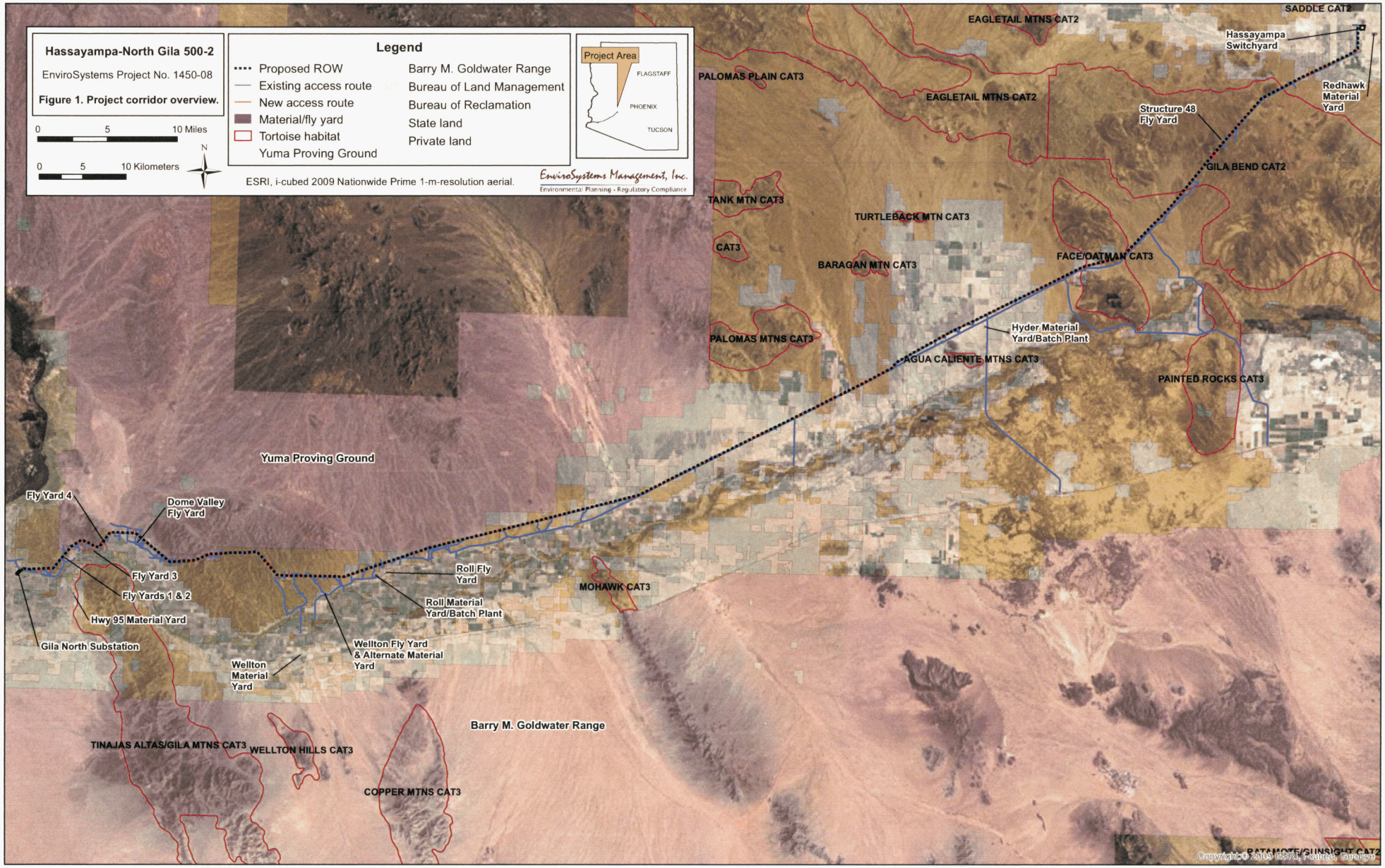
BACKGROUND

As currently designed, the HANG2 transmission line would extend over a distance of 111.36 miles. The line will cross 53.74 miles of Bureau of Land Management (BLM) land, 1.63 miles of Bureau of Reclamation land, 8.97 miles on the Yuma Proving Ground (YPG), 25.94 miles of Arizona State Trust land, and 21.08 miles of private land in Maricopa and Yuma counties, southwestern Arizona (*Figure 1*). The transmission line will consist primarily of self-supporting, galvanized steel, 4-legged lattice structures that parallel the existing HANG1 500kV-4 transmission line. The proposed project is needed to support the continuing development and growth occurring and anticipated in the Yuma region. The required ROW width is 200 feet.

The project area occurs primarily in the Lower Colorado River Subdivision of the Sonoran Desert, but includes Arizona Upland Subdivision (Brown 1994) where the project traverses the Gila Bend Mountains. The climate is arid with mean annual precipitation ranging between 3 and 7 inches (WRCC 2012a and 2012b). Topography is variable, ranging from rocky mountainous slopes to low-lying, relatively flat areas with gravel and desert pavement and alluvial deposits. Hydrologic features consist of xeric washes that range from broad to narrow and flow only in conjunction with seasonal precipitation. The EA (EPG 2007) affirms that no wetlands, riparian zones (including wild and/or scenic rivers), or natural perennial water sources occur in the project area. This was confirmed during site visits conducted in 2011-2012.

WILDLIFE OVERVIEW

Wildlife species that are anticipated to occur in the project area are those generally associated with arid desertscrub habitats of the Sonoran Desert. Typical mammals include Harris' antelope ground squirrel (*Ammospermophilus harrisii*), coyote (*Canis latrans*), kangaroo rat (*Dipodomys* spp.), black-tailed jackrabbit (*Lepus californicus*), javelina (*Pecari tajacu*), mule deer (*Odocoileus hemionus*), pocket mice (*Perognathus* spp.), round-tailed ground squirrel (*Spermophilus tereticaudus*), desert cottontail (*Sylvilagus audubonii*), desert bighorn sheep (*Ovis canadensis*), kit fox (*Vulpes macrotis*), and gray fox (*Urocyon cinereoargenteus*). Common bird species are black-throated sparrow (*Amphispiza bilineata*), cactus wren (*Campylorhynchus brunneicapillus*), roadrunner (*Geococcyx californianus*), Gambel's quail (*Callipepla gambelii*), Gila woodpecker (*Melanerpes uropygialis*), black-tailed gnatcatcher (*Polioptila melanura*), curve-billed thrasher (*Toxostoma curvirostra*), LeContes thrasher (*Toxostoma lecontei*), and mourning dove (Zenaida macroura). Typical amphibians and reptiles include Sonoran desert toad (Bufo


Hassayampa-North Gila 500-2
EnviroSystems Project No. 1450-08
Figure 1. Project corridor overview.
0 5 10 Miles
0 5 10 Kilometers
N
Legend
Proposed ROW
Existing access route
New access route
Material/fly yard
Tortoise habitat
Yuma Proving Ground
Barry M. Goldwater Range
Bureau of Land Management
Bureau of Reclamation
State land
Private land
Project Area
FLAGSTAFF
PHOENIX
TUCSON
ESRI, i-cubed 2009 Nationwide Prime 1-m-resolution aerial.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
SADDLE CAT2
EAGLETAIL MTNS CAT2
Hassayampa Switchyard
PALOMAS PLAIN CAT3
EAGLETAIL MTNS CAT2
Redhawk Material Yard
Structure 48 Fly Yard
GILA BEND CAT2
TANK MTN CAT3
TURTLEBACK MTN CAT3
CAT3
BARAGAN MTN CAT3
FACE/OATMAN CAT3
Hyder Material Yard/Batch Plant
PALOMAS MTNS CAT3
AGUA CALIENTE MTNS CAT3
PAINTED ROCKS CAT3
Yuma Proving Ground
Fly Yard 4
Dome Valley Fly Yard
Fly Yard 3
Fly Yards 1 & 2
Hwy 95 Material Yard
Gila North Substation
Roll Fly Yard
Roll Material Yard/Batch Plant
MOHAWK CAT3
Wellton Fly Yard & Alternate Material Yard
Wellton Material Yard
Barry M. Goldwater Range
TINAJAS ALTAS/GILA MTNS CAT3
WELLTON HILLS CAT3
COPPER MTNS CAT3
PATAMOTE/GUNSIGHT CAT2
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alvarius), zebra-tailed lizard (*Callisaurus draconoides*), whiptails (*Cnemidophorus* spp.), rattlesnakes (*Crotalus* spp.), horned lizards (*Phyrnosoma* spp.), chuckwalla (*Sauromalus ater*), and tree lizard (*Urosaurus ornatus*) (EPG 2007).

This project could affect a range of wildlife species through habitat disturbance, vegetation removal, human presence, and other construction-related activities. It is expected that impacts to wildlife would be low and that modified habitat would account for a small percentage of overall habitat in the project vicinity. It is also expected that long-term impacts to wildlife would be minimal, given that the new ROW corridor would parallel the existing HANG1 ROW corridor for its length. Additionally, this project would utilize mostly existing roads, thereby reducing the need to create new roads. Furthermore, project mitigation may reduce much of the anticipated disturbance and temporary effects to habitats.

SPECIAL STATUS SPECIES

Some special status wildlife species have the potential to occur in the project area. ESM reviewed existing reports relevant to the project and completed new independent database searches to refine the list of species to consider in this Plan.

Environmental Assessment

In October 2007 Environmental Planning Group (EPG) analyzed potential impacts to 18 special status wildlife species in an Environmental Assessment based on information from the BLM, U.S. Fish and Wildlife Service (USFWS), and Arizona Game and Fish Department (AGFD) (*Tables 1* and *2*). The species are the California leaf-nosed bat (*Macrotus californicus* Baird), cave myotis (*Myotis velifer*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), spotted bat (*Euderma maculatum*), American peregrine falcon (*Falco peregrinus anatum*), great egret (*Ardea alba*), cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), western burrowing owl (*Athene cunicularia hypugaea*), southwestern willow flycatcher (*Empidonax traillii extimus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), Yuma clapper rail (*Rallus longirostris yumanensis*), desert bighorn sheep (*Ovis canadensis*), Sonoran pronghorn (*Antilocarpa americana sonoriensis*), Arizona chuckwalla (*Sauromalus ater* [Arizona population]), desert rosy boa (*Charina trivirgata gracia*), Gila monster (*Heloderma suspectum*), Sonoran desert tortoise (*Gopherus morafkai*), and Yuman fringe-toed lizard (*Uma notata rufopunctata*).

Of these 18 identified and analyzed species, upon further investigation 15 have been dismissed from further analysis in this Plan—11 because their potential to occur in the project area has been determined to be unlikely and four because they originally did not have special status (desert bighorn sheep) or no longer have special status (Arizona chuckwalla, pocketed free-tailed bat, and Gila monster; all are formerly BLM sensitive species, Table 1). The BLM issued a *Finding of No Significant Impact* (FONSI) and *Decision Record* for the project on November 6, 2007. Speaking to the desert bighorn sheep, the public review draft (April 2012) of the U.S. Army Garrison Yuma Proving Ground's *Integrated Natural Resources Management Plan* does call for, to the extent practical, avoidance of bighorn sheep during lambing season (primarily January 1-April 30) (see notation to this effect in Table 1).

Of further note, for the identified species the great egret, western yellow-billed cuckoo, southwestern willow flycatcher, and Yuma clapper rail are confined largely to riparian habitat. Such habitat occurs only along the Gila and Colorado rivers, which are outside the project area/areas of potential effect (APE).

TABLE 1. SPECIAL STATUS WILDLIFE SPECIES ANALYZED IN 2007 EA BUT DISMISSED FROM FURTHER CONSIDERATION IN THIS PLAN

Species	Status	Habitat	Potential to Occur in Project Area
Arizona chuckwalla (*Sauromalus ater* [Arizona population]) (Source: PEP & ER)	None	Predominantly found near cliffs, boulders, or rocky slopes in association with creosote bush. 1,140 - 2,410 feet elevation for the Arizona population (AGFD 2009).	**Possible**. Potentially suitable habitat may occur in the northeast and southwest portions of the project area.
American peregrine falcon (*Falco peregrinus anatum*)	WSC	Inhabits open wetlands near cliffs; also found living in cities with tall buildings or bridges.	**Unlikely but possible**. Lack of suitable nesting habitat in project area. Could utilize project vicinity as a transient.
Cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*)	BLM-S, WSC	Northern extend of range in southern Arizona. Found in riparian, broadleaf gallery forests, Sonoran desertscrub with braided wash systems, and semi-desert grasslands with wooded drainages. Cavity nesters.	**Unlikely but possible**. Lack of suitable foraging habitat (i.e., specific density and structural diversity of vegetation for prey species).
California leaf-nosed bat (*Macrotus californicus* Baird) (Source: PEP & ER)	BLM-S, WSC	Sonoran desertscrub; roosts in mines, caves, and rockshelters below 4,000 feet elevation with most records below 2,500 feet (AGFD 2008a).	**Unlikely but possible**. No suitable habitat in project area for day roosting. Individuals may potentially utilize project vicinity for hunting at night.
Cave myotis (*Myotis velifer*)	BLM-S, WSC	Prefers lower elevations in xeric habitats such as creosotebush or palo verde-mixed scrub plant associations; typically within a few miles of a permanent water source. Often inhabits mines and caves in large colonies, as well as bridges and buildings.	**Unlikely but possible**. No suitable habitat in project area for day roosting. Individuals may potentially utilize project vicinity for hunting at night.
Desert bighorn sheep (*Ovis canadensis*)	None	In western Arizona found in precipitous, desert mountain ranges with broken rock, numerous gullies, and relatively sparse vegetation. Association with water sources including rock catchments, springs, and human-made drinkers. BLM considers lambing areas to be sensitive.	**Likely**. Known to occur in project area. YPG INRMP (2012) recommends, to the extent practical, *avoiding construction activities on mountaintops during lambing season (January 1-April 30).*
Desert rosy boa (*Charina trivirgata gracia*)	BLM-S	Found in rocky areas with basalt and granite soils in desert ranges, especially in canyons with permanent or intermittent streams; 700-5,650 feet elevation.	**Unlikely but possible**. Range includes project vicinity, but absence of water reduces likelihood for species to occur in project area.
Gila monster (*Heloderma suspectum*)	None	Prefers undulating, rocky foothills, bajadas, and canyons; tends to avoid open sandy plains. Cottonwood-willow riparian, mesquite bosque, mixed riparian scrub, Mohave desertscrub, and Sonoran desertscrub; sea level-4,100 feet elev.	**Likely**. Suitable habitat in project area, especially along rocky washes.
Great egret (*Ardea alba*) (Source: PEP & ER)	WSC	Marshes, swampy woods, tidal estuaries, lagoons, mangroves, streams, lakes, rivers and ponds; also in fields & meadows (AGFD 2010c).	**Not possible**. Suitable habitat not present in project area.

Species	Status	Habitat	Potential to Occur in Project Area
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	None	Predominantly found in high cliffs in rugged rocky country. Its northern limit is the Bill Williams River in western Arizona.	**Unlikely but possible.** Limited suitable habitat in project area for day roosting. Individuals may potentially utilize project vicinity for hunting at night.
Southwestern willow flycatcher (*Empidonax traillii extimus*) (Source: PEP, ER & USFWS)	LE, WSC	Riparian obligate that prefers dense canopy cover, large volume of foliage, & surface water during midsummer; willow-cottonwood thickets, tall dense tamarisk, Russian olive, & riparian associates; 75-9,180 ft elev (AGFD 2007a; USFWS 2012a, 2012b). (*Maricopa & Yuma counties)*	**Not possible.** Suitable habitat not present in project area.
Spotted bat (*Euderma maculatum*)	BLM-S, WSC	Prefers rocky cliffs in dry deserts where it roosts in crevices, caves, and buildings. Also recorded in conifer forests and habitats with riparian associations, with or without cliff-roost habitats nearby.	**Unlikely but possible.** Low likelihood of occurrence in project area.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) (Source: PEP, ER & USFWS)	C, WSC	Suitable habitats west of Continental Divide limited to narrow, widely separated, riparian cottonwood-willow galleries; salt cedar (aka tamarisk) also used. Dense understory foliage appears to be important for nest selection. In Arizona cuckoos also found in larger mesquite bosques; <6,000 feet elevation (AGFD 2011e & USFWS 2012b). (*Yuma County)*	**Not possible.** Suitable habitat not present in project area.
Yuma clapper rail (*Rallus longirostris yumanensis*) (Source: PEP, ER & USFWS)	LE, WSC	Only clapper rail to breed in freshwater marshes; also inhabits brackish water marshes & side waters. Most found within Lower Colorado Subdivision of Sonoran Desertscrub biome. Territories appear to be distributed along a zone where standing water gives way to saturated soil within marsh. Interface between water, soil, & vegetation seems far more important than plant species that cover a site. In Arizona 100-1,500 feet elevation (AGFD 2000; USFWS 2012a, 2012b). (*Maricopa &Yuma counties)*	**Not possible.** Suitable habitat not present in project area.
Yuman fringe-toed lizard (*Uma rufopunctata*)	BLM-S, WSC	Restricted to sparsely vegetated, fine windblown sand dunes, flats, riverbanks, & washes or arid desert. Found only in extreme southwestern Arizona and adjacent Mexico; 160-900 feet elevation.	**Unlikely but possible.** Lack of suitable habitat (i.e., fine windblown sand). Dry washes have this attribute but not enough to support species in project area.
Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) (Source: USFWS)	LE	Desert scrub habitat w/ agave & columnar cacti present as food plants. Day roosts in caves and abandoned tunnels; 1,600-11,500 feet elevation (USFWS 2012a, 2012b). (*Maricopa & Yuma counties)*	**Unlikely but possible.** No suitable habitat in project area for day roosting so unlikely to occur. Slight possibility of individuals utilizing project vicinity for hunting at night.
BLM-S = BLM sensitive species; WSC = wildlife of special concern (State); HDMS = Heritage Data Management System; LE = Listed Endangered; C = Candidate			

Plan of Development

From 2011-2013 EnviroSystems Management, Inc. (ESM) conducted additional research in preparing the biological sections of the Plan of Development for the HANG2 project. ESM obtained shapefiles from APS to document the proposed project route on USGS 7.5' topographic quadrangles. EMS then obtained GIS shapefiles from resource specialists at AGFD and the BLM to overlay species and habitat occurrences onto the HANG2 project area. Current information was acquired and reviewed for 19 special status wildlife species that are known to occur or could occur in the HANG2 project vicinity, including federal and state species listed as endangered or threatened, proposed as endangered or threatened, candidates for listing, species of concern, and BLM sensitive species. This information was compared with that used to compile the 2007 list of species in the EA to account for any addition or subtraction of species and to ensure the legal and agency status was current for all species.

AGFD Heritage Data Management System – Project Evaluation Program

ESM requested a project review from the AGFD Heritage Data Management System (HDMS) *Project Evaluation Program* (PEP, dated December 13, 2011). The PEP review identified 13 special status wildlife species that are known to occur or could occur within a 5-mile buffer of the project area, including some that are associated with riparian habitats. The PEP response (dated January 5, 2012) identified the Arizona chuckwalla (Arizona population), California black rail, California leaf-nosed bat, flat-tailed horned lizard, great egret, least bittern, pocketed free-tailed bat, southwestern willow flycatcher, western burrowing owl, western yellow bat, western yellow-billed cuckoo, Yuma clapper rail, and Yuman desert fringe-toed lizard. Many of these species were considered in the 2007 EA. Those species that were not considered in the EA are not likely to occur in the project area (e.g., the California black rail, which occurs only in freshwater marshes along the Colorado River outside the project area). Additionally, we consulted with AGFD regarding eagles. This is the information conveyed to ESM in January 5, 2012 correspondence with the AGFD HDMS Program Supervisor: Our analysis shows that, "we did not have any golden eagles within the project area. In fact, we did not have any within 12 miles of the proposed line. There are two wintering bald eagles about 7.5–10 miles away. One in on the Colorado River north of the terminus of the line, and the other is at the northwest end of Painted Rock Reservoir." None [no eagles] were within the suggest[ed] 7-mile radius of the USFWS."

On-line Environmental Review Tool

ESM also utilized the AGFD *On-line Environmental Review* (ER) *Tool* (accessed November 6, 2012) and identified one additional wildlife species within a 3-mile buffer of the project area that was not previously considered: bald eagle (Sonoran Desert winter population). In April 2012 the USFWS found that the Sonoran Desert Area population of bald eagle does not qualify as a distinct population segment (DPS), and listing the Sonoran Desert Area population of bald eagle is not warranted (USFWS 2012c). The Sonoran Desert population of bald eagles continues to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Threatened and Endangered Species, Maricopa and Yuma Counties, Arizona

Further information was obtained from the USFWS Arizona Ecological Services website (accessed November 7, 2012) for 10 species that are currently listed as threatened or endangered, proposed for listing as threatened or endangered, candidates for listing, and species of concern in Maricopa County (USFWS 2012a) and Yuma County (USFWS 2012b). These species include the California least tern (*Sterna antillarum browni*), desert pupfish (*Cyprinodon macularius*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*); Mexican spotted owl (*Strix*

occidentalis lucida); razorback sucker (*Xyrauchen texanus*); Sonoran pronghorn (*Antilocarpa americana sonoriensis*); Sprague's pipit (*Anthus spragueii*); Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*); and woundfin (*Plagopterus argentissimus*). Six of these species require aquatic or riparian habitat which is not present in the project area; the ranges of two others (Mexican spotted owl and Tucson shovel-nosed snake) are outside the project area; one has no suitable habitat for day roosting but was added to the bottom of Table 1 because there is the slight possibility of it hunting at night in the project vicinity (lesser long-nosed bat); and the single remaining species (Sonoran pronghorn) had already been considered in the 2007 EA and is more comprehensively discussed below.

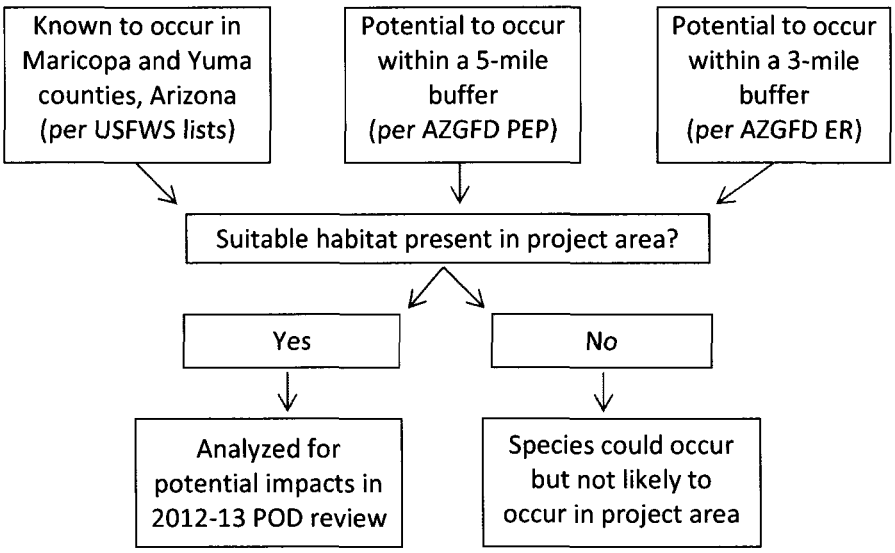
Of the 18 species analyzed in the EA (EPG 2007), status changed only for the Sonoran desert tortoise, which was upgraded by the USFWS in 2010 from a species of concern to a candidate for federal listing. It was also recognized as a separate species—as opposed to one of two populations of *Gopherus agassizii* (Mojave population and Sonoran population)—and renamed *Gopherus morafkai*. Altogether, 43 wildlife species were considered for potential impacts resulting from the HANG2 project, and of the 18 species analyzed in the 2007 EA, only the following three were identified as having potential habitat in the project area or vicinity and are further considered in this Plan (*Table 2*).

TABLE 2. SPECIAL STATUS WILDLIFE SPECIES ANALYZED IN 2007 EA AND FURTHER CONSIDERED IN THIS PLAN

Species	Status	Habitat	Potential to Occur in Project Area
Sonoran pronghorn (*Antilocarpa americana sonoriensis*) (Source: USFWS)	LE (NEP)	Broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations. Typically bajadas are used as fawning areas and sandy dune areas provide food seasonally. Cacti (e.g., jumping cholla) appear to make up substantial part of diet. This subspecies also occurs in Mexico (USFWS 2012a & 2012b). (*Maricopa and Yuma counties)*	**Likely**. A non-essential experimental population (NEP) was established just north of the proposed line in Area A, which includes Yuma Proving Ground, Kofa National Wildlife Refuge, and BLM lands.
Sonoran desert tortoise (*Gopherus morafkai*) (Source: PEP, ER & USFWS)	C, WSC	Primarily rocky (often steep) hillsides and bajadas of Sonoran and Mojave desertscrub. In Lower Colorado River Valley Subdivision, caliche caves and cutbanks of washes are also used for shelter sites (though these sites are rarely found in shallow soils). Washes and valley bottoms used in dispersal; 510-5,300 feet elevation (AGFD 2011d; USFWS 2012a & 2012b). (*Maricopa and Yuma counties)*	**Likely**. Project traverses Gila Bend Category II habitat and Face/ Oatman Category III habitat in vicinity of Gila Bend Mountains near Secret Mountain Wilderness.
Western burrowing owl (*Athene cunicularia hypugaea*) (Source: PEP & ER)	SC, BLM-S	Open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands, often associated with burrowing mammals. At times observed in open areas such as vacant lots near human habitation, golf courses, and airports; 650-6,140 feet elevation (AGFD 2010e).	**Likely**. Suitable habitat present within project area.
Status definitions: C = USFWS Candidate; BLM-S = BLM Sensitive; SC = USFWS Species of Concern; WSC = Wildlife of Special Concern (State), LE = Listed Endangered, NEP = Non-essential Experimental Population			

Figure 2 provides a visual representation of the basic approach used to preclude species from the current analysis, based primarily on habitat suitability and range.

FIGURE 2. PROCESS FOR DETERMINING SPECIES POTENTIAL IN THE PROJECT AREA



According to the BLM *Desert Tortoise Mitigation Policy* (IM No. AZ-2012-031), mitigation efforts shall be applied to attain no net loss of quality or quantity of desert tortoise (DT) designated habitat. Compensation for loss of habitat in categorized DT habitat will be implemented as discussed below in accordance with the BLM's *Desert Tortoise Mitigation Policy*. The western burrowing owl and Sonoran pronghorn are also further assessed and discussed.

Biological Field Surveys

In conjunction with the current analysis, field visits were carried out on three separate occasions: July and August 2011, April 2012, and November 2012. ESM biologists surveyed numerous locations along the HANG2 ROW to identify potentially suitable habitat and individual occurrences of two special status species: Sonoran desert tortoise and western burrowing owl. The entire project corridor was examined during the first two field sessions, but due to the lack of accessibility and time constraints, the mountainous areas of the proposed ROW were not surveyed in November 2012. The section titled *Species-Specific BMPs & Mitigation* summarizes the information collected during the biological field surveys (see below after the section titled *Regulatory Compliance*).

REGULATORY COMPLIANCE

Endangered Species Act

The *Endangered Species Act* (ESA) of 1973 (as amended) authorized the USFWS to oversee projects that may affect the survival of a species listed as federally threatened or endangered. If a project may affect a federally listed species, then federal consultation is required under Section 7 of the ESA between the lead federal agency and the USFWS. In April 2013 the BLM specifically consulted with the USFWS regarding the Sonoran pronghorn nonessential population; USFWS responded in May 2013. The ESA defines *take* as killing, harming, or harassing any federally listed species; *harm* includes major habitat modification. No federally listed threatened or endangered species have been identified as occurring in or near the project area. Additionally, no designated critical habitat occurs in the project area. It is expected that this project will comply fully with the ESA and that no take will occur to any listed species.

Migratory Bird Treaty Act

The *Migratory Bird Treaty Act* (MBTA) of 1918 (as amended) protects more than 800 species of native, North American migratory birds by making it unlawful to pursue, hunt, take, capture, kill or sell birds listed therein, as well as any bird parts (with narrow exceptions), including feathers, eggs, and nests. All active nests (i.e., those with eggs or young present) are protected by the MBTA. The breeding season and nest activity can vary by location and species, but for most North American raptors it falls between February 1 and August 31 (APLIC 1996).

It is anticipated that migratory birds may utilize the project area and that the new ROW will cross a variety of suitable habitats that could attract migratory bird species. For this project the MBTA pertains to migratory bird species that may be affected during construction. The 2007 EA describes potential impacts to migratory birds, including "loss of nests and nesting habitat through ground clearing and vegetation removal, potential nest abandonment due to noise and construction activity disturbance, death by impact with the transmission lines, and increased perching habitat for avian predators." Some large birds (i.e., raptors, ravens, and turkey vultures) may use existing towers on the adjacent HANG1 transmission line for perching, roosting, and nesting. Those structures could provide nesting sites where natural nest substrates are scarce (APLIC 1996). However, the structure perches are also used to predate on desert tortoise.

Mitigation for Migratory Birds

Compliance with the MBTA requires surveying for and delineating a 200-foot, non-disturbance buffer for nesting birds during the breeding season (February 1–August 15; *personal communication*, K. Grove, BLM RECO Team Biologist, December 11, 2012). Surveys/monitoring shall be conducted around tower sites, laydown/staging areas, and access road/spur road locations. If breeding birds with active nests are found, then a biological monitor shall establish a buffer around the nests, and no activities shall be allowed within the buffer until the young have fledged from the nest or if the nest fails. The biological monitor shall then conduct regular monitoring of the nest (following additional coordination with AGFD) to determine success/failure and to ensure that project activities are not conducted within the buffer. The biological monitor shall be responsible for documenting the results of the surveys and the ongoing monitoring, and the resulting reports will be provided to the affected BLM offices (Yuma & Lower Sonoran FOs). Additionally, APS has developed and implemented a *Wildlife Protection Program* designed to minimize the danger of active powerlines to raptors and other animals, including resident and migratory birds (APS 2012). The program's website offers contact information for reporting concerns about a raptor or animal occupying a power facility, as well as a hotline for reporting wildlife injuries. It is expected that the HANG2 project will comply fully with the MBTA.

Bald and Golden Eagle Protection Act

The *Bald and Golden Eagle Protection Act* (Eagle Act) provides criminal penalties for *taking* any individuals of either species, as well as any part, nest, or egg. The term *take* in the act includes any attempts to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." For this project the Eagle Act pertains to potential disturbance of nesting golden eagles.

The 2012 project review showed no eagle nests or evidence of eagle activity in the project area, though it is anticipated that new tower structures could encourage perching, roosting, and nesting on those structures. Golden eagles are known to nest outside the project area in the Gila Bend Mountains according to information obtained in November2012 from Kenneth Jacobson, Raptor Management Coordinator at AGFD, who reviewed GIS shapefiles of the project corridor for golden eagle surveys and

nest search results. The data reveals the closest potential breeding area as 3.5 miles south of proposed HANG2 Structure 40, which occurs in the northeast portion of the alignment northeast of the Gila Bend Mountains. At this location AGFD biologists observed large, eagle-sized nests, though use and occupancy were not determined. According to Mr. Jacobson, "the 3.5-mile distance should be more than adequate not to disturb the nesting attempt even if the site was occupied" (*personal communication,* 15 November 2012). In addition, according to Sabra Tonn, HDMS Program Supervisor at AGFD, there are no documented golden eagles within the project area; the closest is more than 12 miles from the proposed line (*personal communication,* 5 January 2012).

The southwestern part of the project area crosses through the foothills of the Muggins Mountains and Laguna Mountains, neither of which were surveyed by AGFD for nesting golden eagles. APS requested that the BLM, acting as the lead agency for this project, consult with biologists at the Yuma Proving Ground to assess eagle presence or absence in that part of the project corridor. YPG has not surveyed the south end of their range (the Muggins area); therefore, it is unknown if eagles are there or not (comments from Daniel Stewart, YPG Wildlife Biologist, 7 May 2013).

Wintering bald eagles are known to use riparian habitats beyond the western terminus of the HANG2 project corridor. Ms. Tonn indicated by *email* that two wintering bald eagles were detected 7.5–10 miles away from the project area (*personal communication,* 5 January 2012). Ms. Tonn's email also verified that both eagle sites were beyond the 7-mile avoidance radius suggested by the USFWS. No riparian habitat occurs within or adjacent to the project area, so it is unlikely that bald eagles would utilize the project area due to unsuitable habitat for nesting or foraging.

Mitigation for Bald and Golden Eagles

Bald or golden eagles are not expected to occur within the project area, but the potential exists for golden eagles to forage in the project area at some point in the future. The APLIC report (1996) asserts that golden eagles and other large, aerial-perching birds often utilize tall structures such as transmission towers for optimal views of potential prey. However, standard design features of 500kV towers have reduced the risk of electrocution to a level of insignificance (APLIC 1996). Additionally, in years prior to scoping this project, APS' Wildlife Protection Program was implemented to reduce impacts to a number of wildlife species including bald and golden eagles (APS 2012). It is expected that the HANG2 project will comply fully with the Bald and Golden Eagle Protection Act.

Bureau of Land Management Resource Management Plans

The BLM's Resource Management Plans (RMPs) provide management guidance and standards for wildlife and wildlife habitat on public lands that are managed by the BLM. The BLM manages habitat for wildlife by gauging the ability of an area to provide adequate forage, cover, water, and space requirements. The EA (EPG 2007) affirmed that the HANG2 project "complies with the standards and guidelines specified" in the *Lower Gila South RMP and Decision Record* (BLM 1988, amended July 2005) and the *Yuma Field Office Record of Decision and Approved RMP* (BLM January 2010).

State Regulations

When protected, threatened, or endangered wildlife species occur on federally managed lands, the appropriate state or tribal agency affords them the same level of protection as state-listed sensitive species. The AGFD has established a list of wildlife species that are protected under the authority of Arizona Revised Statutes (ARS) Title 17.101–17.471. This project will implement a number of mitigation measures to protect state-listed species in an effort to comply fully with ARS Title 17.

MITIGATION: RESEEDING

Following construction, many sites within the project area will be reseeded to stabilize soils and to reestablish 70% of background cover. These areas include new tower work areas, pull sites, and stretches adjacent to new roadways. APS plans to hydro-seed these areas using a certified weed-free, native seed mix. Dry, straw mulch will serve as the primary mulch cover and will be placed in treated areas within 48 hours of hydro-seeding, then affixed by crimping and/or tacking. Straw will be derived from oats, rye, wheat, or other grain-type crop and will be clean and free from invasive weeds, mold, and other objectionable materials. Reseeding is discussed in the *Vegetation Management Plan*, including approved seed mix sources.

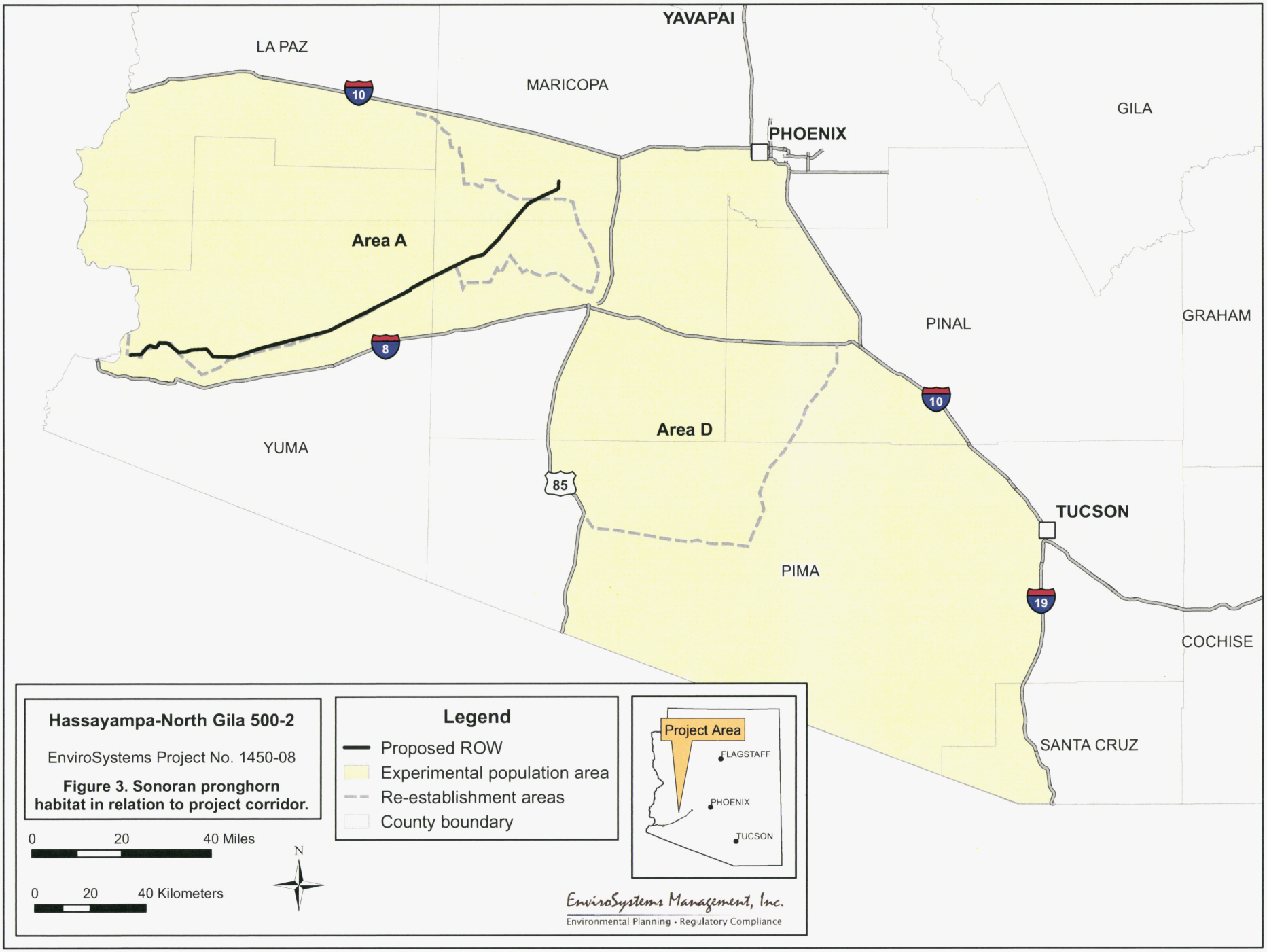
SPECIES-SPECIFIC BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

This section describes best management practices (BMPs) and mitigation measures for two species identified by the BLM as high priorities for this project: Sonoran desert tortoise and western burrowing owl. The Sonoran pronghorn population in the project area is also discussed. Burrowing animals were identified in the 2007 EA as having the greatest potential for impacts, due mostly to burrows collapsing from construction-related activities. Use of a *fiber optic scope* to determine if burrows are occupied will aid in minimizing these impacts. BMPs and mitigation will be implemented to minimize project impacts on both species. These measures are anticipated to reduce the potential impacts to a level of insignificance.

Sonoran Pronghorn

The Sonoran pronghorn (*Antilocarpa americana sonoriensis*) is a federally listed endangered species. The proposed project area in southwestern Arizona traverses lands where the species was reestablished in June 2011 as a non-essential experimental population (NEP) under Section 10j of the Endangered Species Act (USFWS 2011). This population is not subject to Section 7(a)(2), which requires all Federal agencies to consult with the USFWS to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of a listed species. The USFWS treats an NEP as proposed for listing on BLM land within the 10j boundary, such as the HANG2 project area, and only two provisions of Section 7 apply: Section 7(a)(1) and Section 7(a)(4). Section 7(a)(1) requires all federal agencies to use their authorities to carry out programs for the conservation of listed species. Section 7(a)(4) requires Federal agencies to confer, rather than consult, in the form of conservation recommendations that are optional. Because the NEP is, by definition, not essential to the continued existence of the species, effects of proposed actions on the NEP will generally not rise to the level of jeopardizing the continued existence of the species. As a result, a formal conference will likely not be required within the NEP area though some agencies may choose to voluntarily confer (USFWS 2011). The BLM has a policy of conferring with the USFWS under Section 7(a)(4) on their actions that may affect proposed species (BLM 6840 Manual).

The NEP encompasses Areas A and D in Arizona, the primary areas of focus for population reestablishment, as well as areas into which Sonoran pronghorn are likely to disperse. The NEP is defined as follows: An area north of Interstate 8 and south of Interstate 10, bounded by the Colorado River on the west and Interstate 10 on the east; and an area south of Interstate 8, bounded by Highway 85 on the west, Interstates 10 and 19 on the east, and the United States–Mexico border on the south (*Figure 3*). The Kofa National Wildlife Refuge, Yuma Proving Ground, Barry M. Goldwater Range, Tohono O'odham Nation, Buenos Aires National Wildlife Refuge, and BLM lands comprise much of the NEP.


YAVAPAI
LA PAZ
MARICOPA
GILA
PHOENIX
Area A
PINAL
GRAHAM
Area D
YUMA
TUCSON
PIMA
COCHISE
SANTA CRUZ
10
8
85
19
Hassayampa-North Gila 500-2
EnviroSystems Project No. 1450-08
Figure 3. Sonoran pronghorn habitat in relation to project corridor.
0 20 40 Miles
0 20 40 Kilometers
N
Legend
Proposed ROW
Experimental population area
Re-establishment areas
County boundary
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance

Some activities do have greater potential to compromise the success of the Sonoran pronghorn reestablishment. Construction of new highways, particularly those with right-of-way fencing, or new canals could create barriers to movement and bisect important habitat. BLM-authorized large-scale solar power plants and agricultural leases, particularly in the valleys east of Kofa National Wildlife Refuge, could remove large blocks of habitat (USFWS 2011). The proposed transmission line would not create a barrier to pronghorn movement and habitat loss would be comparatively small.

Mitigation for the Sonoran Pronghorn Antelope

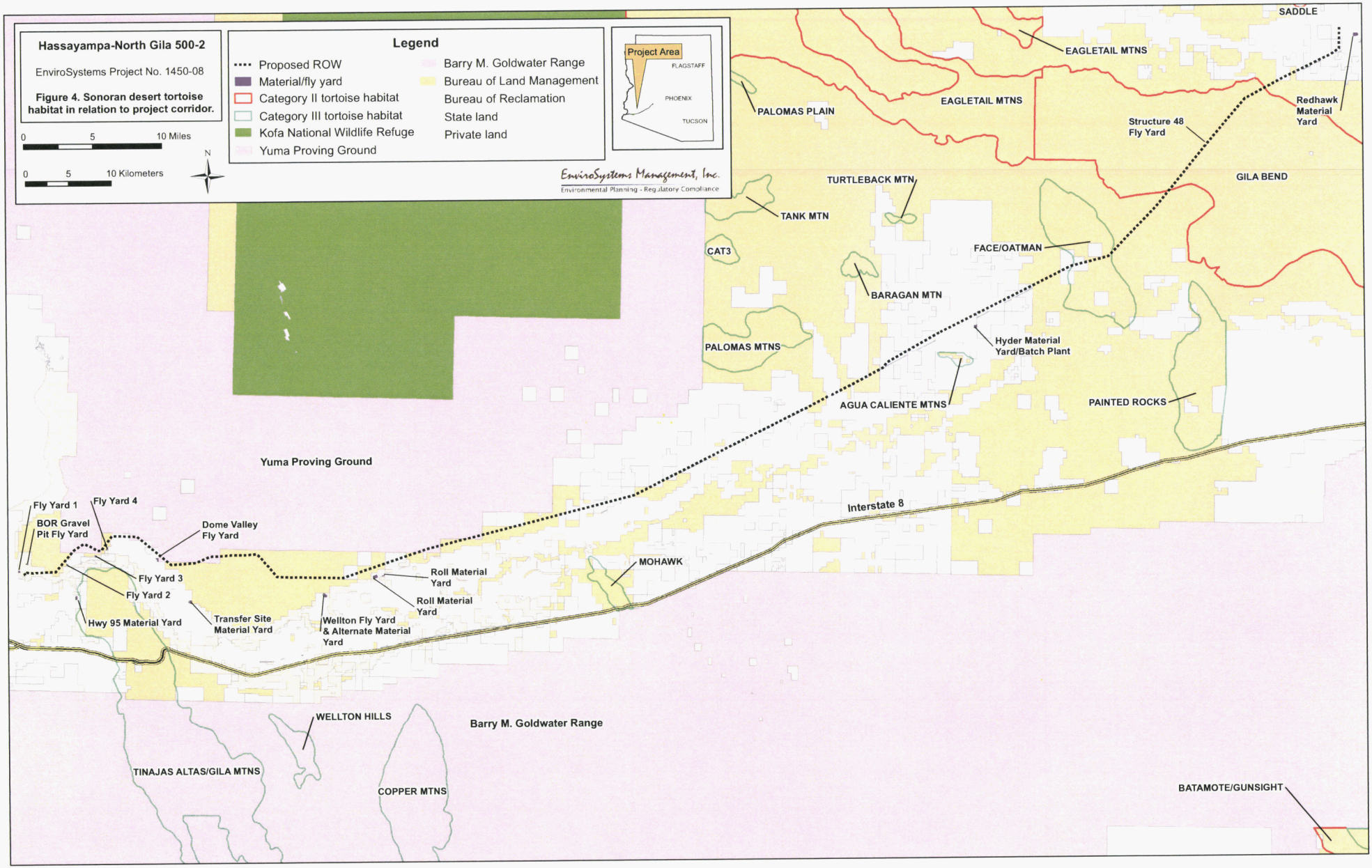
Current BLM conferencing with USFWS on the HANG2 project in May 2013 resulted in the following FWS-recommended mitigation measures (FWS to BLM, Draft Conference Report letter dated 5/15/13):

- The USFWS recommends that sightings of Sonoran pronghorn or sign on or in the vicinity of the project, with associated coordinates or location descriptions to the extent practical, be reported to the USFWS and AGFD. Documentation of sightings of animals, tracks, droppings, and hair, through digital or other photography, to the extent practical, is recommended.
- The USFWS recommends that layout of fencing around construction areas or yards avoid creating "dead end" or "trap" zones between fenced areas to allow easy egress for Sonoran pronghorn from a given area if startled by humans or predators. It is recommended that any fencing be designed to avoid ensnarling pronghorn and other large mammals.
- The USFWS recommends that Worker Education and Awareness Programs (WEAPs) for construction workers at project facility sites include briefing materials on Sonoran pronghorn including identification and the importance of avoiding disturbing any animals encountered. USFWS recommends a 25-mile per hour speed limit in construction areas and that vehicles yield to pronghorn encountered to allow time for the animals to safely move out of harm's way. USFWS recommends that the BLM work with the USFWS and AGFD in development of WEAP material for Sonoran pronghorn.
- The USFWS recommends that work areas be kept clean, including of edible garbage, and that feeding of animals be prohibited.

Sonoran Desert Tortoise

The Sonoran desert tortoise (*Gopherus morafkai*) is classified as a USFWS candidate for federal listing under the ESA. It is listed in Arizona as a wildlife species of concern and is protected from collection under Arizona state law (ARS Title 17). Most of the HANG2 project area occurs on BLM-administered lands, portions of which cross BLM-designated DT habitat within a BLM-designated utility corridor (*Figure 4*). The Category (CAT) II designation includes areas with a goal to maintain stable, viable populations and halt further declines in tortoise habitat values. Category II habitat areas are essential to the maintenance of viable populations. The Category III designation includes areas with a goal to limit tortoise habitat and population declines to the extent possible by mitigating impacts. Category III habitat areas are also considered essential to the maintenance of viable populations (BLM 2012). Individuals could occur in the project area wherever suitable habitat is present (i.e., Sonoran Desertscrub vegetation with rocky slopes and bajadas). Its use of burrows makes the DT susceptible to impacts from ground-disturbing activities (EPG 2007).

In late January of 2012, GIS shapefiles were obtained from the BLM-RECO Biologist that included DT habitat data for the years 2008-2011. Those shapefiles were plotted on a map of the project corridor to illustrate where the ROW and known access routes would overlap DT habitat categories. Based on these


Hassayampa-North Gila 500-2
EnviroSystems Project No. 1450-08
Figure 4. Sonoran desert tortoise habitat in relation to project corridor.
0 5 10 Miles
0 5 10 Kilometers
N
Legend
Proposed ROW
Material/fly yard
Category II tortoise habitat
Category III tortoise habitat
Kofa National Wildlife Refuge
Yuma Proving Ground
Barry M. Goldwater Range
Bureau of Land Management
Bureau of Reclamation
State land
Private land
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning - Regulatory Compliance
SADDLE
EAGLETAIL MTNS
EAGLETAIL MTNS
PALOMAS PLAIN
Structure 48 Fly Yard
Redhawk Material Yard
GILA BEND
TURTLEBACK MTN
TANK MTN
CAT3
FACE/OATMAN
BARAGAN MTN
PALOMAS MTNS
Hyder Material Yard/Batch Plant
AGUA CALIENTE MTNS
PAINTED ROCKS
Yuma Proving Ground
Interstate 8
Fly Yard 1
Fly Yard 4
BOR Gravel Pit Fly Yard
Dome Valley Fly Yard
Fly Yard 3
Fly Yard 2
Hwy 95 Material Yard
Transfer Site Material Yard
Wellton Fly Yard & Alternate Material Yard
Roll Material Yard
Roll Material Yard
MOHAWK
WELLTON HILLS
Barry M. Goldwater Range
TINAJAS ALTAS/GILA MTNS
COPPER MTNS
BATAMOTE/GUNSIGHT

data, the project area would traverse the Gila Bend CAT II habitat between Structures 28 and 62 over a distance of approximately 8.5 miles and the Face/Oatman CAT III habitat between Structures 84 and 95 for a distance of 2.75 miles (see Construction Maps 2c-2g). No CAT I habitat occurs in the project area.

Biological Field Surveys for Desert Tortoises

In conjunction with the current analysis, field visits were carried out on three separate occasions: July and August 2011, April 2012, and November 2012. ESM biologists surveyed numerous locations in the project area to identify potentially suitable habitat and individual tortoises. In July and August of 2011, tortoise sign data were collected at two locations in the project area, though both occurred well outside the designated habitat areas. The April 2012 survey detected no signs of tortoise activity. The November 2012 survey focused on the southwestern portion of the project area, where biologists surveyed several of the laydown yards between the Gila Mountains and Laguna Mountains, though no potential habitat was recognized for the Sonoran desert tortoise. Regardless, mitigation measures will be implemented to protect this species and its habitat in the CAT II and III areas (see below).

Mitigation for the Sonoran Desert Tortoise

Mitigation efforts shall be applied to reach no net loss of quality or quantity of DT designated habitat in accordance with current BLM policy. The actual framework for DT mitigation, including surveys, monitoring, and handling, will follow the BLM's *Desert Tortoise Mitigation Policy* (IM No. AZ-2012-031, 2012) and Arizona Interagency Desert Tortoise Team's (AIDTT) *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (2008). The mitigation measures in *Table 3* rely on guidance provided in the 2007 EA, which comply with NEPA regulations and USFWS mitigation policy.

TABLE 3. MITIGATION MEASURES FOR THE SONORAN DESERT TORTOISE

1. APS shall designate a field contact representative (FCR) who shall be responsible for overseeing compliance with the DT mitigation measures and for coordination on compliance with the BLM. The FCR and authorized/qualified biologist(s) shall have the authority and responsibility to halt all project activities that are in violation of the mitigation measures. The FCR shall serve as a contact point for personnel that encounter DTs. The FCR shall be on site during project activities and shall be familiar with and have a copy of the DT mitigation measures.

2. A biologist trained and qualified to work with the DT will be present on site whenever construction occurs in suitable tortoise habitat. For surface-disturbing activities that occur when tortoises are most active (typically March 1 to November 1), a biologist shall be present during all activities in which encounters with tortoises may occur. The biologist shall watch for tortoises wandering into construction areas, check under vehicles, check at least 3 times per day any excavations that might trap tortoises, and conduct other activities necessary to minimize death and injury to individual DTs.

3. Burrows in or within 40 feet of areas to be disturbed shall be examined for signs of use by tortoises. If signs of activity are detected, then an authorized biologist will utilize a *fiber optic burrow probe system* to determine burrow contents. If a tortoise is detected inside a burrow, then the authorized biologist shall excavate the burrow using hand tools. Tortoises shall then be relocated between 300 and 1,000 feet outside the project area on public land where similar habitat is present. Burrows discovered in areas of pending project disturbance shall be blocked/ covered to prevent re-entry. DTs or any DT eggs found in areas scheduled for disturbance shall be relocated and handled in accordance with the following measure.

4. DT handling procedures shall adhere to protocols outlined in *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* (AGFD 2007b) and *Recommended Standard Mitigation Measures for Projects in Sonoran Desert Tortoise Habitat* (AIDTT 2008).
5. Only biologists authorized by the BLM and AGFD shall handle DTs. The holder shall submit the name(s) of the proposed authorized biologists(s) to the BLM for review and approval prior to the onset of activities that could result in harm to individual tortoises.
6. The authorized biologist shall maintain a record of all DTs encountered during project activities. For each DT encountered, this information shall include:
   - Locations and dates of observation;
   - General condition and health, including injuries and state of healing and whether animals voided their bladders;
   - Location moved from and location moved to; and
   - Diagnostic markings (i.e., identification numbers of marked lateral scutes). No notching of scutes or replacement of fluids with a syringe is authorized.
7. Vehicle use shall be limited to existing or designated routes.
8. Areas of new construction or disturbance shall be flagged or marked on the ground prior to construction. All construction workers shall strictly limit their activities and vehicles to areas that have been marked. Construction personnel shall be trained to recognize markers and understand the equipment movement restrictions involved.
9. Project features that might trap or entangle DTs, such as open trenches, pits, footer holes, etc., shall be covered or modified to prevent entrapment.
10. Construction sites shall be maintained in a sanitary condition at all times. APS will be responsible for controlling and limiting litter, trash, and garbage by immediately placing refuse in predator-proof, sealable receptacles. Trash and debris shall be removed when construction is complete.
11. APS shall submit a monitoring report to the BLM within 60 days of project completion. For long-term or ongoing projects that may result in continuing impacts to tortoises and habitat, annual monitoring reports shall be prepared. The report shall make recommendations for modifying or refining the mitigation program to enhance DT protection and reduce needless hardship on APS.
12. Workers shall check under vehicles for DTs before vehicles are moved. If tortoises are found, then they shall be allowed to move out of harm's way on their own or shall be moved by an authorized biologist prior to moving the vehicle.
13. No unleashed pets (e.g., dogs) shall be allowed on the project site.
14. In DT habitat, project-related vehicles shall not exceed 25 miles-per-hour on unpaved roads.
15. If any tortoises are observed, then their location shall be recorded and the sighting, along with any information concerning the sighting, shall be reported to the field contact representative. Wildlife data collected by the biological monitor will be provided for inclusion in the AGFD Heritage Data Management System.

The BLM's *Desert Tortoise Mitigation Policy* requires compensation for residual impacts that cannot otherwise be mitigated. Mitigation, including compensation, must be designed to meet the purposes of the *Rangewide Plan*, including maintaining viable populations as well as maintaining the quantity and quality of Category I and II desert tortoise habitat (BLM 2012). Because the policy allows for no net loss

of DT habitat within designated category areas (CAT I, II, and III), it provides guidance for compensation to be determined in one of two ways: (1) the amount of needed replacement habitat in terms of land; or (2) the funding amounts to compensate for other tortoise resource needs. Page 4 of the mitigation policy memo offers the option to acquire "fewer acres of higher quality habitat (Category I or II) to compensate for anticipated residual impacts to lower quality habitat (Category III) if an overall benefit to desert tortoise can be justified" (BLM 2012). A discussion of impacts to BLM-designated tortoise habitat appears below. Ultimately, APS will coordinate with the BLM to finalize compensation for loss of designated CAT II and CAT III habitat.

Impacts to Category Habitat on BLM Lands

Permanent impacts are those that modify an area and cannot be mitigated through habitat restoration. For this project it is expected that residual impacts to CAT II and III habitat would result from the removal of vegetation for both construction and maintenance actions. The overall loss of vegetation would reduce the amount of locally available forage and cover material for the DT, thereby contributing to a loss of habitat within the Gila Bend CAT II area and the Face/Oatman CAT III area. Despite these impacts, it is anticipated that local habitat functions would remain intact, and that the post-construction environment would not impede the movement of tortoises through the project area. Regardless, BLM requires a no net loss approach per *Desert Tortoise Mitigation Policy* (IM No. AZ-2012-031), and to enforce this policy compensation is required (see below). Acreage calculations for impacts to designated tortoise habitat appear in *Table 4*.

Throughout the ROW vegetation will be largely avoided or trampled and left in place, except where absolutely necessary (e.g., structure locations, new roads, and to some extent pull sites). In the CAT habitat areas, understory vegetation will be left intact outside of these direct impact areas. Tall-growing vegetation, which occurs relatively sparingly along the project corridor, will be removed only as needed and transplanted to the extent possible (see *Vegetation Management Plan*). Specifically, in CAT II habitat between Structures 28 and 62, up to 1,126 tall-growing trees will have to be removed in the 84- to 104-foot wide wire zone. For CAT III between Structure 84 and 95, the total falls to 101 trees.

TABLE 4. ACRES OF LOSS IN CATEGORY II & III AREAS

BLM Habitat	Disturbance Type	Acres
Gila Bend Category II	Structure work areas (100 × 200 feet × 35 structures)	16.069
	New access roads (2.9 miles × 12 feet)	4.218
	Temporary pull sites (seven 200 × 300 feet, two 200 × 600 feet)	15.15
	Tree removal (1126 × 25 feet square)	0.60
Total Acres of CAT II Disturbance/Loss		**36.037**
Face/Oatman Category III	Structure work areas (100 × 200 feet × 12 structures)	5.059
	New access roads (2.14 miles × 12 feet)	3.112
	Temporary pull sites (three at 200 × 300 feet)	4.132
	Tree removal (101 × 25 feet square)	0.06
Total Acres of CAT III Disturbance /Loss		**12.363**

Structure Footers: Thirty-five power pole structures are planned for construction in the Gila Bend CAT II area, which would account for a loss of up to 16.069 acres covering installation of concrete footers (generally four for each structure) and each surrounding work area. In the Face/Oatman CAT III area, 12 structures would be constructed resulting in a loss of 5.509 acres.

New Access Roads: New access roads are expected to account for the second most significant level of disturbance in BLM-designated tortoise habitat, including 4.218 acres of new roads in CAT II habitat and 3.112 acres in CAT III habitat.

Temporary Pull Sites: Temporary pulling or tensioning sites will involve some removal and otherwise compression of vegetation during construction, after which these areas will be restored. In the Gila Bend CAT II habitat, 15.15 acres would be affected, and in the Face/Oatman CAT III area 3.112 acres.

Compensation for Impacts to Desert Tortoise

Compensation for impacts resulting from the project was determined utilizing the evaluation criteria presented in BLM IMAZ-20120031 (including Attachments 1 and 2), which articulates the mitigation policy of the desert tortoise and its habitat on public lands managed by the BLM. Per IMAZ-2012003 there are principally two forms of mitigation: (1) determine the amount of needed replacement habitats in terms of land, or (2) determine the funding amounts to compensate for other tortoise research needs. For overall loss of Category II and III habitat for this project, the BLM is requiring funding to compensate for other tortoise research needs. Using the instructions contained in IMAZ-20120031, a **compensation value of 4.5** was reached for the 36.037 acres of Category II, and a **compensation value of 1** has been applied to the 12.363 acres of Category III. Using these values and following the directions contained in IMAZ-20120031, the required total compensation was calculated by the BLM. The final calculations for determining the actual amount owed, however, is pending the result of land value appraisals requested by APS.

No CAT I habitat occurs in the project area, and the tortoise sign observed during the 2011 field surveys occurred well outside the BLM-designated habitat areas. Any temporary loss of forage would in part be reclaimed by reseeding, which should promote the development of native, low-growing plants that could be used by tortoises for forage material and shade. Temporary impacts will also be mitigated by the restriction of movement in the project area along existing access roads to the extent possible. Following the conclusion of construction activities, vehicular traffic will be drastically reduced to a level of insignificance, allowing vegetation and thus habitat recovery along the project ROW.

Western Burrowing Owl

The western burrowing owl (*Athene cunicularia hypugaea*) is a grassland specialist distributed throughout western North America, primarily in open areas with short vegetation and bare ground in desert, grassland, and shrub-steppe environments (USFWS 2003). It uses underground burrows for nesting and escape cover typically March through mid-July, but they can be year-round residents in desert areas (ABOWG 2007). In Arizona the elevation range for this species is from 650-6,140 feet above mean sea level (AGFD 2010e). The western burrowing owl is classified as a USFWS species of concern, National Bird of Conservation Concern, and a BLM sensitive species. In Arizona the burrowing owl is protected by the MBTA and by Arizona state law.

The HANG2 project crosses potential habitat for the burrowing owl within a BLM-designated utility corridor on federal, state, and private lands. The EA (EPG 2007) suggests that suitable habitat for

burrowing owls may be found in the project area and that the use of existing burrows would make them susceptible to impacts from ground-disturbing activities.

Preliminary Surveys for Burrowing Owls

In conjunction with the current analysis, field visits were carried out on three separate occasions: July and August 2011, April 2012, and November 2012. ESM biologists surveyed numerous locations along the project corridor to identify potentially suitable habitat and individual occurrences of burrowing owls. The August 2011 and April 2012 surveys identified no signs of burrowing owl activity. The November 2012 survey focused on the southwestern portion of the project area, where biologists surveyed several of the laydown yards between the Gila Mountains and Laguna Mountains, though no potential habitat was recognized for burrowing owls. However, suitable habitat was recognized outside the project corridor on adjacent agricultural lands. Regardless, mitigation measures will be implemented to protect this species and its habitat in the project area (see below).

Mitigation for Burrowing Owls

All owls and active burrows shall be identified in the project area prior to any ground disturbance. If owls or potentially occupied burrows are detected (i.e., owl *sign* observed at borrow opening), then the authorized biologist shall determine burrow status by using a fiber optic burrow probe system. Except for the authorized biologist, no project personnel shall disturb burrows in any way to avoid possible violations to the MBTA.

Compliance with the MBTA will requires that a 200-foot, non-disturbance buffer be established for active owl burrows during the breeding season (February 1–August 15) and that no activities be allowed within the buffer until the young have fledged from the nest or if the nest fails. Surveys/monitoring shall be conducted around structure locations, staging areas, and access roads/spur roads. The biological monitor shall then conduct regular monitoring of the nest (following additional coordination with AGFD) to determine success/failure and to ensure that project activities are not conducted within the buffer. The biological monitor shall be responsible for documenting the results of the surveys and the ongoing monitoring. If necessary, displaced owls may be relocated by permitted individuals, provided that the required permits and/or written permission are secured from USFWS and AGFD. Additional guidance for survey timing, protocol, reporting, and mitigation are described in *Burrowing Owl Project Clearance Protocol*, including a *Burrowing Owl Survey Report Form* (ABOWG 2007).

Ninety percent of artificial burrows in California were immediately occupied, and those burrows supported successfully breeding birds for 3 consecutive years (Trulio 1995 in USFWS 2003). Artificial burrows were used when they were approximately 50-100 meters (106-330 feet) from the natural burrow (Thomsen 1971; Haug and Oliphant 1990 in USFWS 2003). Artificial burrows located more than 100 meters from the eviction burrow may greatly reduce the chances that new burrows will be used (USFWS 2003). There are conservation firms who employ authorized/permitted burrowing owl relocation specialists. If the authorized biologist determines that construction activities are likely to harm active burrows in the project area, then the authorized biologist shall contact an approved firm to trap and relocate owls to artificial burrows adjacent to the project area.

RELEVANT AGENCY CONTACTS

In Phoenix and central Arizona:

Arizona Game and Fish Department
Urban Wildlife Program, Mesa Office
7200 E. University
Mesa, Arizona 85207
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Arizona Game and Fish Department
Urban Wildlife Program, Tucson Office
555 N. Greasewood Road
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(520) 628-5376
www.azgfd.gov

US Fish & Wildlife Service
Ecological Services Office
2321 W. Royal Palm Road, Suite 103
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http://www.fws.gov/southwest/es/arizona/

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http://www.fws.gov/southwest/es/arizona/

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APPENDIX D2

VEGETATION MANAGEMENT PLAN

Vegetation Management Plan

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INTRODUCTION

The *Vegetation Management Plan* (VMP) will serve as a site-specific plan for avoiding and/or mitigating impacts to native plants and special status species that occur in the APS Hassayampa-North Gila 500-2 (HANG2) Transmission Line project area (*Figure 1*). The project area includes a right-of-way corridor and new access/spur roads to the new powerline structures. Existing access routes have already been cleared of vegetation and will not be included in this analysis. Project-specific avoidance and mitigation measures were prepared using established agency standards. It is expected that implementing these measures would reduce short-term and long-term environmental impacts to a level of insignificance. The VMP was prepared as a required supplement to the Plan of Development (POD) for this project. It builds upon the analysis of impacts and mitigation measures contained in the *Environmental Assessment* (EA) prepared under BLM direction by EPG in 2007. The VMP includes an updated review of species and habitat information; routine methods for maintaining vegetation in the ROW; information on noxious weeds; results from native plant inventories; plant salvage information; a vegetation maintenance plan; and specific mitigation and guidelines for special status plants, noxious weeds, and plant salvage.

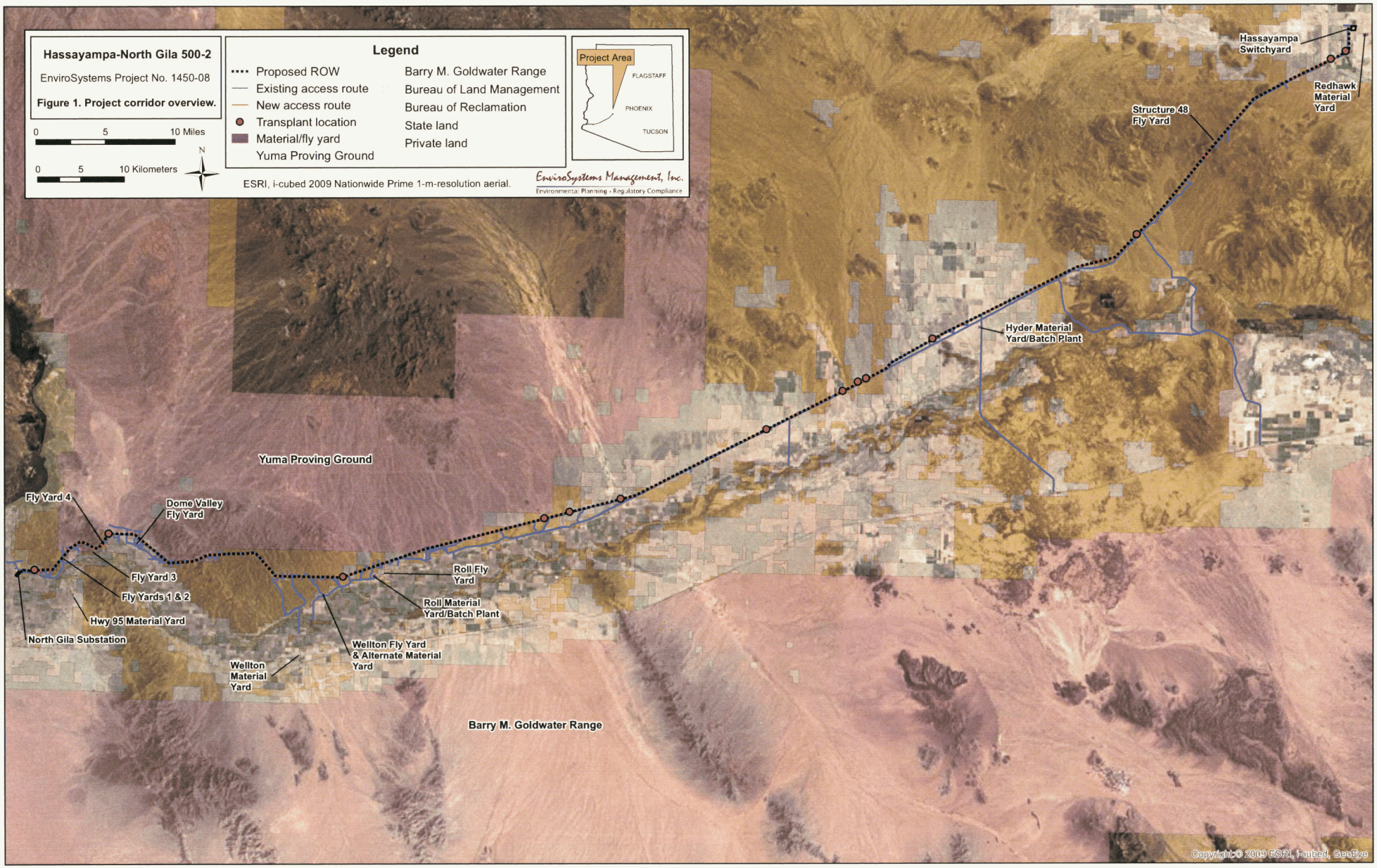
BACKGROUND

As currently designed the HANG2 transmission line will extend over a distance of 111.36 miles. The line will cross 53.74 miles of Bureau of Land Management (BLM) land, 1.63 miles of Bureau of Reclamation land, 8.97 miles on the Yuma Proving Ground, 25.94 miles of Arizona State Trust Land, and 21.08 miles of private land in Maricopa and Yuma counties in southwestern Arizona. The transmission line will consist primarily of self-supporting, galvanized steel, 4-legged lattice structures that parallel the existing HANG1 500kV-4 transmission line. The proposed project is needed to support the continuing growth and development occurring and anticipated in the Yuma region. The required ROW width is 200 feet.

The project area occurs primarily in the Lower Colorado River Subdivision of the Sonoran Desert, but includes Arizona Upland Subdivision (Brown 1994) where the project traverses the Gila Bend Mountains. The climate is arid with mean annual precipitation ranging between 3 and 7 inches (WRCC 2012a and 2012b). Topography is variable, ranging from rocky mountainous slopes to low-lying, relatively flat areas with gravel and desert pavement and alluvial deposits. Hydrologic features consist of xeric washes that range from broad to narrow and flow only in conjunction with seasonal precipitation. The EA (EPG 2007) states that no wetlands, riparian zones (including wild and/or scenic rivers), or natural perennial water sources occur in the project area. This was confirmed during site visits conducted in 2011-2012.

VEGETATION OVERVIEW

Vegetation in the project area is typically sparse and generally consistent with the Sonoran Desertscrub biotic community, including creosotebush (*Larrea tridentata*), ocotillo (*Fouquieria splendens*), foothill paloverde (*Parkinsonia microphylla),* ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), barrel cactus (*Ferocactus wislizenii*), and several cholla species (*Cylindropuntia* spp.), among others. Throughout the HANG2 corridor the vegetation type is more or less continuous, with the exception of areas where the transmission line will traverse upland bajadas that have higher species diversity due to increased moisture runoff.


Hassayampa-North Gila 500-2
EnviroSystems Project No. 1450-08
Figure 1. Project corridor overview.
0 5 10 Miles
0 5 10 Kilometers
N
Legend
Proposed ROW
Existing access route
New access route
Transplant location
Material/fly yard
Yuma Proving Ground
Barry M. Goldwater Range
Bureau of Land Management
Bureau of Reclamation
State land
Private land
Project Area
FLAGSTAFF
PHOENIX
TUCSON
ESRI, i-cubed 2009 Nationwide Prime 1-m-resolution aerial.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Hassayampa Switchyard
Redhawk Material Yard
Structure 48 Fly Yard
Hyder Material Yard/Batch Plant
Yuma Proving Ground
Fly Yard 4
Dome Valley Fly Yard
Fly Yard 3
Fly Yards 1 & 2
Hwy 95 Material Yard
North Gila Substation
Roll Fly Yard
Roll Material Yard/Batch Plant
Wellton Fly Yard & Alternate Material Yard
Wellton Material Yard
Barry M. Goldwater Range
Copyright © 2009 ESRI, i-cubed, GeoEye

Potential Impacts to Vegetation

This project could affect a range of plant species through habitat disturbance, vegetation removal, and other construction-related activities. There is likely to be short-term loss of vegetation due to trampling/ compression and soil compaction in the immediate vicinity of construction areas.

Modified habitat will account for a small percentage of overall habitat in the project vicinity. It is also expected that long-term impacts to plants will be minimal, given that the new ROW corridor will parallel the existing HANG1 ROW corridor for its length. Additionally, this project will utilize mostly existing roads, thereby reducing the need to create new roads.

SPECIAL STATUS SPECIES ANALYSIS

Environmental Assessment

In October 2007 Environmental Planning Group (EPG) completed analysis for potential impacts to five special status plant species based on information obtained from the BLM, U.S. Fish and Wildlife Service (USFWS), and Arizona Game and Fish Department (AGFD), as well as plants listed under the Department of Agriculture Arizona Native Plant Law (ANPL). These species consisted of straw-top cholla (*Cylindropuntia echinocarpa*), longleaf sandpaper plant (*Petalonyx linearis*), Kearney sumac (*Rhus kearneyi*), Schott wire lettuce (*Stephanomeria schottii*), and Arizona Sonoran rosewood (*Vauquelinia californica* spp. *sonorensis* (*Table 1*). The BLM issued a *Finding of No Significant Impact* (FONSI) and *Decision Record* on November 6, 2007 (BLM 2007a).

TABLE 1. PLANT SPECIES ANALYZED IN EA (EPG 2007)

Species	2007 Status	Habitat	Potential to Occur in Project Area
Arizona rosewood (*Vauquelinia californica* ssp. *sonorensis*)	BLM Sensitive	Desertscrub & desert grassland, in woodland or forest at base of cliffs, along canyon bottoms and/or on moderate to steep slopes in a variety of substrates; 2,328-3,720 feet elevation (AGFD 2010c).	**Unlikely but possible.** Species known to occur well beyond project area but has a low likelihood of occurring in project area itself (EPG 2007).
Kearney sumac (*Rhus kearneyi*)	BLM Sensitive	Plants grow on arid slopes, along canyons and drainages, in relatively small numbers; 1,000-2,000 feet (AGFD 2011b).	**Unlikely but possible.** Plant known to occur in mountain ranges S of project area, but not known to occur in project area and has low likelihood of occurring there (EPG 2007).
Longleaf sandpaper plant (*Petalonyx linearis*)	BLM Yuma Field Office priority species	Canyons, washes, & steep slopes of sand, gravel, or rocks in Colorado, Mohave, & Sonoran deserts, and adjoining deserts of Baja California; 142-3,220 feet elevation in AZ (AGFD 2005).	**Possible.** Populations of this plant known to occur in areas N & S of project area. Not known to occur in project area but has potential to occur there (EPG 2007).
Schott wire lettuce (*Stephanomeria schottii*)	BLM Sensitive	A sand dune endemic of the Gran Desierto region. Habitat includes semi-stabilized sand dunes with creosote, white bursage, big galleta grass, & other wildflowers; 350-800 feet (AGFD 2010a).	**Unlikely but possible.** Species known to occur in areas S of project area, but has low likelihood of occurring within project area since semi-stabilized sand dunes do not occur there (EPG 2007).
Straw-top cholla (*Cylindropuntia echinocarpa*)	Salvage restricted	Lower bajadas, plains, & occasionally slopes in Mojave & Sonoran deserts; 984-4,593 feet elevation (Calflora 2012).	**Likely**. Populations of this plant range throughout project area and have a high likelihood of occurring there.

Plan of Development Current Review

From 2011-2013 EnviroSystems Management, Inc. (ESM) conducted additional research in preparing the biological sections of the Plan of Development for the HANG2 project. ESM obtained shapefiles from APS to document the proposed project route on USGS 7.5' topographic quadrangles. ESM then obtained GIS shapefiles from resource specialists at AGFD and the BLM to overlay species and habitat occurrences onto the HANG2 project area. Current information was acquired and reviewed for eight special status plant species that are known to occur or could occur in the HANG2 project vicinity, including federal and state species listed as endangered or threatened, proposed as endangered or threatened, candidates for listing, species of concern, and BLM sensitive species. This information was compared with that used to compile the 2007 list of species in the EA to account for any addition or subtraction of species and to ensure the legal and agency status was current for all species.

AGFD Heritage Data Management System – Project Evaluation Program

ESM requested a project review from the AGFD Heritage Data Management System (HDMS) *Project Evaluation Program* (PEP, dated December 13, 2011). The PEP review identified one special status plant species that is known to occur or could occur within a 5-mile buffer of the project area. The PEP response (dated January 5, 2012) identified the blue sand lily (*Triteleiopsis palmeri*), a BLM sensitive plant species. This plant is also listed as salvage restricted under the ANPL.

AZGFD On-line Environmental Review Tool

ESM also checked the AGFD *On-line Environmental Review Tool* (accessed November 2012), which identified the straw-top cholla as ANPL salvage restricted within a 3-mile buffer of the project area.

USFWS Threatened and Endangered Species, Maricopa and Yuma Counties, Arizona

Further information was obtained from the USFWS Arizona Ecological Services website (accessed November 2012) for species that are currently listed as threatened or endangered, proposed for listing as threatened or endangered, candidates for listing, and species of concern in Maricopa County (USFWS 2012a) and Yuma County (USFWS 2012b). These species are the proposed endangered Acuña cactus (*Echinomastus erectocentrus* var. *acunensis*) and endangered Arizona cliffrose (*Purshia subintegra*). Both species are also listed as highly safeguarded under the ANPL.

BLM Sensitive Species List 2010

Review of the 2010 BLM Sensitive Species List for Arizona (BLM Instructional Memorandum No. AZ-2011-005, Attachment 1, dated 12/29/10), which was not available for the 2007 EA, identified the Kearney sumac, Schott wire lettuce, Arizona Sonoran rosewood, and blue sand lily. The blue sand lily had not been previously identified as BLM sensitive; however, it was included on the 2010 BLM sensitive species list. The longleaf sandpaper plant is not on the BLM sensitive species list but is considered a priority species by the BLM Yuma Office.

Arizona Department of Agriculture Arizona Native Plant Law

The straw-top cholla and Kearney sumac continue to be listed as salvage restricted by the ANPL. The AGFD PEP Review identified the blue sand lily, which also is listed as salvage restricted on the APNL. The Acuña cactus and Arizona cliffrose are identified as highly safeguarded on the APNL list.

Comparison of Species Identified in 2007 EA and Current Review

Table 2 lists information on the current status of special status plant species resulting from the above-mentioned consultations. Species that were included in the EA have been updated if a change in status has occurred. Additional species identified during the current consultations and have been included.

TABLE 2. SPECIAL STATUS SPECIES CURRENT REVIEW

Species	2012 Status	2007 EA Evaluation	Habitat	Potential to Occur in Project Area
Acuña cactus (*Echinomastus erectocentrus* var. *acunensis*)	PE, HS	Was not analyzed in depth due to unlikely presence of suitable habitat & outside known distribution	Well-drained knolls and gravel ridges in Sonoran desertscrub; 1,198 to 3,773 feet elevation (AGFD 2011a). (*Maricopa County*)	**Unlikely but possible.** Acuña cactus found at Organ Pipe National Monument, Ajo, & Coffee Pot Mtn. Potential habitat in Sand Tank Mtns. & on Tohono O'odham tribal lands. *No locations near project area.*
Arizona cliffrose (*Purshia subintegra*)	LE, HS	Was not analyzed in depth due to lack of suitable habitat & outside known distribution	Rolling, rocky, limestone hills & slopes w/in sparsely vegetated Sonoran Desertscrub where landscapes dissected by ephemeral drainages. Occurs where winters are mild, summers are hot, & 9-34 inches of rainfall is evenly distributed b/w summer & winter rainfall periods; 2,120-4,000 feet elevation (AGFD 2001).	**Not possible.** *P. subintegra* requires limestone substrate from tertiary lakebed deposits. Based on field observations and a review of geologic soil maps (NRCS 2012), no limestone substrates occur in the project area.
Arizona rosewood (*Vauquelinia californica* ssp. *sonorensis*)	BLM-S	Status has not changed from that of 2007 evaluation	Desertscrub/desert grassland, in woodland or forest at base of cliffs, along canyon bottoms and on moderate to steep slopes in variety of substrates; 2,328-3,720 feet elevation (AGFD 2010c).	**Unlikely but possible.** Species is known to occur well beyond the project area, but has a low likelihood of occurring in the project area itself (EPG 2007).
Blue sand lily (*Triteleiopsis palmeri*)	BLM-S, SR	Was not analyzed	Open, sandy areas (dunes) in low desert; 2.99 cm of annual precipitation; 356 frost-free days; 250 to 1,660 feet elevation (AGFD 2012).	**Unlikely but possible.** In AZ blue sand lily is found in Pima County & Gila Mountains, Pinta Sands, &Tule Desert in Yuma County. Not documented in project area or found during recent plant inventories.
Kearney sumac (*Rhus kearneyi*)	BLM-S, SR	APNL salvage restriction status added	Plants grow on arid slopes, along canyons and drainages, in relatively small numbers; 1,000-2,000 feet elevation (AGFD 2011b).	**Unlikely but possible.** Plant known to occur in mountain ranges S of project area, but is not known to occur in project area and has low likelihood of occurring there (EPG 2007).
Longleaf sandpaper plant (*Petalonyx linearis*)	BLM Yuma FO priority species	Status has not changed from that of 2007 evaluation	Canyons, washes, steep slopes of sand, gravel, or rocks in Colorado, Mohave, &Sonoran deserts, & adjoining deserts of Baja CA; 142-3,220 feet in AZ (AGFD 2005).	**Possible.** Plant populations known to occur in areas N & S of project area. Not known to occur in project area but has potential to occur (EPG 2007).

Species	2012 Status	2007 EA Evaluation	Habitat	Potential to Occur in Project Area
Schott wire lettuce (*Stephanomeria schottii*)	BLM-S	Status has not changed from that of 2007 evaluation	A sand dune endemic of the Gran Desierto region. Habitat includes semi-stabilized sand dunes with creosote, white bursage, big galleta grass, & other wildflowers; 350-800 feet (AGFD 2010a).	**Unlikely but possible**. Species known to occur in areas S of project area, but has low likelihood of occurring within project area since semi-stabilized sand dunes do not occur there (EPG 2007).
Straw-top cholla (*Cylindropuntia echinocarpa*)	SR	Status has not changed from that of 2007 evaluation	Lower bajadas, plains, & occasionally slopes in Mojave &Sonoran deserts; 984-4,593 feet elevation (Calflora 2012).	**Likely**. Populations of this plant range throughout project area & have a high likelihood of occurring there.
Status definitions: BLM-S = BLM Sensitive; HS = highly safeguarded (ANPL); LE = listed endangered (USFWS); PE = proposed endangered (USFWS); SR = salvage restricted (ANPL)				

As stated previously, five special status plant species were analyzed in the 2007 EA, but only two species had potential to occur in the project area: longleaf sandpaper plant, which is a priority species of the BLM Yuma Field Office, and straw-top cholla, salvage restricted under the ANPL.

For the current review eight special status plant species were initially identified as potentially occurring in the project vicinity (see Table 2). After reviewing up-to-date species and habitat information from AGFD, BLM, and USFWS, it was determined that only the straw-top cholla and longleaf sandpaper plant, also analyzed in the 2007 EA, are anticipated to occur in the project area (*Table 3*). Construction crews and monitors will be provided with information about these species, so if they are encountered any plants may be flagged for avoidance. The remaining plants are not expected to be encountered during the project; however, construction crews and monitors should be provided with information about these species as well, so if they are encountered they too may be flagged for avoidance.

TABLE 3. SPECIAL STATUS SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA

Species	2012 Status	Potential to Occur in Project Area
Straw-top cholla (*Cylindropuntia echinocarpa*)	SR	**Likely**. Populations of this plant range throughout the project area & have a high likelihood of occurring there, though the numbers may be small. It prefers lower bajadas, plains, & occasionally slopes in the Mojave & Sonoran deserts; 984-4,593 feet elevation (Calflora 2012).
Longleaf sandpaper plant (*Petalonyx linearis*)	BLM Yuma FO priority species	**Possible.** Populations of this plant are known to occur in areas north and south of the project area. It is not known to occur in the project area but has potential to occur there (EPG 2007).
Status definition: SR = salvage restricted (ANPL)		

NATIVE PLANT SURVEYS

To comply with the native plant survey requirements, pedestrian surveys were conducted for native plants throughout the HANG2 areas of potential effect. ESM surveyed all proposed access roads outside the ROW, as well as pull sites and laydown yards outside the ROW on three separate occasions: July and August 2011, April 2012, and November 2012. In total, ESM inventoried 1,097 plants outside the ROW. Native plants survey was also conducted specifically documenting the number of cacti, succulents, and

trees proposed for removal from State Trust Land within the ROW and along newly proposed access roads to mitigate for the planned land-disturbing activities (ASLD 2012).

In July and early August 2011 Davey Resource Group (DRG) surveyed a 100-foot-wide corridor (50 feet each side of centerline) along the full length of the proposed HANG2 transmission line ROW, as well as a 200 × 200-foot area around all proposed tower locations (DRG 2011). In total, DRG inventoried 9,627 plants within the ROW. Taken together, ESM and DRG inventoried 10,724 plants, of which 722 individual plants were identified as non-native (tamarisk & tree of heaven). *Table 4* provides a list of all inventoried plants, including ANPL status (if applicable) and specific quantities for each species. Of 9,627 trees inventoried along the ROW, 1,638 would be left in place and 7,904 would be removed because they are situated in the wire zone 42 feet each side/84 feet along the ROW centerline or consist of trees greater than 20 feet tall within 42-52 feet each side/84-104 feet of centerline.

TABLE 4. NATIVE PLANTS INVENTORIED IN HANG2 PROJECT AREA (2011-2012)

Species	ANPL Status	Quantity
Barrel cactus (*Echinocactus spp. / Ferocactus spp.*)	HS	52
Beavertail cactus (*Opuntia basilaris*)	SR	228
Blue palo verde (*Parkinsonia floridum*)	None	3
Buckhorn cholla (*Cylindropuntia acanthocarpa*)	None	246
Catclaw acacia (*Acacia greggii*)	None	1,090
Cholla species (*Opuntia* spp. and/or *Cylindropuntia* spp.)	SR	19
Crucifixion thorn (*Castela emoryi*)	SR	2
Desert Ironwood (*Olneya tesota*)	SR, HR	636
Fishhook barrel cactus (*Ferocactus wislizenii*)	SR	8
Foothill palo verde (*Parkinsonia microphylla*)	None	12
Hedgehog cactus (*Echinocereus* spp.)	HS	1
Honey mesquite (*Prosopis glandulosa*)	SA, HR	3
Mesquite species (*Prosopis* spp.)	SA	3,666
Mexican fan palm (*Washingtonia robusta*)	None	3
Ocotillo (*Fouquieria splendens*)	SR	100
Palo verde species (*Cercidium* spp.)	SA	1,834
Palo verde species (*Parkinsonia* spp.)	SA	1,621
Pencil cholla (*Cylindropuntia arbuscula*)	None	22
Pincushion cactus (*Corypantha spp.* and/or *Mammillaria spp.*)	SR	8
Saguaro cactus (*Carnegiea gigantean*)	HS	335
Silver cholla (aka straw-top cholla) (*Opuntia echinocarpa*)	SR	17
Smoketree (*Psorothamnus spinosus*)	SA	72
Sonoran palo verde (*Cercidium praecox*)	None	16
Tamarisk (aka salt cedar) (*Tamarix* spp.)	None	718
Teddy bear cholla (*Cylindropuntia bigelovii*)	SR	3
Tree of heaven (*Ailanthus altissima*)	None	2
Unknown	Unknown	2
Velvet mesquite (*Prosopis velutina*)	SA, HR	3
Western catalpa (*Catalpa speciosa*)	None	2
	TOTAL NATIVE PLANTS	**10,724**
ANPL status definitions: HR = harvest restricted; HS = highly safeguarded; SA =salvage assessed; SR = salvage restricted		

As this project will implement a number of mitigation measures to protect state-listed species, it is the intent of APS to comply with the ANPL. Arizona state law (ARS 3-904) allows for destruction of protected plants by private landowners or their agent(s) if (1) the owner or owner's agent notifies the Arizona Department of Agriculture (ADA) in writing at least 60 days before the plants are destroyed (over an area of 40 acres or more); and (2) the protected plants are destroyed within 1 year of the date on the notice. The division shall then mail a copy of the notice to any salvage operator or interested party that has requested notice of such activities occurring during the current calendar year (ASLD 2012). For the removal of non-protected plants, APS obtains written permission from private landowners.

TRANSPLANTABLE TREES

During the DRG native plant inventory (2011), trees suitable for transplant were identified in the ROW corridor. A total of 15 tree or tree-like species were inventoried including mesquite (*Prosopis* sp.), palo verde (*Cercidium* spp. and *Parkinsonia* spp.), acacia (*Acacia* sp.), tamarisk (*Tamarix* sp.; invasive), desert ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), smoke tree (*Psorothamnus spinosus*), Sonoran palo verde (*Cercidium praecox*), Mexican fan palm (*Washingtonia robusta*), velvet mesquite (*Prosopis velutina*), date palm (*Phoenix dactylifera*), tree of heaven (*Ailanthus altissima*; invasive), western catalpa (*Catalpa speciosa*), and one unknown species. Ninety-three trees were rated as good candidates for transplant adjacent to the ROW using 14 planting locations (DRG 2011, *Table 5* and also plotted on Construction Maps 2b, 2f, 2g, 2i, 2j, 2k, 2m, 2n, 2q, 2t, 2u), but subsequently eight of the transplants were determined to fall within archaeological sites and had to be dropped. To be identified for transplant, trees were required to be free of major defects (i.e., breakouts, trunk/root decay, pests).

TABLE 5. TRANSPLANTABLE TREES IDENTIFIED IN HANG2 ROW CORRIDOR

Species	Transplant Type	No. of Trees
Acacia species (*Acacia* spp.)	Manual	5
	Mechanical	3
Sonoran palo verde (*Cercidium praecox*)	Manual	1
Palo verde species (*Cercidium* spp.)	Manual	9
	Mechanical	4
Desert ironwood (*Olneya tesota*)	Mechanical	2
Palo verde species (*Parkinsonia* spp.)	Manual	9
	Mechanical	1
Mesquite species (*Prosopis* spp.)	Mechanical	29
	Manual	19
Mexican fan palm (*Washingtonia robusta*)	Manual	3
	TOTAL TRANSPLANTABLE TREES	**85**

A target minimum of five trees per transplant was identified for each transplant site, and each site will require vehicle access. The 14 transplant sites (plotted on Figure 1) were identified to be on the side of the proposed route opposite the existing 500kV line so as not to interfere with operation of that line and potential equipment conflicts during the transplant process. Sites considered suitable for transplant lacked excessive rock, steep terrain, or insufficient vehicle access. Transplants are to be planted greater than 52 feet from the centerline and preferably as close as possible to the edge of ROW. Trees identified for transplant will be relocated and watered via water truck a single time. As the Arizona desert is an extremely harsh environment, the limitation of a single watering will likely affect the survival of

transplanted trees. APS plans to transplant all trees during the fall and winter months to take advantage of lower ambient temperatures and any potential rainfall that may occur. *Overall, understory vegetation will be left intact as much as possible.*

NOXIOUS WEEDS

Noxious weeds are opportunistic plants that thrive in disturbed areas. Construction activities could increase the potential for noxious weeds to invade and spread within a given area. The BLM defines a noxious weed as "a plant that interferes with management objectives for a given area of land at a given point in time." The State of Arizona defines the term as "any species of plant that is, or is liable to be, detrimental or destructive and difficult to control or eradicate..."

The ADA maintains a list of noxious weed species in Arizona. The list defines three categories:

1. **Prohibited**: Noxious weeds (including plants, stolons, rhizomes, cuttings, and seeds) are prohibited from entry into the state of Arizona;
2. **Regulated**: Noxious weeds are regulated (including plants, stolons, rhizomes, cuttings, and seeds) and, if found within the state, *may* be controlled or quarantined to prevent further infestation or contamination;
3. **Restricted**: Noxious weeds are restricted (including plants, stolons, rhizomes, cuttings, and seeds) and *shall* be controlled or quarantined to prevent further infestation or contamination.

The 2011 DRG survey identified a total of eight noxious weed species in 76 spans of the HANG2 ROW (*Table 6*).

TABLE 6. NOXIOUS WEEDS IDENTIFIED IN HANG2 ROW CORRIDOR

Species	Classification	Density in Span	No. of Spans Present
Sahara mustard (*Brassica tournefforti*)	None	Very low	1
African rue (*Peganum harmala*)	PR	Very low	1
Cheatgrass (*Bromus tectorum*)	None	Very low	12
		Low	7
		Medium	6
Field bindweed (*Convolvulus arvensis*)	PR, RG	Very low	7
		Low	1
Fountaingrass (*Pennisetum setaceum*)	None	Very low	1
Jointed goatgrass (*Aegilops cylindrica*)	PR, RS	Low	1
Leafy spurge (*Euphorbia esula*)	PR	Low	1
Quackgrass (*Elymus repens*)	PR, RS	Very low	30
		Low	8
TOTAL SPANS WITH NOXIOUS WEEDS PRESENT			**76**
Noxious weeds status definitions: PR = prohibited; RG = regulated; RS = restricted			

By following the mitigation measures, it is expected that this project will not contribute to the increase or spread of noxious weeds in the project area.

BEST MANAGEMENT PRACTICES & MITIGATION

Mitigation measures applied project-wide will address many of the concerns associated with impacts to vegetation in the project area. Included below under *Construction* and *Operation and Maintenance* are the Standard Construction and Operating Procedures and Mitigation Measures, as well as Other Mitigating Measures, that pertain to vegetation protection. They are taken from Appendix A of the project's FONSI and EA.

Design and Engineering

To the degree possible, consideration has been given to the use of existing and overland access and to minimizing the disturbance associated with the improvement or addition of new access in the layout of facilities.

Construction

- All construction vehicle movement outside the right-of-way will be restricted to predesignated access, contractor-acquired access, or public roads. (Mitigation Measure No. 1)
- The limits of construction activities will typically be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate survey or construction activity limits. The right-of-way boundary will be flagged in environmentally sensitive areas described in the specific plan of development to alert construction personnel that those areas should be avoided. (Mitigation Measure No. 2)
- In construction areas where recontouring is not required, vegetation will be left in place wherever possible to avoid excessive root damage and allow for resprouting. (Mitigation Measure No. 3)
- In construction areas (e.g., marshalling yards, structure sites, spur roads from existing access roads) where ground disturbance is significant or where recontouring is required, surface restoration will occur as required by the landowner/land-management agency. The method of restoration will typically consist of returning disturbed areas to their natural contour (to the extent practical), reseeding or revegetating with native plants (if required), installing cross drains for erosion control, placing water bars in the road, and filling ditches. Seed must be tested and certified to contain no noxious weeds in the mix by the State of Arizona Agricultural Department. Seed viability must also be tested at a certified laboratory. (Mitigation Measure No. 4)
- All construction and maintenance activities shall be conducted in a manner that will minimize disturbance to vegetation, drainage channels, and intermittent and perennial streambanks. In addition, all existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line. (Mitigation Measure No. 10)
- The alignment of any new access roads or overland routes will follow the designated area's landform contours where possible, provided that such alignment does not additionally impact resource values. This would minimize ground disturbance and reduce scarring.
- Holder shall remove only the minimum amount of vegetation necessary for the construction of structures and facilities. Topsoil will be conserved during excavation and reused as cover on disturbed areas to facilitate re-growth of vegetation. (Other Mitigating Measure No. 8)
- The holder will be responsible for the total reclamation of the ROW shall it ever be relinquished or terminated. This reclamation will include the scarification of the road surface(s) and reseeding of

the entire disturbed area with a native seed mixture that will be approved the authorized officer prior to the reclamation work. (Other Mitigating Measure No. 10)

Operation and Maintenance

All new access roads not required for maintenance will be permanently closed using the most effective and least environmentally damaging methods appropriate to that area with concurrence of the landowner or land manager (e.g., stock piling and replacing topsoil, or rock replacement). This will limit access into the area. Fencing, signing, and other closure methods will be determined by the BLM and paid for by the contractor or APS. (Mitigation Measure No. 19)

The holder shall trim trees in preference to cutting trees and shall cut trees in preference to bulldozing them as directed by the authorized officer. (Other Mitigating Measure No. 7)

Sensitive Plants

Biological monitors will be on site and will be made aware of the any special status plants with the potential to occur in the project area. If special status plant populations or individuals are identified, they will be flagged for avoidance. Equipment operators will be notified in order to employ caution for access and movement in and around the delineated area(s). Any required permits authorizing this activity will be acquired by the Construction Contractor(s).

Noxious Weeds

Noxious weeds will be controlled significantly by the following project requirements:

1. Where feasible, construction will begin in weed-free areas before operating in weed-infested areas.
2. Prior to arrival at the work site, construction vehicles and equipment shall be cleaned using high-pressure equipment (compressed air) at designated stations (typically at construction/ show-up yards) to remove mud, dirt, and plant debris before entering the project area. The cleaning activities will concentrate on tracks, feet, or tires and on the undercarriage, with special emphasis on axles, frame, cross members, motor mounts, and underneath steps, running boards, and front bumper/brush guard assemblies. The location of vehicle cleaning stations will be identified by the Construction Contractor and reviewed by the appropriate agency project manager for approval.
3. Project personnel shall remove and properly dispose of weed seed and plant parts found on clothing and equipment.
4. In areas where infestations are identified or noted, the Contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area to eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes.
5. Imported gravel, fill, straw or hay bales (used for sediment barrier installations or mulch distribution), and seed sources shall be obtained from sources that are certified as weed-free and approved by the BLM and other land managers as appropriate.
6. Noxious weed locations shall be documented and reported to the BLM.

Reseeding in Areas of Temporary Disturbance

Following construction, many sites within the project area will be reseeded to stabilize soils and reestablish 70% of background cover. These areas include new tower work areas, pull sites, and those stretches adjacent to new roadways. APS plans to hydro-seed these areas using a certified weed-free, native seed mix. Appropriate area-specific blends that include a diversity of forbs, grasses, and shrubs will be used and modified as necessary where conditions vary. One of the best sources for determining availability of native seed for restoration efforts is the *Native Seed Network*, which identifies seed by State and Ecoregion (http://www.nativeseednetwork.org/ecodetail?region=81). The applicable region for the line is Sonoran Basin & Range, and the specific community is Creosotebush Scrub. About 30-35 appropriate species are identified as available for sale (as of June 2013). Dry, straw mulch will serve as the primary cover and will be placed in treated areas within 48 hours of hydro-seeding, then affixed by crimping and/or tacking. Straw will be derived from oats, rye, wheat, or other grain-type crop, clean and free from invasive weeds, mold, and other objectionable materials (Kitchell 2012). Continuing re-vegetation efforts will ensure adequate vegetative cover, preventing the invasion of noxious weeds.

APS TRANSMISSION VEGETATION MANAGEMENT PROGRAM

For public safety and service reliability, APS is required to control vegetation growing in proximity to high-voltage transmission powerlines. APS maintains vegetation that could interfere with its powerlines and structures or that could become a fuel load issue under the lines, as well as to provide vehicle access to the structures for maintenance and repair. Ongoing maintenance generally falls under two categories: Routine Maintenance and Hazard Maintenance (see below).

Routine Vegetation Maintenance

Routine vegetation maintenance involves the cyclical treatment of ROW vegetation – typically every 5 to 10 years – utilizing mechanical, manual, and herbicide treatments as discussed below in the *Vegetation Maintenance Methods* section.

Hazard Vegetation Maintenance

Vegetation that presents a hazard to the powerline and structures requires treatment on an ongoing basis outside the routine maintenance cycle. The need to treat hazard vegetation is not common due to the ongoing routine maintenance but is occasionally required. These hazards can be categorized into three levels and are treated somewhat differently for each level:

1. ***Level 1 Emergency Hazard***: An emergency caused by vegetation occurs when vegetation is arcing to the line, has caused a power fault, is burning from contact or arcing with the line, and when all or a portion of a tree is in contact with the line from falling or growing into the wires. An emergency due to vegetation on a large, 500kV line is uncommon, but if it were to occur, it is a serious event. APS must act immediately to eliminate the hazard no matter the weather or road conditions or time of day or year.

2. ***Level 2 Imminent Threat Hazard***: There can be two types of imminent threat hazards: (1) A live or dead standing tree or vegetation having defects in the roots, butt, bole, or limbs, which predispose it to imminent mechanical failure that could damage whole or part of the powerline or tower; and (2) An imminent threat hazard may also be a tree or branch that has come close enough to the powerline such that it poses a safety risk to the public and tree workers. Imminent

threat hazards must be treated as soon as possible once the hazard is identified. These hazards are typically treated within a week of identification.

3. ***Level 3 Off-Cycle Hazard***: This type of hazard includes any live or dead tree that poses a future threat to the powerline or structures and cannot be left untreated until the next growing season or next maintenance cycle. These hazards do not pose an imminent threat, but must be treated prior to the next growing season or out-of-cycle before it becomes an imminent threat. Treatment of off-cycle trees may sometimes be scheduled around seasonal timing restrictions.

Vegetation Maintenance Methods

Mechanical Treatment Methods

Mechanical treatment involves the use of a mower to remove and mulch vegetation on site. The mower consists of a rotary cutting device mounted on an arm on a rubber-tired or tracked vehicle that mulches trees and large shrubs from the top down. A mechanical mower may be used along the majority of the powerline ROW for routine vegetation maintenance. The mower would not operate in areas with steep slopes, poor access, water drainages, or within desert tortoise category habitat or cultural resource sites. Manual hand crews may be used to assist the mower operation in pruning or vegetation disposal.

Manual Treatment Methods

Hand crews are used for all hazard vegetation work and for some routine vegetation maintenance work. For routine vegetation maintenance, hand crews may be used to assist the mechanical mowers, to cut vegetation where mowers cannot be used, or as an alternative method to mechanical mowing. Hand crews consist of line clearance tree workers that use hand tools (e.g., chain saws, hand saws, rope) to cut down or prune vegetation. They typically only use pickup trucks as a means of travel to the work site but may also use a bucket truck and/or chipper.

Herbicide Treatment Methods

The purpose of herbicide treatment is to efficiently maintain clearances obtained following mechanical and/or manual treatments. Herbicide treatment is ideally conducted within 1-3 growing seasons following the mechanical and/or manual treatments. ***Herbicide treatments will only be applied for vegetation maintenance following an Environmental Assessment specific to herbicide application and its approved decision record. A site-specific pesticide use proposal approved by the BLM will also be required prior to herbicide application.***

Vegetation targeted for herbicide treatment includes most vegetation that is targeted for manual and mechanical treatment, the exception being saguaros. Herbicide treatment involves vegetation that is less than 10 feet tall whose physiology is such that is could encroach within the associated FAC-003 clearance distance, impact the reliability of the transmission line or transmission facilities (e.g., structures, guy wires, etc.), or pose a fire fuel load concern. APS also proposes to treat any invasive species encountered during the course of an herbicide project within the permitted ROW where it is reasonable and prudent to do so, and provided the herbicide being applied would be an effective treatment. All activities will be conducted within the existing APS powerline ROW.

All herbicide applications are spot treatments utilizing backpack, handheld, and quad/UTV-mounted sprayers with a support vehicle to control re-sprouting and/or emerging vegetation. The support vehicle will be available at intervals along the powerline to load the chemical sprayers.

All treatments are conducted over a 2-year interval. The initial treatment applications are scheduled between April 1 and November 30 with a follow-up application to be conducted 1 year later between April 1 and November 30. Following treatment, the powerline ROW is evaluated each year to determine when the next cycle of herbicide application is needed.

APS contractors employ a sealed, closed system that requires no waste disposal or on-site chemical mixing. In this system the herbicides are pre-mixed to the project specifications and shipped to the contractor. Each container of herbicide has a bar code attached to it that is tracked from the day it is shipped to the day it is returned empty. The herbicide containers are returned to the supplier after use. There is no waste disposal of chemical jugs or packaging required.

APS utilizes two product mixes, an Upland Mix and an Aquatic Mix, both utilizing Thinvert, a paraffinic oil emulsion, as the carrier. Any product listed in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (page 2-12 in Table 2-2 under the column for State of Arizona; BLM 2007b) and any product amended or added to this Plan, and approved for use in the State of Arizona, will be considered for use. In addition to these, APS would like to evaluate Milestone VM and Streamline for use.

All applicable labels, federal and state laws, and regulations with regard to the storage, handling, and application of herbicides will be strictly adhered to as appropriate to the project. Applicators will wear the maximum PPE required per the label for each herbicide being applied, including but not limited to long-sleeve shirts and pants, gloves, socks, and boots. Those operating the quad/UTV-mounted sprayers will also be required to wear goggles or safety glasses and helmets. Tailboard safety meetings will be conducted each morning or when the crew is moved to a new location. All herbicide applications will be conducted during daylight hours, typically from Monday to Friday, although weekend operations may take place as needed.

MSDS and labels will be on site at all times and all safety precautions listed on the product labels shall be adhered to strictly. Each crew will consist of licensed herbicide applicators, and at least one crew member will have a minimum of 3 years' experience applying herbicides. Crews working on the project will have telephones, chemical spill kits, shovels, first-aid kits, and fresh water available to them.

Vegetation Maintenance Protocol

The long-term vegetation management strategy for electric utility corridors is to apply the methods of Integrated Vegetation Management (IVM) to create and foster the formation of low-growing, herbaceous and woody plant communities. The desired outcome of IVM is the development of stable shrub/grass/forb (low-growing) plant communities that will not interfere with overhead powerlines, pose a fire hazard, or hamper access to the lines and support structures.

Arizona state law (ARS 3-915) also provides exemptions for the destruction of native plants in connection with ongoing, routine vegetation maintenance in electric utility corridors (see below; ANPL 2012 and *personal communication* with Tracy Moore, 2012).

ARS 3-915. <u>Exemptions</u>

A. This chapter does not apply to existing canals, laterals, ditches, electrical transmission and distribution facilities, rights-of-way and other facilities, structures or equipment owned, operated, used or otherwise possessed by public service corporations and special districts established under Title 48, Chapter 11, 12, 17, 18, 19, 21 or 22.

B. This chapter does not apply to normal and routine maintenance of improvements which may cause the incidental or unavoidable destruction of native plants.

Protocol for hazard vegetation work is simple and typically only requires 2-6 tree workers accessing the area of concern to prune or remove the offending hazard vegetation. This work is usually completed within 1-2 working days. The resulting slash is cut such that it lies within 18–24 inches of the ground surface and is lopped and scattered within the ROW in the immediate area.

Protocol for routine vegetation maintenance requires more steps. The remainder of this section focuses on the protocol for routine maintenance work. Listed here is the typical routine maintenance protocol:

1. APS crews will follow all necessary and outlined protocol for preventing the introduction of invasive weed seed to the project area.

2. Tall-growing vegetation within the ROW is cut down and may be treated with herbicides according to the Herbicide Treatment Methods section above (note: while saguaro is listed as a species to cut, it would not be treated with herbicides, and every reasonable effort will be made to leave them in place all together or to transplant healthy, effected saguaro within close proximity to a viable transplant site). Major vegetation species to be cut down or transplanted within the HANG2 ROW, listed from most abundant to least abundant are:
    a. Palo verde (*Cercidium* spp. and *Parkinsonia* ssp.)
    b. Mesquite (*Prosopis* spp.)
    c. Acacia (*Acacia* spp.)
    d. Desert ironwood (*Olneya tesota*)
    e. Saguaro (*Carnegiea gigantean*)
    f. Tamarisk (*Tamarix* spp.)

3. For each structure location along the line, all woody vegetation, including shrubs and trees, would be cut down and treated with herbicides (with herbicide treatment excluding cacti) underneath the structure and 40 feet out from each structure footer/foundation.

4. Low-growing vegetation such as creosotebush and small cacti that do not fall within the 40 feet around the tower structures are left untreated unless (1) the shrubs or cacti block access along designated access routes within the ROW; or (2) the shrub density is high causing a fuel load issue under the line. In the case of high density vegetation, the shrubs are thinned to a reasonable and safe density level, while providing as much protection as possible to the line and structures in case of fire.

5. Where the line spans high above canyons and slopes, either no treatment will be needed or some thinning may be necessary to break up fuel load under the line. Typically no treatment is required if the line is 100 feet or greater above vegetation unless the fuel density is heavy and needs to be broken up by thinning.

6. Herbicide application targets vegetation 10 feet tall or smaller that was cut during manual or mechanical vegetation treatment. This treatment ideally is done 1-3 growing cycles following mechanical or manual treatment. The initial treatment applications are scheduled between April 1 and November 30 with a follow-up application to be conducted 1 year later between April 1 and November 30.

7. Stumps from vegetation treatments are cut no greater than 12 inches above the ground, and where possible are cut flush to the ground.

8. For the hand crew operations, slash is lopped and scattered throughout the immediate area in a manner such that debris lies within 18–24 inches of the ground. Where chippers are used, the chips are broadcast across the ROW to a depth of no more than 4 inches.

9. For mower operations the majority of vegetation, except larger logs, is mulched by the mower and material is broadcast across the ROW no deeper than 4 inches.

10. Access for all treatment methods is done using only established roads and access routes to approach the ROW. There will be no new roads or access routes required for vegetation maintenance. If a portion of the line ROW is inaccessible by road, the crew will drive to the nearest location and walk into the ROW with the necessary equipment.

11. Vegetation maintenance crews will make every effort to keep impacts within the ROW to a minimum, and APS will only work within the ROW when the soils are dry enough to prevent ruts.

12. All vehicles will be operated in a safe and prudent manner.

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APPENDIX E

CULTURAL CONSIDERATIONS

Table E1. Archaeological Site-specific Treatment Recommendations for HANG2 Construction Activities (by Level of Effect then Location)

Site Number	Site Type/Name	Jurisdiction/ NRHP Eligibility	Nearest Proposed Structure	Treatment Recommendations/Procedures
SITES AVOIDED IN THEIR ENTIRETY				
AZ T:10:84(ASM) (*Figs 2a-h2; i-k; l-p*)*	Southern Pacific Railroad Phoenix Cutoff	BLM/Private; Eligible**	NA	Railroad tends to parallel both 500kV lines (existing & newly proposed) for much of project length. *All crossings at railroad are confined to existing roads.*
AZ T:9:25(ASM) (*Figure 2b*)	Crag Railroad Station	State/Private; Eligible *(SHPO 2000)*	NA	On south side of RR & outside both transmission line ROWs. However, ESM relocated a few features at site's southwest corner near existing access road to be used by APS. Although there is no proposed construction activity in the site vicinity & impacts are unlikely to occur, ESM recommends confining traffic to existing road with no turnarounds or widening of the road in the site area. *Southwest corner of site will be flagged for avoidance*.
AZ T:9:104(ASM) (*Figure 2c*)	Gillespie Siding	BLM; Eligible *(2007 project consultation)*	35	HANG1 ROW extends through site. Newly proposed access road extending NW around site was examined; no cultural materials were noted. By development of this new access route, vehicular traffic will be confined to this route outside the *site boundary, which will be marked for avoidance prior to road development*.
AZ S:16:41(ASM) (*Figure 2f*)	Historic artifact scatter with features	BLM; Eligible *(recommended by LSD 2008)*	Between 83 & 84	HANG1 extends through site while HANG2 would cross directly NW. A proposed access road & locations of Strs 83 & 84 are also NW of site; all were examined & contained no surface cultural materials associated with the site. No construction activity will be conducted within the site boundary, and *use of an existing access road through the site will be disallowed, marked off at the site edges for non-use*. There is an access road on SE side of RR tracks, and travel is also possible on the NW side of tracks just outside the site boundary.
AZ Y:3:29(ASM) (*Figures 2i/j*)	Prehistoric artifact scatter	State; Eligible *(2013 project consultation)*	Between 144 & 145	HANG1 ROW extends through site while the HANG2 ROW extends immediately adjacent along site's NW exterior. Confine APS vehicular traffic to existing roads outside the site boundary. Strs 144 & 145 are just outside site, but *boundaries will be marked for avoidance*.
AZ Y:2:29(ASM) (*Figures 2i/j*)	Horn Siding (railroad station)	BLM/Private; Eligible *(2007 project consultation)*	162	Site primarily situated between the two transmission line ROWs. Confine APS vehicular traffic to paved road S of RR tracks. New road to be used N of tracks to access Str 162 is in HANG 2 ROW but outside site boundary. *No boundary will be marked for avoidance*.
AZ Y:1:148(ASM) (*Figures 2m/n*)	Prehistoric artifact scatter & features	State; Eligible *(2007 consultation)*	Between 217 & 218	Site is situated on the edges of both transmission line ROWs. *Its boundary will be marked for avoidance*.
AZ X:4:400(ASM)/ ESM 1 (*Figure 2q*)	Prehistoric cleared areas, rock features, trail	BLM; Eligible *(2013 project consultation)*	North of 271	Use of existing access road to Str 271 & placement of structure will occur to south of site. *Vehicular traffic will be prohibited north of Str 271*.
AZ L:7:30(ASM)/ AZ X:3:371(ASM) (*Figure 2t*)	State Route 95	BLM; Eligible *(multiple dates; SHPO, ADOT)*	Crossed by HANG2 just east of Str 350	Highway will not be impacted by construction activities.
AZ X:3:445(ASM) (*Figure 2u*)	Prehistoric trail system	BLM/BOR; Undetermined	Between 375 & 376	Only Trail Segment 21 has been identified within the HANG2 ROW/APE. It will be spanned by the line and is not near any access routes. Segments 12, 20, & 23 are near the APE and will be marked for avoidance as necessary.
AZ X:3:446(ASM) (*Figure 2u*)	Two prehistoric trail segments	BLM; Undetermined	Northeast of 376	Segment 2 parallels an existing access road & will be marked for avoidance.

Table E1. Archaeological Site-specific Treatment Recommendations for HANG2 Construction Activities (by Level of Effect then Location)

AZ X:3:679(ASM)/ ESM 7 (*Figures 2t/u*)	Prehistoric cleared area, trail, flaked stone scatter	BLM; Eligible *(2013 project consultation)*	NA	Confine APS vehicular traffic to existing road directly W of site. *Site boundary will be marked for avoidance*.
AZ-050-1286✓ (*Figure2t/u*)	Isolated petroglyph	BLM; Eligible *(recommended by ESM 2012; BLM determined)*	NA	**No vehicular traffic permitted along existing access route from SR 95 to Str 357**. Use of existing road from SR 95 to Str 353 then SW along ROW is preferred access route. *Access along road to Str 357 will be closed to avoid site*.
AZ X:7:20(ASM) (*Figure 2u*)	Gila Gravity Main Canal	Reclamation; Eligible *(2007 consultation)*	NA	All crossings at the canal are confined to existing roads.
AZ X:7:28(ASM)✓ (*Figure 2u*)	Flaked stone scatter with features	Reclamation; Eligible *(LSD 2008)*	NA	Site just east of existing access road north to Str 381, *site boundary will **NOT** be marked for avoidance*.
AZ X:7:29(ASM)✓ (*Figure 2u*)	Flaked stone scatter & cleared area	Reclamation; Undetermined	NA	Site in close proximity to proposed access road alignment that extends NNE to Str 379. Development of road will not veer east of currently proposed alignment. *Site will **NOT** be marked for avoidance*.
AZ X:7:30(ASM)✓ (*Figure 2u*)	Flaked stone scatter, cleared area, 2 trail segments	Reclamation; Undetermined	NA	Site in close proximity to/on N side of existing access road but will not be impacted by its use. Confine APS vehicular traffic to existing road. *Site will **NOT** be marked for avoidance*.
SITES IMPACTED BY ACCESS ROADS				
AZ T:9:158(ASM)/ ESM 12 (*Figure 2b*)	Historic railroad siding	Private; Eligible *(2013 project consultation)*	NA	Existing access roads on N side of RR tracks extend through site & to be used by APS. Confine vehicular traffic to existing roads with no maintenance of roads within site perimeter. *Site boundary where roads enter & exit will be flagged*.
AZ T:13:122(ASM) (*Figure 2c*)	Harqua Station	BLM; Eligible *(SHPO 2000)*	40 & 41	Site is large though new spur roads to Strs 40 & 41 & the structures were placed outside its boundaries. Historic artifacts & structural material extend into existing access roads that traverse the site; therefore, confine vehicular traffic to existing roadways within the site & proposed spur roads outside the site once developed. *Access routes north of RR tracks & within site will be clearly marked to prevent any off-road activity in the site area*.
AZ Y:1:149(ASM)/ AZ-050-1174 (*Figure 2o*)	Trail & cleared area	YPG; Undetermined *(LSD 2008; YPG determined)*	Between 249 & 250	Testing recommended to provide NRHP eligibility determination. HANG2 ROW would extend through site. Confine APS vehicular traffic to existing road that extends across trail & N of cleared area; *road to be clearly marked through site*.
AZ X:4:1(ASM) (*Figures 2q/r*)	Prehistoric sleeping circles, trail segments, flaked stone scatter	BLM; Eligible *(recommended by ESM 2012; BLM determined)*	Between 290 & 291	Site is well outside HANG2 ROW with no construction activity associated with the area. An existing access road to be used by APS extends through site's northern portion. Confine vehicular traffic to existing road with no improvements within site boundary. *Road to be clearly marked through site*.
AZ X:3:376(ASM)/ AZ X:3:488(ASM) (*Figure 2t*)	Historic mining activity & camp site	BLM; Eligible *(recommended by ESM 2012; BLM determined)*	NA	Site was initially recorded as two separate sites; they have been combined due to their close proximity & connection by artifacts & features. Confine APS vehicular traffic to existing road through site, and *road to be clearly marked to ensure avoidance of site's contents*.
AZ X:4:393(ASM) (*Figure 2t*)	Historic wagon road	YPG; Eligible (A) *(2012-2013 ACS project consultation)*	Passes by and extends north from 341	Confine APS vehicular traffic to existing roadway which is in use and does not retain historic integrity in project area.
AZ X:3:680(ASM)/ ESM 6 (*Figure 2u*)	Artifact scatter & rock features; mining camp	YPG; Eligible *(2013 project consultation)*	Between 358 & 359	Confine APS vehicular traffic to existing road across the site boundary. *Road to be clearly marked through the site*.

Table E1. Archaeological Site-specific Treatment Recommendations for HANG2 Construction Activities (by Level of Effect then Location)

SITES IMPACTED BY PROPOSED INFRASTRUCTURE				
AZ T:9:24(ASM) *(Figure 2b)*	Historic homestead	State/Private; Eligible *(recommended by LSD 2008)*	8	Both transmission lines extend through southern portion of site, & site boundary encompasses Str 8. Examination of proposed structure placement & newly proposed spur road identified no surface cultural materials &/or features. Prior to vegetation clearing and construction, *access routes will be clearly marked* to ensure confinement of APS vehicular traffic to existing roads, the spur road, and at Str 8. **Will confirm absence of cultural materials at structure location prior to placement.**
AZ S:16:38(ASM) *(Figure 2e)*	Saddle Siding	BLM; Eligible *(2007 project consultation)*	67	Site falls within Dendora Valley Archaeological District (AZ S:16:37 [ASM]). Both transmission lines extend through site, as do existing access roads and one new route to Str 67. *New access route will be laid out* **w/ archaeologist present** *to minimize site impact, and all access routes will be marked* to ensure APS vehicular traffic confined to designated routes within site boundary. During survey of access routes, ESM observed some flakes in the area (part of Site AZ S:16:37[ASM]); therefore, **archaeological monitor will be present during pad preparation of proposed Str 67** *at site's W boundary* to ensure no significant cultural materials are encountered during construction activity.
AZ S:16:39(ASM) *(Figure 2f)*	Papago Maneuvering Area	BLM; Eligible *(2007 project consultation)*	85-89	Site is large & encompasses proposed placement of Strs 85-89. Confine APS vehicular traffic primarily to existing road that extends through site's southern portion along RR line; use of this road will not impact site. All cultural features have been avoided by proposed structure placements, new access routes, & pull site placement (just outside site to east). *Roadways will be flagged off through the site* to ensure confinement of APS vehicular traffic. **Archaeologist will be present during layout of all new access routes, the pull site, and Strs 86-89.**
AZ S:15:10(ASM) *(Figure 2h-i)*	Camp Hyder-WWII Military Training Base	Private; Eligible *(2007 project consultation)*	129-131	Both transmission lines extend through site. *Existing access roads will be marked* to ensure APS vehicular traffic is confined to these roads within site boundary. Placement of Strs 129-131 was examined & contained no surface cultural materials &/or features that could be impacted by construction activities. **Will confirm absence of cultural material at structure locations prior to placement.**
AZ Y:2:49(ASM) *(Figures 2k-l)*	Camp Horn/Fort Horn Monument	State/Private; Listed on NRHP	169-177	Site situated directly N of RR tracks & encompasses Strs 170-177. However, none of structure locations or roads to be used by APS would impact any associated artifacts or features. Fort Horn Monument is between Strs 176 & 177; monument shall be avoided by all construction activities. *Each end of site will be marked along main access road so it is known when one is in the site boundary*. Access to be restricted to approved & marked routes. **Archaeologist to be present during initial placement of proposed structures & spur access routes to ensure feature avoidance.**
AZ Y:2:30(ASM) *(Figure 2l)*	Kofa Railroad Station	State; Eligible *(2007 project consultation)*	194	Site encompasses both transmission line ROWs and proposed placement location of Str 194. *Nearby Features 11-16 will be marked for avoidance*. Confine APS vehicular traffic to the two existing roads through site. No features were observed that would be impacted by development of the new spur access to Str 194, *but route will be marked prior to development*.

Table E1. Archaeological Site-specific Treatment Recommendations for HANG2 Construction Activities (by Level of Effect then Location)

SITES REQUIRING DATA RECOVERY				
AZ S:16:37(ASM) (*Figures 2e-f*)	Dendora Valley Archaeological Site	BLM; Eligible *(2007 project consultation)*	59-83	Site encompasses an enormous area that includes proposed Strs 59-83. Confine APS vehicular traffic through site to existing roads. During survey of new spur access routes, all proposed facilities were visited. ESM observed flakes only in vicinity of Str 62. Regardless of the lack of materials noted, *placement of new access routes, proposed structures, and pull sites within site boundary will require comprehensive in-field analysis of all cultural materials encountered prior to development; all temporally diagnostic or specialized tools to be collected*. **An archaeological monitor will be present during pad preparation/excavation at the 25 structure locations**; *any identified subsurface cultural materials will also be field analyzed and assessed within the context of each proposed facility.*
AZ X:4:399(ASM)/ ESM 4 (*Figures 2r/s*)	Prehistoric rock alignments, trail, artifact scatter	BLM; Eligible *(2013 project consultation)*	309	Alternative access to proposed placement area of Str 309 is not plausible. **100% mitigation of this small site will be conducted due to the location of the proposed access route & position of site on a very narrow ridgetop**.
AZ X:7:10(ASM) (*Figure 2u*)	Prehistoric artifact scatter with features	Reclamation; Eligible *(2007 project consultation & previously)*	383-385	Site is large (though quite sparse in its lithic content) & encompasses access roads, proposed placements for Strs 383-385, and a spur road and two pull sites for Str 384. Confine APS vehicular traffic to existing roads & new spur road to Str 384, *all of which will be marked*. The extent of the two pull sites around Str 384 will be minimized to the extent possible. Examination of proposed structure placements did not indicate impact to any cultural resources. Nevertheless, *comprehensive in-field analysis of all cultural materials within Loci D, G, H, & K/L which contain the new spur route, each structure location, and both pull sites will be accomplished prior to development; all temporally diagnostic or specialized tools to be collected*. **Monitor will also be present during pad preparation/ excavation at the three structure locations**; *any identified subsurface cultural materials will also be field analyzed and assessed within the context of each proposed facility.*

*These figures reference the full set of 11 × 17-inch, 1:24,000-scale maps appended to the project's Plan of Development (POD); the figure numbers also conform to the ESM 2012 inventory report location maps.

**Agency determination of eligibility with SHPO concurrence as a result of current 2013 consultation, EPG 2007 HANG 2 ROW inventory consultation, or prior.

✓Removed from overall count of affected, eligible/undetermined sites.

APPENDIX E2

HANG2 CULTURAL RESOURCES MONITORING & DISCOVERY PLAN

CULTURAL RESOURCES MONITORING & DISCOVERY PLAN FOR THE HASSAYAMPA–NORTH GILA 500kV-2 PROJECT

Purpose

The Monitoring and Discovery Plan (MDP or Plan) for the Hassayampa–North Gila 500kV-2/HANG2 (the Project) ensures that any discoveries of cultural resources during construction or other ground-disturbing activities are treated promptly and in consultation with appropriate parties in accordance with the National Historic Preservation Act (NHPA), Native American Graves Protection and Repatriation Act (NAGPRA), Archaeological Resources Protection Act (ARPA), and other applicable laws. Section 106 consultations for the project resulted in a determination of adverse effect for 29 sites. Of these sites, the impact to 26 will be minimized through avoidance or activity placement, while three National Register-eligible archaeological sites will undergo data recovery and whose detailed treatment has been addressed in a separate Historic Properties Treatment Plan and Memorandum of Agreement. Although significant cultural resource discoveries are not anticipated during the course of the Project, having this stand-alone Monitoring and Discovery Plan in place is a proactive approach to identifying, evaluating, and treating such discoveries. Right-of-way grants and other authorizations from the Bureau of Land Management (BLM) and other land managers require that APS and its contractors comply with the provisions of this Plan.

In reference to the NHPA, the MDP addresses the regulations at 36 CFR Part 800.13, Post-review Discoveries, which requires the lead agency (BLM) to evaluate the eligibility of any unanticipated discoveries of historic properties for the National Register of Historic Places and to consult with the State Historic Preservation Officer (SHPO) and claimant Indian tribes regarding the effects to eligible properties and to identify appropriate actions to resolve any adverse effects.

The MDP describes the procedures for monitoring and addressing any discoveries of historic or prehistoric cultural materials that could result from ground-disturbing activities associated with project construction on and off sites would be handled. The MDP describes monitoring procedures, protocols for discovery situations; roles and responsibilities of government agencies, APS, and other consulting parties; steps of notification and consultation in the event of a discovery; and procedures for protection, recordation, and evaluation of newly identified cultural resources.

Roles and Responsibilities

1. BLM: The BLM is the lead agency and land-managing agency for compliance with the NHPA and National Environmental Policy Act and is responsible for notifying consulting parties of discoveries within required timeframes. The BLM Arizona Renewable Energy Coordination Office (RECO), Yuma Field Office (YFO), and Lower Sonoran FO (LSFO) conduct consultations regarding eligibility for nomination to the National Register of Historic Places and effects on any eligible historic properties, and are responsible for ensuring implementation of treatment identified through consultations to resolve adverse effects in accordance with the Secretary of the Interior's standards.

2. Yuma Proving Ground (YPG), Bureau of Reclamation (Reclamation), and Arizona State Land Department: Along with the BLM, these are the other land-managing agencies responsible for compliance with NHPA, as well as NAGPRA, or relevant State laws with respect to ASLD. These land managers participated as consulting parties and issue permits and authorizations

for monitoring activities and any data recovery conducted in accordance with NHPA, ARPA, and the State Historic Preservation Act (SHPA).

3. APS: The Project proponent is responsible for carrying out the conditions of any authorizations issued by BLM and other land managers, including the provisions of this MDP, and ensuring that contractors and subcontractors abide by the Plan. APS is responsible for implementing related worker education and monitoring programs; retaining a qualified archaeological consultant to carry out these programs and to evaluate and document any discoveries; halting construction in the immediate area in the event of a discovery; promptly notifying the BLM or appropriate land manager; protecting discoveries from damage as directed by the BLM; participating as a consulting party in the NHPA/SHPA process; and ensuring that agency-approved treatment actions are fully implemented. APS will bear the costs of carrying out this Plan.

4. Qualified Archaeological Consultant (QAC): The archaeological consultant will carry out worker education, monitoring, and discovery provisions of this MDP under the oversight of the BLM. APS shall retain a consultant that meets the Secretary of the Interior's standards and possesses or obtains a Cultural Resource Use Permit from the BLM Arizona State Office and Arizona Antiquities Act Blanket Permit from Arizona State Museum (ASM). For purposes of monitoring only, the consultant shall obtain a Fieldwork Authorization from BLM YFO and/or Lower Sonoran FO, any authorizations from Reclamation or YPG, and a Project-specific Permit from ASM. The QAC will have authority to halt construction in the immediate area as necessary to assess discovered resources.

Consulting Parties

Consulting parties will initially include the BLM RECO Supervisor (or designees), YPG and Reclamation Archaeologists, and State Land Archaeologist/ASM Permit Coordinator (should the discovery be on their lands). The BLM or other relevant land manager will then determine how to proceed. If further consultation is deemed necessary, the BLM or QAC (on behalf of the BLM) will consult with the Arizona State Historic Preservation Office and preservation officers (or designees) for the following tribes or a subset thereof: Cocopah Indian Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Fort Yuma-Quechan Tribe, and The Hopi Tribe.

Cultural Resource Monitoring

Prior to the construction commencement, a qualified archaeological consultant meeting the standards found at 43 CFR 7.8 will provide cultural resources awareness training to construction personnel and other non-cultural environmental inspectors/monitors. Trainees will learn the types of resources to be avoided and immediately reported to an on-site environmental compliance inspector; the types of archaeological materials that exist in this region of western Arizona; the special sensitivity of any human remains or associated items; and the legal penalties for damaging sites. Training will also address the procedures to follow in a discovery situation. The cultural resources awareness training will occur prior to ground-disturbing construction activities. APS has notified all contractors that their employees must receive cultural resources training before participating in on-the-ground activities. Each person who participates in this training will be recorded on a sign-in sheet, which will be subsequently distributed to all cultural resources monitors to aid in ensuring compliance. Any new employee will be directed by their supervisor (who has already received training) to check in with a cultural resources monitor to obtain this training in the

field before starting work. The name and affiliation of an employee trained in the field by a cultural resources monitor will be included in the monitor's daily log and forwarded to the resources compliance manager for inclusion on the master list. The project's primary construction contractor will also issue stickers to trained workers for placement on their hard hats.

Avoidance and Discovery Monitoring Activities

Two types of monitoring activities are associated with the avoidance or mitigation of adverse impacts to historic properties within the APE. The first is *avoidance monitoring* where the purpose is to ensure that NRHP eligible/undetermined historic properties to be avoided are not inadvertently disturbed by construction activities associated with the Project. The second is *discovery monitoring* where, during the course of Project-related activities, previously unknown archaeological materials or historic properties are inadvertently discovered (e.g., a buried feature without any surface expression). Both types of monitoring will occur during the course of HANG2 construction, depending on the proposed level of effort to avoid or mitigate adverse construction impacts to any specific historic property.

Unlike discovery monitoring where qualified archaeologists inspect the progress of ground-disturbing activities (see below, *Discovery Actions and Notifications*), avoidance monitoring will involve a number of procedures to ensure the protection of archaeological sites during the course of construction activities. These procedures involve the following:

- Mark the relevant boundaries of all historic properties that will be avoided in their entirety;
- Mark the length and edges of all approved access routes through historic properties;
- Mark for closure all existing, unapproved routes within historic properties;
- Conduct weekly or biweekly (depending on level of activity in the vicinity of a given site area) *avoidance monitoring* at identified historic properties to ensure markings remain appropriately visible and that no activities have occurred within marked areas for avoidance. Photographs will be taken of approved impact areas prior to construction, again during post-construction monitoring, and during if necessary to document existing conditions;
- If a Compliance Monitor finds that any markings have been altered or removed or that a site has undergone unauthorized disturbance, s/he will immediately inform the Compliance Inspector and the appropriate construction supervisor in the field to rectify the situation;
- Each monitoring even will be documented in a Daily Monitoring Log/Report that will be kept on file by the Resources Compliance Manager (ESM); bimonthly progress reports will be made to the BLM's Authorized Officer; and
- The timeline and results of all avoidance monitoring efforts at designated sites will be included in the final monitoring report.

Discoveries

Types of discoveries could include prehistoric chipped stone, ground stone, or ceramic artifacts; prehistoric features such as rock rings, cleared circles, hearths, trails, or cremations; or historic artifacts or features such as trash dumps or debris from military training or railroad activities. Prior to the commencement of construction, a qualified archaeological consultant meeting the standards found at 43 CFR 7.8 will provide cultural resources awareness training to construction personnel and other non-cultural environmental inspectors/monitors. Trainees will learn the types of resources to be avoided and immediately reported to an on-site environmental compliance supervisor; the

types of archaeological materials that exist in this region of western Arizona; the special sensitivity of any human remains or associated items; and the legal penalties for damaging sites. Training will also address the procedures to follow in a discovery situation. The cultural resources awareness training will occur prior to ground-disturbing construction activities. APS has notified all contractors, construction or otherwise, that their employees must receive cultural resource training before participating in on-the-ground activities. Each person who participates in this training will be recorded on a sign-in sheet, which will be subsequently distributed to all cultural resource monitors to ensure compliance. Any new employee will be directed by their supervisor to see a cultural resource monitor to obtain this training in the field before starting work. The name and affiliation of an employee trained in the field by a cultural resource monitor will be included in the monitor's daily log and forwarded to the cultural resource compliance manager for inclusion on a master list.

Construction Activities

Pre-construction activities include site mobilization which allows for removal of vegetation (with hand-cutting only within marked archaeological sites), the installation of fencing, construction trailers, construction trailer utilities, and construction trailer parking at a particular site. Limited ground disturbance, grading, and trenching associated with the abovementioned pre-construction activities is considered part of site mobilization. Walking, driving, or parking a passenger vehicle, pickup truck and/or light vehicles will occur during site mobilization.

Construction activities include on-site work to install permanent equipment or structure for any facility. Ground disturbance associated with construction includes removal of top soil or vegetation removal at the site for access roads and linear facilities. Grading, boring, and trenching activities also include subsurface soil work such as leveling, hole drilling, removal of hills or high spots, moving soil from one area to another, and general removal of soil. *Imported gravel may be laid down on any access roads within eligible/undetermined archaeological sites as protective plating where portions of certain roads need to be leveled or where erosion/rutting results in exposure of cultural material.* This option has been accepted as a viable method of minimizing site impacts by APS, though its execution is anticipated to be limited since the project area is so dry.

A number of different treatment actions are recommended at National Register-eligible/ undetermined sites depending on Project effects. Project levels of effect and treatment actions for each of the 29 eligible/undetermined sites within the APE are also summarized in POD Appendix/ Table E1, *Archaeological Site-specific Treatment Recommendations for HANG2 Construction Activities*. Project activities fall into four different categories or levels of effect, with each one defined by the kind of disturbance likely to take place at certain sites: 1) Sites Avoided in Their Entirety, 2) Sites Impacted by Access Roads, 3) Sites Impacted by Proposed Infrastructure, and 4) Sites Requiring Data Recovery.

1. <u>Sites Avoided in Their Entirety:</u> The first category is where proposed activities will occur near archaeological sites but will not impact them in any way. Thirteen sites fall into this category, and the primary proposed treatment is to mark site boundaries to prohibit any inadvertent travel/ activities within the site interiors. A qualified archaeologist will conduct weekly or biweekly *avoidance monitoring* to ensure that boundary markers/flags are still in place and that there have been no construction-related impacts to the sites.

2. <u>Sites Impacted by Access Roads:</u> The second category is where pre-existing access roads bisect sites and the only impact will be vehicular travel through their interiors. Seven sites fall into this category, and the proposed treatment is to clearly demarcate these travel corridors to prohibit

any inadvertent travel/activities outside the defined routes. No road maintenance will be allowed within the boundaries of these seven sites. A qualified archaeologist will visit each site once a week during construction activities in the area to conduct *avoidance monitoring*, ensuring that designated access routes are being used as prescribed.

3. Sites Impacted by Proposed Infrastructure: The third category is where Project infrastructure development will take place within sites. Six historic Euroamerican sites fall into this particular category. The exact location of these facilities will be determined in the field with the QAC to ensure avoidance of all artifact concentrations and features. When artifacts cannot be avoided, these will be analyzed in the field or collected in the case of unique artifacts. Also, no maintenance will be allowed on pre-existing access roads. A qualified archaeologist will be present to conduct both *avoidance* and *discovery monitoring* during the course of ground-disturbing activities. This includes during excavation of any structure pads/holes, spur road development, and when pulling sites are established.

4. Sites Requiring Data Recovery: The fourth category is where proposed Project activities will substantially impact sites to a level of requiring data recovery. Three prehistoric sites fall into this particular category: S:16:37(ASM), X:4:399(ASM), and X:7:10(ASM).

The QAC will maintain a monitoring log as a component of environmental compliance documentation for the project. Bimonthly progress reports will be submitted to the BLM. After clearing activities and all monitored excavations within site areas are completed, the QAC will provide the BLM, other land managers, and SHPO with a letter report summarizing the monitoring results. In the event that a cultural monitor notes damage having occurred to a documented or undocumented cultural site, the monitor will notify the BLM and other relevant land managers and document the disturbance photographically, assessing the damage. The monitor will complete an incident report, which they will submit to the BLM, and as necessary, other land manager.

Reporting on Discoveries and Treatment of Discoveries

Types of discoveries could include prehistoric chipped stone, ground stone, or ceramic artifacts; prehistoric features such as rock rings, cleared circles, hearths, trails, or cremations; or historic artifacts or features such as trash dumps or debris from military training or railroad-related activities.

As stated above, bimonthly monitoring updates shall be provided to the BLM via email, and reporting will be more frequent should any significant results (e.g., resource discoveries or damage) require reporting. These progress reports will include any discoveries made since the prior report. APS' archaeological consultant will prepare and distribute draft and final reports on the results of any archaeological investigations associated with treatment of a discovery; the reports will be provided to all relevant land managers, SHPO, and the consulting tribes.

Discovery Actions and Notifications

Construction, operations, or decommissioning activities may result in discoveries of artifacts, features, or other archaeological materials. The Project proponent is responsible for all costs associated with the evaluation and any decision relating to implementation of proper mitigation measures required by the authorized officer. In instances of discoveries of artifacts related to modern military activities or isolated occurrences, the BLM (and other land managers, as appropriate) may deem it sufficient to document the find without further consultation. Decisions

regarding treatment of a discovery will be made on a case-specific basis following consultation with the affected land manager.

In accordance with 36 CFR 800.13(b)(3), which relates to the discovery of heretofore unknown and undocumented historic properties, the BLM would notify the appropriate land manager, SHPO, and the consulting Tribes within 48 hours of discovery. Similarly, the SHPO and Tribes shall have 48 hours to respond to the BLM's (and other land manager) eligibility recommendations and proposed actions; both the SHPO and Tribes would be provided with a report detailing the actions resulting from discovery.

Procedures for Non-burial Related Discoveries

In the event of a non-burial discovery of prehistoric/Native American cultural materials not covered under NAGPRA or State burial statutes, the QAC and BLM will carry out the following procedures for protection, recordation, and evaluation of discoveries. Selected recordation techniques will document the findings, including a comprehensive narrative, photographic documentation, detailed sketch drawings of any artifacts or features, and recording UTM coordinates.

- The construction contractor halts construction work within 30 meters (100 feet) of the discovery and implements protective actions to prevent damage/disturbance.
- The Resources Compliance Manager notifies the BLM and any other relevant land manager(s) of the discovery immediately.
- A qualified archaeologist assesses the discovery.
- The archaeologist documents the find, including a comprehensive narrative, photographs, detailed sketch drawing of artifacts or features, and recording UTM coordinates of the find location. The assessment results are then reported to the BLM/land manager within72 hours.
- The BLM/land manager notifies SHPO and other consulting parties to initiate consultation on eligibility, effect, and if needed, additional treatment implementation to resolve adverse effects.
- Consulting parties shall respond within 48 hours of the notification. The BLM/affected land manager shall take into account the recommendations and then carry out appropriate actions.
- The BLM shall provide the consulting parties with a report of actions when completed.
- If additional treatment measures are to be implemented beyond those undertaken to initially document the discovery, the procedures would be similar to those outlined for artifacts and features indicated in the Historic Properties Treatment Plan. Specifically, all artifacts from features (including screened excavated fill) will be collected, and the following methods would be employed depending on the feature type:

  Ash Stains, Hearths, other Thermal Features: Location will be mapped and the feature profiled and photographed. Excavated fill will be screened through ¼-inch or smaller mesh. If it appears that the feature can be dated through association of artifacts or stratigraphy, appropriate samples may be taken, including charcoal fragments for radiocarbon dating.

  Storage Pits: Location will be mapped and the feature profiled and photographed. The feature will be fully excavated, and the fill screened through ¼-inch or smaller mesh screen. If it appears that the feature can be dated through association of artifacts or stratigraphy, appropriate samples may be taken.

  Buried or Partially Buried Structures and Other Features: Examples of buried or partially buried features include pit structures and masonry rooms. Location will be mapped and the feature profiled and photographed. Treatment of buried or partially buried features is a two-

stage process involving (1) nature and extent testing within the feature-specific APE to define the boundary of the feature and detect the presence of additional features; and (2) data recovery within the APE. Systematic trenching in conjunction with hand test units, or other subsurface investigative techniques, may be used within the APE. Excavated fill will be screened through ¼-inch or smaller mesh. If it appears that the feature can be dated through association of artifacts or stratigraphy, or by radiographic or archaeomagnetic dating, appropriate samples may be taken.

Miscellaneous Prehistoric Features: Examples of miscellaneous features include buried cultural horizons and agricultural features. Location will be mapped and the feature profiled and photographed. The strategy for treatment of miscellaneous prehistoric features is the same as that for buried or partially buried features.

- The BLM/land manager will ensure that the QAC implements the approved course of action.
- The QAC provides a report to the BLM and consulting parties in accordance with the prescribed treatment activities.
- The discovery will be avoided until such time as all consultations/agency actions are completed.
- Construction may resume upon implementation of treatment and approval by the BLM/ appropriate land manager.

NAGPRA/State Burial Statute Procedures

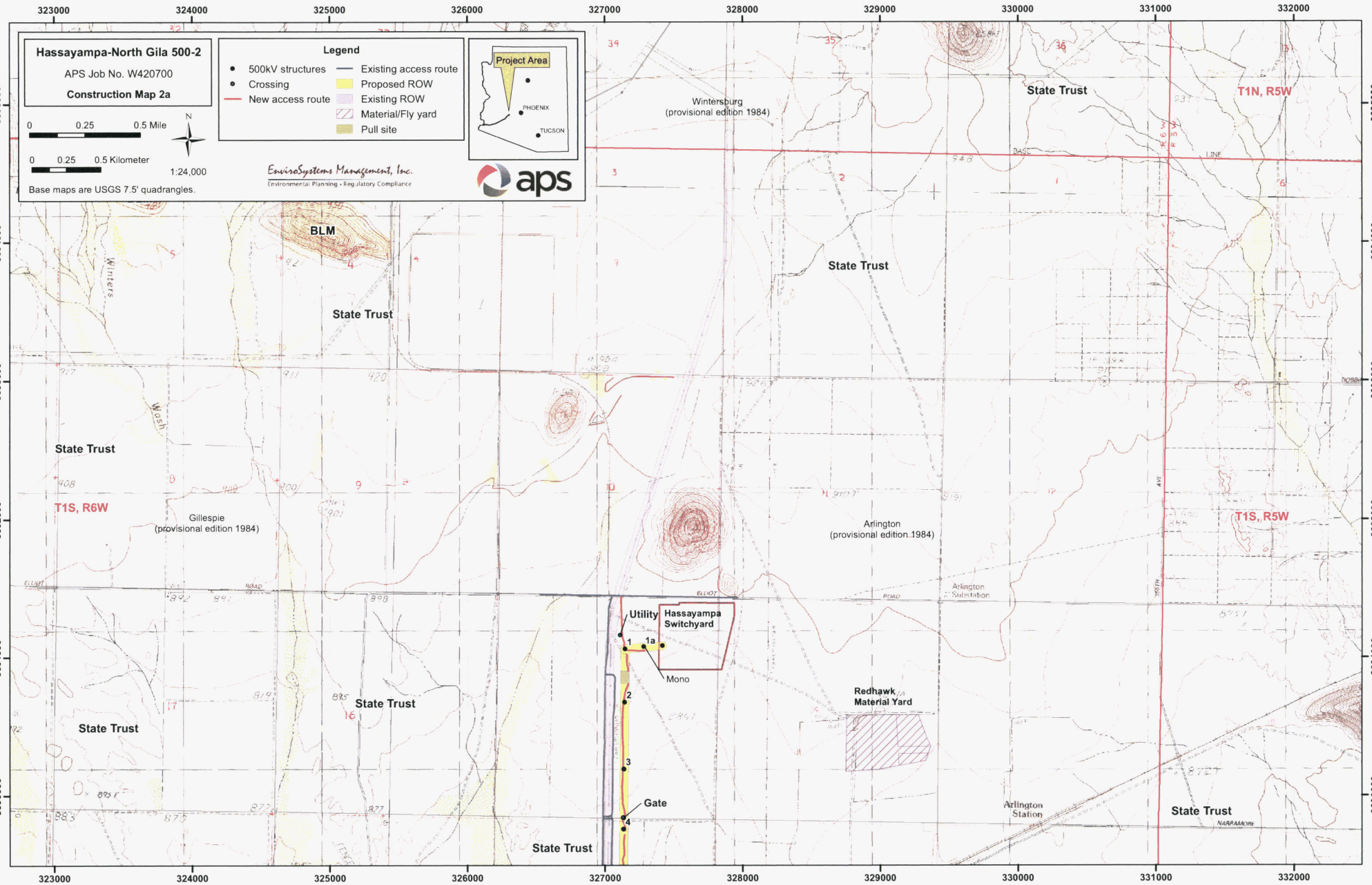
As the lead land-managing agency, the BLM has primary responsibility for compliance with the Native American Graves Protection and Repatriation Act, though they are obligated to contact other federal land managers immediately of NAGPRA-related discoveries on their lands (Reclamation and YPG). If human remains are discovered, APS will notify the BLM authorized officer, as well as any other relevant land manager, immediately by telephone and in writing within 24 hours. Upon receipt of the written notification, the BLM or affected land manager shall certify the written notification and notify the consulting tribes by telephone and in writing within 72 hours to initiate consultation as required by the regulations implementing NAGPRA (43 CFR 10.4). In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony as defined in the NAGPRA (PL 101-601; 104 Stat. 3048; 25 USC 3001) are discovered, the procedures following the specific land manager's protocols shall be implemented. In the case of State lands, Arizona Revised Statute §41-844 applies, and for private lands, §41-865; the specific treatment and disposition of human remains will be determined in consultation with ASM.

Post-Construction and Long-Term Monitoring

Once the HANG2 transmission line has been fully installed, regular on-the-ground inspections will occur approximately every 7 years. This involves an inspection crew driving a standard line truck on approved access roads and climbing each structure. Upon completion of each inspection, any necessary repairs to the line itself or to any of the structures will take place. The only other time that a physical inspection or repair will occur is when an annual helicopter flyover identifies an immediate danger to the public, the powerline faults, or emergency repairs are required as a result of fire or lightning.

Prior to any inspection and repair along the line, APS Land Services and Environmental departments are consulted regarding the location of any protected biological and cultural resources. Inspection and repair crews will follow stipulations set forth in the POD and in this Monitoring and Discovery Plan when conducting activities within the boundaries of the 28 historic properties identified herein that will not have undergone 100% data recovery. If repairs are expected to occur within any of these sites, then a qualified archaeologist will be engaged to inspect the repair activity location, and if deemed necessary upon notification to the affected land manager, provide avoidance/discovery monitoring during repairs. If any cultural materials are discovered during the course of the repair activities, then the stipulations set forth in this MDP regarding such discoveries will be used to ensure adequate documentation, evaluation, and protection. Following completion of repair work, a monitoring report will be compiled and distributed to the appropriate land manager.

APPENDIX A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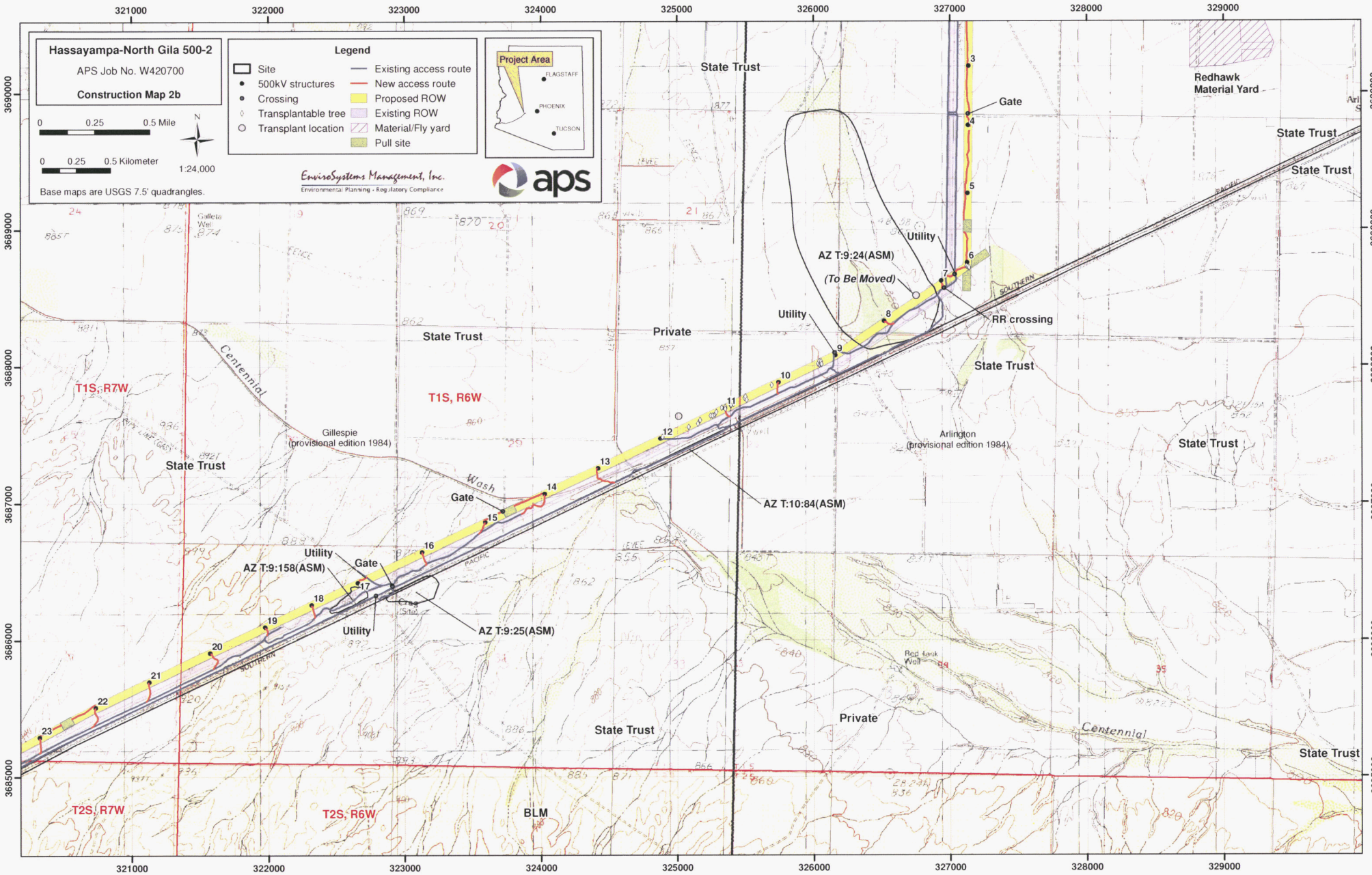
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
500kV structures
Crossing
New access route
Existing access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
PHOENIX
TUCSON
323000
324000
325000
326000
327000
328000
329000
330000
331000
332000
3695000
3694000
3693000
3692000
3691000
3690000
Wintersburg
(provisional edition 1984)
State Trust
T1N, R5W
BLM
Winters
Wash
State Trust
State Trust
State Trust
T1S, R6W
Gillespie
(provisional edition 1984)
Arlington
(provisional edition 1984)
T1S, R5W
Arlington
Substation
Utility
Hassayampa
Switchyard
1
1a
Mono
2
3
Gate
4
Redhawk
Material Yard
State Trust
State Trust
Arlington
Station
State Trust
State Trust


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2b
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
Legend
Site
500kV structures
Crossing
Transplantable tree
Transplant location
Existing access route
New access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning - Regulatory Compliance
aps
State Trust
Private
BLM
T1S, R7W
T1S, R6W
T2S, R7W
T2S, R6W
Redhawk Material Yard
Gate
Utility
AZ T:9:24(ASM)
(To Be Moved)
RR crossing
AZ T:10:84(ASM)
AZ T:9:158(ASM)
AZ T:9:25(ASM)
Gillespie (provisional edition 1984)
Arlington (provisional edition 1984)
Centennial
Wash
SOUTHERN
PACIFIC
Red tank Well
Gallete Well
321000
322000
323000
324000
325000
326000
327000
328000
329000
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3688000
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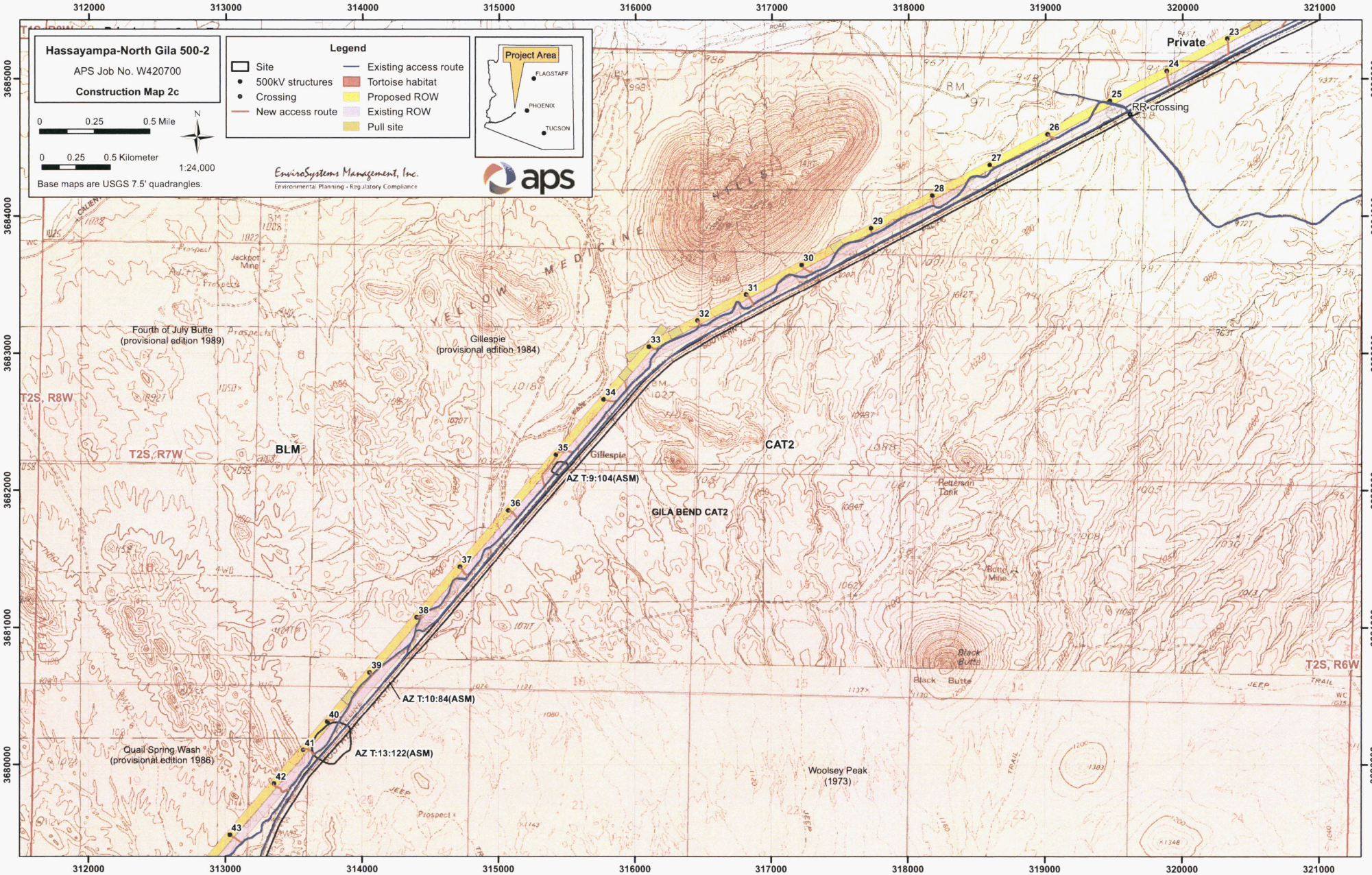
3686000
3685000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APS Job No. W420700
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0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
Crossing
New access route
Existing access route
Tortoise habitat
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
312000
313000
314000
315000
316000
317000
318000
319000
320000
321000
3685000
3684000
3683000
3682000
3681000
3680000
Private
RR crossing
YELLOW MEDICINE HILLS
Fourth of July Butte
(provisional edition 1989)
Gillespie
(provisional edition 1984)
T2S, R8W
T2S, R7W
T2S, R6W
BLM
CAT2
GILA BEND CAT2
AZ T:9:104(ASM)
AZ T:10:84(ASM)
AZ T:13:122(ASM)
Quail Spring Wash
(provisional edition 1986)
Woolsey Peak
(1973)
Black Butte
Jackpot Mine
Petterson Tank
Butte Mine
23
24
25
26
27
28
29
30
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32
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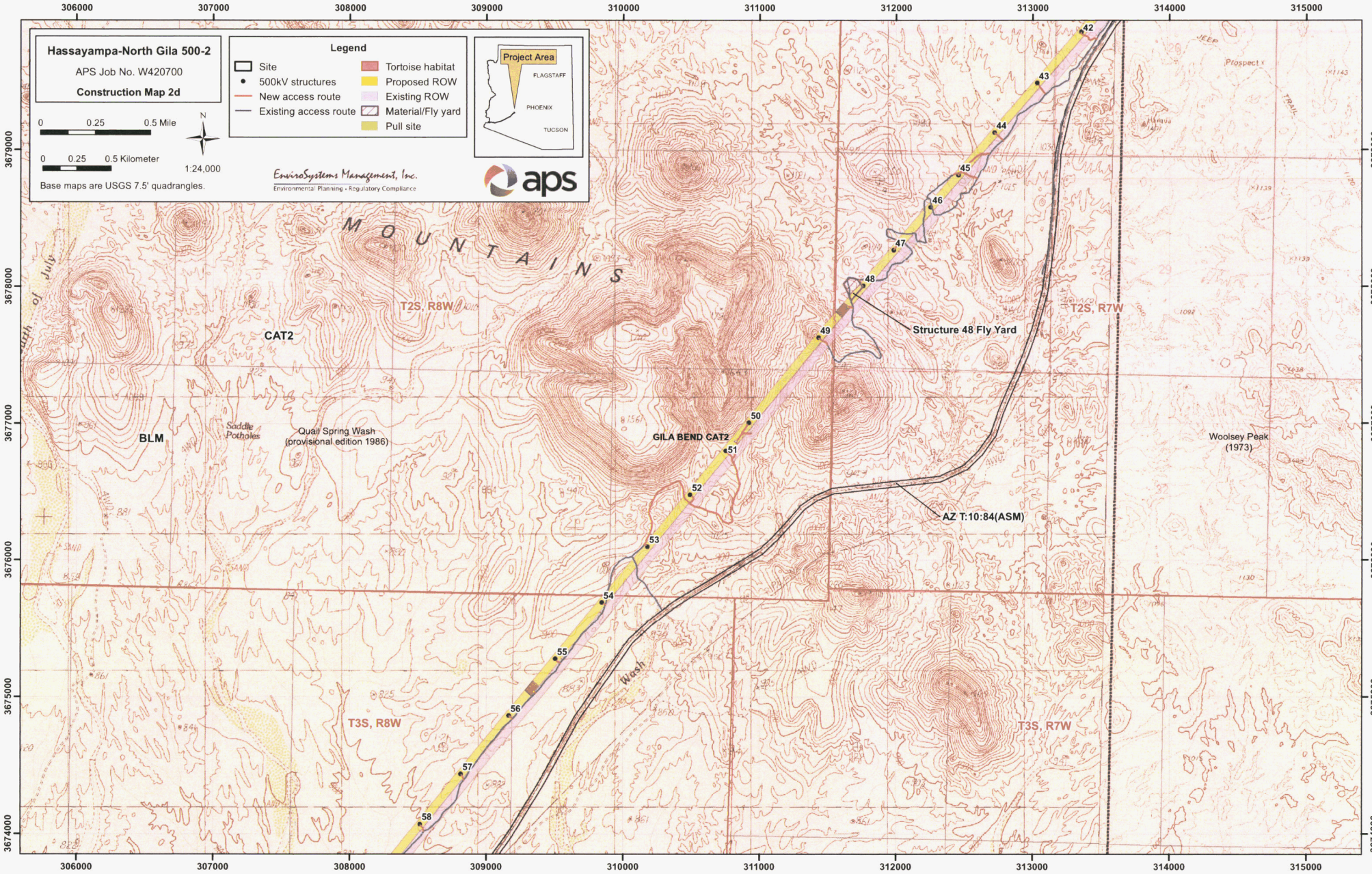
42
43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APS Job No. W420700
Construction Map 2d
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0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
New access route
Existing access route
Tortoise habitat
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
MOUNTAINS
T2S, R8W
T2S, R7W
T3S, R8W
T3S, R7W
CAT2
BLM
Saddle Potholes
Quail Spring Wash (provisional edition 1986)
GILA BEND CAT2
Structure 48 Fly Yard
AZ T:10:84(ASM)
Woolsey Peak (1973)
Wash
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
306000
307000
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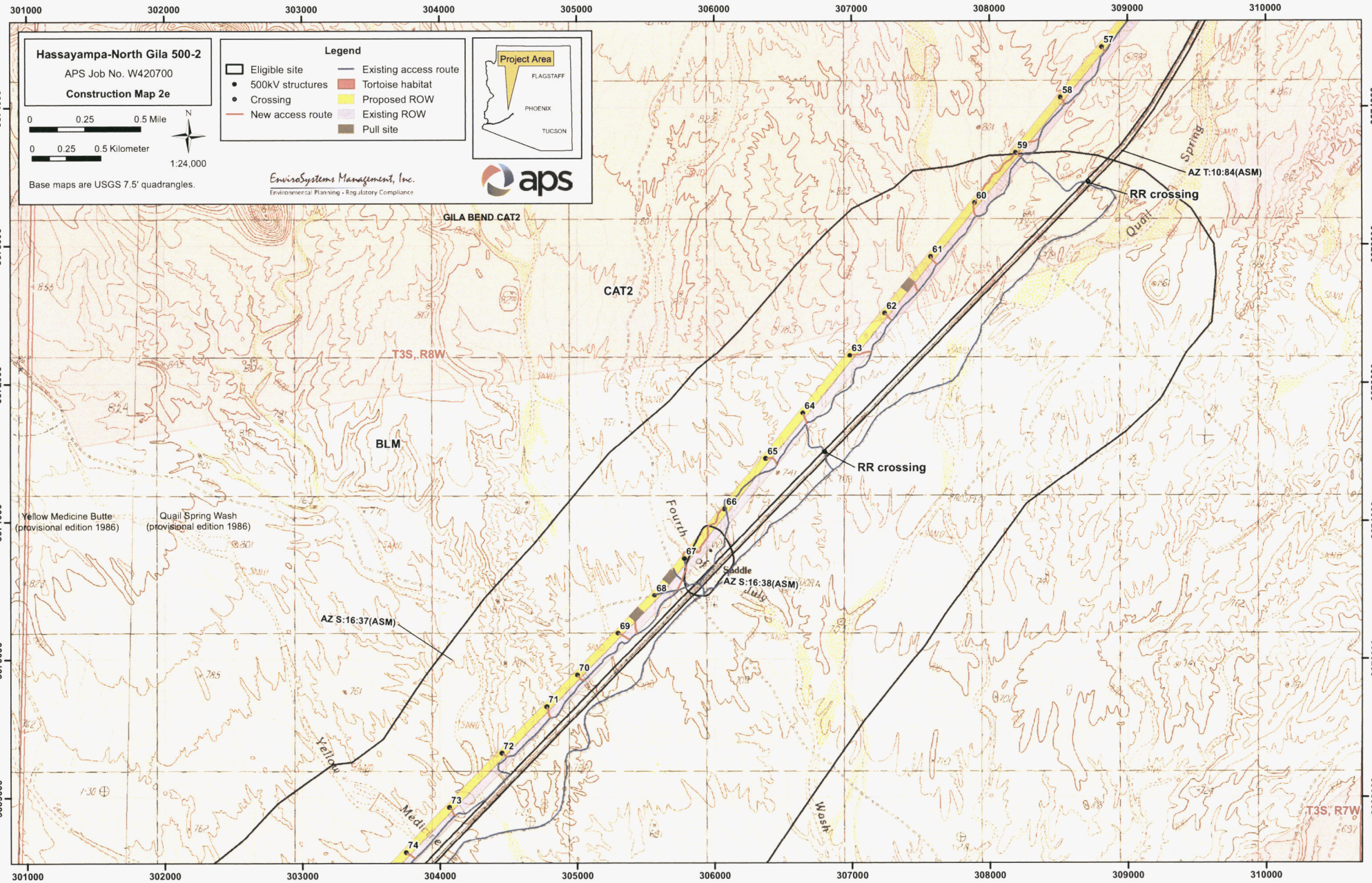
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2e
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Eligible site
500kV structures
Crossing
New access route
Existing access route
Tortoise habitat
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
GILA BEND CAT2
CAT2
T3S, R8W
BLM
Yellow Medicine Butte
(provisional edition 1986)
Quail Spring Wash
(provisional edition 1986)
AZ S:16:37(ASM)
AZ S:16:38(ASM)
Saddle
AZ T:10:84(ASM)
RR crossing
RR crossing
Fourth
Quail
Spring
Yellow
Medicine
Wash
T3S, R7W
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
301000
302000
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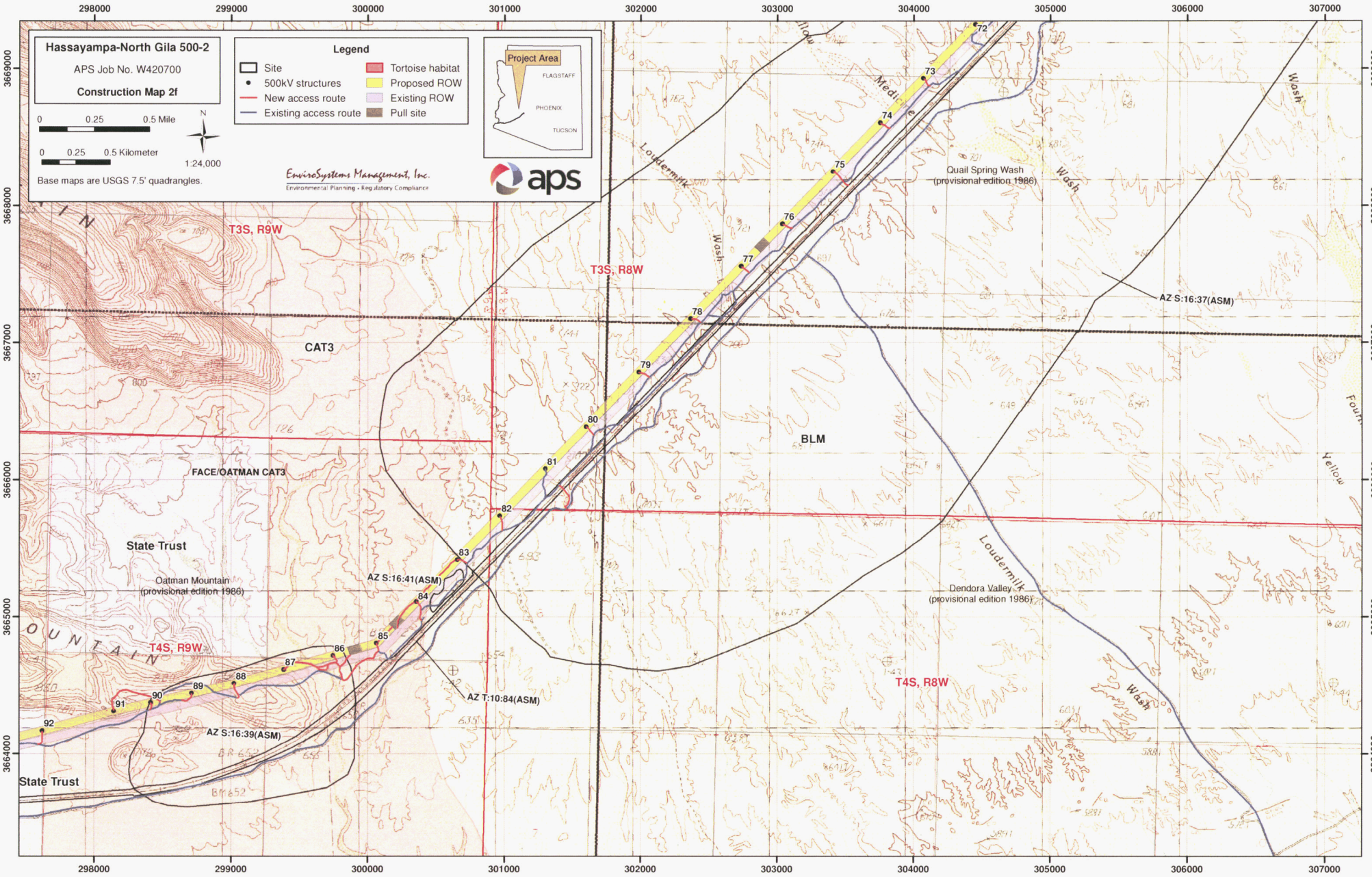
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APS Job No. W420700
Construction Map 2f
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0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
New access route
Existing access route
Tortoise habitat
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
298000
299000
300000
301000
302000
303000
304000
305000
306000
307000
3669000
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3667000
3666000
3665000
3664000
T3S, R9W
T3S, R8W
T4S, R9W
T4S, R8W
CAT3
FACE/OATMAN CAT3
State Trust
BLM
Oatman Mountain
(provisional edition 1986)
Quail Spring Wash
(provisional edition 1986)
Dendora Valley
(provisional edition 1986)
Loudermilk Wash
Medicine Wash
Yellow Wash
Fourth Wash
AZ S:16:37(ASM)
AZ S:16:41(ASM)
AZ T:10:84(ASM)
AZ S:16:39(ASM)
72
73
74
75
76
77
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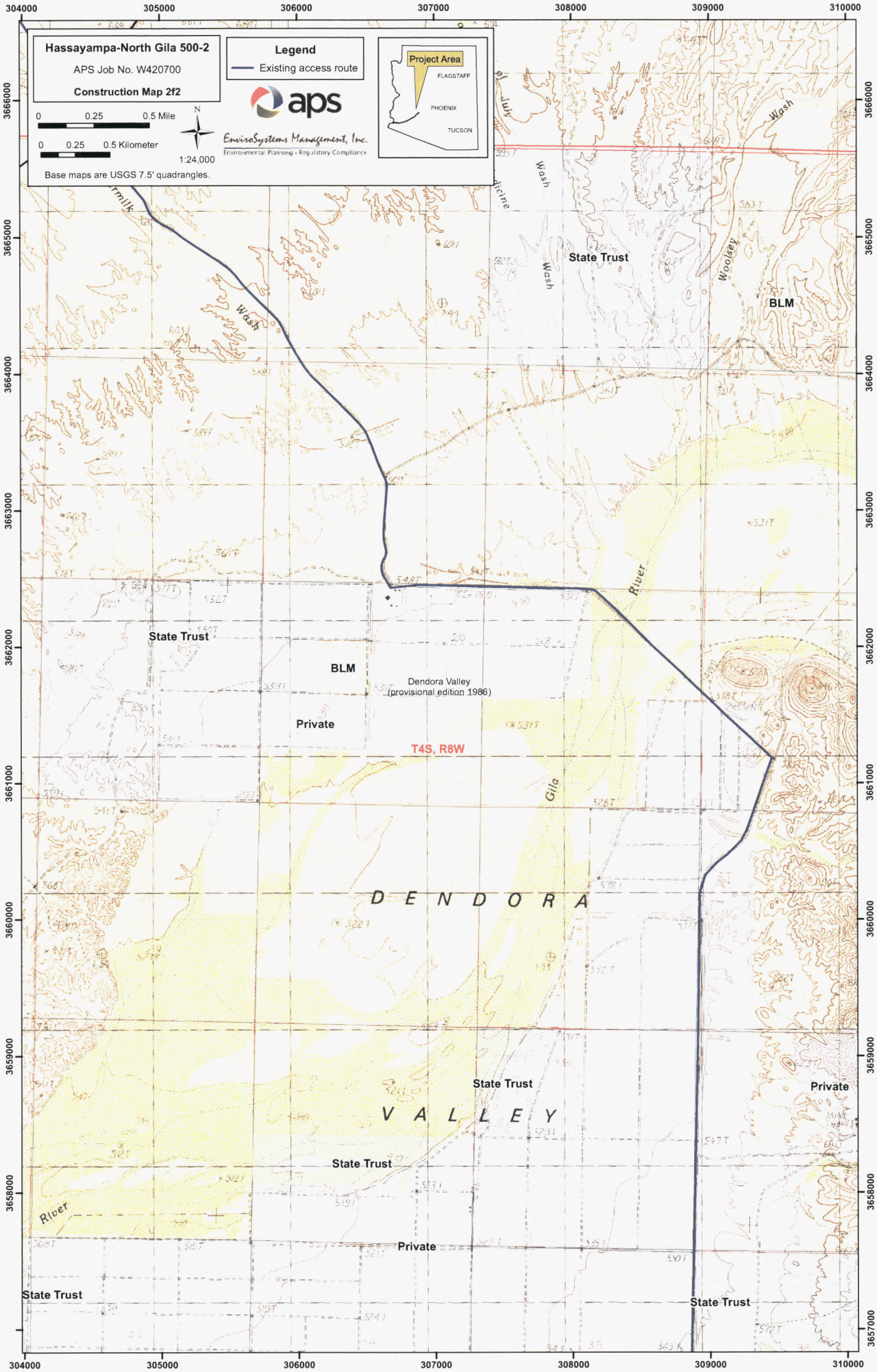
92


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2f2
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
Legend
Existing access route
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Project Area
FLAGSTAFF
PHOENIX
TUCSON
State Trust
BLM
Dendora Valley
(provisional edition 1986)
Private
T4S, R8W
D E N D O R A
V A L L E Y
Gila
River
Wash
Woolsey
July
304000
305000
306000
307000
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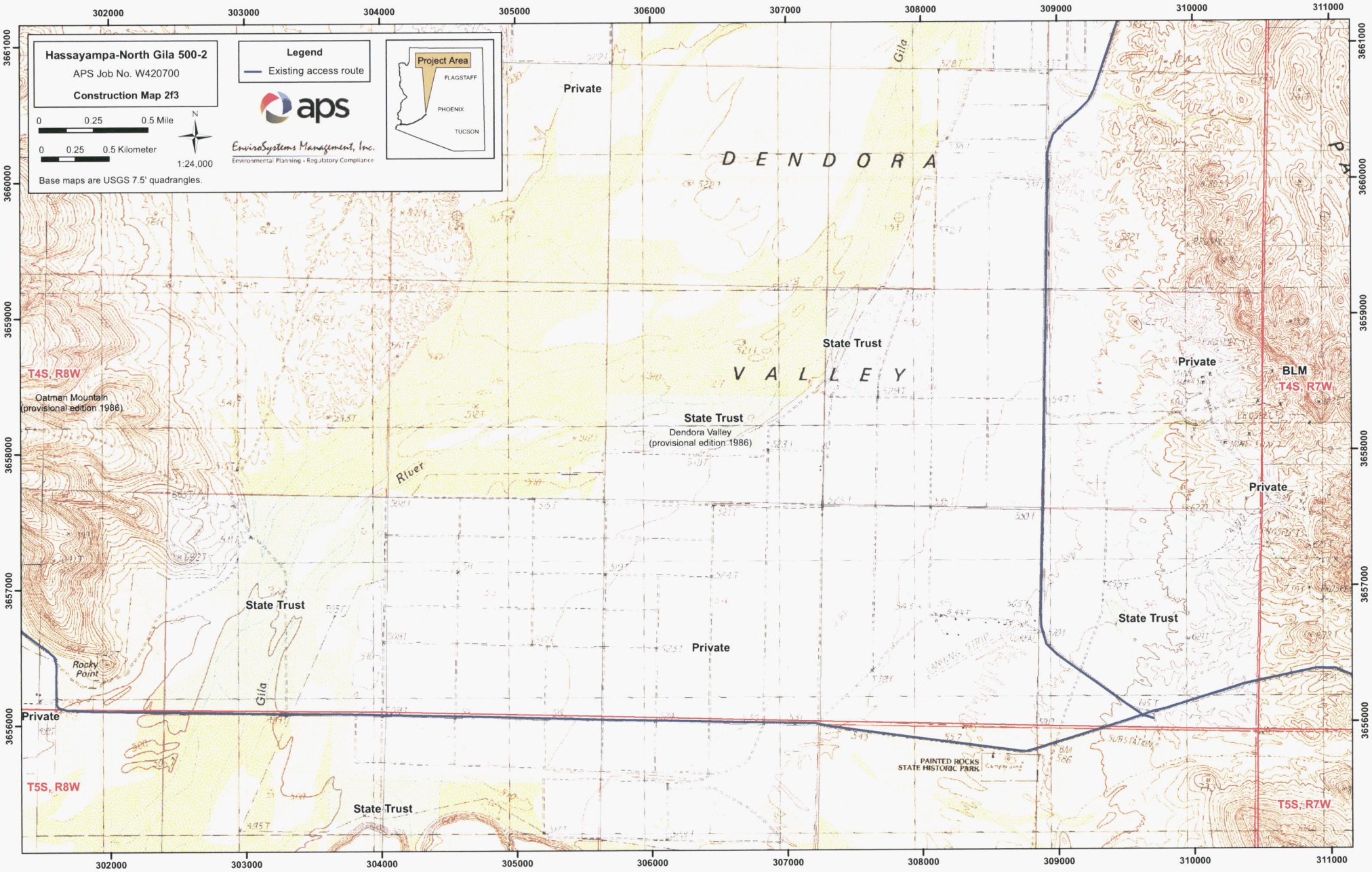
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2f3
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
Legend
Existing access route
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Project Area
FLAGSTAFF
PHOENIX
TUCSON
N
302000
303000
304000
305000
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310000
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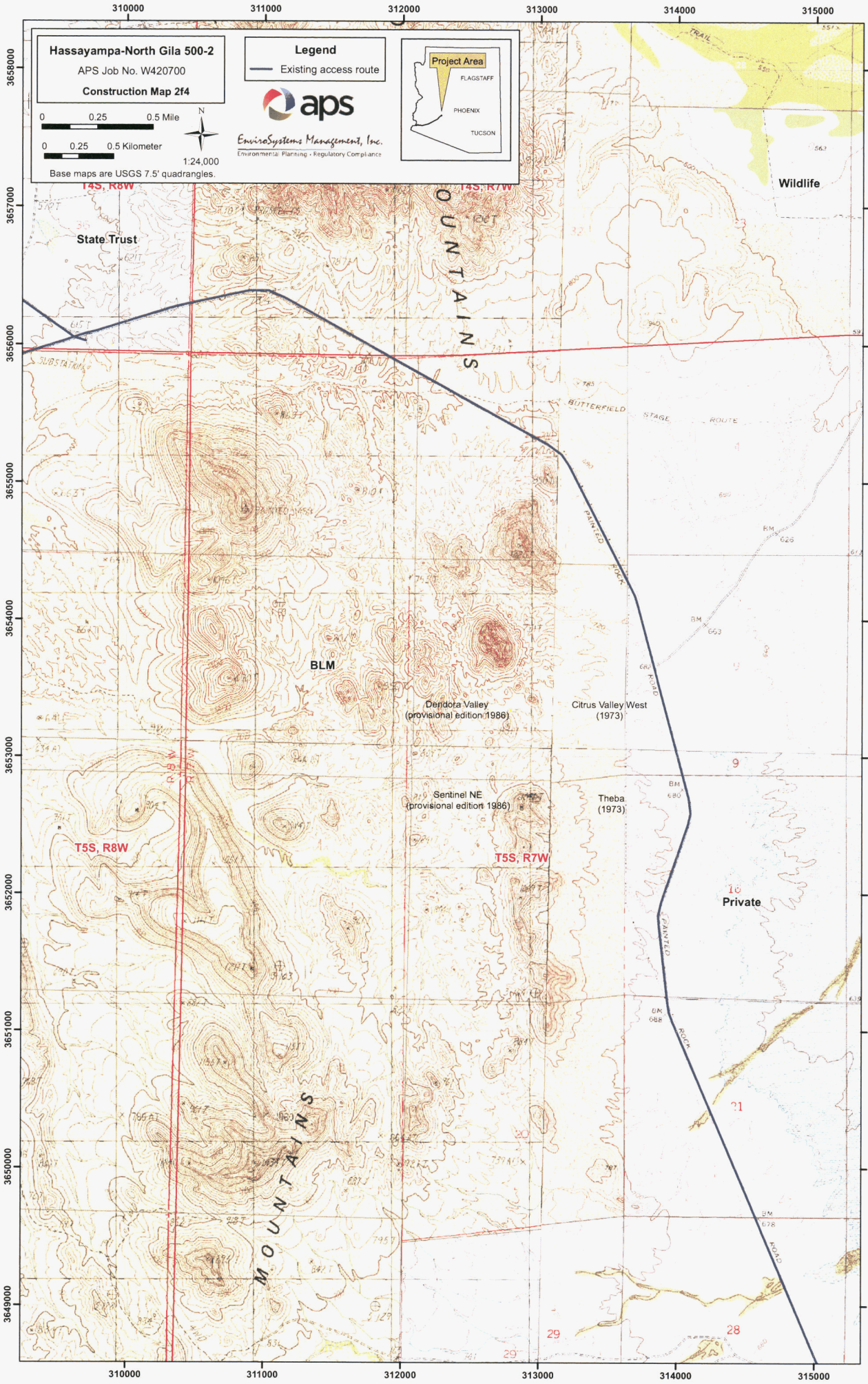
3660000
3659000
3658000
3657000
3656000
Private
D E N D O R A
V A L L E Y
State Trust
Dendora Valley
(provisional edition 1986)
Private
BLM
T4S, R7W
T4S, R8W
Oatman Mountain
(provisional edition 1986)
Gila
River
State Trust
Private
State Trust
Rocky Point
Private
PAINTED ROCKS
STATE HISTORIC PARK
SUBSTATION
T5S, R8W
State Trust
T5S, R7W


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2f4
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
N
Legend
Existing access route
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Project Area
FLAGSTAFF
PHOENIX
TUCSON
310000
311000
312000
313000
314000
315000
3658000
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3656000
3655000
3654000
3653000
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3651000
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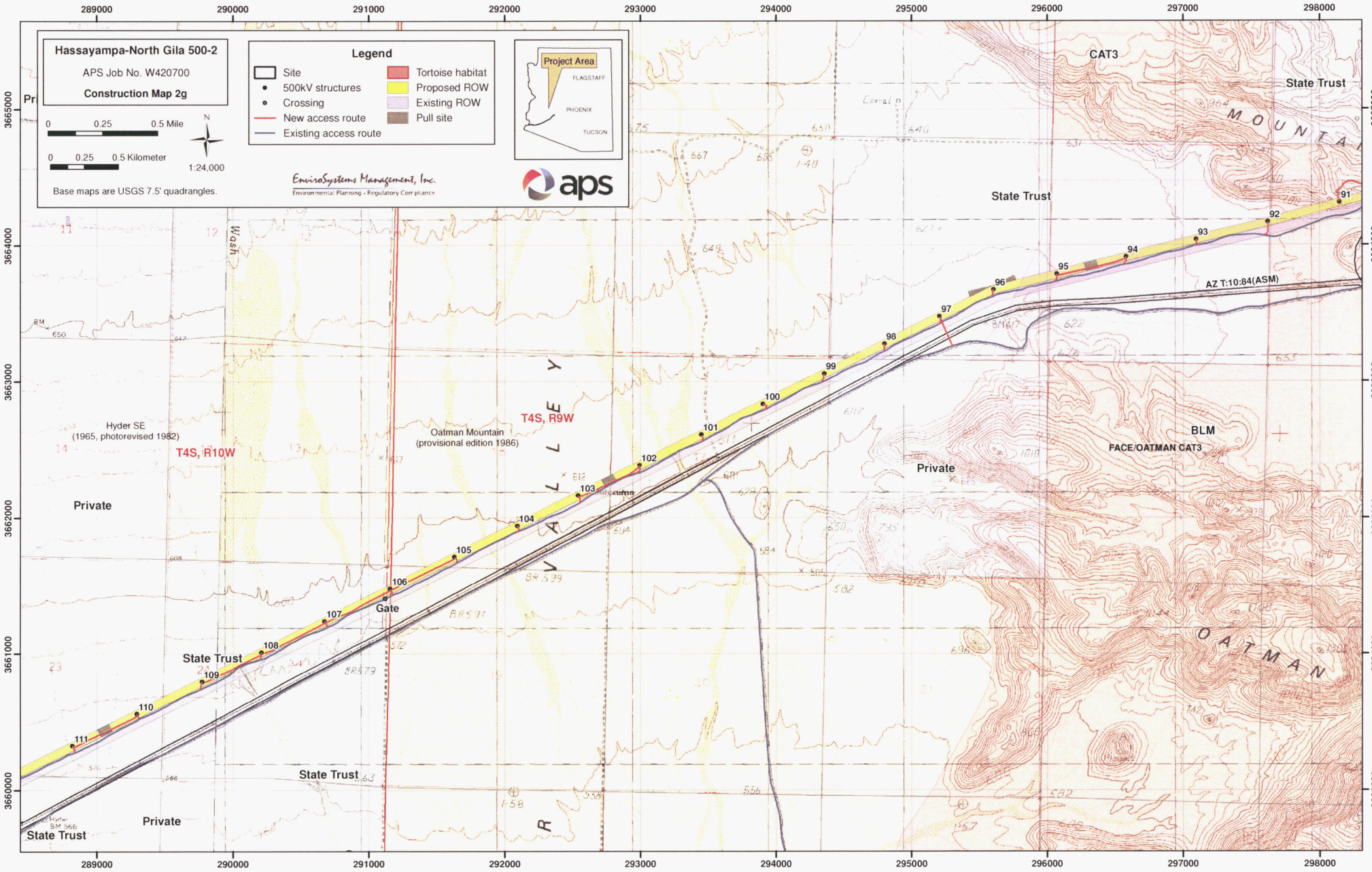
3649000
T4S, R8W
T4S, R7W
State Trust
Wildlife
BLM
Private
T5S, R8W
T5S, R7W
Dendora Valley
(provisional edition 1986)
Citrus Valley West
(1973)
Sentinel NE
(provisional edition 1986)
Theba
(1973)
MOUNTAINS
MOUNTAINS
BUTTERFIELD STAGE ROUTE
PAINTED ROCK ROAD
SUBSTATION
TRAIL
9
10
21
28
29
29


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2g
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
Legend
Site
500kV structures
Crossing
New access route
Existing access route
Tortoise habitat
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
289000
290000
291000
292000
293000
294000
295000
296000
297000
298000
3665000
3664000
3663000
3662000
3661000
3660000
CAT3
State Trust
State Trust
AZ T:10:84(ASM)
Hyder SE
(1965, photorevised 1982)
T4S, R10W
Oatman Mountain
(provisional edition 1986)
T4S, R9W
Private
Private
BLM
FACE/OATMAN CAT3
Gate
State Trust
State Trust
Private
State Trust
91
92
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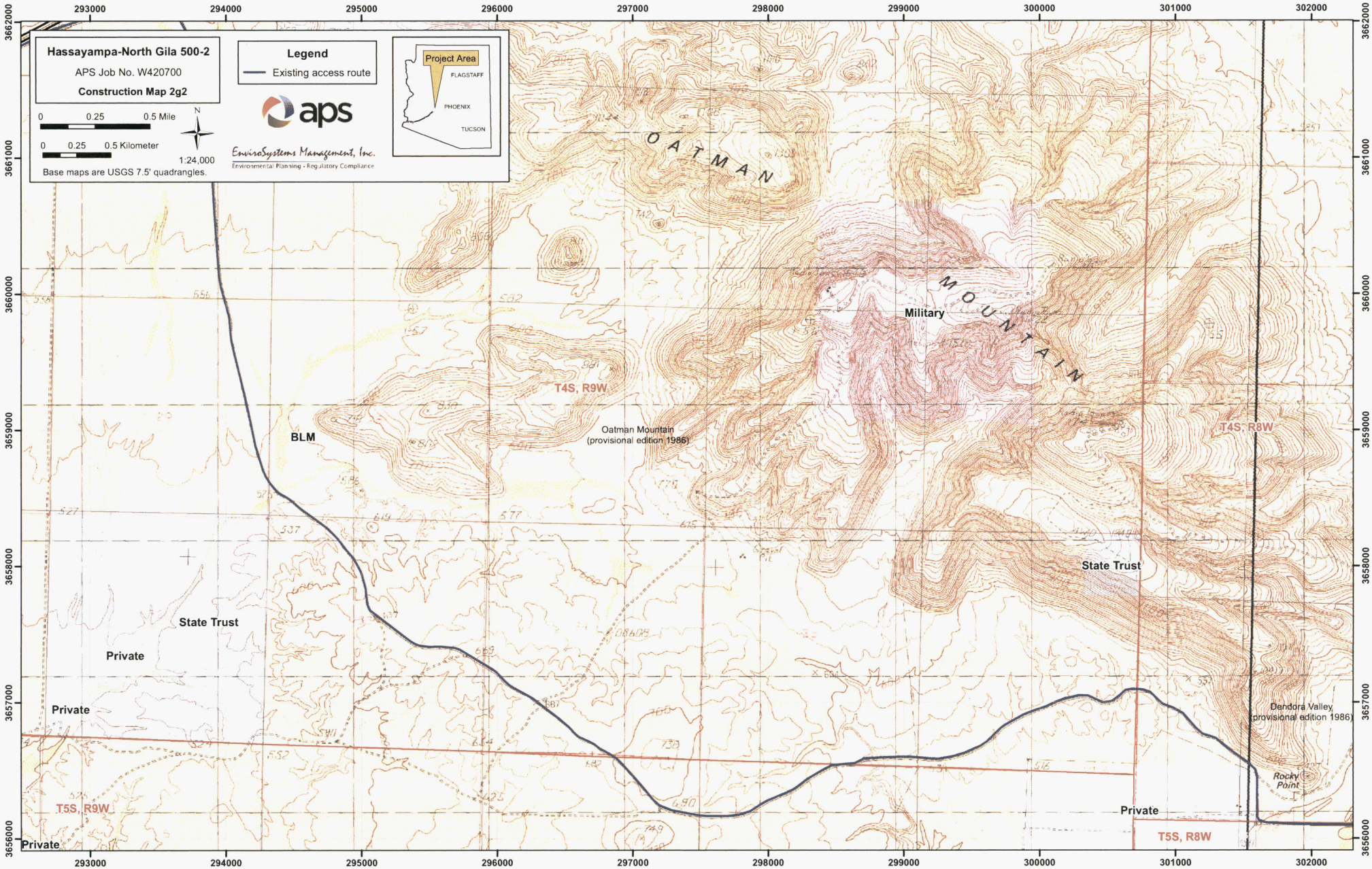
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2g2
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
N
Legend
Existing access route
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Project Area
FLAGSTAFF
PHOENIX
TUCSON
293000
294000
295000
296000
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298000
299000
300000
301000
302000
3662000
3661000
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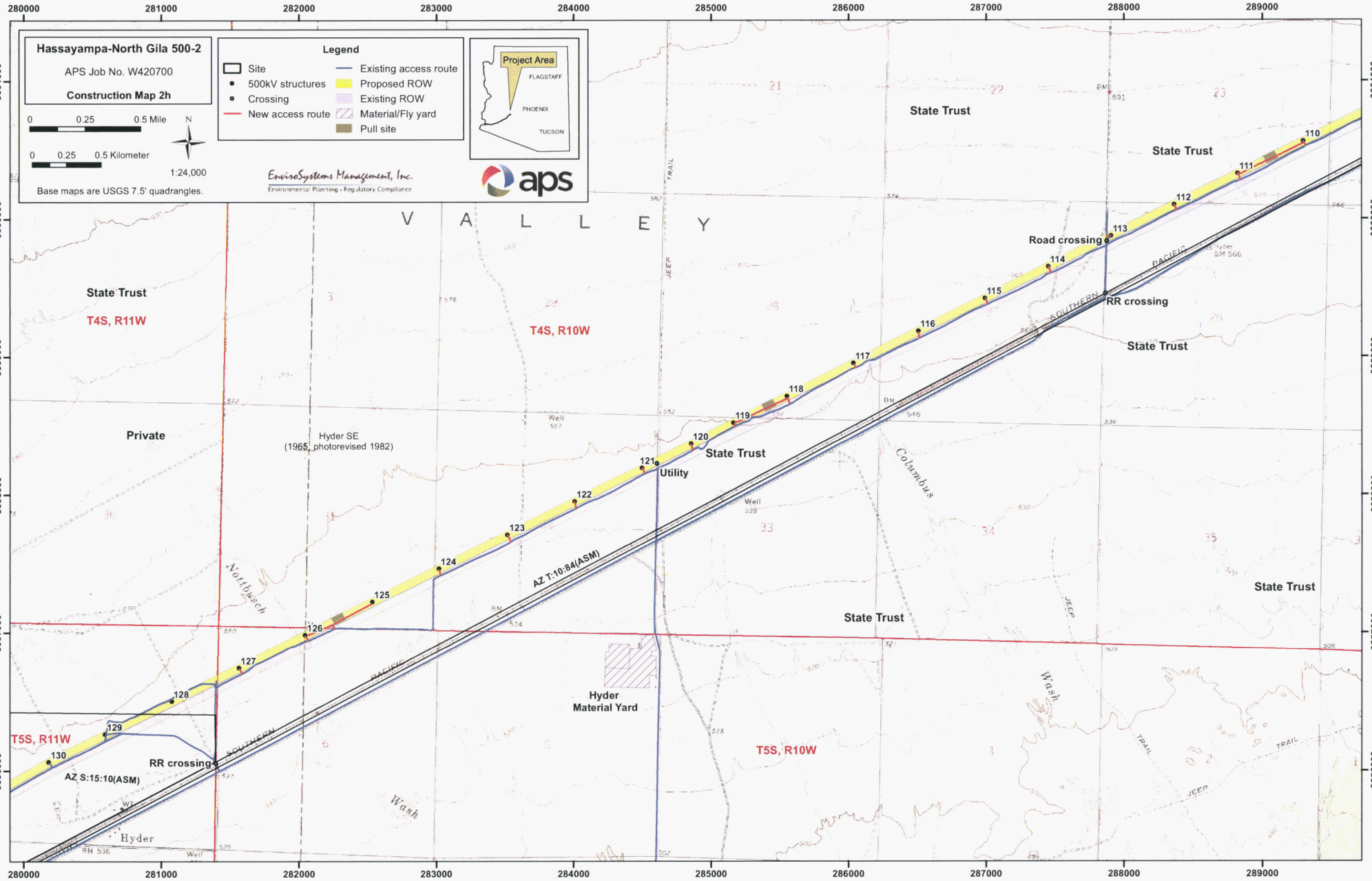
3658000
3657000
3656000
OATMAN
MOUNTAIN
Military
T4S, R9W
T4S, R8W
BLM
Oatman Mountain
(provisional edition 1986)
State Trust
Private
Dendora Valley
(provisional edition 1986)
Rocky Point
T5S, R9W
T5S, R8W


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2h
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
Crossing
New access route
Existing access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
V A L L E Y
State Trust
T4S, R11W
T4S, R10W
Private
Hyder SE
(1965, photorevised 1982)
Road crossing
RR crossing
Utility
Hyder
Material Yard
AZ T:10:84(ASM)
AZ S:15:10(ASM)
T5S, R11W
T5S, R10W
Hyder
Nottbusch
Wash
Columbus
Wash
PACIFIC
SOUTHERN
JEEP
TRAIL
110
111
112
113
114
115
116
117
118
119
120
121
122
123
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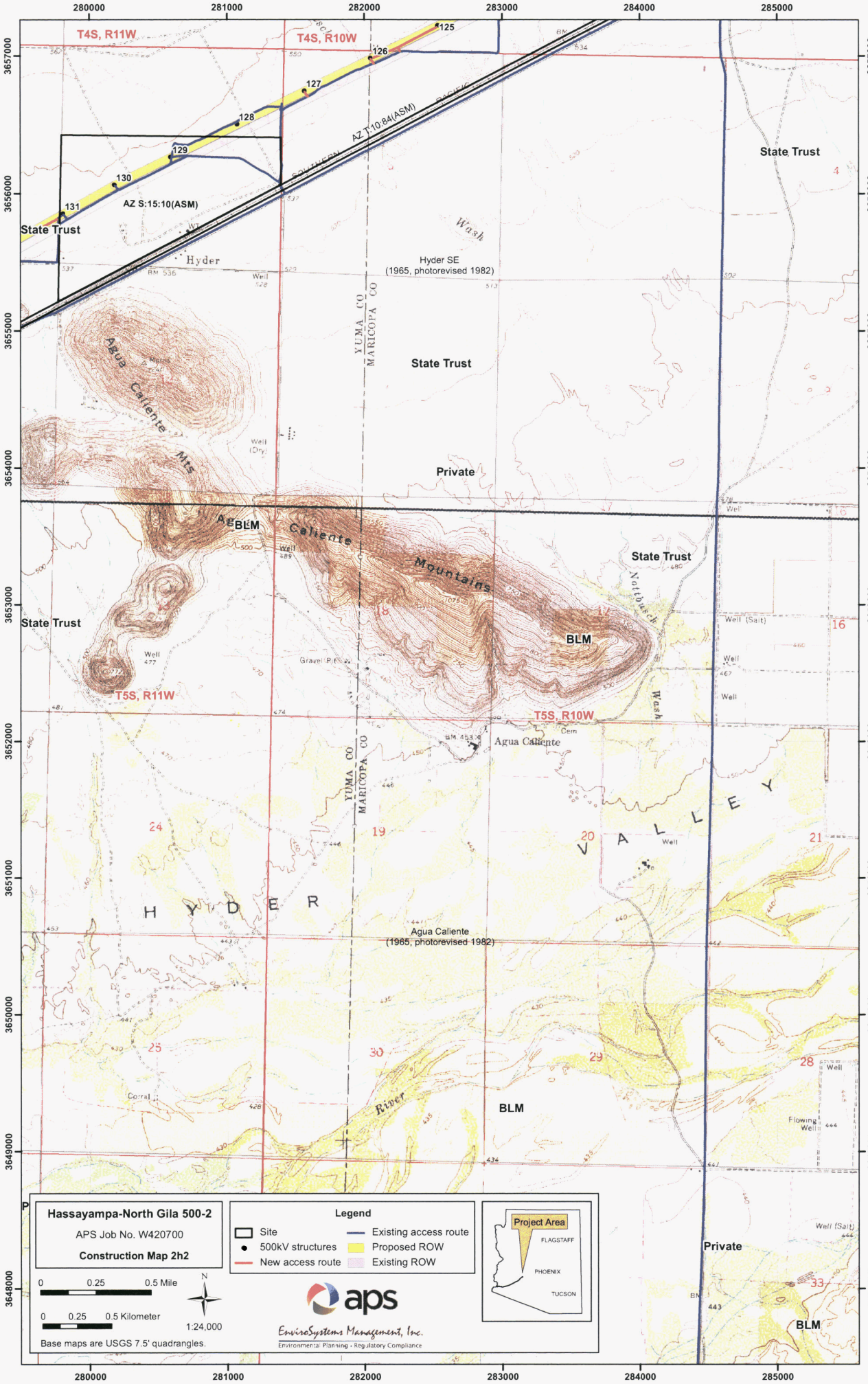
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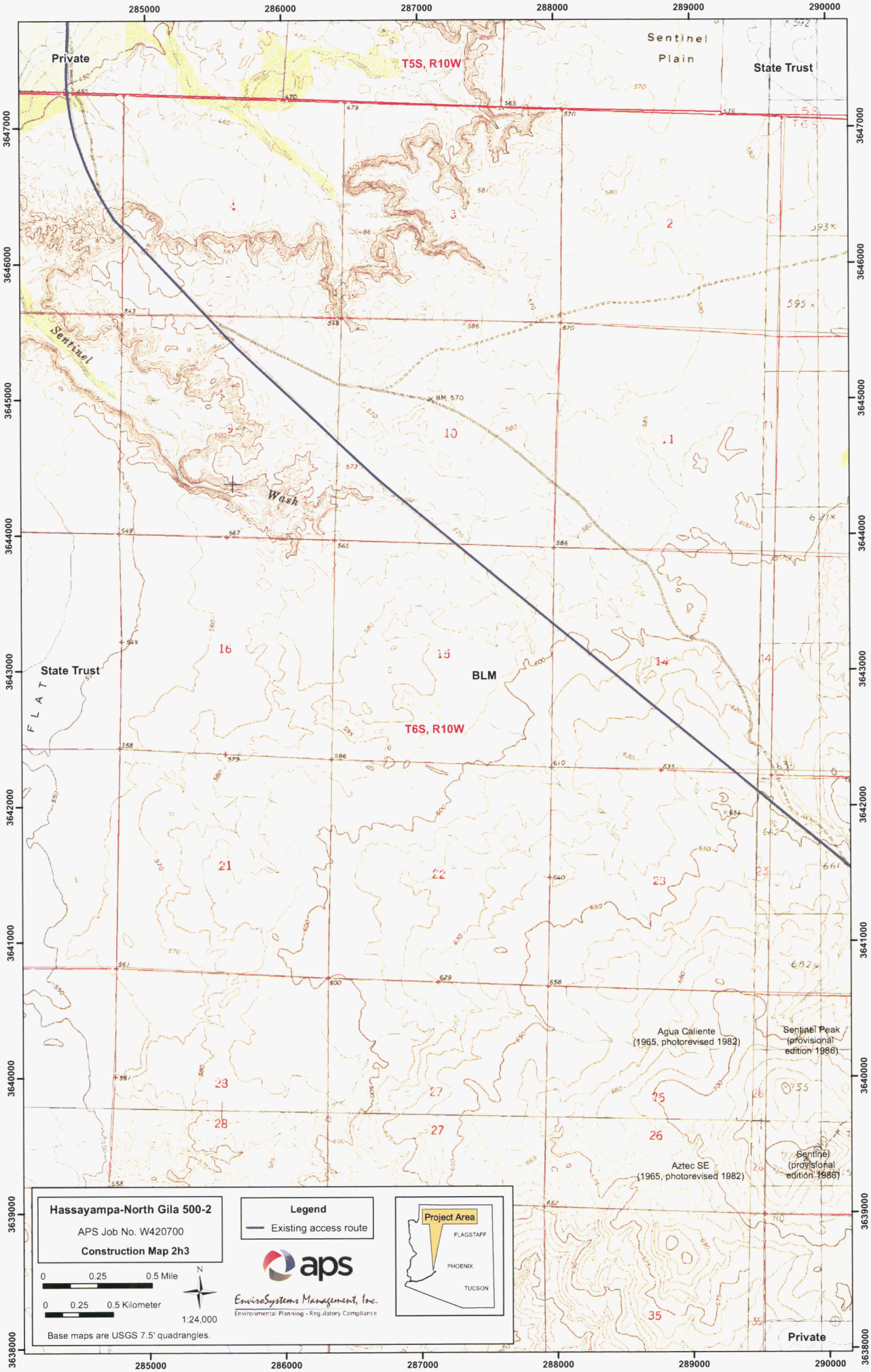
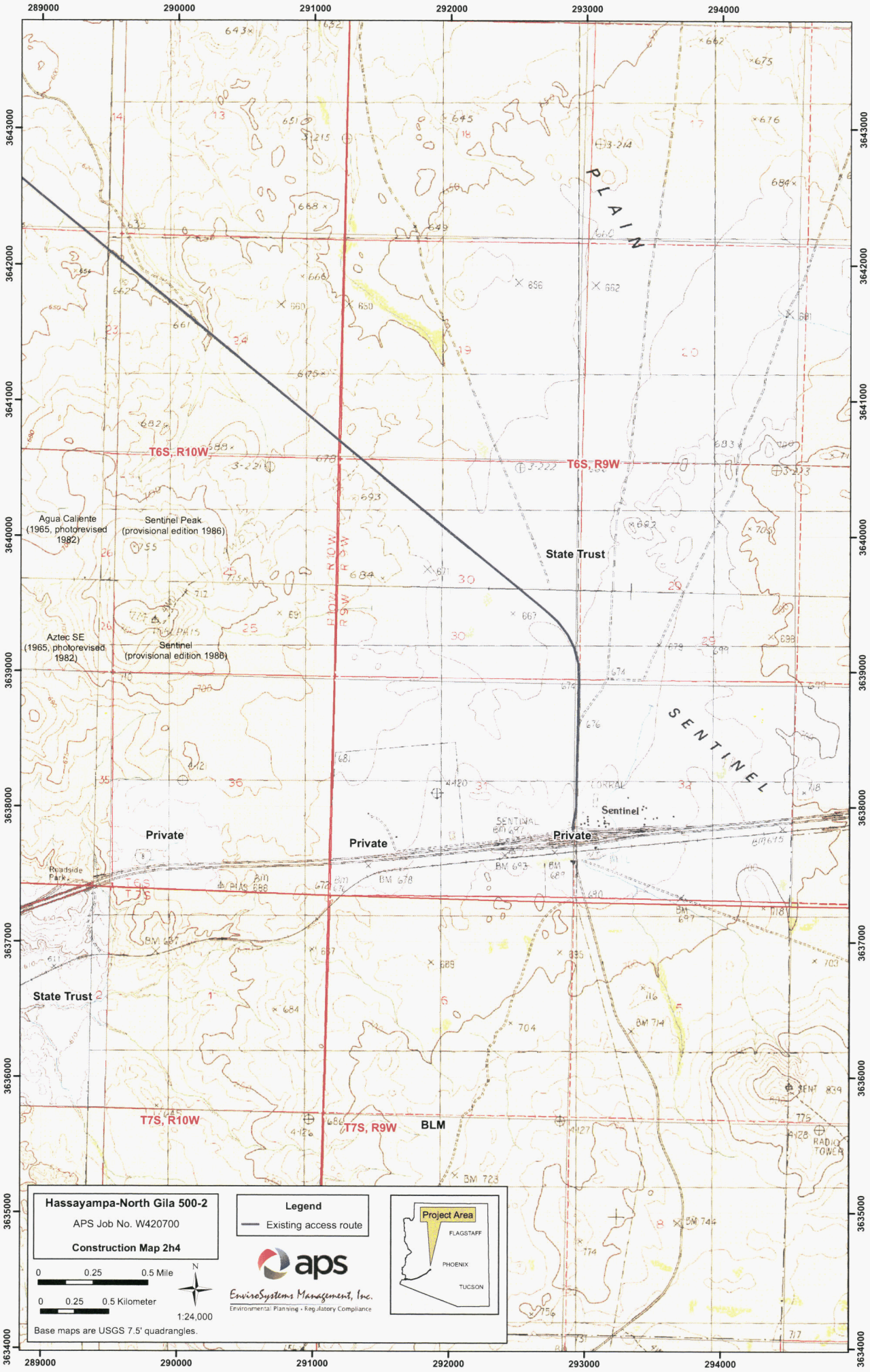
T4S, R11W
T4S, R10W
T5S, R11W
T5S, R10W
125
126
127
128
129
130
131
AZ T:10:84(ASM)
AZ S:15:10(ASM)
State Trust
Hyder
Hyder SE
(1965, photorevised 1982)
Wash
YUMA CO
MARICOPA CO
Agua Caliente Mts
Agua Caliente Mountains
BLM
Private
Notbach Wash
Agua Caliente
HYDER VALLEY
Agua Caliente
(1965, photorevised 1982)
River
Corral
Well
Well (Salt)
Flowing Well
Gravel Pit
Cem
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2h2
Legend
Site
500kV structures
New access route
Existing access route
Proposed ROW
Existing ROW
Project Area
FLAGSTAFF
PHOENIX
TUCSON
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance


Private
T5S, R10W
Sentinel
Plain
State Trust
Sentinel
Wash
BM 570
State Trust
FLAT
BLM
T6S, R10W
Agua Caliente
(1965, photorevised 1982)
Sentinel Peak
(provisional
edition 1986)
Aztec SE
(1965, photorevised 1982)
Sentinel
(provisional
edition 1986)
Private
285000
286000
287000
288000
289000
290000
3647000
3646000
3645000
3644000
3643000
3642000
3641000
3640000
3639000
3638000
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2h3
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
Legend
Existing access route
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Project Area
FLAGSTAFF
PHOENIX
TUCSON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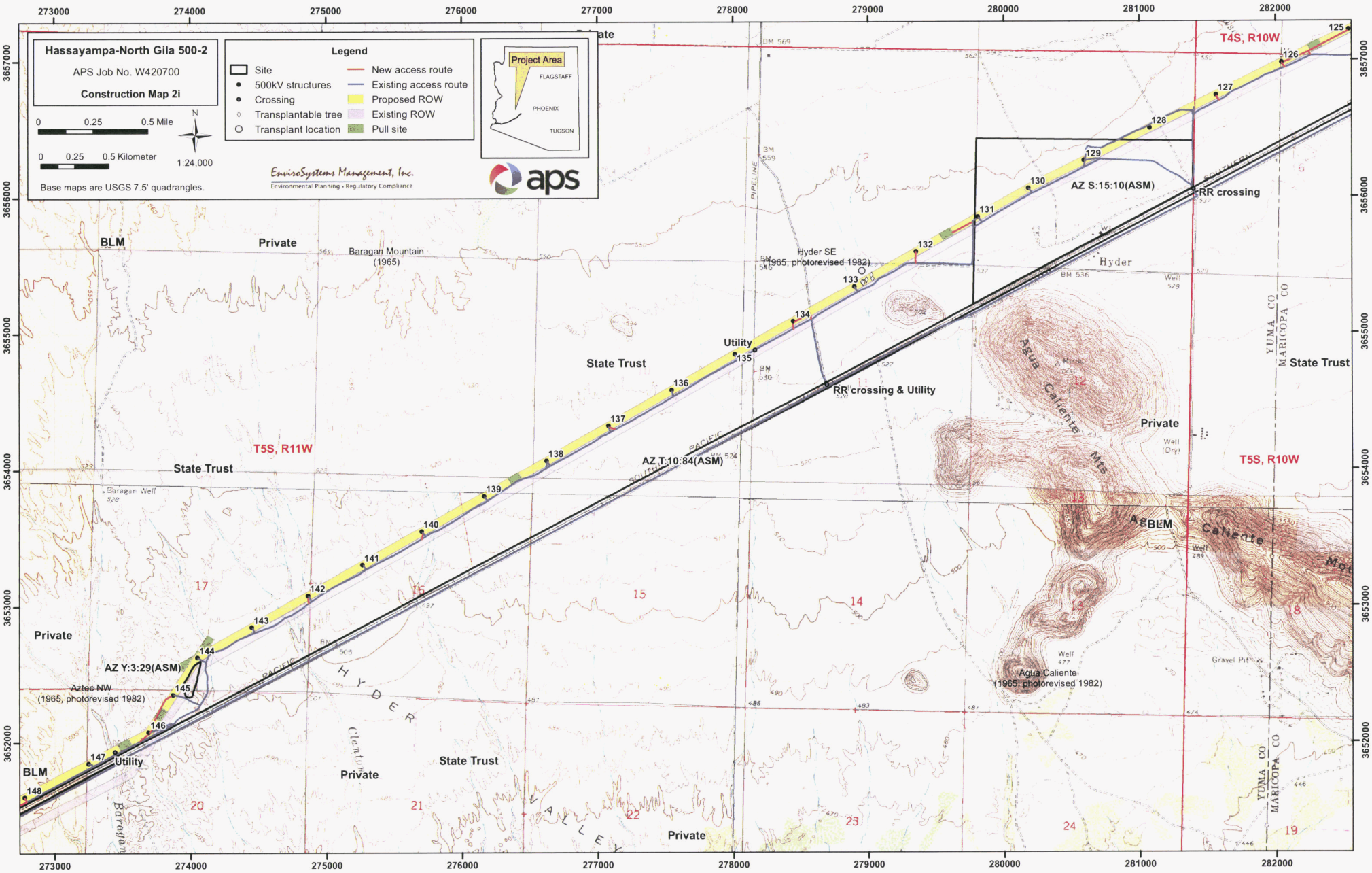
291000
292000
293000
294000
3643000
3642000
3641000
3640000
3639000
3638000
3637000
3636000
3635000
3634000
PLAIN
SENTINEL
T6S, R10W
T6S, R9W
T7S, R10W
T7S, R9W
Agua Caliente
(1965, photorevised
1982)
Sentinel Peak
(provisional edition 1986)
Aztec SE
(1965, photorevised
1982)
Sentinel
(provisional edition 1988)
State Trust
Private
Private
Private
Sentinel
State Trust
BLM
Roadside
Park
RADIO
TOWER
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2h4
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
Legend
Existing access route
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Project Area
FLAGSTAFF
PHOENIX
TUCSON


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2i
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
Legend
Site
500kV structures
Crossing
Transplantable tree
Transplant location
New access route
Existing access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
T4S, R10W
T5S, R11W
T5S, R10W
AZ S:15:10(ASM)
AZ T:10:84(ASM)
AZ Y:3:29(ASM)
RR crossing
RR crossing & Utility
Utility
Hyder
Hyder SE
(1965, photorevised 1982)
Baragan Mountain
(1965)
Aztec NW
(1965, photorevised 1982)
Agua Caliente
(1965, photorevised 1982)
Agua Caliente Mts
BLM
Private
State Trust
YUMA CO
MARICOPA CO
HYDER VALLEY
Baragan
Clanton
PIPELINE
SOUTHERN PACIFIC
Gravel Pit
Baragan Well
Well (Dry)
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
273000
274000
275000
276000
277000
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279000
280000
281000
282000
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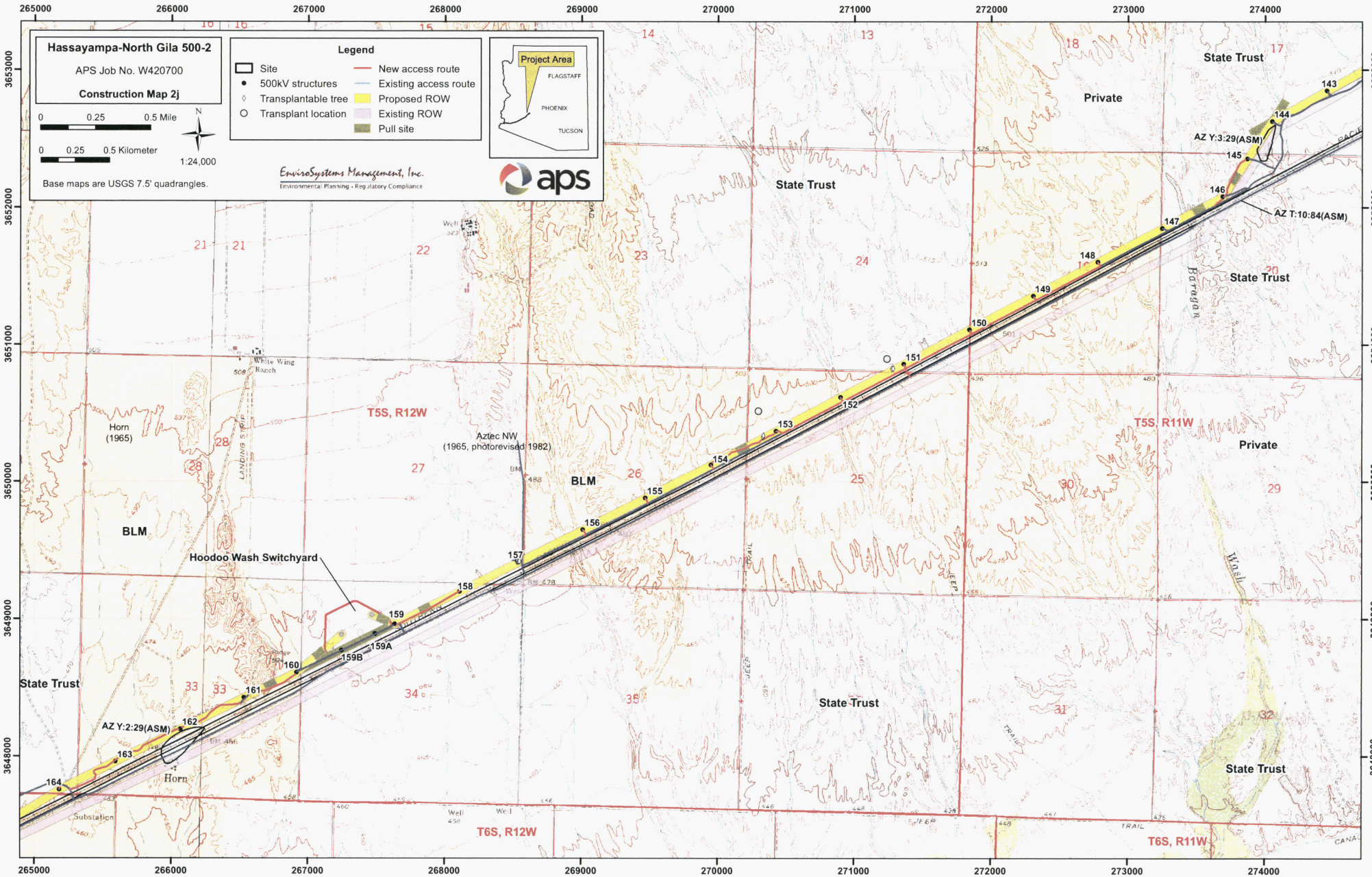
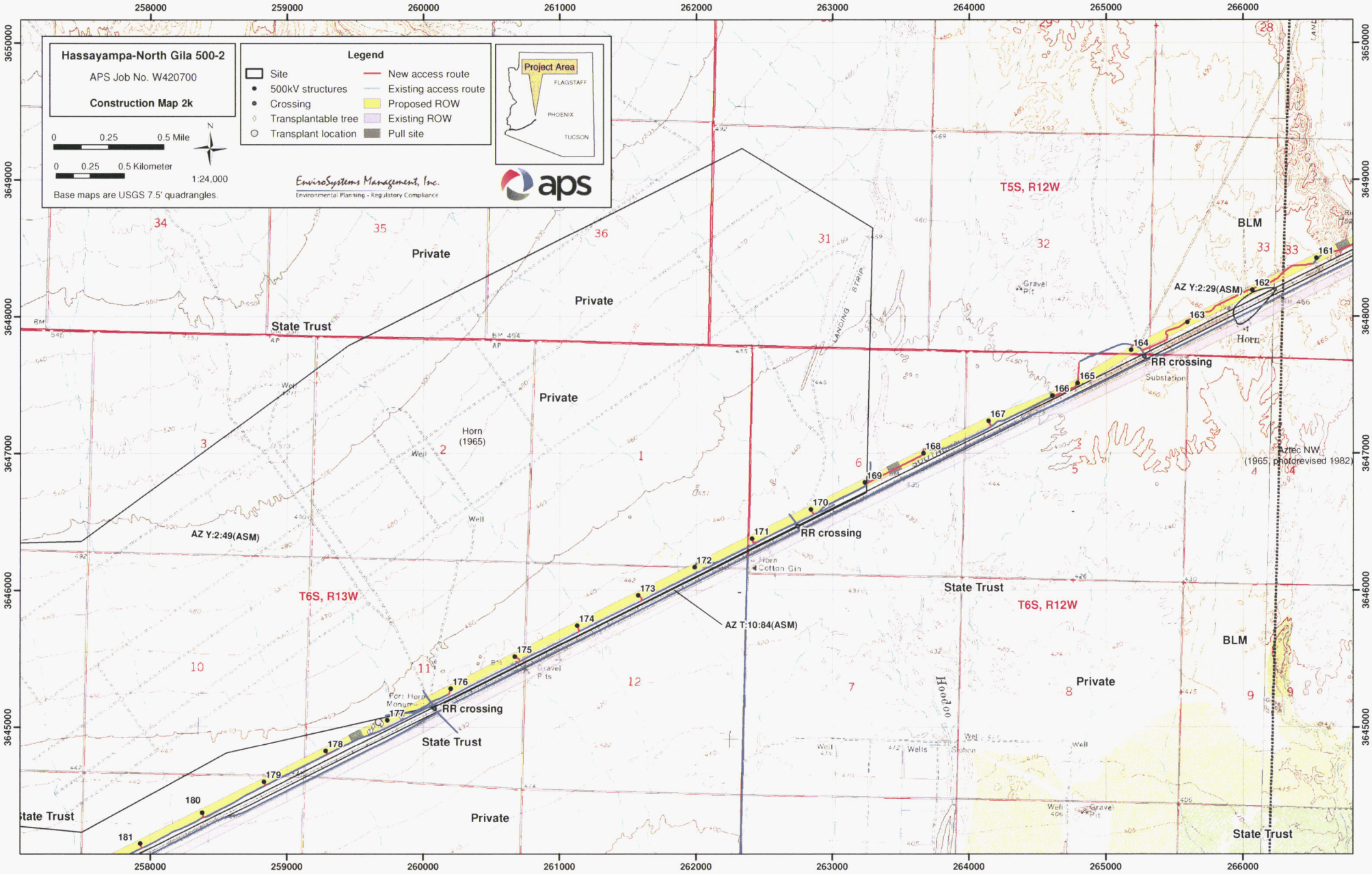
3656000
3655000
3654000
3653000
3652000


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2j
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
Transplantable tree
Transplant location
New access route
Existing access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
265000
266000
267000
268000
269000
270000
271000
272000
273000
274000
3653000
3652000
3651000
3650000
3649000
3648000
State Trust
Private
BLM
T5S, R12W
T5S, R11W
T6S, R12W
T6S, R11W
Hoodoo Wash Switchyard
Aztec NW
(1965, photorevised 1982)
Horn
(1965)
White Wing
Ranch
Horn
Substation
Barragan
Wash
AZ Y:3:29(ASM)
AZ T:10:84(ASM)
AZ Y:2:29(ASM)
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
159A
159B
160
161
162
163
164


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2k
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
Legend
Site
500kV structures
Crossing
Transplantable tree
Transplant location
New access route
Existing access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
258000
259000
260000
261000
262000
263000
264000
265000
266000
3650000
3649000
3648000
3647000
3646000
3645000
T5S, R12W
T6S, R13W
T6S, R12W
Private
State Trust
BLM
AZ Y:2:29(ASM)
AZ Y:2:49(ASM)
AZ T:10:84(ASM)
RR crossing
Horn (1965)
Aztec NW (1965, photorevised 1982)
Substation
Gravel Pit
Cotton Gin
Hoodoo
Wells
161
162
163
164
165
166
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168
169
170
171
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173
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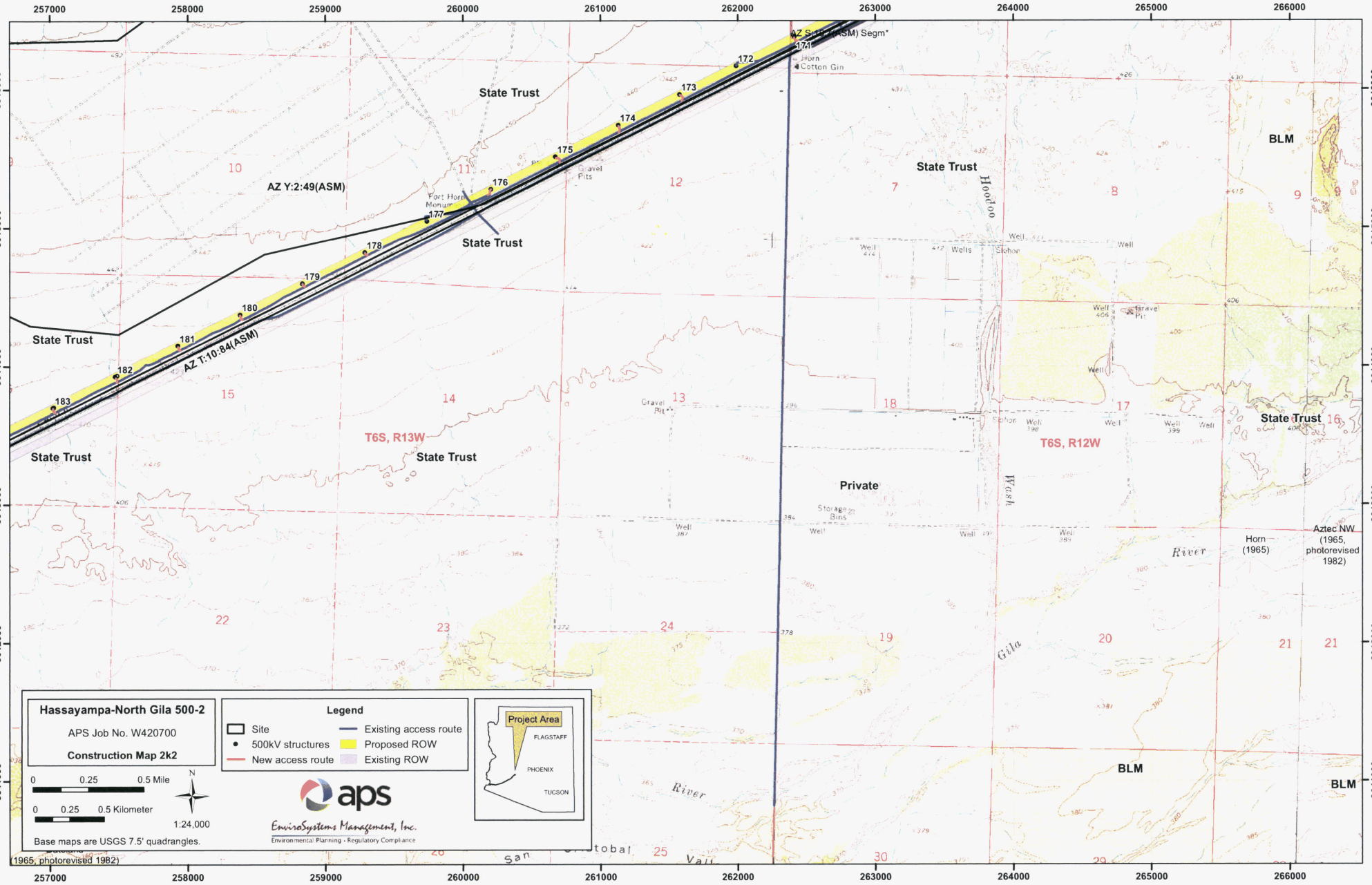
181


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2k2
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
(1965, photorevised 1982)
Legend
Site
500kV structures
New access route
Existing access route
Proposed ROW
Existing ROW
aps
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
Project Area
FLAGSTAFF
PHOENIX
TUCSON
AZ Y:2:49(ASM)
AZ T:10:84(ASM)
State Trust
Private
BLM
T6S, R13W
T6S, R12W
Hoodoo
Wash
Gila
River
Horn
(1965)
Aztec NW
(1965, photorevised 1982)
Cotton Gin
Gravel Pits
Fort Horn Monument
Storage Bins
Wells
Station
Well
Gravel Pit
San Cristobal Valley
171
172
173
174
175
176
177
178
179
180
181
182
183
257000
258000
259000
260000
261000
262000
263000
264000
265000
266000
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3645000
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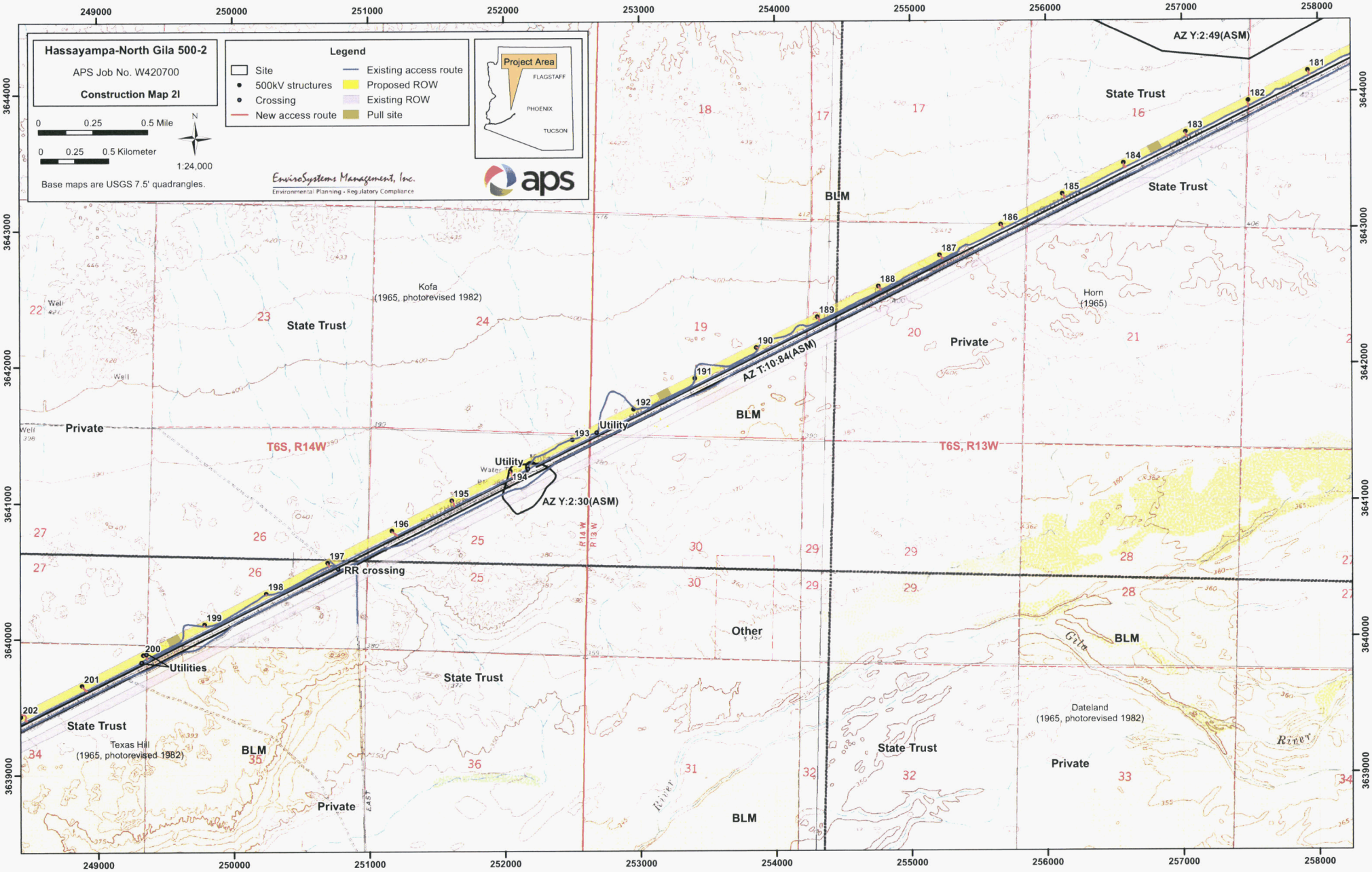
3643000
3642000
3641000


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2I
Legend
Site
500kV structures
Crossing
New access route
Existing access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
249000
250000
251000
252000
253000
254000
255000
256000
257000
258000
3644000
3643000
3642000
3641000
3640000
3639000
AZ Y:2:49(ASM)
AZ T:10:84(ASM)
AZ Y:2:30(ASM)
State Trust
BLM
Private
Other
Kofa
(1965, photorevised 1982)
Horn
(1965)
Dateland
(1965, photorevised 1982)
Texas Hill
(1965, photorevised 1982)
T6S, R14W
T6S, R13W
R 14 W
R 13 W
EAST
Utility
Utilities
RR crossing
Water
Well
Gila
River
181
182
183
184
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186
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195
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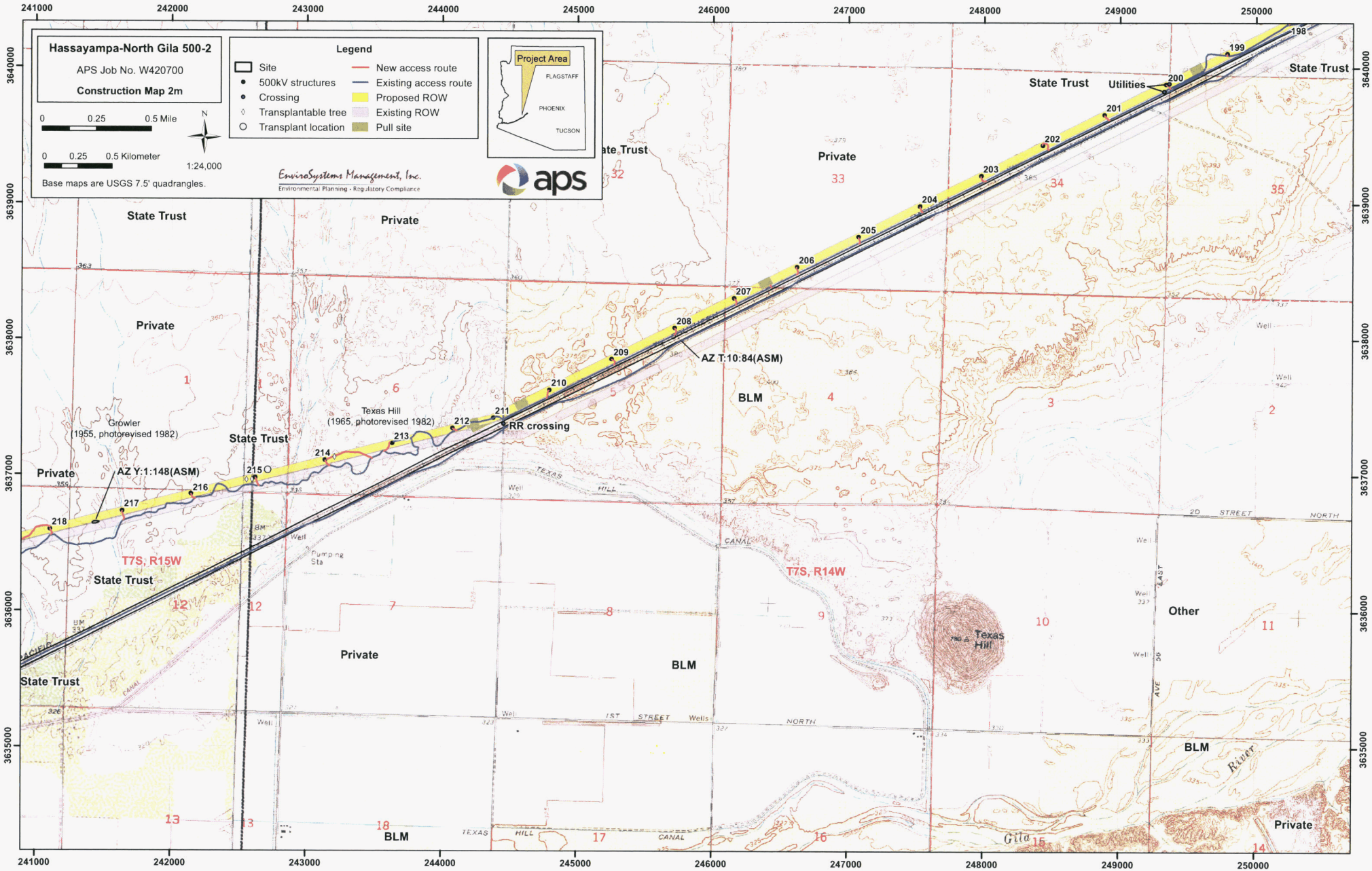
201
202


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2m
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
Crossing
Transplantable tree
Transplant location
New access route
Existing access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
State Trust
Private
BLM
Other
Utilities
AZ T:10:84(ASM)
AZ Y:1:148(ASM)
RR crossing
Texas Hill
(1965, photorevised 1982)
Growler
(1955, photorevised 1982)
T7S, R15W
T7S, R14W
Texas Hill
Gila River
TEXAS HILL CANAL
1ST STREET NORTH
2D STREET NORTH
Pumping Sta
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
241000
242000
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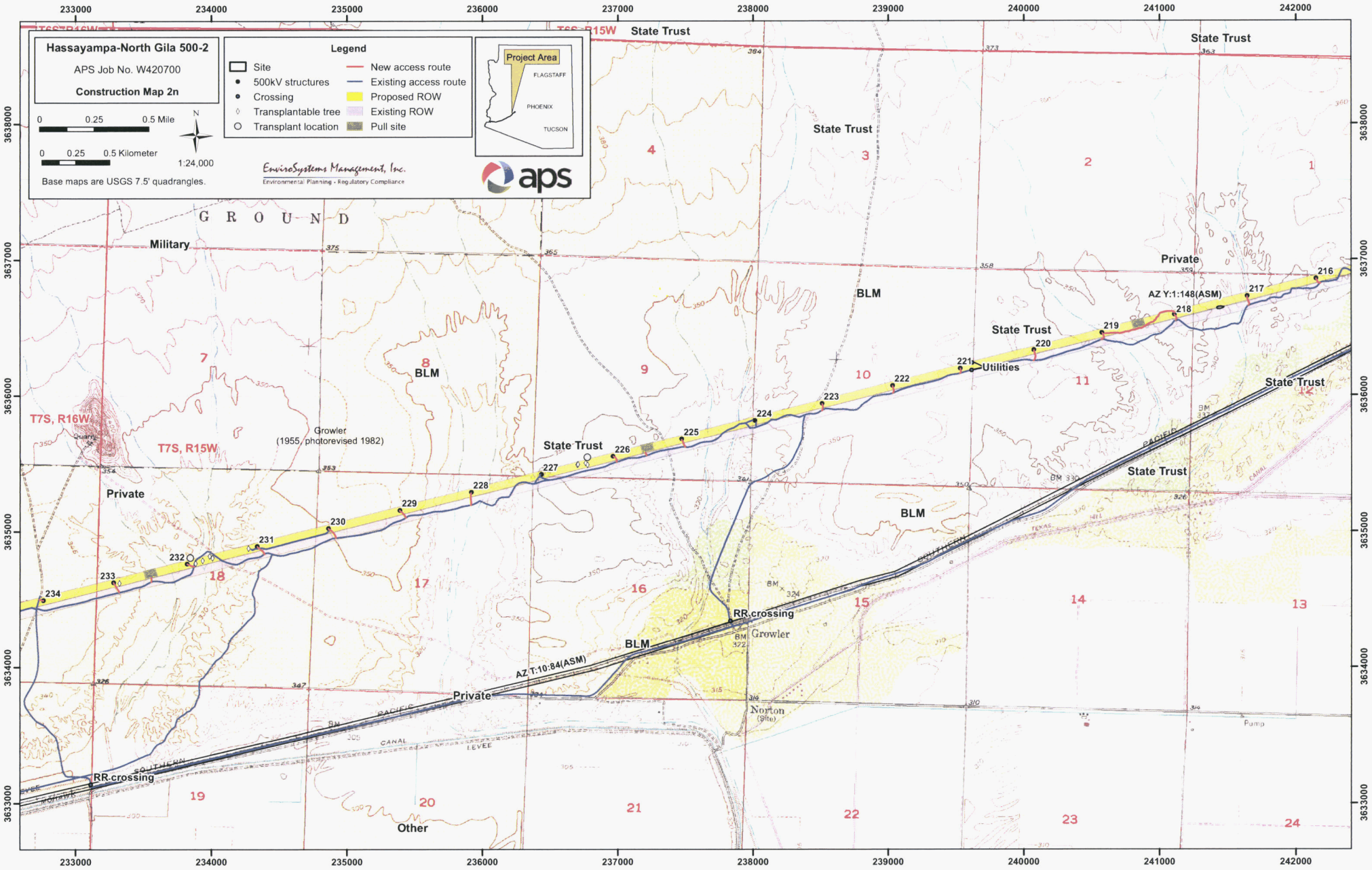
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2n
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning - Regulatory Compliance
aps
Legend
Site
500kV structures
Crossing
Transplantable tree
Transplant location
New access route
Existing access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
N
233000
234000
235000
236000
237000
238000
239000
240000
241000
242000
3638000
3637000
3636000
3635000
3634000
3633000
T6S, R16W
T6S, R15W
T7S, R16W
T7S, R15W
State Trust
Military
Private
BLM
Other
Utilities
Growler
(1955, photorevised 1982)
RR crossing
AZ T:10:84(ASM)
AZ Y:1:148(ASM)
Norton
(Site)
Quarry
Pump
SOUTHERN PACIFIC
CANAL
LEVEE
TEXAS HILL
GROUND
1
2
3
4
7
8
9
10
11
12
13
14
15
16
17
18
19
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21
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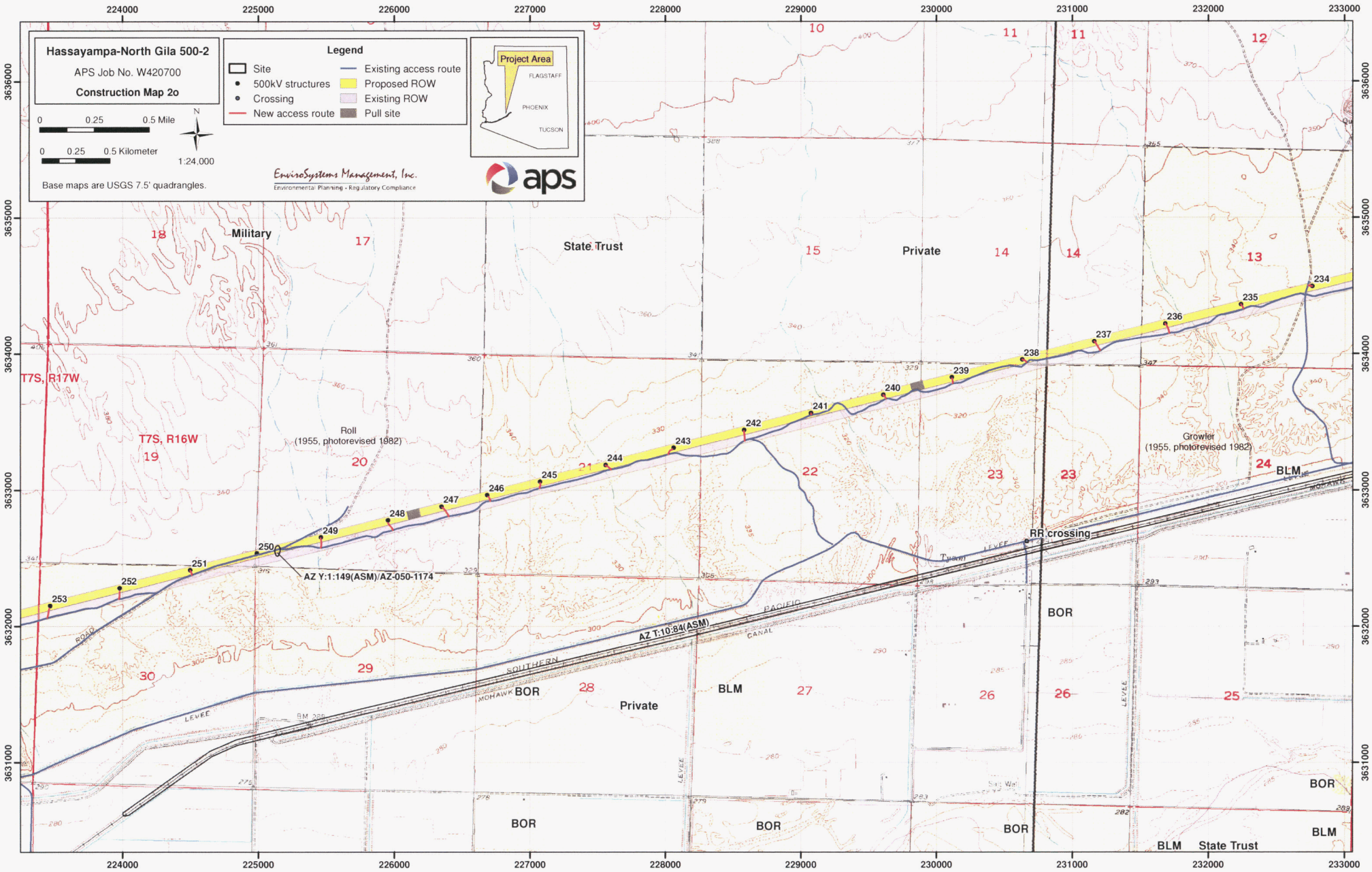
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2o
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
Crossing
New access route
Existing access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
224000
225000
226000
227000
228000
229000
230000
231000
232000
233000
3636000
3635000
3634000
3633000
3632000
3631000
Military
State Trust
Private
T7S, R17W
T7S, R16W
Roll
(1955, photorevised 1982)
Growler
(1955, photorevised 1982)
BLM
BOR
RR crossing
AZ Y:1:149(ASM)/AZ-050-1174
AZ T:10:84(ASM)
SOUTHERN
PACIFIC
MOHAWK
CANAL
LEVEE
ROAD
Tyrum
Site Well
253
252
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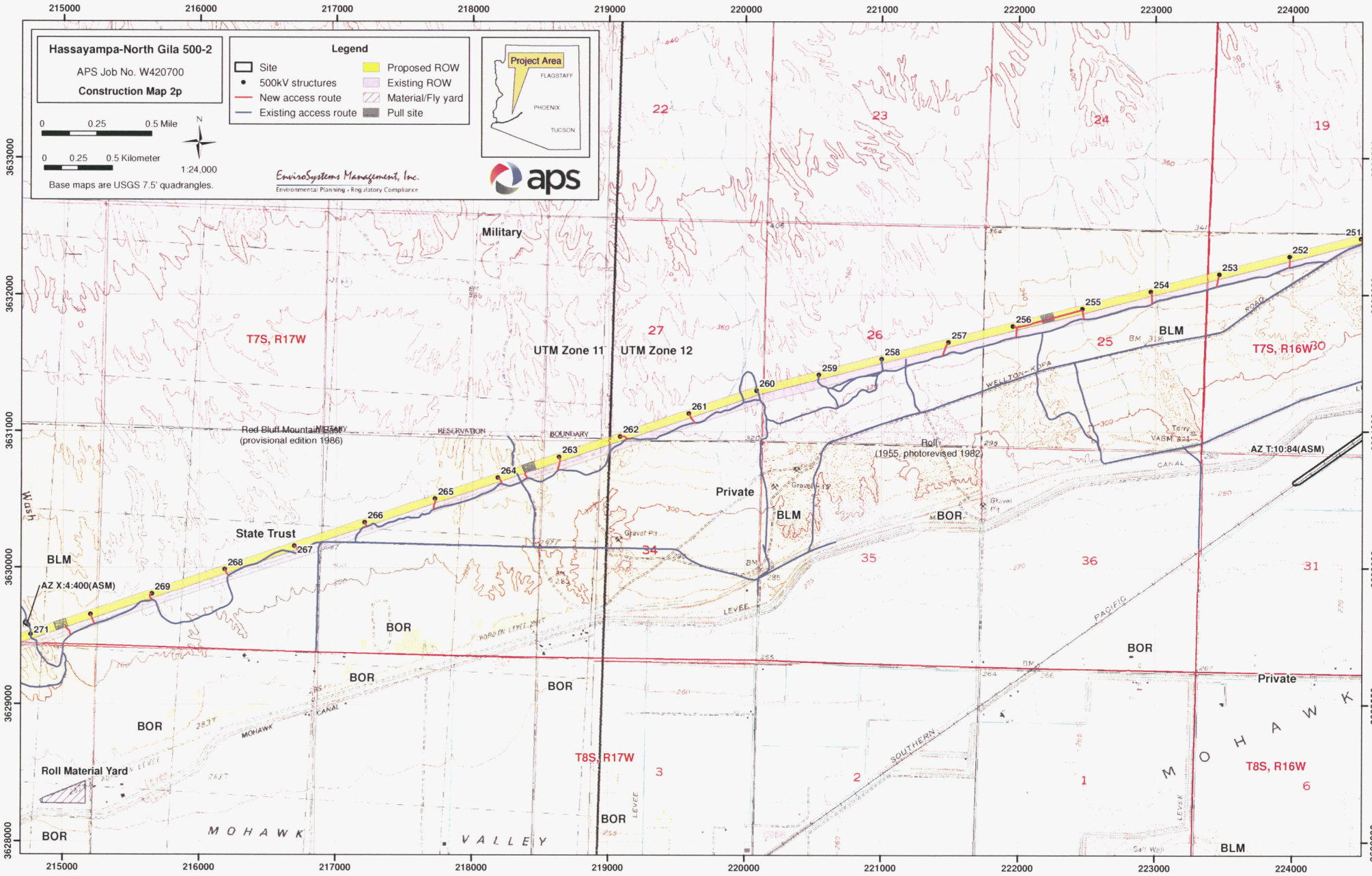
234


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2p
Legend
Site
500kV structures
New access route
Existing access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Military
T7S, R17W
UTM Zone 11
UTM Zone 12
T7S, R16W
Red Bluff Mountain
(provisional edition 1986)
Roll
(1955, photorevised 1982)
AZ T:10:84(ASM)
AZ X:4:400(ASM)
State Trust
Private
BLM
BOR
T8S, R17W
T8S, R16W
Roll Material Yard
MOHAWK VALLEY
MOHAWK CANAL
SOUTHERN PACIFIC
WELLTON-KOFA ROAD
LEVEE
RESERVATION BOUNDARY
Gravel Pit
Salt Well
Tank
VABM 324
BM 318
251
252
253
254
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257
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259
260
261
262
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265
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215000
216000
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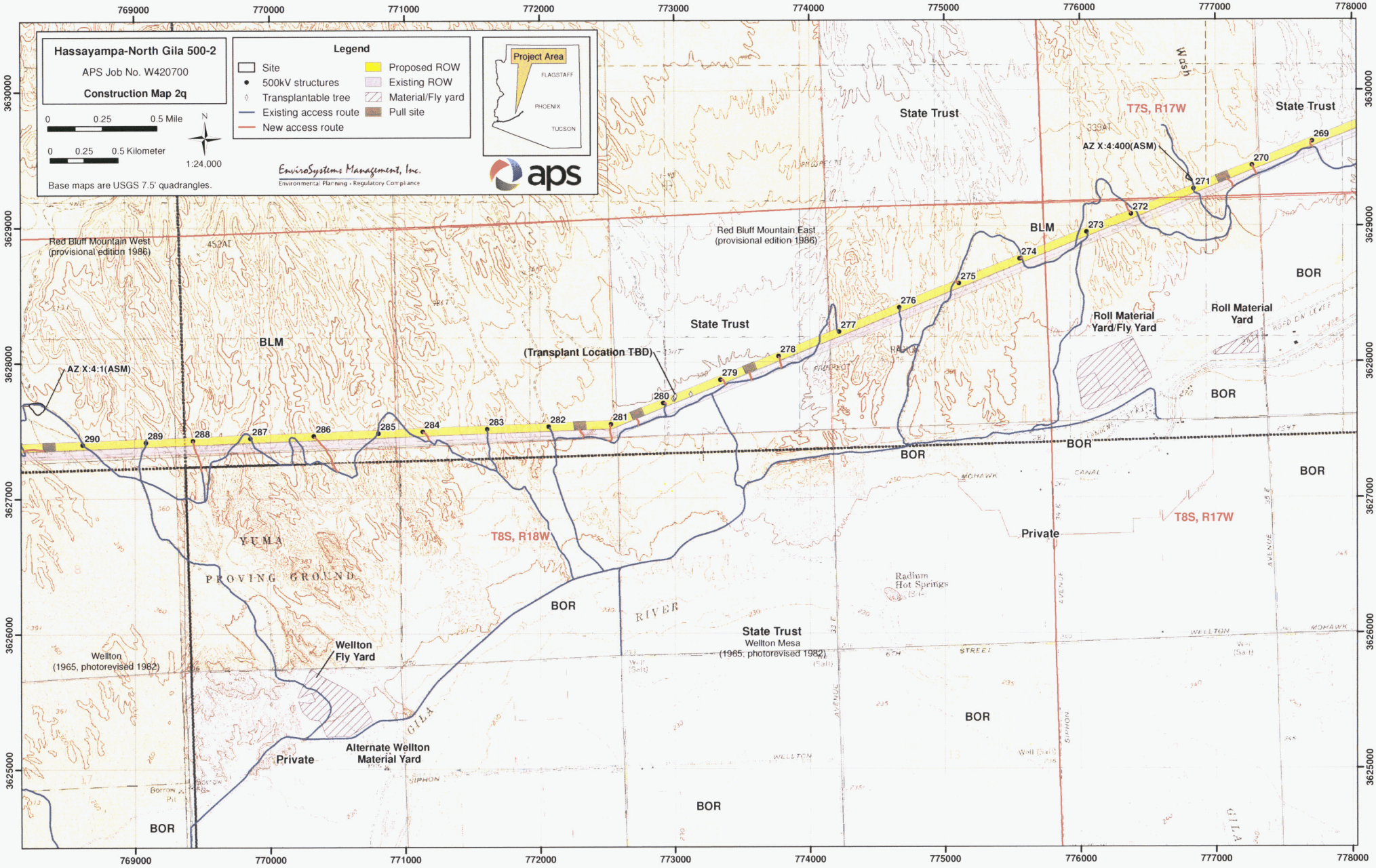
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2q
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
Transplantable tree
Existing access route
New access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
769000
770000
771000
772000
773000
774000
775000
776000
777000
778000
3630000
3629000
3628000
3627000
3626000
3625000
Red Bluff Mountain West
(provisional edition 1986)
Red Bluff Mountain East
(provisional edition 1986)
State Trust
BLM
BOR
Private
T7S, R17W
T8S, R17W
T8S, R18W
AZ X:4:400(ASM)
AZ X:4:1(ASM)
(Transplant Location TBD)
Roll Material Yard/Fly Yard
Roll Material Yard
Wellton Fly Yard
Alternate Wellton Material Yard
Wellton
(1965, photorevised 1982)
Wellton Mesa
(1965, photorevised 1982)
YUMA
PROVING GROUND
GILA
RIVER
Radium Hot Springs
MOHAWK
CANAL
WELLTON
STREET
AVENUE
SIPHON
Wash
269
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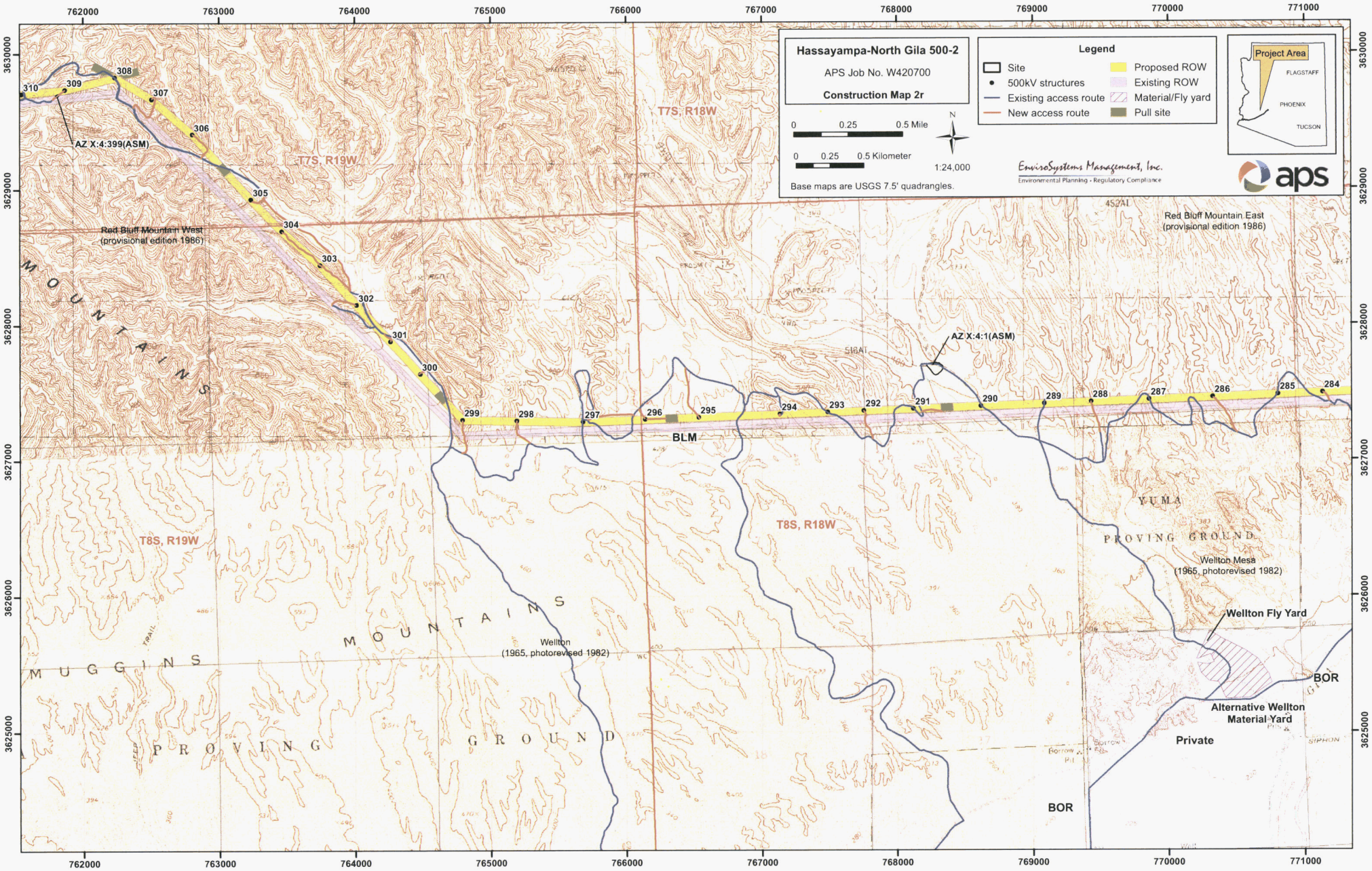
290


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2r
Legend
Site
500kV structures
Existing access route
New access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
762000
763000
764000
765000
766000
767000
768000
769000
770000
771000
3630000
3629000
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3625000
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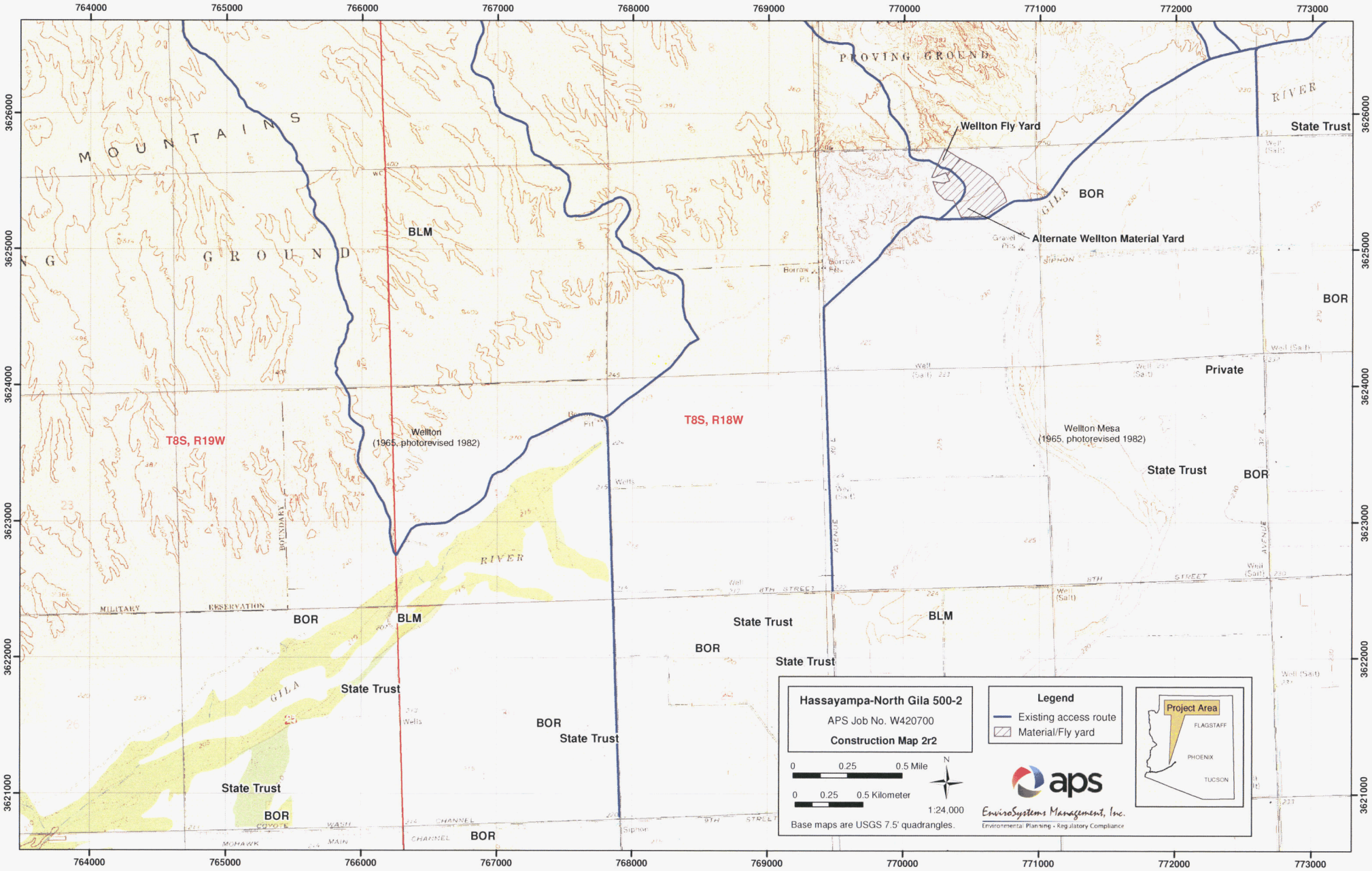
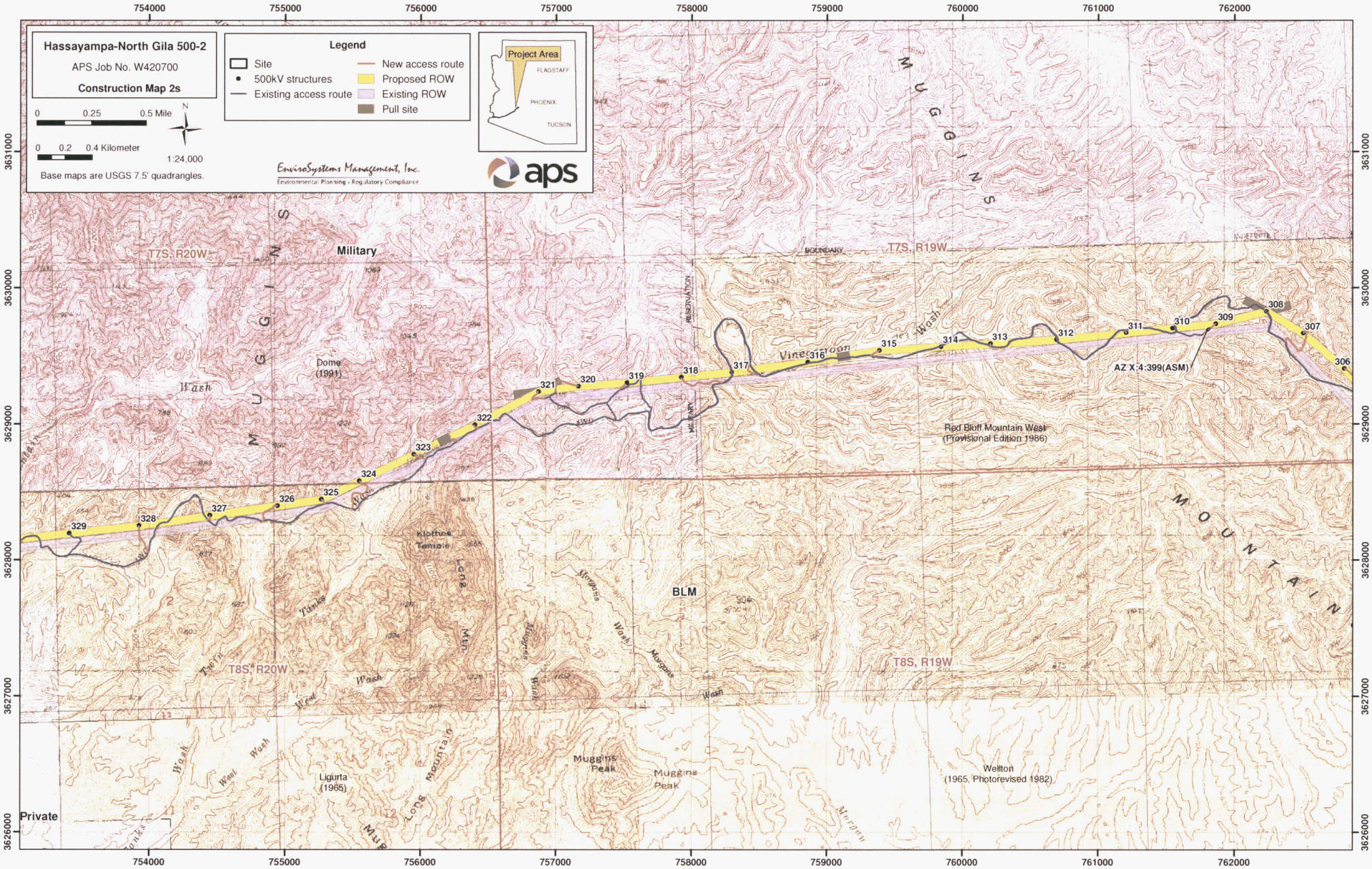
286
285
284
AZ X:4:399(ASM)
AZ X:4:1(ASM)
T7S, R19W
T7S, R18W
T8S, R19W
T8S, R18W
Red Bluff Mountain West
(provisional edition 1986)
Red Bluff Mountain East
(provisional edition 1986)
MOUNTAINS
MUGGINS MOUNTAINS
PROVING GROUND
YUMA PROVING GROUND
BLM
Wellton
(1965, photorevised 1982)
Wellton Mesa
(1965, photorevised 1982)
Wellton Fly Yard
Alternative Wellton
Material Yard
Private
BOR
BOR


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2r2
Legend
Existing access route
Material/Fly yard
Project Area
FLAGSTAFF
PHOENIX
TUCSON
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
N
Base maps are USGS 7.5' quadrangles.
aps
EnviroSystems Management, Inc.
Environmental Planning - Regulatory Compliance
Wellton Fly Yard
Alternate Wellton Material Yard
Wellton
(1965, photorevised 1982)
Wellton Mesa
(1965, photorevised 1982)
T8S, R19W
T8S, R18W
BLM
BOR
State Trust
Private
PROVING GROUND
MOUNTAINS
GILA RIVER
MILITARY RESERVATION
BOUNDARY
8TH STREET
AVENUE
COYOTE WASH
MOHAWK
MAIN CHANNEL
764000
765000
766000
767000
768000
769000
770000
771000
772000
773000
3626000
3625000
3624000
3623000
3622000
3621000


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2s
0 0.25 0.5 Mile
0 0.2 0.4 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
Legend
Site
500kV structures
Existing access route
New access route
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning - Regulatory Compliance
aps
754000
755000
756000
757000
758000
759000
760000
761000
762000
3631000
3630000
3629000
3628000
3627000
3626000
MUGGINS
MOUNTAIN
T7S, R20W
T7S, R19W
T8S, R20W
T8S, R19W
Military
Dome
(1991)
Vineyard
Wash
Red Bluff Mountain West
(Provisional Edition 1986)
AZ X:4:399(ASM)
Klothos
Temple
BLM
Muggins
Peak
Wellton
(1965, Photorevised 1982)
Ligurta
(1965)
Private
306
307
308
309
310
311
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315
316
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318
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323
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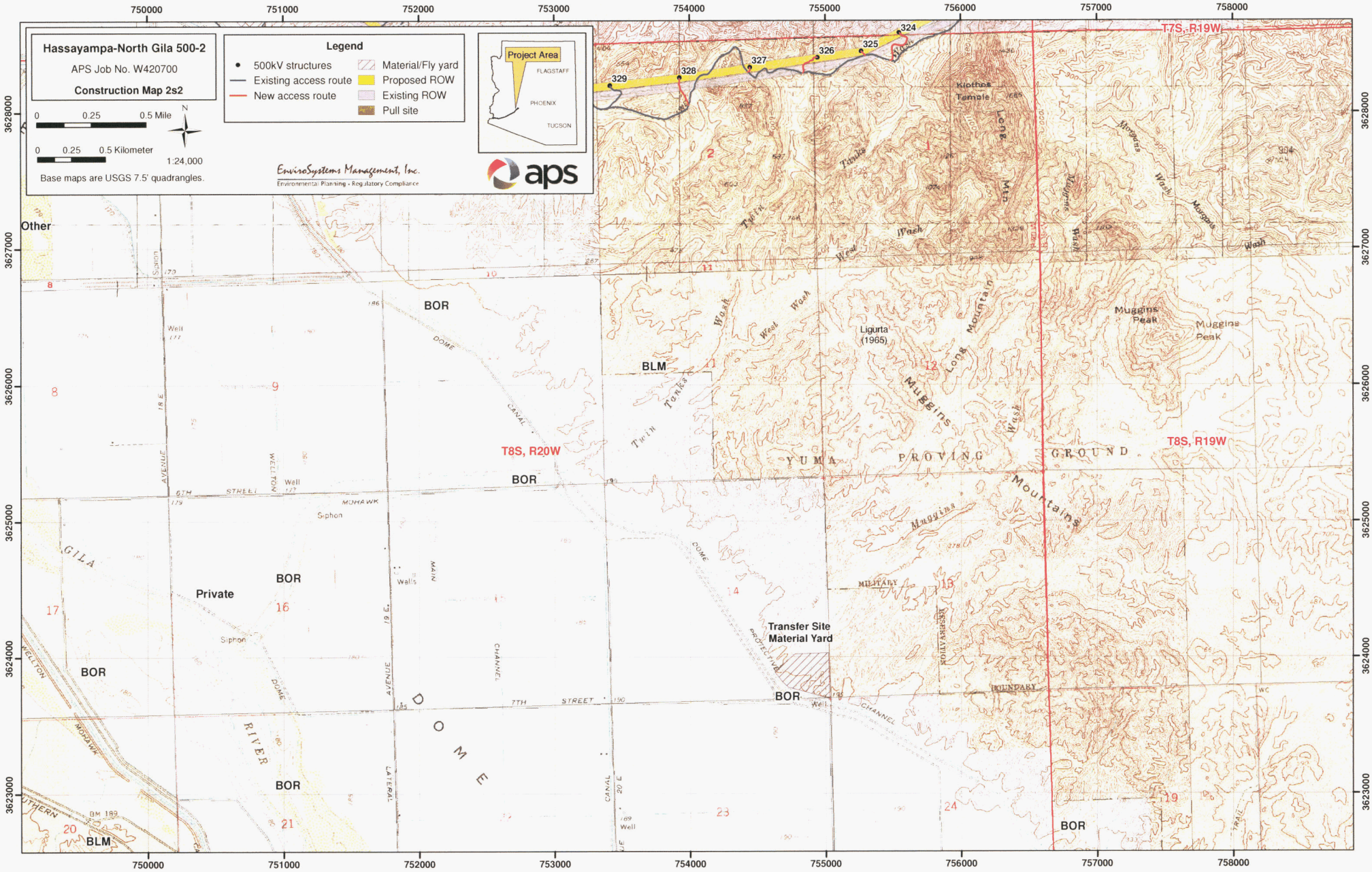
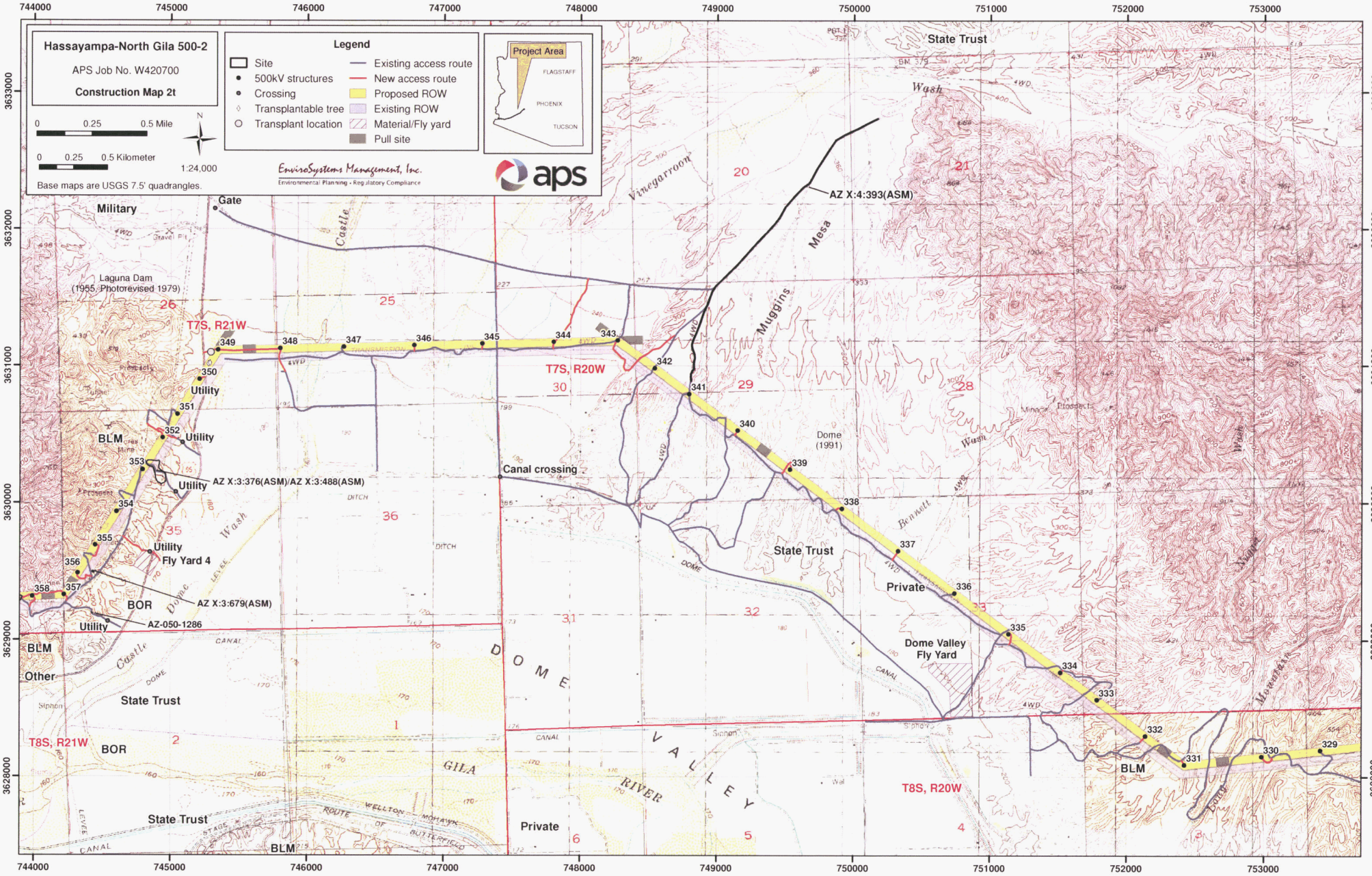
328
329


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2s2
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
500kV structures
Existing access route
New access route
Material/Fly yard
Proposed ROW
Existing ROW
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
329
328
327
326
325
324
T7S, R19W
T8S, R20W
T8S, R19W
Other
BOR
BLM
Private
Transfer Site
Material Yard
YUMA PROVING GROUND
Muggins Peak
Ligurta (1965)
Kiothos Temple
GILA RIVER
DOME
750000
751000
752000
753000
754000
755000
756000
757000
758000
3628000
3627000
3626000
3625000
3624000
3623000


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2t
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
Legend
Site
500kV structures
Crossing
Transplantable tree
Transplant location
Existing access route
New access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
744000
745000
746000
747000
748000
749000
750000
751000
752000
753000
3633000
3632000
3631000
3630000
3629000
3628000
Military
Gate
Laguna Dam
(1955, Photorevised 1979)
T7S, R21W
T7S, R20W
T8S, R21W
T8S, R20W
Utility
BLM
AZ X:3:376(ASM)/AZ X:3:488(ASM)
Fly Yard 4
BOR
AZ X:3:679(ASM)
AZ-050-1286
Other
State Trust
Canal crossing
AZ X:4:393(ASM)
Vinegarroon
Mesa
Muggins
Dome
(1991)
Private
Dome Valley
Fly Yard
DOME VALLEY
GILA RIVER
Castle
Wash
Benault
Mountain
Gravel Pit
Prospects
Mine
DITCH
CANAL
LEVEE
DOME
Siphon
ROUTE OF WELLTON MOHAWK BUTTERFIELD STAGE
349
348
347
346
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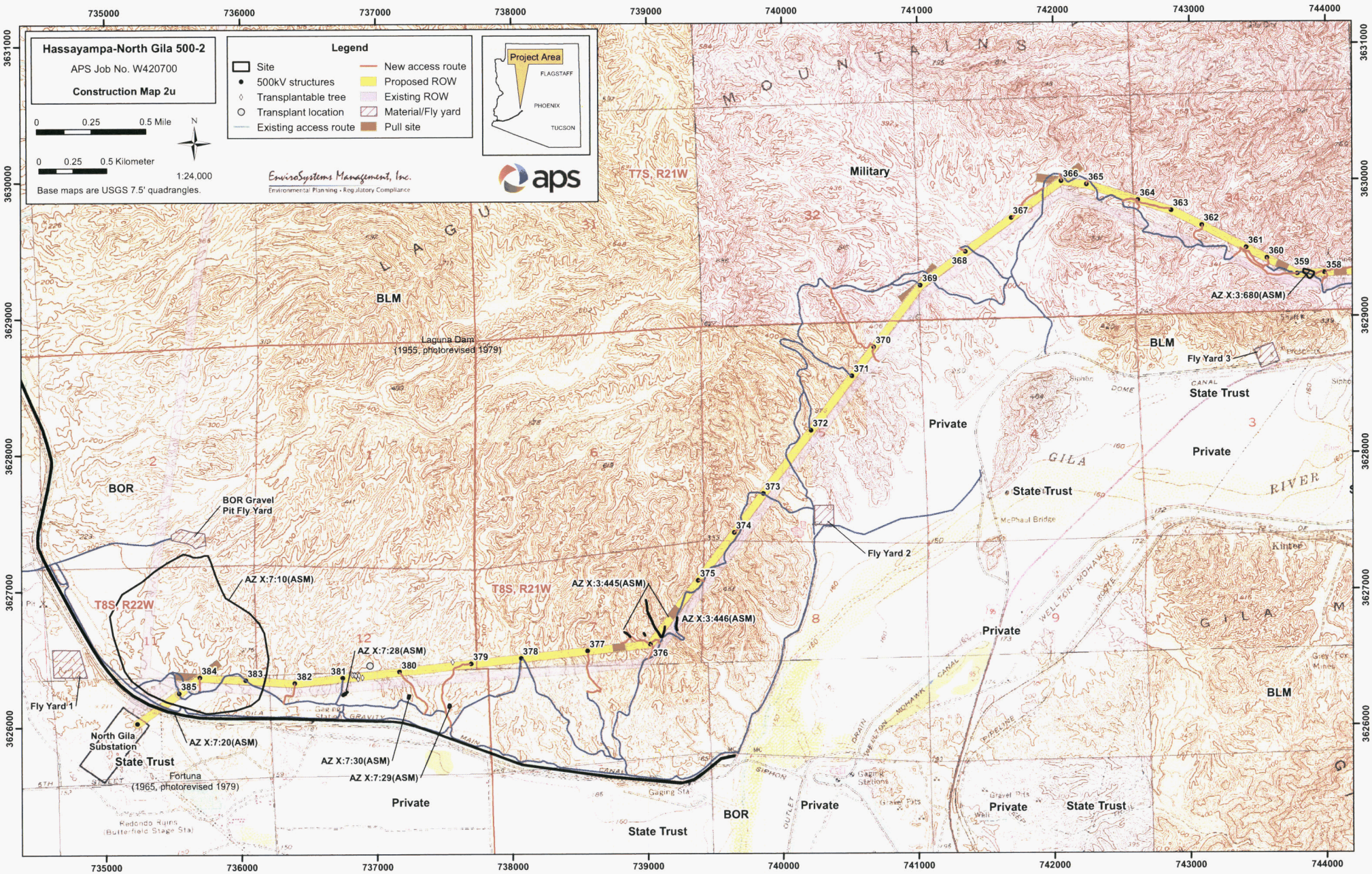
Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2u
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
Legend
Site
500kV structures
Transplantable tree
Transplant location
Existing access route
New access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
735000
736000
737000
738000
739000
740000
741000
742000
743000
744000
3631000
3630000
3629000
3628000
3627000
3626000
T7S, R21W
T8S, R21W
T8S, R22W
Military
BLM
BOR
Private
State Trust
Laguna Dam
(1955, photorevised 1979)
Fortuna
(1965, photorevised 1979)
Redondo Ruins
(Butterfield Stage Sta)
North Gila Substation
BOR Gravel Pit Fly Yard
Fly Yard 1
Fly Yard 2
Fly Yard 3
AZ X:7:20(ASM)
AZ X:7:10(ASM)
AZ X:7:28(ASM)
AZ X:7:30(ASM)
AZ X:7:29(ASM)
AZ X:3:445(ASM)
AZ X:3:446(ASM)
AZ X:3:680(ASM)
358
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365
366
367
368
369
370
371
372
373
374
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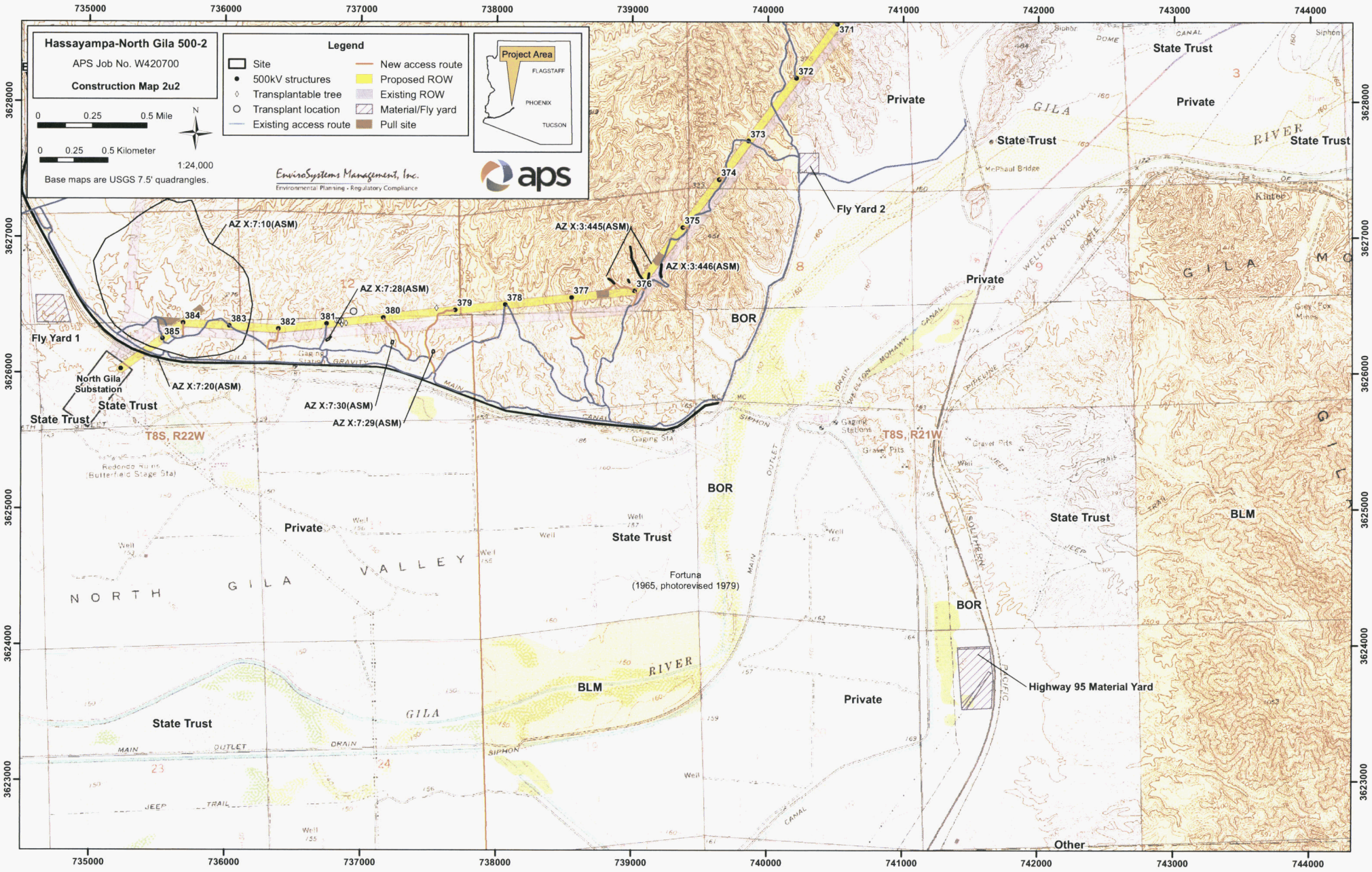
382
383
384
385
McPhaul Bridge
Kinter
Gaging Sta
Gaging Stations
Gravel Pits
Well
Grey Fox Mines
GILA RIVER
GILA MOUNTAINS
LAGUNA
WELLTON-MOHAWK CANAL
WELLTON-MOHAWK DRAIN
WELLTON-MOHAWK PIPELINE
GILA GRAVITY MAIN CANAL
SIPHON
OUTLET
DOME
CANAL
Siphon


Hassayampa-North Gila 500-2
APS Job No. W420700
Construction Map 2u2
0 0.25 0.5 Mile
0 0.25 0.5 Kilometer
1:24,000
Base maps are USGS 7.5' quadrangles.
N
Legend
Site
500kV structures
Transplantable tree
Transplant location
Existing access route
New access route
Proposed ROW
Existing ROW
Material/Fly yard
Pull site
Project Area
FLAGSTAFF
PHOENIX
TUCSON
EnviroSystems Management, Inc.
Environmental Planning • Regulatory Compliance
aps
735000
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737000
738000
739000
740000
741000
742000
743000
744000
3628000
3627000
3626000
3625000
3624000
3623000
371
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380
381
382
383
384
385
AZ X:7:10(ASM)
AZ X:7:28(ASM)
AZ X:3:445(ASM)
AZ X:3:446(ASM)
AZ X:7:20(ASM)
AZ X:7:30(ASM)
AZ X:7:29(ASM)
Fly Yard 1
Fly Yard 2
North Gila Substation
State Trust
Private
BOR
BLM
Other
Highway 95 Material Yard
T8S, R22W
T8S, R21W
NORTH GILA VALLEY
GILA RIVER
Fortuna
(1965, photorevised 1979)
McPhaul Bridge
Kinter
Gaging Stations
Gravel Pits
Redondo Ruins
(Butterfield Stage Sta)
Gaging Sta
Well
MAIN OUTLET DRAIN
SIPHON
CANAL
JEEP TRAIL
WELLTON-MOHAWK CANAL
SOUTHERN PACIFIC